

Figure 24-13. Set the parting tool's side in the first station.

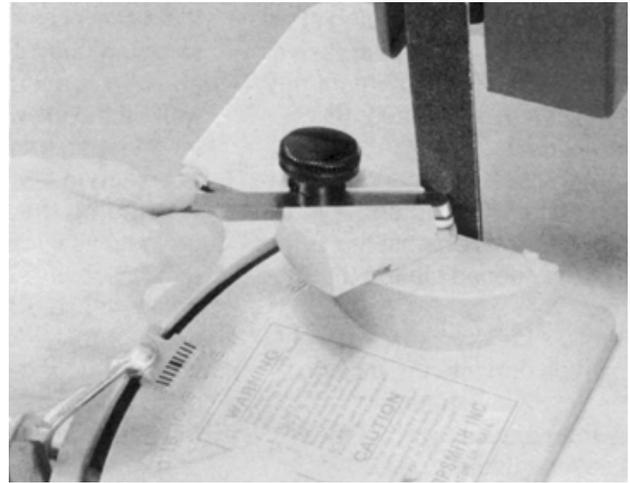


Figure 24-14. Position the roundnose chisel, bevel up in the fourth station. Tighten the knob.

Place the gouge in the third station of the sharpening guide and lay the side of the gouge against the left wall of the station (Figure 24-12). Rotate the gouge until its center touches the abrasive.

With the machine "OFF" practice rotating the gouge, first clockwise from the center to the edge, and then counterclockwise from the center of the gouge to the edge. You should notice while rotating the gouge that in order to keep the bevel in contact with the abrasive, you must slide the gouge forward on the station as the bevel is ground from the center to each edge.

After you get the feel of this grinding motion, be sure the gouge is not touching the abrasive and the speed dial is set to "**Slow**" (if you are using the Mark V), then turn on the machine.

Gently slide the gouge against the wall of the station and into the moving abrasive. Start rotating the gouge, like you practiced. Repeat this several times.

Grind away only enough metal to remove any damage to the cutting edge and create a slight burr. If the gouge is being ground for scraping, it is ready to use (the burr is sharp and scrapes very well). If the gouge is being ground for shearing or cutting, it will need to be honed to a razor sharp edge.

Grinding the Parting Tool— The parting tool has a bevel ground on both the top and bottom edges. To grind these angles the parting tool must be held on its side at the proper angle to the moving abrasive, turned over and reset at the exact same angle. These angles are controlled by the sharpening guide.

To grind the parting tool, lay the side of the parting tool in the first station of the sharpening guide (Figure 24-13). Be sure the parting tool **is not** touching the abrasive and the speed dial is set to "**Slow**" (if you are using the Mark V), then turn on the machine.

Gently slide the parting tool on the station and into the moving abrasive. Hold it there momentarily then back it away. Repeat this several times.

Turn the parting tool over and lay the other side in the first station. Slide the parting tool on the station and into the moving abrasive. Hold it there momentarily then back it away. Repeat this several times.

Grind away only enough metal to remove any damage to the cutting edge and create a slight burr. It is VERY important to grind an equal amount from each bevel so that the widest part of the parting tool is **exactly** at the cutting edge. If the parting tool is being ground for scraping, then it is ready to use (the burr is sharp and scrapes very well). If the parting tool is being ground for cutting, it will need to be honed to a razor sharp edge.

Grinding the Roundnose Chisel—The roundnose chisel has a bevel ground on the bottom at an angle measured from the top. This bevel is curved to form a round cutting edge. To grind this curved bevel the roundnose chisel must be held at the proper angle to the moving abrasive, pivoted and fed into the abrasive. The bevel angle is controlled by the sharpening guide.

Grinding the roundnose chisel on the fourth station is the only grinding operation that does not repeat the "factory" angle. The new 15° bevel angle is ideal for scraping. The distance between the pivoting station and the moving abrasive will set the radius of the cutting edge. Position the pivoting station close to the abrasive and the cutting edge will be ground completely around the chisel leaving no sharp corners. Position the pivoting station further away from the abrasive and the cutting edge will be ground around the chisel on a large radius leaving sharp corners where the sides and the curved cutting edge join.

