



TRU-GRINDTM

Tool Sharpening System

USA Patent No. US 6,935,937 B2
NZ Patent Appl. No. 521080

The Woodcut **Tru-Grind** sharpening system will enable you to sharpen all your woodturning tools, with only one jig:

- **Bowl Gouges**
- **Fingernail Gouges**
- **Scrapers**
- **Skew Chisels**
- **Parting Tools**



Woodcut Tools Limited

Haumoana, Hawkes Bay, New Zealand

Phone + 64 (06) 875 1066

e-mail: sales@woodcut-tools.com

www.woodcut-tools.com

SETTING UP THE TRU-GRIND SHARPENING SYSTEM

Open the box and identify all the parts: the **Base-slide**, **3 screws** for securing the Base-slide, the **Tool-holder**, **Instruction booklet**, **Video CD**, and **Short Steel Rod**.

Watch the video first then prepare to set up the unit on a wooden base or direct to your workbench. You will need a screwdriver, square, pencil and ruler to do the job.

In the course of this setup you may be able to create, or improve on, some important features of your tool sharpening. Notably: the height of your grinder above the floor; integration of a tool protrusion setting block with the grinder base block; a better grindstone.

It is important that your grinder is at a comfortable height. We recommend the centre of the grinding wheel be at approximately the same height as your lathe spindle.

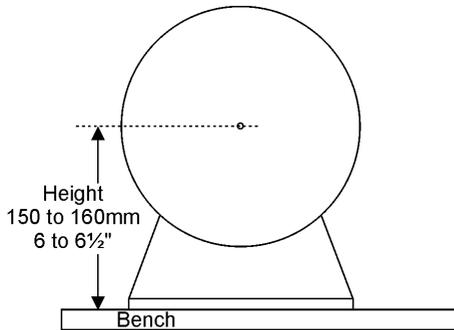
Mount your grinder securely on a flat bench or table. It is best if the height from the bench, and thus the foot of the Base-slide, to the centre of the wheel is 150 to 160mm (6-6½ inches).

Next set your Tru-Grind base unit below the grinding wheel. Align the pivot points as close as possible to the center line of the grinding wheel. For 6" (150mm) wheels align the rear edge of the Tru-Grind base plate with the centre line of the grinder. For 8" (200mm) grinders bring the base plate forward to about ¾" (20mm) from the centre line of the grinder. Once you have achieved this, mark and drill the holes for the Base-slide and affix the screws firmly.

You may have to remove the manufacturers tool rest from the grinder if this obstructs use of the Tru-Grind system. If you would like to have continuing use of a simple toolrest at the grinder then you can add a Woodcut Sturdy Rest (see page 16) to your Tru-Grind.

Add a stopper of hard wood along part of the front edge of the base board or your bench 50mm (2") back from the edge of the base board or bench. This is for consistently setting the same tool protrusion from the Tru-Grind Tool holder.

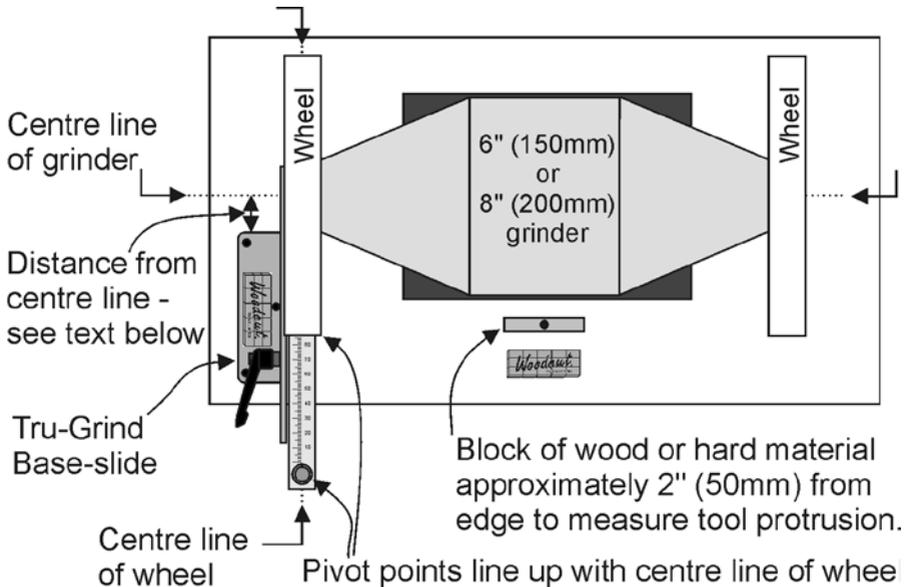
Grinder Height



Height from the bench to the centre of wheel should be 150 - 160mm (6-6½") for both 150mm (6") and 200mm (8") grinders.

