



Charles County Department of Emergency Services  
**STANDARD OPERATING PROCEDURES**

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## Section 100 - Management & Administration

Vehicles, Apparatus & Equipment - 104.00		
S.O.P. # 104.17	<b>Use, Maintenance, Cleaning and Storage of Hand and Power Tools</b>	PAGE: 1 OF 11
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### 104.17.01 Purpose

The SOP outlines the Department's guidelines for the operation, maintenance, safety, and training for hand and portable power tools used by the Department/Division and its employees

### 104.17.02 Cited Materials

- NFPA 1936: Standard on Powered Rescue Tools
- NFPA 30: Flammable and Combustible Liquids Code
- Occupational Safety and Health Standard Title 29 CFR 1910
- The American National Standards Institute (ANSI) Z88.2-1992

### 104.17.03 Scope

This SOP applies to the Department and all employees and where hand or portable power tools are in use or will be used. This manual specifically references:

- Hand Tools
- Electric Tools
- Gasoline and Mixed Fuel Tools
- Hydraulic Tools
- Pneumatic Tools
- Powdered Rescue Tools

### 104.17.04 Definitions

1. **Hand Tools** - Tools that are manually operated and powered by human force such as screw drivers, pliers, wrenches, and cutting shears, etc.
2. **Portable Power Tools** - Power tools that are hand held, manually operated, and powered by electricity, air, gasoline, diesel, or explosion, such as circular saws, sanders, drills, reciprocating saws, air wrenches, air grinders, air fasteners, chainsaws, and rescue tools.



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### 104.17.05 Responsibility

1. **Risk Management and Safety:** RMS is responsible for:
  - a. Reviewing hazards associated with hand and portable power tools during workplace inspections.
  - b. Reviewing and updating the hand and portable power tools policy.
  - c. Working with Divisions and Safety Coordinators in establishing appropriate personal protective equipment (PPE).
  - d. Working jointly with Safety Coordinators in the development of safety protocols for tools that present a unique hazard to employees and students.
  - e. Assisting Divisions and Safety Coordinators in establishing operational and safety guidelines for hand and portable power tools utilized within the Department/Division.
  
2. **Department/Division:** The Department/Division shall be responsible for:
  - a. Safe condition of tools and equipment used by employees including tools and equipment which may be furnished by the employees.
  - b. Providing proper storage facilities in the tool room and on the job.
  - c. Designating one (1) or more persons to serve as Safety Coordinators (s) to implement policy requirements for the Department/Division.
  - d. Documenting employee training.
  - e. Documenting those employees permitted to use hand and portable power tools and the supervision required.
  - f. Documenting and providing required PPE.
  - g. Establishing operational and safety guidelines for hand and portable power tools utilized within the Division.
  
3. **Safety Coordinators:** The Division Safety Coordinator(s) is/are responsible for:
  - a. Training employees who operate hand and portable power tools within their area of responsibility.
  - b. Ensuring the proper use of PPE.
  - c. Ensuring that guards and switches on portable power tools are in place and functioning.
  - d. Ensuring unsafe hand or portable power tools are not issued for use.
  - e. Establishing regular tool inspection procedures and providing repair when hand and portable power tools are damaged or malfunctioning.
  - f. Establishing a procedure for control of tools such as a check out system at tool cribs.
  - g. Documenting inspection, maintenance and care of hand and portable power tools.





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Guards, as necessary, shall be provided to protect the user and others from the following:

- Point of operation;
- Nip points;
- Rotating parts;
- Flying chips; and
- Sparks.

Safety guards shall never be removed when a tool is being used.

4. **Safety Switches:** The following portable power tools shall be equipped with a momentary contact "on-off" control switch: drills, tappers, fastener drivers, horizontal, vertical and angle grinders with wheels larger than two inches in diameter, disc and belt sanders, reciprocating saws, saber saws and other similar tools. These tools also may be equipped with a lock-on control provided that turnoff can be accomplished by a single motion of the same finger or fingers that turn it on.

The following portable powered tools may be equipped with only a positive "on-off" control switch: platen sanders, disc sanders with discs two inches or less in diameter; grinders with wheels two inches or less in diameter; routers, planers, laminate trimmers, nibblers, shears, scroll saws and jigsaws with blade shanks quarter inch wide or less.

Other portable powered tools such as circular saws having a blade diameter greater than two inches, chain saws and percussion tools without positive accessory holding means shall be equipped with a constant pressure switch that will shut off the power when the pressure is released.

