



Mastering the Cylinder

Lock in the foundational skills of spindle turning

BY BETH IRELAND

I've always made a living as a woodworker. Before I started turning, in 1985, I made cabinets and furniture, and I taught myself to turn so I could put more curves into my work. When I discovered that this new work was also putting good money into my bank account, I began to specialize in turning—soon scores of balusters and newel posts were stacked in my shop. As I turned similar shapes again and again, I figured out how to turn with an economy of movement and an un-

derstanding of my tools that led to a clean finished product that was easily repeatable and needed little sanding. The foundation of it all was making a perfect cylinder.

Mounting the workpiece

There are many gadgets for finding the center of a turning blank. I use a cheap plastic type sold at most woodworking stores. Whatever you use, be sure to mark from all four corners; this will give you the exact center even if your blank is out

of square. You can also find the center by placing a straightedge corner to corner and marking an X. Once you've found the center points with a pencil, punch them with an awl, and put the blank between centers.

In the tailstock, which spins freely, I usually use a cone center. It meets the workpiece with a point, allowing me to turn a piece down to a small dimension. In the headstock, the drive center, I typically use a spring-loaded spur called a steb, which makes it easy to get pieces on and off the

Set up

MOUNT THE WORKPIECE

Nail the center point. After marking the center point, Ireland punches it with an awl (her awl's shopmade handle reveals her sculptural flair).



Drive center. In the lathe's headstock, Ireland uses a spring-loaded spur called a steb, which makes it easy to get the workpiece on and off the lathe.



Live center. Ireland uses a free-spinning cone center in the lathe's tailstock, tightening the workpiece by adjusting and locking the tailstock's quill.

ADJUST THE TOOL REST



Elevate to the midpoint. To set the height of the tool rest, lay the back of the gouge on the rest and hold the handle horizontal. Raise the rest until the cutting tip of the tool is dead center on the workpiece.



Parallel placement. Adjust the tool rest so its long edge is parallel with the workpiece and the gap between the two is $\frac{1}{8}$ in.

How to hold the tool

For clean, efficient turning, keep your arms, your torso, and the tool locked in a triangle, and advance the tool along the workpiece by moving your whole body laterally.

Connect the tool to your body. Hold the gouge perpendicular to the workpiece with its handle against your side. As you look down, the tool, your arms, and your torso will form a triangle.



Guide the tool along the rest. Ireland's left hand grips the shaft of the gouge. She keeps her index finger fully extended, and as it glides along, cradled in the cove of the tool rest, it keeps the tool's cutting edge moving parallel to the workpiece.



The tool travels as you shift your weight. Instead of standing still and moving your arms to advance the cut, keep your arms and the tool in their triangle and move your whole body. Ireland, who is right-handed, moves from left to right. Start with a wide, stable stance with your torso parallel to the lathe. Push off with your left foot and gradually shift your weight to your right.



lathe without having to jam the spurs into the wood. The steb holds the work without excessive pressure; too much pressure can cause a piece to flex, producing diagonal chatter marks on the wood.

The checklist

When I teach turning, I make sure my students run through a checklist before the machine goes on. After a while, these moves become automatic.

Set the lathe speed—In spindle turning, you want your workpiece to spin fast, but not so fast that it vibrates too much. Set the speed based on the size of the workpiece. For a blank 2 in. square by 12 in. long, you might set the machine for 1,800 rpm. For a blank 3 in. square by 27 in. long, you might spin it at 800 rpm. If your lathe has variable speed control, start with the dial at off and turn it up until you hit the point of vibration. If you change speeds by moving a belt, start at the slowest setting, check how smoothly that spins, and move to progressively faster settings until the blank is spinning fast, but still not vibrating too much. Many students turn with the lathe spinning way too slow. Experiment with speed and cutting until you find the sweet spot.

Adjust the tool rest—Set the height of the rest by placing your roughing gouge on it. Hold the tool parallel to the floor and adjust the tool rest height until the cutting edge of the gouge is at the center point of the workpiece. Lock the rest there. You might have to readjust for other tools.

Turn the cylinder



Set the speed. Whether with a variable speed dial or by changing a belt, gradually raise the speed until the blank is spinning fast but still not vibrating too much.



Find the bevel. After removing the corners, it will be easier to ride the bevel. Start with the handle low and raise it gradually to find the point where the bevel and the cutting edge are both contacting the work and the tool is slicing, not scraping.



Always readjust. As you remove material, periodically stop the lathe and reset the tool rest closer to the workpiece. A $\frac{1}{8}$ -in. gap is ideal.

