Sharpening

by Mike Davies

Sharp tools are essential for effective woodcarving. Even though many manufacturers of woodcarving tools supply their products ready sharpened, I would recommend that you spend time, right from the very start, learning how to maintain the cutting edge to get the best results from your tools.

If your tools are not razor sharp, it will make learning to carve difficult and frustrating, so I can’t stress how important it is for you to master this.

To begin, let us consider how carving tools are manufactured. The steel blades of carving tools undergo a heat treating process called tempering. This process makes them very hard and durable. However, if the tools are heated excessively during the sharpening process, they may lose their tempered quality and become brittle.

Many woodworkers have bench grinders in their workshops which are very effective at removing metal quickly. The one drawback, however, is that if used incorrectly, they can also burn your tools very quickly.

Re-grinding your tools should be a last resort, as the majority of maintenance on well-kept tools can be done by honing the cutting edge with bench stones and strops.

There are many different sharpening systems available on the market and many will produce razor sharp results. However, regardless of which system you choose, you will need an understanding of the basic sharpening principles.

Sharpening Angles

There are two main angles to consider when sharpening your carving tools. The first is the blade angle, which is used to describe the angle of the cutting edge in relation to the centre line of the tool (Photo.1).

For the majority of carving tools, the blade angle is kept at 90° to the centre line of the tool. The cutting edge needs to be completely flat and the outer tips of the cutting edge should be intact, not rounded over.

The second angle to consider is the cutting edge angle or ground edge angle (Photo.1a). The cutting edge angle of your carving tools will vary anywhere between 20° to 30°.

This angle should vary in relation to the density of the timber that you are carving. A 20° angle will give you a far keener edge but it will be more susceptible to damage. For smaller finishing tools, or if you carve mostly softwoods, a 20° angle would be ideal.

If you were to use a mallet to remove large quantities of hardwood, such as Jarrah, then a greater angle closer to 30° would be required to maintain a functional cutting edge. As a general rule, the harder the timber, the greater the angle should be. For a multipurpose tool aim for 25°.

Incorrect sharpening techniques can lead to defects such as chips along the cutting edge, rounded tips to the cutting edge and the blade angle is no longer at 90° to the centre line of the tool. Where the cutting edge has become rounded rather than a clean straight angle, this is caused by poor honing techniques.

Traditional Sharpening Techniques

With a badly damaged tool, the only way forward is to regrind the blade angle and then the cutting edge angle.

When using a dry wheeled grinder, it is essential to keep the steel cool at all times. This can be done by applying minimal pressure with the blade onto the grind stone. It is also important to dip the tool in water after each pass on the
machine. When using a grindstone, always wear eye protection, keep your fingers away from moving components and make sure all loose fitting clothing is tucked away from the machine.

Good lighting is also important so that you can see your progress as you shape the cutting edge.

Ensure the grinding wheels on your machine are clean, flat across the face and running true. With the grinder switched off and unplugged, adjust the toolrest so that it is close to the wheel and rotate the wheel by hand to make sure it runs at a consistent distance from the tool rest. If not, the wheel will need dressing.

The first task is to grind the blade angle. The goal is to obtain a perfectly straight line at 90° to the centre line of tool. Note in Photo.2 how all the chips in the cutting edge have been ground away and the tips of the tool are clean and intact. You will also see how a flat has been created along the cutting edge. This is often referred to as a flat-line or line-of-light.

The next task is to create the cutting edge angle. Some carvers make a series of templates to help grind to a precise angle, but the simplest approach is to draw several angles on a piece of paper and use them as a guide.

Use your forefinger and thumb to pinch the blade of the carving tool, so that your forefinger forms a stop against the toolrest of the grinder (Photo.3). The trick here is to maintain the same grip on the tool from the start of the grind to the finish. In this manner your finger will help to achieve a consistent angle.

Remember not to change your grip on the tool when dipping the blade in water. This technique applies to both flat cutting edge chisels and curved shaped gouges. If you are grinding a curved gouge, then rotate the tool as you pass the blade across the grind stone. Try to avoid grinding numerous flat spots around the edge (Photo.4). You need to create a consistent ground edge angle around the circumference of the gouge (Photo.5).

Continue grinding a consistent angle until you reach the stage where the flat line is almost completely removed. The goal is to have a consistent flat line that is less than 0.1mm in thickness along the cutting edge. Avoid grinding through the flat line as this will create a tool with a wavy cutting edge.

Honing

Having set the cutting edge angle, the next step is to hone the blade. There are numerous sharpening stones available — silicone carbide, natural Arkansas stones and diamond sharpening systems to name but a few. Whichever one you choose, the same techniques will be required.

I recommend having two stones for honing. The first can be used for curved gouges and the second for flat cutting edge chisels.

There are two schools of thought for the honing angle. Many like to slightly increase the honed angle from the ground edge angle. The benefit is that you can be confident about putting the cutting edge in contact with the stone, as opposed to the back edge of the ground angle (also called the heel). The downside is that you can quickly create a convex shape to the ground bevel and to remove this will require a fresh re-grind.

