



Hand and Power Tool Safety



**AR Training
DMME**

Division of Mineral Mining

General Safety Precautions

- Employees who use hand and power tools must be provided with the particular PPE necessary to protect them from the associated hazards.
- Employees and employers have a responsibility to work together to establish safe working procedures. If a hazardous situation is encountered, it should be brought to the attention of the certified foreman immediately.

General Safety Precautions

- ❏ All personnel have the responsibility to use appropriate personal protective equipment while using portable power tools and hand tools.

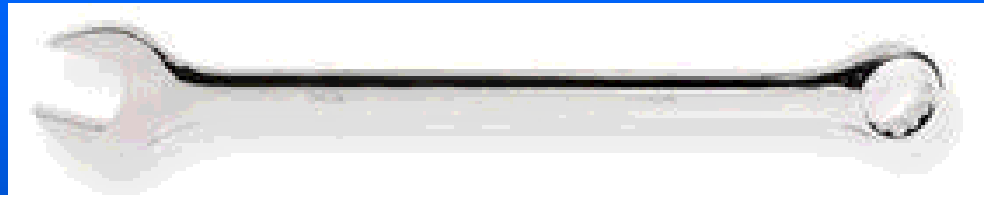
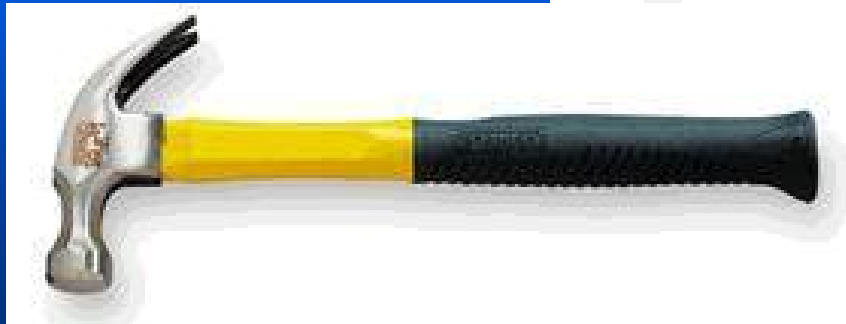


- ❏ Work areas should be kept as clear and dry as possible to help prevent accidents with or around dangerous hand tools.



Hand Tools

Hand tools are non-powered. They include anything from axes to wrenches. The greatest hazards posed by hand tools result from misuse and improper maintenance.



Misuse and Poor Maintenance

Some examples:

- ✉ Using a screwdriver as a chisel may cause the tip of the screwdriver to break and fly, hitting the user or other employees.
- ✉ If a wooden handle on a tool such as a hammer or an axe is loose, splintered, or cracked, the head of the tool may fly off and strike the user or another worker.
- ✉ A wrench must not be used if its jaws are sprung, because it might slip or snap.
- ✉ Impact tools such as chisels, wedges, or drift pins are unsafe if they have mushroomed heads. The heads might shatter on impact, sending sharp fragments flying.

