

# Notes from the Shopsmith Woodworking Academy

## *Clean Cuts* — PART 2 – LATHE TOOL SHARPENING

As a rule, when a brand-new set of lathe chisels arrives in a woodworker's shop, both experienced turners and novices alike can't resist taking a minute, just to look at them. But, while a novice may merely gaze in unfocused wonderment at the unspoiled ash handles and the beauty of the satin sheen on the steel, the "old hand" peers critically and carefully at the thickness of the steel, the length of the handles, and...the *cutting edges* of the tools.



Why? Because it's that tiny portion of the chisels that holds the true key to producing "happy results" in lathe turning. But it isn't merely the sharpness of the edge that dictates the results you achieve...the angle, length and thickness of the *bevel* is equally important to your success. But which bevel works best?

**A Shorter Bevel:** Most full-size, standard lathe chisel sets come from the factory with a 45-degree bevel. This provides a lot of steel back-up for the cutting edge. As a result, it's a strong, long-lasting bevel for a utility turning tool that can be used for *scraping* – a technique that centers a lot of stress on the tool's edge.



**A Longer Bevel:** Many "Master Turners" typically prefer a 30-degree to 35-degree bevel for *shearing*. This longer bevel helps them get a better approach to the workpiece and provides easier control of the cutting tool. Even though the cutting edge isn't as durable (because there's less steel backing-up the edge), it will hold a sharp edge well when it's used for this more subtle kind of work. It is important to note, however, that if you use a tool with a longer bevel to scrape, it will dull quickly. A Bevel Sharpening Gauge is a handy tool for helping you judge the proper angle when grinding and/or honing chisel edges.

**Flat Or Hollow Ground?:** Although you have a number of choices on how to grind the bevel you want, the bevel on a lathe tool is almost always ground *flat*. Lathe chisels with *hollow ground* edges are available for special techniques, but again, a flat bevel is tougher and longer lasting if you're using a *scraping* technique, like most turners.



**Benchstones Or Machine Grinding?:** You can use an ordinary benchstone to grind your chisels. To save "elbow grease", start with a coarse stone such as silicon-carbide, aluminum-oxide, India or a coarse Oriental waterstone...then switch to a fine grit Arkansas, waterstone or diamond stone for the finishing touches. It may take some effort, but it will also help you avoid overheating the steel and drawing the temper out of the edge.

Machine grinding is another option. There are three ways of doing this with the Shopsmith Woodworking System.

**The Disc Sander:** The first and perhaps easiest of these is to use the Disc Sander on your Shopsmith MARK V, in conjunction with....

**...Shopsmith's Sharpening Guide** This special device mounts easily to your MARK V's Extension Table with two screws. A template is provided for locating the mounting holes. Once mounted, it can be quickly set to grind your chisels to nine different angles for shearing or scraping...from 25-degrees to 65-degrees in 5-degree increments (See Fig 1).

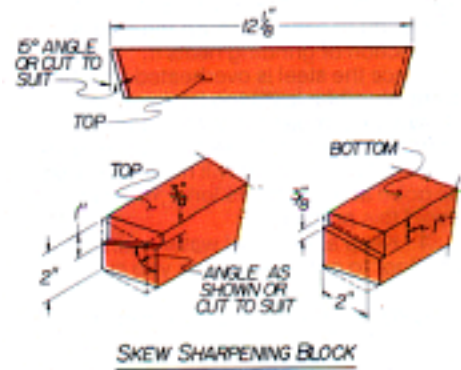


**Fig. 1**

As with any type of machine sharpening, it's important that you be careful not to overheat the steel of the chisel during sharpening, as this will draw the temper out of the edge. Once the edge turns blue/black, it's too late. The steel will be permanently softened ...and that means that it will no longer hold as good an edge for as long. Here are three ways to prevent this problem:

- 1: Keep a bucket of water nearby on the floor to cool the steel as you sharpen it, dipping your chisel into it frequently.
- 2: Always use a medium or coarse grit Sanding Disc at the slowest RPM.
- 3: Lessen the pressure and actual time of the grinding as you work the bevel down to the cutting edge of the steel. Some craftsmen avoid grinding to the extreme edge, choosing instead to hone it with a benchstone only.

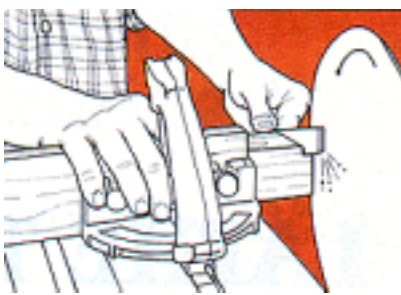
If you'd prefer to try and make your own shop-built Jig, just follow the plans shown in Figure 2. The dimensions on the example Jig are for grinding a 30-degree cutting edge (15-degrees on each side of the bevel) with a 15-degree Skew angle. You'll have to make a different block to suit each bevel angle you're after. Just remember, it must be a Jig with two separate positions for grinding both sides of the Skew.



