EFI/Electronic ignition K100 2v troubleshooting

Disclaimer:

This page is a guide but not a reference. I am not a professional but only a K100 enthusiast with good knowledge of the bike.

Most of the information contained is this document was not available anywhere on the Internet at the time this guide was written. After a couple of month of research, I finally compiled this printable version. The HTML version posted on the K100 forum has been viewed 5,000 times in 5 months. From all the feedback received, the information published has been confirmed to be accurate.

Please use your own judgement when testing the electronic as I CANNOT be responsible if you short or fry an electronic component. This is an on going project and this file will be upgraded when new information will be available. Please check it regularly.

Bertrand Vogel (Crazy frog)

This document should help you to understand how the LE-Jetronic and the electronic ignition are working.
I would happily add your comments and experience to this page if they are relevant.
Click here to email me additional information

You don't need electronic knowledge but basic electrical knowledge in order to test both units following the information on this page.

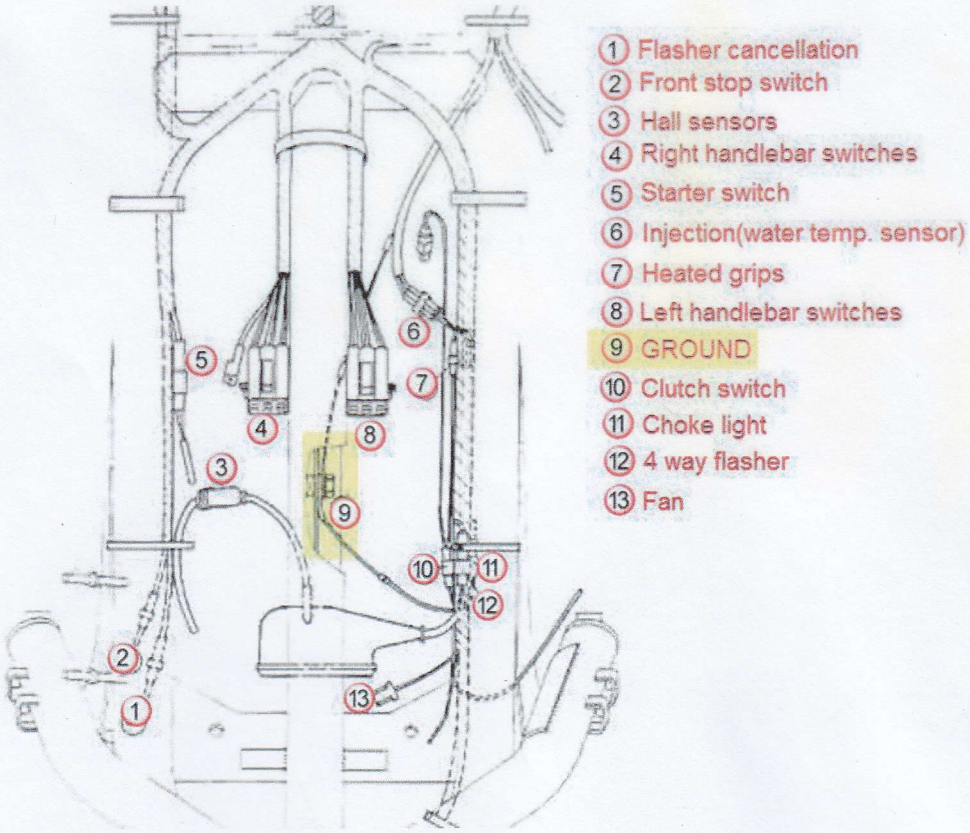
**The following explanations and schematics are specific to the early K100 2 valves.
The 4 valves RS is different (Motronic) but the same principle applies to it.
The K75 shares the same technology and the principle is similar at the exception of an extra coil.**

First, you have done all the basic troubleshooting such as: checking the fuses, ignition switch, kill switch, side stand switch (not applicable on early K100), transmission in neutral, clutch in, starter connection, Fuel pump connector on the fuel tank, and battery connections.
The ground connections are critical for the electrical system. The ground connection between the battery (-) and the side of the transmission should be cleaned and tested. the connection #9 on the frame should also be checked. (Remove the screw and clean all the connectors)

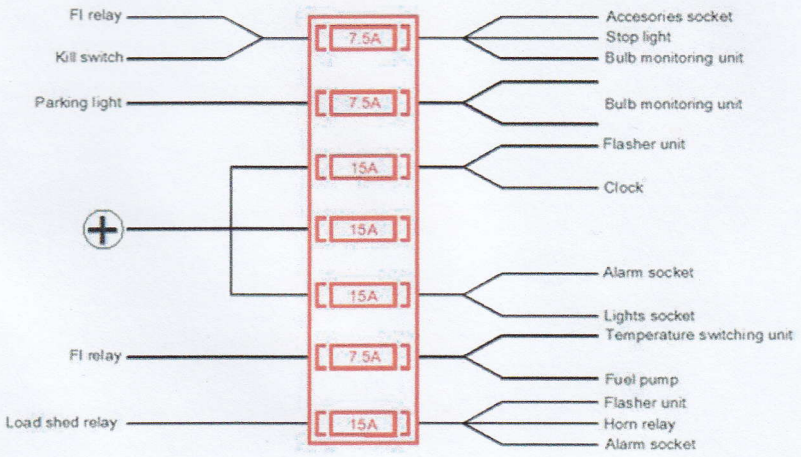
Most of the starting failures are related to a corroded ground connector!

First, here are a couple of schematics showing the location of the electrical components:

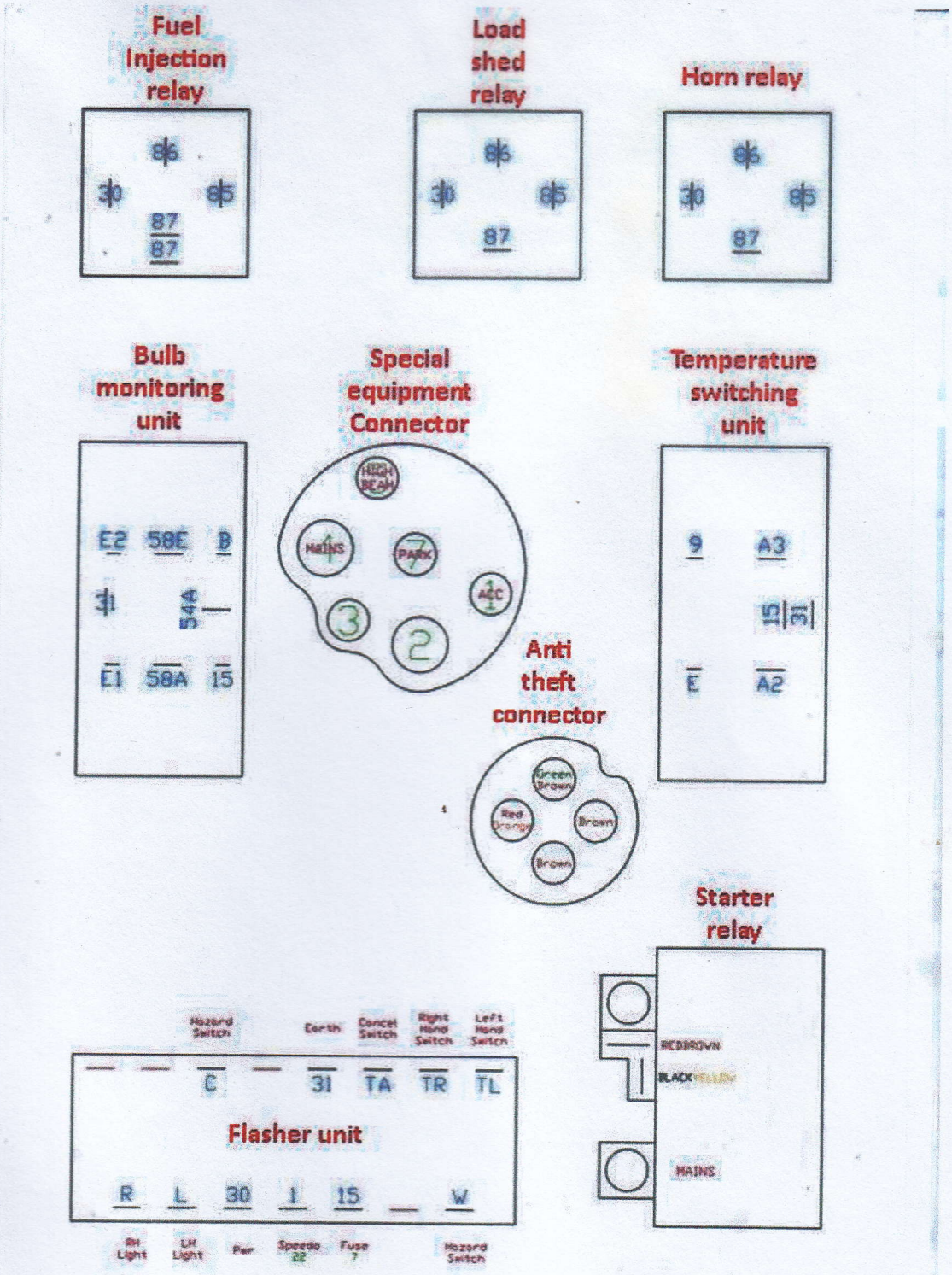
Under tank connectors and ground



Fuse box layout

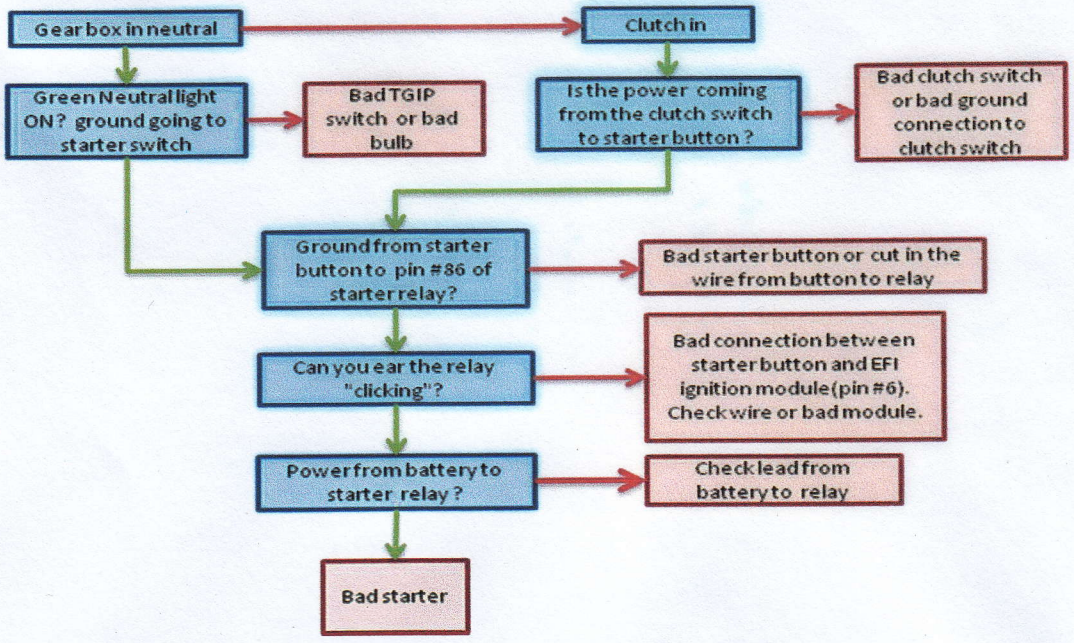


Layout of electrical components (in the tray under the tank).