It may be necessary to place a packer under the mounting base of the grinder or under the Tru-Grind Base-slide to get the height correct.

Grinder Layout



Set up the Tru-Grind and grinder on your bench as above with centre of the pivot points aligned with the centre line of the wheel.

Stopper for Chisel Protrusion

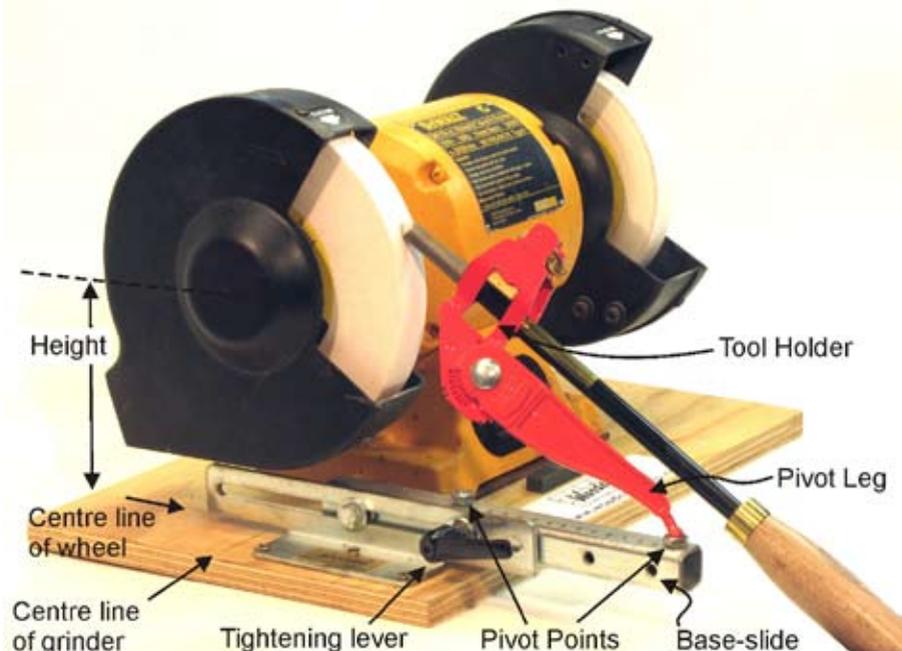
Fix a stopper of hard wood along part of the front edge of the base board or your bench. This is 50mm (2") back from the edge of the base board or bench. This stopper will be chipped away with repeated use so make it easy to replace.



INTRODUCTION

Your Woodcut Tru-Grind system is designed to enable woodturners to repeatedly grind perfect bevels on all types of bowl gouges, spindle gouges, roughing gouges, skews, and scrapers. Once the Base-slide is set up as described, grinding a perfect bevel on a tool is very easy and you will be able to repeat this perfect bevel every time you re-sharpen the tool.

The hollow ground bevel also gives you the ability to hone the edge easily, and get it very sharp. Such a truly sharp tool will enable you to turn wood to a finish so smooth that even the end grain requires no sanding.



Wheel Dressing

Dress your grinding wheels whenever they appear dirty or are unevenly worn.

If grinding wheels are not trued and dressed (cleaned) they will cease to sharpen and will overheat and burn the tools. The Woodcut T-Bar dresser covers the complete wheel face to give you an even flat surface.

If you have removed the regular tool rest from the grinder to fit the Tru-Grind system then support the T-Bar Dresser on a piece of wood resting on the grinder frame.



SHARPENING INSTRUCTIONS

Grinding grit can damage your eyesight. Make sure you are wearing **approved safety glasses** before starting your grinder.

Basic steps with Tru-Grind sharpening

These are the basic adjustments to be made when sharpening all woodturning tools with the Tru-Grind jig:

1. Tool Protrusion - In the setup instructions, we suggested you screw a block to your bench, approximately 2 inches (50mm) from the edge, which you use to set the protrusion of the chisel end from the Tru-Grind Toolholder. This setting must be consistent every time you grind the tool.

