Print

HAND AND POWER TOOLS, SUBPART I

MODULE DESCRIPTION

This module will cover how to StartSafe and StaySafe while using hand and power tools.

OBJECTIVES

After completing this module, you will be able to:

List the hand and power tool safety rules.
Identify the precautions essential to the safe use of different types of tools.
Name the guarding techniques that apply to hand and power tools.

MODULE OUTLINE

1. Safety Rules

To use hand and power tools safely, you should:

- Maintain all tools on a regular basis.
- Use the right tool for the job.
- Operate the tool according to the manufacturers instructions.
- Use the right personal protective equipment (PPE).
- Use proper guarding devices.

2. Safety Precautions

Hand Tools: Certain precautions must be taken and protection must be worn when working with hand tools.

- Use the proper PPE, including safety goggles, hard hats, and gloves to protect you from hazards, such as falling and exposure to harmful vapors and fumes.
- Keep floor surfaces in your work area free from debris and tripping or slipping hazards.
- Keep cutting tools sharp.

Power Tools: Certain precautions must be taken and protection must be worn when working with power tools.

- Disconnect tools when not in use, before servicing and cleaning, and when changing accessories
- Keep people not involved with the work away from the work area
- Secure your work with clamps or a vise, freeing both hands to operate the tool

- Do not hold the switch button while carrying a plugged in tool
- Keep tools sharp and clean
- Consider what you wear loose clothing and jewelry can get caught in moving parts
- Remove damaged electrical tools and tag them: Do Not Use
- Do not use power tools that are not fitted with guards and safety switches

Electrical Cords: Certain precautions must be taken and protection must be worn when working with electrical cords. Including:

- Not carrying portable tools by the cord.
- Not using the electrical cord to hoist or lower tools
- Not yanking the cord or hose to disconnect the tool
- Keeping cords and hoses away from heat, sharp edges, and oil

Electrical Power Tools: Certain precautions must be taken and precaution must be worn when working with electrical power tools.

- The tool must contain a 3-wire cord plugged into a grounded receptacle.
- The tool must be double insulated or it must be powered by a low-voltage isolation transformer.
- Use glove and safety shoes.
- Do not wear loose clothing.
- Operate within the tool design limits.
- Store tool in a dry place.
- Do not use in wet locations, unless approved.
- Keep work areas well lit.
- Ensure cords do not present a tripping hazard.

3. Abrasive Wheel Safety Precautions

All of the precautions are good to know. Another tool that we are going to learn about is the abrasive wheel.

When working with an abrasive wheel, you must remember that it can throw off flying fragments, which is why guards are essential. A guard is used so that a minimal amount of the wheel I exposed when in use.

Your wheel should be equipped with guards that:

- Cover the spindle end, nut, and flange projections.
- Maintain proper alignment with the wheel.
- Dont exceed the strength of the fastenings.

To inspect and test:

- Closely examine the wheel for damage.
- Perform a sound or ring test by tapping the wheel gently with a light, non-metallic instrument to ensure that the wheel is free from cracks/defects.
- Do not use a wheel that sounds cracked or dead since this is an indication the wheel might break during use.

When using an abrasive wheel, make sure that you:

- Let the tool come up to speed prior to grinding and cutting.
- Do not stand in front of the wheel as it comes up to full speed.

- Do not adjust the wheel while it is rotating.
- Use eye and/or face protection.

Even when following these precautions, wheel cracking can sometimes occur. There are three steps you can take to prevent this:

- Fit the wheel on the spindle
- Tighten the spindle nut enough to hold the wheel in place without distorting the flange
- Make sure the spindle speed does not exceed the maximum speed marked on the wheel

Abrasive wheels are to be equipped with adjustable work rests attached to compensate for wheel wear. The rests are for supporting the work. The work is to be securely clamped after each adjustment, which is not to be done while the wheel is in motion.

Work rests are also an essential safety precaution when working with offhand grinding machines. They should be attached to abrasive wheels to support the work and should be of rigid construction and adjustable to compensate for wheel wear. Work rests should be kept adjusted closely to the wheel with a maximum opening of 1/8 inch to prevent the work from jamming between the wheel and the rest, which could cause the wheel to break.