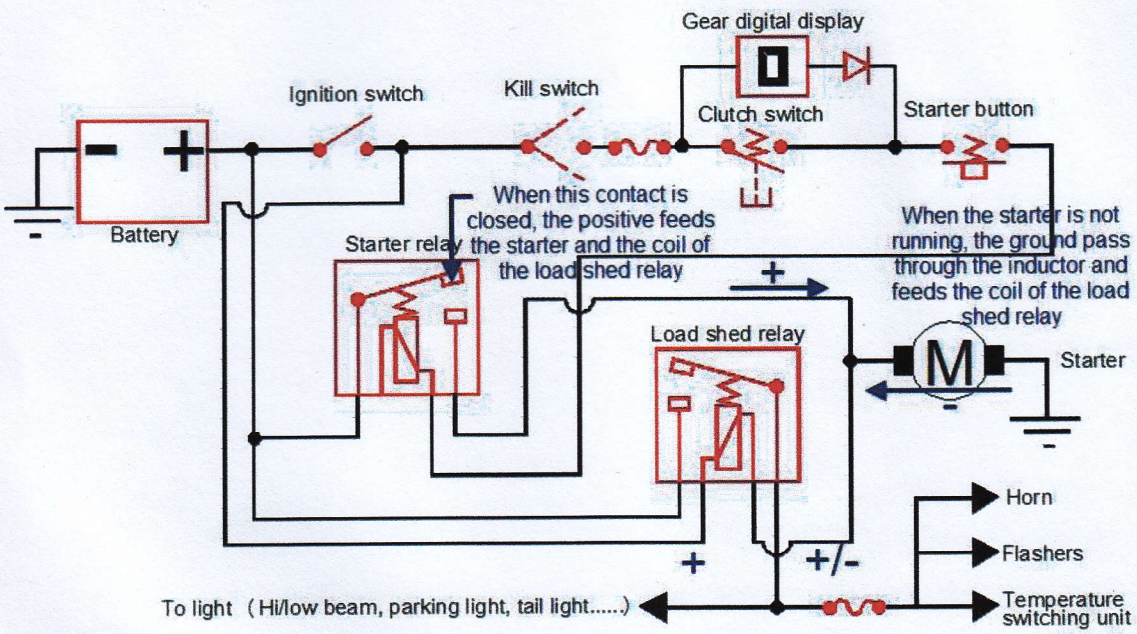


Now, let's start the troubleshooting.....

Is the starter turning?

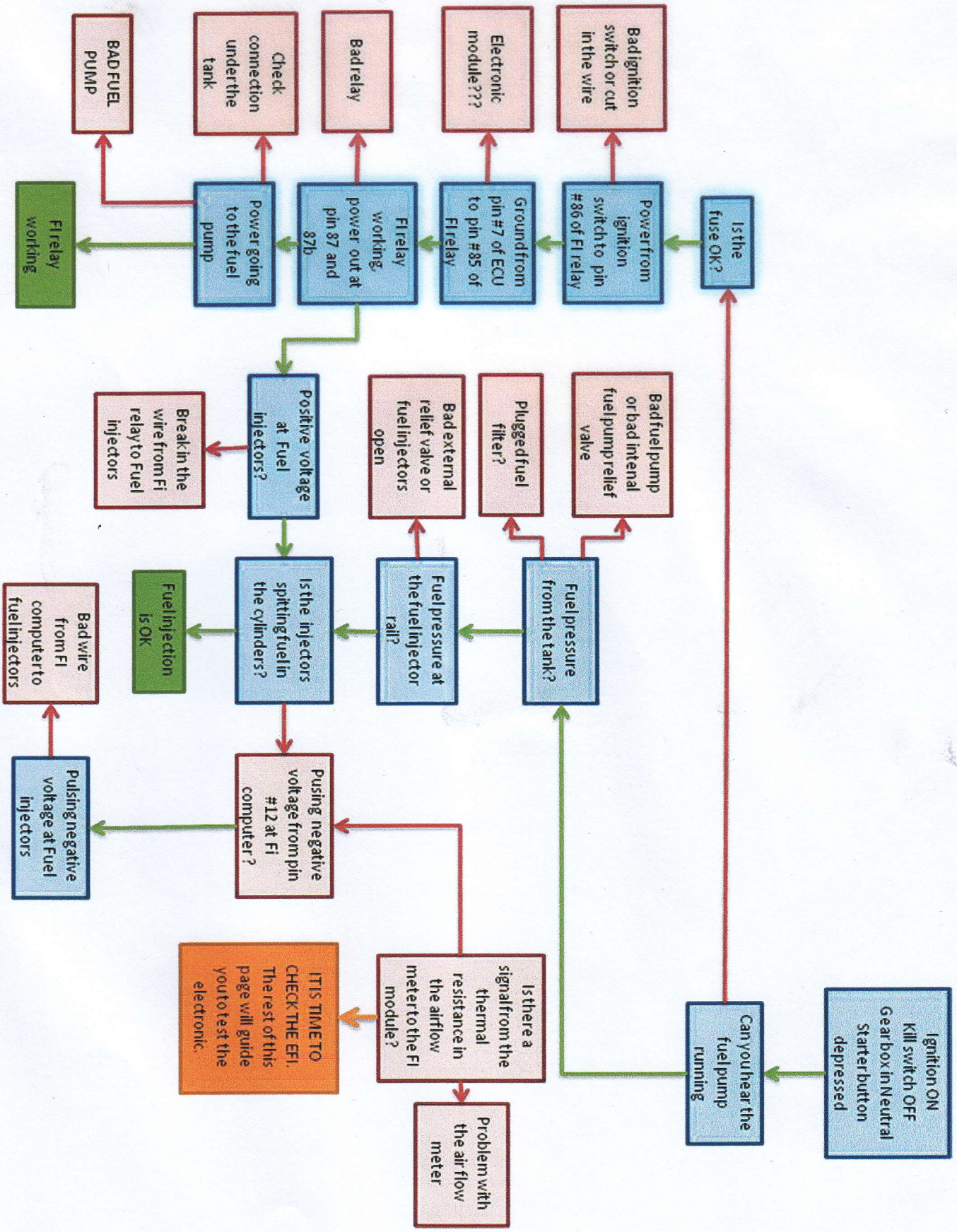


Here is a simplify schematic of the starter circuit



Bert (2009)

If the engine is cranking, continue with this chart.



You reached the orange box and the result of your investigation points to the EFI system.



How does it works?

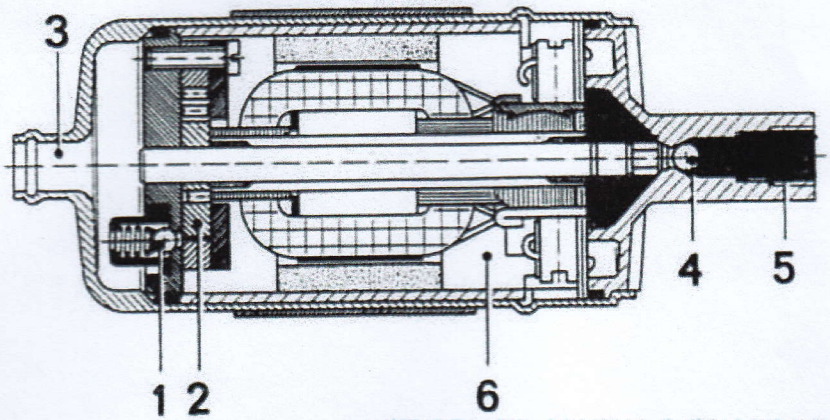


You may not be an electronic engineer, but after reading the remaining of this document you should have a pretty good knowledge of the system.

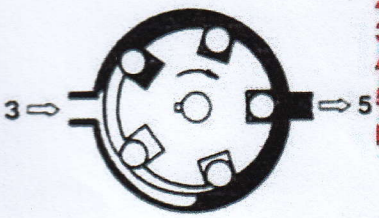
2 major factors influence the EFI computer: Air flow detected by the air flow meter and engine rpm detected by the HALL sensor.
Other data collected by the EFI computer are: Air temperature, Water temperature, Throttle switch position and Battery voltage.

Following is a listing of the basic components and functions of the EFI system:

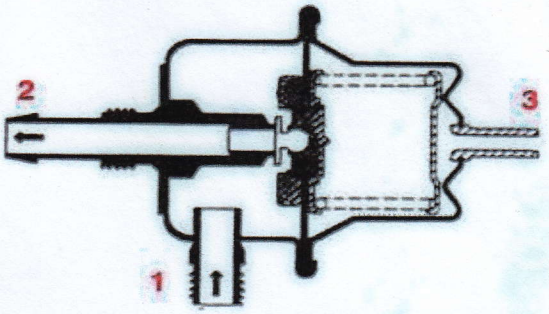
Fuel pump:



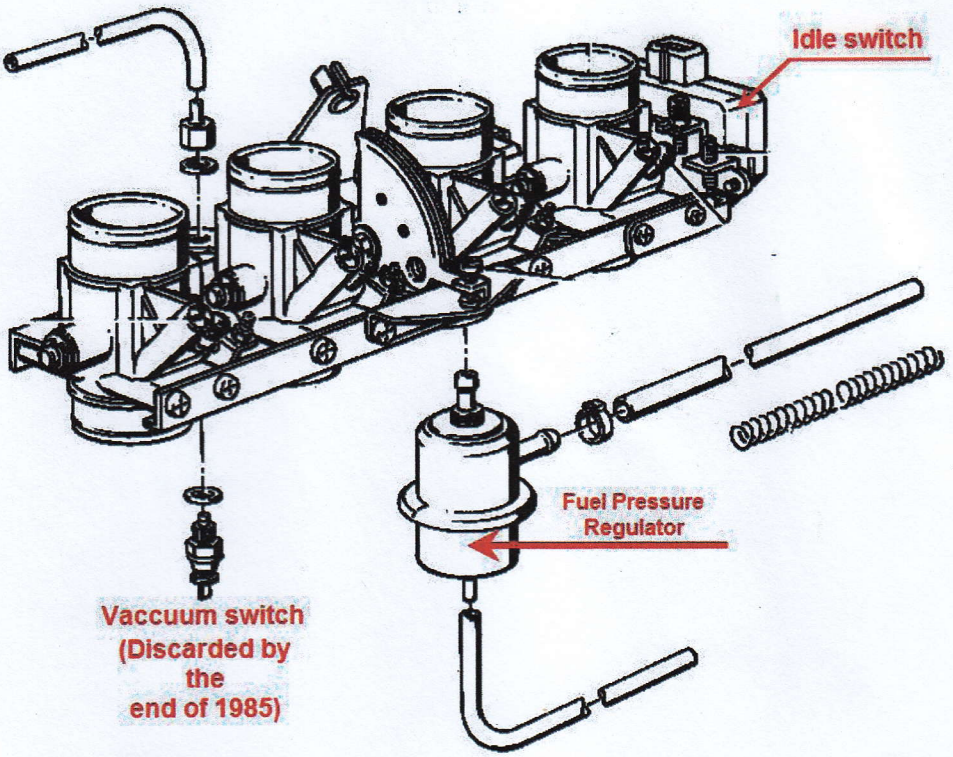
1 pressure relief valve (open at 4.5 bars ~ 65PSI)
2 pump chamber
3 intake
4 One way valve
5 output
pressure chamber (45 liters/hour)



Fuel pressure regulator:

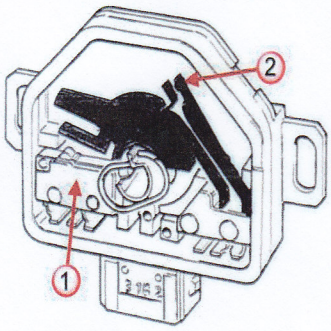


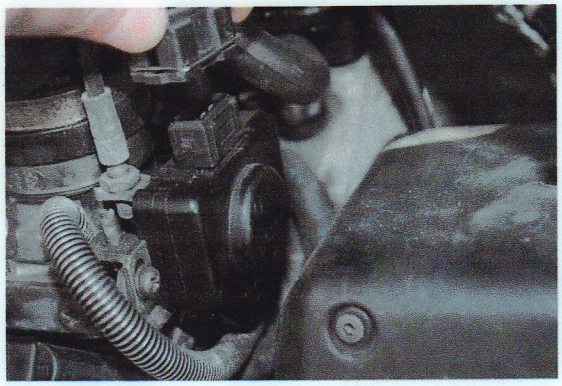
1) gas intake
2) return to tank
3) Depression from air intake



Fuel pressure is sent from the pump to the Fuel injector rail. The fuel pressure regulator will keep a constant pressure into the fuel injector rail. The fuel pressure regulator is located on the back of the fuel injection rail (not easy to access) and its depression is collected at the intake manifold for cylinder #4. The fuel pump is delivering 65 PSI of pressure, and the pressure regulator drops it to 36PSI.

