

## **HIGH-IMPACT POWER TOOL SAFETY**

This easy-to-use Leader's Guide is provided to assist in conducting a successful presentation. Featured are:

**INTRODUCTION:** A brief description of the program and the subject that it addresses.

**PROGRAM OUTLINE:** Summarizes the program content. If the program outline is discussed before the video is presented, the entire program will be more meaningful and successful.

**PREPARING FOR AND CONDUCTING THE PRESENTATION:** These sections will help you set up the training environment, help you relate the program to site-specific incidents, and provide program objectives for focusing your presentation.

**REVIEW QUESTIONS AND ANSWERS:** Questions may be copied and given to participants to document how well they understood the information that was presented. Answers to the review questions are provided separately.

**ATTENDANCE RECORD:** Document the date of your presentation as well as identify the program participants. The attendance record may be copied as needed.

### **INTRODUCTION**

We use portable power tools in a variety of tasks each day: repairing machinery, installing new equipment and performing routine maintenance. In fact, we rely on such tools as drills, saws, sanders and grinders so much that we have a tendency to become too comfortable with them. Our complacency often leads us to disregard safe work practices. When this happens, we leave ourselves open to burns, cuts, electrocution and other injuries. In fact, more than 20,000 injuries are attributed to power tool use each year.

This video features six accident reenactments to remind power tool users about key safety issues and to make them aware of the painful injuries that result from unsafe use. "Voices of experience" provide real-world advice on using tools to get the job done while staying safe at the same time.

Topics include inspecting tools before use, selecting the proper tool for the job, being trained and authorized to use tools and correct body placement and tool positioning. Electrical extension cords, GFCI's, dangers of compressed air, avoiding horseplay, recognizing fire hazards and using proper PPE are also covered.

### ***PROGRAM OUTLINE***

#### **THREE KEYS TO PROTECTING OURSELVES FROM POWER TOOL INJURIES**

- Always choose the right tool for the job and follow manufacturer's instructions for use.
- Maintain power tools in a safe condition and always wear the appropriate personal protective equipment for the job.
- Understand how to use the tool correctly and be authorized for each task you undertake.

#### **USING PORTABLE DRILLS SAFELY**

- When using portable drills, avoid placing your hand or other body parts in harm's way.
- Be aware of drilling blindly into unknown areas which may contain electrical cables or other potential hazards.

- Always remember personal protective equipment, such as safety glasses and face shields.

### **SANDERS**

- Take care when using belt or disc sanders, as the abrasive surfaces are exposed.
- When using the tool, keep it away from your body and keep clothing away from moving parts.
- You may want to wear a dust mask for protection from flying dust and debris. If the material is toxic, you must wear the appropriate respirator.
- Never lock the tool in the “on” position when the job you are performing may require you to stop immediately.

### **GRINDERS**

- When using grinders, make sure to wear all of the appropriate PPE: safety goggles or glasses, a face shield, a dust mask or even a respirator may be required.
- Hearing protection may be required during extended work periods.
- Always make sure the work area is free of combustibles and flammables that could be ignited by sparks. Make sure to keep a fire extinguisher close by.
- Keep co-workers a safe distance away by erecting work barriers.
- Always make sure the grinder is in the “off” position before energizing the tool.
- Do not use a rotary die grinder with the cutter aimed towards yourself. If the grinder slips, you could suffer an injury.

### **GRINDING WHEELS AND ABRASIVE DISCS**

- Choose the correct grinding wheel for the material with which you are working. If you use a grinding wheel on a soft material that is designed for hard material, the wheel can load excessively and shatter.
- Always make sure the wheel or disc is secure. Unsecured cutters and wheels can be thrown from the grinder.

### **CIRCULAR SAWS**

- Disconnect the saw from its power source before adjusting or changing accessories or blades.
- Always replace or return safety guards to correct adjustments before using the tool. Never tie the guard back and leave the blade exposed.
- Make sure to read, understand and follow the manufacturer’s instructions before use.
- Inspect the tool for good condition before use and make sure to use the proper PPE.
- Always select the proper blade for the material being worked. Also, make sure the speed marked on the blade is at least as high as the no-load RPM on the saw’s nameplate.
- Before making a cut, be sure the electrical cord is safely out of the way.
- To make a safe cut, set the blade’s depth no more than a quarter inch greater than the thickness of the piece to be cut.

- Before making the cut, allow the blade to reach full speed.
- Check for knots, warped wood and other imperfections that can contribute to kickback.
- If the blade does bind up, release the switch immediately. Never remove the blade from the cut while the blade is rotating.

