

ABC's – XYZ's of Bowl Turning

Florida Woodturning Symposium

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Safety First

When using machinery of any kind you need to always be focused on the task at hand. Do not let your mind wonder. Accidents happen when you are not paying attention to what you are doing. If you find yourself getting fatigued or tired mentally or physically it may be time for a break.

You should always wear Eye protection of some sort, face shield preferable, ear protection, no loose clothing, jewelry or hair, etc.

You should go through a safety checklist before you turn on the lathe.

Proper personal safety equipment(above).

Tailstock in place and tight.

Lathe speed turned down or on the lowest speed.

Tool rest and banjo tight and in correct position to begin cut but won't hit the piece when the power is applied.

Materials suitable and safe for turning, be cautious with pieces that have cracks, voids/bark inclusions or that have been glued.

Area is clear of others.

Lathe speed

There is no easy formula for figuring out the best speed. The speed on a large piece will be much slower than the speed on small piece. Faster speeds will help the tool cut easier and more efficiently especially on natural edge bowls or on bowls with intermittent edges. The best way to approach it is to not turn the speed up any faster than you feel comfortable with and does not cause any excess vibration.

Tools

Most of the time I will be using a 5/8" swept back grind / Ellsworth style bowl gouge (60 degree bevel angle). There are times that gouges with other bevel angles are needed to reach different areas of deeper bowls or closed form style bowls. 40 degree, 70 degree, and 80 degree seem to cover most situations I encounter.



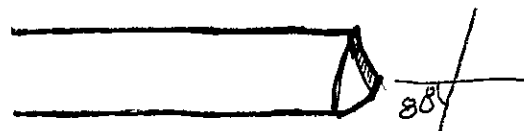
The 60 degree swept back grind Ellsworth style bowl gouge is a very effective, general purpose grind for turning most bowls.



The 40 degree grind bowl gouge is a complementary tool to the Ellsworth grind. Cuts that are awkward to make with one tool often are easier to make with the other because of the required handle position.



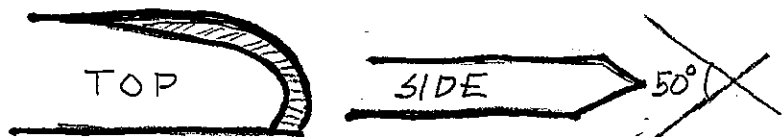
The 70 degree gouge with a relieved heel is used in deeper or more closed form bowls in order to maintain bevel contact around the bottom corner.



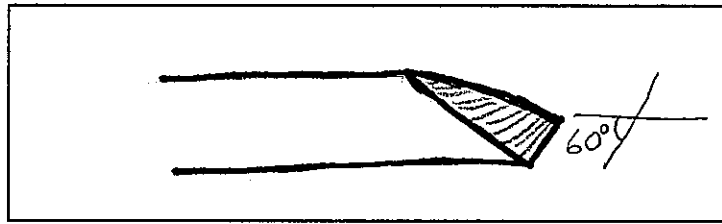
On some very deep or closed form bowl shapes, sometimes a gouge with an 80 degree bevel angle is required to maintain bevel contact throughout entire bottom curve.



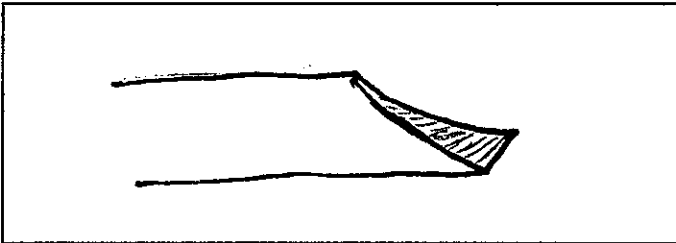
The detail gouge with a 35 degree bevel angle and relieved heel is great for detailing it can get into tight places that most bowl gouges cannot.



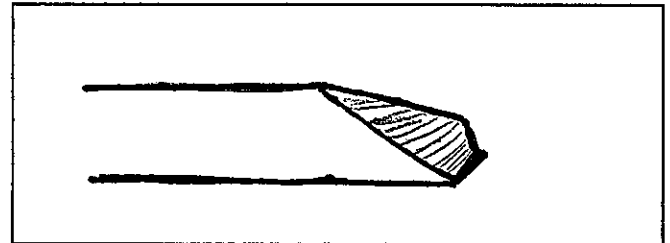
The negative rake scraper can be effective for refining and smoothing the inside surface of bowls. Especially on undercut rims.



