

POWER OPERATED HAND TOOLS

A. General

1. Maintain all power tools in safe operating condition
2. Do not remove protective guards
3. Use only for their intended use
4. Wear appropriate protective devices when operating power tools
5. Only experienced qualified persons will use power tools
6. If the tool is not operating properly do not use it

B. Electric Tools

1. Electric tools will only be operated with proper grounding. All generators on job sites must be accompanied by an approved ground fault circuit interrupter (GFCI). All electric tools must be operated with use of a GFCI. Any work in wet/conductive areas requires use of GFCI.
2. Power cords must be in good shape and checked regularly for breaks in the insulation.
3. Always disconnect the power source to electric tools whenever changing tools or making adjustments/repairs to the tool.
4. Never use power cords for hoisting or lowering tools.

C. Gasoline Engine Driven Tools

1. Do not use gasoline motors in unventilated areas.
2. Make sure gasoline motors are in good condition before use.
3. Always shut off engine whenever fueling.
4. Use only approved metal safety cans for transporting gasoline. Safety cans must be free of leaks and must have spark arrestors in place.

D. Air Tools – Refer to compress air and air tools section

E. Portable Saws

1. Keep chainsaws sharp. Keep the blade well lubricated and adjusted to the proper tension.
2. Use target saw blades that are appropriate for the material being cut.

F. Powder-Actuated Tools

1. Only trained persons will use powder-actuated tools
2. Powder actuated tools will be inspected daily for proper operation.
3. Tools will not be loaded until just before use. Tools will not be left unattended while still loaded.
4. Always use safety goggles and appropriated hearing protection while using tools.

POWER OPERATED HAND TOOLS (cont.)

5. All persons conducting Cad-Weld operations will wear protective gloves and a full face shield.
6. All Cad-Weld molds must be heated and dried out before use. **Never Cad-Weld with moisture in the mold or on the connection.**

PROTECTION OF PUBLIC

All safety information in this document pertains to protection of the general public as well as our own employees and fellow contractors. All personnel are expected to be aware of all persons in the vicinity of the job site and take care not to allow harm to come to them or their property as a result of our work. Keep all barriers and barricades back far enough to keep people at a safe distance from operations. Take care when directing traffic and use personnel to direct people during dangerous operations. Do not allow anyone from the general public to enter the work zone. Do not allow anyone to enter the work area without the appropriate protective equipment.

HORSEPLAY

No disruptive activities will be tolerated at any time. Wrestling, name calling, and practical jokes are forbidden. Vulgar language will not be tolerated in public while representing this company.

COMPRESSED AIR AND AIR TOOLS

A. PERSONAL PROTECTIVE EQUIPMENT

- a. Adequate eye protection either in the form of approved goggles or glasses must be worn when working with any air tools where flying chips or debris could occur.
- b. Most air-powered operations are in excess of 90 decibels. Appropriate hearing protection must be worn whenever performing such operations.

B. HOSES

- a. Hoses must be in good shape and free of cracks and holes.
- b. Connector must be properly clamped on hoses.
- c. Pins or wires must be used to lock connectors together.
- d. Hoses should be placed to protect from damage.
- e. Hoses shall not be used to lower or hoist tools.

C. AIR PRESSURE

- a. Never exceed manufacturers specs for maximum air pressure to hoses and tools.
- b. All hoses exceeding 1/2" in diameter will have a safety device at the source of supply or branch line that will reduce pressure in case of failure.
- c. Air used for parts cleaning in the shop should be done only with a blowgun made for that purpose. These guns reduce air pressure to 30 psi or less.

D. AIR TOOLS

- a. Keep tools lubricated and in good condition.
- b. Use proper lifting techniques when lifting jack hammers.
- c. Make sure the muzzle safety device on pneumatic nailers (over 100 psi) is functional. This device keeps the gun from firing unless it is in contact with the work surface.
- d. Wear proper protective clothing and eye protection when operating sand blaster.

COMPRESSED GAS CYLINDERS

- A. Valve protection caps must be in place before compressed gas cylinders are transported, moved, or stored.
- B. Cylinder valves must be closed when work is finished and when cylinders are empty or being moved. Make sure safety plugs are installed.
- C. Compressed gas cylinders will be secured in an upright position at all times.
- D. Keep cylinders at a safe distance from welding and cutting operations.
- E. Place cylinders such that they cannot become part of an electric circuit.
- F. Never store oxygen and acetylene together. Keep tanks away from sources of ignition and away from flammable/combustible materials.
- G. Make sure fuel/gas regulators and hoses are in good working condition before use.
- H. All propane tanks must be stored outside only in a designated storage area. Refer to OSHA 1926.153 for specs on propane storage.