2. The position of the Toolholder Pivot Leg determines the style of grind. Use position 1 for grinding standard traditional bowl gouges and roughing gouges. This will give a bevel angle which is similar on the sides and on the nose. The greater angle that you adjust the Pivot Leg to the Toolholder head (or the greater the number), the more will be the difference in bevel angle between the nose and the sides of the tool, and the further back you will grind the sides of the gouge, i.e. increasing the length of the fingernail.

You may need to find the closest setting notch to the previous angle and re-grind your gouge so that this setting can be used for future re-grinds.

Position 9, with the Pivot Leg pushed all the way forward, is used for grinding scrapers and ring tools.

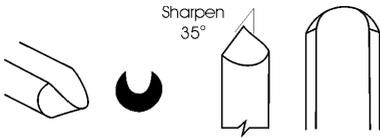
3. Adjust the Base-slide. After steps 1 and 2 above are set, you must adjust the Base-slide in or out to get the desired angle of your bevel, particularly on the nose of the chisel.

4. Record the setting. For each chisel write down, or record in some other way, the angle setting of the Toolholder and extension of the Base-slide.

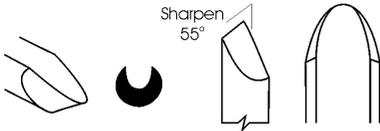
Aids to Sharpening. As the grindstone will wear and result in your recorded Base-slide positions being erroneous, make or obtain a jig which will repeatedly and accurately set the distance between the grindstone and the pivot point on the Base-slide.

To have a good example of a standard grind to refer to, obtain the Woodcut Tru-Grind Profiler.

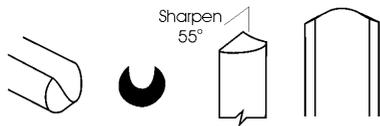
SUGGESTED SHARPENING ANGLES FOR COMMONLY USED TOOLS



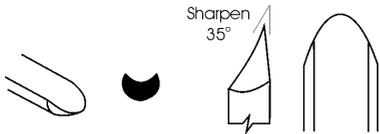
Traditional bowl gouge. Used on its side with the flute facing in the direction of the cut. With the bevel rubbing for a smooth finish even on end grain. Usually 10 to 15mm wide.



Fingernail or Celtic Grind bowl gouge. Used on its side with the flute facing in the direction of the cut. With the bevel rubbing for a smooth finish even on end grain. Usually 10 to 15mm wide.



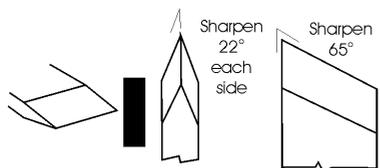
Bowl bottom gouge. Used on its side with the flute facing in the direction of the cut. Intended for use in the bottom of bowls. Usually 10 to 15mm wide.



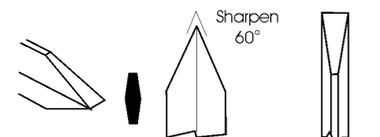
Spindle or Detail gouge. The main shaping tools of the spindle turner. Used for detail work, beads, coves, and ogees, to which the modern round shape is particularly suited. 5 to 15mm wide.



Spindle Roughing gouge. An essential tool for between-centre work (spindle turning). This tool quickly reduces square timber to the round. Also ideal for long, shallow curves. Usually 25mm wide.



Skew Chisel. The skew will produce the finest possible finish when used correctly. For cleaning end grain, pommels, rolling beads, etc. when both long point and heel can be used. 15 - 50mm wide.



Diamond parting tool. An excellent all round parting tool. The double taper provides clearance along the sides of the tool to prevent excess binding while cutting.

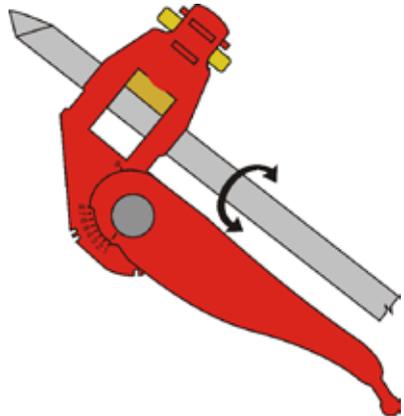
Standard Traditional Bowl Gouge

Fit the bowl gouge into the Toolholder.
Tighten it down so it is firm and straight.
We suggest approximately 2 inches or 50mm of tool protruding from the front of the Toolholder body. This protrusion must be the same each time you grind.