Idle switch

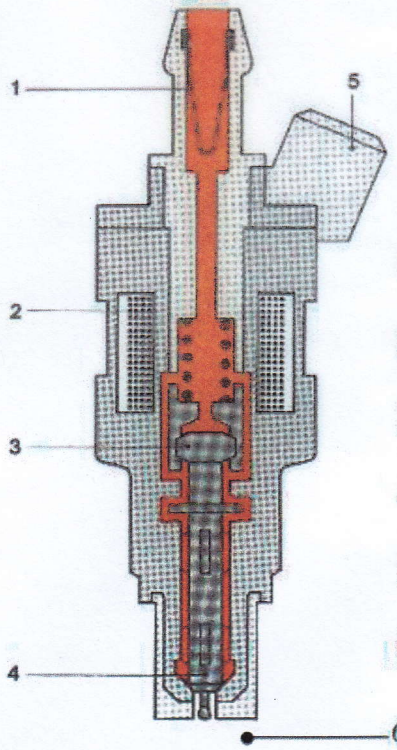




The idle switch (Also called butterfly switch or throttle switch) is located at the end of the fuel injector rail. It wills cut-off the fuel injector when releasing the throttle. **With this system, when decelerating (switch 1 close), the fuel injection is disabled until the rpm goes down to 2000rpm. If the engine is still decelerating and the rpm is lower than 2000, the EFI is re-enabled and the injection is controlled again by the FI computer. As an example, when riding at 5000rpm and cutting the throttle, the injection will be cut off between 5000 and 2000rpm. (This is one of the reason why the K100 really slow down when you shut down the throttle.)**
This switch assembly only signals idle or full throttle to the EFI. Mid throttle signal to the EFI was controlled by the vacuum switch. This switch has been removed in the late 1985)
A good indication of a bad setup is when the engine backfires when decelerating. When you twist the throttle, the same switch (contact # 2) will tell the EFI computer that the engine is on full load and the mixture air/fuel will be enriched

IF the bike doesn't start and you suspect the fuel injection, try to start the engine with this switch disconnected. A bad switch may send a wrong signal to the EFI computer. When this switch is disconnected, the EFI thinks that you are twisting the throttle.

Fuel injectors:



1 Screen mesh filter

2 Solenoid Winding

3 Solenoid Armature

4 Needle Valve

5 Electrical Connection

6 Valve Seat

The 4 injectors all open and close at the same time when commanded to do so by the ECU. It's important to understand that the injectors do not really spray fuel, they are just valves that open and close. They are needle valves that plug a small hole when closed. They are opened by a tiny electromagnet in each injector that pulls the needle away from its hole enabling fuel to pass into the intake system. When they are open fuel sprays in as a result of fuel pressure, so **it's really the pump and fuel pressure regulator that control how much fuel sprays in for a given amount of time when injectors are open**. The ECU regulates how much fuel is sprayed in by controlling the time the injectors are open. The ECU assumes the fuel pump and regulator supply the correct fuel pressure. If the fuel pressure is incorrect, it will affect the ECU's calculations. An injector can go bad in a number of ways. They can have external leaks, internal leaks, fail to open, or fail to close or be clogged with combustion debris. Symptoms of a bad injector or injectors can include difficult or impossible cold or warm starting, irregular idle, lack of power, poor fuel economy, missing, high emissions and external fuel leakage.

It's important to check the injector internal electrical coil. Remove the injector's electrical connector and check the resistance between the injector coil's terminals. It should be 16 Ω. If the coil is bad, you will have to buy a new injector because there is no way to replace the coil.

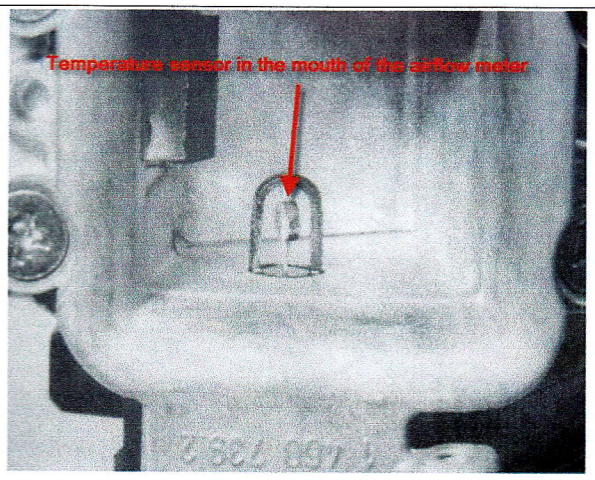
If your injector is leaking internally or failing to close fully the bike might run OK depending on just how bad the problem is. The way to check for this problem is simple. When you change spark plugs inspect them. If one or two are a lot blacker then the others you probably have a leaking injector on those cylinders. If the leak is bad or the injector never closes, the bike will run poorly at low RPM but improve at high RPM when the engine is sucking in enough air to burn the fuel.

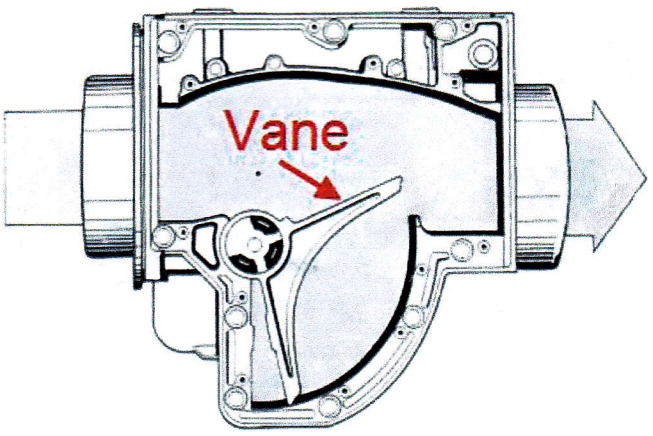
The most common injector problem and the most difficult to detect is the partially clogged or "dirty" injector. Unfortunately there is no practical way to check for this problem without pulling out the injectors so we need to use the process of elimination. If you have checked everything else out and your bike still has some running problem then it's probably one or more dirty injectors. Putting injector cleaner in the fuel tank will not clean the injectors. To clean them they need to be pulled out and sent to an injection shop. Most injection shops have a service that will include ultrasonic cleaning, new tips and intake screens for about $25-$35 dollars for each injector.

THERE IS NO SUCH THING AS A REBUILT LE-JETRONIC INJECTOR! . That's it! The life limiting component is the internal O ring and it can't be replaced.

Air flow meter:

When the engine revs under 900rpm, the EFI computer doesn't take into account all the data collected by the air flow meter. It collects only the air temperature and adjusts the fuel injection accordingly. (The air temperature sensor is a small thermi-resistor located in the mouth of the airflow meter).





Air traverses the air filter and goes to the air flow sensor. When you open the throttle, the depression is moving the internal vane of the air flow meter and a bigger amount of air is sucked in by the engine. The movement of the vanes will turn a variable resistance. This variable resistance will tell the EFI computer how much gas it has to send to the injectors to balance the mixture air/fuel.

The volume of air drawn in by the engine reflects the condition of the load. The precise measurement of this parameter is essential to determine the exact volume of fuel to inject.

The sensor plate adopts an angular position in relation to the force applied to it by the air drawn in by the engine
Positioned in the damper chamber, the compensator flap (with the same effective area as the sensor plate) reduces pulsations due to any back pressure in the inlet manifold.

A temperature sensor is connected in parallel in the air flow sensor electrical circuit. This is a thermi-resistor and its resistance reduces as the temperature rises. It modifies the output signal from the air flow sensor in relation to the intake air temperature. Some air, not taken into account by the sensor plate, pass through the by-pass. By altering the section of the by-pass, the idling mixture can be altered.

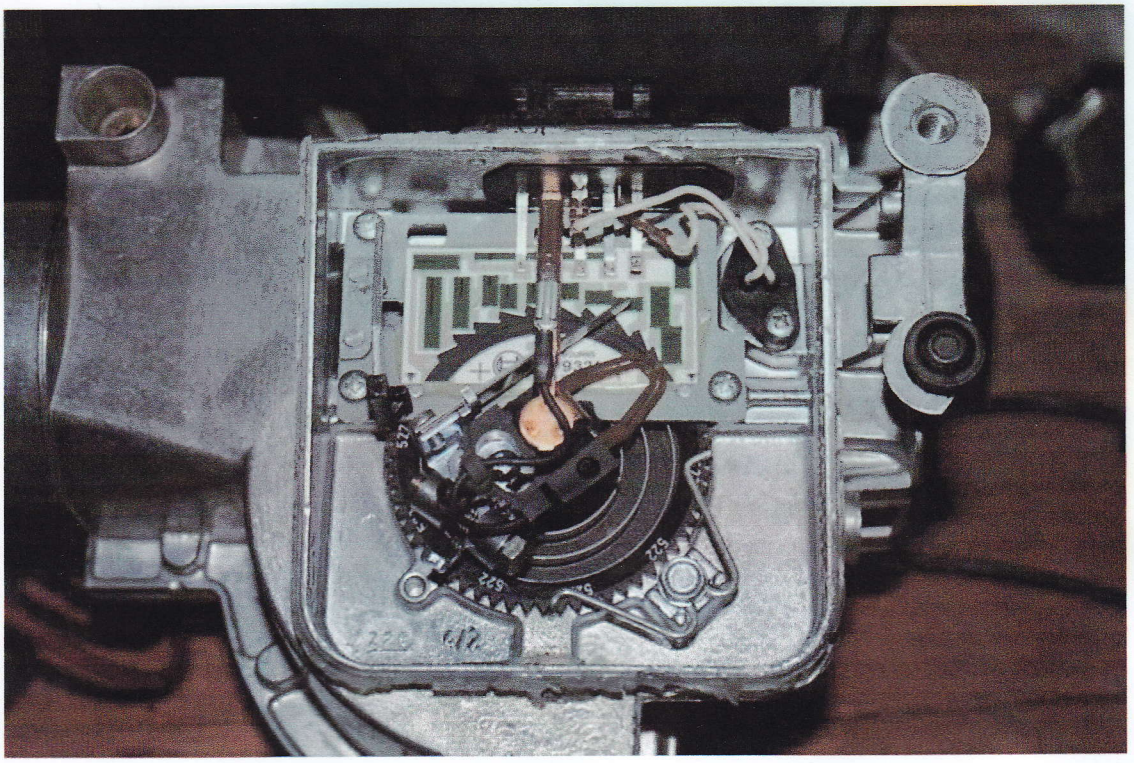
The potentiometer, directly attached to the sensor plate, transmits to the electronic control unit the voltage corresponding to the angular position of the sensor plate. It is assembled in dry conditions in a sealed casing. The potentiometer consists of ceramic plate supporting a contact strip and several resistors whose values have been adjusted by laser beam. These resistors have the special quality of not varying with the sharp changes of temperature which occur in the engine compartment. A cursor directly attached to the sensor plate makes contact with the contact strip.

The battery voltage doesn't influence the signal from the potentiometer, it is the relationship between the potentiometer signal and the battery voltage which is taken into account by the electronic control unit.

The intake air temperature, measured by the temperature sensor, has a direct effect on the voltage of the potentiometer signal.

Here is what you will find when opening an airflow meter. This one is defective and the problem comes from pin #5
(The connection with the board is broken and doesn't make contact with the circuit.)

This airflow meter is factory sealed. If you don't experience problems avoid breaking the seal on the cover. Dirt on the circuit board will affect the value of the resistance.