Correct profile for 60 degree swept back/Ellsworth style grind

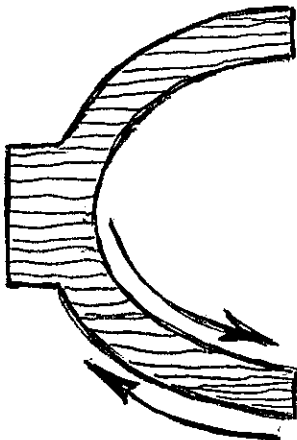


Incorrect: Grinding too much on the sides

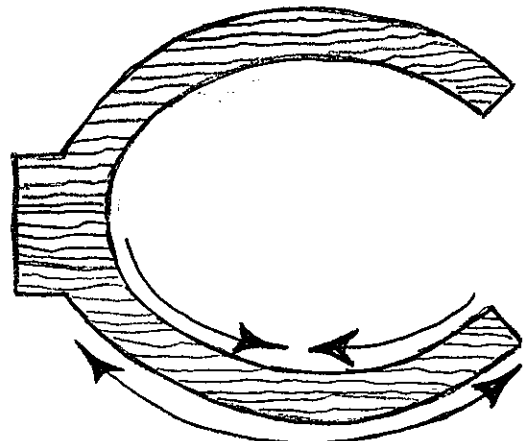


Incorrect: Grinding too much on the front

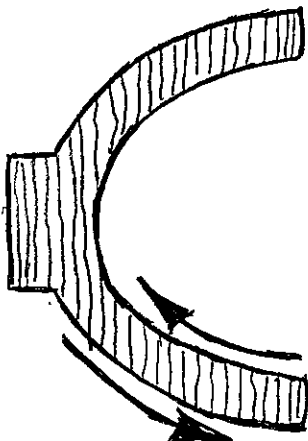
Grain direction: knowing the grain direction in the wood is important for two reasons. 1) It will allow you to make your cuts in the proper direction which will give you a much cleaner cut and smoother surface which will require less sanding. 2) It greatly influences the aesthetics and balance of the piece.



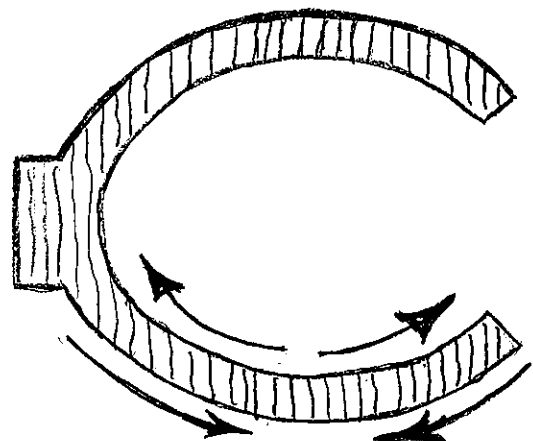
End Grain Open Form - Direction of Cuts



End Grain Closed Form - Direction of Cuts



Face Grain Open form - Direction of Cuts



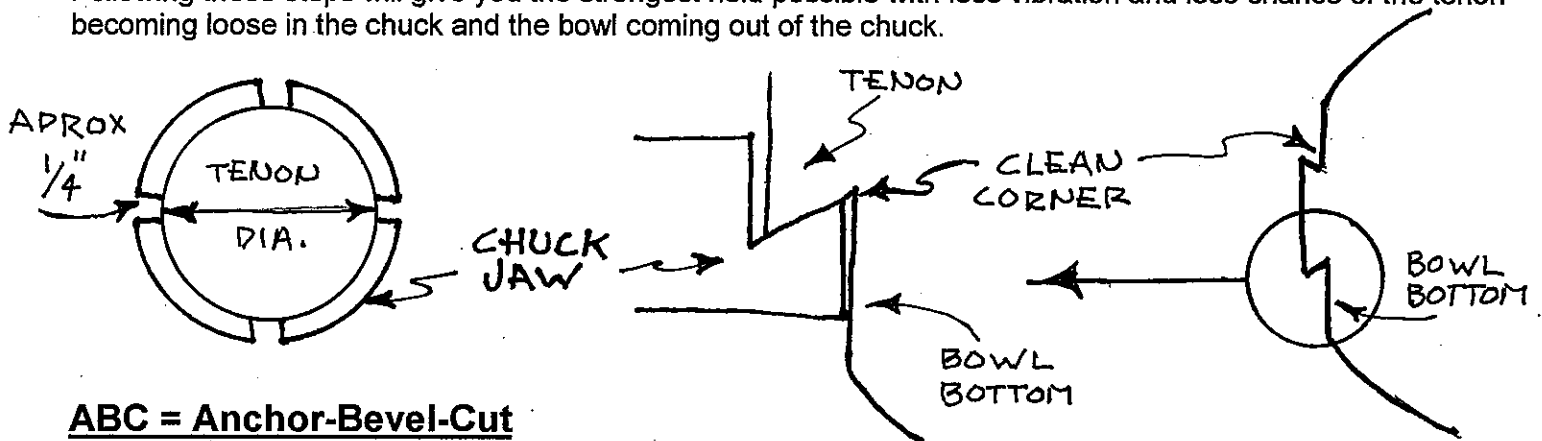
Face Grain Closed Form - Direction of Cuts

Using a Chuck correctly:

When cutting the tenon for the chuck there are five important factors that will ensure the strongest most secure hold on the tenon.

