This is an excerpt from the book

Turning Bowls

by Richard Raffan

CHAPTER

4 ROUGH-TURNING THE PROFILE

I always rough out bowls in two stages. First I turn the profile (the outside form) with the face that will be the top of the bowl toward the headstock. Then I remount the partly turned bowl for hollowing, gripping it by the foot.

The transformation of a seasoned blank to the profile of a small bowl ready for sanding can take well less than a minute. Turning green wood can be even faster. Once the blank is mounted, I typically shape a 10-in. (250mm) salad bowl in a few minutes. Consequently it is important to have simple, quick, and efficient ways of fixing a blank on the lathe and then equally simple ways of removing it. So before I discuss how to use the tools to best advantage at the roughing stage, let's look at the options for mounting your blanks.

Fixing a Blank on the Lathe

For rough-turning the profile, you can fix a blank on the lathe using a screw chuck, a faceplate, or a chuck, or you can mount it between centers. There are pros and cons for each method, and which you choose will depend partly on the diameter and thickness of the blank, partly on whether the wood is evenly grained or off-balance, and then on the flatness or unevenness of the faces.

Ideally you want to grip the blank without tail-center support so that, with the face that will be the top of the bowl toward the headstock, you can work all around the profile from any angle without the tail center getting in the way. Most of the splits and defects you might want to eliminate will be on or near the outside of the blank, so with the blank aligned this way, you can eliminate everything you don't want, as well as adjust the overall proportions of the bowl as you work the profile. On occasions when you need tail-center support, you can still work all of the outside of the bowl except for the very center of the base.

SCREW CHUCKS

Screw faceplates (often referred to and marketed as screw chucks) have a single center screw to which blanks can be attached on the lathe. Most modern chucks convert to a screw chuck.

For speed and efficiency when mounting bowl blanks, it's hard to beat a screw chuck, shown in use in the photo at right on the facing page. I regard these as essential tools for any

For speed and efficiency when mounting bowl blanks, it's hard to beat a screw chuck.

A range of screw chucks enables you to provide optimum support for a blank.

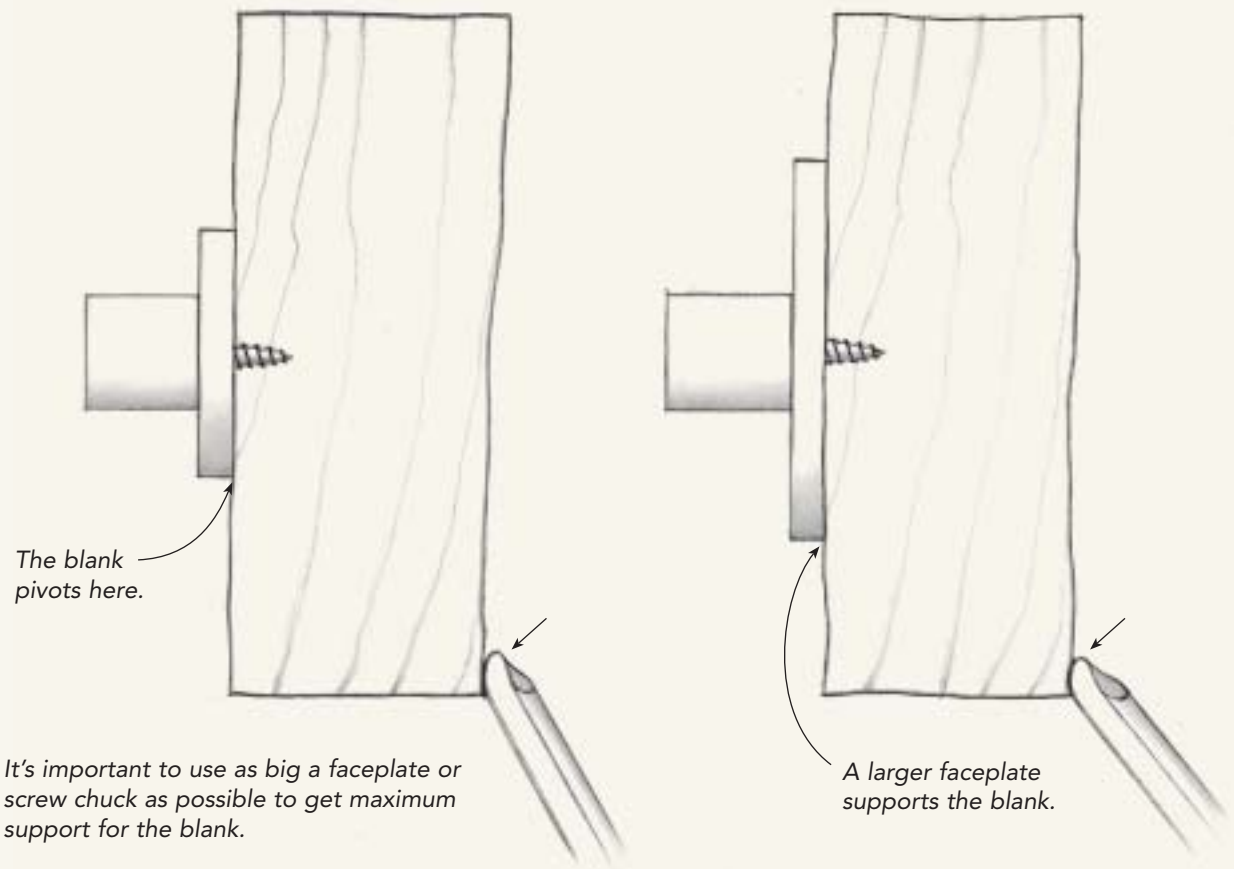
A small blank can be held on a very short screw, here about ⅜ in. (9mm) long.