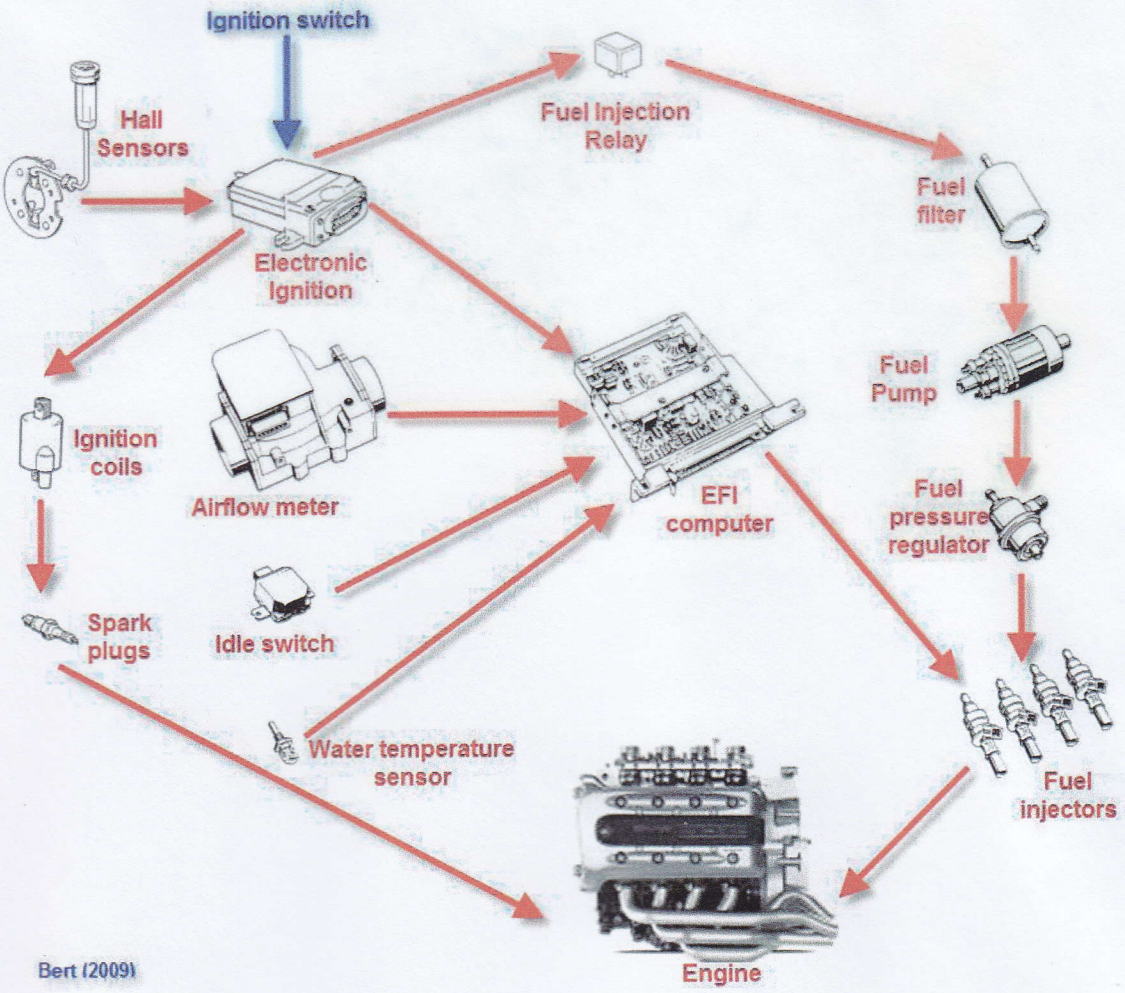


The EFI computer is pre-programmed to get maximum optimization during startup. As long as the starter switch is depressed, the EFI computer will enrich the mixture air/fuel.

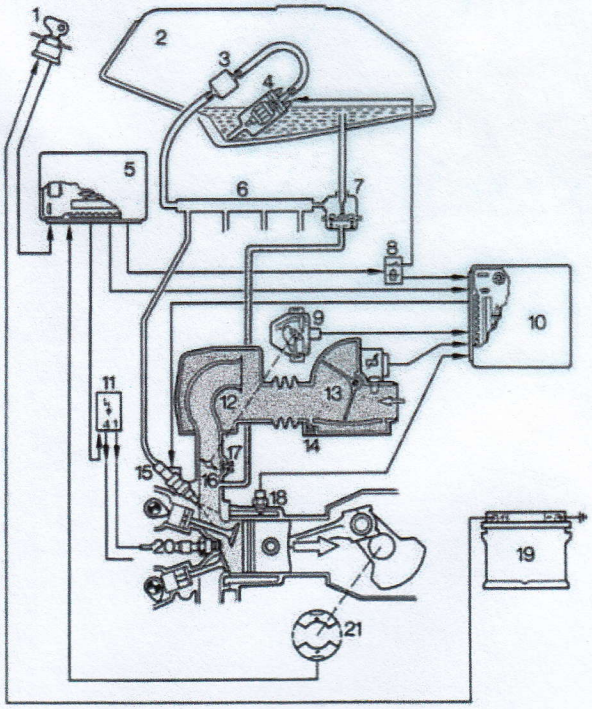
When the engine reaches 900rpm, the air vane position is fed to the EFI computer.

Now, let's get practical....

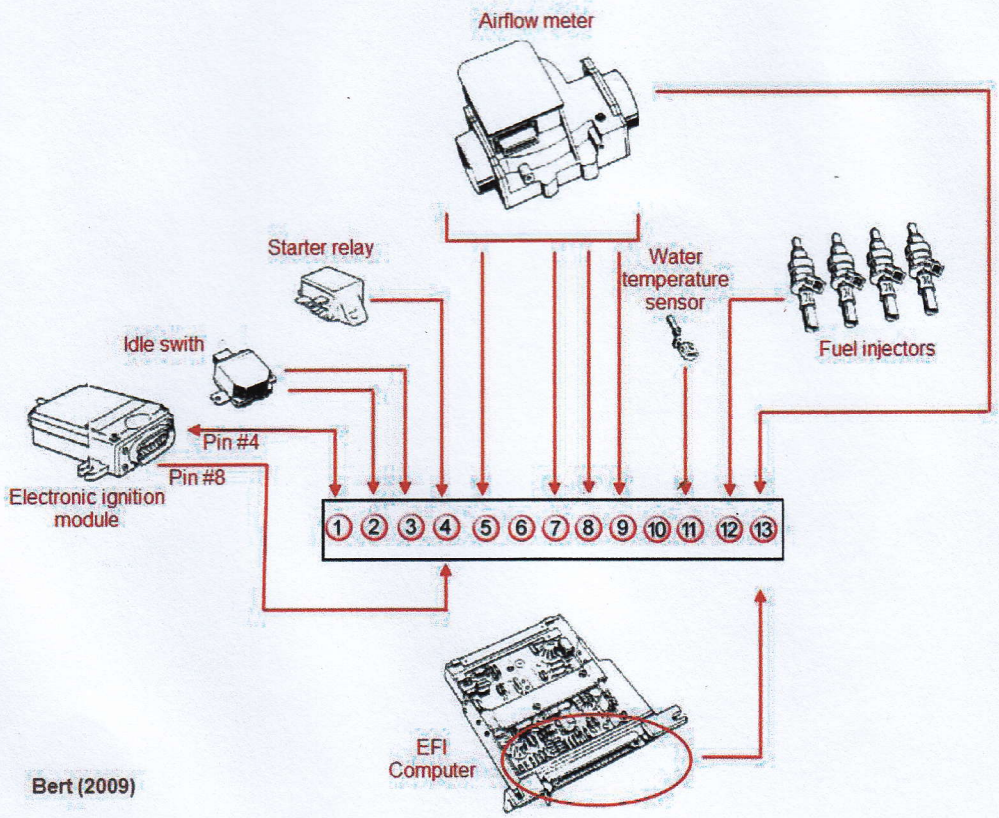
EFI and Electronic ignition components:



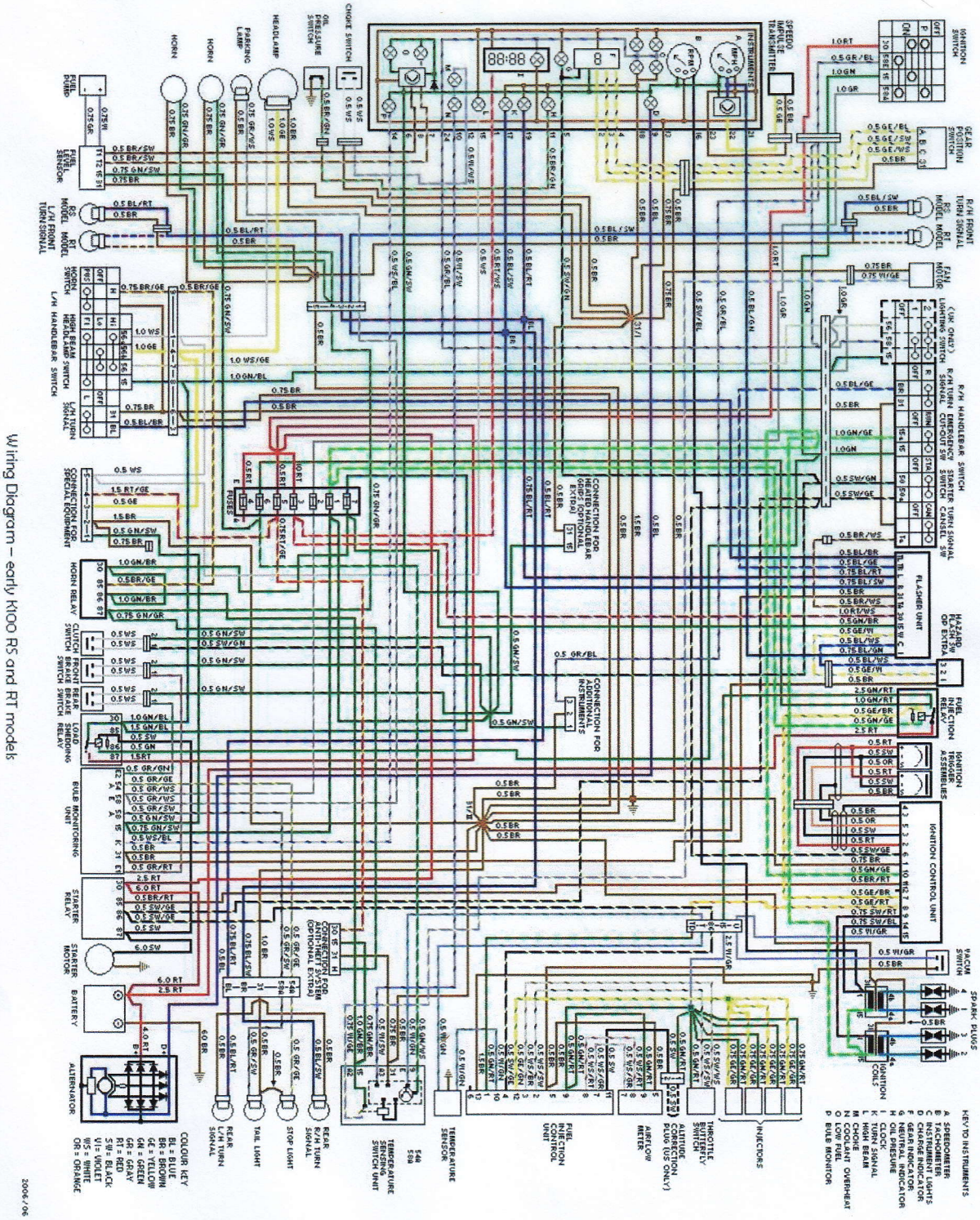
The following graphic shows the different components and their connection to the EFI computer.



