

SCC CMA Training Curriculum

Manual Lathe Basics

Objectives: Upon completion the User will be able to operate the Manual Lathe in a safe manner. User will be able to set up the machine, including fixturing the stock, mounting a cutting tool, and setting the tool position. User will understand how to use the DRO or Vernier dials on the handwheels to move the carriage in a precise manner. User will understand how to select proper Speeds and Feeds based on materials and tooling to be used. User will be able to perform basic turning, facing, boring, and drilling operations.

Time required: for a group of 8 users or less it should take about 2 hours to deliver this material. This allows for quick user interaction with the machine, but no actual practice time.

Outline:

1. Safety
 - a. Clean work area
 - b. PPE / loose clothing / jewelry / hair
 - c. Buddy Requirement
 - d. Only 1 person operates the machine
 - e. Workpiece Chucking / Clamping / whipping
 - f. Swarf containment
 - g. Sign into SUMS kiosk
2. Machine Anatomy / Terminology
 - a. Head Stock / Spindle / Chuck
 - b. Quick change gear box
 - c. Bed / Ways
 - d. Carriage / Apron
 - e. Cross feed
 - f. Compound
 - g. Toolpost
 - h. Tailstock
3. Machine Controls – explain and demonstrate function – cover all machines at SCC
 - a. Spindle switch
 - b. Jog button
 - c. Gears to select spindle speed
 - d. Gears to select feed speed / threading pitch / direction
 - e. Cross feed
 - f. Long feed

- g. Half nut engagement and threading dial
 - h. Carriage locks (if equipped)
 - i. Tail stock quill and quill lock
 - j. Discuss and demonstrate backlash and how to compensate for it
4. Machine Set-up
- a. Selecting method of chucking material
 - b. Additional workpiece supports – live center / steady / follow rest
 - c. Quick change tool post and mounting tools
 - d. Setting tool position / height and angle
 - e. Basic DRO function and touching off
 - f. Speeds and Feeds – sample chart – recommend online calculators
5. Lathe Cutting Techniques – show power feed use
- a. Turning
 - b. Facing
 - c. Drilling
 - d. Boring
 - e. Threading (time permitting)
6. Clean-up
- a. Cleaning the carriage / ways / chip tray
 - b. Sweep around machine – how far did the chips fly?
 - c. Wipe down the ways and compound / WD-40
 - d. Sign out of SUMS kiosk