

GROUNDING PORTABLE ELECTRIC POWER TOOLS

1.00 INTRODUCTION

This section describes the proper grounding of portable electric power tools and methods of obtaining effective grounds.

2.00 GENERAL

2.01 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 appearance of voltage on the frame of the tool.

Note: Tools operated from ungrounded portable electric generators (circuit isolated from ground) do not require grounding.

2.02 Grounding, as described in this section, is accomplished by a third conductor used to connect the tool housing to the local power ground-

ing system or to other equivalent grounds such as a cold water pipe.

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

3.00 CAUTIONS

3.01 Use only electric tools provided by the telephone company.

3.02 Electric power tools should always be grounded except as noted in 2.01. Take special care to ensure that this grounding is adequate (see Parts 4 and 5).





3.03 Before connecting a tool to a power supply, check the apparatus plate on the tool to be certain that the proper voltage and type of current (ac or dc) is available.

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

3.05 All cords assembled or repaired locally should be tested for continuity of the grounding conductor before connecting the tool to a power supply. Periodic testing of the grounding conductor should be followed in accordance with local procedures.

3.06 Make certain that the grounding connections do not become disengaged during the operation of the tool.

4.00 PROVISIONS FOR GROUNDING

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

4.02 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 Fig. 2). Lamps and soldering coppers do not require grounding.

4.03 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.

Note: The earlier-type plugs may continue to be used until replacement is necessary at which time the standard plug should be used. See Fig. 3 for typical cord make-up.

4.04 Extension cords are required for connecting power tools to outlet receptacles located away from the work area. This is a 30-foot cord, with 18-gauge conductors, having a standard plug at one end and a standard connector at the other.

Caution: The C extension cord (Fig. 3) should not be used with portable electric tools where conductors of a larger size are required, such as 1/2-inch electric drills and electric soldering pots.

4.05 The pigtail grounding terminal on adapters or attachment plugs should be connected to a suitable conductor. As shown in Fig. 4, 14-gauge ground wire or the B or C grounding cord will be satisfactory.

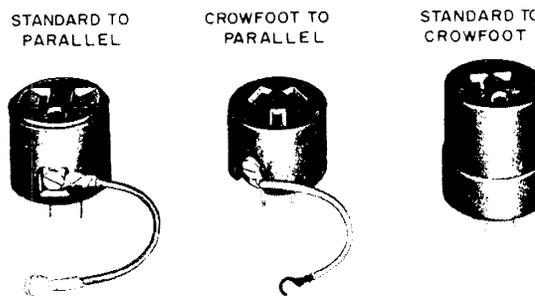


Fig. 1 — Adapters

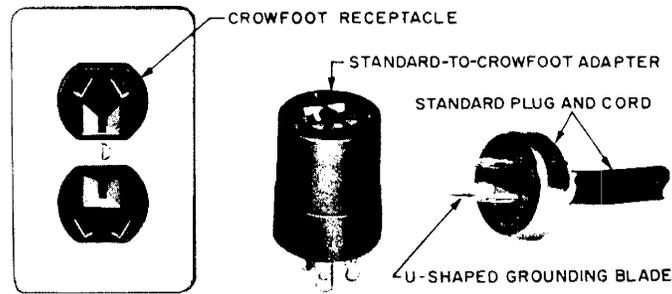


Fig. 2 — Standard-to-crowfoot Adapter

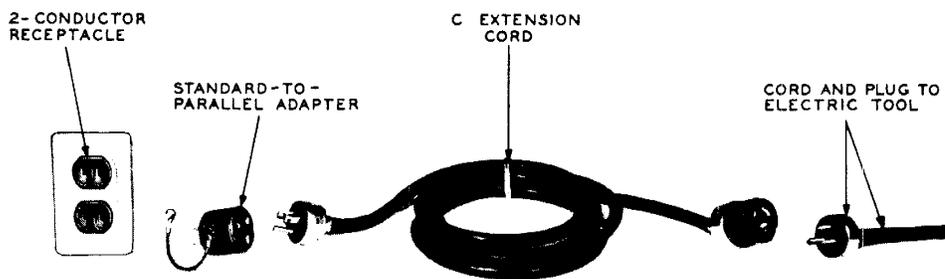


Fig. 3 — Typical Cord Make-up

5.00 METHOD OF GROUNDING

3-wire Grounding-type Receptacles

5.01 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 Fig. 5).

Note: The standard-to-crowfoot adapter must be used when the receptacle is a crowfoot type and the plug is standard (see Fig. 2).

2-wire Receptacles (Ungrounded Outlet Box)

5.02 Where electrical connections are to be made at 2-wire parallel receptacles, proceed as follows:

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

- Attach ground wire to ground terminal on plug or adapter and to the grounded object selected, making certain a good metallic connection at both ends is accomplished (see Fig. 4).
- Insert the adapter or plug into the receptacle for operation of the tool.