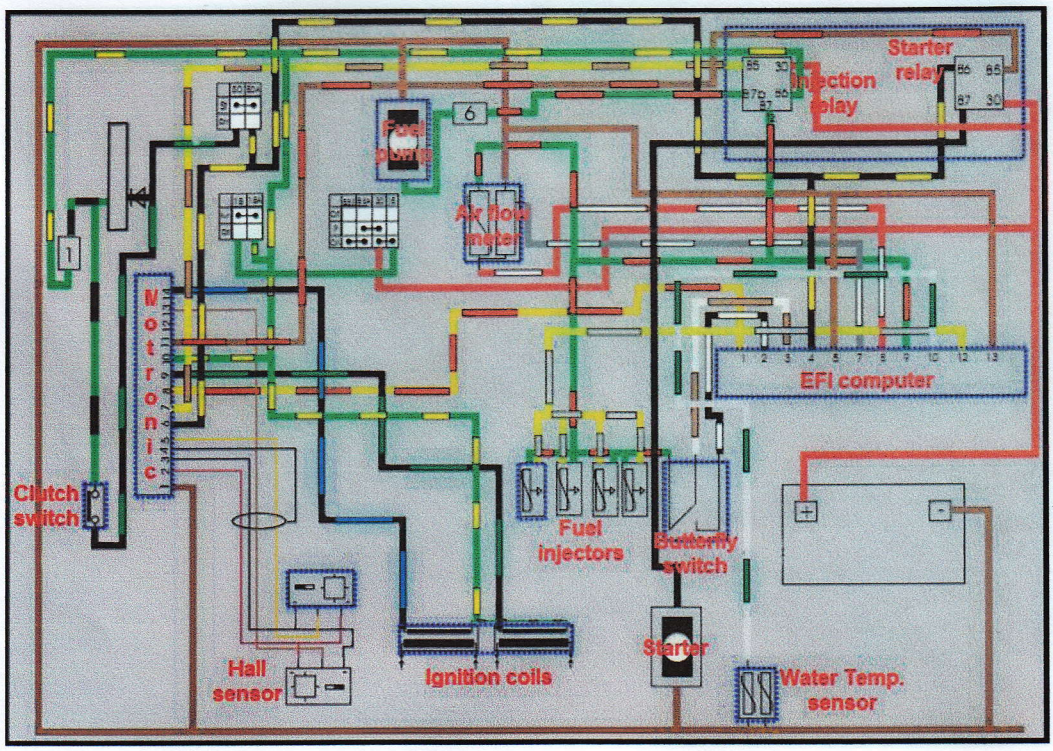
1 Ignition switch
2 Gas tank
3 Gas filter
4 Gas pump
5 Ignition module
6 Fuel injector ramp
7 Fuel pressure regulator
8 Fuel injector relay
9 Throttle switch
10 Fuel injection module
11 Ignition coils
12 Air manifold
13 Air flow meter
14 Idle air setting
15 Injectors
16 Throttle
17 Idle speed setting
18 Water temperature sensor
19 Battery
20 Spark plug
21 Hall effect sensor



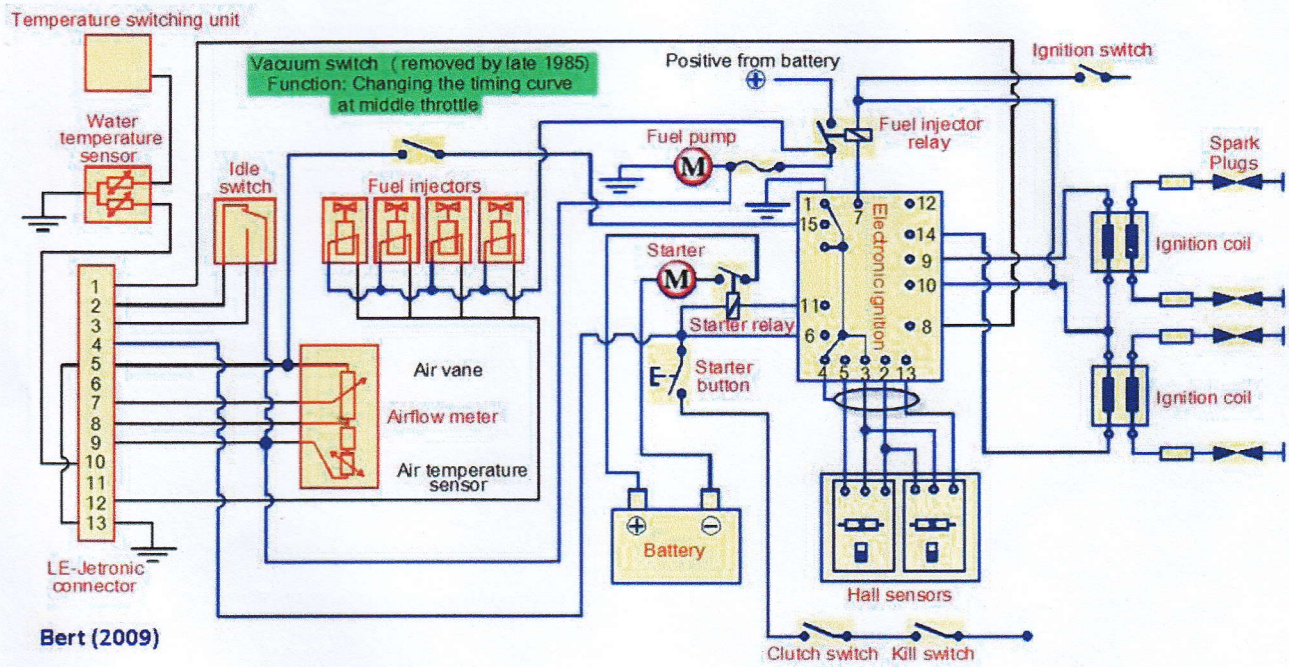
You can try to follow the full wiring diagram, but this is very confusing.



To help you, I have detailed the wiring related to the EFI / Electronic ignition:



Or if you prefer, this simplified schematic of the wiring:



Quick explanation of the principle:

What's happening when you press the starter switch:

The starter relay and Fuel Injection relay close, Hall sensors get power.
The FI relay energizes (+) the fuel pump, the idle switch, the injectors and the air flow meter.
The LE-Jetronic receives (pin #4) the signal that the engine is starting and it sets itself on starting mode (enriching the air/fuel mixture)
Electronic ignition module pin # 9-10-14 send power to the ignition coil
Electronic ignition module pin #8 send engine rpm info to pin #1 of FI computer
Electronic ignition module pin #7 sends ground to the coil of the FI relay as soon as the starter switch is depressed. The ground will stay on after the starter switch is released as long as the Electronic ignition module receives a signal from the Hall sensors.
Note: Under 1300rpm, the timing is set to 6°. Then, the Electronic ignition module will modify the timing according to the engine rpm.
At 8777rpm, the timing is reset back to 6°.
At 8905 rpm, the fuel injection is shutdown by cutting the signal from pin #8 (Electronic ignition module) to pin #1 (LE-Jetronic) and will resume when the rpm come back down to this value (This is to avoid over running the engine).
When engine runs over 710rpm, the Electronic ignition module shuts off the ground to the coil of the starter relay (pin #11). (This is a higher rpm than what the starter is capable. and at this point the Electronic ignition module assumes that the engine is running).
If the engine stalls (no more signal from the Hall sensor), the Electronic ignition module will shut off the ground to the FI relay and to the coils. (This is to protect the output transistors and coils).

This is time to get your multimer (Ohm meter / Volt meter) and start to collect values from the system.

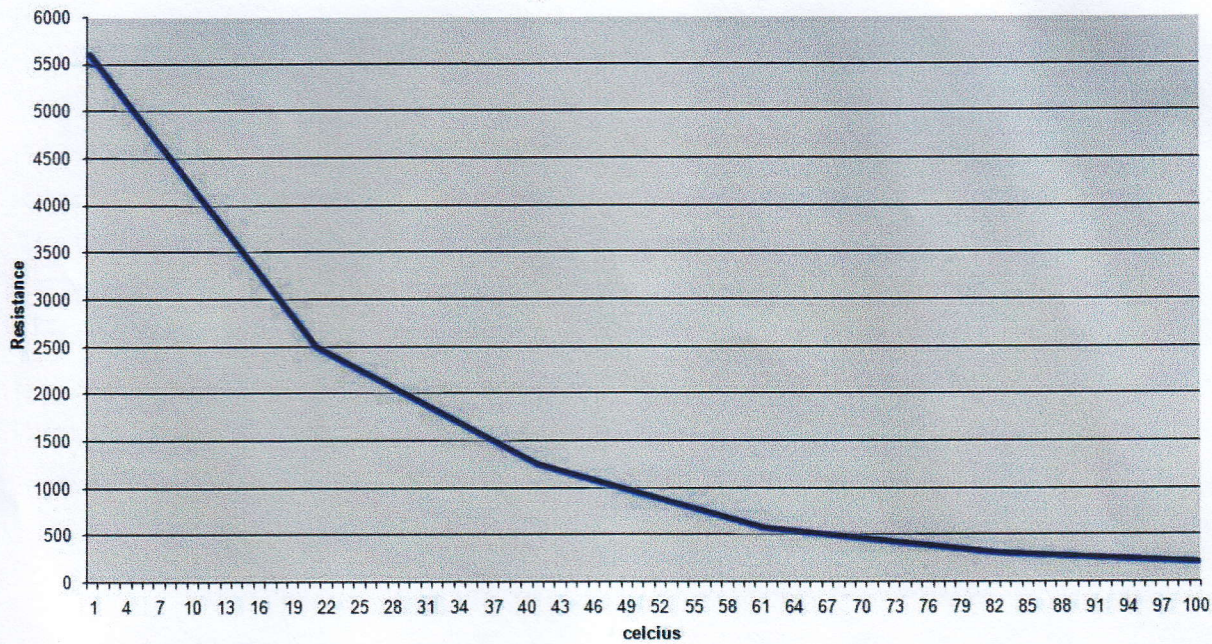
Water temperature sensor:

The bike will not start if the water temperature is above the normal range of operation. A bad temperature sensor will send the wrong signal to the EFI.

The water temperature sensor contains 2 resistors: 1 feeding the EFI and one feeding the temperature switching unit. One resistor may be defective when the other one may be OK. If only the one feeding the EFI is bad, you won't see the temperature light glowing. If the water temperature light stays on, and the engine doesn't start, this is a good indication of a bad temperature sensor.

If you suspect a problem with your water temperature sensor, here is what you should read when testing it. Take a pot of water, immerse a thermometer. Plug your ohmmeter to the sensor and have the tip of the sensor immersed in the water. Let the water slowly warm up and get the value for every increase of 10° Celsius. The following graphic shows you the expected values.

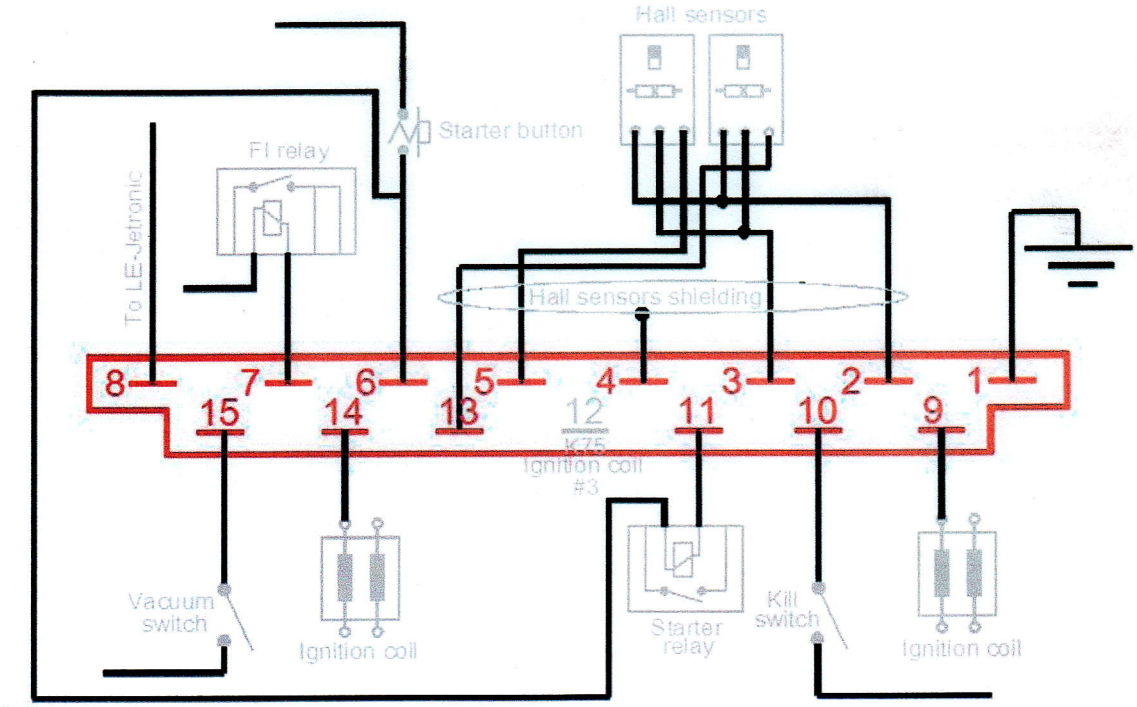
Water temperature sensor values



Because the Electronic ignition module send data to the LE-Jetronic (EFI), it may be necessary to test both units.

