

## Grounding of Portable Electric Tools

Shock from electrical tools and equipment constitutes a common source of fatalities and injuries. Although all shocks are not fatal, electrical burns or secondary injuries, when distracted by the shock, occur more frequently. The following general practices should be followed when using electric tools:

- Operate electric tools within their design limitations.
- Wear gloves, safety footwear and eye protection.
- Store tools in a dry place when not in use.
- Do not use “E” tools in wet location.
- Work areas should be well lighted.

The operator can be best protected from shock by providing equipment that incorporates “double insulating” or a third wire grounding system.

In the first instance, the portable electric tool is designed with an outer plastic “envelope” around the tool to prevent the operator from contacting any material capable of carrying an electrical current. Equipment so protected must be labeled “Double Insulated.” Operators should be cautioned against dismantling the equipment for repairs, thereby, breaking seals and voiding the protection provided; or using equipment with the outer plastic “envelope” broken.

A second common method of protecting the operator is to use equipment provided with a third wire ground. With this protection, the current from any defect or short inside the tool can be drained from the metal frame through the ground wire instead of through the operator’s body.

Many electrical tools have a ground wire built into the tool. This wire is connected to the tool housing at one end and to a three-prong power plug at the other end. When the operator plugs the cord into a grounded receptacle, the operator is protected from shock. Unfortunately, some operators attempt to use ungrounded receptacles or extension cords that do not match the three-prong power plug. To compensate, they break off the grounding pin from the power plug, thereby, exposing themselves to potentially fatal injury. Operators should be counseled against this type of negligent act and all equipment should be periodically inspected to assure the grounding pin is in place and the equipment is in good, safe, working order.

Older equipment which has been modified to provide a separate ground path may still be in use in some areas. This type equipment was not manufactured with provisions for grounding. Modifications were typically made by taping a separate wire to the power cord, attaching one end to the tool housing and attaching a clip to the other end. When the operator attaches the clip to a grounded pipe or other object, he/she will be protected against shock.

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Unfortunately, the third wire may not be properly attached, the operator may forget to attach the clip, or the object the clip is attached to may, itself, be ungrounded. Use of modified electrical tools should be discouraged.

Another method used to protect operators is the use of Ground Fault Circuit Interrupters. A GFCI is a fast acting circuit breaker which senses small imbalances in the circuit caused by current leakage to ground and, in a fraction of a second, shuts off the electricity. This is a very effective system and may be required in some jurisdictions/work conditions. However, use of GFCI's should not be considered a substitute for providing electrical tools in good working order with either double insulation, or third wire ground protection.

Contact your local Great American Loss Prevention Specialist for additional information.

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301 E. Fourth Street, Cincinnati, OH 45202 F13362D-LP (01/13)

