Homeowners Tips Sheets

GFCIs

Ground Fault Circuit Interrupters

This document is a sample from the Home Inspections Fundamentals class

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Ground Fault Circuit Interrupters

Two common types of GFCIs

GFCIs are sometimes in electrical panels but most often in outlets. The GFCI works by measuring the difference in currents flowing in the hot and neutral wires.

Arc Faults/Ground Faults

AFCI and GFCI breakers look similar but the are not the same thing. AFCIs are primarily designed to prevent fires, GFCIs prevent electric shocks.

Ground Fault Circuit Interrupters

How do they work?

Electricity flows from the outlet through the device, (say a hair dryer) and back to the outlet.

The GFCI ‘counts’ electrons, for every electron that leave the outlet, one has to return.

If you dropped that hair dryer in the toilet, electrons that should return to the outlet will flow into the water and to the ground.

This ground fault will trip the GFCI shutting off the power.

Ground Fault Circuit Interrupters

Locations of GFCIs over time

GFCI receptacles were required in houses in 1971.

Originally they were only required at the exterior of the house and by swimming pool equipment.

Today the are required in garages, bathrooms, kitchens, etc, anywhere that is within 6 feet of a water source.

GFCI Breaker Testing

Testing GFCI Breakers

www.homedepot.com

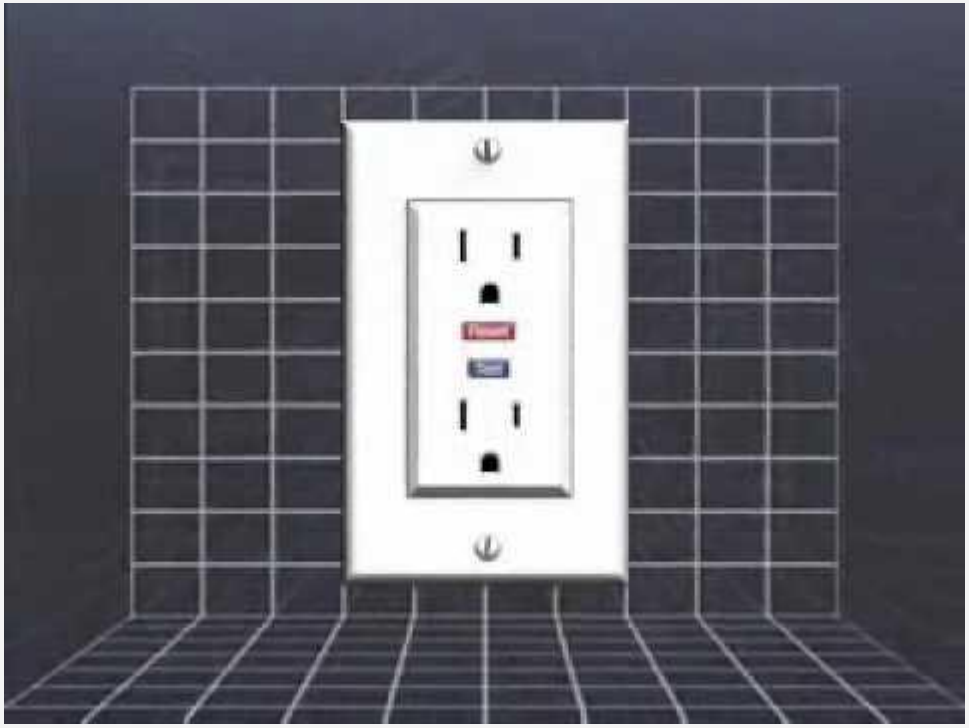
Push the test button and the GFCI breaker should trip to the halfway point. Turn off the breaker all the way off and back on.

If **anything** else happens (the GFCI breaker does not trip or does not reset), note your observations in your report as a safety issue.

GFCI Testing

Testing GFCIs

Insert the GFCI tester and push the test button and the GFCI should pop. Reset the GFCI.



If **anything** else happens (the GFCI does not pop or does not reset), note your observations in your report as a safety issue.