The following testing show the results expected at the connector of both computers. **These testing are done at the female connectors and NOT at the computers pins.**

Electronic ignition module (female connector):



Bert (2009)

Electronic ignition module test:

Pin #	Function	Testing mode	type	Expected value
1	Direct ground	continuity with ground at the battery	Ω	.5 max.
2	power to Hall sensors	control with ignition ON	Volts	12v
3	Ground to Hall sensors	continuity with ground at the battery	Ω	0
4	Shielding of Hall sensors wires	continuity with ground at the battery	Ω	0
5-13	signal from Hall sensors	Cannot check with voltmeter/Ohmmeter (see below)		
6	Signal from starter switch	When starter is running	Volts	12
7	Ground to FI relay	Engine not running ignition ON	Volts	12
7	Ground to FI relay	When starter is running	Volts	0 to 1
8	Signal Engine RPM	When starter is running	Volts ~	10 to 20 mV
8	Signal Engine RPM	When engine is running	Volts ~	3 to 4 v
9-10-14	Ground to primary of ignition coils	When starter is running	Volts ~	1.5 to 4v
10	+12v of Electronic ignition module	Ignition ON	Volts	12v
11	Control ground to starter relay	When starter is running	Volts	0 to 1
11	Control ground to starter relay	Engine running, starter switch depressed, engine rpm < 710	Volts	12

Hall sensors:

ELECTRICAL CHARACTERISTICS ⚠			
	TYP 25°C	CURRENT SINK MAX	CURRENT SINK REMARKS
SUPPLY CURRENT	10 mA	22 mA	PLUS LOAD CURRENT
OUTPUT VOLTAGE (OPERATED) (ON)	0.2 VOLTS	0.4 VOLTS	20 mA MAX LOAD
OUTPUT LEAKAGE CURRENT (RELEASED) (OFF) ⚠2	0.2μA	10μA	OUTPUT TRANSISTOR LEAKAGE
OUTPUT SWITCHING TIME ⚠1			40 mA LOAD
RISE TIME (REL. POINT)	6.2μS	12μS	10% TO 90%
FALL TIME (OPER. POINT)	0.2μS	1μS	90% TO 10%

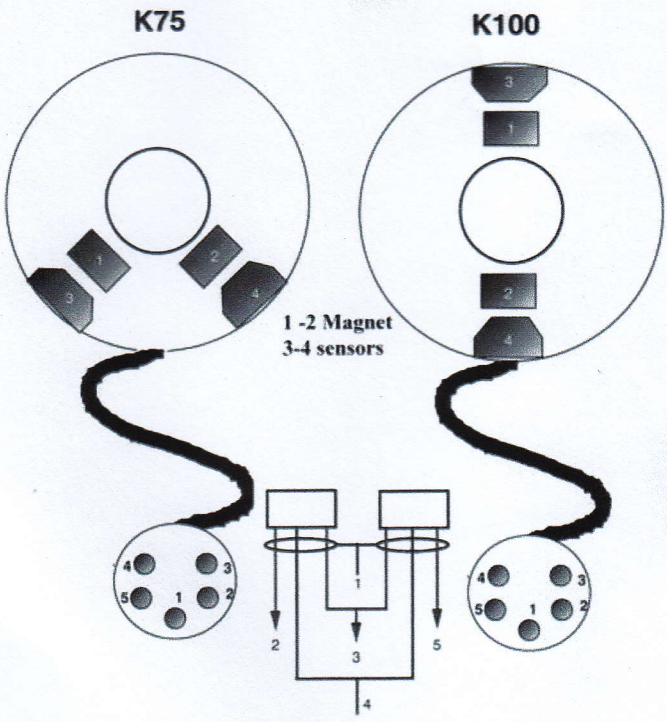
ABSOLUTE MAXIMUM RATINGS ⚠4	
SUPPLY VOLTAGE (Vs)	-40 TO +30
VOLTAGE EXTERNALLY APPLIED TO OUTPUT	+40 VDC MAX WITH SWITCH IN "OFF" CONDITION ONLY -0.8 VDC MIN WITH SWITCH IN "ON" OR "OFF" CONDITION
LOAD ON OUTPUT	40 mA 5 MIN. MAX
TEMPERATURE	-40°C TO +160°C 2 HR MAX
TRANSIENT SUPPLY VOLTAGE	+80V FOR 250 mSEC MAX
TRANSIENT SUPPLY CURRENT	-.5 A TO + .5 A FOR 15μ SEC MAX
TRANSIENT OUTPUT CURRENT	-.5 A TO + .5 A FOR 15μ SEC MAX

The Hall sensors are known to fail when hot. They are rated to operate at a temperature between -40 to +160 degrees Celsius. If the bike has a problem only when hot, warm up the sensors with a hair dryer and test them at different temperatures.

WARNING: On the next test, never substitute the LED for a bulb.

The excess current drained by a bulb would burn the sensor
As noted on the specs sheet, the maximum load is 40 mA
The 12v LED could be substituted by a regular 3v but a 470Ω resistor would have to be installed in series with the the LED

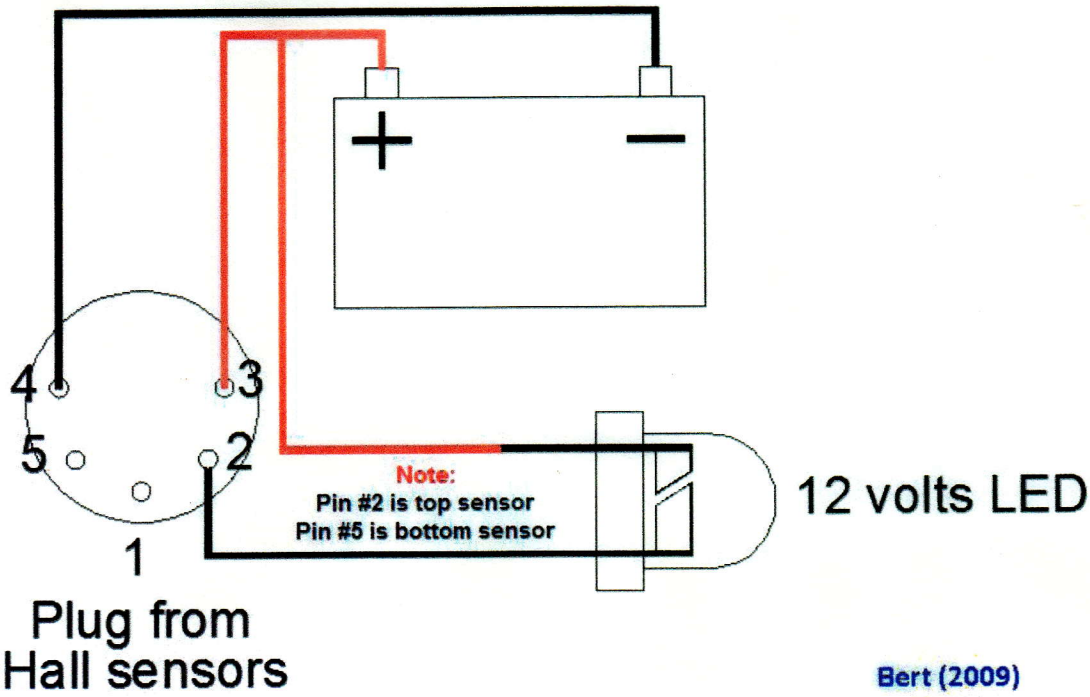
Layout of the Hall sensors:



K100
1 Shield
2-5 (green) output
3 Red: +
4 Black: -

K75
1 Shield
2-5 (green) output
3 Red: +
4 Black: -

Here is how to test the sensors.



Any good sensor should light the LED until something metallic, like a feeler gauge, is introduced in to the sensors gap, the LED will then go out.

Any sensor that doesn't light the LED or doesn't go out when the sensor gap is obstructed is defective.

R bikes and K bikes share the same sensors. (HONEYWELL S&C - 2AV54)
The sensors can be purchased for only $15.00. Just type 2AV54 in Google.

Ignition coils, ignition wires and spark plugs:

First, let's get a little bit of boring theory about coils....

An ignition coil is essentially an autotransformer with a high ratio of secondary to primary windings. The primary and secondary windings are not actually separated - they share a few of the windings.

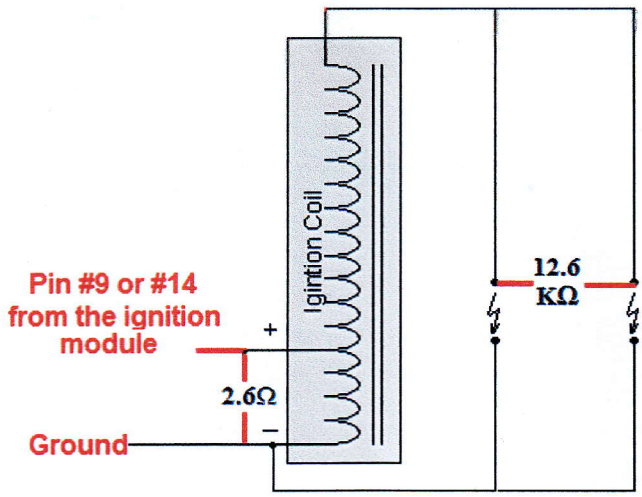
The ratio of secondary to primary turns in an ignition coil is somewhere around 100:1. The ignition coil is operated directly off a 12 volt source. However, the ignition coil does not work like an ordinary transformer. An ordinary transformer will produce output current at the same time that input current is applied. An ignition coil actually does most of its work acting as an inductor. When the ignition coil is connected to the battery, the inductor is 'charged' with current. It takes a few milliseconds for the current to build up the magnetic field - this on account of reverse voltage caused by the increase in magnetic field. During this short charging period, maybe a thousand

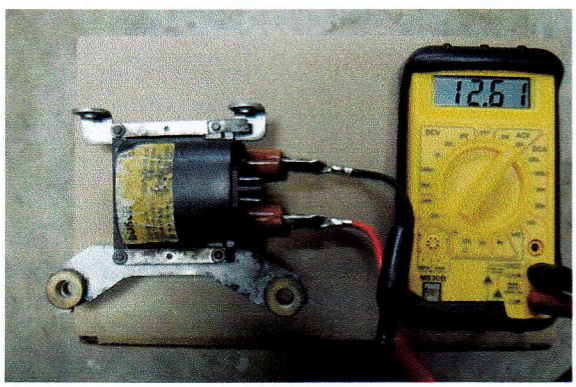
volts are produced at the high voltage terminal, not enough to actually cause a spark.

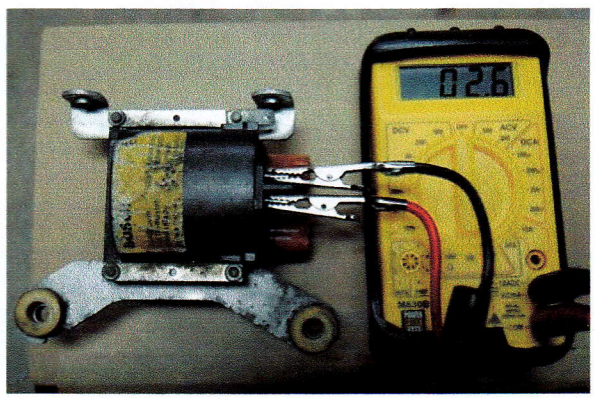
The actual spark is generated when the breaker contacts **open**.