- 1) Know the type of tenon your chuck requires; **dove-tail** or **straight**.
- 2) Size the **diameter** of the tenon so that there is only about $\frac{1}{4}$ " or less space between the chuck jaws when closed on the tenon.
- 3) Size the **length** the tenon as long as possible but **not** so long that it contacts the bottom inside of the chuck. This will ensure that the bottom of the bowl is fully contacting the face of the chuck jaws. This is where the maximum support and stability comes from.
- 4) Make sure the inside corner where the tenon intersects the bottom of the bowl is slightly less than 90 degrees or slightly less than the angle of the taper of dove-tail jaws and is very clean not rounded in the corner. This is necessary also to ensure the bottom of the bowl fully contacts the face of the chuck jaws.
- 5) Tighten the chuck from each of the key holes at least twice each and continue to check the tightness once in awhile throughout the turning process.

Following these steps will give you the strongest hold possible with less vibration and less chance of the tenon becoming loose in the chuck and the bowl coming out of the chuck.



ABC = Anchor-Bevel-Cut

Following this procedure (in this order) will make your turning safer; give you more control of your cuts leaving you with a smoother surface.

Anchor - anchor the tool on the tool rest.

Bevel - lightly contact the surface of the wood with the bevel of the tool but not the cutting edge.

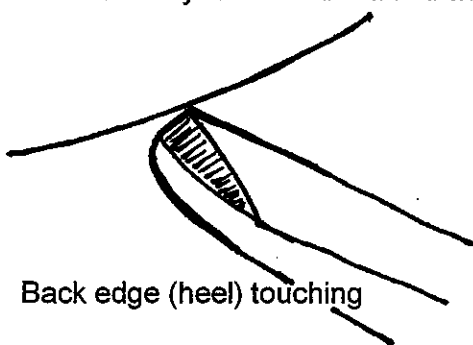
Cut - while maintaining bevel contact move the tool handle toward the direction of cut to slowly bring the cutting edge into contact with the wood to begin the cut.

When cutting with a bowl or spindle gouge there are four things that will help prevent getting an unexpected dig-in (catch is a harsh word).

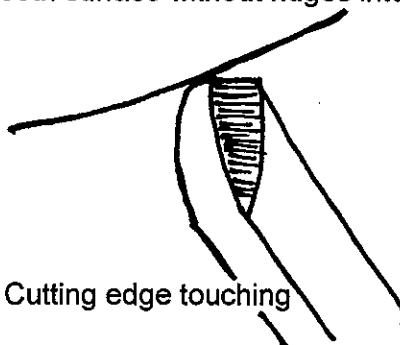
- 1) Point the tool in the direction you want to cut.
- 2) Roll the tool over 45 degrees with flute pointed in the direction you are cutting.
- 3) Lightly contact the bevel of the tool to the surface of the wood before beginning the cut.
- 4) Push tool in the direction you want to cut (the direction it is pointed).

The bevel of the gouge provides support for the cutting edge of the tool; this gives you total control over where and when the tool cuts.

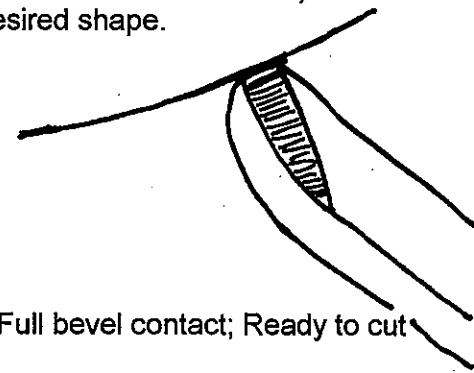
Riding the back (heel) of the bevel will make the tool cut out of the wood - riding the front of the tool will make it cut in. This is controlled by the movement of the hand on the tool handle (not the hand on the tool shaft). This is what allows you to cut the wood with a smooth surface without ridges into the desired shape.