To grind the roundnose chisel, position it, bevel up in the fourth station (the pivoting station). Slide it under the knob until the center of the round nose chisel touches the abrasive and tighten the knob (Figure 24-14).

With the machine "OFF" practice pivoting the roundnose chisel first to the left, and then to the right to complete the edge. You will notice that the chisel will need to be repositioned further forward on the grinding station to complete the bevel.

After you get the feel of this grinding motion, be sure the round-nose chisel is not touching the abrasive and the speed dial is set to "**Slow**" (if you are using the Mark V), then turn on the machine.

Gently slide the roundnose chisel in the fourth station until it just touches the moving abrasive. Tighten the knob and start pivoting the roundnose chisel, like you practiced. Repeat this several times. Grind away only enough metal to remove any damage to the cutting edge and create a slight burr. The roundnose chisel is ground for scraping, so it is ready to use as is and should not be honed (the burr is sharp and scrapes very well).

Grinding Lathe Chisels using the Grinding Wheel

The Shopsmith Grinding wheel mounts on the Mark V and will grind skews, gouges, parting tools and roundnose chisels. Set up the grinding wheel on the Mark V and grind the chisels according to the applicable instructions below.

Grinding the Skew—The skew chisel has a bevel ground on both sides at an angle not perpendicular to either the side faces or the top and bottom edges. To grind this compound angle the skew must be held at the proper angle to the **side** of the wheel and leaned to either the left or to the right on the appropriate sides of the wheel. **Warning: Do not grind the skew on the front of the wheel. This will leave a hollow ground bevel on the skew that may make the chisel difficult to control.**

One angle is controlled by the tool rest and the other angle (the lean of the tool) is controlled by feel.



Figure 24-15. Hold the skew on the tool rest with the tip up and the bevel against the wheel.

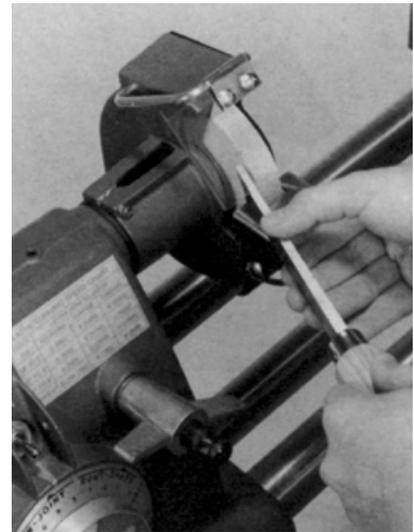


Figure 24-16. Position the tip up, and lay the right side bevel against the left side of the grinding wheel.

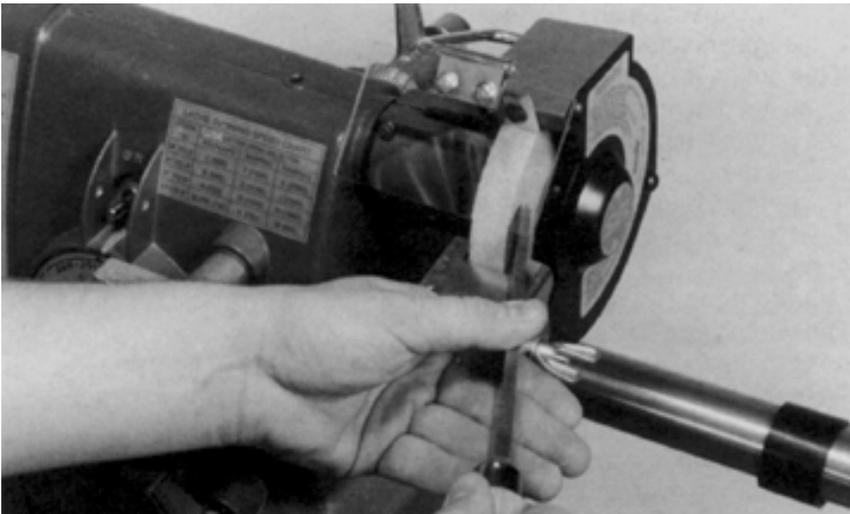


Figure 24-17. Position the left bevel, with the tip up, near the right side of the wheel.