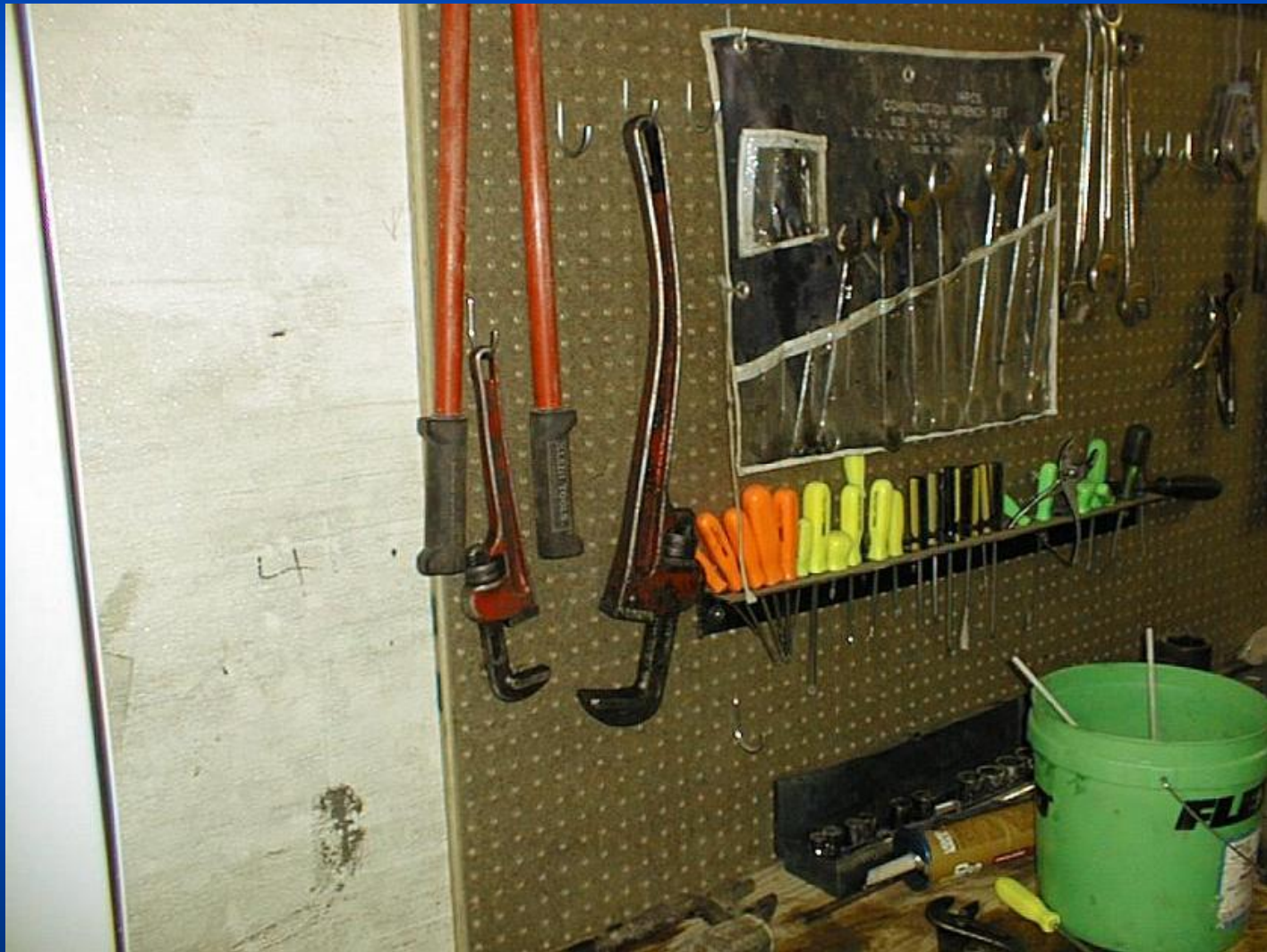
Responsibilities

- ❏ The employer is responsible for the safe condition of tools and equipment used by employees but the employees have the responsibility for properly using and maintaining tools.
- ❏ Employers must establish safe procedures for the use of tools and accomplishing various tasks.
- ❏ Employers must see that employees are properly task trained.
- ❏ Employees must follow proper procedures.

Hand Tool Best Practices

- Always inspect tools prior to each use.
- Perform needed maintenance (dressing) prior to use.
- Remove unsafe tools from service (tag-out and/or report to supervisor).
- Around flammable substances, spark-resistant tools made from brass, plastic, aluminum, or wood should be used.

See Anything You Shouldn't Use?



