

**PROGRAMME: ICP
CENTRE: POINT FORTIN
COURSE: ELECTRICAL INSTALLATION LEVEL # 1
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USE POWER TOOLS



LESSON OBJECTIVES

At the end of this unit, the students will be able to:

- Identify what a power tool is.
- Describe the difference between electric and pneumatic power tools.
- State the proper use of power tools.
- Perform power tools safety measures.

WHAT IS A POWER TOOL?

- A power tool is a tool that is actuated by an additional power source and mechanism other than the safely manual labour used with hand tools. The most common types of power tools use electric motor. Internal combustion engine and compressed air etc

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WHAT IS A POWER TOOL?

- Power tools are used in industry, in construction, in the garden, for house work task such as cooking, cleaning, and around the house for driving (fasteners), drilling, cutting, shaping, sanding, grinding, routing, polishing, painting, heating, and more (Safety Culture, 2022).

HOW TO USE POWER TOOLS SAFELY?

- Appropriate personal protective equipment (PPE), such as safety goggles and gloves, must be worn to protect oneself against hazards that may be encountered while using power tools. The workplace floor shall be kept as clean as possible to prevent slips and accidents involving dangerous hand tools (Safety Culture, 2022).

HOW TO USE POWER TOOLS SAFELY?

- Power tools must be fitted with guards and safety switches, they are extremely hazardous when used improperly. **The types of power tools are determined by their power source:** electric, pneumatic, liquid fuel, hydraulic, and powder-actuated.

POWER TOOLS MAY INCLUDE BUT NOT LIMITED TO ELECTRIC OR PNEUMATIC:

- drills
- grinders
- jigsaws
- nibblers
- cutting saws
- threading machines
- sanders
- planers
- routers
- pedestal drills
- pedestal grinders

THE DIFFERENCE BETWEEN ELECTRIC AND PNEUMATIC

- An **electric actuator** is one that makes use of electrical energy to produce mechanical energy. A **pneumatic actuator** is an air-operated actuator that converts air pressure into mechanical force to operate the valve.

POWER TOOLS ARE USED FOR:

- adjusting
- dismantling
- assembling
- finishing
- cutting
- scraping
- threading
- cleaning
- lubricating
- tightening
- simple tool repairs
- hand sharpening
- adjustments

EXAMPLES OF POWER TOOLS

RECIPROCATING SAW

TOOLLESS BLADE-CHANGE SYSTEM
Fast and effortless blade installation and removal when drilling and chipping

COMPACT SIZE
Only 18.4 in. long, allows easy cutting in challenging positions

VARIABLE-SPEED TRIGGER
Enables easy cutting into material without kickbacks



CONSTANT RESPONSE CIRCUITRY
Maintains speed under load

ORBITAL ACTION
Fast cutting in all types of materials with orbital action

VIBRATION CONTROL COUNTERBALANCE TECHNOLOGY
Limits vibration for easier handling and comfort

OSCILLATING MULTI TOOL

DYNAMIC ACCESSORY RANGE
Compatible with all Starlock® accessories

OSCILLATING MULTI-TOOL VERSATILITY
Accomplish flush-cutting, plunge-cutting, sanding, grinding and many other tasks



WIDE 2.8" OSCILLATING ARC
Better accessory utilization and increased productivity

STARLOCK® 3-D TOOL-ACCESSORY INTERFACE
Best-in-class grip means more torque transfer

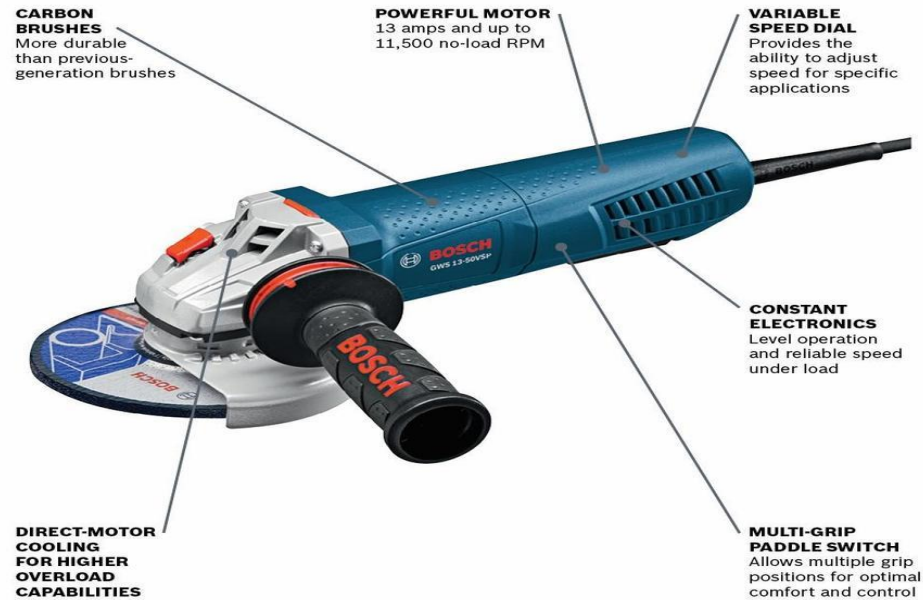
VARIABLE-SPEED DIAL
Match speed to application (5,000 to 20,000 oscillations per minute) for outstanding results