### **RECIPROCATING SAWS**

- A reciprocating saw has many uses and is simple and safe to operate if proper procedures are followed.
- When choosing a blade for a reciprocating saw, make sure it is designated for the material you are cutting. The blade should not be any longer than needed for the cut.
- When making a plunge or pocket cut, make sure the blade is designed for this purpose.
- If making a blind cut, check for hidden wires, pipes or other obstructions that could contribute to an injury.

### **TOOL INSPECTION**

- We must inspect our tools regularly for operating defects that could lead to an injury.
- This inspection is in addition to the inspection we make just before we use the tool. A complete inspection at specified intervals is part of the company's electrical safety-related work procedures.
- Every company has its own system of identifying the last inspection date of a tool. If you're unsure, ask your supervisor.

### **EXTENSION CORDS**

- Electrical extension cords and their plugs should be inspected before use and maintained in good condition at all times.
- Be mindful of where you place your tools and never leave them in overhead places where they could be pulled down by their cords.
- Keep cords out of harm's way and safely away from people and moving equipment. Be aware of placing them in contact with nails, bolts or other sharp edges.

### **PROPER GROUNDING**

- The ground fault circuit interrupter (GFCI) is a lifesaving device when used with power tools and extension cords that incorporate a ground wire.
- If there is a defect or short circuit inside the tool or cords, the current is routed to the ground circuit where it is interrupted before a serious shock can occur.
- Be sure to effectively ground all electrical tools except double-insulated and battery-powered tools.
- Always make sure the ground pin on the plug is in place when using grounded equipment.

### **USING COMPRESSED AIR**

- Compressed air hoses conduct power to air tools, and like extension cords, have their own potential hazards.

- When placing hoses across walkways and aisles, place boards on each side of the air line for protection.
- Always use locking pins in CP fittings.
- Many systems have a safety device that automatically shuts the air off in the event of a line fracture.
- Check to see if the safety-check valve is compatible with the airflow rate of the tool. If you're unsure about this, ask your supervisor.
- Compressed air can be very dangerous. Do not engage in horseplay while using compressed air.

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### Accidents & Their Safety Lessons

#### Accident #1: Using Improper Drill Results In Severe Puncture Wound

Maintenance worker Ralph Johnson was using a electrical drill motor and drill to make a hole in a piece of angle iron. The angle iron was to be used to facilitate the installation of a new gauge. When Ralph placed his hand in a dangerous position to stabilize the angle iron, the drill slipped and punctured his hand.

##### Safety Lessons:

- *Always keep body parts out of the line of fire.*
- *Always use the correct tool for the job (incorrect drill used for this job).*
- *Don't apply excessive force to the tool.*
- *Always use proper technique and procedure (centering punch, pilot hole, etc.).*

Accident #2: Unstable Ladder Shifts And Worker Suffers Traumatic Facial Injury By Portable Band Saw  
Victor Rivera, a maintenance technician, was standing on a ladder while using a portable band saw. He was cutting a piece of pipe that was part of a series of pipes that ran horizontally and mounted to the wall. The ladder was not tall enough to allow him to position his body correctly to reach the work. When the ladder moved, Victor lost his balance and the saw cut his face.

##### Safety Lessons:

- *When using power tools, always be sure your body is in the correct position.*
- *Get the proper ladder for the job. A taller ladder would have allowed him to position his body correctly.*

#### Accident #3: Sparks Produced By Side Grinder Ignite Fire

Alan Myers was using a side grinder in an area where flammable liquids were stored. The sparks produced by his work ignited some oily rags nearby.

##### Safety Lessons:

- *Get hot work permits when required.*
- *Clear the area of flammables and combustibles before welding or grinding.*
- *Always think about the consequences of your actions.*

#### Accident #4: Kickback Of Unguarded Saw Results in Deep Leg Laceration

James Morgan, veteran mechanic and welder, used a circular saw to prepare a large vertical pump for shipping. In the process, he decided to tie back the saw's guard because it was in the way. The saw kicked back and cut his leg.

##### Safety Lessons:

- *Never defeat guards on power tools; they are there for your protection.*
- *Always use proper procedure in accomplishing your work.*
- *Recognize when additional hazards exist (such as wet or green wood causing kickback).*

#### Accident #5: Worker Grabs Damaged Power Cord And Is Electrocuted

Alvena Chavis was using an extension cord to power a reciprocating saw. She yanked the cord for more length, resulting in damage to the insulation and exposing bare wires. She grabbed the bare wires while handling the cord. A GFCI was not used as it should have been and she received a fatal electric shock.

