Installing and Testing a GFCI Receptacle

Please read this leaflet completely before getting started.

3. Should you install it?

Installing a GFCI receptacle can be more complicated than installing a conventional receptacle.

Make sure that you:
- Understand basic wiring principles and techniques
- Can interpret wiring diagrams
- Have circuit wiring experience
- Are prepared to take a few minutes to test your work, making sure that you have wired the GFCI receptacle correctly

4. LINE vs. LOAD

A cable consists of 2 or 3 wires.

**Cable** | **Wires**
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**LINE cable:** Delivers power from the service panel (breaker panel or fuse box) to the GFCI. If there is only one cable entering the electrical box, it is the LINE cable. This cable should be connected to the GFCI’s LINE terminals only.

**LOAD cable:** Delivers power from the GFCI to another receptacle in the circuit. This cable should be connected to the GFCI’s LOAD terminals only. The LOAD terminals are under the yellow sticker. Do NOT remove the sticker at this time.

**5. Turn the power OFF**

Plug an electrical device, such as a lamp or radio, into the receptacle on which you are working. Turn the lamp or radio ON. Then, go to the service panel. Find the breaker or fuse that protects that receptacle. Place the breaker in the OFF position or completely remove the fuse. The lamp or radio must turn OFF.

6. Identify cables/wires

Important:
- DO NOT install the GFCI receptacle in an electrical box containing (a) more than four (4) wires (not including the grounding wires) or (b) cables with more than two (2) wires (not including the grounding wire). Contact a qualified electrician if either (a) or (b) are true.

**Procedure:**
- (a) Detach two of the cable’s white and hot wires from the receptacle and cap each one separately with a wire connector. Make sure that they are from the same cable.
- (b) Re-install the receptacle in the electrical box, attach facia plate, then turn the power ON at the service panel.
- (c) Determine if power is flowing to the receptacle. If so, you have identified the LINE cable (go to step d). If not, the LINE is one of the other cables with the capped wires. Tag this cable and repeat this procedure with the two remaining cables until you have identified the LINE.
- (d) Turn the power OFF at the service panel, label the LINE and LOAD wires, then remove the receptacle.
- (e) Go to step 7A.

**Placement in circuit:**
- The GFCI’s place in the circuit determines if it protects other receptacles in the circuit.

Sample circuit:

**7. What is a GFCI?**

A GFCI receptacle is different from conventional receptacles. In the event of a ground fault, a GFCI will trip and quickly stop the flow of electricity to prevent serious injury.

**Definition of a ground fault:** Instead of following its normal safe path, electricity passes through a person’s body to reach the ground. For example, a defective appliance can cause a ground fault.

A GFCI receptacle does NOT protect against circuit overloads, short circuits, or shocks. For example, you can still be shocked if you touch bare wires while standing on a non-conducting surface, such as a wood floor.

A GFCI is used to protect against electrical currents that could pass through your body. If a current is too great, it will shut down the equipment.

A GFCI cannot pass its internal test, indicating that it may not be able to provide protection in the event of a ground fault.

**NOTE:**
- There is no power being supplied to the GFCI.
- The GFCI is wired incorrectly due to reversal of the LINE and LOAD leads.
- The GFCI cannot pass its internal test, indicating that it may not be able to provide protection in the event of a ground fault.

If the GFCI is miswired, do the following procedure to the right.

**NOTE:**
- A GFCI receptacle does NOT protect against circuit overloads, short circuits, or shocks.
- A GFCI does not protect against electrical currents that could pass through your body.

If this happens, NEVER touch the GFCI receptacle with bare hands because if the GFCI trips on a circuit that powers life support equipment because if the GFCI trips it will shut down the equipment.

**8. Procedure to the right:**

**Sample circuit:**
- The GFCI’s place in the circuit determines if it protects other receptacles in the circuit.

Sample circuit:

**9. Procedures to the right:**

**Placement in circuit:**
- The GFCI’s place in the circuit determines if it protects other receptacles in the circuit.

Sample circuit:
Connect the LINE cable wires to the LINE terminals: 
- The white wire connects to the WHITE terminal (Brass).
- The black wire connects to the BLACK terminal (Brass).

About Wire Connections: Side Wire: 
- Wire 3/4" (1.9 cm)
- For Side wire - Loop clockwise 3/4 of the way around screw
- For Back wire - Insert bare wire fully and tighten terminal clamp on conductor ONLY
- Back Wire: Wire 6" (1.6 cm)

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Connect the LOAD cable wires to the LOAD terminals: 
- The white wire connects to the WHITE terminal (Silver).
- The black wire connects to the HOT terminal (Brass).

Connect the switch leads to the switch controlled LOAD (not GFCI protected, shown in diagram): 
- One black switch lead connects to the LINE side black wire.
- One white switch lead connects to the LINE side white wire.
- One black switch lead connects to the LOAD side black wire.
- One white switch lead connects to the LOAD side white wire.

NOTE: For switch looped installation (diagram shown above): 
- Connect a 6-inch bare copper (or GREEN) 12 or 14 AWG wire to the grounding terminal on the GFCI. Also connect a similar wire to the grounding terminal on the box. Connect the ends of these wires to the LINE cable's bare copper (or GREEN) wire using a wire connector. If these wires are already in place, check the connections.

Complete the installation: 
- Fold the wires into the box, keeping the grounding wire away from the WHITE and HOT terminals. Screw the receptacle to the box and the facerplate.
- Go to step 8.

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8. Test your work
Why perform this test?
- If you reset the GFCI it may not prevent personal injury or death due to a ground fault (electrical shock).
- If you mistakenly connect the LINE wires to the LOAD terminals, the GFCI will not reset and will not provide protection to either the GFCI receptacle face or any receptacles fed from the GFCI.

Procedure: 
(a) This GFCI is shipped from the factory in the tripped condition and cannot be reset until it is wired correctly and power is supplied to the device. Plug a lamp or radio into the GFCI (and leave it plugged in). Turn the power ON at the service panel. Ensure that the GFCI is still in the tripped condition by pressing the TEST button. If the lamp or radio is OFF, and the GFCI will not reset, go to the Troubleshooting section as the Line and Load connections are reversed.

(b) Press the RESET button fully and release. If the Status Indicator Light turns Green and the lamp or radio is ON, the GFCI has been installed correctly. If the Status Indicator Light is still or continuously blinks Red, or the GFCI cannot be reset, go to the Self-Test Operation section.

(c) If you installed your GFCI using step 7B, plug a lamp or radio into surrounding receptacles to see which one(s), in addition to the GFCI, lose power when you press the GFCI TEST button. Place a "GFCI PROTECTED" sticker on each receptacle that lost power, then press the TEST button to reset the GFCI. DO NOT plug life saving devices into any of the receptacles that lost power.

(d) Press the TEST button (then RESET button) every month to assure proper operation. If the Status Indicator Light does not turn Green when the RESET button is depressed and then released, or the GFCI cannot be reset, it must be replaced.

TROUBLESHOOTING

Turn the power OFF and check the wire connections against the appropriate wiring diagram in step 7A or 7B. Make sure that there are no loose wires or loose connections. If the Status Indicator Light is not ON, the device is unable to provide this could be a result of no power available. Start the test from the beginning of step 8 if you rewired any connections to the GFCI.

LEVER LOCKOUT

Lockout devices are available. Start the test from the beginning of step 8 if you rewired any connections to the GFCI.