

Metal Lathe Operation and Safety

Safety Considerations:

1. **KNOW** the use of the feed clutch and split nut to avoid damage of the lathe and possibly your work.
2. **NEVER** leave the chuck key in the chuck.
3. Secure work in the chuck and consider leverage in extending work from the chuck. Consider supporting work with the tailstock.

Select correct turning speed and feed rate based on work size (diameter) shape and hardness.

Operating The Rockwell 11" Metal Lathe

A. Starting the Lathe and adjusting speed.

1. Connect special power adapter to the end on the power cord so it will fit in the 220 volt wall outlet. (Found in the cabinet)
2. Make sure work is secure in the chuck and carriage is clear of the head stock.
3. Notice the power switch has a forward and reverse position, move switch to forward position.
4. Select drive lever position for direct and low speed positions
.... low speed range is 40-240 rpm
.... direct speed range is 250-1500 rpm
5. Adjust spindle speed **ONLY** when motor is running. Turn speed change hand wheel to right to increase and left to decrease speed. Speed is indicated on speed indicator dial next to speed change hand wheel.
6. For machining wood on a metal lathe higher speeds are recommended.

B. Adjusting feed rates using quick change gear box and tumblers.

1. Feed rates are in .001" per revolution of the spindle.
2. Select desired feed rate in .001" on the feed and thread cutting chart.
Example .0225" Move left tumbler to letter "E" and the right tumble directly under the .0225" on the chart.
3. Generally for turning wood on the metal lathe try feed rates from .010"-.030" per revolution.

C. Engaging the clutch lever for power on the saddle and cross slide.

1. See page 10 in your handout for detailed instructions
2. Using the feed selector lever move it to the upper position for longitudinal power feed (move carriage left and right). The lower position moves the cross slide in and out.
3. Feed direction forward and reverse is adjusted by the feed reversing lever on the headstock. **CAUTION:** only adjust the lever when the spindle is stopped.
4. To engage the feed move the clutch lever to the down and engaged position. The carriage or cross slide will engage depending on the feed selector lever position. To disengage the feed lever simply move it to the neutral or centered position. **PRACTICE USING THE FEED CLUTCH LEVER SEVERAL TIMES BEFORE OPERATING THE LATHE.**

D. Using the split nut for thread cutting.

1. Placing the feed selector lever in the center position allows engagement of the split nut for thread cutting. **WE DON'T RECOMMEND** use of the split nut for turning without additional instruction.

E. Use of the carriage assembly and micrometer dials.

1. Manual operation of the carriage is done using the apron hand wheel to move it left and right on the bed. The cross slide may be moved by using the cross slide hand wheel.
2. The cross slide and compound have micrometer dials calibrated in .001" units. Each .001" line will remove .001" from the diameter of the stock being machined. The micrometer dials have friction fit slip rings that may be moved to "0" or any other position on the scale.

F. Use of the compound rest.

1. The compound rest is designed for turning shot angles and tapers on the lathe. The swivel base may be adjusted by loosening the two holding nuts one on each side of the base. The compound is calibrated in 1 degree units from 0-90 degrees. Reference marks are found on the cross slide to set an angle on the compound.
2. The carriage lock screw may be locked when using the compound or cross slide when the carriage is to remain in a fixed position.

G. Use of the tool post and tool holders.

1. The tool post assembly is designed to accommodate a variety of tool holders. The tool post has a washer and rocker wedge designed to allow the centering of the tool bit at the work.
2. The right hand tool holder starts at the right and moves to the left.
3. The center holder can be moved in either direction on the work.
4. The left hand holder starts at the left and moves right.
5. This lathe accommodates 1/4" and 5/16" high speed steel tool bits.

H. Use of the three jaw universal chuck.

1. This chuck is the easiest to use on the lathe and may be used to hold work on the outside. It is considered a self centering chuck.
2. Simply put the work in the jaws and tighten with the chuck wrench.
ALWAYS REMOVE THE CHUCK WRENCH
3. The work should be ROUND for holding in the chuck.
4. The spindle on the lathe has a 1-3/8" opening and will allow work to extend through the spindle 1-3/8" dia. and smaller.
5. Changing jaws may be done by noting the number on each jaw. Jaws must be installed starting with 1 then 2 and finally 3. If the jaws aren't centered when finished remove them and repeat the steps.
6. The three jaw chuck may be removed using a spanner wrench and cradle block found in the cabinet. The loosening direction is marked on the spindle nut. **USE CAUTION** not to drop the chuck onto the ways when removing or installing. The cradle block will help with aligning the chuck and spindle nose and keep the chuck from damming the ways.

I. Use of 4 jaw independent chuck.

1. This chuck is for chucking irregular shaped work or for offset applications.
2. Each jaw is adjusted independently. Concentric circles on the face of the Chuck can be used to help center the work in the chuck.
3. A tool holder mounted in the tool post can also be used to help align work along with a pencil. Turn the work by hand or at **SLOW SPEED** (50-100 rpm). Using the pencil to mark the high side of the round work. For precision alignment secure a dial indicator to center accurately.
4. Jaws in the four jaw chuck are reversible and can be for holding larger diameter work

J. Use of the boring bar assembly.

1. The boring bar holder and boring bars are used for internal turning.
2. The boring bar holder inserts in place of the tool post on the compound.
3. Select the largest boring bar that will fit internal of the work to be bored.
4. Extend the boring bar no further than required to reach the depth of the hole to be bored.
5. You will need a 3/16" or 1/4" high speed steel tool bit ground with the proper clearance and rake to remove smooth chips from the wood part.
6. make sure the tool bit is on center and parallel with the bed of the surface of the cross slide assembly.