GFCI Testing

Ungrounded GFCIs

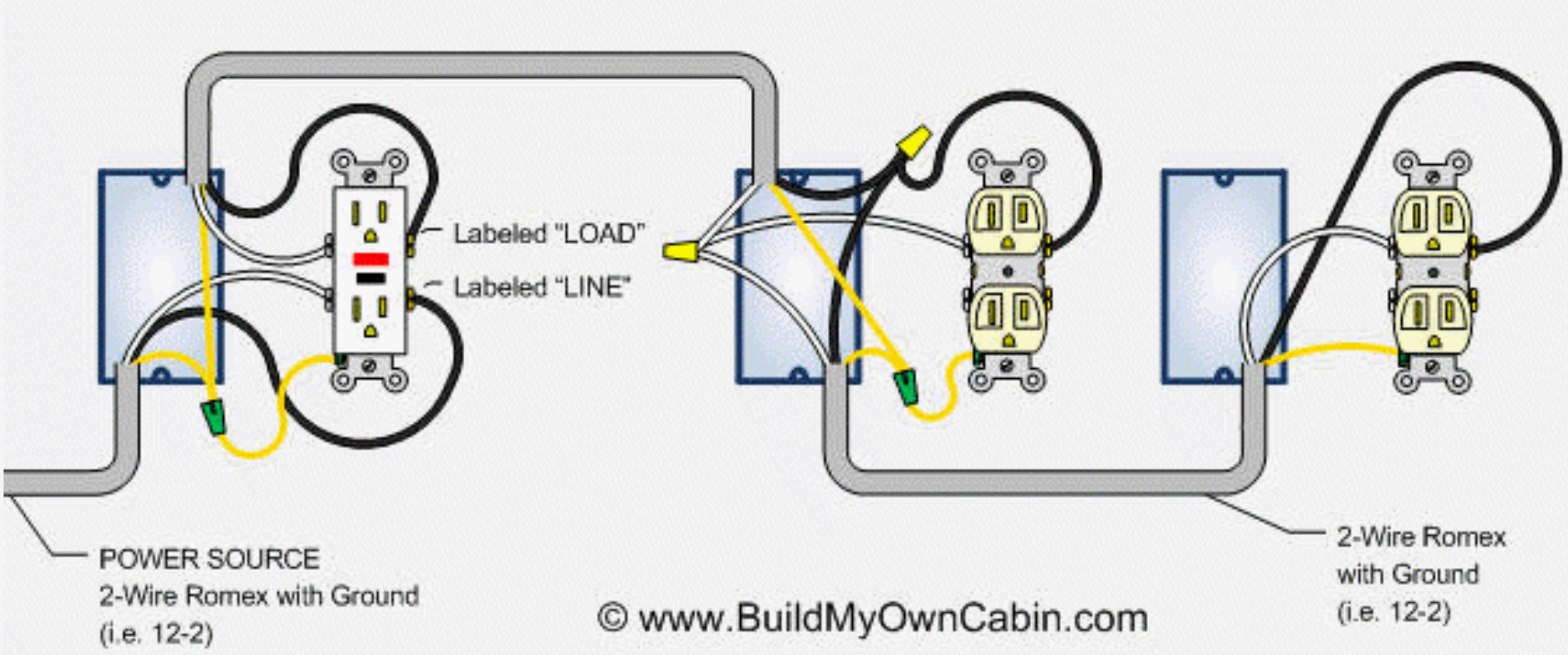
GFCI's wired to 2 wires (open ground) are legal and safe, but will not trip with the tester.

They should be marked: "NO EQUIPMENT GROUND"

This condition will cause your GFCI tester to **not work correctly**

GFCI Protection Downstream

GFCIs can protect other outlets.



All circuits connected to the load side of the GFCI receptacle are also protected