QTY L.P. Gas Stored

500# or less

501 to 6000#

6001 to 10,000#

Over 10,000#

Distance from nearest building

0 feet

10 feet

20 feet

25 feet

ELECTRICAL

A. EXTENSION CORD AND POWER CORD REQUIREMENTS

- a. 3-wire type, protected from damage.
- b. Not hung from wires or stapled/nailed in place.
- c. In good condition. Worn or frayed cables may not be used.
- d. No cord will be used with a damaged plug or terminals.
- e. Flexible cords must be continuous with no splices.
- f. Strain relief must be provided. When passing through holes in covers, outlet boxes, etc. The wire must be restrained with a bushing or fitting.

B. TROUBLE LIGHT & TEMPORARY LIGHT REQUIREMENTS

- a. All hand-lamps must be equipped with a substantial guard except on lamps where the bulb is deeply recessed in the reflector.
- b. All hand-lamps must employ a rough service type bulb.
- c. Utility lights shall not be suspended by cords unless so designed.
- d. Electrical cord must conform to the requirements in ((a) above).
- e. For wet or conductive locations, use ground fault circuit interrupters (GFCI).
- f. Lamps with plug-in receptacle in handles are prohibited.
- g. Lamps must be in good condition.

- C. Cable passing through work areas will be covered or elevated to protect from damage.
- D. No employee may work in proximity to any electric power circuit that may be contacted during the course of work, unless the circuit is de-energized and grounded, or effectively insulated.
- E. Workers will be required to wear insulated electrical protective gloves whenever working with jack hammers, bars, or other hand tools in the area of underground power lines where the exact locations of the lines is not visible.
- F. A GFCI (ground fault circuit interrupter) must be used on all construction sites. This includes the use of portable generators on the job.
- G. Be aware of electrical lines above as well as below ground when operating equipment.

EQUIPMENT OPERATION

A. GENERAL

- a. Only authorized and qualified operators will operate equipment.
- b. Operators are responsible for lubricating and inspecting each machine before use.
- c. Any problems found must be reported to job supervisor and to the mechanic. Any problems that pose a hazard during use must be repaired before use.
- d. Seat belts must be worn on all machines with adequate canopies and rollover protective structures.
- e. No riders will be allowed in equipment cabs or buckets.
- f. Make sure back-up alarms are functional on all machines with obstructed rear views.
- g. Do not leave machine idling on loose material or on an inclined surface when there is danger of the machine vibrating into motion.

B. EXCAVATORS AND LOADERS

- a. Make sure equipment is on solid footing as necessary, before operation.
- b. Keep other workers out of swing zone and use appropriate barricades when needed.
- c. Never swing the bucket over anyone.
- d. Never operate with boom or other parts closer than 10 feet to electric utility lines. For lines over 50,000 volts, clearance must be increased to 10 feet plus 0.4 inches for each 1,000 over 50,000 volts.
- e. Never leave the machine with the bucket left in the air unless it is properly blocked or braced.
- f. Always comply with VOSHA regulations. Do not allow persons in the excavation unless proper shoring is provided.
- g. Watch what you are doing. Notify personnel when they are distracting you, especially while working in tight situations or while excavating close to underground utilities.
- h. Designate one single person and make sure signals are understood.

