

## Drill Press (Metal)

### I. Competencies

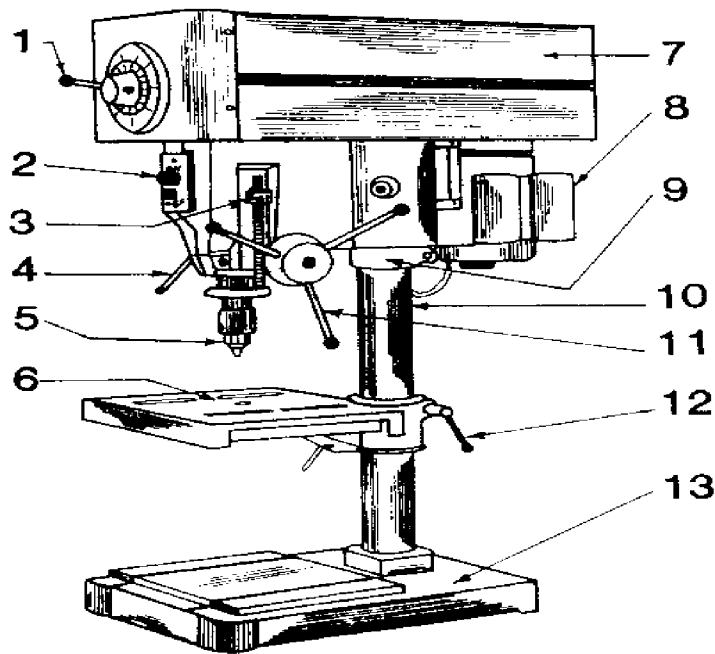
Given a properly adjusted drill press, accessories, instruction and demonstration of use, each student will be able to:

- A. Identify the major parts of the drill press.
- A. Pass a written test on safety and operating procedures of the drill press with 100 percent accuracy.
- B. Demonstrate ability to use the drill press, following suggested safety rules and correct operation procedures.

### II. Instructional Materials and Procedures

#### A. Identification of Basic Drill Press Parts

- |                           |                         |
|---------------------------|-------------------------|
| 1. Variable speed control | 8. Motor                |
| 2. Switch                 | 9. Head support collar  |
| 3. Depth stop             | 10. Column              |
| 4. Quill lock             | 11. Pilot feed lever    |
| 5. Chuck                  | 12. Table locking clamp |
| 6. Table                  | 13. Base                |
| 7. Safety guard           |                         |



## B. Drill Press Safety

1. Do not wear loose clothing or jewelry while operating a drill press. Confine long hair with a cap or hair net.
2. Wear industrial quality eye protection while drilling.
3. Keep all guards in place.
4. Keep work space around the drill press clean. Make certain that cutting oil and cooling lubricant are not spilled on the floor.
5. Turn off power before making adjustments.
6. Drill only with sharp drill bits with shanks that are matched to the type of chuck being used.
7. Secure bit by tightening in each hole of the drill chuck. Remove the chuck key before the drill press is turned on.
8. Clear the drill press table of all tools, metal, rags, etc. before drilling.
9. Secure all work in a drill press vise or with a clamp before drilling.
10. Never hold material by hand while drilling.
11. Never attempt to stop a revolving piece of work in the drill press by hand.
12. Never allow any part of your body to touch the drill bit or any revolving part of the drill press while it is in motion.

## C. Drill Press Basic Operating Procedures

1. Adjust drill speed and feed to the type and size of hole being drilled. Check drill specifications for recommended drill speeds and feed.
2. Position long stock so it is to the left of the drill press operator while being drilled.
3. Select proper sized bit by using drill gauge. Make certain the drill shank and chuck are matched, i.e. use a straight shank drill in a Jacobs chuck and a tapered shank drill in a morse tapered chuck.
4. Tighten the drill bit securely in chuck.
5. Mark all metal to be drilled with a center punch.
6. Support the end of long stock with a stand.
7. Clamp the metal to be drilled in vise. Place a block of wood under the metal being drilled to prevent the bit from cutting into the vise after coming through the work.
8. Align the drill bit with the center punch mark.

9. Make certain the chuck key had been removed from the chuck before starting the drill press.
10. Make sure that guard(s) is/are in place and the table locking clamp is tightened securely.
11. Use the proper cutting lubricant for the material being drilled.
12. Set the drill speed to match the material being drilled and hole size. Note that variable speed drill presses require the machine to be running to adjust the operating speed.
13. Turn on the power and apply appropriate cutting lubricant. The cutting lubricant should be applied to the upper portion of the bit.
14. Apply pressure to pilot feed lever, feed drill bit into metal fast enough to keep drill bit cutting at all times. Continue to apply lubricant as needed.
15. Just as the bit begins to cut through the metal, reduce the feed pressure so the bit will not seize the metal. Seizing causes the material to be grabbed by the bit, which will cause the material to revolve around the bit or will break the bit. Stop the drill press before removing any revolving material.
16. After the hole is drilled release the pilot feed lever slowly and allow the chuck to return to the starting position.
17. Turn off power.
18. When work is removed from the vise be careful, the underside of the hole may have sharp burrs which will need to be filed or ground smooth.
19. Remove drill bit, clean, and return it to proper storage place.

20. When drilling long stock; put work on the drill press table, long end to the left of the drill press operator. Lower the drill bit to the work and align the center punch mark with the drill bit. Then tighten the quill lock and clamp the material to the table using a clamp. Use a support to hold up the unclamped end of the stock. Release the quill lock and drill the hole.
21. When drilling round stock; use a V-shaped drill block to support and hold the material. After the material is center punched and aligned with the drill bit, clamp the stock to the drill press table using clamp, then drill the hole.