

GFCIs and OR-OSHA's ground-fault-protection rules

OR-OSHA recently revised its existing ground-fault-protection rule and adopted a new one, *OAR 437-003-0404*, that will require *ground fault circuit interrupters* (GFCIs) on all 125-volt, single-phase, 15-, 20-, and 30-ampere receptacles that employees use for temporary power at construction sites. OR-OSHA is delaying the new rule's effective date until October 1, 2003, so that employers can learn about GFCIs and purchase them if they need to upgrade equipment.

Though the requirement for GFCI protection at construction sites is new, GFCIs have been protecting us in our homes for almost 30 years. The National Electrical Code first required them in outdoor receptacles in 1973, then extended GFCI protection to bathroom receptacles in 1975, to garage wall outlets in 1978, to kitchen receptacles in 1987, and to outlets in unfinished basements in 1990.

Types of GFCIs

GFCIs are available in circuit breakers, receptacles, portable plug-in receptacles, and extension cords.

Circuit breaker GFCI. Installed in a panel box, a circuit breaker GFCI prevents ground faults in all electrical equipment connected to that branch circuit (the wiring from the circuit breaker to specific switches, outlets, and receptacles). An electrician must install the device.

Receptacle GFCI. This device fits into a standard outlet box and prevents ground faults in all equipment plugged into the outlet. Most receptacle GFCIs can be installed so that they protect outlets that are further downstream in the branch circuit. One who knows how to wire electrical outlets can install them.

Portable plug-in and cord-type GFCIs. These are probably the most practical devices for construction workers who use receptacles and cord sets for temporary power. One simply plugs the GFCI into an outlet and then plugs equipment into the GFCI.

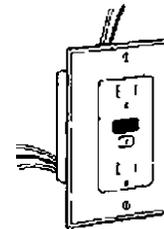
Ground-fault circuit interrupters



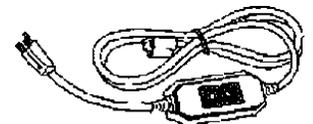
Circuit breaker



Portable plug-in



Receptacle



Portable cord type

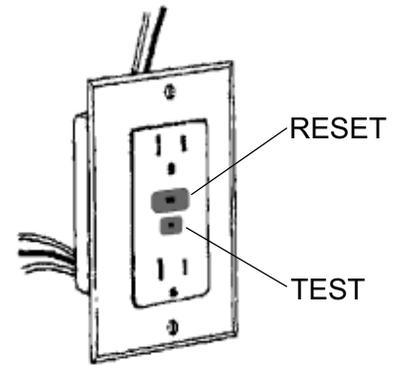
How GFCIs protect us

GFCIs are remarkable devices designed to prevent a ground-fault shock — the most common electrical injury in homes and construction workplaces. A ground fault occurs when electricity flows to the ground rather than to a neutral wire. Caused by a loose or worn internal wire, water, or even high humidity, a ground fault can electrify appliances and tools such as drills, saws, and sanders. The unsuspecting person who touches electrified equipment provides an ideal path to ground the current. A GFCI eliminates that threat, however, by comparing the amount of current going into the equipment with the amount of current returning. If the difference exceeds 5 milliamperes, the GFCI shuts off the electric power within $\frac{1}{40}$ of a second — quickly enough to save a life.

Testing receptacle GFCIs

Test receptacle GFCIs after you install them and then once every month. To test a GFCI, plug a nightlight or lamp into the outlet. Turn the light on, then press the GFCI *TEST* button. The *RESET* button should pop out. Press the *RESET* button to restore the power.

- If the *RESET* button pops out and the light does not go out, the GFCI is not wired properly.
- If the *RESET* button does not pop out, the GFCI is defective. Replace it.



About OR-OSHA's new ground-fault protection rule

While OR-OSHA's existing rule allows GFCIs *or* an assured equipment grounding conductor program to protect employees who use 125-volt receptacles for temporary power, the requirement in the new rule — summarized below — makes GFCI protection mandatory:

All 125-volt, single-phase, 15-, 20-, and 30-ampere receptacles used for temporary power at construction sites must have ground-fault circuit interrupters at the outlet end of the circuit. Portable plug-in and extension cord-type GFCIs, approved by a qualified testing laboratory, are also acceptable.

This means that employees who need to use temporary power for any reason must be protected by a GFCI. You can provide that protection with a circuit-breaker GFCI, a receptacle GFCI, or a portable plug-in or cord-type GFCI.

Which rule do I follow?

Between now and October 1, 2003, you can follow the existing rule [OAR 1926.404(b)(1)] or the new rule [OAR 437-003-0404]. After October 1, 2003, the new rule applies. Both rules are in subdivision 3/K of the Oregon safety-and-health construction standards.

Where to learn more

Occupational Safety and Health Administration, www.osha.gov

- *Ground-fault protection on construction sites*, U.S. Department of Labor, Occupational Safety and Health Administration, OSHA publication no. 3007, 1998 (revised)
- *Controlling electrical hazards*, U.S. Department of Labor, Occupational Safety and Health Administration, OSHA publication no. 3075, 2002 (revised)

U.S. Consumer Product Safety Commission, www.cpsc.gov

- *Use a Ground-Fault Circuit Interrupter with Every Power Tool*, CPSC document no. 5040
- *GFCIs Fact Sheet*, CPSC document no. 99

Permits Protect, www.permitsprotect.info

- Information to help you complete building and remodeling projects legally and safely

Electrical safety videos available from OR-OSHA

No.	Title	No.	Title
V0485	Awareness and elimination of electrical shock hazard	V0723	Electrical safety: the hazards of electricity
V1067	Electrical equipment hazards	V1065	Electrical shock hazards
V0173	Electrical safety	V0841	Electricity: a powerful force
V0221	Electrical safety training program	V0355	Hazard recognition program for employees
V0691	Electrical safety training program (Spanish-language)	V1068	Safe practices in electrical maintenance
V0722	Electrical safety: safe work practices		You can request a video from the AV Library by calling toll-free, (800) 922-2689, or by visiting OR-OSHA online: www.orosha.org