Next adjust the pivot leg until it is parallel with the handle of the bowl gouge (position #1 on the Toolholder). Fit the pivot ball at the bottom of the leg into the rear pivot point on the base slide. Move the Base-slide in or out until the correct bevel angle is achieved. We set the bevel angle of our traditional gouges at 35 degrees. This angle can be checked with a Woodcut Tri-gauge.

Hold the Tru-Grind Tool Holder comfortably in your hands. Locate the ball foot of the Tool Holder in the Pivot Point. Apply the chisel to the grinding wheel and rotate it from side to side. Recheck your angle. Now continue to grind until you have a sharp edge. With this system you may grind all of the gouge at one time or you may grind the sides or the nose or whatever area you need to. When reshaping a badly ground gouge, work on the sides only, until they are correct, and then blend the nose to match.



It is important that the pivot leg angle is the same every time. So once you have decided on which angle to use, mark the number on the handle of the tool for next time. It is important to use the same settings to get a consistent regrind.

If a long-fluted gouge is slim or won't align true in the Toolholder then insert the Short Steel Rod supplied under the clamp block "V" and into the flute of the gouge. Tighten as normal.



Fingernail or Celtic Grind Bowl Gouge

This style of gouge has the sides of the tip ground back. To achieve this you need to adjust the pivot leg on the Tool Holder forward to between positions #4 and #8. The higher the number, the more the wings or sides will be ground back. Take note of the number setting you have chosen. This can be written on the wooden handle of the gouge to help you repeat the same grind.

The flute shape should be parabolic or "U" shaped to achieve a good Celtic or Fingernail grind.



Spindle Gouge

This style of gouge has the sides of the tip ground back. To achieve this you need to adjust the pivot leg on the Toolholder forward to between positions #4 and #8.

The higher the number, the more the wings or sides will be ground back. Take note of the number setting you have chosen. This can be written on the wooden handle of the gouge to help you repeat the same grind.

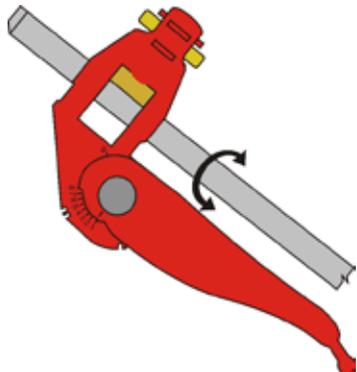


Spindle Roughing Gouge

Roughing Gouges should be sharpened with the Pivot Leg at position # 1 and at a bevel angle of 45 degrees.

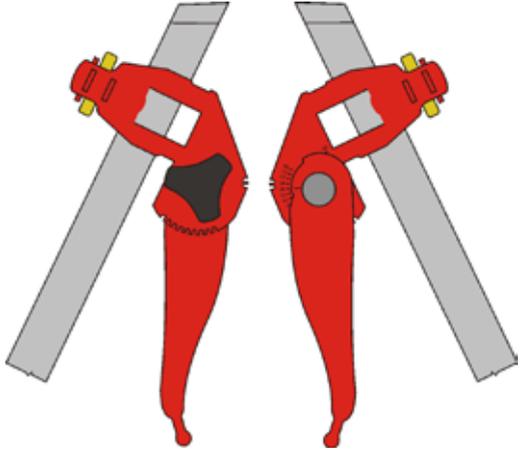
This will result in a finer edge towards the wings of the gouge than at the centre, but the tool will operate just as well as one with exactly 45 degrees across the whole edge.

The end of a Spindle Roughing Gouge should be straight across - no grinding back of the wings.



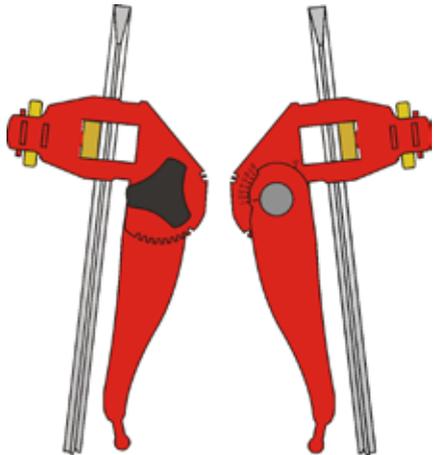
Skew Chisel

Place your skew chisel into the Tru-Grind Toolholder with the blade vertical and the point at the bottom. Adjust the protrusion to 2 inches or 50mm from the toolholder body and clamp it down firmly. Put the pivot leg into the rear base pivot position and lay the body on its side. Adjust the Toolholder leg angle until the cutting edge is horizontal with the face of the wheel. Then lay it on the wheel and adjust the base slide until the bevel angle is correct - we suggest 22 degrees. Start the grinder and commence sharpening. The more you move the skew from side to side, the more radiused will be the edge. The shape of this edge is a personal choice. Rotate the Toolholder to sharpen the other side.



