

Fitting New HT Leads To Kettle/GT Range Ignition Coils

Riding down the road your Kettles three Ignition Coils sit hidden away under the petrol tank each in turn, quietly supplying perhaps 40,000 volts worth of sparks to the engine up to 7500 times a minute..... what a hard life that is!!!! When the engine is running, if you accidentally come into contact with the metal “live” end or the protective insulation on any of the spark plug (HT) leads is damaged it will certainly give you a jolt that you won't forget in a hurry (neither may your underwear!!!!). It could in extreme circumstances stop your heart completely if there is a bit of a weakness there so old blokeys beware!!!!

The coils work due to electrical induction, that is, interacting windings made up of copper wire increasing 12 volts at a fairly low amperage, the primary circuit, into a high voltage of 30,000 – 40,000 with a high amperage, the secondary circuit, capable of jumping a healthy spark across the spark plug gaps. The coils build up this massive output in a fraction of a second as long as the points or other electronic triggering device remain closed, allowing the circuit to build up a high voltage. When the points open the charge in the secondary circuit collapses and the stored energy is discharged along the HT leads to the spark plugs igniting the fuel/air mixture in the cylinders. The process as you might imagine generates heat, but as this High Tension is constantly being built up and discharged, the coils should remain no more than warm in operation, but leave the ignition on for a long period of time without the secondary circuit discharging and they can overheat with the potential for failure of the windings making replacement of the coils the only option!

To do their job properly and deliver a powerful “blue” spark to the plugs it is essential that HT leads have the least line of resistance in their path to the spark plugs with good clean connections at either end and no loss of energy through damaged insulation. Over the years you may find the original HT leads outer insulation has become damaged or hard and brittle with the possibility of some of the central core wires in the inner conductor being broken. This can reduce the coils ability to deliver an efficient powerful spark to the plugs or cause leakage to earth in wet weather resulting in poor erratic running. Clearly, there are no moving or serviceable parts in a Kettle Ignition Coil pack but you can replace the HT leads with modern more durable ones. Often the original leads as well as being in a poor physical condition will be chewed and loose where the spark plug caps screw onto the copper wire core and shorter than they should be having been cut back on every fitting of new caps! Please don't be tempted to cut the leads back to say a couple of inches of the coil bodies and install “in-line” connectors as this will only create another point of weakness for volts to be lost and is guaranteed to cause you problems at some time in the future!

Replacing all three leads is an easy and inexpensive way to improve the ability of perfectly good but tired looking coils to deliver their best in all normal operating conditions. The original Suzuki leads have a wire core (which delivers the electrical charge to the spark plugs) encased in soft rubber, a flexible plastic casing and a further thick plastic protective casing along maybe two thirds of their length. They are connected to the coils by being pushed firmly onto a "spike" an inch or so into the coil body, held in place and sealed from the elements with an epoxy resin (Araldite etc) which can be seen to have oozed out and solidified around the joint. Most modern HT leads available today come with either a traditional copper wire encased in rubber with a plastic coating or fibrous carbon core re-enforced with a silicone and glass fibre sheathing offering protection from damage. More exotic materials are of course available but they are mainly intended for "sporting" or specialist applications, cost a lot more and are way over specification for use on a Kettle!

So for the sake of much less than a fiver and a leisurely hour of your time you can upgrade your coils with modern plastic or silicone HT leads in black or whatever colour you desire.

If you buy 1metre of your chosen HT lead type it will give a good length of lead per coil. The original Suzuki HT leads are 7mm in diameter where they fit into the coils, I use silicone ones of the same diameter and they make a good fit in the coil bodies once the old ones are removed.

Removing the Old HT Leads

Using a Dremel or similar with a cutting disc or a junior hacksaw cut away the old epoxy resin up to the face of its fitting in the coil then firmly pull on the lead; you may find the central rubber/wire core pulls out leaving the outer plastic sheathing still in place. To remove the sheathing push a thin electrical screwdriver between it and the coil body making your way around the circumference. Pieces of epoxy resin should start to break away as you continue to ease the plastic sheathing from its housing and eventually it will come free reasonably easily and can be prised out. Be careful not to put undue pressure on the locating spike in the centre because if broken the coil becomes no more than scrap as it cannot be repaired. Clean out the recess that houses the lead and repeat the procedure on the other 2 coils.