Power Tools

- ☞ Today's tools offer more power, adaptability and dependability than ever before.
- ☞ With enhanced tool performance comes the responsibility to address power-tool safety issues.
- ☞ Those responsible for specifying and using power tools have a responsibility to check out a tool's safety features, then ensure that manufacturer safety precautions and other recommendations are followed at all times.

Power Tool Hazard Prevention

- ☞ All hazards involved in the use of power tools can be prevented by following five basic safety rules:
 - ☞ Keep all tools in good condition with regular maintenance.
 - ☞ Use the right tool for the job.
 - ☞ Examine each tool for damage before use.
 - ☞ Operate according to the manufacturer's instructions.
 - ☞ Provide and use the proper protective equipment.

Power Tool Best Practices

- ☞ All employees must be properly task trained.

- ☞ Know the power tool:

 - ☞ Operators must read and understand the owner's manual.

 - ☞ Labels affixed or included in the shipping container must be read and understood.

 - ☞ Keep tools well maintained, per the manual, (sharp and clean) for the best performance.

Power Tool Best Practices

- ❏ Be aware of all power lines, electrical circuits, water pipes and other mechanical hazards in your work area, particularly those below the work surface, hidden from the operator's view, that may be contacted.
- ❏ Wear proper apparel. Do not wear loose clothing, dangling objects or jewelry. Long hair must be restrained. Gloves should not be worn when operating certain power tools. Check appropriate tool manuals.

Power Tool Best Practices

- ❏ Avoid dangerous environments; areas that are wet or damp, explosive atmospheres – fumes – dust and flammable materials.
- ❏ Be certain tools are properly grounded, unless double insulated.
- ❏ Disconnect tools when not in use, before servicing and when changing accessories such as blades, bits and wheels.

Power Tool Best Practices

- ❏ Never carry a tool by the cord or hose.
- ❏ Never yank the cord or the hose to disconnect it from the receptacle.
- ❏ Keep cords and hoses away from heat, oil, and sharp edges.
- ❏ Always maintain good footing and balance while operating tools.

Power Tool Best Practices

- Secure work with clamps or a vise, freeing both hands to operate the tool.
- Avoid accidental starting. Workers should not hold a finger on the switch button while carrying a plugged-in tool.
- All observers should be kept at a safe distance away from the work area.

Power Tool Best Practices

- ☞ The Manufacturer's recommendations and instructions should be followed in all circumstances.
- ☞ All portable power tools that are damaged shall be removed from use and tagged "Do Not Use".
- ☞ Hazardous tools or conditions are to be reported to the certified foreman.

Special Precautions For Electric Tools

- Employees using electric tools must be aware of several dangers; the most serious is the possibility of electrocution.
- Among the chief hazards of electric-powered tools are burns and slight shocks which can lead to injuries or even heart failure.



Special Precautions For Electric Tools

- Under certain conditions, even a small amount of current can result in fibrillation of the heart and eventual death.
- A shock also can cause the user to fall off a ladder or other elevated work surface.

Electric Tool Grounding

- ❏ Electric tools must either have a three-wire cord with ground and be grounded or be double insulated.
- ❏ Double insulation is the most convenient. The user and the tools are protected in two ways: by normal insulation on the wires inside and by a housing that cannot conduct electricity to the operator in the event of a malfunction.

Electric Tool Best Practices

- ☞ These general practices should be followed when using electric tools:
 - ☞ Electric tools should be operated within their design limitations.
 - ☞ Gloves, if kept clear of rotating parts, are recommended during use of electric tools.
 - ☞ When not in use, tools should be stored in a dry place.
 - ☞ Electric tools should not be used in damp or wet locations.
 - ☞ Work areas should be well lighted.

Cords To Avoid

Ground prong removed



Insulation pulled



Splices



Pneumatic Tools

- ❏ Pneumatic tools are powered by compressed air and include chippers, drills, hammers, and sanders.
- ❏ The primary dangers include getting hit by one of the tool's attachments or by debris from the piece being worked on.
- ❏ Noise is another hazard. Working with noisy tools requires the use of proper hearing protection.