Parting Tool

Place the tool in the Tru-Grind Toolholder horizontally with the same tool protrusion as other tools. Next lay the tool on the wheel and adjust the pivot leg until the point angle is approximately 35 degrees. Rotate the Toolholder to sharpen the other side.

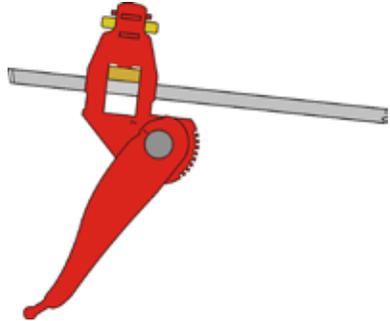


Traditional Scraper

Place the scraper in the Toolholder protruding as before and clamp tight. Next move the pivot leg forward as far as it will go i.e. position #9 (where it is level with the nose of the scraper). Place the pivot leg into the forward pivot position on the base slide. Move the base slide in or out to adjust the bevel angle as required (Generally around 55 degrees).

Apply the scraper to the wheel and rotate until your preferred shape is achieved.

This method can also be used to sharpen Ring Tools used for hollowing.



Negative-rake Scraper

A square-ended negative-rake scraper is sharpened like a skew, but usually with less angle to the cutting edge.

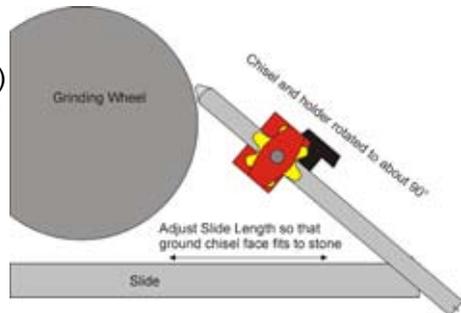
Negative-rake scrapers with an unequal and curved sharp edge need to be sharpened using a regular grinder tool rest or the Sturdy Rest on the Tru-Grind system.



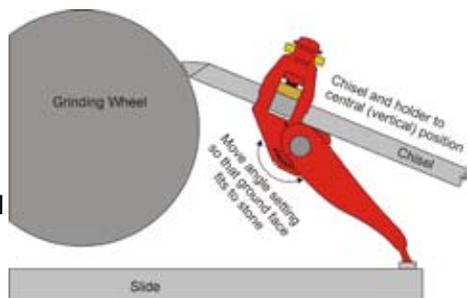
Sharpening your old grind or someone else's grind

Every now and then someone will come along and ask for an oddball woodturning chisel to be sharpened. Skews and parting tools are easy but gouges need a little more attention. A common different gouge grind is one with a greater sweep to the wings, sometimes it is a gouge with a small angle on the nose and greater angle on the wings, or maybe just one that is in between the “standards” previously mentioned.

First Setting: Fit the gouge into the Tru-grind Toolholder with a 50mm (2”) protrusion as you would for any other gouge. Loosen the Base-slide of the sharpening jig and put the foot of the toolholder into the Pivot Point at the end of the slide. Now, rotate the Toolholder until the chisel is around towards right angles to the stone, or the last bit of the ground face is still in contact with the stone. Shift the Base-slide in or out until that part of the face of the chisel is in contact with the stone so that the entire length of the face will be ground. Tighten the Base-slide Tightening lever.



Second Setting: Rotate the Toolholder and chisel back to a central (vertical) position. Change the tool holder head to leg angle until the nose of the chisel is in contact with the stone so that the entire length of the face will be ground. Tighten the nut.



