Shock Stopper*

*Protect your home and family with a GROUND-FAULT INTERRUPTER

Electricity has become so much a part of our lives that we take it for granted. We tend to overlook the fact that it must be handled with respect. Carelessness, misuse, and defective electrical equipment all contribute to more than 1000 deaths and thousands of injuries from electric shock each year.

What causes shocks?

What happens in an electrical system to cause a shock? Most electrical shocks are the result of ground faults. A ground fault is a condition that exists when the current supplied to a circuit tries to return to its source through the ground, rather than the return wire. This could be because the appliance or piece of equipment is defective, or because you have come in contact with a live wire.

How can you protect yourself against such hazards? The answer is the ground-fault interrupter (GFI). It prevents painful or deadly electric shock by interrupting the flow of current before it reaches a magnitude high enough to harm you.

When does a ground fault exist?

When you turn on an appliance, such as a lamp or toaster, electricity flows into it through a "hot" wire and returns to its source through a neutral wire. The current in the neutral wire should be the same as the current in the hot wire. However, if for some reason the current in the neutral wire becomes less than that in the hot wire, a ground fault exists. Part of the current is escaping and returning through the ground to its source. If you touch the hot wire, or if the wire is in contact with a metal part of the appliance and you touch the appliance, the electricity will try to travel through you to ground.

How much of a shock you receive depends on how much current goes through you. And this depends on the physical conditions surrounding you.

If your hands are dry, and you're standing on a dry floor, you may only receive a slight shock. However, if your hands are wet, or if you're standing on damp ground or in water, or if you simply have direct contact with the ground, you could be electrocuted.

Current: how much is too much?

It only takes a little current to do a lot of damage. That is why fuses and circuit breakers are no help in a potentially dangerous situation. More than 15 amperes of current are needed to blow out a 15 amp fuse or trip a 15 amp circuit breaker. In contrast, it only takes .01 to .03 amperes (10 to 30 milliamperes (ma)) — much less than the amount of current flowing through a bulb in a two-cell flashlight) to produce muscular contractions so severe that a healthy adult cannot let go of the appliance or wire. Such currents are very painful, frightening, and hard to endure for even a short time.

If the shock continues, it can cause asphyxiation, heart fatigue, and eventual death. Just 50 to 150 milliamperes can produce ventricular fibrillation, a fluttering action of the heart. The heart stops pumping and death occurs shortly if the heart is not stabilized.

So how can the GFI help?

This amazing device senses ground faults that are too small for fuses and circuit breakers to detect. The GFI constantly monitors the amount of current flowing to and returning from various appliances on a circuit. Remember that these two should be exactly the same. If there is a difference greater than 5 milliamperes, the GFI detects it and instantly switches off the electricity. Reaction is so immediate, in less time than a heartbeat in fact, that damage to the body is prevented. You may feel a slight shock, but it isn't harmful.