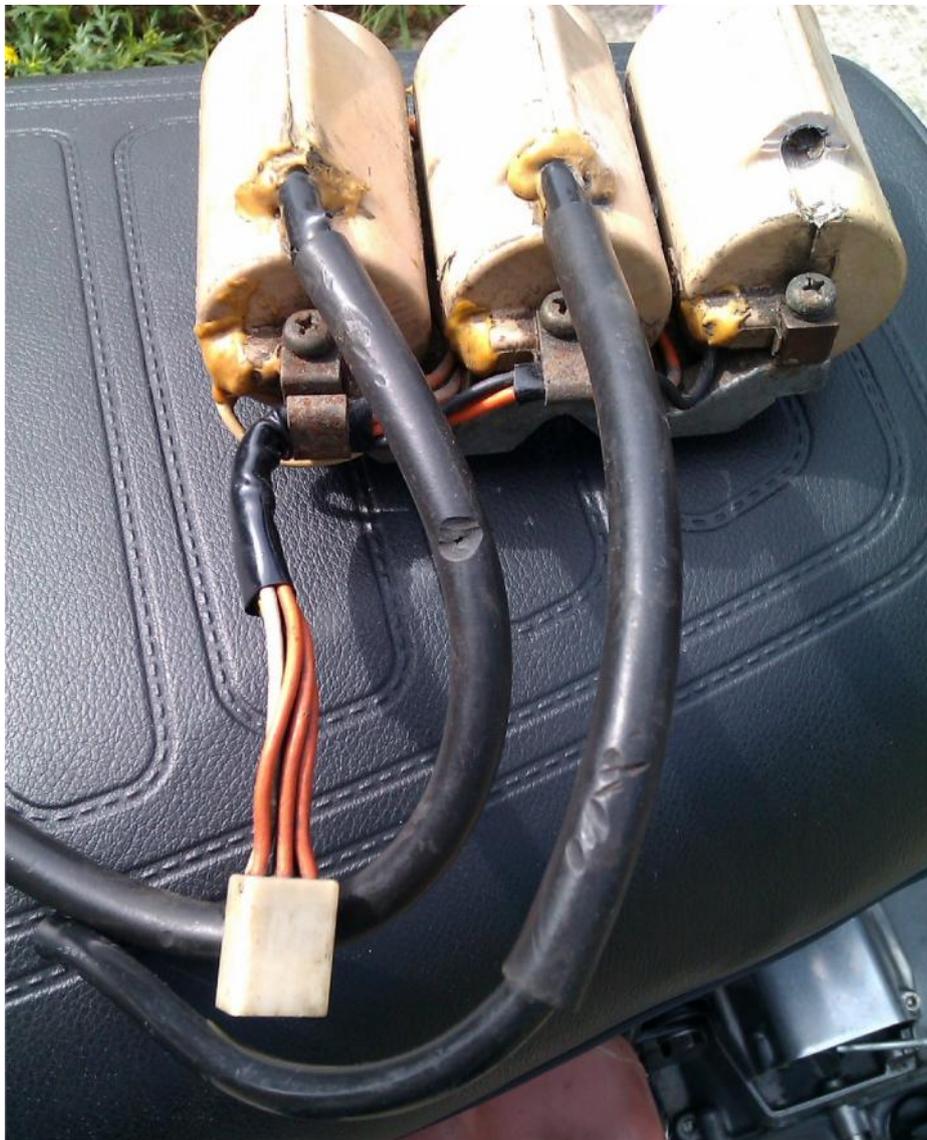
Fitting new HT Leads

Once cut into 3 equal lengths the replacement leads can be fitted. Note how far the leads will push into the coils and run a thin film of epoxy resin around the outside of the HT lead so that the resin will extend about 1cm into the body of the coil when fitted. Push the new HT lead into the coil body ensuring it goes all of the way to the bottom of the recess and seats firmly onto the centre spike. If necessary apply a further amount of epoxy resin at the joint surface to completely seal the HT lead in

place. Again the same procedure should be carried out for the other coils then set them to one side whilst the resin hardens. If you had not done so previously fit the spark plug caps with their rubber boots, re-fit the coils and fire up the bike!!!!

Not a particularly difficult job to do, using Haynes rating probably 2 out of 5 spanners, but if you don't know or were not that confident, maybe you might want to give it a go!!!!

Coils with old worn out HT leads..... one removed



Remains of plastic HT lead sheathing to be prised out



All leads removed and housings thoroughly cleaned to ensure good electrical contact



New leads in place prior to gluing with epoxy resin



Epoxy resin set and coils ready to refit