To find the desired tool rest angle setting hold the skew on the tool rest with the tip **up** and the bevel of the cutting edge against either side of the wheel. Loosen the wing nut and pivot the tool rest until the cutting edge is parallel to the rotation of the wheel (Figure 24-15). At the same time, slide the tool rest to within 1/16" of the wheel and then secure the wing nut.

To grind the skew, position the tip up and lay the **right** side bevel against the **left** side of the grinding wheel (Figure 24-16).

Tilt the skew away from the wheel and be sure the skew **is not** touching it and the speed dial is set to "**Slow**". Then turn on the Mark V and set the speed dial to "A" (3400 RPM).

Gently lean the skew back toward the side of the grinding wheel. Feel for the bevel of the skew against the side of the grinding wheel. Hold it there momentarily then lean it away. Repeat this several times.

Reposition the **left** bevel with the tip **up** near the **right** side of the wheel (Figure 24-17).

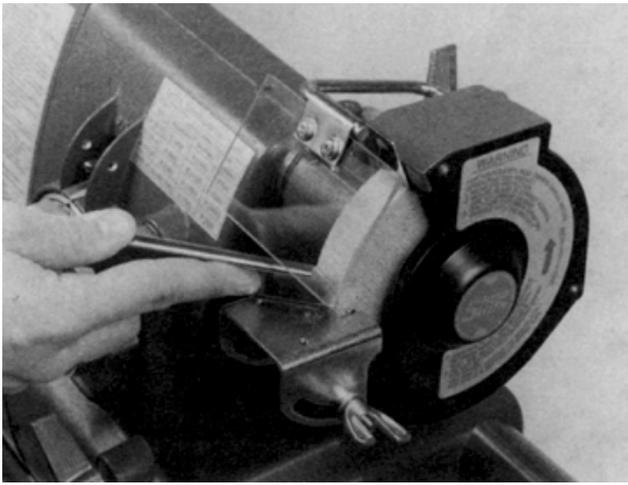


Figure 24-18. Practice rolling the gouge toward the front of the tool rest. Feel the bevel seat on the wheel.



Figure 24-19. Roll the gouge to the front of the tool rest, this time with the handle pointing to the right.

Gently lean the skew into the side of the grinding wheel. Feel for the bevel of the skew against the side of the grinding wheel. Hold it there momentarily then lean it away. Repeat this several times.

Grind away only enough metal to remove any damage to the cutting edge and create a slight burr. If the skew is being ground for scraping, then it is ready to use (the burr is sharp and scrapes very well). If the skew is being ground for shearing or cutting, it will need to be honed to a razor sharp edge.

Grinding the Gouge—The gouge chisel has a bevel ground on the convex side (bottom) at an angle measured from the concave side (top). This bevel is curved to form a rounded cutting edge. To grind this complex curved bevel, the gouge must be held at the proper angle to the grinding wheel, rotated and fed into the wheel. The angle and the roll of the gouge is controlled by feel.

Set the tool rest to 90° and slide it to within 1/16" of the wheel and then secure the wing nut. Set the gouge on the tool rest with the center of the bevel against the front of the grinding wheel and the handle pointing to the **left**.

Practice rolling the gouge toward the front of the tool rest (Figure 24-18). Feel for the bevel against the grinding wheel while keeping the side firmly against the tool rest. Repeat this movement with the gouge handle pointing to the **right** (Figure 24-19).

When you feel confident with the rolling movement of the gouge, slide it away from the wheel. Be sure that the gouge is not touching the wheel and that the speed dial is set to "**Slow**". Then turn on the Mark V and set the speed dial to "A" (3400 RPM).

Gently slide the gouge into the grinding wheel. Feel for the bevel of the gouge against the grinding wheel. Roll the gouge just as you practiced, first with the handle to the right, then with the handle to the left. Repeat this several times.

Grind away only enough metal to remove any damage to the cutting edge and create a slight burr. If the gouge is being ground for scraping, then it is ready to use (the burr is sharp and scrapes very well). If the gouge is being ground for shearing or cutting, then it will need to be honed to a razor sharp edge.

