PORTABLE ELECTRIC POWER TOOLS GROUNDING

1. GENERAL

1.01 This practice describes the procedure for the proper grounding of portable electric power tools and methods of obtaining effective grounds.

1.02 The grounding of portable electric tools protects the operator from electric shock caused by insulation breakdown on current carrying parts within the tool housing. Grounding prevents the presence of voltage on the tool frame.

1.03 Grounding as described in this practice is accomplished by a third conductor used to connect the tool housing to the local power grounding system or to other equivalent grounds, such as a cold water pipe.

1.04 Permission should be obtained from the property owner or an authorized person before connecting the power tool to an outlet receptacle on a customer's premises.

2. PRECAUTIONS

2.01 Use only electric tools provided by the company.

2.02 *Electric power tools must always be adequately grounded.*

2.03 Before connecting a tool to a power supply, check the tool apparatus plate to be certain that the proper voltage and current type (AC or DC) is available.

2.04 Replacement cords should have equal or larger gauge wire than the original cord.

2.05 All cords assembled or repaired locally should be tested for continuity of the grounding conductor before connecting the tool to a power supply.

2.06 Make certain that the grounding connections do not become disengaged while the tool is being operated.

3. PROVISIONS FOR GROUNDING

3.01 The adapters shown in Figure 1 permit connections when the outlet receptacle is not the same type as the plug.

3.02 All electric power tools (except lamps and soldering coppers) should be equipped with a 3-conductor cord which terminates in a 3-blade plug (see Figure 2). Lamps and soldering coppers do not require grounding.

3.03 The 3-blade standard plug supersedes two other types of plugs; 3-blade crowfoot and the 2-blade parallel with an external attached pigtail grounding wire.

3.04 Extension cords are required for connecting power tools to outlet receptacles located away from the work area. This is usually a 50' cord with 16 gauge conductors having a standard plug at one end and a standard connector at the other.

CAUTION: The extension cord (Figure 3) should not be used with portable electric tools where conductors of a larger size are required.

3.05 The pigtail grounding terminal on adapters or attachment plugs should be connected to a suitable conductor as shown in Figure 4.

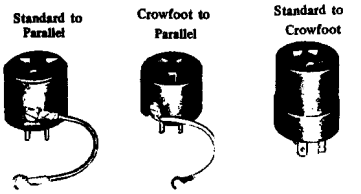

FIGURE 1. Adapters.

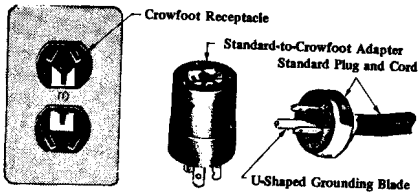

FIGURE 2. Standard-to-crowfoot Adapter.

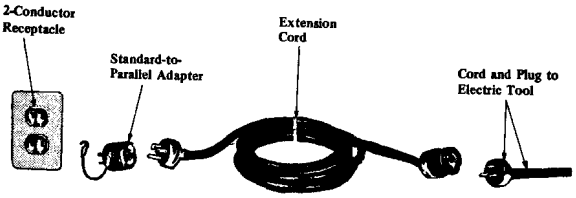

FIGURE 3. Typical Cord Make-up.

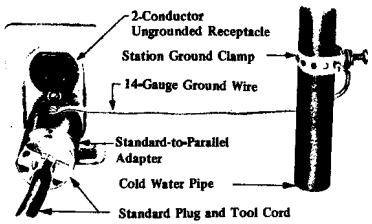

FIGURE 4. Ungrounded 2-conductor Receptacle.

4. METHOD OF GROUNDING

4.01 *3-Wire Grounding Type Receptacles*—The most satisfactory method of providing an effective ground is through the connection of a 3-blade plug to a comparable 3-wire receptacle. See Figure 5.

NOTE: The standard to crowfoot adapter must be used when the receptacle is a crowfoot type and the plug is standard. See Figure 2.

4.02 *2-Wire Receptacles (Ungrounded Outlet Box)*–Where electrical connections are to be made at 2-wire parallel receptacles, proceed as follows:

a. Locate a nearby grounded object (such as a cold water pipe) to which the ground wire or grounding cord may be attached.

b. Attach a ground wire to the green ground terminal on the plug or adapter and to the grounded object selected, making certain a good metallic connection is achieved at both ends. See Figure 4.

c. Insert the adapter or plug into the receptacle for tool operation.

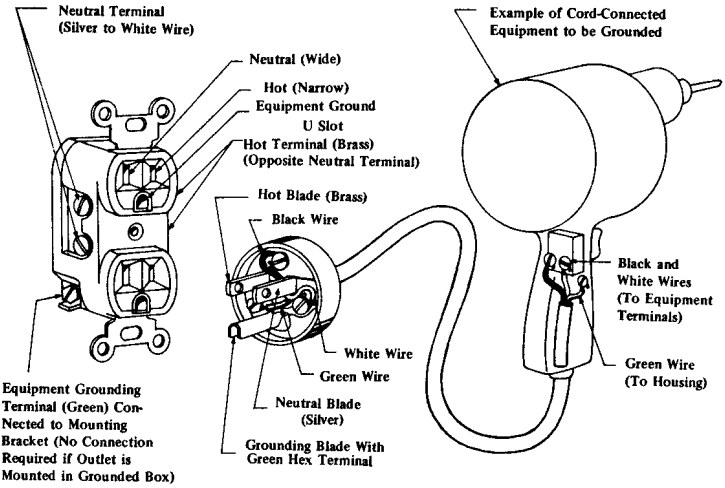

FIGURE 5. Wiring of 125-volt Standard Plug and Receptacle.

4.03 *2-Wire Receptacles (Grounded Outlet Box)*–Where it is known that a building is wired with metallic conduit, armored cable, or nonmetallic sheath cable with a grounding conductor, the outlet boxes may be grounded. Under these conditions and only after it has been found that the boxes are grounded, the grounding pigtail terminal on the adapter or plug may be fastened under the coverplate screw of the receptacle. See Figure 6. In grounding to a 2-conductor receptacle (Figure 6), connect pigtail to coverplate screw before inserting adapter into the receptacle.

NOTE: If grounding cannot be accomplished as outlined in this practice, the electric tool must not be operated. Nonelectric tools should be used to complete the job.

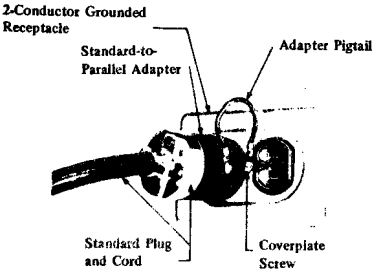

FIGURE 6. Grounded 2-conductor Receptacle.