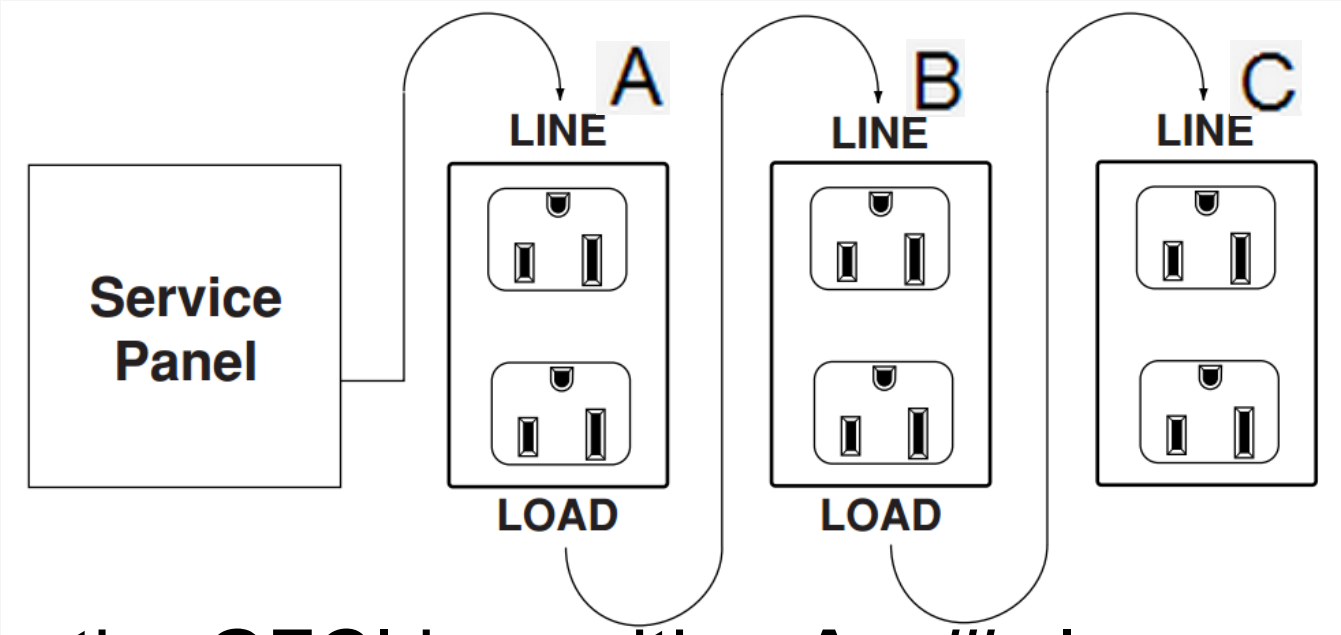
GFCI Protection Downstream

Why protect downstream outlets?

GFCI outlet are expensive averaging 20x the cost of a standard outlet.

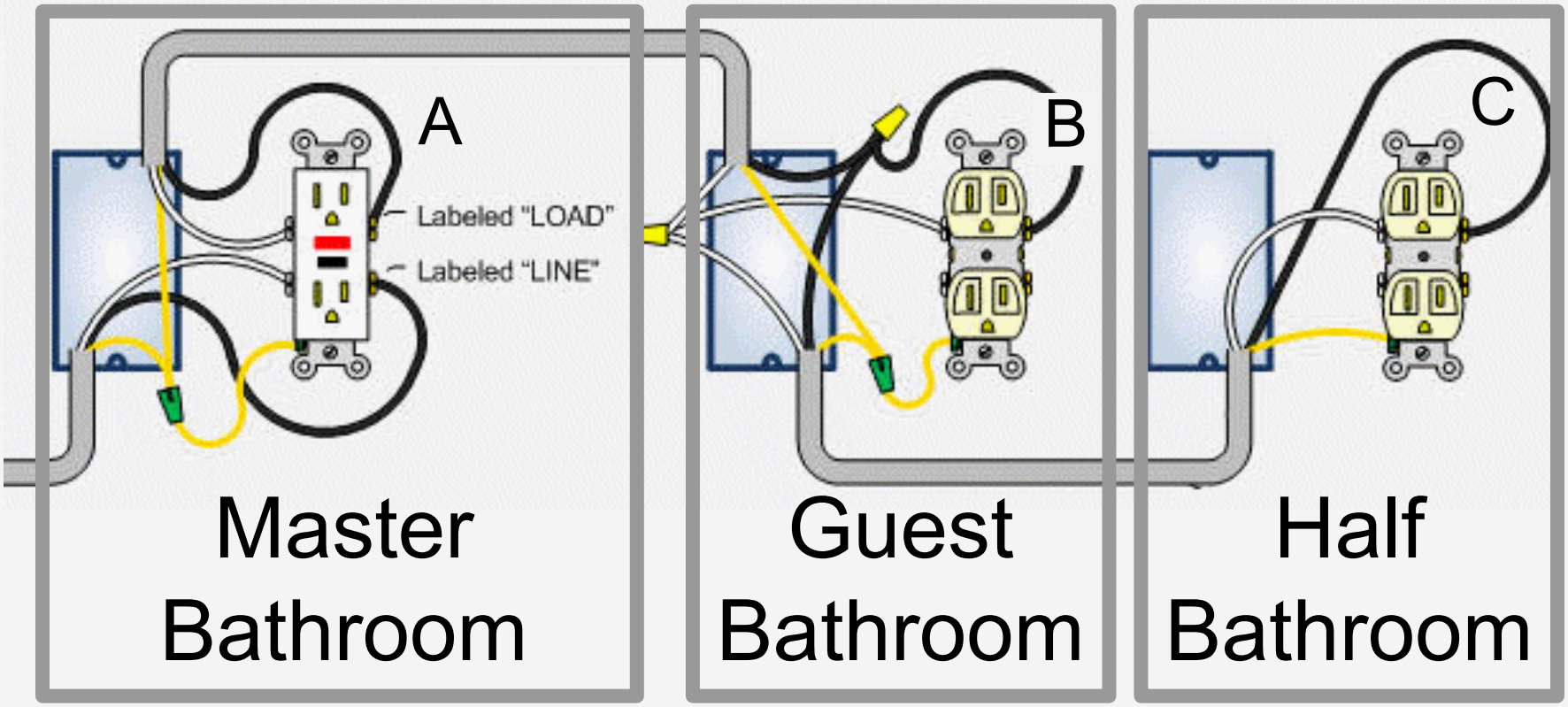
Instead of putting a GFCI in every receptacle, you can protect all the outlets by protecting one and wiring the rest to the load side of the GFCI.

