PARTS OF THE LATHE

The wood lathe consists of a bed, a headstock, a tailstock, and a tool rest. The headstock is permanently fastened to the bed. The tailstock slides and can be locked in any position on the bed. The tool rest supports the turning tool close to the workpiece. It can be moved along the bed and adjusted to various heights and angles. Fig. 30-2.

The headstock has a hollow, tapered spindle that is threaded on both ends. For most turning operations, a spur, or live (moving) center, is fastened to the headstock spindle and a cup center is inserted in the tailstock spindle. The stock is then held between the live center on the headstock spindle and the dead (stationary) center on the tailstock spindle. This is called spindle turning, or turning between centers.
DANGER
DO NOT EXCEED THESE RECOMMENDED SPEEDS. SERIOUS INJURY CAN RESULT IF PARTS BEING TURNED ARE THROWN FROM THE LATHE.

<table>
<thead>
<tr>
<th>DIA. OF STOCK (IN INCHES)</th>
<th>ROUGHING R.P.M.</th>
<th>GEN. CUTTING R.P.M.</th>
<th>FINISHING R.P.M.</th>
</tr>
</thead>
<tbody>
<tr>
<td>UNDER 2</td>
<td>1520</td>
<td>3000</td>
<td>3000</td>
</tr>
<tr>
<td>2 TO 4</td>
<td>780</td>
<td>1600</td>
<td>2480</td>
</tr>
<tr>
<td>4 TO 6</td>
<td>510</td>
<td>1080</td>
<td>1650</td>
</tr>
<tr>
<td>6 TO 8</td>
<td>380</td>
<td>810</td>
<td>1240</td>
</tr>
<tr>
<td>8 TO 10</td>
<td>300</td>
<td>650</td>
<td>1000</td>
</tr>
<tr>
<td>10 TO 12</td>
<td>250</td>
<td>540</td>
<td>830</td>
</tr>
<tr>
<td>12 TO 14</td>
<td>220</td>
<td>460</td>
<td>710</td>
</tr>
<tr>
<td>14 TO 16</td>
<td>190</td>
<td>400</td>
<td>620</td>
</tr>
</tbody>
</table>

General cutting follows the rough cutting. It is a shaping and smoothing operation. Most designs are cut during general cutting. Finish cutting is the final smoothing of the stock. It includes fine, detail cutting, as well as sanding. Figure 41-6 gives the proper speeds according to stock diameters and types of cuts.

Most lathes have a variable speed control. Adjust the speed on these lathes while the lathe is running. Set the speed before you mount the stock.

Some lathes have a four-step pulley system. To change speeds on these lathes, you must stop the machine. Disconnect the power first. Then move the belt to the desired pulleys. Placing the belt on the smallest motor pulley produces the slowest speed.

Lathe Safety
- Know and follow the general safety rules for operating power tools on page 211.
- Wear a face shield or safety goggles when using a lathe. If you wear a face shield, you must also wear safety glasses.
- Do not use a lathe unless you have permission from your instructor.
- Make sure the stock is free of knots, splits, and other defects. Loose pieces are easily thrown from lathes.
Keep your tools sharp. Dull tools are more dangerous than sharp ones.
- Do not use your hands to touch the turning stock.
- Never wear loose clothing when using a lathe. Always tie back long hair. It is easy to catch hair and clothing in the lathe.
- Always turn the stock by hand before starting the lathe.
- Check the speed setting before turning on the lathe. Turning stock too fast is dangerous.
- On a variable speed lathe, adjust the speed before mounting the stock. Set the speed control at its lowest setting.
- Always keep the tool support as close to the stock as possible. This is usually less than 1/8 inch (3 mm). As the stock becomes smaller, reposition the tool support. Stop the machine before adjusting the support.
- Keep the tool support and the tailstock clamped securely.
- Lubricate the cup center to reduce friction. This will help prevent burning. You need not lubricate ball bearing centers.
- Hold the tools securely. Keep one hand near the tool support. Place the other hand on the end of the tool's handle.
- When faceplate turning, use only the scraping method of cutting. Do not use a gouge.
- Always remove the tool support when sanding on the lathe. Otherwise, you can pinch your hands between the stock and the support.

- Always remove the centers after you finish turning. They are sharp. If brushed against, they can cause injuries.
- Let the stock come to a stop by itself. Never grab the stock to slow it down.

Cutting Methods

Two cutting methods are used to shape stock on the lathe. See Fig. 41-7. Scraping is the easiest and most used method. You can use any of the lathe tools for scraping. Hold the tool flat on the tool support. Move the tool horizontally into the turning stock. The tool scrapes away the wood fibers and leaves a rough surface. You can, however, produce a fairly smooth surface by taking light cuts. Be sure to use the proper lathe speed.

Shearing cuts are more difficult to make than scraping cuts. Shearing cuts remove the stock much faster, however. They also produce a smoother surface, which requires less sanding. Use only gouges and skewes to make shearing cuts. Hold the tool at an angle to the stock. Roll the tool as you cut the desired shape. To do this successfully you must practice a great deal.

Spindle Turning

Spindle turning is also called turning between centers. This is because the stock is supported between the two centers. See Fig. 41-8. The spur (live) center rotates in the headstock spindle. This rotation turns the stock. The cup (dead) center is located in the tailstock. It remains stationary and holds the stock in position. Spindle turning is used to shape table legs, tool handles, baseball bats, and other similar items.

Preparing the Stock. First select the stock. It should be about 1 inch (25 mm) longer than the finish length. It should also be a little larger than the finish diameter. The ends of the stock should be cut square.