

This page discusses basic electric guitar wiring and alternative ideas. Wiring is shown as wiring diagrams rather than schematics for the benefit of the novice. Attempts are made to explain concepts in plain English.

Pickups & Phasing

Pickup phasing can be a mystery, especially when various manufacturers use different default polarity, winding directions, and wire colors. Remember, pickups (or two coils of any pickups) are in phase if one of 2 conditions exist:

1. The magnetic polarity and winding direction are the same for both coils.
2. The magnetic polarity and winding direction of the 2 coils are BOTH opposite from each other.

Out of phase pickups sound much brighter and weaker, but only when the out of phase pickups are both active or selected. Some people find this a useful sound, some don't. To keep both sounds at your fingertips, check out my [wiring diagrams](#) for instructions on how to get both sounds using a switch.

The following is a wonderful test for the phasing of coils.

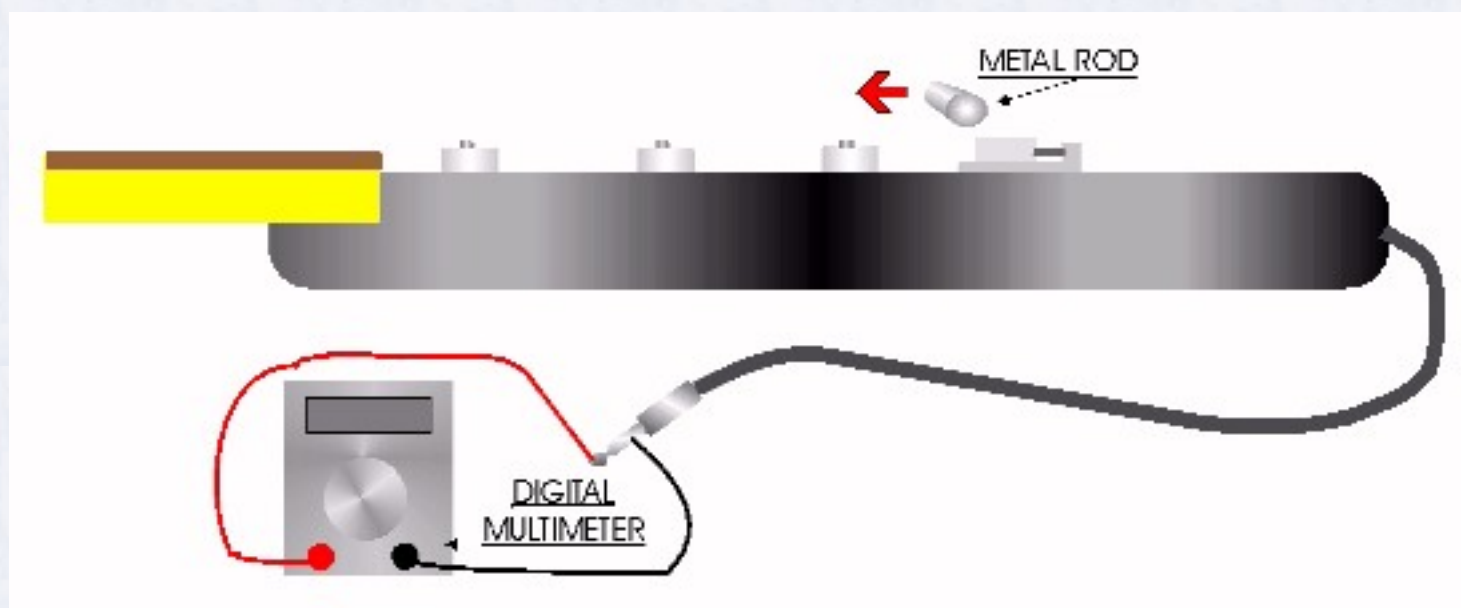
PREP: Insure that the 2 coils you wish to test are active using the guitar's switches.

Insure the volume and tone controls are at their maximum setting (10).

Have a multimeter, a guitar cable, and a piece of metal ready.

THE TEST: Plug the guitar cable into the guitar.

Attach the multimeter to the other end of the guitar cable using the tip of the jack as the (+) and the shaft of the jack as the (-). Larger alligator clips attached to the multimeter's probes make this job easier. Set the multimeter to measure the smallest amount of DC Voltage as possible.



Place the piece of metal by the bridge. Without touching the strings, move the piece of metal toward the first coil being tested. As the piece of metal comes close to the coil, the meter will register either a positive or negative voltage. As the piece of metal is passed over and past the coil, it will register voltage in the opposite direction (+ or -). Now repeat the process for the second coil. If the meter registers voltage in the same directions, the pickups are in phase. If the meter registers

voltage in the opposite direction, the pickups are out of phase.

NEAT: The same methods work for loudspeakers! Instead of passing a piece of metal over a coil, hook the multimeter up to the speaker wires or speaker terminals and gently push on the speaker cone. Then, gently release the speaker cone. You'll notice the reaction of the multimeter is the same as when you passed the piece of metal over and past the pickup coil.

Fixing A Phasing Problem

This can be tricky. If a coil has 2 colored wires plus a bare wire ground, all you have to do is reverse the colored wires. Do not change the bare wire ground.

If the coil or pickup has a shielded wire with a braided ground (like a guitar cable), you must reverse the wires where they are soldered to the pickup. The shielded ground must always be attached to the metal casing of the pickup (if there is one). For example, your coil or pickup has a white wire, a black wire, and a plain braided ground, examine the connections on the coil or pickup. If the white wire, for example, is soldered to the braided ground and attached to the pickup coil wire and the black wire is attached only to the pickup coil wire, you must unsolder the black and white wires and switch them (attach the black wire to the coil and braided ground, attach the white wire to the other coil wire connection).

Warning: Pickup coil wire is very delicate (about the size of human hair). Be careful not to break this wire or you will rapidly increase the difficulty of this project. If you are uncomfortable attempting this project, please have a professional repair person do this for you.