Factsheet: GFCIs to the Rescue

A great breakthrough in electrical safety came with the invention of the *ground fault circuit interrupter (GFCI).*

A *ground fault* occurs when electrical current flows on a path where it's not supposed to be.

Under normal conditions, current flows in a *circuit,* traveling from the source, through the device it operates, called the *load,* and then back to the source.

Current (amps) flows out to the load from the "hot" side (which is generally at 120 volts AC) and returns on the "neutral" side (which is at zero volts). Under normal conditions, these two currents (hot and neutral) are equal.

If they are not equal, because of *current leakage* (current returning on a different path than the neutral conductor), we get a ground fault.

This can occur if current flows through your body and returns to the source through a path to ground.

Electricity will take <u>any</u> available path to return to its source. We want it to return only on the neutral.

The ground fault circuit interrupter (GFCI) works by using the above principles. It measures total current on the hot side and total current on the neutral side of the circuit. They are supposed to be equal.

If these two currents differ from each other by *more than 5 milliamps* (plus or minus 1 mA), the GFCI acts as a fast-acting circuit breaker and shuts off the electricity within 1/40 of 1 second. You can still feel this small amount of current, but it will quickly shut off.

GFCIs are manufactured in many forms. The most common one is the GFCI outlet. However, there are also GFCI circuit breakers, plug-in GFCI outlets and GFCI extension cords, as well as GFCIs hard-wired into devices such as hair dryers. All types have "**Test"** and "**Reset"** functions.

The GFCI must trip when you press the "Test" button.

It must also energize the circuit when you press "Reset."

If either test fails, you must replace the GFCI in order to be protected!