

PRINCIPLES OF TURNING

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Most turning problems occur because some basic principle is violated or ignored. Beginning turners have the advantage of not having accumulated years of bad habits. Experienced turners are often “good enough” to get by with some really scary techniques. I believe that if you really understand how a tool cuts and how to control the cut you can avoid catches, skids, tear-out, and many other nasty surprises and aggravations.

There are a few basic principles of woodturning and many common sense ideas that can help you build your turning skill. I hope to help you improve your technique, safety, and product so you can (as my friend Gary Roberts extols) “enjoy turning.”

I have included a basic outline of topics with a few short notes and some references. I hope you will use the extra space to jot down the details which you think are important. Please feel free to ask questions or interject ideas as time permits.

SETTING YOURSELF UP FOR SUCCESS

The Lathe

Height (Center of spindle at elbow height)

Light (Diffused and coming from as many different angles as possible)

Ways (Clean, smooth, waxed – SS Brillo pads, Johnson’s Paste Wax)

Tool Rests (Smooth, waxed, correct height, good design, set for comfort – draw filing)

Tail Stock (Must be in line with the center of rotation)

The Stance (to dance)

Balance (at a point on the ball of each foot about 1” behind the web of the big toe)

Alignment (You can only move effectively along a line connecting the 2 balance points)

Position (Strive to be at balance at the end of the cut)

Movement (When possible move you body not your arms)

Soft Knees (NEVER lock your knees)

Posture (Stand up straight. DO NOT STOOP.)

Tools

Appropriate (Use the right tool for the job.)

Sharp (Really Sharp! A dull tool is a paperweight.)

Grip (Most tool control comes from the “back hand” rather than the hand near the tool rest.) Top grip, bottom grip, finger-under-rest grip.

RPM (Start slow, increase until it shakes, add or subtract a few RPM to avoid resonance.)

Depends on - wood, tool, skill, diameter.

Surface feet per minute = $\text{RPM} \times \pi D'' \div 12$ (or $\text{RPM} \times .262D = \text{SFPM}$)

Effective Range = 500 – 1500 SFPM (a good compromise is 850 SFPM)

$\text{RPM} = \text{desired SFPM} \div .262 D''$

Safety: THINK!

Dust (It will kill you. Use cross-ventilation, dust collectors, dust masks, air helmets.)

Noise (EH? Use ear plugs or protectors.)

Gloves (Be careful...they can get you hurt.)

Clothing (tight is right)

Eye/Face (goggles or face shields)

Jewelry (TAKE IT OFF)

Sound Wood (It’s those little cracks that get you hurt)

WHAT HAPPENS WHEN THE TOOL MEETS THE WOOD?

THE WOOD

- Wood is a bundle of fibers
- It can be cut in Three Basic Directions
- Supported Fibers vs. Unsupported Fibers

THE TOOL

- Sharp Edge (20° - 45° included angle)
- 45° Shear Angle (skewed, tilted)
- Double Support (Tool Rest and Bevel)
- Levers and Fulcrums (tool rest close) (secondary bevel)

THE CUT

- Sharp edge at 45° (Why does a shear angle make a difference?)
- The “body” as a tool holder.
- ABC (anchor, bevel, cut)
- “Float” the bevel ... but where is the bevel?
- Turning the Tangent
- Motions of Control : up-down, left-right, in-out, throttle
(Start in neutral, rotate toward catch, stop just before it gets scary, and end in neutral.
Or start with the bevel floating and lower the cutting edge until it engages.)

DIFFERENT TOOLS

- Skew (5 cuts) planing, peeling, facing, v-cut, bead (also, excellent scraper)
- Spindle Gouge (6 cuts) push cut, pull cut, open cut, facing cut, beads, coves (shear scrape)
- Bowl Gouge (3 cuts) push cut, pull cut, open cut (shear scrape)
- Hook/Ring Tools (2 cuts) bottom cut, side cut

RECOMMENDED READING:

Woodturning: a Foundation Course; Rowley, Keith; Guild of Master Craftsman Publications, 2000; ISBN 1-86108-114-6

Turning Wood; Raffin, Richard; Taunton Press, 2001; ISBN 1-56158-417-7

Fine Woodworking on Spindle Turning; Taunton Press; 1992; ISBN 0-918804-73-6

Fine Woodworking on Faceplate Turning; Taunton Press, 1992; ISBN 0-918804-72-8