Pneumatic Tool Best Practices

- Task training including review of the manufacturer's recommendations and instructions is required.
- When using pneumatic tools, employees must check to see that the tool is fastened securely to the hose to prevent it from becoming disconnected.
- A short wire or positive locking device attaching the air hose to the tool will serve as an added safeguard.

Pneumatic Tool Best Practices

- ❏ The manufacturer's safe operating pressure for hoses, pipes, valves, filters and other fittings shall not be exceeded.
- ❏ The use of hoses for hoisting or lowering tools should not be permitted.
- ❏ All hoses exceeding 1/2-inch inside diameter should have a safety device at the source of supply or branch line to reduce pressure in case of hose failure.

Pneumatic Tool Best Practices




- ❏ A safety clip or retainer must be installed to prevent attachments, such as chisels on a chipping hammer, from being unintentionally shot from the barrel.
- ❏ Screens must be set up to protect nearby workers from being struck by flying fragments around chippers, grinders, sanders or air drills.
- ❏ Compressed air guns should never be pointed toward anyone. Users should never "dead-end" it against themselves or anyone else.

Power Tool Accessories and Attachments

- There's a variety of accessories available for use on or with power tools.
- Caution must be exercised when selecting and using any accessory with any power tool.
- Choosing the wrong accessory or using an accessory incorrectly can result in serious injury.
- Always disconnect tools from the power source before installing, adjusting or changing any accessory or attachment.

Power Tool Accessories and Attachments

 Don't use an accessory or attachment unless:

-  The power tool manufacturer recommends its use on the product.
-  The accessory limitations and specifications -- such as speed, size, mounting and guarding requirements, etc. -
- match the limitations and specifications of the power tool as shown in the owner/operator's manual.
-  The use of the accessory does not require the removal of or defeating of any guards, barriers or other safety-related devices on the power tool.

Powered Abrasive Wheel Tools

- ❏ Powered abrasive grinding, cutting, polishing and wire buffing wheels create special safety problems because they may throw off flying fragments.
- ❏ Before an abrasive wheel is mounted, it should be inspected closely and sound- or ring-tested to be sure that it is free from cracks or defects.
- ❏ To test, wheels should be tapped gently with a light non-metallic instrument. If they sound cracked or dead, they could fly apart in operation and so must not be used. A sound and undamaged wheel will give a clear metallic tone or "ring."

