



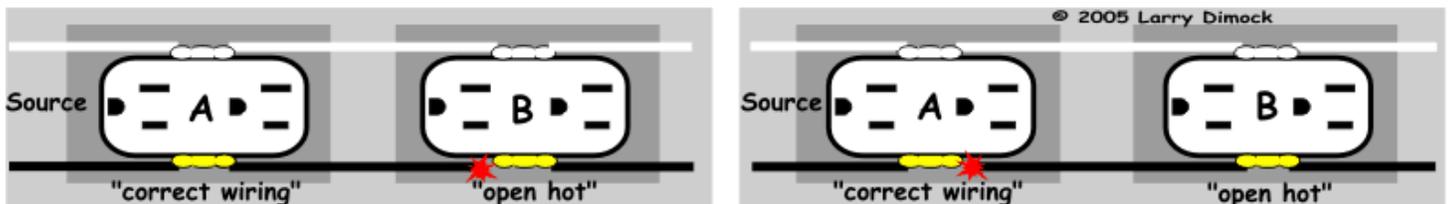
## Open Neutral, Hot and Ground; Reversed Polarity



A home electrical inspection for real estate purposes will often reveal electrical defects the homeowner was unaware of. Many of these are code violations, some of which raise real safety concerns and others that do not. **Here I am addressing only the common corrections or recommendations that home inspectors call for in regard to the proper connection, GFI-protection, and functionality of plug-in receptacles in homes.** Because some of these corrections involve a knowledge of circuits and a troubleshooting strategy, [The Circuit Detective's website](#) as a whole may be of value to you.

Many of these inspector recommendations are generated by their 3-prong outlet tester, which also often tests GFCIs as well. I discuss the meaning and **limitations of what these testers say** in [Interpreting An Outlet Tester](#). Here I describe their usual meanings:

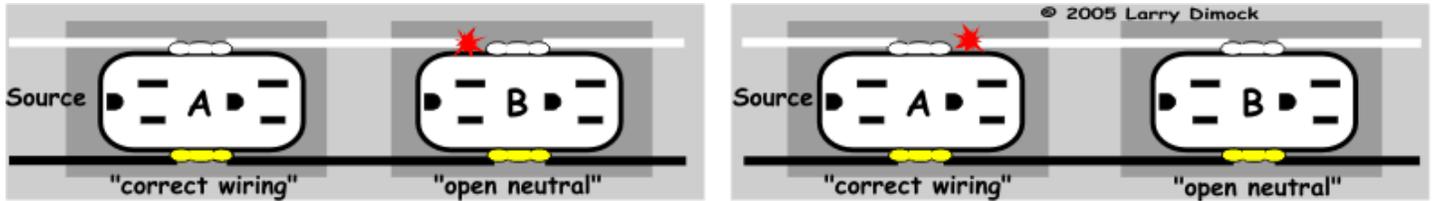
### Open Hot



If the tester is correct, this means the receptacle is dead from the "hot" wire (usually black) not actually being hot. In the illustration above, the left-hand scenario shows the bad connection being at outlet "B", which is the outlet that reads "open hot". The right-hand one shows the bad connection being at outlet "A", which actually reads "correct wiring" itself. For how to trace and correct an open hot and to be sure a breaker or GFI is not the cause, go through my [Diagnostic Tree](#).

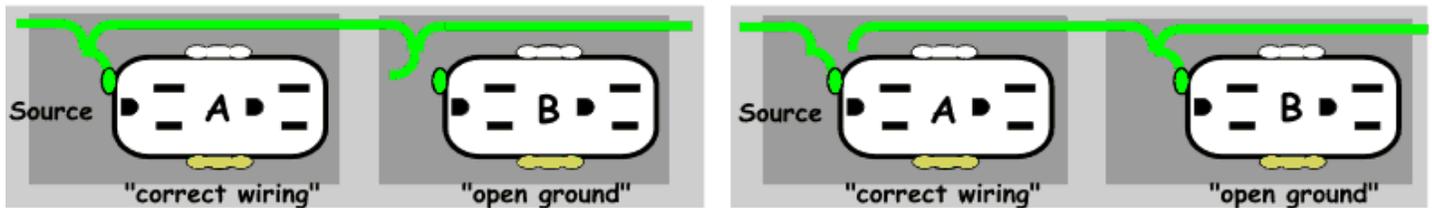


## Open Neutral



If the tester is correct, this means the receptacle is not working because, even though the black wire is hot, the white (neutral) wire is not connected well somewhere, so that it cannot carry any current "back" to the main panel. In the illustration above, the left-hand scenario shows the bad connection being at outlet "B", which is the outlet that reads "open neutral". The right-hand one shows the bad connection being at outlet "A", which actually reads "correct wiring" itself. To find an open neutral it may be helpful to use my [Finding an open](#).

## Open Ground



As with the open hot or neutral, an open ground can be happening at the receptacle itself (or its box) -- "B" of the left-hand scenario above -- or else at an outlet "upstream": "A" of the right-hand one. With grounds, an open is often a case of someone simply never connecting a ground to the receptacle or forgetting to reconnect if they had occasion to disrupt it. Still, the ideas for finding this open are similar to finding an open neutral. For instance, you could go to [Finding Your Open](#), except that you would not get lucky at making a light blink on by wiggling things. The other common reason for an open ground is that the home was built before the 1970s and someone has since installed a grounding-type receptacle without providing a real ground; in that case, it should be replaced with a [two-hole receptacle](#), given a ground wire that is connected (ultimately) to the panel, or given GFI protection upstream from it (in this case, code allows these 3-hole receptacles to remain).