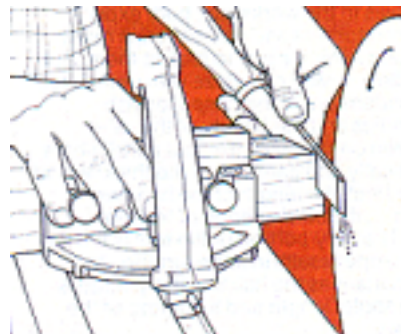
**Fig. 2**

When using the Jig, be sure to mount it securely to an auxiliary Miter Gauge Extension Face. Then clamp the entire assembly to the Worktable and position the Table with its edge 2" to 3" away from the face of the Sanding Disc...so the Skew's long handle will clear everything during grinding (See Figs. 3 & 4).

A simple Jig for the 1" and 3/8" Gouge can be made from a 2" x 4", cut at a 30-degree angle (providing that's the bevel angle you want). Clamp it to your Miter Gauge Face and the Worktable



**Fig. 3 Grinding first side of 1" Skew. Jig clamped and extended so Skew handle clears edge of Worktable. Feed tool toward Disc slowly and firmly.**



**Fig. 4 Grinding second side of 1" Skew. Adjust clamping jig so that you use the Disc Sander surface equally. Avoid overheating tool steel by backing tool off Disc frequently and dipping in water.**

with a 3/4" thick piece of scrap stock underneath the Jig. This scrap stock should extend enough to hold the Gouge handle and ferrule off the surface of the Worktable during grinding. Be sure to do your grinding on the upper portion of your Sanding Disc (See Fig 5).

Use a two-step procedure: With the concave side of the Gouge flat down on the Worktable, hold it firmly with both hands and push it in, making contact with the Sanding Disc the entire time. Rotate the tool smoothly in a clockwise motion around half its contour. To hone out the grinding scratches, hold the Chisel steady on the edge of wide piece of scrap stock clamped in a bench vise. Rub a benchstone across its bevel as shown in Fig 6. You might be surprised by the control this method provides. When doing Gouges, use a Curved Gouge Slipstone.

**The Shopsmith Grinding Wheel Guard:** A second method for machine sharpening is to use a rotating Grinding Wheel on the MARK V (See Fig. 7). It's important to note that using such a device will grind the chisel's edge to a concave shape, making the edge extremely sharp...but thinning it out and therefore, limiting its durability. If you want to produce a FLAT bevel using a Grinding Wheel, you'll have to do your sharpening against the side of a Wheel that's been made specifically for cutting steel against its side.

**WARNING: Shopsmith Wheels are NOT made for side grinding! NEVER** use a wheel that's made for grinding only on its circumference to grind a flat bevel on its side, as the wheel could crack or be weakened by undercutting. Either way, once the wheel's out of balance, vibration can build enough to literally explode the wheel right off its arbor!

There are a couple of ways to avoid this concave grinding...**without** using the side of the Wheel: **1):** Make several light passes at progressively steeper angles, equalizing the amount of metal removed from the heel, middle and tip of the bevel. – and – **2):** Instead of holding the Chisel's bevel perpendicular to the Wheel's direction of rotation, move the Tool Rest close to the Wheel and hold it on the Rest so its bevel is in line with the Wheel. This should deliver a good, flat bevel, assuming the Wheel's surface is flat.

### **The Shopsmith Strip Sander Chisel Sharpening**

**Attachment:** The third and final method of machine sharpening is provided by this ingenious device, which replaces the Worktable on your Shopsmith Strip Sander (See Fig. 8). Its adjustable trunion allows a full range of bevel angle settings for every imaginable type of Chisel.



**Fig. 5 Grinding Gouge.** For this first step in a two-step procedure, firmly and slowly push the tool into the Disc with clockwise rotation following angle of jig and traveling through half of the Gouge bevel contour.



**Fig. 6 Honing Lathe Chisels.** Lubricate the benchstone and rub it on the Chisel bevel as you hold the tool steady.



**Fig. 7**

Just position the butt end of your Chisel's handle into the special cup-shaped holder, adjust it for the proper length and sharpen. Start with a 150-grit Belt and work your way, step-by-step all the way up to a 600-grit Belt to produce a super-sharp "honed" edge.

**Practice Grinding Safety.** Safety when grinding tools of any type is a simple matter of plain old common sense. Use eye and face protection, of course for maximum comfort and to give yourself a feeling of security. Cover the Way Tubes on your MARK V with a board or piece of aluminum sheeting to protect them from grit as you grind. **NEVER** use rags or other flammable materials for this job as they might catch fire!

Once you've learned to sharpen your Lathe Chisels properly, you'll gain new knowledge and respect for them – and all your turning projects will be more professional-looking and more fun to turn, as well!

**Coming up in the November/December issue — PART THREE – *All About Router Bits***



**Fig. 8**