##### **Safety Lessons:**

- *Always use a GFCI when required.*
- *Treat all electrical cords with respect and understand that they contain a potentially fatal hazard.*
- *When routing electrical cords, pay attention to hazards such as sharp objects and hot surfaces that can damage insulation.*

#### Accident #6: Horseplay With Air Hose Results In Debris Being Blown In Co-Worker's Eye

Tony Maurice, shop maintenance person, used an air gun to blow off a worktable when some horseplay erupted. This resulted in some debris being blown into a co-worker's face, causing an eye injury. Tony had been warned about horseplay previously.

##### **Safety Lessons:**

- *Recognize that compressed air is an energy source and treat it with respect.*
- *Follow all company rules related to use of pneumatic tools and compressed air.*
- *Resist the temptation to engage in horseplay. It seems harmless but often leads to injuries.*
- *Eye hazards are often associated with compressed air and other gases.*

### **PREPARE FOR THE SAFETY MEETING OR TRAINING SESSION**

Review each section of this Leader's Guide as well as the videotape. Here are a few suggestions for using the program:

Make everyone aware of the importance the company places on health and safety and how each person must be an active member of the safety team.

Introduce the videotape program. Play the videotape without interruption. Review the program content by presenting the information in the program outline.

Copy the review questions included in this Leader's Guide and ask each participant to complete them.

Make an attendance record and have each participant sign the form. Maintain the attendance record and each participant's test paper as written documentation of the training performed.

#### **Here are some suggestions for preparing your videotape equipment and the room or area you use:**

Check the room or area for quietness, adequate ventilation and temperature, lighting and unobstructed access.

Check the seating arrangement and the audiovisual equipment to ensure that all participants will be able to see and hear the videotape program.

Place or secure extension cords to prevent them from becoming a tripping hazard.

### **CONDUCTING THE PRESENTATION**

Begin the meeting by welcoming the participants. Introduce yourself and give each person the opportunity to become acquainted if there are new people joining the training session.

Explain that the primary purpose of the program is to remind power tool users about key safety issues and to make them aware of the traumatic injuries that can result from unsafe work practices.

Introduce the videotape program. Play the videotape without interruption. Review the program content by presenting the information in the program outline.

Lead discussions about injuries involving power tools that have occurred at your facility and how these injuries could have been prevented. Use the review questions to check how well the program participants understood the information.

After watching the videotape program, the viewer will be able to explain the following:

- The three keys to personal protection from power tool injuries;
- The importance of using extension cords, GFCI's and compressed air hoses properly;
- Safe work practices for each power tool covered in the video;
- The importance of avoiding horseplay, not defeating guards and recognizing fire hazards when using power tools.

**HIGH-IMPACT  
POWER TOOL SAFETY  
REVIEW QUIZ**

Name \_\_\_\_\_ Date \_\_\_\_\_

*The following questions are provided to check how well you understand the information presented during this program.*

1. What should you do if the blade of a circular saw binds up while making a cut?
  - a. remove the blade immediately while it is still rotating
  - b. apply more pressure to the tool and continue the cut
  - c. release the power switch immediately and remove the blade when it stops rotating
  
2. A power tool doesn't need to undergo a complete inspection on a regularly-scheduled basis as long as it is inspected before each use.
  - a. true
  - b. false
  
3. When using a circular saw, you should set the depth of the blade no more than \_\_\_\_\_ greater than the thickness of the material to be cut.
  - a. ¼ inch
  - b. ½ inch
  - c. 1 inch
  - d. 1¼ inch
  
4. If you use a grinding wheel on a soft material that is designed for hard material, it can overload and shatter.
  - a. true
  - b. false
  
5. Which of the following caused the puncture wound suffered by the maintenance worker who was drilling angle iron in the video?
  - a. he placed his hand in a dangerous position
  - b. he used the wrong tool for the job
  - c. he applied excessive force to the drill
  - d. all of the above
  
6. When is it safe to tie back the guard on a saw?
  - a. when the guard makes it difficult to reach the work
  - b. when there are no hazards in the material that might cause kickback
  - c. when you are sure your body will be out of harm's way
  - d. never
  
7. You may need to use a GFCI if you are operating a \_\_\_\_\_.
  - a. battery-operated tool
  - b. double-insulated tool
  - c. power tool with a ground wire
  - d. none of the above
  
8. If you are sanding a material that is toxic, you are required to wear a respirator for protection.
  - a. true
  - b. false

***ANSWERS TO THE REVIEW QUESTIONS***

1. c

2. b

3. a

4. a

5. d

6. d

7. c

8. a