### 104.17.07 Policy

1. It is the policy of the Department that all personnel expected to use, or likely to use in the performance of their job duties, hand and/or power tools; shall be equipped with, given access to, and trained in the proper use and maintenance of said tools.
2. Employees shall only utilize tools which they are trained and approved to use.
3. Tools shall be inspected daily or prior to each use.
4. Tools or their component parts, which are observed to be worn, defective, or damaged, shall be removed from service immediately and a suitable replacement part shall be provided.
5. Employees shall don the proper level of PPE prior to tool use.



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### 104.17.08 Operating Requirements

The following contains requirements for the proper use of various types of hand and portable power tools. Most tools have similar hazards however, if there are questions as to the proper and safe use of a tool, consult the manufacturer's tool manual and/or a Safety Coordinator. Do not use a tool if you are unsure how to use it in a safe manner.

1. **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. Some examples of misuse include the following:
  - a. Using a screwdriver as a chisel may cause the tip of the screwdriver to break and fly, hitting the user or bystanders;
  - b. Using a tool with a wooden handle (e.g., hammer) if the handle is loose, splintered, or cracked, the head of the tool may fly off and strike the user or bystander;
  - c. Using a wrench if its jaws are sprung, because it might slip; and
  - d. Using impact tools (e.g., chisels, wedges) if they have mushroomed heads since the heads might shatter on impact, sending sharp fragments flying.
  - e. Knives and scissors shall be sharp. Dull tools can be more hazardous than sharp ones;
  - f. Floors shall be kept as clean and dry as possible to prevent accidental slips with or around dangerous hand tools; and
  - g. Around flammable substances, sparks produced by iron and steel hand tools can be a dangerous ignition source. Where this hazard exists, spark-resistant tools made from brass, plastic, aluminum or wood shall be used.
  
2. **Portable Power Tools:** Portable power tools can be hazardous when improperly used. There are several types of portable power tools, based on the power source they use: electric, pneumatic, liquid fuel, hydraulic and powder-actuated. The following general precautions shall be observed by portable power tool users:
  - a. Read the owner's manual to understand the tool's proper applications, limitations, operation, and hazards;
  - b. Select tool based on the task it is designed for. Only use attachments specifically recommended for the portable power tool and ensure they are properly installed;
  - c. Inspect the tool for damage including the cord, guards, alignment, binding of components or any condition that would affect the tools safe operation;
  - d. Avoid excessive force trying to make cutting tools cut faster;
  - e. Use the tool at the rate for which it is designed to prevent excessive wear and maintain control;
  - f. Maintain tool control by keeping a tight grip on the tool and using the tool's safe handle;
  - g. Do not operate a portable power tool under the influence of medications and/or alcohol or if you are tired or distracted;



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- h. Never carry a tool by the cord or hose;
  - i. Never remove prongs from any cords;
  - j. Never stand in or near water when using tools;
  - k. Never “yank” the cord or the hose to disconnect it from the receptacle;
  - l. Keep cords and hoses away from heat, oil and sharp edges;
  - m. Replace all frayed and/or damaged extension cords. Do not try to tape cords;
  - n. Use Ground Fault Circuit Interrupter (GFCI) for corded tools;
  - o. Always check for hidden wires that may contact bladed tools;
  - p. Disconnect tools when not in use, before servicing and when changing accessories such as blades, bits and cutters;
  - q. All observers shall be kept at a safe distance away from the work area;
  - r. Secure work with clamps or a vise, freeing both hands to operate the tool;
  - s. Avoid accidental starting. The worker shall not hold a finger on the switch button while carrying a plugged-in tool;
  - t. Tools shall be maintained with care. They shall be kept sharp and clean for the best performance. Follow instructions in the user’s manual for maintenance, lubricating and changing accessories;
  - u. Maintain good footing and balance;
  - v. Avoid loose fitting clothes, ties or jewelry such as bracelets, watches or rings, which can become caught in moving parts. Long hair must be restrained;
  - w. Do not use electric portable power tools in the proximity of flammable vapors, dusts, or construction material;
  - x. Keep work area well lighted when operating electric tools; and
  - y. All portable electric tools that are damaged shall be removed from use and tagged “Do Not Use”. This shall be done by Safety Coordinators.
3. **Electric Tools:** The main hazard of electrical tools is electrocution. Electricity can cause burns, shocks, and death. The factors that increase the risk of electrocution while using electrical portable power tools are:
- a. Faulty power cords;
  - b. Misuse of power cords;
  - c. Failure to use GFCI;
  - d. Improper grounding;
  - e. Improperly insulated tools, and;
  - f. Working around wet surface.



