Session One

Drills; Saws, Part 1
Objectives

When trainees have completed this session, they should be able to do the following:

1. Identify and explain how to use various types of power drills and impact wrenches.
   
   a. Identify and explain how to use common power drills and bits.
   
   b. Identify and explain how to use a hammer drill.
   
   c. Identify and explain how to use pneumatic drills and impact wrenches.
Continued Objectives

2. Identify and explain how to use various types of power saws.
   
a. Identify and explain how to use a circular saw.

b. Identify and explain how to use saber and reciprocating saws.
Session One Performance Task

Safely and properly demonstrate the use of the following tool(s):

- Electric drill
- Hammer drill or rotary hammer
• One of the most important power tool safety rules is to make sure that the tool has been **disconnected from its source of energy** before replacing parts such as, bits, blades, or discs.
Basic drill design is the same for most types, with only slight differences.
• A trigger lock is a small lever, switch, or part that can be used to activate a locking catch or spring to hold a power tool trigger in the operating mode even when the trigger is released. If a power tool is equipped with a trigger lock, do not use the **trigger lock**.
Types of Power Drills

Types of power drills are often used in the construction industry:

- Electric drill
- Cordless drills
- Electromagnetic drills
- Hammer drills
- Pneumatic drills
- Electric screwdrivers
Section 1.1.0 – Drills and Bits 2 of 2

Bit selection depends upon the material being drilled and, of course, the size of the hole required.
Section 1.1.0 – Drills

These drills work well between studs and joists in walls and ceilings. The difference between the two models shown here is power.
Section 1.1.2 – Drills

These drills are operated like a drill press, using a hand wheel to push the bit against the workpiece. Maintain power to maintain the electromagnet!
Section 1.1.3 – Using a Drill 1 of 2

Use the chuck key to tighten the chuck jaws; use all three holes in the chuck.

(A) INSERT THE BIT SHANK INTO THE CHUCK OPENING.

(B) TIGHTEN WITH THE CHUCK KEY.

(C) HOLD THE DRILL PERPENDICULAR TO THE MATERIAL AND START THE DRILL.
Section 1.1.3 – Using a Drill 2 of 2

Most cordless drills have a simpler type of chuck that does not require a key, but grip is slightly compromised.

(A) INSERT THE BIT SHANK.

(B) KEEP BIT STRAIGHT AND PARTIALLY TIGHTEN THE CHUCK.

(C) TIGHTEN THE CHUCK SECURELY.
Section 1.2.0 – Rotary Hammers 1 of 2

• Rotary hammers provide more pounding action than hammer drills, and at a lower frequency.
Hammer drill

- Hammer drills will not hammer until pressure is applied to the drill bit against a surface.
Section 1.2.0 – Rotary Hammers 2 of 2

Each rotary hammer brand requires a specific bit shank style. Adapters can be used, but they extend the overall length of the bit.
Sections 1.3.1 to 1.3.3 – Pneumatic Tools 1 of 2

Pneumatic drills and impact wrenches eliminate the electric motor and provide plenty of power and durability.
• A pneumatic drill is typically used when there is no available source of electricity, or when a high rate of production is desired.
Sections 1.3.1 to 1.3.3 – Pneumatic Tools 2 of 2

A whip check keeps the hose from whipping about if the connection is severed while under pressure.
Section 2.1.0 – Circular Saws 1 of 2

Like drills, all circular saws have a great deal in common. However, the weight, balance, and feel of saws can differ quite a bit.
• The blade is protected by two guards. On top, a rigid plastic guard protects workers from flying debris and from **accidentally touching the spinning blade.**
Section 2.1.0 – Circular Saws 2 of 2

Blade choice depends upon the material being cut, cut direction (cross-cut or rip for wood), and how smooth the cut edge needs to be. Carbide teeth increase blade life significantly.
The saw kerf must be considered in measurements and when making the cut. Always be aware of which side of the cut line you need to place the saw blade.

Circular saw blades leave a kerf that is roughly 1/8 inch wide. Be sure to cut on the waste side of the cut mark to allow for the blade’s kerf, or the finished piece will be short.
Sections 2.1.1 and 2.1.2 – Circular Saws 2 of 3

• As you mark the cut line, mark an X on the side that is waste.

• Guards will move as the cut progresses.

• Both hands on the saw. The material should be clamped, not held with one hand.

• Use the blade as a guide once the notch in the baseplate moves off the workpiece.
Sections 2.1.1 and 2.1.2 – Circular Saws 3 of 3

- Never force the saw.

- Manage the power cord before the cut begins.

- Keep the lower blade guard free and clean. Do not add oil or grease.
Section 2.2.1 – Saber Saws

Technically, these are reciprocating saws too. Adjustable baseplates, swiveling left to right, allow them to make beveled cuts.
• Saber saws, sometimes referred to as jig saws, have very fine blades. **Saber saws are an effective tool for doing delicate and intricate work**, such as cutting out patterns or irregular shapes from wood or thin, soft metals. (cutting circles)
Sections 2.2.2 to 2.2.4 – Reciprocating Saws (SawZall)

These saws are excellent for demolition work. Their design and cutting action makes them unsuitable for detail work.
• Reciprocating saws are used to cut irregular shapes and holes in plaster, plasterboards, plywood, studs, cement boards, metal, and most other materials that can be cut with a saw.

• Before using the saw, make sure that the **switch is in the OFF position** before it is plugged into a power source.
Sections 2.2.2 to 2.2.4 – Reciprocating Saws

SAFETY

• Clamp the workpiece down or be sure that what is being demolished is physically sound.

• Be aware of what may fall or change position in the midst of, or at the end of, a cut.

• Use sharp blades; they can dull quickly.

• Use higher speeds for wood than metal. Metal blades have significantly more teeth.
Sections 2.2.2 to 2.2.4 – Reciprocating Saws 3 of 3

• Avoid bending the blade over while cutting.

• Ensure the blade is properly secured in the saw; broken blades often leave a piece in the saw blade mount.

• Keep a firm grip. These saws often jump around, especially when using coarse blades.
Next Session...

Read Sections 2.3.0 through 4.3.1. Complete the Section Reviews for each section as you complete the reading (including Section 1.0.0).