Public and Indian Housing

U.S. Department of Housing and Urban Development

Special Attention of:
Office Directors of Public Housing;
Regional Directors; Public Housing
Agencies.

Notice PIH 2011-29 (HA)

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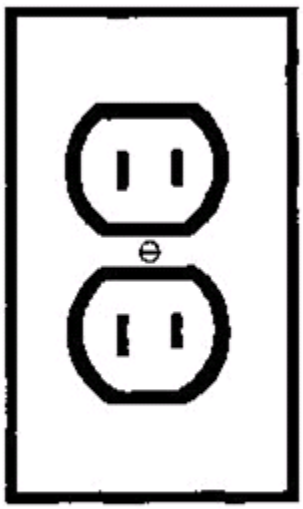


FIGURE 1 UNGROUNDED

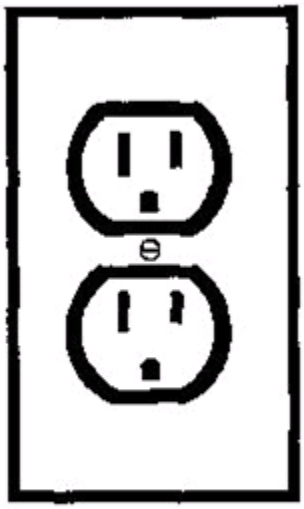


FIGURE 2 GROUNDED

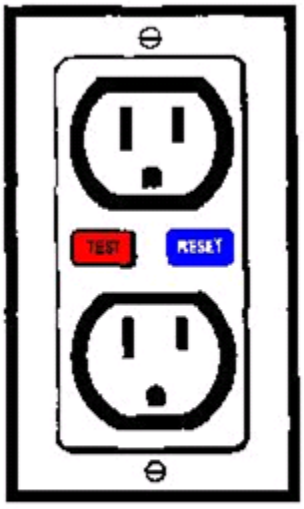


FIGURE 3 GFCI

Ungrounded Outlets

Older construction (pre-1975) housing will usually have ungrounded two-pronged outlets, which is an acceptable type of outlet under the HQS. (Figure 1) Homes constructed with a two-wire electrical system include only a hot and neutral wire. Two-pronged ungrounded systems and outlets are acceptable under HQS as long as the outlet is in proper operating condition. An owner does not need to upgrade the electrical system of the unit (replace two-pronged outlets to three-pronged) in order for the unit to pass an HQS inspection.

Grounded Outlets

Newer construction housing will usually have three-pronged outlets, which are acceptable under HQS if the outlets are grounded. (Figure 2) Newer units constructed with a three-wire electrical system include a hot, neutral, and ground wire. This Notice outlines traditional methods of testing grounded outlets for proper operating condition below.

"Upgraded" Outlets

Many of the cords for today's appliances contain three-pronged plugs, which can cause problems when an older home does not have three-pronged outlets for these grounded plugs. In the case of older homes, owners often replace two-pronged, ungrounded outlets with three-pronged, grounded type outlets in order to establish appropriate outlets for appliances that have cords with three-pronged plugs. However, in some cases, owners may replace two-pronged, ungrounded outlets with the three-pronged, grounded type outlets without the necessary rewiring that adds a ground wire to the newly installed, grounded type outlet.

Three-pronged, grounded type outlets should not be substituted for ungrounded outlets unless (1) a ground is connected to the outlet, or (2) a Ground Fault Circuit Interrupter (GFCI) protects the outlet. (Figure 3) Installing a new ground wire may require a licensed electrician to install a new wire to the circuit breaker box and may be prohibitively expensive. A more

cost-effective method is to protect the outlet with a GFCI, which provides protection to the outlet. If the GFCI senses a difference in current flow between the hot and the neutral terminals, it shuts off the flow of current to the outlet.

An older construction house with a grounded outlet (Figure 2) would be an indication that the unit may have undergone some upgrading. In such cases, the Department recommends testing a sample of outlets in the unit to determine if three-pronged outlets are in proper operating condition, in addition to verifying the proper operating condition of the required number of outlets per room.