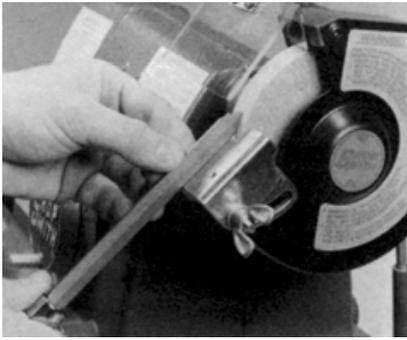


Figure 24-20. Lay the parting tool edge on the tool rest as shown.

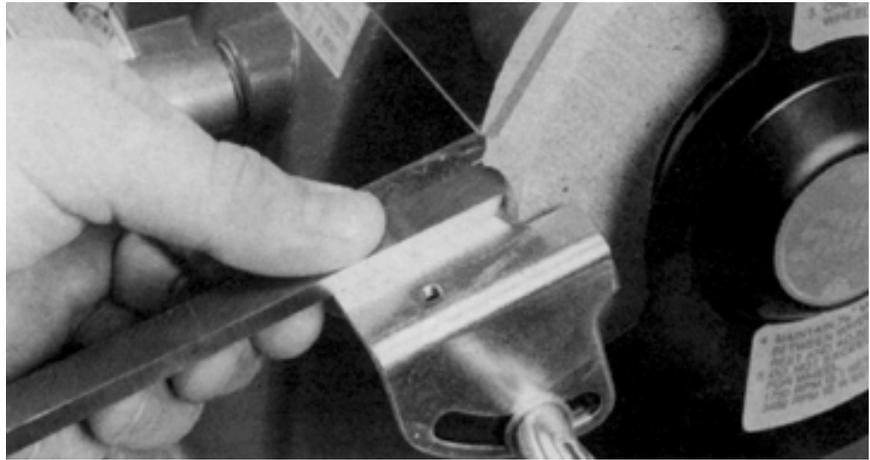


Figure 24-21. Slide the chisel, bevel down, until its center touches the grinding wheel.

Grinding the Parting Tool—The parting tool has a bevel ground on both the top and bottom edges. To grind these angles the parting tool must be held on its edge at the proper angle to the grinding wheel, turned over and held at the exact same angle. Adjust the tool rest to match the center of the bevel previously ground on the parting tool and slide the tool rest to within 1/16" of the wheel and then secure the wing nut.

Lay the edge of the parting tool on the tool rest (Figure 24-20). Practice sliding the tool forward while holding it perpendicular to the tool rest and the grinding wheel. Try this on both sides of the parting tool. When you feel confident with the movement of the parting tool, slide it away from the wheel. Be sure that the parting tool is not touching the wheel and that the speed dial is set to "Slow". Turn on the Mark V and set the speed dial to "R" (3400 RPM).

Gently slide the parting tool on the tool rest and into the grinding wheel. Hold it there momentarily then back it away. Repeat this several times.

Turn the parting tool over and lay the other edge on the tool rest. Slide the parting tool on the tool rest and into the grinding wheel. Hold it there momentarily then back it away. Repeat this several times.

Grind away only enough metal to remove any damage to the cutting edge and create a slight burr. Be sure to grind an equal amount from each side so that the widest part of the parting tool is exactly at the cutting edge. If the parting tool is being ground for scraping, then it is ready to use (the burr is sharp and scrapes very well). If the parting tool is being ground for cutting, it will need to be honed to a razor sharp edge.

Grinding the Roundnose Chisel—The roundnose chisel has a bevel ground on the bottom at an angle measured from the top. This bevel is curved to form a rounded cutting edge. To grind this curved bevel the roundnose chisel must be held at the proper angle to the grinding wheel, pivoted and fed into the wheel. The bevel angle is controlled by the tool rest.

Set the tool rest to a 5° to 10° angle to the wheel and slide the tool rest to within 1/16" of the wheel. Then secure the wing nut.

Grinding the roundnose chisel is the only grinding operation that does not repeat the "factory" angle. The hollow-ground 5 to 10° bevel angle is excellent for scraping.