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TLE - Electrical Installation and Maintenance (EIM) Quarter I – Module 4 Testing and Resetting GFCI (Week 4)



What I Need to Know

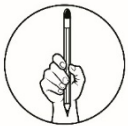
This module gives you information on how to test and reset GFCI devices. GFCIs need to be tested regularly to ensure a 100% functionality and to give efficient protection to persons.

This lesson will guide you how to test and check GFCI devices before connecting them into the electrical circuit. The lesson includes the following:

- When to Test GFCIs
- Procedure on How to Test and Reset GFCI Devices
- Tools and Equipment Used to Test and Reset GFCIs

After going through this module, you are expected to:

1. know when GFCIs are to be tested,
2. identify tools and equipment used to test GFCI, and
3. test and reset GFCI devices using GFCI tester.



What I Know

Use a separate sheet in answering the test. Be sure to write the following:

Name: _____ Year & Section: _____
Module Title: _____ Quarter: _____ Module #: _____ Week #: _____

Directions: Read each statement carefully and write the letter and word/s of your answer on a separate sheet.

1. A testing device used to test the functionality of the GFCIs?
A. Test light B. GFCI tester C. VOM D. Ground tester
2. Aside from the RESET button, GFCI has a _____ button which should be pushed to examine its functionality.
A. Push button B. Relay button C. Magnetic button D. Test button
3. GFCIs should be tested regularly, at least _____ to guarantee they are in working conditions.
A. Once a month B. Twice a month
C. Once every two months D. Twice every two months
4. If the flow of electricity stops when the TEST button is pressed, then the GFCI device is _____.
A. Defective B. Partly defective C. Functional D. Partly functional
5. A testing equipment used in the absence of VOM to indicate the presence of electricity in the outlet when testing GFCIs?
A. GFCI tester B. Resistance tester C. Test light D. Ground tester
6. To test your GFCI receptacle, simply plug something in and press the button labeled 'TEST'. If what is plugged in _____, your GFCI is working properly.
A. Energized B. Tripped OFF C. Turned OFF D. Turned ON
7. External part of the GFCI receptacle that is to be pressed after a trip or a test.
A. TEST button B. RESET button C. Ground terminal D. Neutral terminal

8. The best form that holds important information to use in testing and checking GFCI device is the _____.
 - A. Manufacturer's manual
 - B. Purchased receipt
 - C. Purchased order
 - D. Warranty receipt
9. It is advisable that any infrastructure more than _____ years old should have their GFCI outlets tested and replaced.
 - A. 7-10
 - B. 8-11
 - C. 8-10
 - D. 7-11
10. Before testing GFCIs make sure that _____.
 - A. there is electricity in the circuit
 - B. there is faulty in the electrical system
 - C. there is no electricity in the circuit
 - D. there is no faulty in the electrical system



What's In

Before installation, it is very important that a certain electrician must know how to test and check electrical devices to be installed in accordance with the manufacturer's specification. Some devices are already defective from the production area itself, that means electrical devices that are brand new still need to be tested even if they were bought directly from a trusted supplier.

There are many ways on how to test different electrical devices. The easiest way is using senses such as smelling, if there is a burnt odor, touching, if there are deformations and dislocation of parts, feeling, if there are vibrations and changing of temperature, and seeing, if there are discoloration and abnormalities. Such techniques are less accurate, that is why experienced technicians will not just rely on senses but use testing tools to have a precise result.

To have a better understanding of this lesson, recall the uses and functions of the testing equipment shown below.



Figure 3.1: Testing equipment used to test GFCI devices



What is It

When to Test GFCIs?

GFCIs should be tested regularly, at least monthly, to guarantee they are in working condition. It is advisable that any infrastructure more than 7-10 years old should have their GFCI outlets tested and replaced. Whether you have a receptacle or circuit breaker GFCI, pushing the TEST button should turn off the power to the circuit. For the receptacle-type GFCI, pushing the “TEST” button should cause the “RESET” button to pop up.

How should GFCIs be tested?

GFCIs can be damaged by voltage surges like lightning, installation or simply from regular usage. If these devices are not functioning properly, then users cannot be protected from shock or electrocution.

The only reliable way to check GFCIs is to use a circuit tester that has its own GFCI test button. Regardless of the type, most GFCIs are tested using the same procedure.

Before testing GFCIs make sure that there is no fault in the electrical system. Faulty circuits will affect the testing result and, in the future, may defeat its purpose as to protect the electrical system and its user.