I generally prefer to make the honed angle as close to the ground angle as possible (Photo.6).

Honing Flat Chisels

Position the sharpening stone on your workbench with its length running away...
from you. Add a little oil or water to the surface according to the manufacturer’s instructions.

Place the chisel onto the stone’s surface at the required angle and slide it back and forth in a continuous motion (Photo.7). It is essential that the same angle is maintained throughout this process. Continue until you are able to feel a small ridge of steel that will form on the opposite side of the cutting edge. This is called a burr and needs to be removed using a slip stone.

**Honing Curved Cutting Edges**

When honing a gouge, fluter or veiner, place the stone horizontally in front of you and add oil or water as appropriate.

Place the gouge at the required angle on the stone’s surface and slide it from side to side along the stone’s length. As you slide, rotate the handle of the gouge so that the curvature of the blade receives an even grind (Photos.8-10). Be careful not to hone away the corners or tips of the cutting edge, which need to be kept at a sharp 90° angle to the shank of the tool. The shank refers to the entire length of the steel blade between the handle and the cutting edge.

If the corners become rounded, then it is probably due to the gouge being rotated too far. It may be helpful to practise the sliding motion initially on a flat piece of softwood.

When using the stone, continue the process until you can feel the burr on the inside of the gouge’s curve, opposite the ground edge angle. This should then be removed with a slip stone.

**Using a Slip Stone**

Slipstones are used to remove burrs and provide a finer cutting edge. The slipstones should be a finer grade than the bench stone and when working with curved cutting edges, they must fit inside the tool profiles.

Hold the slip stone between your fingertips and thumb and rub the length of the slipstone on the inside contour of the carving tool. The objective is to remove the burr.

Some carvers like to form an inside bevel, though I prefer to avoid this. Therefore I keep the entire flat face of the slipstone rubbing against the length of the shank (Photo.11).

After removing the burr, you can then use the slip stone to create a finer cutting edge. To do this, simply use the flat side of the slipstone to rub ‘up and down’ the cutting edge (Photo.12). Be sure to maintain a consistent angle, ie. the honed edge angle. You do not want to round over the sharp cutting edge.

**Stropping the Blade**

The final process involves a leather strop, similar to one that a barber would use to refine the edge of a razor.

The leather should be impregnated with a fine abrasive compound, such as jewellers rouge. Run the outside and inside faces of the cutting edge down the leather strop to produce a polished cutting edge which should produce razor sharp results (Photo.13).

**Testing the Sharpness of Your Tools**

Test the sharpness of your tools by using them on a piece of scrap carving wood. Try sliding the blade through the timber, both with the grain and across it. If you have a razor sharp cutting edge it should glide effortlessly through the timber, like a hot knife through butter.

Take a close look at the finished cut. If you have tiny ‘white’ drag marks in the timber, there is a defect in the blade, which needs to be removed by further work with slipstones or even honing.

The goal is a polished cut straight from
the blade. In Photo.14 there are two cuts. The one on the left is a polished cut and the one on the right has fine drag marks caused by imperfections in the cutting edge. The tool that created the drag marks will require further work until the cutting edge can produce a clean and polished surface.

A video presentation on the traditional method of sharpening carving tools can be viewed on my Woodcarving Foundation Skills DVD, available through The Australian Woodworker Mail Order Bookshop (details at the end of the article).

Wet Stone Sharpening Systems

A wet stone sharpening system is an ideal method for grinding and honing tools to a razor finish. The system carries water to the blade as it is being ground, making it impossible to overheat your tools.

You can produce accurate angles effortlessly, regardless of the shape of tool, using an angle setting gauge (Photo.15). Most wet stone grinders are available with a host of jigs (Photos.16 & 17), but it is important to consider the whole system when making your purchase. The grade and quality of the stone and jigs, and the availability of accessories will affect the performance and versatility of the sharpening system.

Most wet stone sharpening machines are fitted with a honing wheel, allowing you to use the same jigs when switching from grinding to honing. This allows you to ensure the honed edge angle is identical to the ground edge angle.

A good quality wet stone grinding system should enable the novice to produce a mirror finish and a razor sharp cutting edge, quickly and consistently.

Further Information

You can view sharpening tutorial videos for flat chisels, gouges and V-tools, using a wet stone sharpening system, at www.recordpower.com.au. Go to Woodworking Machines, Sharpening & Grinding, Sharpening Systems and then click on the video’s tab of the WG250.

This series of Woodcarving by Numbers articles is based around the tools found in the the Record Power 12 Piece Carving Tool Set. This is available with the bonus Woodcarving Foundation Skills DVD and booklet for RRP $132.00 from The Australian Woodworker Mail Order Bookshop, pp.82-90, Ph: 02 4759 2844 or from Record Power stockists.

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