

Worksite: \_\_\_\_\_ Instructor: \_\_\_\_\_ Date/Time: \_\_\_\_\_

## Topic C015: Grounding & Electrical Tools

**Introduction:** Electricity can be safe if properly respected. A large percentage of electrical accidents are caused from using improperly grounded temporary electrical systems or damaged power tools and extension cords at work. The National Electrical Code for grounding conductors requires that a system grounding conductor be connected to any local metallic water-piping system available on the premises, provided the length of the buried water piping is a minimum of 10 feet. If this is not possible, then a grounding electrode must be utilized.

**Ground Fault Circuit Interrupters (GFCI)** will help to minimize most dangerous situations. However, keep in mind that GFCIs are not foolproof, and under wet conditions are not always effective. Fatal shocks are most likely to occur under damp or wet conditions or if the user of an electrical device is touching a metal object such as a ladder or pipe.

**Extension cords** are used at work for many purposes and, if not carefully chosen for the job and properly cared for, can be hazardous. If the wrong length or size of cord is selected for a particular tool then the voltage available is reduced to the tool, creating an over-current hazard.

**Plugs and receptacles** must match the job at hand. Each type of receptacle is designed to handle a specific amount of voltage and current. Most plug-in electrical tools manufactured today are designed to reduce the danger of electrical shock and have plastic housings, double insulation, and other safety features. If possible, use only tools of this type.

### Specific OSHA regulations that cover grounding requirements:

**A conductor used** as a grounded conductor or as an equipment ground should be identifiable and distinguishable from all other conductors.

**No grounded conductor** should be attached to any terminal or lead in such a way to reverse designated polarity.

**A grounding terminal** or grounding-type device on a receptacle, cord connector, or attachment plug should not be used for any other purpose.

**The employer should** use either a GFCI or an assured equipment grounding conductor program as specified to protect employees in the workplace.

**All 120-volt**, single-phase, 15- and 20-amp receptacle outlets at the workplace which are not a part of the permanent wiring of the building or structure and which are in use by employees should have approved GFCIs for personnel protection.

**Receptacles** on a two-wire, single-phase portable or vehicle-mounted generator rated not more than 5KW, where the circuit conductors of the generator are insulated from the generator frame or other grounded surfaces, do not need to be GFCI protected.

**The employer must ensure** that all portable electrical tools used in the workplace are equipped with proper system grounding plugs (three prong), and should have double insulated housings for added shock protection.

Keep in mind that GFCIs are not foolproof, and under wet conditions are not always effective. Fatal shocks are most likely to occur under damp or wet conditions or if the user of an electrical device is touching a metal object.

**Conclusion:** The above-mentioned regulations and requirements were established and implemented to curtail electrical shock fatalities. It is the employer's responsibility to provide safe conditions and equipment. Likewise, it is the employee's responsibility to use safe work practices, good sense, and caution when electrical equipment is in use. Follow these requirements for safe electrical-powered operations.

**Employee Attendance:** (Names or signatures of personnel who are attending this meeting)

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These guidelines do not supersede local, state, or federal regulations and must not be construed as a substitute for, or legal interpretation of, any OSHA regulations.