

Coils and Electronic ignition unit.

Only thing to do to the coils was a good clean up and replating of the mounting flanged nuts. A more important thing is to get a good earth connection to the now coated frame. Instead of compromising the coating on the coil mounts I used an additional earth wire directly from the mounting posts back to a main negative battery connection. Out came the crimp connectors, soldering bits and some black with yellow tracer wire. The wire was stripped, tinned with solder then crimped, the crimp was then soldered and shrink wrap used for protection.



Negative lead from coil 1 - 4



Loop wire and negative lead to main ground connection

The wire back to the main negative connection was spiral wrapped with the power and signal wires from the Piranha electronic ignition box and routed with the main harness.



Ignition Coils relay conversion

As standard most bikes from this era were built with the thinnest wire possible, thin wire and long runs via switches and high current draws for aftermarket headlights etc. and you will see a lot of lost voltage, even with the OEM 40-50W headlights these thin wire will have enough resistance to loose 2V or so from battery voltage.

The best solution besides a complete rewire with larger gauge wire is to run the high current items via relays as cars have done for many years.

My RD400C was also fitted with Piranha ignition and as it had a kick start I was not to bothered when the battery started to fail. Only when it got down to just under 10V it would not start. Early electronic ignition units like the Piranha seem to be a bit fussy and require a good battery voltage to work right. With the Z500 only having an "Electric Foot" only I decided to give the Piranha ignition unit the best possible chance.

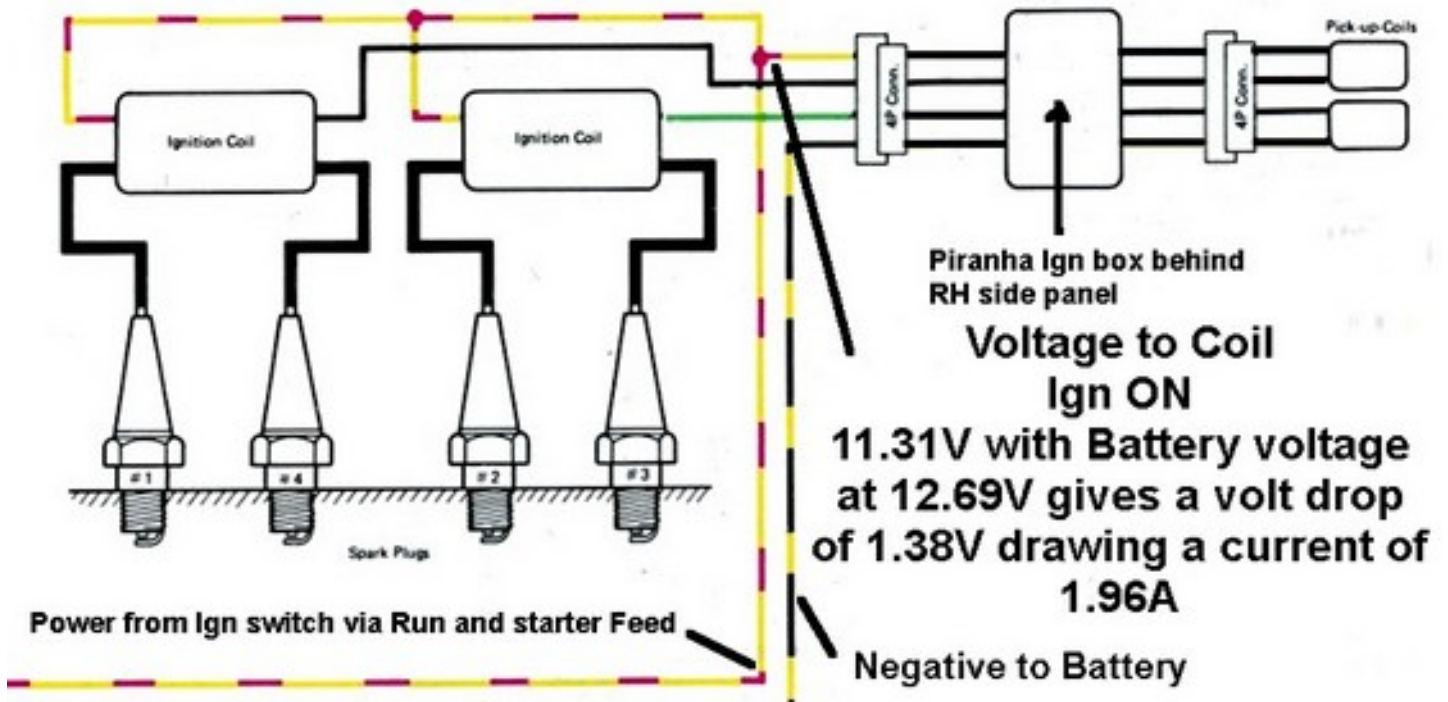
Even with the contact breaker ignition the coils will pull 5-6 amps. The primary winding spec is between 3.2 an 4.8 Ohms. From Ohms law ($\text{Amps} = \text{Volts} / \text{Resistance}$) at 12v with a resistance in the middle of the spec (4.0 Ohms) each coil will take 3.0 Amps.