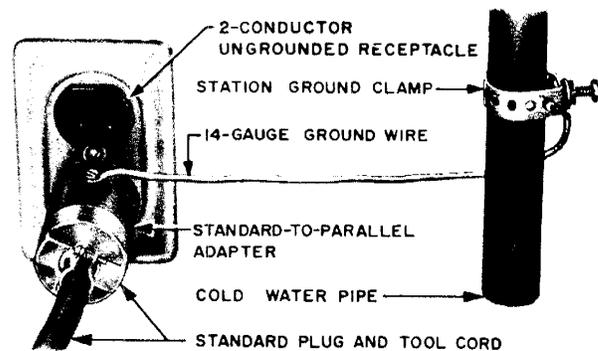


Fig. 4 — Ungrounded 2-conductor Receptacle

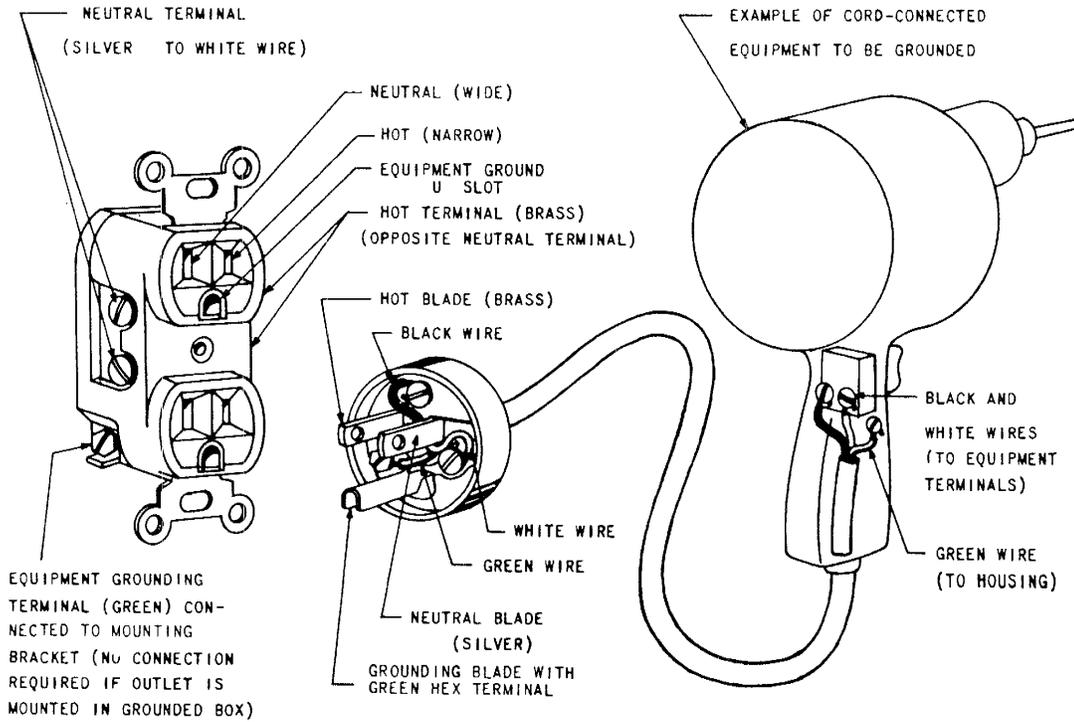


Fig. 5 — Wiring of 125-volt Standard Plug and Receptacle

5.03 The B and C grounding cords are used to ground power tools at 2-wire receptacles.

- The B grounding cord is a 15-foot, 18-gauge, single-conductor cord with clips at both ends (see Fig. 6).
- The C grounding cord is similar to the B except that it has a clip on one end and a standard-to-parallel adapter on the other (see Fig. 7).

2-wire Receptacles — (Grounded Outlet Box)

5.04 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 Fig. 8.)

5.05 In grounding to a 2-conductor receptacle (Fig. 8), connect pigtail to coverplate screw before inserting adapter into the receptacle.

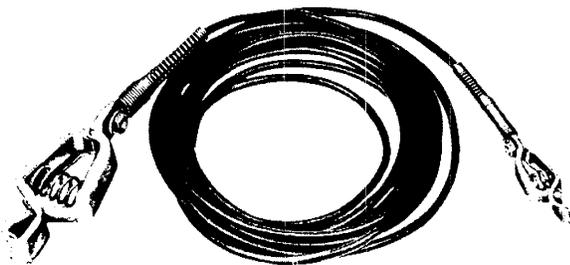


Fig. 6 — B Grounding Cord

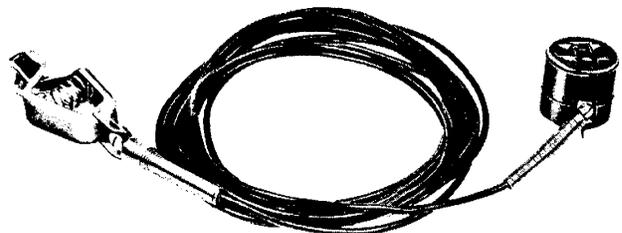


Fig. 7 — C Grounding Cord

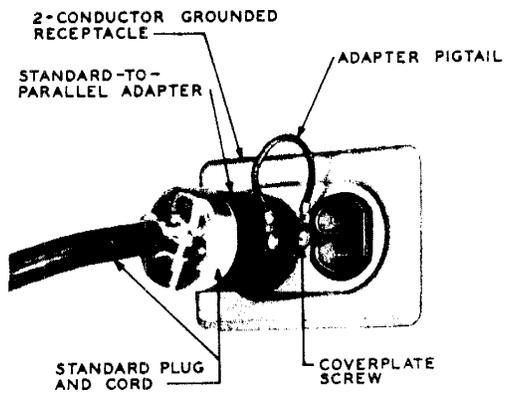


Fig. 8 — Grounded 2-conductor Receptacle



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