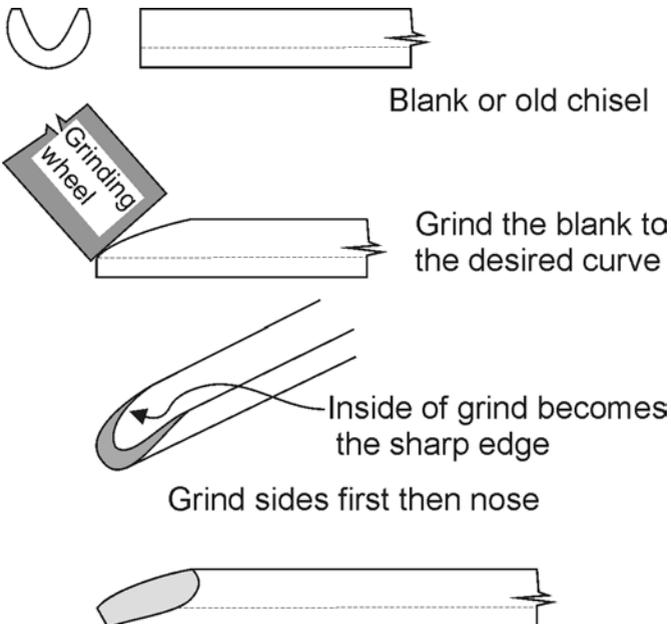
Return to the first setting to check that all is well.

Sharpen the chisel.

Re-shaping or maintaining the same shape?

If, before you commence sharpening, the shape of your gouge is grossly incorrect, you have various options to bring it back to a desired shape. This may be because you have purchased a new, unshaped, gouge or if, through repeated sharpening, the shape has changed from the original.

1. You can correct the shape on the wheel freehand.
2. Set the Tru-Grind to match the Woodcut “TruGrind Profiler” (see page 17) as a template or reference to reshape your gouge.
3. Set the Tru-Grind to match another chisel in your kit or a borrowed one.
4. Roughly shape a fingernail grind as in the drawing below before sharpening the gouge in the Tru-Grind jig.



CARE AND MAINTENANCE

Your Tru-Grind system and your grinding wheels need regular care and maintenance to get the best from them.

Really sharp tools cut the wood cleanly and efficiently and leave you with less time spent on sanding and general cleanup. To achieve this first address the set-up, (as outlined in the video) then the condition of the grinding wheels, followed by the shape and sharpness of the tools themselves.

We have designed the T-Bar Wheel Dresser to help you. This accessory will safely and easily true and dress the grinding wheel for you. When a new wheel is fitted it must first be carefully trued so it runs smoothly then periodically cleaned (dressed) each time it gets dirty or dull using the T-Bar dresser. If the wheel gets dull it will cause friction and overheat the tools causing them to go blue and burn.

We don't recommend you quench your high speed steel tips in water for cooling during grinding because the shock can lead to shrinkage at the fine tip and develop fine cracks as a result. It is better to leave the tool to cool naturally.

Maintenance of your Tru-Grind is minimal but important. Grinding grit will work its way down into the base slide and into the main thread of the Toolholder to cause binding. The simplest way to clean this is with a compressed air gun to blow the grit away. Alternatively dismantle the slide from time to time and clean with a cloth and re-assemble.

Apart from these simple considerations no further maintenance will be required. Any spare parts can be supplied direct from the factory.

Which size stone?

This is about the curve the grinder puts into the face of the chisel; mostly bowl gouges and skews. There are three reasonably available options: the 6" stone; 8" stone; and a flat device such as a belt or disc sander.

A bowl maker should be rubbing the bevel of the bowl gouge around both the outside and the inside of the bowl. The curve in the chisel face created by a 6" grinder makes that chisel a neat fit on the outside of a small bowl, not so good on a large bowl, and likely to dig-in on the inside curve of a bowl. Some bowl makers have a gouge ground with a double bevel for the inside of bowls. A gouge sharpened on an 8" grinder will be fine on the outside and less catchy on the inside of the bowl. A compromise may be the flat grind but then it is not as easy to rub the bevel on the outside.

The skew is good for straight spindle turning, slight coves, and beads and spheres. Here the curve on the face of the skew from a 6" grind may be fine for beads and spheres but when it comes to a nice straight cut that curve may be too great and the skew tends to dig in. That suggests that a flat grind will be best for a skew, but it is very difficult to rub the bevel on a large bead or sphere when the steel behind the cutting edge of the chisel is perfectly flat. Thus the 8" grind seems to be a good compromise.

If you wish to use a flat grinder then take care to get a true flat grind. The abrasive belt or disk will form a little wave in front of the cutting edge of the chisel and thus give you a rounded sharpen instead of the flat you desire.