Back edge (heel) touching



Cutting edge touching



Full bevel contact; Ready to cut

Begin the Bowl; My preferred method of starting a bowl is between centers. This gives you more flexibility in positioning the blank which allows you to orient the grain, natural edge, other features or flaws as you like.

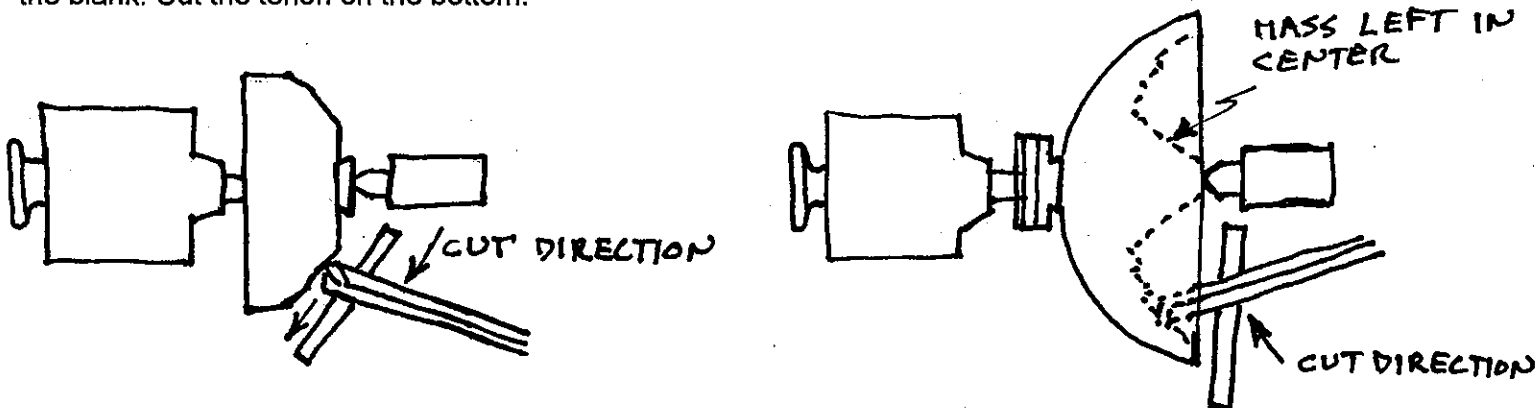
If turning a natural edge bowl the bark and cambium layer need to be removed down to solid wood where the drive spur will be. A drill press is the easiest, but it can also be done with a hand drill or a chisel and mallet. Remove a large enough area of bark that will allow you to be able to move the drive spur around a bit to orient the blank.

Put the blank between centers with the tenon end toward the tailstock. This will give you the center mark that you will use when you reverse chuck the bowl to finish the bottom. Make sure the drive spur is seated into the bowl blank securely and make sure the tail stock is securely locked down and tight. **A word of caution, be sure to check the tightness of the tailstock frequently especially on mini lathes, they have a tendency to become loose.**

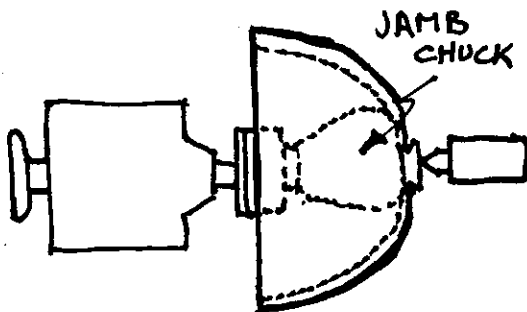
Check to make sure the lathe speed is turned down or the pulleys are set to the slowest speed.

It is a good idea to stand to the out of the way of the blank when the lathe is turned on and then bring the speed up slowly to a safe level. On lathes that are not variable speed always start on the slowest speed and be cautious when going to the next pulley speed setting.

Remember the Anchor – Bevel – Cut. Begin cutting the corner of the blank at about a 45 degree angle from the tailstock toward the headstock. Continue working from the tailstock toward the headstock to round out the blank. Cut the tenon on the bottom.



Mount bowl in the chuck; After mounting the bowl in the chuck it is a good idea on larger bowls to bring up the tailstock to add some support for the initial cuts. Eventually you will need to remove the tailstock and this would be a good time to check the tightness of the chuck. I will cut the interior of the bowl in stages leaving some mass in the middle; this prevents the bowl from warping and you ending up with the sides or some areas thinner than others.



Reverse on a jamb chuck and finish the bottom; There are several ways of finishing the bottom of a bowl; my preferred method is to simply jamb chuck the bowl between centers. You can turn a several sizes of jamb chucks from scrap wood or purchase products such as Rubber Chucky's; www.rubberchucky.com.