A. Breaker type GFCIs

To test your GFCI circuit breaker, simply press the test button in. You will hear a snap sound that trips the breaker and cuts power off to the circuit. This can be checked with a voltage tester or a multimeter to be certain it has turned off the power. You could also plug in any appliances to the circuit and when it quits working when you hit the test button, you'll know the breaker safety mechanism works. Now that you know it is functioning properly, press the reset button and the breaker should once again be on. Again, you can test this with a tester or by observing the plug-in appliance works again.



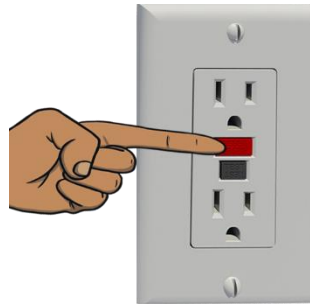
Figure 3.2: Testing GFCI breaker using circuit tester <https://tinyurl.com/ybfkmyz9>

B. Other types of GFCI

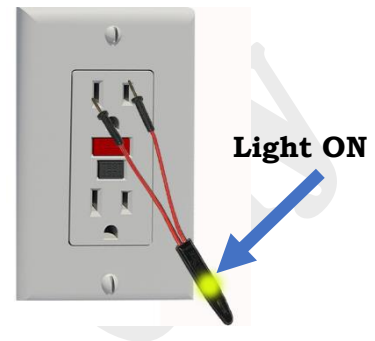
Like the GFCI breaker, other types of GFCIs should also be tested. Portable and other types of GFCI have the same testing procedure. Choose the most available current indicator you have in your house like a cell phone charger with a light indicator, light bulb connected in a plug, small appliances and the like. In this lesson we will be using a Test light.

Below are the steps on how to test GFCI. To protect yourself in doing so, you need to wear eye goggles.

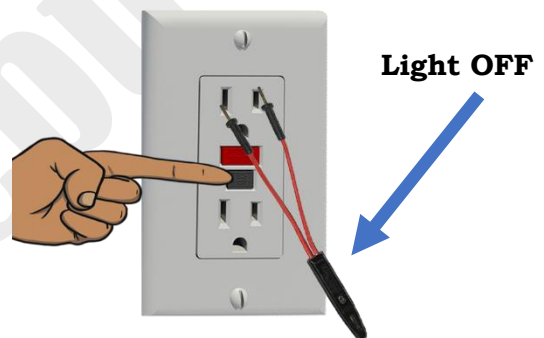
Step 1: Push the RESET button



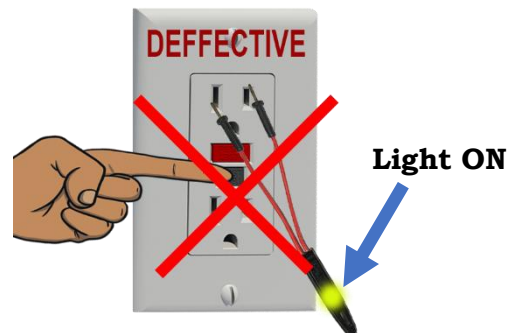
Step 2: Plug a current indicator in the receptacle
(the Test light should be energized)



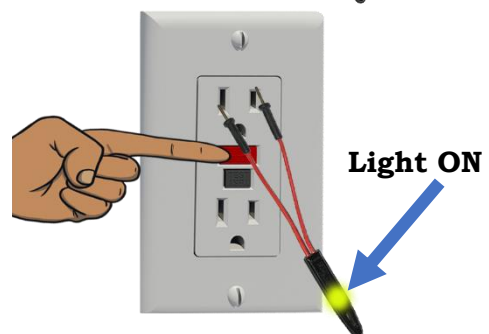
Step 3: Push the TEST button
(the light indicator should turn OFF)



NOTE: After pushing the TEST button and the light indicator remains energized, the GFCI is **defective**



Step 4: Push the RESET button again
(The light indicator should turn back ON.)



How to RESET a GFCI?

There are times that we need to restore the flow of electricity in the electrical system because of many unexpected electrical disturbances like short circuit, over current due to lightning, overload and other related problems. Before electricity can be returned, the GFCI must be reset. FIRST ensure that it is safe to do so. Turn off or unplug all devices that are plugged into the circuit. If you are not sure, unplug all appliances and devices especially those that are sensitive in a sudden change of current. Make sure no unsafe condition is present before restoring power. If everything is okay, do the steps below.