bowl turner—I have three and also an engineer's chuck with a coach bolt seen to the rear in the photo above. Both of the chucks in front have a reversible collar that gives each three diameters for the optimum support of a blank. Each face of these chucks has a tiny bead at the rim that a blank seats against more securely than against a flat face. The wider a faceplate is the better it grips and the greater support it can offer with a shorter screw. You should use the widest face your blank will allow (see the illustration on p. 64).

All commercial screws are at least 1 in. (25mm) long, which is typically far more than you need. Small blanks can usually be gripped on little more than ¼ in. (6mm), so I have a series of scrapwood discs seen to the front in the photo at left above to reduce the effective length of the screw. If the screw fails to grip, simply remove one disc.

A handy variation of the screw center is a lag bolt set in a three-jaw engineer's chuck. The bolt can be moved in and out to vary the effective length of the screw or be changed to one larger. If a blank spins on one screw, you simply

FACEPLATES AND LEVERAGE

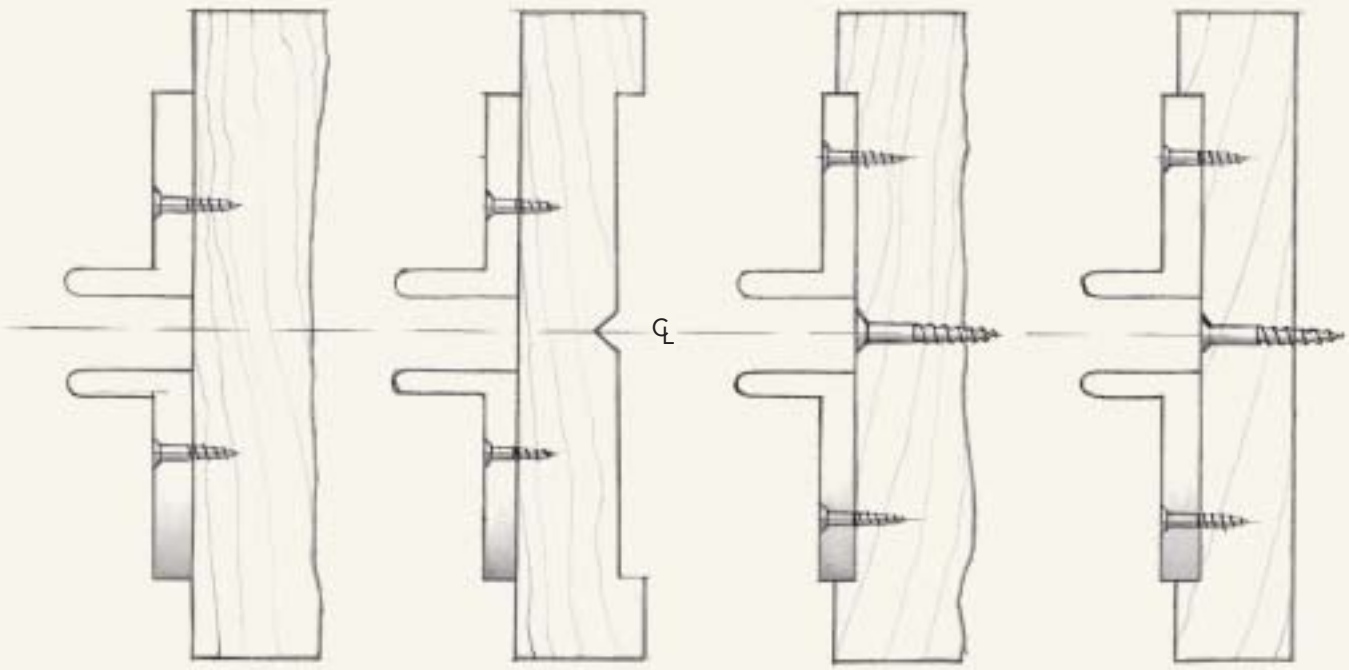


The Glaser screw (left) with it's finely machined thread is vastly superior to the copy (right), typical of many offered as a chuck accessory.

transfer the blank to another. The three jaws always provide a firm backing for the blank, but they're hazardous and can be painful if you catch your knuckles on them.

Traditionally, turners made their own screw faceplates, attaching a disc to a standard faceplate and fixing a large screw at center, as shown in the illustration on the facing page. They work well, and if they get damaged or worn, it's easy to make another. I replaced mine only when Jerry Glaser introduced his screw chuck with its hardened stainless-steel screw and parallel shank seen to the left in the photo at left. This screw has been much copied—the screw shown to the right is typical—but rarely emulated. I use

MAKING A SCREW CHUCK