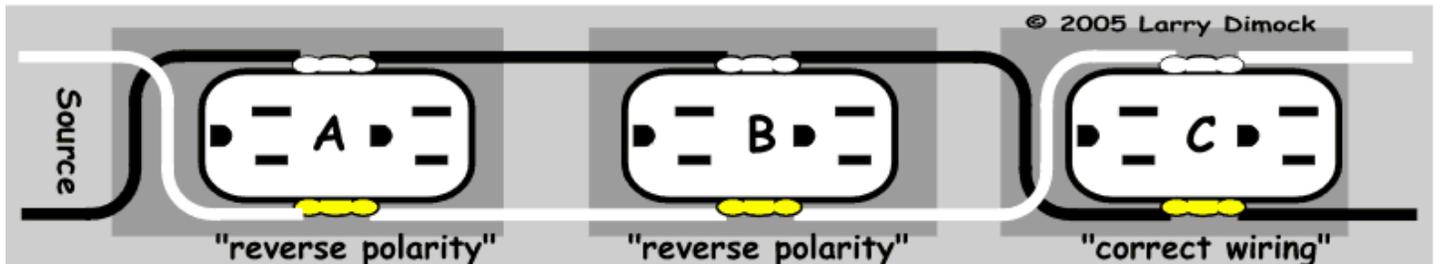
## Hot and Ground Reversed

Usually this is just another case of Open Neutral; the different reading is from the fact that somewhere among the non-working parts of the circuit an electrical item is trying to run and so is letting the hotness from the hot wire through itself onto the white wire; since the white wire is "open" (not connected well) somewhere between there and the main panel, it shows this hotness at the normally "neutral" slot of the receptacle and gives this odd reading.



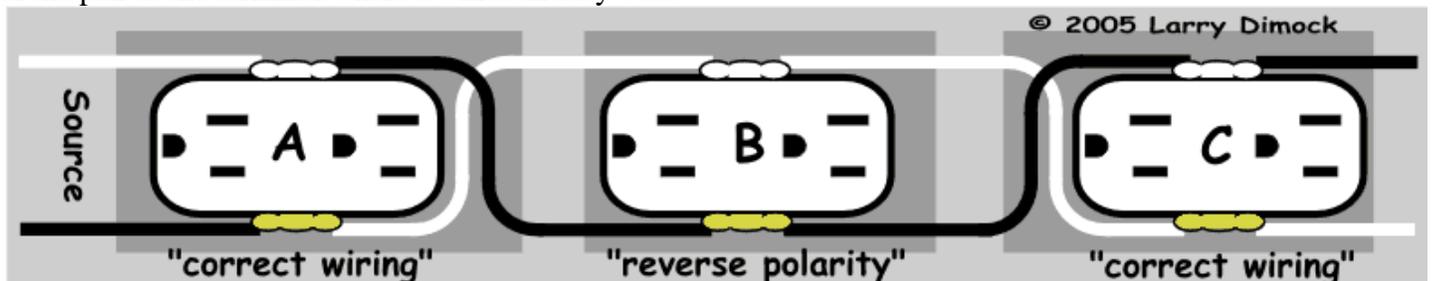
## Reverse Polarity / Reversed Polarity / Hot and Neutral Reversed

(This condition lets the outlet run things, but there can be circumstances in which this would not be entirely safe). If the tester is correct, this means that the right-hand slot of the receptacle (viewing the three holes as a face) is probably connected to wires that are actually neutral, whereas that slot is supposed to be for hot wires. And the left-hand slot is connected to hot wires instead of neutrals.



In this diagram whoever connected outlet "A" put the black on the white's side and vice versa. He also hooked "B" up this same wrong way, but for some reason hooked up "C" right. So "C" reads "correct wiring" and "A" and "B" read "reverse polarity". The solution here is simply to move all blacks and whites at reverse-polarity outlets to their correct side.

But let's consider a complication. There is another (less common) way that reverse polarity tends to come about. It is where someone installing or replacing a receptacle (or even trying to correct the polarity of some) connected the white of a black-white pair to a terminal where another black was (see "A" below) and the black of the pair to the terminal where a white already was:



The effect of this, as shown here, would be a polarity reversal in the color-coding of the wires themselves; then the polarity would read reversed or proper at the receptacle these wires attached to next, depending on whether they were attached there according to color ("B") or according to actual hotness ("C"), respectively. Both "A" and "C" are reading "correct wiring" in spite of the fact that some wires at them are the wrong color. I will not try to advise you on straightening this sort of thing out, except to say that you may want to start from scratch, making sure every receptacle along the circuit has whites on the white side and blacks on the black side and that the blacks, and only the blacks, end up actually hot.



## **GFCI Protection Recommended**

A home electrical inspection will often result in a recommendation to give certain outlets GFCI protection. You can learn more about when and where Code required GFI protection in homes at [GFI locations](#). Here I bring up the point that inspectors should distinguish between places your home should have had this protection from the beginning and where they merely recommend having it. In most jurisdictions there is no requirement for a home, even when changing owners, to meet current Code in this matter. Of course, you may not want to spend time fighting a buyer over the importance of the inspector's recommendation. I also want you to understand that GFI receptacles do not necessarily need to be installed at every location you decide to have protected. Often a GFCI receptacle installed at one point (say, in a kitchen) will be able to protect several other normal receptacles in the area, if you connect it in a particular way. Also be warned that there are several wrong ways to hook up GFIs that will result in their tripping or not working.

Searchers who need to read the material on this page may be using terms found in this statement: An electric outlet, wall plug, or wall socket may show hot ground reverse or hot neutral reverse; these readings are different than open hot electrical, open neutral electrical, or open ground electrical.

© 2005 Larry Dimock