The feed for the coils can be traced via the wiring diagram. From the battery via the main 20A fuse along the top of the frame to the headlight shell, then to the ign switch, back to the headlight, down the frame near the coils where it goes up the RH switchgear loom to the kill button, looped over the the start button common connector, back down the RH switchgear loom to the coils. This adds up to a good 2 metre run. I did some measurements.



With the ignition ON and kill switch in RUN position I had 12.69V across the battery and only 11.31V across the coils (measured from the Yellow/ Red coil wires). A difference of 1.38V.

Z500 with Piranha Ign Unit



To verify this I measured the actual voltage drop between the Coils positive and the battery positive and also the current draw with the ignition in the RUN position.

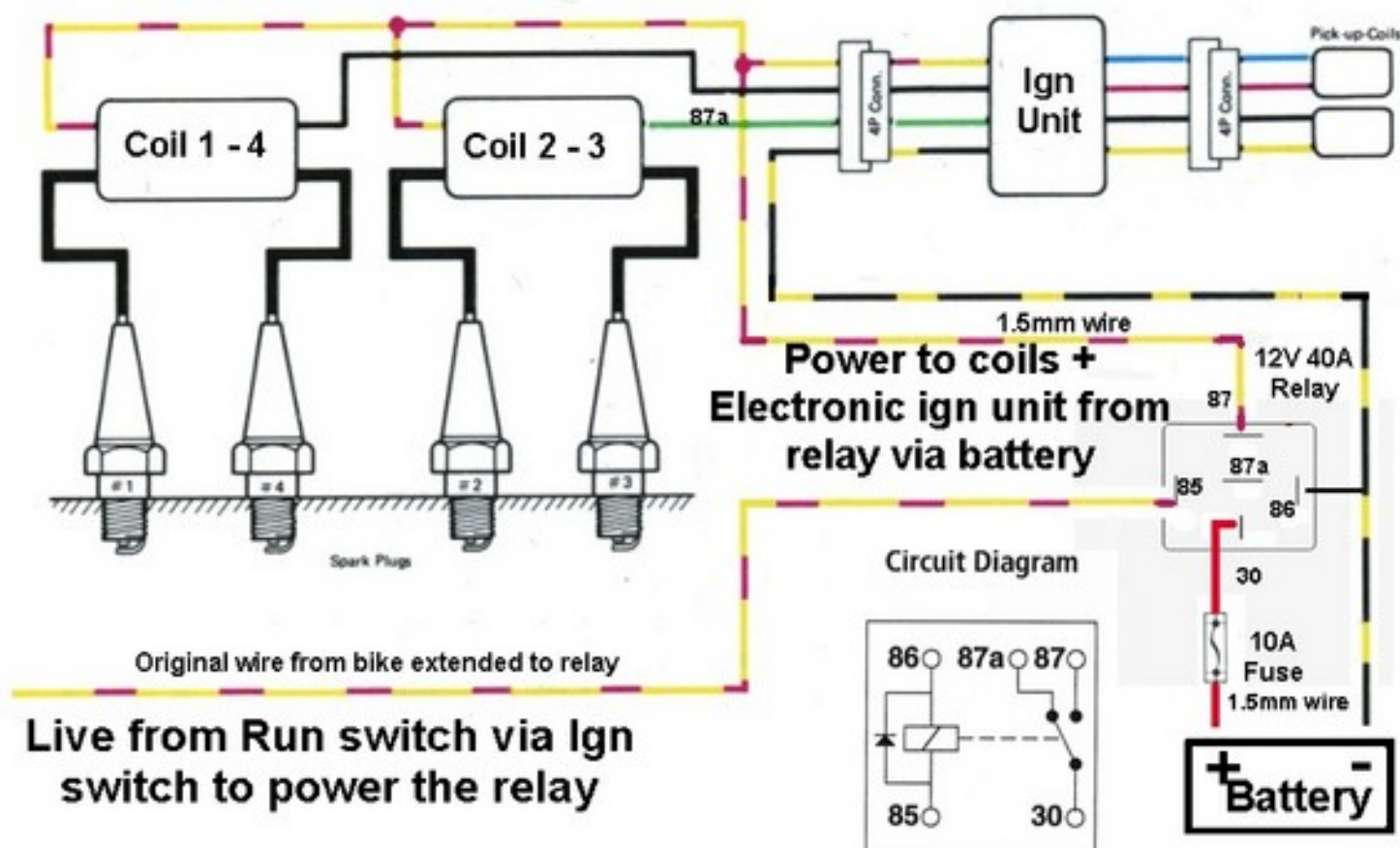


1.386 Volts and 1.96 Amps. Only 1 of the 2 coils are running here, it will depend on where the crank is at the time. Current flows in the primary winding until the contact breakers open stopping the current and causing the stored energy in the coil to induce a high voltage in the secondary winding hence a spark across the plugs. There has to be enough power (current multiplied by voltage) to store enough energy in the coil to generate a good strong spark.

The circuit was modified so the STD Yellow / Red wire will energise a relay, not the coils. This relay will take about 0.14 A to work so is a very light load on the STD wiring. The heavy work of powering the coils and the ign unit will be feed from the positive terminal of the battery via a 10A inline fuse to the common contact of this relay. Then from the switched contact to the ign unit and looped up to the coils all using larger 1.5mm² heat proof wire.