1. Mount the disc on a standard faceplate.

2. Recess and countersink the disc for faceplate.

3. Remount the disc on the faceplate with a center screw.

4. Thin the disc to extend the length of the center screw.

a Glaser screw to grip all my blanks, including those 66-lb. (30kilo) chunks for which I also use tail-center support.

Most commercial chucks come with a 2-in. (50mm) jaw set that converts to a screw faceplate with a long center screw. These are fine for small blanks up to 6 in. (150mm) in diameter but next to useless for larger and heavier blanks, when the small jaws cannot offer enough support or grip, no matter how long the screw. Tail-center support can keep the wood spinning true on the axis as you cut, but chances are that the screw will spin in a heavy chunk of wood and you'll need to transfer to a standard faceplate. You can broaden the face of the chuck in screw faceplate mode by making a washer as shown in the photo at left on p. 66, but a dedicated screw faceplate is better.

There are two ways of getting a blank on a screw chuck, and each requires that you drill a pilot hole the diameter of the screw shank in the center of the flat face of a blank. (If you use a compass to mark out your blanks, there will be a deep pinprick at center.) If the face of the blank is less than flat and the blank is rocking on the screw, causing difficulties in cutting, use tail-center support to keep the blank spinning true. This keeps you from working all the base, and the tail center leaves a conical hole, so if you are mounting blanks and completing the

A turned washer broadens the face of a set of standard chuck jaws to provide a better grip for blanks above 6 in. (150mm) in diameter.

Heavy blanks are easiest to mount with the lathe running just fast enough to feed the screw into the center hole.

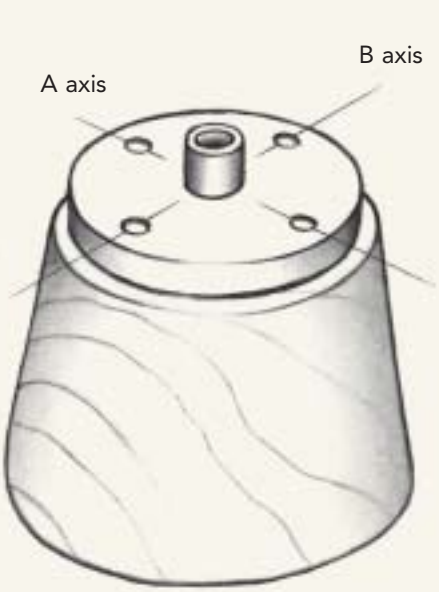
bowl profile (rather than just roughing out the form), ensure that the face of the blank is flat so it seats securely against the faceplate and doesn't require tailstock support.

