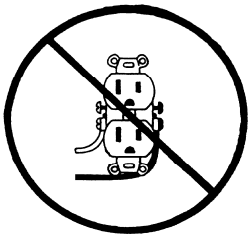
WIRING ALTERNATIVES FOR "TWO WIRE" (NON GROUNDED) ELECTRICAL SYSTEMS

CITY OF IOWA CITY

Housing & Inspection Services
356-5130

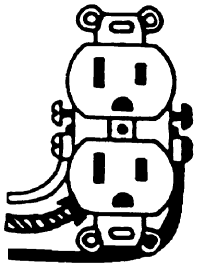
The National Electrical Code (NEC) has established rules for replacement of receptacles of nongrounded electrical systems.

NEC 406.3(D)(3) Grounding type receptacles and cord connectors having grounded contacts shall have those contacts effectively grounded.



THIS GROUNDING TYPE RECEPTACLE LACKS A GROUNDING CONDUCTOR

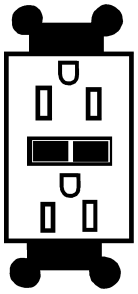
REPLACE WITH:



Tamper Resistant Grounding Receptacle

OR

Receptacle or Circuit Breaker



Tamper Resistant Ground-Fault Circuit-Interrupter

Note: A receptacle found to be defective or improperly wired that is located in one of the following locations must be replaced with a tamper-resistant G.F.C.I. receptacle.

CODE REQUIRED LOCATIONS FOR GFCI OUTLETS IN DWELLING UNITS.

1. All bathrooms.
2. Garages, except not readily accessible dedicated receptacle (freezer, refrigerator).
3. Outdoors within 6'-6" of grade.
4. Crawl spaces at or below grade and unfinished basements, except dedicated receptacle for laundry circuit or a single receptacle for a sump pump.
5. Receptacles serving kitchen counter tops, except dedicated receptacle (stove, refrigerator).

406.3 General Installation Requirements.

Receptacle outlets shall be located in branch circuits in accordance with Part III of Article **210**. General installation requirements shall be in accordance with **406.3(A)** through (F).

(A) Grounding Type. Receptacles installed on 15- and 20-ampere branch circuits shall be of the grounding type. Grounding-type receptacles shall be installed only on circuits of the voltage class and current for which they are rated, except as provided in **Table 210.21(B)(2)** and **Table 210.21(B)(3)**.

*Exception: Nongrounding-type receptacles installed in accordance with **406.3(D)**.*

(B) To Be Grounded. Receptacles and cord connectors that have equipment grounding conductor contacts shall have those contacts connected to an equipment grounding conductor.

*Exception No. 1: Receptacles mounted on portable and vehicle-mounted generators in accordance with **250.34**.*

*Exception No. 2: Replacement receptacles as permitted by **406.3(D)**.*

(C) Methods of Grounding. The equipment grounding conductor contacts of receptacles and cord connectors shall be grounded by connection to the equipment grounding conductor of the circuit supplying the receptacle or cord connector.

The branch-circuit wiring method shall include or provide an equipment grounding conductor to which the equipment grounding conductor contacts of the receptacle or cord connector are connected.

(D) Replacements. Replacement of receptacles shall comply with **406.3(D)**(1), (D)(2), and (D)(3) as applicable.

(1) Grounding-Type Receptacles. Where a grounding means exists in the receptacle enclosure or an equipment grounding conductor is installed in accordance with **250.130(C)**, grounding-type receptacles shall be used and shall be connected to the equipment grounding conductor in accordance with **406.3(C)** or **250.130(C)**.

(2) Ground-Fault Circuit Interrupters. Ground-fault circuit-interrupter protected receptacles shall be provided where replacements are made at receptacle outlets that are required to be so protected elsewhere in this *Code*.

(3) Non–Grounding-Type Receptacles. Where attachment to an equipment grounding conductor does not exist in the receptacle enclosure, the installation shall comply with (D)(3)(a), (D)(3)(b), or (D)(3)(c).

(a) A non–grounding-type receptacle(s) shall be permitted to be replaced with another non–grounding-type receptacle(s).

(b) A non–grounding-type receptacle(s) shall be permitted to be replaced with a ground-fault circuit interrupter-type of receptacle(s). These receptacles shall be marked "No Equipment Ground." An equipment grounding conductor shall not be connected from the ground-fault circuit-interrupter-type receptacle to any outlet supplied from the ground-fault circuit-interrupter receptacle.

(c) A non–grounding-type receptacle(s) shall be permitted to be replaced with a grounding-type receptacle(s) where supplied through a ground-fault circuit interrupter. Grounding-type receptacles supplied through the ground-fault circuit interrupter shall be

marked “GFCI Protected” and “No Equipment Ground.” An equipment grounding conductor shall not be connected between the grounding-type receptacles.

(E) Cord-and-Plug-Connected Equipment. The installation of grounding-type receptacles shall not be used as a requirement that all cord-and-plug-connected equipment be of the grounded type.

(F) Noninterchangeable Types. Receptacles connected to circuits that have different voltages, frequencies, or types of current (ac or dc) on the same premises shall be of such design that the attachment plugs used on these circuits are not interchangeable.