Much smaller coils are used and in the case of the K100. One coil is servicing two spark plugs (These coils put off about 20kv). It is called a wasted spark system. In this arrangement the coil generates two sparks per cycle to both cylinders. The fuel in the cylinder that is nearing the end of its compression stroke is ignited, whereas the spark in its companion that is nearing the end of its exhaust stroke has no effect. The wasted spark system is more reliable than a single coil system with a distributor. Coils contained in a single moulded block with multiple high-tension terminals are commonly called a coil-pack.

On a K100 coil, the resistance measured between the 2 high voltage terminals is about 12.6KΩ and the primary coil should measure about 2.6 Ω.







What could go wrong with a coil?
You may find a cut in the winding, burnt insulation, crack in the casing or corroded connections. Your best friend is the Ohmmeter and a visual inspection at night to locate a crack. A spark will travel along the crack and will be visible in the dark.

Spark plugs and ignition wires:

I have read on other forums people finding after market ignition wires and caps. This could be a big money saver, but it can also be a source of concern if you don't pay attention to the following points:

The K100 is originally fitted with Bosch X5DC (or can be fitted with the NGK D7EA). Both are non resistor spark plugs and here is the reason:
The original BMW spark plug cap already integrates a resistance of 5KΩ. Similarly, the connector at the other end of the original ignition cable also includes a resistance of 1KΩ (The total resistance is 6KΩ).

If you replace the wires with after market non resistor wires and caps and keep the original spark plugs, you will run into troubles and take a chance to damage the output transistors of the ignition module (resistance of the wire/spark plug will be close to 0).

It is possible to fit a K100 with after market plugs and wires, but the spark plugs have to be replaced with a resistive type (Bosch XR5DC or NGK DR7EA). These spark plugs have a built in 5kΩ resistor.

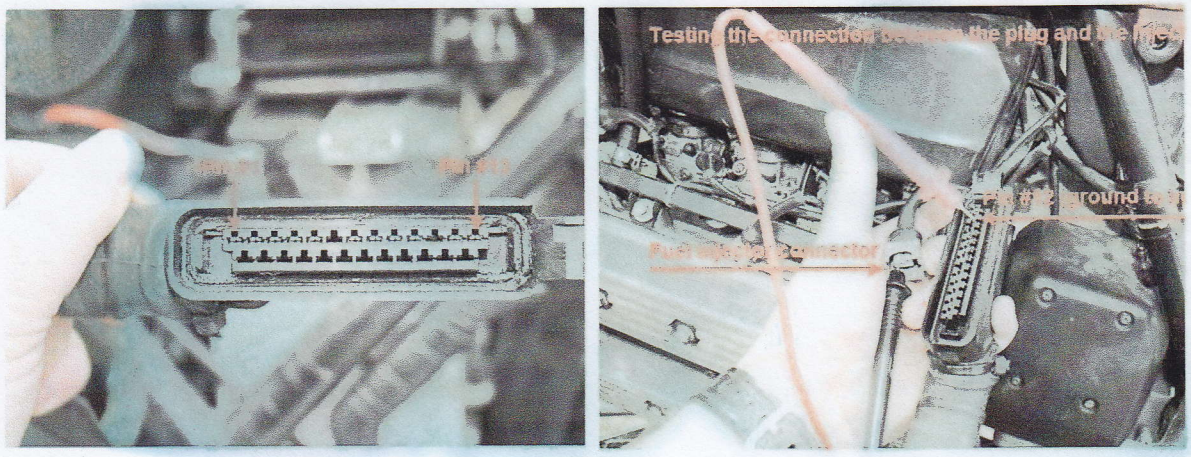
The X(R)5DC has a thermal index of 5 the **D(R)7EA** has a thermal index of 7.Even if the thermal index is different, both are suited to be installed on a K100 engine....
Why is the Bosch having a thermal index of 5 and NGK has a 7?
Each manufacturer uses its own designation for the heat range:
On the Bosch plugs the higher the number (from 4 to 8) the hotter is the plug. NGK works on the opposite and goes from 8 to 4 (a lower number indicates a hotter plug)

The term spark plug heat range refers to the speed with which the plug can transfer heat from the combustion chamber to the engine head. It has been found the optimum combustion chamber temperature for gasoline engines is between 500°C–850°C. When it is within that range it is cool enough to avoid pre-ignition and plug tip overheating (which can cause engine damage), while still hot enough to burn off combustion deposits which cause fouling.

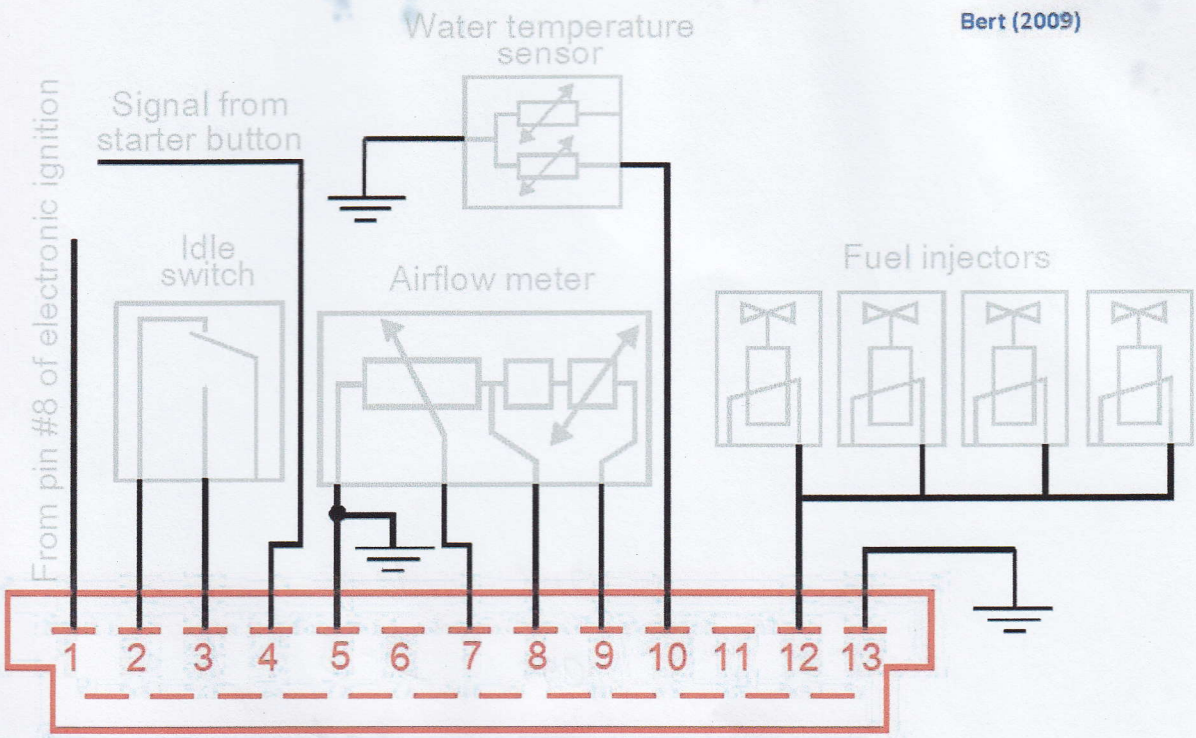
The spark plug can help maintain the optimum combustion chamber temperature. The primary method used to do this is by altering the internal length of the core nose, in addition, the alloy compositions in the electrodes can be changed. This means you may not be able to visually tell a difference between heat ranges. When a spark plug is referred to as a "cold plug", it is one that transfers heat rapidly from the firing tip into the engine head, which keeps the firing tip cooler. A "hot plug" has a much slower rate of heat transfer, which keeps the firing tip hotter.

Electronic Fuel Injection .

Here is a picture of the Electronic Fuel injection module female connector where the testing has to be done:



Electronic Fuel Injection module (female connector)



LE-Jetronic (EFI) test:

1	info on engine rpm	When starter is running	Volts ~	10 to 20mv
2	Idle switch (idle)	Ignition ON, FI relay ON, throttle OFF	Volts --	12v
3	Idle switch (full throttle)	Ignition ON, FI relay ON, throttle full	Volts --	12v
4	starter running	Starter switch depressed	Volts --	12v
5	Ground air flow meter		Ω	0Ω
7	Info on air flow meter	between pin#7 and pin #5	Ω	
7	Info on air flow meter	between pin#7 and pin #8	Ω	
8	Info on air temperature	between pin#8 and pin#9	Ω	
9	Power (+) to computer, air flow meter and injectors	When starter is running	Volts --	12
10	Water temperature	Between pin #10 and ground	Ω	2.5KΩ @20°C 300Ω @ 80°C
12	Ground to injectors	Between pin #12 and pin #9	Ω	1 injector 16Ω
			Ω	2 injectors 8Ω
			Ω	3 injectors 5.33Ω
			Ω	4 injectors 4Ω
13	Ground	Between ground of battery and pin 13	Ω	0Ω

Testing the airflow meter:

Test can be done directly at the airflow meter. (Pin # 5-7-8-9)

If you are checking the airflow meter at the injection computer plug, **it must be done with the fuel tank electrics unplugged**. Otherwise pin 9 is earthed via the fuel pump and all the readings between pins 5-7-8-9 are wrong.

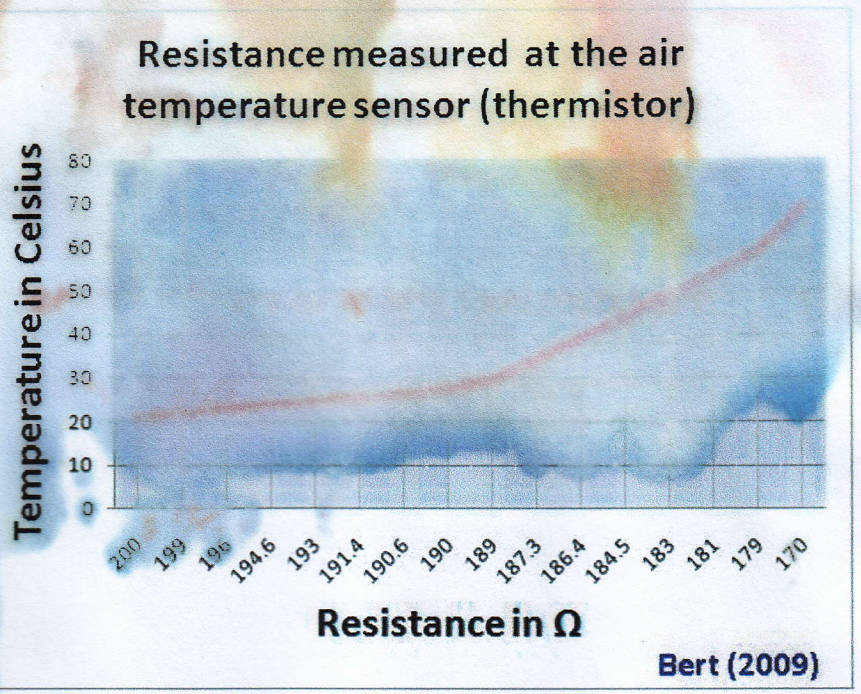
The airflow meter can be tested by applying 12v between pins 5 and 8 and measuring the voltage across pin 5 and 7 while moving the vane. The reading moves smoothly between about 2v and 12v.

The following resistance value reflects test from 3 people on 5 different units.