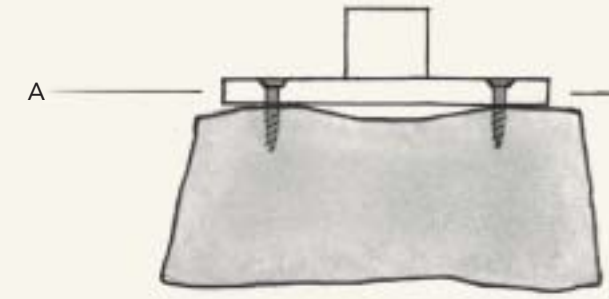
The safest way to mount a bowl blank on a screw faceplate is with the lathe turned off. Use the handwheel to rotate the screw chuck, as you offer the blank up to the screw with the other hand. It can be difficult to bring the blank tight against the faceplate, so lock the drive shaft and use both hands to complete the job.

A faster way of mounting blanks, much favored by professional turners, is with the lathe running. This is not a technique for novices to use at higher speeds, but you shouldn't have a problem if your lathe is running 300 rpm to 500 rpm. (A major advantage of having a variable-speed lathe is that you can easily drop the speed to mount the blank, then increase it as required for the turning.) The blanks should be at least 6 in. (150mm) in diameter so they have enough weight for inertia to snug them against the chuck as the screw spins in. Hold the blank so that when the screw catches in the hole only your palm is in contact with the face of the blank. It's almost a throwing action. If you have a variable-speed unit, mounting with the lathe running is by far the easiest way to handle heavier blanks because the lathe does the work (see the photo above).

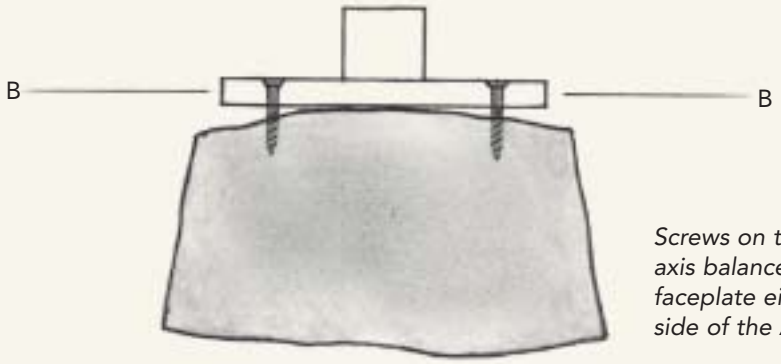
Very large and heavy blanks should be mounted with the lathe running just fast enough to feed the screw into the center hole. Lack of torque at very low revs will usually keep the screw from spinning the wood as you hold it, but a better technique is to switch the lathe

FACEPLATES ON IRREGULAR BLANKS





With screws on only the A axis, the blank will not be held securely.



Screws on the B axis balance the faceplate either side of the A axis.

off the moment the screw grabs the wood. For this you must have an "off" button you can nudge with your knee or hip. This is strictly a low-speed operation.

FACEPLATES

Faceplates are the flat metal discs that screw on to a drive spindle and come as standard with every lathe. Blanks are attached off the lathe by two or more screws, as shown in the photo at right, which makes faceplate mounting tedious when compared with screw chucks, especially on smaller bowls. Consequently I hardly ever use a faceplate anymore. However, they are better than a screw chuck for gripping uneven surfaces because screws can be inserted on either side of a high spot or axis, as shown in the illustration above.

A faceplate is the most secure way to hold a blank on the lathe.

Small blanks can be conveniently gripped in a chuck to shape most of the bowl's profile. You can complete the rim when you remount the blank for hollowing.

Expanding long-nose jaws within a drilled hole is a fast and simple way to grip a small blank.

Faceplates provide the most secure fixing for bowl blanks. Most come with four equally spaced screw holes, but you can easily drill more if you feel the need. In the days when I used faceplates, I seldom used more than two #14 wood screws penetrating the wood about ¾ in. to 1 in. (19mm to 25mm) on blanks up to 15 in. (380mm) in diameter. If the blank came loose as work proceeded, I'd stick in another couple of screws; if I had a massive catch, I'd just replace the screws with longer or fatter ones. During initial roughing cuts, you might want to bring up the tail center for extra support.