FIRE PROTECTION

- A. All company owned and leased vehicles are required to carry dry chemical type ABC fire extinguishers. The vehicle operator is responsible for ensuring that the extinguisher is fully charged and in good condition. Know the location of the fire extinguisher in every vehicle you use.
- B. Fire extinguishers are conspicuously located and mounted at various locations around the office and shops. All employees should note these locations and report any problems with this equipment immediately to the office.
- C. ECI will provide training and annual refresher training on the following:
 - a. Familiarization with principles of fire extinguisher use.
 - b. Familiarization with hazards involved with incipient stage fire fighting.
- D. Fire and emergency numbers is 911. The Vermont Gas Company emergency number is 863-4511.
- E. **FIRE OR EMERGENCY ON THE JOB:**
 - a. Use company radio to notify office of type and location of emergency.
 - b. Use cell phone to call office or authorities directly.
 - c. Flag someone down or drive to nearest phone.
- F. **FIRE PREVENTION**
 - a. Fire prevention begins with good housekeeping practices. Keep work area neat and free of flammable and combustible debris.
 - b. Take special care when working with heat and open arcs and flames.
 - i. Remove all fire hazards from vicinity of work.
 - ii. Make sure personnel doing work are properly trained.
 - iii. Provide fire watch where necessary.
 - iv. Be familiar with all rules outlined in this document. (i.e.: flammable & Combustible Materials and Welding, Cutting & Heating Sections)
 - v. Report any potential fire hazards to supervisor or office immediately so that appropriate measures may be taken to eliminate the problem.

FLAMMABLE AND COMBUSTIBLE LIQUIDS

- A. Only approved containers and portable tanks will be used for storage and handling of flammable and combustible liquids. (Liquids with vapors that can ignite below 140° F are considered flammable. Liquids with vapors that can ignite above 140° F are considered combustible.)
- B. Gasoline will only be stored in approved metal safety cans.
 - a. Cans must be in good condition and free of leaks and punctures.
 - b. Spark arrester screens must be in place.
 - c. Can must be labeled “Flammable Liquid” and “Gasoline”.
- C. Other flammable liquids in excess of one gallon must be stored in approved safely containers. For quantities of one gallon or less, they may be used from and stored in the original container.
- D. No more than 25 gallons of flammable/combustible liquids may be stored in a room outside an approved safety cabinet.
See OSHA 1926.152 for specs on such cabinet. Pay attention- all flammable storage cabinets must be labeled “Flammable-Keep Fire Away”.
- E. No more than 60 gallons of flammable liquids or 120 gallons of combustible liquids may be stored in any one storage cabinet. No more than 3 cabinets are allowed per storage area.
- F. Flammable or combustible liquids may not be stored in areas used for exits, stairways, or normally used for safe passage of people.
- G. Suitable fire extinguishers should be located within the flammable storage area and should be readily accessible.
- H. Whenever transferring flammable liquids from one tank/drum to another, the containers must be electrically bonded together to avoid static spark. Containers should be also grounded.
- I. There shall be no smoking or open flames in area used for fueling, servicing fuel systems, or receiving/dispensing combustible/flammable liquids.
- J. Only trained/qualified personnel shall have access to flammable liquids/gases. Training includes knowledge of the characteristics of the substances, potential exposures, and related precautions.
- K. Regular inspection of all areas and equipment will help ensure safe working conditions.
- L. Everyone is responsible for using good housekeeping practices and common sense. Keep things clean and in good condition and report any problems to the office.
- M. Rules of thumb for proper use of flammable liquids and solvents:
 - a. Use only appropriate solvents for cleaning operations.
 - b. Never use flammable liquids near welding, burning, or other operations involving open flames, sparks or heat.
 - c. Never use containers that do not properly identify the contents.
 - d. Never mix solvents/chemicals unless they are supposed to be mixed. Follow specific instructions when applicable.
 - e. Always adequately ventilate areas when using flammable liquids.
 - f. Never apply heat to flammable liquids or solvents.

- g. Dispose of all flammable rags in appropriate covered containers.
 - h. Return containers to appropriate storage areas after use.
 - i. Know what you're dealing with and review the material safety data sheet (MSDS) for the chemical you are using. All employees have access to the MSDS file. The office is happy to make copies of MSDS and explain them to any employee.
- N. All tanks or containers that have contained flammable liquids or gases should be purged before any repair work is attempted. The proper purging of such tanks must be done by qualified personnel using appropriate equipment.

O. REFUELING EQUIPMENT

- a. Shut off ignition before beginning refueling operation.
- b. Smoking is not permitted within refueling areas.
- c. All refueling should be done in open air.
- d. Make sure the fire extinguisher is fully charged and in place.
- e. Never completely fill a fuel tank or container. Allow for expansion of fuel.
- f. Avoid spillage by remaining at the nozzle until fueling is complete.
- g. Report any spills or potential hazards to the office so immediate action can be taken.

FORKLIFT

Only trained and authorized operators will be permitted to use the forklift. ECI will train and certify such persons. Operators will be responsible for inspecting the forklift before use. Any defects should be reported immediately and the machine must be made safe before operating. Always wear seat belt when operating the forklift.

