

Lesson 1: Sharpening and Reconditioning a Twist Drill, Lawn Mower Blade, and Chain Saw Chain

Sharpening a Twist Drill

Objective: Students will sharpen a twist drill.

Directions: Students will use a bench grinder to sharpen a twist drill.

Materials and Equipment:

Bench grinder with appropriate grinding wheel

Twist drill that needs sharpening

Face shield or other approved face and eye protection*

Leather apron or any other protective clothing recommended by instructor

Tool gauge

Container of water for cooling the drill

* Everyone participating in or observing the demonstration should wear appropriate protective eyewear and any other protective clothing as needed.

Procedure:

1. Wear appropriate safety equipment.
2. Follow correct procedure for setting up the grinding wheel.
 - a. Inspect equipment, materials, and work area to ensure safe and correct operation.
 - b. With the power disconnected, adjust the tool rest and make sure all guards are in place. The tool rest should be horizontal to the center of the wheel. There should be a 1/16-in. space between the tool rest and the face of the wheel.
 - c. When all adjustments are made, plug in the grinder.
 - d. Stand to the side of the grinder and turn it on. Let the grinder run before using.
3. Follow the correct procedure for sharpening the twist drill. Use the following steps and any others recommended by the instructor. (Steps a. through e. explain the positioning of the twist drill.)

CAUTION: Do not touch the drill to the grinding wheel before the drill is in the proper position.

- a. Hold the drill perpendicular to the face of the wheel.
 - b. Swing the drill around to the left so that it is at a 59-degree angle to the face of the wheel.
 - c. Rotate the drill until one cutting lip is horizontal to the center of the wheel.
 - d. Hold the drill between the thumb and index finger of the left hand with approximately 1 in. of the drill exposed. Use the right hand to hold the shank of the drill.
 - e. Place the back of the left index finger on the tool rest. Be careful to not let the fingers touch the grinding wheel.
 - f. Touch the cutting lip to the face of the grinding wheel and slowly elevate the cutting tip by lowering the back end of the drill. At the same time, give the drill a slight clockwise turn.
 - g. Dip the drill in water frequently to avoid overheating it.
 - h. Use the tool gauge to check lip angle and heel clearance.
 - i. Make additional passes as needed to restore the cutting edge.
 - j. When one lip is properly sharpened, turn the drill half a turn and repeat the procedure for the other lip.
4. Perform assigned shutdown and cleanup procedures. Materials and equipment should be returned to their proper places.
 5. Turn in work to be graded by the instructor.