What sort of stone? There are many stones available, yet they are often not easy to find. You will need to hunt but the reward of having a good stone is worth it – you will be using it for many years.

White aluminium oxide stones will be the easiest to find. Eighty grit is fine for the average hobby woodturner. The finer 120 grit does give a better edge but has the downside of the stone clogging more and thus needing dressing more often. Norton make a blue 'Seeded Gel' or SG stone as their premier stone for the grinding of hard metals such as high speed steel. The finest grit rating of these wheels is 80 but that is said to give a far better grind on woodturning chisels than other stones. Diamond coated wheels are available but manufacturers of pure diamond coatings do not advise their use for high speed steel. Diamond CBN (Cubic Boron Nitride) Sharpening Wheels, commonly referred to as CBN Wheels, will create a superior sharp edge but are difficult to purchase in a size useful for woodturning chisels.

ABOUT GRINDSTONES

Grinding Wheels for High Speed Steel

Most suppliers of turning tools and accessories carry regular white aluminium oxide grinding wheels suitable for sharpening high speed steel tools.

A diamond wheel dresser (such as the Woodcut T-Bar dresser) will clean and remove steel particles from the wheel and expose fresh sharp wheel particles for efficient sharpening.



Honing

All of the bevels created on round grindstones are hollow ground and lend themselves to honing with regular hand-held stones or a small diamond hone. These work very quickly to produce a sharp edge and can be used until the hollow grind is reduced in size.

By contacting the heel and the edge with the hone, it is easy to produce an evenly honed edge. Since the sharpness of an edge depends on the smoothness of two surfaces, the honed bevel and the flute, it's necessary to hone the flute with a slipstone. The slipstone should lay flat against the flute. Don't be tempted to use the slipstone too aggressively near the edge causing a rounding-over and increasing the included angle between the bevel and the flute. A well honed edge will cut cleaner and faster than one just off a grinding wheel. Using a hone can also extend the period between grinds considerably.

OPTIONAL ATTACHMENTS

STURDY REST AND BASE SLIDE. Codes: SRS-LH & SRS-RH

Available for left and right wheels.

The answer to the problem of flimsy and difficult to adjust grinder tool rests. Woodcut's STURDY REST is made from thick plate steel to eliminate flexing and can be easily attached to your Tru-Grind Base-slide.



STURDY REST

Codes: PVS-LH and PVS-RH

The Sturdy Rest without the Base Slide.
Available Left or Right.

EXTRA BASE SLIDE.

Codes: TRUB-LH and TRUB-RH

Available Left & Right.



EXTRA TOOL HOLDER.

Code: SCRTH

T-BAR DIAMOND WHEEL DRESSER

Code: T-BAR

Essential for maintaining your grinding wheels.



WOODCUT TOOLS.... DESIGNED BY WOODTURNERS FOR WOODTURNERS

TRU-GRIND PROFILER Code: TRPR

A reference for reshaping gouge shapes to the correct profile. Can be used as a visual reference, or put into the Tru-Grind Toolholder for adjustment to match the same shape as the profiler, before replacing with your gouge for grinding to the same shape.

**TRI-GAUGE** Code: TRIG

For accurate sharpening angles for all woodturning tools.

**STEM SHARPENER**

Code: STEM

For quick and easy sharpening of Cup Cutters and Scraper Blades

**TOOL HOLDER** Code: SCRTH

To hold and sharpen Woodcut Powerheads, Shepid Cutters & small 1/4" square shaft cutters.

**BASE BOARD** Code: TRBBD

For mounting your grinder and the total Tru-Grind System.



Other Side Base-slide Assembly

The Base-slide is made to fit on either side of the grinder but may be supplied to fit the wrong side for your preference on your grinder.

If you prefer to use the other side simply take the assembly apart and re-assemble it. The picture below shows the parts. Assemble it for the other side. Then mount it under the wheel in the same manner as instructed for the original fitting making sure that the pivot points are in line with the centre line of the grinding wheel.





The Ultimate Sharpening Centre

This will incorporate a Base-slide under each wheel. One side for shaping using a 60 or 80 grit wheel and the other side for finishing using a 120 grit or finer wheel.

GENERAL SAFETY RULES – Warning! Failure to follow these rules may result in serious personal injury.