1. Press the “TEST” button. If it does not click when you press in, then it was tripped already
2. Next press the “RESET” button until you feel it click.
3. Power to the circuit should be restored at this point.
4. If the GFCI receptacle **trips** again after plugging a load in, do the steps in testing GFCIs discussed in the previous page.

Caution:

1. Before resetting GFCIs, inspect the device being plugged in for worn wires. Look in the surrounding area for water, wet or greasy dust, and worn insulation. Make sure that the outlet itself has not sustained any damage. If so, call a licensed electrician in your area.
2. Since resetting GFCIs need a hot circuit, as much as possible, do not touch any electrical devices without having another person to watch over you and always protect yourself by wearing appropriate PPE.
3. GFCIs are not repairable, hence, do not attempt to patch it up or replace it with a non-GFCI. Remember that GFCIs are installed in certain locations because it is a requirement.



What's More

Write the answer of the following in your notebook.

A. answer the following questions and support your answer.

1. When and why should GFCI be tested regularly? Explain your answer (5 points)

2. What must you do to ensure that the GFCI devices you are going to install are in good condition? (5 points)

B. Enumeration. Write the procedures of the following:

1. Testing GFCI (5 points)
2. Resetting GFCI (5 points)



What I Have Learned

Write the answer of the following in your notebook.

True or False. Write TRUE if the statement is correct, otherwise write FALSE.

1. The flow of current will stop when the RESET button of the GFCI is pressed.
2. RESET button will pop-up when the GFCI receptacle tripped.
3. Buddy systems are important in doing electrical work.
4. Resetting GFCIs may cause the power system of the affected circuit to shut-off.
5. Immediate testing of GFCI devices should be done regardless of unknown worn insulation or damage receptacles.
6. In testing and resetting GFCI, the circuit breaker should be turned OFF.

Fill-in the blanks. Fill-in the blanks below with the correct answer.

1. To test your GFCI receptacle, simply plug something in and press the button labeled 'test'. If what is plugged in _____, your GFCI is working properly
2. Aside from the RESET button, GFCI has a _____ button which should be pushed to examine its functionality.
3. GFCIs should be tested regularly (_____) to guarantee they are in working condition.
4. The best form that holds important information to use in testing and checking GFCI devices is the _____.
5. If the current stops flowing when the TEST button is pressed, then the GFCI device is _____.



What I Can Do

Now let's check if you can perform testing and resetting the GFCI receptacle. Prepare the materials and carefully follow the steps below:

Materials

1. 1-unit GFCI receptacle with box
2. 1-pc Male plug with ground
3. 1-pc Gang box
3. 1-meter cord with 3 wires in it
(red, green, black)
4. 1-m #14 red TW wire
5. 1-m #14 black TW wire
6. 1-m #14 green TW wire

PPE/Tools/Equipment

1. One of the following:
VOM
GFCI tester
Simple circuit with one bulb (AC)
Test Light indicator
2. Rubberized gloves
3. Eye goggles
4. Philip and Flat screwdriver
5. Longnose pliers
6. Side-cutting pliers
7. Lineman's pliers
8. Wire stripper

IMPORTANCE: It is understood that at this point, you have undergone many electrical related tasks during your previous training. Henceforth, it is expected that you already know the safety and proper handling of electrically related tasks like this.

Before you proceed, wear your PPE, and ask your parents or somebody to watch over you. Ask them to take a video for your documentation. The video taken will be your output for this performance task. If you don't have the capacity of making a video because you don't have a gadget, just narrate your performance and write it on a clean sheet of paper.

If you have a “**Pre-Installed**” GFCI receptacle in your house, proceed to **STEP 4** immediately.

Good luck!

To the Trainer

If the parents/learner decide to have their own learning materials for this activity, be sure to orient them regarding safety protocols and instruct the parents to watch and be with the student during the performance task.

Step 1:

Strip the wire and connect it to the plug as shown in the figure. Make sure that no conductor is exposed after closing the plug.