Now stand over the tool rest and sight downward, adjusting the rest until its long edge is parallel with the machined edge of the bed. Then set the rest so it is about $\frac{1}{8}$ in. from the workpiece. Spin the blank a full rotation by hand to be sure it won't hit the rest when you switch on the lathe. It's important to maintain this $\frac{1}{8}$ -in. distance as you turn; as the size of the workpiece diminishes, you'll need to stop the lathe periodically to move the tool rest forward. The farther the tool rest is from the workpiece, the higher you have to lift the handle of the tool; this disengages the bevel and causes the cutting edge to scrape,



Come back for a final pass. With the cylinder nearly finished, Ireland rolls the gouge counterclockwise for a shearing cut and takes a light pass from right to left to achieve the final surface.

Now turn a taper

To taper a workpiece, apply all the elements of turning a cylinder, but with the tool rest set parallel to the intended taper.

Taper layout. Wanting to taper one half of a cylindrical workpiece, Ireland marked the midpoint of the cylinder's length, then marked the small diameter of the taper on the end of the piece.



Story stick sets the tool rest. Set the end of the tool rest $\frac{1}{8}$ in. from the workpiece and mark the end of a stick with the distance between the tool rest and the layout line (above left). Then, at the center point, use the marking on the stick to set the angle of the tool rest.

instead of slice. Scraping is still a cut, but it doesn't leave a clean finish. I constantly readjust the rest as I work.

Cover your eyes—Always use eye protection! I wear a face shield when roughing, because chunks from the corners of the blank fly up toward your face and eyes. Glasses are not good enough.

After double-checking everything on the checklist, you're ready to turn.

Posture makes perfect

In turning, achieving consistent shapes and surface quality begins with connecting the tool to your body. You don't want your body stationary while the tool moves; you'll have way more control if you move your body, not your hands, to make the tool travel down the workpiece.

First place your feet in a wide, stable stance parallel to the bed of the lathe. Then place the gouge on the tool rest and anchor the handle of the gouge against your body. If you are right-handed this will be against your right side. Put your left hand beneath the shaft of the gouge with your index finger extended and lying in the cove of the tool rest. Wrap your left thumb around the top of the tool.

The tale of the taper. The angle of the tool rest will determine the angle of the taper. Set your stance with your torso parallel to the tool rest this time, rather than parallel to the lathe.





Start at the end. Using the same tool holding, posture, and body movement, begin cutting with shorter passes at the narrow end of the taper, and take progressively longer passes.



Long passes finish the taper. With the taper almost fully formed, Ireland begins a pass just shy of the workpiece's midpoint.



Don't mind the gap. When tapering, Ireland doesn't move the tool rest in as she goes. Turning with the tool extended produces a rougher surface but ensures the correct taper.

When you look down, your arms, the tool, and your torso will form a triangle. To move the tool, you don't move your hands; instead, keeping your index finger in full contact with the tool rest, push off with your left foot and shift your weight smoothly to your right. This moves the whole triangle. Your finger sliding along the tool rest keeps the cutting edge moving parallel to the spinning wood. Sway back and forth, feeding the gouge in a little with each pass. Keep the tool perpendicular to the workpiece as much as possible.

Bevel rider

"Ride the bevel" is the turner's chant, and it distills the most important advice for turning. Look at your tool and identify the cutting edge (sharpest part), the bevel (where the grind marks are) and the heel (where the bevel transitions into the body of the tool). As you turn, you want the tool to be at the position where the bevel and cutting edge are both touching the surface of the wood. This will be hard to judge until the piece is round. Remember that spindle turning is about delicacy, not muscle.

When you begin to rough out a blank, angle the handle of the gouge downward and use the heel of the tool like a metal finger to feel where the four corners are, so you don't go in too quickly and lose a chunk. Feel with the heel and lift the



Sandpaper cleanup. A sanding block and some 120-grit paper quickly smooths out any tears in the tapered surface.

handle up gently until you see the cut actually happen.

Find a good grind

The bevels you'll see on roughing gouges can vary quite a bit. The longer the bevel, the sharper your tool, but this is not always a good thing when roughing. A thin blade is a delicate blade and will break down quickly. Also, the longer the bevel, the farther downward you must move the gouge's handle to keep the bevel in contact with the wood. With the handle held

down low, you lose the space to fit your index finger beneath the tool on the rest. I grind a bevel that allows me to stand in a relaxed position with the gouge's handle neither too high nor too low. If you get the bevel, the stance, and the tool rest setting right, and keep your index finger running along the rest, you should end up with an almost perfect cylinder. □

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