- 1. FOR YOUR OWN SAFETY, READ THE MANUAL BEFORE OPERATING THE TOOL.** Learn the machine's application and limitations plus the specific hazards peculiar to it.
- 2. ALWAYS USE SAFETY GLASSES – FULL FACEMASK strongly recommended.** Safety glasses (must comply with ANSI STANDARD Z87.1 USA) Everyday eye glasses usually are only impact resistant; they are not safety glasses. Also use face or dust mask if cutting operation is dusty.
- 3. WEAR PROPER APPAREL.** Do not wear loose clothing, gloves, neckties, rings, bracelets or other jewellery, which may get caught in moving parts. Non-slip footwear is recommended. Wear protective hair covering to contain long hair.
- 4. USE EAR PROTECTORS.** Use earmuffs for extended period of operation. Use muffs rated to 103 DBA LEQ (8 hr).
- 5. DON'T USE IN DANGEROUS ENVIRONMENT.** Don't use power tools in damp or wet locations, or expose them to rain. Keep work area well lighted.
- 6. KEEP WORK AREA CLEAN.** Cluttered areas and benches invite accidents. Build up of sawdust is a fire hazard.
- 7. KEEP CHILDREN AND VISITORS AWAY.** All children, infirm and visitors should be kept a safe distance from work area.
- 8. MAKE WORKSHOP CHILDPROOF** with locks, master switches, or by removing starter keys.
- 9. GROUND ALL TOOLS.** If the tool is equipped with a three-prong plug, it should be plugged into a three hole electrical receptacle. If an adapter is used to accommodate a two-prong receptacle, the adapter lug must be attached to a known ground. Never remove the third prong.
- 10. MAKE SURE TOOL IS DISCONNECTED FROM POWER SUPPLY** while the motor is being mounted, connected or reconnected.
- 11. DISCONNECT TOOLS from wall socket** before servicing and when changing accessories such as blades, bits, cutters and fuses.
- 12. AVOID ACCIDENTAL STARTING.** Make sure switch is in the Off position before plugging in power cord.
- 13. NEVER LEAVE MACHINE RUNNING UNATTENDED.** Do not leave tool unless it is turned off and has come to a complete stop.
- 14. KEEP GUARDS IN PLACE** and in working order.
- 15. USE RIGHT TOOL.** Do not use a tool or attachment to do a job for which it was not designed.
- 16. USE RECOMMENDED ACCESSORIES.** The use of improper accessories may cause hazards.
- 17. DON'T FORCE TOOL.** It will do the job better and be safer at the rate for which it was designed.
- 18. MAINTAIN TOOLS IN TOP CONDITION.** Keep tools sharp and clean for best and safest performance. Follow instructions for lubricating and changing accessories.
- 19. NEVER STAND ON TOOL.** Serious injury could occur if the tool is tipped or if the cutting tool is accidentally contacted.
- 20. REMOVE ADJUSTING KEYS AND WRENCHES.** Form a habit of checking to see that keys and adjusting wrenches are removed from tool before turning it on.
- 21. DON'T OVERREACH.** Keep proper footing and balance at all times.
- 22. DIRECTION OF FEED.** Feed work into a blade or cutter against the direction of rotation or the blade or cutter only.
- 23. ATTENTION TO WORK.** Concentrate on your work. If you become tired or frustrated, leave it for awhile and rest.
- 24. SECURE WORK.** Use clamps or a vice to hold work when practical. It's safer than using your hand and frees both hands to operate tool.
- 25. CHECK DAMAGED PARTS.** Before further use of the tool, any part that is damaged should be carefully checked to ensure that it will operate properly and perform its intended function. Check for alignment of moving parts, binding of moving parts, mounting, and any other conditions that may affect its operation. Any damaged part should be properly repaired or replaced.
- 26. DRUGS, ALCOHOL, MEDICATION.** Do not operate tool while under the influence of drugs, alcohol or any medication.
- 27. DUST WARNING.** The dust generated by certain woods and wood products can be harmful to your health. Always operate machinery in well ventilated areas and provide for proper dust removal. Use wood dust collection systems whenever possible.

WARRANTY TERMS

We are committed to our products and customers and guarantee our tools against faulty workmanship and faulty materials for twelve months. Fair wear and tear excluded. We will replace or repair any tool returned to the supplier or factory free of charge. Freight to and from the factory will be at the expense of the purchaser.

Woodcut Tools Limited

Haumoana, Hawkes Bay, New Zealand

Phone + 64 (06) 875 1066

e-mail: sales@woodcut-tools.com

www.woodcut-tools.com