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- g. To protect the user from electrocution, tools must either have a three-wire cord or be double insulated. Three-wire cords contain two current carrying conductors and a grounding conductor. One end of the grounding conductor connects to the tool's metal housing. The other end is grounded through a prong on the plug. Whenever an adaptor is used to accommodate a two-hole receptacle, the adaptor wire must be attached to a known ground. The third prong shall never be removed from the plug. Double insulation is more convenient. The user and the tools are protected by normal insulation on the wires inside and by a housing that cannot conduct electricity to the user in event of a malfunction.

The following general practices shall be followed when using electric tools:

### Do Not:

- Energize the tool until just before use;
  - Get near the moving parts of an electrical tool unless the power is off;
  - Lay electrical cords over sharp edges or through doorways or holes in walls;
  - Use an electric tool in an area where flammable gases or vapors may be present unless the tool is rated for that application;
  - Use any tool that is sparking or appears to have an electrical short;
  - Use any tool with a damaged cord or exposed wiring;
  - Use electric abrasive tools if the grinding wheel, buffer, or wire brush wobbles or vibrates excessively;
  - Use excessive force on saws or drills to cut through hard materials;
  - Use any tool unless the blade or bit is securely tightened; and
  - Use any tool with the blade guard removed or rendered inoperable.
4. **Gasoline and Mixed Fuel Tools:** Some tools are fuel powered and are dangerous because of the potential for burns, explosion, and fire. The most serious hazard with fuel powered tools comes from fuel vapors that can burn or explode and exhaust emissions that can create a hazardous atmospheric condition. Observe the following when working with gasoline and other mixed fuel tools:
    - a. Fuel shall be stored and transported in approved flammable liquid containers, according to proper procedures for flammable liquids;
    - b. Before filling the tank for a fuel powered tool, turn off the engine and allow it to cool to prevent accidental ignition of vapors;
    - c. Effectively ventilate an enclosed area or don the appropriate PPE to avoid inhalation of carbon monoxide; and
    - d. Ensure access to fire extinguishers.



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- e. When using these tools, inspect them for:
    - i. A constant pressure throttle control that will shut off the power when the pressure is released;
    - ii. A handle or trigger guard or lock to prevent accidental activation of the tool;
    - iii. A tip guard on chainsaws;
    - iv. A working blade break;
    - v. Fuel leaks;
    - vi. Muffler condition; and
    - vii. Spark plug and wire connection condition.
  - f. Gasoline powered tools may not be used:
    - i. In confined spaces;
    - ii. In tunnels.
  - g. Gasoline powered tools may be used inside buildings only after ensuring proper ventilation.
5. **Hydraulic Tools:** The fluid used in hydraulic power tools shall be an approved fire-resistant fluid and shall retain its operating characteristics at the most extreme temperatures to which it will be exposed. The manufacturer's recommended safe operating pressure for hoses, valves, pipes, filters and other fittings shall not be exceeded. Hydraulic tools such as jacks operate under pressure and can cause injury if a hose burst or develops a pinhole leak. Manufacturer recommended hoses designed to withstand the pressure being applied shall be used. Armored hoses shall be used where physical damage to the hose may occur. Hoses shall be located such that they do not create a trip hazard.
6. **Pneumatic Tools:** Pneumatic tools are powered by compressed air. They include chippers, drills, hammers, and sanders. There are several dangers encountered in the use of pneumatic tools which are described below:
- a. Being struck by one of the tool's attachments or a fastener. Eye protection is required and face protection is recommended;
  - b. Depending upon the noise decibel levels and duration hearing protection may be required;
  - c. Disconnection of the tool from the air hose. The user must check to see that the tools are fastened securely to the hose by a means that prevents them from becoming disconnected. A short wire or positive locking device attaching the air hose to the tool will serve as an added safeguard;
  - d. 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;



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- e. Screens must be set up to protect others from being struck by flying fragments around chippers, rivet guns, staplers, and air drills;
- f. Compressed air guns shall never be pointed toward anyone. The user shall never "dead-end" it against him or herself or anyone else;
- g. Airless spray guns which atomize paints and fluids at high pressure must be equipped with automatic or visual manual safety devices which will prevent pulling the trigger until the safety device is manually released;
- h. If an air hose is more than one-half inch in diameter, a safety excess flow valve must be installed at the source of the air supply to shut off air automatically in case the hose breaks;
- i. Heavy jackhammers can cause fatigue and strains to the user; heavy rubber grips reduce these effects by providing a secure handhold;
- j. Jackhammer users must wear safety glasses, hearing protection, and safety shoes; and
- k. The air-line hose used must be designed to withstand the pressure being applied.