Failure to Ring Test



Spindle guard removed for better viewing

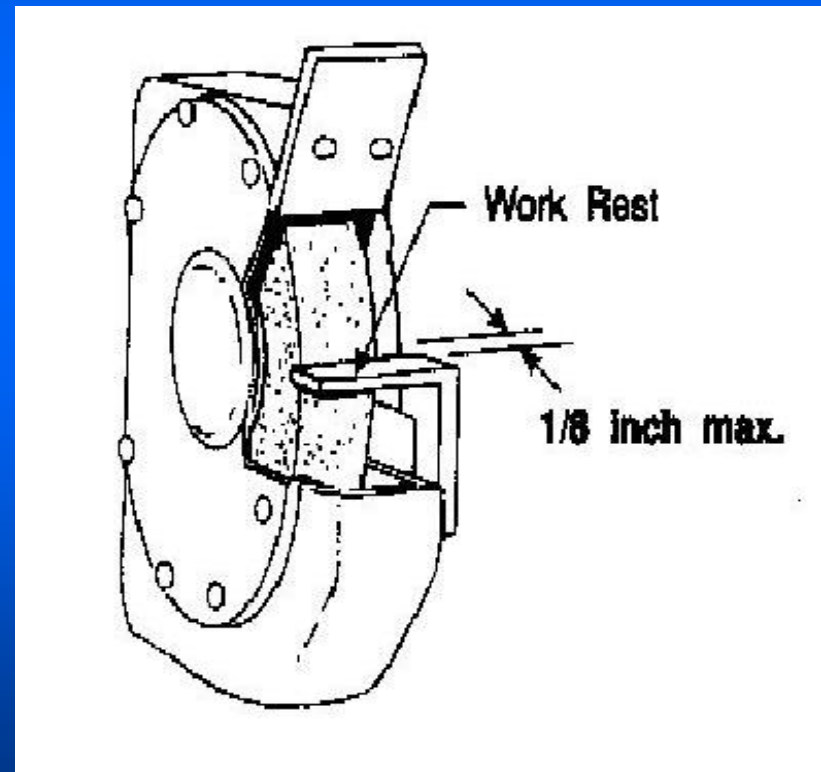
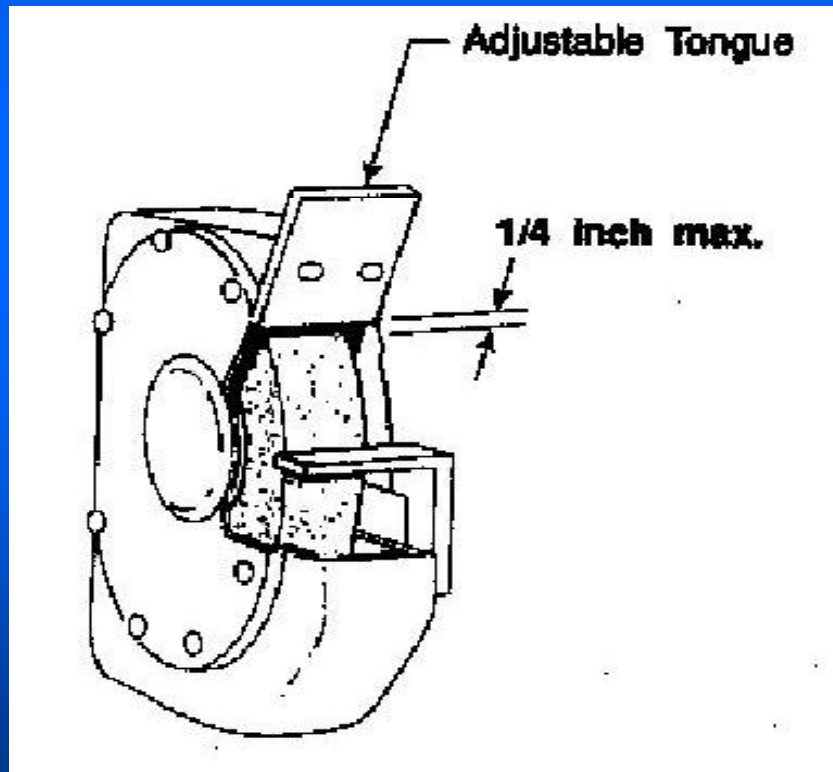
- ❏ Failure to ring test could result in a disintegrating wheel.
- ❏ This could lead to serious injury or death.

Powered Abrasive Wheel Tools

- ❏ To prevent the wheel from cracking, the user should be sure it fits freely on the spindle.
- ❏ The spindle nut must be tightened enough to hold the wheel in place, but, without distorting the flange.
- ❏ Follow the manufacturer's recommendations.
- ❏ Due to the possibility of a wheel disintegrating (exploding) during start-up, never stand directly in front of the wheel as it accelerates to full operating speed.

Powered Abrasive Wheel Tools

☞ Do your grinders meet these specifications?



Powered Abrasive Wheel Tools

- ☞ Portable grinding tools need to be equipped with safety guards to protect workers not only from the moving wheel surface, but also from flying fragments in case of breakage.
- ☞ In addition, when using a powered grinder:
 - ☞ Always use eye protection.
 - ☞ Turn off the power when not in use.
 - ☞ Never clamp a hand-held grinder in a vise.