Testing of Outlets to Determine Proper Operating Condition

Two-pronged, Ungrounded Outlets

The traditional method of testing a two-pronged, ungrounded outlet is to plug an appliance into the outlet and verify that the appliance turns on. This simple method is acceptable for determining that the ungrounded outlet is in proper operating condition and meets HQS.

Three-pronged Outlets

A three-pronged outlet must meet one of the following three standards for the inspector to consider the outlet in "proper operating condition" as required by HQS:

1. The outlet is properly grounded.
2. A GFCI protects the three-pronged, ungrounded outlet.
3. The outlet complies with the applicable state or local building or inspection code.

The inspector needs to use an outlet tester to determine whether the outlet is properly grounded. There are two types of outlet testers that an inspector can use to determine a properly grounded outlet: a two-wire tester or a three-pronged tester.

Two Wire Tester

Three Prong Tester

To test an outlet with a two-wire tester, an inspector inserts one probe into the hot slot (usually, the smaller slot) of the outlet and one probe into the ground hole (bottom hole). If the outlet is properly grounded, the indicator light should light brightly in the same manner

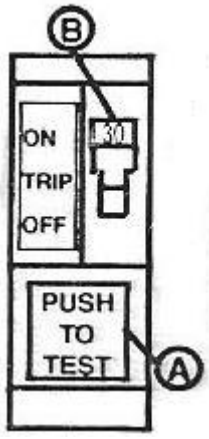
that the light shines when the inspector inserts the probes of the tester into the hot and neutral (right and left) slots.

To test an outlet with a three-pronged tester, the inspector should plug the device in and note the pattern of the lights. Usually there will be a legend printed on the device describing what the lights indicate. The instructions provided by the manufacturer of the tester should be followed.

If the inspector determines that the outlet is not properly grounded based on the results of the outlet tester, he/she may need to conduct some additional investigation to determine if a GFCI protects the outlet. A GFCI can be located at the outlet that is being tested or upstream on the circuit of the outlet. If the GFCI is at an outlet, it will look similar to Figure 3 above, and the inspector should accept the outlet as GFCI-protected after testing the functionality of the GFCI as indicated below.

As stated above, an ungrounded outlet may be protected by a GFCI at another outlet that is upstream from the ungrounded outlet. If the inspector suspects that this may be the case, there is an easy way to determine if the GFCI protects an outlet. The inspector should "trip" all of the GFCIs in the unit; both at the outlet and in the circuit breaker box and determine if there is power to the ungrounded outlet. If the power to the outlet is off, then one of the GFCIs protects the outlet.

Occasionally, a GFCI may be located on the circuit breaker at the load center (circuit breaker box). The following image depicts a GFCI breaker: the distinctive indicator is the "Test" button mounted on the breaker. An inspector may want to "trip" the GFCI in order to identify that the power shuts off to any ungrounded outlet that is protected by the breaker. To "trip" the GFCI, the inspector would press the test button (A) and the switch (B) will move and shut off power to the circuit. This allows the inspector to verify that the outlet is GFCI- protected.



GFCI Breaker

C. Testing of Ground Fault Circuit Interrupters (GFCIs) To Determine Proper

Operating Condition

If an outlet contains a GFCI, the GFCI must work as designed in order for the inspector to consider the GFCI in proper operating condition. However, a GFCI can be in proper operating condition even if it is not grounded. A GFCI is in proper operating condition if pressing the "TEST" button on the GFCI trips the circuit and shuts off power through the receptacle. It is important to note that some three-prong testers have a GFCI test button function built into the tester. The test button on a three-prong tester only works to trip a grounded GFCI. Therefore, if the GFCI is not grounded, the circuit tester will erroneously indicate that the GFCI is malfunctioning. As a result, inspectors cannot depend solely on-three prong testers to determine if a GFCI is in proper operating condition. Instead, the inspector should press the "TEST" button, and if the button trips the circuit and shuts off the power through the receptacle, the GFCI is in proper operating condition.