Session Two

Saws, Part 2; Other Power Tools
Session Two Objectives

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

2. Identify and explain how to use various types of power saws.
   c. Identify and explain how to use a portable band saw.
   d. Identify and explain how to use miter and cutoff saws.

3. Identify and explain how to use various grinders and grinder attachments.
   a. Identify and explain how to use various types of grinders.
   b. Identify and explain how to use various grinder accessories and attachments.
Session Two Objectives

4. Identify and explain how to use miscellaneous power tools.
   a. Identify and explain how to use pneumatic and powder-actuated fastening tools.
   b. Identify and explain how to use pavement breakers.
   c. Identify and explain the uses of hydraulic jacks.
Session Two Performance Tasks

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

- Portable band saw
- Miter or cutoff saw
- Portable or bench grinder
- Pneumatic nail gun
- Pavement breaker
Sections 2.3.0 to 2.3.2 – Band Saws (1 of 2)

- Used almost exclusively on metal.

- Little or no added pressure is required. Check for blade wear if the cut is not progressing as expected.

- Low speeds are best for metal cutting. Many band saws have only one speed.

- The blade can easily be twisted and stressed while cutting, which results in breakage.
Sections 2.3.0 to 2.3.2 – Band Saws (2 of 2)

The **band saw** has one piece blade that runs in one direction around guides at either end of the saw. The blade is a thin, flat piece of steel. The blade must be of the proper length to fit the revolving pulleys that drive and support the blade.
Portable band saw Cuts

- Metal Pipe
- PVC Pipe
- Plastic
- Wood

It is especially good for cutting heavy metal, but it will also do fine cutting work.

The portable band saw generally cuts best at a low speed.
Compound miter saws allow for multiple angles in a single cut. Sliding models allow for cutting wider stock. Many abrasive saws are for cutoff service only; the cutting angle cannot be set.
Power miter saws

• There are two types of power miter saws; power miter saw and compound miter saws.

• The difference between the power miter saw and the compound miter saw is that the blade on the compound miter saw can be tilted vertically, allowing the saw to be used to make a compound cut (combined bevel and miter cut)

• The power miter saw combines a miter box with a **circular saw**, allowing it to make straight and miter cuts.
Section 3.1.0 – Grinders (1 of 2)

Angle grinders are very common metalworking tools, especially for welders, pipefitters, and ironworkers. Knotted wire wheels and cups are common in addition to grinding wheels.
Grinders

• Grinders are available in various configurations.
• Angle grinders are used to grind away hard, heavy materials and to grind surfaces such as pipes, plates, or welds.
• [https://youtu.be/U2Wr72xB8EM?t=14](https://youtu.be/U2Wr72xB8EM?t=14)
Section 3.1.0 – Grinders (2 of 2)

Die grinders and detail grinders are used for finer work, such as removing casting waste from components.
Sections 3.1.1 and 3.1.2 – Grinders (1 of 2)

Always use the adjustable tool rest as a support when grinding or beveling metal pieces. There should be a maximum gap of 1/8-inch (about 3 mm) between the tool rest and the wheel.
Grinder Safety

• Face shields should be worn with all grinders.
• The maximum rpm of the grinding wheel must be greater than or equal to that of the grinder.
• Grinders create a shower of sparks. Ensure the work area is clear of flammable materials.
• Keep the tool rest within 1/8-inch (about 3 mm) of the wheel.
• Before mounting a grinding wheel onto a bench grinder, first check the wheel for chipped edges and cracks.

• **Perform a ring test on new grinding wheels.**

• Special bits can be used on some grinders to remove rough edges and burrs from the inside and outside of pipes and other objects. **Burr bits** operates at high rpm and can catch on burrs and cause the grinder to shift around quite a bit.
Section 4.1.0 – Nailers (1 of 2)

Pneumatic nailers can set many nails very quickly and they eliminate the need to grab and hold the nail. The nose of the nailer must be depressed against a firm surface before it will fire.
Never load a pneumatic nailer with the compressor hose attached. If the nailer is not firing, **disconnect the air hose** before attempting any repairs.
Section 4.1.0 – Nailers (2 of 2)

Powder-actuated tools are excellent when there is no air or electric power. They can fire fasteners directly into concrete, which is their primary use. Alternative methods (drilling and anchors) are much more labor-intensive.
A powder-actuated tool is a low-velocity fastening system powered by gunpowder cartridges, or loads. The tools are used to drive steel pins or threaded steel studs directly into masonry and steel.

Operators of powder actuated tools must be trained and certified by the manufactures of the tool being used.

The safe and efficient use of pneumatically powered nailer is that always read the manufacturer’s instructions.

- Requires special training and certification
A variety of attachments are available for pavement breakers, depending upon the task. A typical pneumatic model weighs between 50 and 90 pounds (20 to 40 kg). Consider what is under the area being broken up, such as wiring or piping.
• These tools do not rotate like hammer drills; they reciprocate (move back and forth).

*Jackhammer*

• The pavement breaker is used for large-scale demolition work, such as tearing down brick and concrete walls and breaking up concrete or pavement.
Section 4.3.0 – Jacks

- Jacks can be used for various tasks, such as raising equipment for the installation of permanent footings and vibration isolators.

- A jack should never be depended upon to hold a load; lift, position supporting materials, and then remove the load from the jack.
• Hydraulic jacks are portable devices used for a wide variety of purposes.
• There are various types of hydraulic jacks including those with internal pumps and those that use a lever-operated pump.
• A **hydraulic** Jack is an example of a Porta-Power tool.
• Power tools are a necessity in the construction industry and it is important to understand how they work and what they do.
• All workers will be safer if everyone is familiar with the tools being used on the job site.
• Always read the manufacturer's manual for any new power tool being used. Never use a tool without proper training.
Next Session…

LABORATORY: USING POWER TOOLS

Review the complete module to prepare for the laboratory and Performance Tasks in the next session.