Pin 7-5	Pin 7-8	Pin 8-5	Pin 8-9	Status
Vane closed(value changes with vane position)	Vane closed(value changes with vane position)	Constant (not affected by vane position)	air temperature	
152	403	361	207	Have problem starting the bike with this unit
82	334	363	207	OK
93	358	360	202	OK
76.6	334	360	205	OK
66	161	33	132	Bike doesn't start

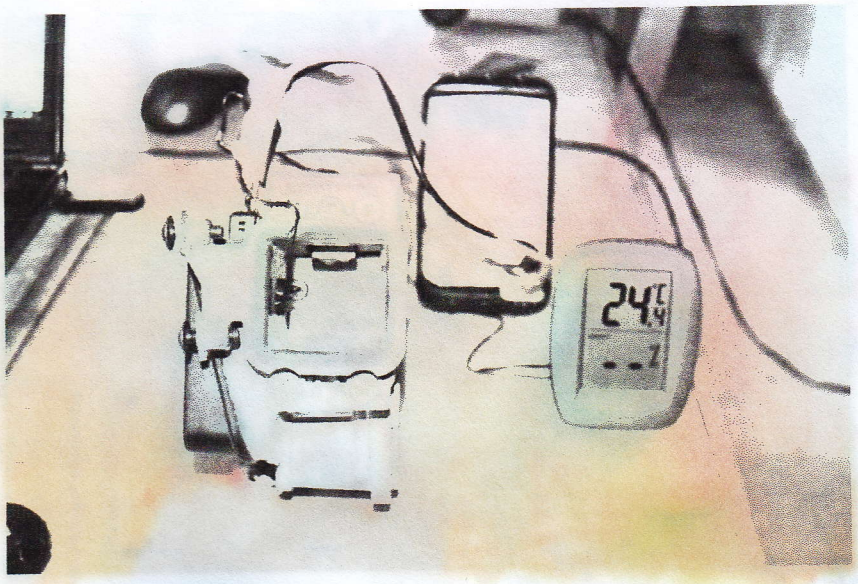
You will notice that the resistance decreases when the temperature rises. The value of the resistance is decreasing by a very small value (1Ω to 2Ω) for each difference of 1 degree.

Resistance	Temperature
203	20
200	21
199	22
196	23
194.6	24
193	25
191.4	26
190.6	27
190	28
189	30
187.3	35
186.4	40
184.5	45
183	50
181	55
179	60
170	70



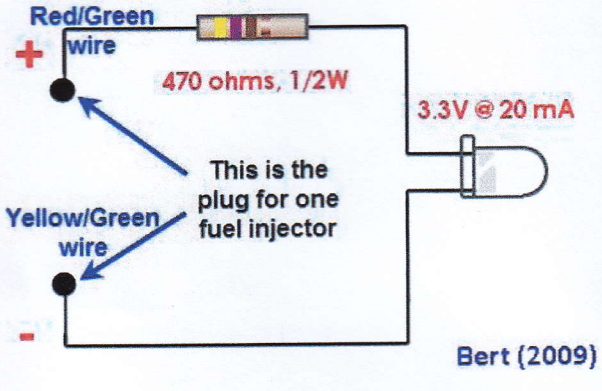
Here is how the thermi-resistor is tested:

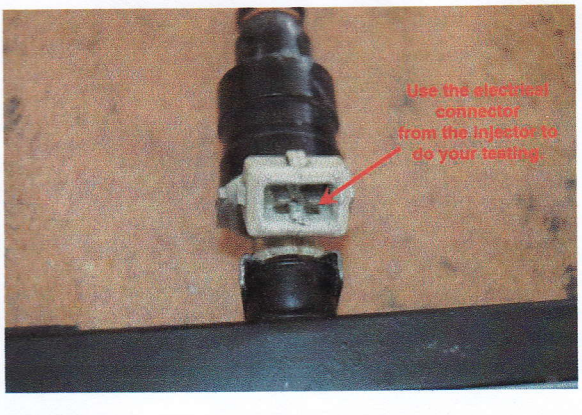
I placed the remote sensor of a digital thermometer in the mouth of the air flow meter. I then plugged my ohmmeter to pin #8 and #9 and started to warm-up the air with a hair dryer. My thermometer could not measure a temperature higher than 70° Celsius.



Testing the electrical power at the fuel injectors:

Because of the injection time varying from 1.5ms to 9ms, it is best is to use an LED to test the EFI computer output. A cheap regular LED should work for this purpose but they are rated for 3.3v/20mA. A resistance would have to be installed in series with the LED in order to drop the voltage to 3.3 volts. At some hobby stores (Radio Shack, The Source..) you are able to buy 12V LED and with them, the resistor won't be needed. The following schematic shows the testing at the fuel injectors. (Red/Green and Yellow/Green are the 2 wires feeding each injector)





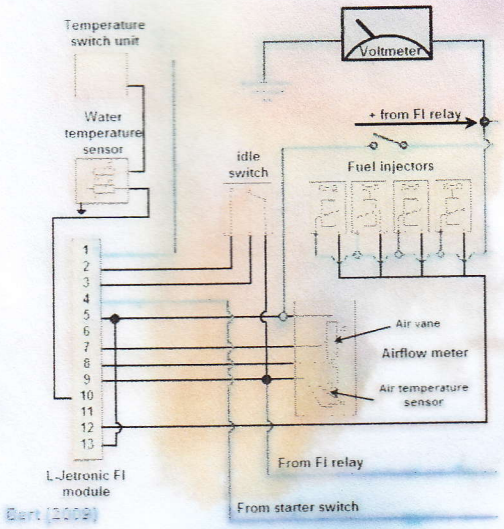
Testing the coil of the fuel injector

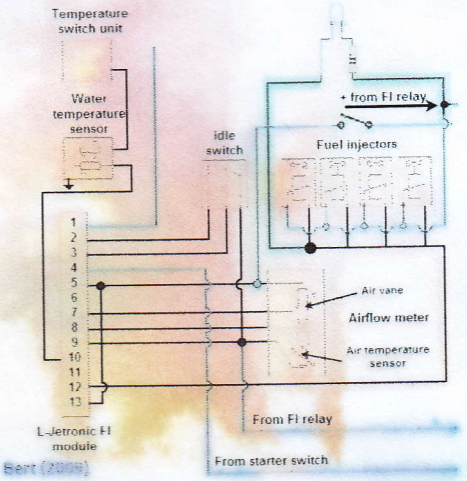
Testing if the Fuel injector relay provides a positive voltage to the injector:

The positive should be permanent as long as the ignition is ON, the kill switch is on the "running" position and the starter button is pressed.

The positive connection to the injectors is also feeding the airflow meter, the idle switch and the fuel pump. If you get a low voltage, disconnect these 3 devices and the FI computer. If one is bad it can drain the voltage. If you get the 12 volts, plug

everything back and check the voltage at the injectors after each device is plugged back.

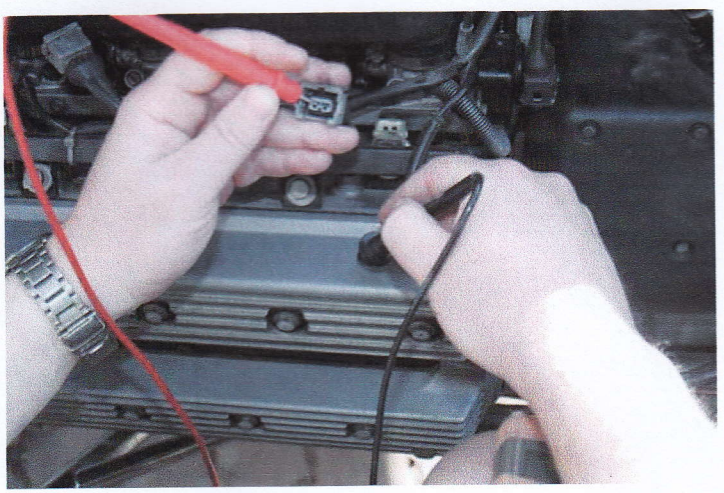




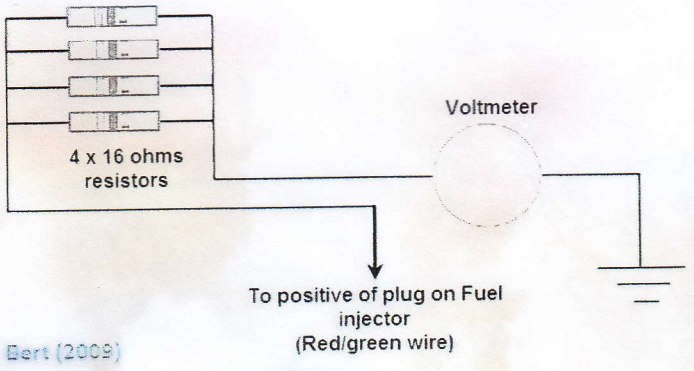
Testing if the EFI computer is sending the "pulsing" negative to the fuel injectors: <u>(The test of the EFI relay has to be conducted first)</u>

When you are pushing the starter button, you should get one pulse for each rotation of the engine. (The 4 injectors are working together).

Here is where you test for power at the fuel injectors:

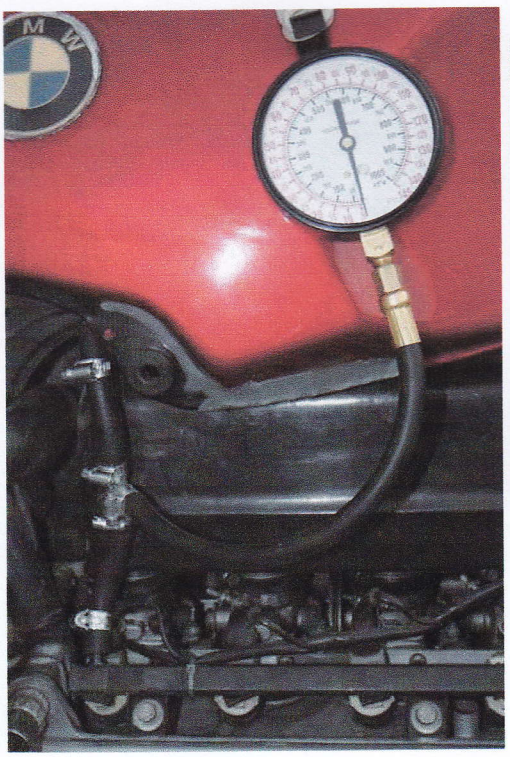


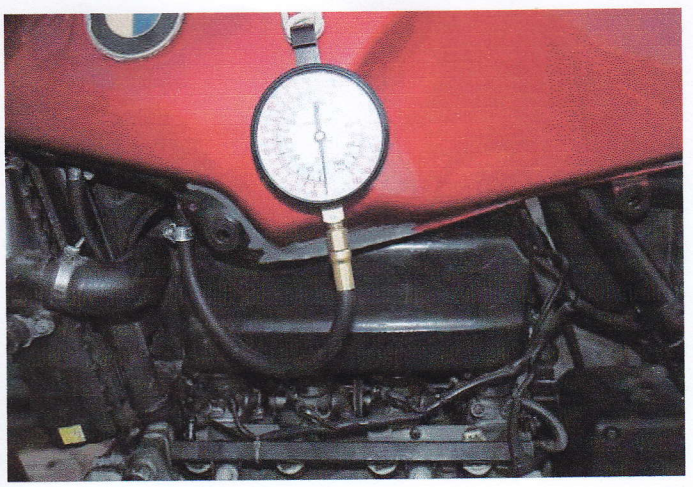
We know that each fuel injector coil has a 16 ohms resistance. If we want to test the circuit in "real" condition, it is easy to disconnect the 4 fuel injectors and insert 4 x 16 ohms resistances on the circuit. Here is the way that I would test it (The 4 resistors could be replaced by 1x 4 Ohms):



Testing the fuel pressure

To test the system fuel pressure, install a manometer in parallel with the fuel pressure hose. If the fuel pump and the external pressure regulator are working correctly, you should read close to 36psi on the gauge





Testing the pump pressure

To test the fuel pressure output of the pump, install the manometer right at the pressure port of the tank. You should read about 65 psi.
The internal relief valve of the pump should keep the pressure to this value.
A lower value reflects a bad fuel pump , bad fuel filter or bad relief valve.
A higher value reflects a problem with the built in relief valve.

This concludes the troubleshooting of the EFI/electronic ignition. If you are looking for extra information, the K100 forum is a great source of information. Very knowledgeable riders are registered here and will most certainly help you. A lot more K100 related documents are available off the forum for registered users.

For other information on the K100, you also be interested to see my page on a K100 rebuilt (available from the forum).

Bertrand Vogel (Crazy Frog)