All work should be securely clamped after each adjustment. It should never be done while the wheel is in motion.

4. Pneumatic Tool Safety Precautions

Pneumatic tools are powered by compressed air, so you should take the same safety precautions with an air hose that you take with an electrical cord. Remember to wear eye protection at all times when working with pneumatic tools. When working with jackhammers you must also wear hearing protection.

When working with pneumatic tools, safety is a main priority. The main hazard to watch out for is getting hit by an attachment or a fastener that the worker is using with the tool

To ensure safety, make sure the tool is fastened securely to the air hose, to prevent a disconnection. Remember to use a short wire or positive locking device when attaching the air hose to the tool.

Always make sure pneumatic tools are secured to the hose by some positive means to prevent the tool from accidentally becoming disconnected. Safety clips and retainers are examples of positive locking tools that are ideal for securing the pneumatic tool to the air hose; however, hose clamps are not.

Safety clips and retainers are examples of positive locking tools that are ideal for securing the pneumatic tool to the air hose. However, hose clamps are not considered positive locking devices.

Pneumatic tools include:

- Nailers
- Chippers
- Sanders
- Staplers
- Jackhammers
- Drills

5. Other Safety Precautions

Liquid Fuel Tools: Liquid fuel tools are usually powered by gas; therefore, the main hazard is fuel vapors. Before refilling

fuel-powered tool tanks, shut down the engine and allow it a sufficient amount of time to cool off.

Note: Remember, if you are using a fuel-powered tool in an enclosed area, be aware that carbon monoxide can replace or deplete oxygen, and testing and ventilation need to be done.

Powder-Actuated Tools: Powder-actuated tools are very dangerous, and any employees using these tools must be licensed and trained to use them safely. Employees must be trained to avoid firing into easily penetrated materials, such as plywood, and to wear appropriate PPE at all times.

Remember these safety tips:

- Inspect the tool daily before loading to ensure that all safety devices are working properly.
- Do not use the tool explosive/flammable areas.
- Do not load the tool unless using it immediately.
- Do not leave the loaded tool unattended.
- Keep both hands clear of the barrel end.
- Never point the tool at anyone.
- Store the unloaded tool in a locked box.

Jacks: All jacks have both a manufacturers rated capacity and a stop indicator. Neither of these should ever be exceeded. When using a jack, make sure that:

- The base is on a firm, level surface.
- The jack is centered.
- The jack head is placed against a level surface.
- You apply the lift force evenly.
- Any jack you use has been lubricated and inspected regularly, or immediately before use.

6. Guarding Safety Precautions

Guarding is very important when working with all tools. A guard is used to provide a barrier between the exposed moving parts of tools and you. The guarding device is designed to prevent contact between you and the dangerous parts of a tool while it is operating.

Guards protect you and others from:

- Point of operation
- In-running nip points
- Rotating parts
- Flying chips and sparks

Tools with the following parts require guarding:

- Belts, Shafts, Sprockets, Flywheels, Gears, Pulleys, Spindles, Chains, and Other moving parts

7. Guarding Techniques

Radial Saw: Radial saws are equipped with an upper and lower blade guard, which prevent you from coming into contact with the rotating blade.

- The upper blade guard completely encloses the upper portion of the blade down to a point that will include the end of the saw

arbor. The upper hood should be attached in a way that it protects you from flying debris.

- The lower blade guard is a device that automatically adjusts itself to the diameter of the work. It remains in contact with the work being cut to give the maximum protection possible for the operation being performed.

Portable Circular Saw: Portable Circular Saws are equipped with an upper and lower guard, which protect you from dangers of the saw blade.

- The upper guard covers the saw to the depth of the teeth, except for the minimum arc required to permit the base from tilting for level cuts.
- The lower guard covers the saw to the depth of the teeth, except for the minimum arc required, allowing proper retraction and contact with the work. The guard slides up as the blade comes into contact with the work.