UNSURPASSED PERFORMANCE-TO-WEIGHT RATIO
Powered by an efficient EC Brushless 12V Max motor

(Bosch, n.d.)

EXAMPLES OF POWER TOOLS CON'T

ANGLE GRINDER



(Bosch, n.d.)

IMPACT DRIVER



(Bunnings Warehouse, n.d.)

EXAMPLES OF POWER TOOLS CON'T

ROUTER



Bosch, n.d.)

NAILER



(Bunnings Warehouse, n.d.)

TYPES OF POWER SOURCE:

Battery Chargers

- A cordless power tool can go anywhere with you. However, they only work if they have enough juice in the battery to run the tool; the more difficult the job, the more power the tool will use. That is why it is important to fully charge batteries before using them.

TYPES OF POWER SOURCE:

Air Compressor

- Pneumatic tools are a class of power tools that get their power from a blast of compressed air. These tools require an air compressor to run, rather than relying on electricity. Pneumatic tools offer a lot of punch and traditionally have been able to provide more torque than electric tools.

TYPES OF POWER SOURCE CON'T:

Extension Cords

- When a battery-operated tool isn't doing the trick, contractors will opt for a corded tool instead. Using a corded power tool ensures you have a steady power supply, even if the job starts to get tough. Since using a corded tool tethers workers to a power outlet, extension cords make sure your tool can reach as far as you need it to.

EXAMPLES OF POWER SOURCE

POWER SOURCE

Electricity

- Plug-in Drills
- Battery Power

Fuel Engines

(Gasoline & Diesel)

Pneumatics (air power)

Hydraulics

Powder actuated (explosive powder)