GFCI Protection Downstream



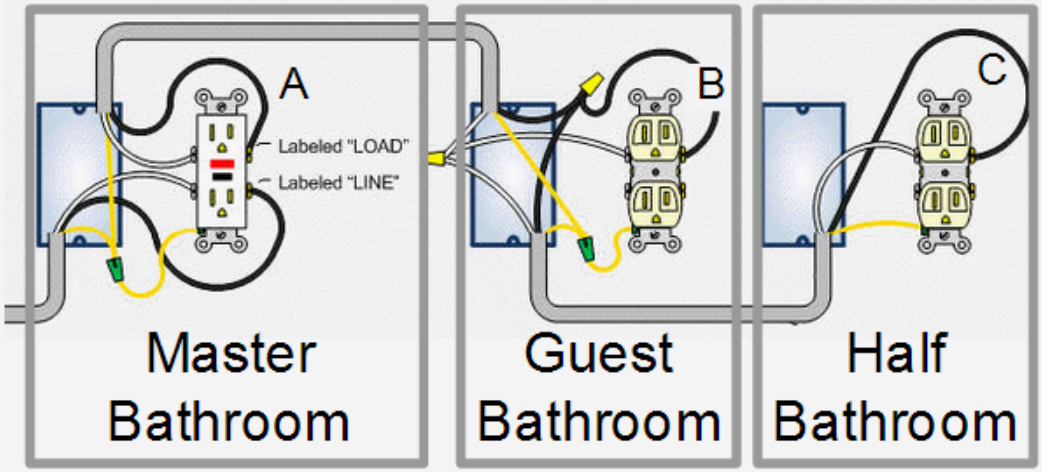
Placing the GFCI in position **A** *will* also provide protection to *"load side"*receptacles **B** and **C**. On the other hand, placing the GFCI in position **C** *will not* provide protection to receptacles **A** or **B**.

GFCI Protection Downstream



What will happen when you use an GFCI tester the **guest** bathroom?

GFCI Protection Downstream



The master bathroom GFCI will pop when ANY outlet is tested downstream if the circuit has a grounding conductor and a working GFCI.

This can make locating upstream GFCIs a problem for home inspectors.

GFCI Protection Downstream

Tips for locating and testing GFCIs
In modern construction:
Most outside GFCIs reset in the garage.
Bathrooms usually share a single GFCI, often located in the bathroom closest to the service panel.
Kitchens usually have 2 GFCI circuits.
Note if any GFCIs are in the electrical panel.

GFCI Protection Downstream

GFCIs that don't reset

When testing GFCIs occasionally they fail to reset. When this happens, all appliances on that circuit are now dead. Be sure to write up your findings in your report, and in addition, I always leave a note for the seller explaining that the GFCI failed when tested and needs to be replaced.

GFCI Protection Downstream

GFCIs that don't reset

When testing an outlet in a garage, the GFCI made a strange noise when it popped. It would not reset.
This circuit was connected to a upright freezer packed with items that would surely start to thaw.
I found a long extension cord in the garage and plugged in that freezer into another working outlet, leaving the sellers a note.
Not too surprising, I got a really appreciative reply from them thanking me for saving the freezer full of food.

GFCIs in Congested Garages

If the garage is full of stuff and you can't locate the GFCI….

I choose not to test for protection and note on the report that I was unable to locate the GFCI.
It may be there, but unless you can find it to reset it, you **do not** want to take a chance of leaving them without power.
I tell my clients "*When the personal belongings are removed, locate and test the garage GFCI, and replace any defective units.*"

Thank You

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Leading tomorrow

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