GRINDING

- A. Always wear approved safety glasses/goggles when performing or working near grinding operations.
- B. Never remove safety guards from grinding tools.
- C. Make sure grinding shields are in position whenever using a bench grinder.
- D. Keep work rests adjusted to be 1/8" minimum distance from the wheel.
- E. Make sure all wheels are in good shape and properly dressed before use.
- F. Use wheels that are designed to fit the grinding device.
- G. Use wheels/blades that are designed for the material to be cut or ground.
- H. Keep the work zone clear of flammable/combustible materials.
- I. Never apply too much force or bang a grinding wheel.
- J. Only qualified and experienced personnel will use grinding tools.

HAND TOOLS

Hand tools should be selected and used for their intended use only. Keep hand tools clean and in good condition. Inspect hand tools before each use. Check wood handles for splitting and make sure they are tightly fitted. Tools in need of repair should be fixed before use. Tools that can't be repaired should be discarded. Use insulated tools and extreme caution when working around electrical circuits. Use non-sparking tools when working in the presence of flammable materials or explosive dusts and vapors.

A. Chisels

- a. Select the proper size and type chisel for the job.
- b. Use a hammer of sufficient weight.
- c. Always wear safety goggles/glasses when chiseling.
- d. Keep eyes on the cutting edge and maintain a relaxed grip.
- e. Whenever another person is striking the chisel, use tongs to hold it in place.
- f. Keep sharp and keep the head ground to avoid mushrooming.

B. Files

- a. Never use a file for anything but filing. Fight off the urge for using files as punches or pry bars. The metal in files is very brittle and can break easily and cause serious injury.
- b. Never use files without appropriate file handles attached.
- c. Keep files clean by using a file card. Clogged teeth can cause a file to slip.
- d. Cutting should be done on the forward pass only.
- e. Make sure work is adequately held in place.

C. Wrenches

- a. Do not extend the wrench with a pipe or cheater bar.
- b. Always pull on wrenches when possible.
- c. Adjustable wrenches will be placed with the jaw facing the direction the handle will move.
- d. Make sure stilson wrench jaws are sharp and in good shape.

D. Punches

- a. Select the right punch for the job.
- b. Grind off mushroomed heads.
- c. Always hold punch securely.
- d. When knocking our rivets or pins, begin with a starting punch and finish with a pin punch.

E. Hatchets, Axes, Adzes

- a. Avoid hatchet or axe rebound toward other workers.
- b. Aim swing as not to hit your legs.

F. Screwdrivers

- a. Use screwdrivers for driving screws only.
- b. Use appropriate size screwdriver for the screw.
- c. Keep tips ground and squared.

G. Handsaws

- a. Cut material with appropriate saw.
- b. Keep teeth and blades properly set.
- c. Hold saw firmly and start slowly.
- d. Hold rip-cut saws at a 60° angle and crosscut saws at a 45° angle to board.
- e. Watch out for foreign objects in material to be cut.
- f. Make sure materials being cut are held firmly and take care to avoid pinching of the blade.

H. Hacksaws

- a. Select proper blade for material to be cut and install with teeth pointing ahead. Tighten the blade until rigid.
- b. Make sure work is securely held.
- c. Use long strokes directed away from yourself.
- d. Cut harder material slower than soft ones.

I. Pliers

- a. Use pliers when no other tool will do the job.
- b. Use cutting pliers for soft materials only.
- c. Don't use pliers as a wrench.
- d. Use only insulated pliers for electrical work.

J. Shovels, Picks, etc.

- a. Make sure handles are in good shape and free of splinters, etc.
- b. Watch your swing when using such tools.

K. Jacks

- a. Use only jacks large enough for the job.
- b. Make sure jack is positioned on a firm level surface and is in line with the vertical movement of the load.
- c. Block or place jack stands under load before working under it. Don't rely solely on the jack.