EXAMPLES

Saws

Sanders

Drills

Chain Saws

Leaf blower, Post hole diggers

Nailers and staplers

Loaders, lifts and presses

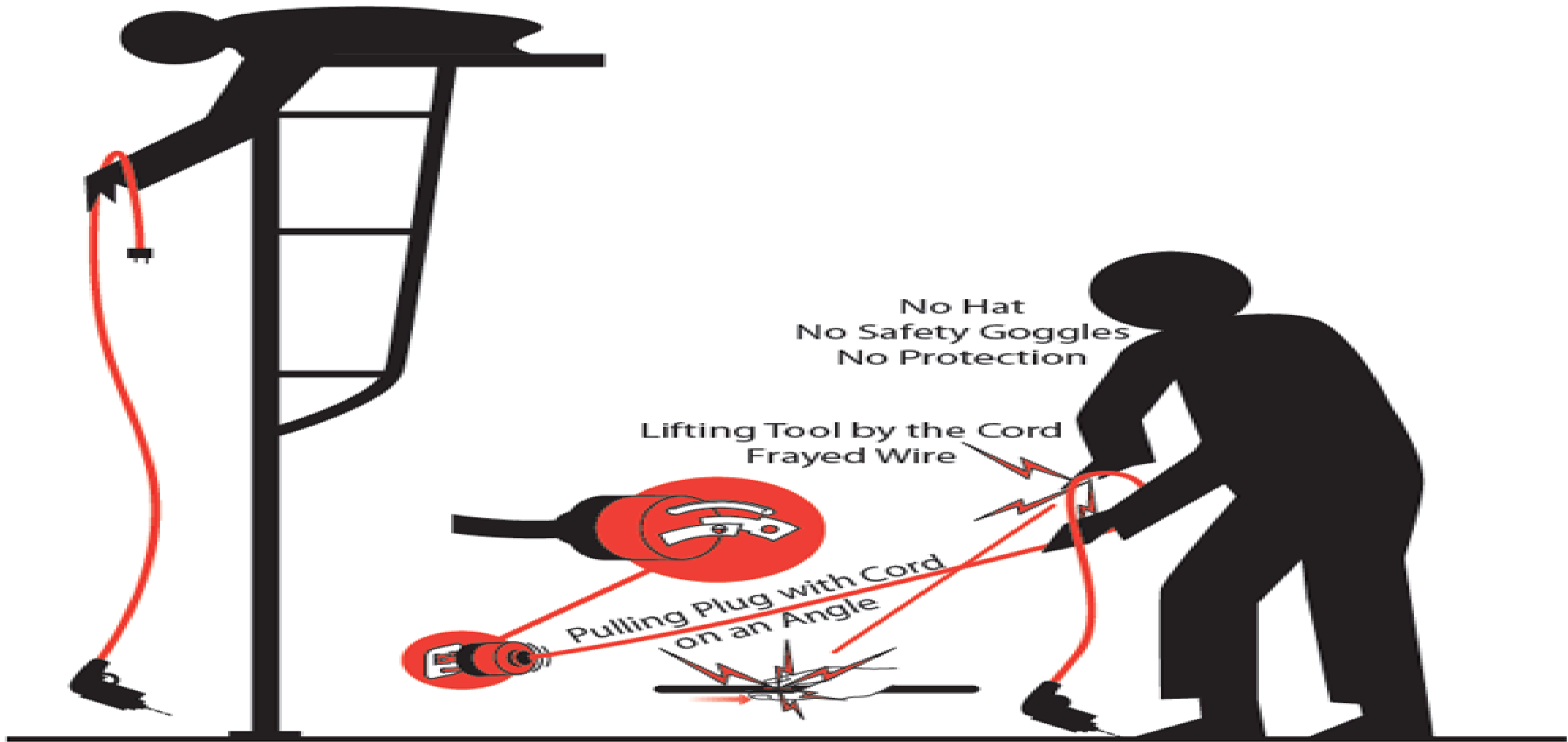
Powder actuated fastener

OSHA SAFETY TIPS

- <https://www.youtube.com/watch?v=NGeJ-oyDISI>

BASIC SAFETY TIPS FOR POWER TOOLS HANDLING

Never carry a tool by the cord or hose. Never yank the cord or the hose to disconnect it from the receptacle outlet. Keep cords and hoses away from heat, oil, and sharp edges. Disconnect tools when not in use, before servicing and cleaning them, and when changing accessories such as blades, bits, and cutters.



No Hat
No Safety Goggles
No Protection

Lifting Tool by the Cord
Frayed Wire

Pulling Plug with Cord
on an Angle

WRONG WAY

POWER TOOL SAFETY

- The right tools should be utilized for the right job.
- Keep tools in good working order.
- Any tools with frayed cords or without a grounding plug shall be taken out of service.
- Do not use tools that you do not know how to operate.

POWER TOOL SAFETY

- Never remove equipment guards without proper authorization.
- Be sure the power tool is off and has stopped rotating before putting it down.
- Disconnect tool from power source to change drill bits, blades, etc.
- Do not use compressed air for cleaning unless the pressure is reduced to less than 30 psi.

CONSTRUCTION TOOL PRECAUTIONS

- Pneumatic power tools shall be secured to the hose in a positive manner to prevent accidental disconnection.
- Safety clips or retainers shall be securely installed on pneumatic impact tools and on hose connectors.
- The manufacturer's safe operating pressure recommendations for all fittings shall not be exceeded.

PNEUMATIC TOOLS

- Powered by compressed air.
- Includes nailers, staplers, chippers, drills, and sanders.
- Main hazard - getting hit by a tool attachment or by a fastener the worker is using with the tool.
- Take the same precautions with an air hose that you take with electric cords (Support, 2023).



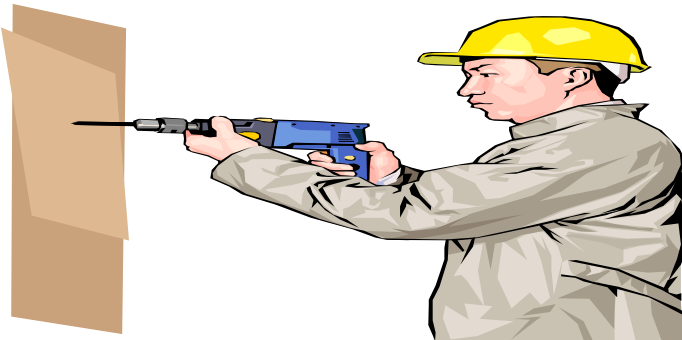
GENERAL POWER TOOL RULES

- Do not stand in water or on wet surfaces when running a power tool.
- Hold all power tools by the plastic hand grips or other nonconductive areas.
- Do not plug multiple electrical cords into a single outlet
- Do not use power tools or extension cords with a missing prong.
- Ground all tools unless double-insulated.



