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Household Electrical Basics

Electric Basics

Most of the receptacles in a typical house are wired for 120 volt AC electrical power. The power/current flows between the 'hot' and 'neutral' wires. To reduce the risk of surges and unstable voltage, the neutral wire is connected to earth ground at the main electrical panel. Typically electrical shocks happen when a persons body is 'grounded' (the worst case is standing barefoot on the damp ground/soil or concrete) and they come in contact with the 'hot' side of the electrical power. This can happen when a metal cased appliance (e.g. a washing machine) has a defect which allows the case to become energized (e.g. the insulation on the power cord is damaged) and a person touches the appliance. It takes very little electrical current to cause death or serious injury. Connecting the metal case of the appliance to ground will greatly reduce the risk of electrical shocks.

<p align="center">3-Prong Receptacles</p> <p>3-prong receptacles are the standard type in use today. The smaller slot is designed to be connected to the 'hot' (or 'live') side of the house wiring. The longer slot is designed to be connected to the 'neutral' side of the house wiring. The semi-round hole is for the ground connection (the grounding conductor).</p>	<p align="center">3-Prong Plug</p> <p>Appliances which have a 3-prong plug must be plugged into a properly wired receptacle to provide the intended protection against electrical shock and damage to sensitive electronic equipment. Typically these are supplied with metal cased appliances or appliances that are used with or near water. They are also used on equipment with sensitive electronics and surge protectors.</p>	<p align="center">GFCI Receptacle</p> <p>Used to provide additional protection against dangerous electrical shocks. See dedicated GFCI protection page.</p>
<p align="center">2-Prong Receptacles</p> <p>2-prong receptacles were widely used until the mid 1960's. Until then, most of the wiring in a typical house did not include a grounding conductor. The narrow slot is designed to be connected to the hot side of the electrical power. Most household appliances have 2-prong plugs and are not affected by the lack of the ground connection.</p>	<p align="center">2-Prong Polarized Plug</p> <p>There are two types of 2-prong plugs, polarized & non-polarized. Polarized plugs are used on some appliances to ensure that the hot side of the electrical power is connected correctly to reduce the risk of electrical shock and/or damage to the appliance. A non-polarized plug can be plugged in either way.</p>	<p align="center">3-Prong to 2-Prong Adapter</p> <p>An adapter is designed to allow a 3-prong plug to be connected to a 2-prong receptacle. These are typically misused due to the fact that the green tab is usually not connected to ground. To provide the intended protection the green tab must be connected to ground.</p>

Typical Defects Noted During Inspections:

- **Open Ground** - A 3-prong receptacle where the ground connection is not attached. This typically occurs on a house where the older wiring does not have a ground conductor. Without the ground connection, an appliance with a 3-prong plug will not have the intended protection. A surge protector requires the ground connection to protect sensitive equipment from spikes/surges.
- **Reverse Polarity** - The hot and neutral connections are reversed at the receptacle. An appliance with a 3-prong plug or a polarized 2-prong plug is designed to have the hot side connected properly. Because of this, a reverse polarity condition should be corrected.