The following precautions shall be followed when using pneumatic tools.

### **Do Not:**

- Kink the hose or subject it to other physical damage;
- Lay the air hose across aisles or walkways;
- Squeeze the trigger on air hammers, impact wrenches, or other tools until the tool is in contact with the work;
- Use an air-line if it has a leak; and
- Use the air line for cleaning unless nozzle pressure is kept below 30 psig and effective chip protection is in place.

### **104.17.09 Training**

1. All personnel expected to use tools shall be trained on its proper use.
2. Training will be scheduled on the use and maintenance of tools.
3. Training and drills in the use of tools shall be provided which simulate as near actual emergency conditions as possible.

### **104.17.10 Transporting**

When transporting hand and portable power tools to and from the job site, observe the following safety guidelines:

1. Do not carry portable power tools by their electric cord, airline, or hydraulic hose;
2. Transport the tool in its carrying case if provided;
3. Do not carry sharp or pointed tools with the edge or point upward and toward the body;



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4. Place all tools in a tool box if one is available;
5. Never carry tools in a manner that obstructs vision;
6. Never give sharp or pointed tools to another person with the sharp end toward the receiver;
7. Never hand another person a portable power tool that is in motion or operation; and
8. Never throw any tools at or toward another person.

### 104.17.11 Maintenance Requirements

The following protocol will be followed during the routine maintenance of hand and portable power tools by authorized repair personnel:

1. Conduct repairs to fuel and ignition systems on portable power tools which could create fire hazards in designated locations;
2. Fire suppression or extinguishing media must be present;
3. Disconnect or remove any power supply prior to repairing portable powered tools;
4. Use only replacement parts equivalent to those in the original design;
5. Do not alter the tool or parts; and
6. Do not add any parts not supplied by the manufacturer or delete any parts supplied by the manufacturer.

### 104.17.12 Care and Use

Take the time to familiarize yourself with the tool by reading its provided manufacturer instructions before use. Unusual working conditions may require additional instructions from a Safety Coordinator. Conduct a pre-use inspection of the tool. Modifications to a tool without the manufacturer's prior written approval are prohibited.

### 104.17.13 Storage

When tools are not in use or will not be used within a short period of time they shall be properly stored. Follow the guidelines below when storing tools.

1. Store sharp tools in a specially designated cabinet or cupboard, with a blade guard in place;
2. Drain gasoline or other flammable fuels from tools if they will be in storage for extended periods of time; and
3. Prior to storage, de-energize tools such as removing air pressure, removing loads and de-pressurizing hydraulics.



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### 104.17.14 Handling and Storage of Power Sources

1. Liquid fuels such as gasoline must be stored and handled in accordance with NFPA Flammable and combustible Liquids Code (NFPA No. 30-1969). Turn off engine or motor before filling fuel tanks.
2. For pneumatic tools, make sure there are no loaded fasteners in place while changing the load, disconnecting/connecting an air-line, or storing.
3. Hydraulic fluid must not be added to jacks or other support tools while they are in use and under stress.
4. Keep batteries and battery chargers away from heat sources and potentially wet areas. Never throw a battery into a fire. Follow equipment manufacturer's safety tips when handling batteries.

### 104.17.15 Inspections

1. **User Inspections:** The user will visually inspect all hand and portable power tools before use to ensure that the tools are in safe and usable condition. All damaged and/or defective tools will be immediately reported to the Safety Coordinator. Only authorized repair personnel will perform maintenance and repairs on hand and portable power tools.
2. **New and Rented Equipment Inspections:** Prior to use, all new or newly arrived rental tools will be inspected to ensure compliance with the provisions of this Program. For new tools, an initial inspection will verify that requirements of the purchase order (or rental agreement) have been met and the equipment is suitable for its intended use. For any newly purchased or rental tool, make sure the proper PPE is available for use.
3. **Inspection Cycle:** Authorized repair personnel will perform the following maintenance checks:
  - a. Verify on an annual basis that the tool has been inspected and is operating properly and is consistent with manufacturer's specifications; and
  - b. Remove equipment from use that is unsafe or not operating within manufacturer's specifications.