- Battery disconnected.
- Coils feed wires (Yellow / Red) disconnected.
- Bracket made and relay mounted to RH of battery box via airbox mounting bolt.
- Ring terminal soldered onto inline fuse positive battery side and other side soldered / shrink-wrapped to wire for terminal 30 on relay.
- Ring terminal soldered to negative return wire (terminal 86) from relay to battery.
- Yellow / Red wire from coils cut above ign unit connector and soldered / shrink-wrapped to wire for terminal 85 on relay (to energise relay).
- New coil supply wire (1.5mm²) soldered / shrink-wrapped to wire from terminal 87 of relay.
- New coil supply wire ran up with main loom to coil location.
- Link and bullet connectors soldered / shrink-wrapped to new coil supply wire.

Ign unit and coils now get full battery voltage





With all wiring double checked the relay was plugged in, the battery reconnected and the the 10A inline fuse fitted. With the ignition on and in the RUN position the relay energised and the voltage across the battery and across the coils measured. Result, only 0.2V dropped. When ran the engine started easier and had a more stable cold idle.

Link to fuse holders



<https://www.ebay.co.uk/itm/5x-Inline-Standard-Blade-Fuse-Holder-Splash-Proof-DC-12V-30A-Fuses-For-Car-Bike/164232827097?epid=26002919402&hash=item263d0a10d9:g:RRgAAOSwZo1c0j-E>

link to relay



https://www.ebay.co.uk/itm/UK-12V-Automotive-Changeover-Relay-40A-5-Pin-SPDT-Switching-Relay-with-Sockets/223592484444?ssPageName=STRK%3AMEBIDX%3AIT&var=522334414108&_trksid=p2057872.m2749.l2649

1.5mm wire link

https://www.ebay.co.uk/itm/Automotive-Auto-Cable-Wire-Wiring-12v-For-all-Vehicle-Applications-All-Sizes/124224780510?ssPageName=STRK%3AMEBIDX%3AIT&var=425078767923&_trksid=p2057872.m2749.l2649