Step 2:

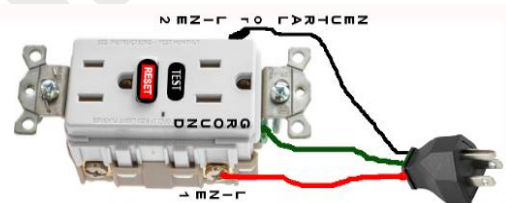
Connect the other end of the wire to the corresponding terminal of the GFCI receptacle. Green wire to ground terminal, Black to neutral and Red to hot terminal

Step 3:

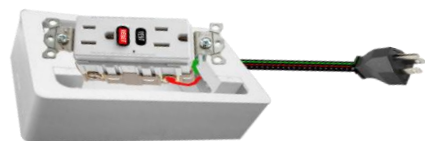
Mount the GFCI receptacle into the gang box to secure the connections.

Step 4:

Unplugged all sudden current change-sensitive appliances from the circuit and check the circuit for worn or damage insulation.



Step 1 and 2



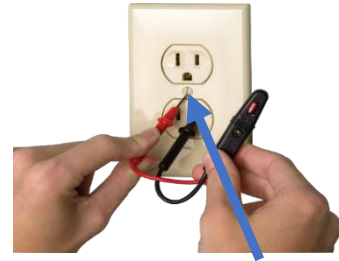
Step 3



Step 4

Step 5:

Using any current indicator, check the current in the outlet. Outlet to be use for this task should be energized before you test the GFCI receptacle.



Step Existing wall outlet in the house

Step 6:

Inform the person who is watching over you and when ready, insert the plug to the outlet to energize the GFCI receptacle.



Step 6 Existing wall outlet in the house

Step 7:

Follow the steps in Testing and Resetting GFCI discussed above and answer the guide questions

NOTE: For this specific job, you may proceed to the task immediately if you have your own materials. But you are **NOT REQUIRED** to buy them if you don't have the items. Instead watch the following videos and answer the guide questions:



Video 1: GFCI plugs, how to reset and test by *myHassleFreeHome* (



Video 2: Quick Inspection Tip: Testing AFCI & GFCI Breakers by *InterNACH*

<https://www.youtube.com/watch?v=tlS8Yc5fjeU>

Guide questions:

1. Before pressing any button of the GFCI, what happens to the current light indicator after you have inserted it to the energized GFCI receptacle?
2. When you pressed the RESET button, as instructed in step 1 in "Testing GFCIs", what happened to the current light indicator?
3. After pressing the RESET button, what happens to the light indicator when you push the TEST button? How about the RESET button?
4. When pressing the RESET button (Step 4 in "Testing GFCI"), after the TEST was done, what happens now to the light indicator?
5. Based on your observation, is your GFCI defective or not? Support your answer.

Your performance will be evaluated using the criteria below:

PERFORMANCE LEVEL					
5- Excellent: Can perform the skill without supervision and with initiative and adaptability to his/her current situation					
4-Very Satisfactory: Can perform the skill with less supervision and with initiative and adaptability to his/her current situation					
3-Satisfactory: Can perform the skill but requires assistance and supervision					
2-Needs Improvement: Can performs some of the skills and requires assistance and supervision					
Criteria	Performance Level				
	Excellent 5	Very Satisfactory 4	Satisfactory 3	Needs Improvement 2	Points Earned
Used of tools and equipment					
Application of procedures					
Safety work habit					
Timeliness and Quality of the task done					



Assessment

Use a separate sheet in answering the test. Be sure to write the following:

Name: _____ Year & Section: _____
Module Title: _____ Quarter: _____ Module #: _____ Week #: _____

Directions: Read each statement carefully and write the letter and word/s of your answer on a separate sheet.

- Aside from the RESET button, GFCI has a _____ button which should be pushed to examine its functionality.
A. Neutral button B. TEST button C. Ground button D. Trip button
- The best form that holds important information to use in testing and checking GFCI devices is the _____.
A. Manufacturer's manual B. Purchased receipt
C. Purchased order D. Warranty receipt
- To test your GFCI receptacle, simply plug something in and press the button labeled 'TEST'. If what is plugged in _____, your GFCI is working properly.
A. De-energized B. Tripped OFF C. Turned OFF D. Turned ON
- If the current stops flowing when the TEST button is pressed, then the GFCI device is _____.
A. Defective B. Repairable C. Loose connected D. Functional



Answer Key

Answer key (What I Have Learned)	True or False
1. Energizes	FALSE
2. TEST	TRUE
3. At least monthly	TRUE
4. Manufacturer's manual	FALSE
5. Functional	TRUE
Fill-in the blank	FALSE

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