LADDERS AND STAIRS

A. PORTABLE LADDERS

- a. A competent person must inspect the ladder before each use and report any time there is a suspected problem with it. The ladder must be free of visible defects such as cracks and splits. Surfaces should be clean and free of oil, grease and other slip hazards. Check all connection points, make sure they are tight and the ladder is structurally sound.
- b. Choose the appropriate portable ladder for the job.
 - i. Ladders must be long enough to extend at least 3 feet above the upper landing surface to which the ladder is used to gain access.
 - ii. Ladders must be capable of supporting the intended loading.
 - iii. Ladders must have non-conductive side-rails (ie: wood or fiberglass) when they are to be used near electrical sources.
 - iv. Ladders equipped with anti-slip cleat must be used on slippery surfaces. If not available, the ladder must be rigidly secured in place.
- c. Never use the top or top step of a stepladder for a step.
- d. Never use the cross bracing at the rear section of stepladders as steps. Make sure the stepladder is locked fully open before use.
- e. Ladders should be pitched one foot out from the support structure for every four feet of ladder height.
- f. Ladders should be secured at the top to prevent slipping.
- g. If a ladder is not long enough to extend at least 3 feet above the landing, then the ladder must be fixed at the top with a rigid and non-deflecting support. A grasping device such as a grab-rail must be installed to assist employees on/off the ladder.
- h. Keep the areas around the top and bottom of the ladder barricaded to keep traffic away and prevent accidental movement.
- i. Never paint a ladder except for the outside faces of the rails.
- j. Do not place a ladder in front of doorways where the door can open into the ladder unless the door can be locked or other protective measures are taken.
- k. When moving up and down the ladder at least one hand should be grasping the ladder at all times.
- l. Workers will face the ladder when going up or down.
- m. Ladders will not be tied or fastened together to create longer sections unless they are designed for such use.
- n. Make sure rungs, cleats, and steps are parallel, level and uniformly spaced when the ladder is in position for use.
- o. Rung, cleats, and steps at base sections of extension ladders must be between 8 and 18 inches apart measured from their center. The rung spacing on the top section must be between 6 and 12 inches. Rung spacing for portable ladders must be between 10 and 12 inches measured from the rung centerline.
- p. The minimum clear distance between rails on portable ladder is 11 ½ inches.

B. FIXED LADDERS

A fixed ladder is one that is permanently fixed to a building or structure. For more information on fixed ladders, consult OSHA 1926.1053. Basic rules for fixed ladders are as follows:

- a. Individual ladder rungs or fixed ladders shall have rungs spaced no less than 10 inches apart and no more than 14 inches apart as measured from rung centerlines. Keep this in mind when installing manhole rungs.
- b. Fixed ladders must have a step across distance between 7 and 12 inches to the access area.
- c. A clear width of 15 inches both sides of a fixed ladder centerline must be maintained unless a permanent cage is installed. See codes for more on cages.
- d. Where the total length of climb on a fixed ladder equals or exceeds 24 feet, self-retracting lifelines or other safety devices must be used. Rest platforms will be available every 150 feet. The only exception to this is when offset 50-foot ladder sections with caging and rest platforms are provided. Examples of these types of climbs are found on our tower jobs.

C. JOB BUILT LADDERS

In some cases, a custom or job built ladder must be fabricated. Conform to the following guidelines when doing so:

- a. All parts must be made from seasoned and smoothed parts.
- b. All fasteners must be driven full length and countersunk at least 1/8".
- c. Use materials with minimal defects and appropriate strength.
- d. Single and double cleat ladders shall not exceed 24 feet in working length.
- e. Single-cleat ladders must be between 16 and 20 inches wide. Double cleat ladders must be between 18 and 22 inches wide.
- f. Cleats will be positioned parallel and level. They must extend full width. Cleats will be spaced between 8 and 12 inches top to top.

D. For information on stairs, refer to OSHA/VOSHA 1926.1053.

LASERS

Only trained personnel will be allowed to operate lasers. When laser light is greater than .005 watts (5 milliwatts), employees will wear proper eye protection. Turn laser off when not needed.

HOUSEKEEPING

All personnel are expected to practice good housekeeping at all levels whether at the office or on the job. Good housekeeping practices will eliminate many unsafe conditions and will promote a good company image. Keep your job site clean. Make sure to pick up and consolidate debris. Pull nails from used lumber and stack the lumber out of the way. Don't leave hoses and tools lying around as trip hazards.

Maintain all warning devices. Frequent inspections of signs, cones and barricades will be made so that pedestrians and motorists are aware of dangers.

Keep all tools and machines in good condition. Report any problems immediately so that prompt action may be taken to repair them.

Put things away in their place. Store pumps and tamps neatly. Hang up cables and hoses. Keep isles and walkways clear of obstructions.