



Ignition coil wiring upgrade

Older bikes, and KZs and Zs in particular, often exhibit symptoms of rough running, backfiring through the carbs, and occasionally sooty spark plugs. When asked about these symptoms, people will often recommend the use of smaller main jets, dropping the jet needles down one notch, or tweaking of the pilot (mixture) screw. Carburetor adjustments such as these are often necessary, especially if the bike has been modified from stock at all, i.e. aftermarket exhaust, pod filters, etc.

However, if you know that the following conditions are all met, your carbs may have nothing to do with the problem.

- * Your air filter is clean, not clogged or dirty.
- * You have recently rebuilt your carbs or know that their innards are clean.
- * You know there is no crud in the carburetor float bowls, preferably because you have installed inline fuel filters that would prevent any crud from getting into the bowls in the first place.
- * Your carburetor float levels are all properly set.
- * The carburetor jetting is approximately correct. A general rule of thumb is that jets should be increased two sizes from stock for an aftermarket exhaust, and another 1-2 sizes for pod filters.

To repeat: if these conditions are met, your carbs may not have anything to do with the problem.

Consider that two things are necessary for complete combustion: the air/fuel mixture must be correct, and you must have a good spark. Since you've already determined that your carburetors -- and thus the air/fuel mixture -- are set up properly, that leaves us with the spark. So now what?

The problems described can be partially attributed to old ignition components or improper timing, but even if you have switched to a state-of-the-art electronic ignition system and new aftermarket coils, you can still experience these problems.

Why?

It's fairly common on older bikes, especially with their older wiring and connections that may have corroded with age, that the current feeding the coils is insufficient to create a strong spark. If this is the case, no amount of carburetor tuning will rid you of the problem or its symptoms. Powering the coils directly from the battery, allowing them to draw all the current they could possibly use, will eliminate this problem. Bosch makes a wide variety of standard automotive relays that will work well for this application, and they can be mounted on the same bolt that retains the starter relay (provided the bolt is replaced with a longer one to allow for the depth of the new relay).

Relay connection and installation diagram

To wire this up, you'll need the following:

- * 12- and 18-gauge wire
- * soldering iron and rosin core solder, intended for electrical (not plumbing) use
- * 3/16" heat-shrink tubing (or electrical tape)
- * standard automotive relay
- * inline fuse holder rated for at least 30 amps
- * 10-amp inline fuse (to fit above holder)
- * 14-gauge male barrel connector
- * 12- and 18-gauge crimp-on female lug connectors
- * Wire ties (optional)

DISCONNECT YOUR BATTERY BEFORE PROCEEDING ANY FURTHER!

Instructions for installation:

- 1.) Crimp a female connector onto one end of a 12-gauge wire and connect this to relay lug #85.
- 2.) Heat this wire on its bare end with the soldering iron and allow solder to flow through the strands of the wire. This is called "tinning" the wire. Let it cool for a couple of minutes.
- 3.) Loosen a frame bolt, wrap the tinned end clockwise around a frame bolt and tighten the bolt down. This is your ground.
- 4.) Crimp a female connector onto one end of another 12-gauge wire and connect to relay lug #30.
- 5.) Put about one inch of heat-shrink tubing onto the other end of the wire and move it towards the relay and out of the way for now.
- 6.) Join one end of the inline fuse holder to the end of the 12-gauge wire and solder.

- 7.) When the solder joint cools, slide the heat shrink over the solder joint and carefully hold a match, hair dryer, or other heat source near it to shrink it down. Alternatively, use electrical tape in place of the heat-shrink tubing.
- 8.) On the other end of the fuse holder, similarly solder a section of wire of a length appropriate to place under the nut that retains the positive wire from the battery where it connects to the starter solenoid (starter relay). This will be the power for the coils.
- 9.) Tin the end of this wire, place it under the nut, and tighten the nut.
- 10.) Put the 10-amp fuse into the inline fuse holder.
- 11.) Find the positive wire that comes out of your kill switch. It is in a bundle under the tank and wrapped in a plastic sleeve. You may have to pull the sleeve back.
- 12.) Open your right hand switch housing to see what color the wire that is connected to the kill switch "ON" position is. This is where you will pick up power to trigger your relay so that it will power the coils only when the bike is running.
- 13.) Cut this wire, strip some insulation from each side of the cut, and splice in a piece of 18-gauge wire. Cover the splice with heat-shrink tubing or electrical tape.
- 14.) Run this 18-gauge wire to the relay, crimp on a female lug connector, and connect to relay lug #86.
- 15.) Your coils have positive power leads and ground wires. We don't need to touch the grounds, which are both black wires or possibly black/yellow on newer bikes. The positive wires will come together into a two-into-one connector and be connected to a yellow/red wire which is the source of your woes! Disconnect the positive coil wires from the yellow/red wire.
- 16.) Cap off the yellow/red wire with electrical tape or heat-shrink tubing and get it out of the way. You won't need it for anything any more.
- 17.) Crimp a round male lug-type connector onto a piece of 12-gauge wire. Plug this connector in where you just removed the yellow/red wire.
- 18.) Run the other end to the relay, crimp on a connector, and connect to relay lug #87.
- 19.) Wire ties may be used at this point to make the installation neater and ensure that no stray wires will rub against the valve covers or cylinder head (which could melt the insulation and short the wire).

Now, when you start the engine, with the kill switch in the "ON" position, your coils will be powered by the new circuit we created and your spark will be much, much stronger. Say goodbye to constantly cleaning your spark plugs and tinkering with your jetting!

BY George Lesho, edited by Chris Lawson