In general, you should place the screws across the grain so that if there is a split you've failed to notice—some are very difficult to spot—the wood is less likely to fly apart. Screws set along the grain sometimes cleave the wood. However, if you are intending to remount a rough-turned bowl using the same screw holes, you should align the screws along the grain where movement is minimal as the wood shrinks.

CHUCKS

Chucks come in a variety of shapes and sizes, with a range of jaws. They are versatile and dependable, gripping either by clamping around a blank or by expanding within a hole drilled on a drill press or a recess turned on the lathe. In most situations, you'll cut a blank round on a bandsaw and grip it, but this is tedious when dealing with blanks smaller than 3 in. (75mm). For such small blanks, expanding within a hole in a square blank is faster.

A two-spur drive is preferable to a four-spur drive because it grips better on an uneven surface.

When working with small, round blanks, a chuck can be the most efficient method for holding the wood, as shown in the photo at left on the facing page. The obvious problem is that you cannot work the rim, but that portion can be easily turned true once the bowl is reversed for hollowing.

Mounting a blank by expanding the chuck jaws into a drilled hole provides a faster and more positive grip than a small screw chuck when working small or lightweight blanks. The hole needs to be only slightly larger than the chuck jaws, but of course the wider the hole the better because that provides more surface area. A flat-bit drill is the fastest way to drill a hole, but the spur can easily go too deep so I use a Forstner bit. If the blank doesn't sit square, slacken the jaws and adjust it by hand as shown in the photo at right on the facing page.

BETWEEN CENTERS

Blanks for natural-edged bowls such as those shown in the photo at right or that have a very uneven face are best rough-turned between centers. Such blanks are easily held between centers, and you can adjust the blank as needed to realign the grain patterns or rim of the bowl. As usual, you will need to turn a foot so you can remount the bowl for hollowing. You can work all but the very center of the base, and the remaining nub will easily break or chisel away.

A two-spur drive is preferable to a four-spur drive because it grips better on an uneven surface. Also, a two-spur drive can be located in a small V-groove that you can quickly chisel into the surface of your blank, to prevent it from spinning. Use a chisel the same width as your drive, as shown in the top left photo on p. 70.

Bark-rimmed bowls generally look best if the rim is balanced around a horizontal plane.

The two spurs allow the blank to be pivoted to either side for precise positioning of the tail center, as shown in the top right and bottom right photos on p. 70. Note how I use some part of the lathe, either the tool rest or the headstock, to steady my arm and the blank while positioning the tail center.

Natural-edged bowls with a bark rim tend to look better when the highest points of the rim are in the same horizontal plane, that is, the same height. Likewise, the lower points of the rim look better on the same lower horizontal plane, parallel to the plane of the upper points. Align the two-spur drive along the main axis of the bark or natural face. Orient the axis on which the upper points lie at 90 degrees to the lathe axis. To bring the lower points into a parallel plane, draw a line from the lowest point on the rim around the partly turned profile and compare the position of this line on the other side of the blank (see the bottom left and center

To mount a blank with an uneven surface between centers, chisel a V-groove to receive a two-spur drive (left). As you bring the tail center up, steady the blank by resting your arm on the tool rest (above).

On blanks with a symmetrical round face, align the two-spur drive along the main axis of the curve on top of the blank. Mount the blank with the top at 90 degrees to the lathe axis and the sides evenly balanced. A pencil line drawn on the roughed bowl profile indicates how much the blank needs to be repositioned to bring the lower portions of the rim into the same plane (left, center). Make this adjustment easier by using the lathe to support your arm as you pivot the blank on the two-spur drive (above).

photos on the facing page). Reposition the tail center until you can draw a line that touches both the lowest points of the rim.

For a more positive drive, you can use a spur faceplate, which is a variation of a two-prong drive. Make this by fixing bolts through two of the four holes in a standard faceplate so that about 1 in. (25mm) of bolt stands proud of the locking nuts. Then on a grinder sharpen the end of each bolt to a point.

You need to drill two holes in the blank to accept the bolts. The easiest way to locate the holes is to align the spur faceplate on the blank, then tap the bolt heads with a hammer to mark the wood.