GENERAL POWER TOOL RULES CONT'D

- Be aware of all power lines, electrical circuits and water pipes that are not visible.
- Do not wear loose clothing, dangling objects or jewellery. Long hair must be restrained.
- All observers should be kept a safe distance from the work area.

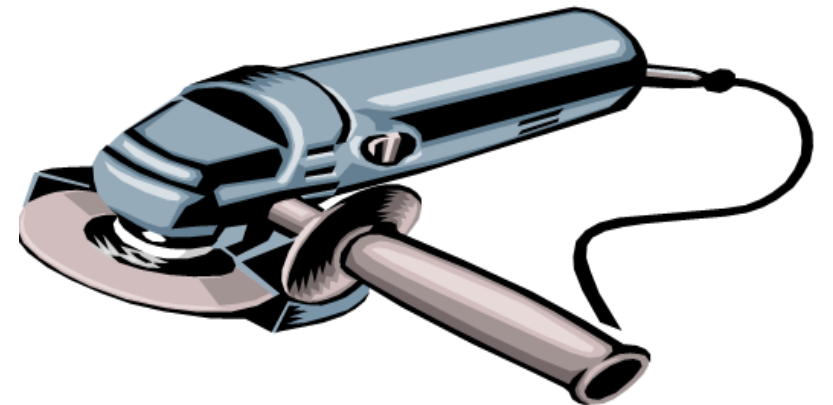


ABRASIVE-WHEEL TOOLS

- Powered abrasive grinding, cutting, polishing, and wire buffing wheels create special safety problems because they can throw off flying fragments.
- Before an abrasive wheel is mounted, it should be inspected closely and sound or ring tested to ensure it is free of cracks or defects.
- To test wheels, tap them with a light non-metallic instrument. If they sound “cracked or dead,” do not use them; they could fly apart.

ABRASIVE-WHEEL TOOLS CONT'D

- Always use the right wheel or cup for the job you are performing. Be sure to match the “RPM Rating” with the tool. Finally, pay close attention to any “special warnings,” that the manufacturer may offer, such as “do not use in wet or high-moisture conditions.”



CIRCULAR SAWS

- Always wear safety goggles or safety glasses with side shields.
- Use a dust mask, especially when cutting treated woods.
- Wear hearing protection, especially during extended periods of operation.



CIRCULAR SAWS

CONT'D

- Use sharp blades because dull blades cause binding, stalling, and possible kickbacks.
- Use the correct blade for the job.
- Ensure the blade guard is in working order, never remove it or tie it back.
- Avoid cutting small pieces that can't be properly secured or the saw shoe can't properly rest.

DRILLS

- Be sure the chuck is securely tightened to the spindle.
- Tighten the bit securely and remove the chuck key.
- Always hold or brace the tool securely and use any auxiliary handles if provided.
- Don't force a drill. Apply only enough pressure for the bit to do the cutting.



MITER/CHOP SAWS

- Because of the saw's downward cutting motion, be sure to keep hands and fingers out of the blades path.
- Be sure all guards are in place and working.
- Ensure that the recommended size and RPM blades are being used.

ANY QUESTION?



The End

The text "The End" is rendered in a bold, white, sans-serif font with a slight 3D effect. It is centered horizontally and set against a background of several overlapping, colorful, organic shapes in shades of red, orange, yellow, blue, and green. The shapes are layered behind the text, creating a vibrant and dynamic visual effect.

ASSIGNMENT

- Define the term “Power Tool.”
- Discuss the difference between electric and pneumatic.
- List 4 power sources and give examples for each.
- Describe 5 power tool hazards.
- Discuss 2 OSHA safety prevention procedures.
- Explain why it is important to inspect your tools before use.

ASSIGNMENT CON'T

- What PPE devices should be use when handling power tools and why is it important to use them?
- Explain how reading a power tool instruction or manual can help you stay safe.
- Define 2 types of power source.
- List 3 basic safety tips when handling power tools

VIDEO LINKS

- <https://www.youtube.com/watch?v=G8Xs9PAjuRA&t=4s>
- <https://www.youtube.com/watch?v=cCxql80FYel>

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