

What Are the Advantages and Disadvantages of RESISTOR SPARK PLUGS AND WIRES?

by Ken McNeil

If you go to a local auto supply store and try to buy replacement spark plugs or replacement wires for your old car, chances are the salesperson (well, more than likely, the young kid standing behind the computer) will ask which car it is for. Go ahead, tell him that they are for a 1919 Dort or for a 1936 Hupmobile. He's going to look at you like you are speaking double-talk.

Today's stores – be they an auto parts store, a hardware store or a giant home building center – carry only the most popular stock keeping units (SKUs). Oddball stuff doesn't sell quickly, so you won't find it on the shelves. Perhaps a smaller, independent auto parts store might have a real car guy behind the counter. He can probably help you find what you are looking for. But even they will probably go to the computer, or at least the manufacturer's catalog. Enter the specialty supplier (see pages ?? in this issue for a number of reliable, trustworthy sources for your old car). It's not likely that these folks will have parts for your 2008 Camry or a 2010 Cube, but they will have the parts that you need for your old car.

When you ask for metal-core spark plug wires or non-resistor spark plugs, they'll know what you need.

A metal-core wire has virtually no resistance

Why can't you use those fancy new carbon-core resistor wires in your old car? What damage can they do? Why metal-core wires instead? And spark plugs with an 'R' in the number? Will they work? Yes. They both will work, but at a cost in performance. Their advantage, though, especially in newer cars, is reduced 'ignition noise' (static) through the radio and other electronic devices.

The carbon or fiber core offers resistance in the wire of between 1,000-5,000 ohms per foot.

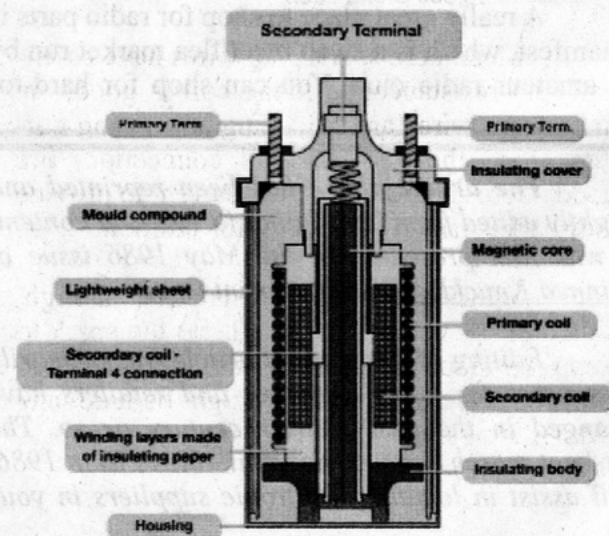
We have discussed the difference between the needs of a six-volt electrical system and a twelve-volt system. Essentially, a device (like a starter motor) requires a certain number of watts to operate.

A watt equals volts times amps. $W_{ATTS} = V_{OLTS} \times A_{MPS}$ To achieve, let's say, 24 watts in a twelve-volt system, you need only 2 amps (12 volts X 2 amps = 24 watts). To achieve the same 24 watts in a six-volt system, you will need 4 amps (6 volts X 4 amps = 24 watts). This means that any restriction in the electrical circuit can reduce the number of amperes getting to the appliance. If the cables are too small, if the wires are not big enough or if external resistors are built into the circuit, the number of amps will be reduced. Result? Not enough 'umph' to operate the appliance efficiently.

What are external resistors? In this case, we are discussing resistor spark plugs and resistor spark plug wires. I recently had a conference call with Federal-Mogul (Champion Spark Plugs) regarding resistor plugs and wires. One of the parties was an electrical engineer for Federal-Mogul and was extremely knowledgeable.

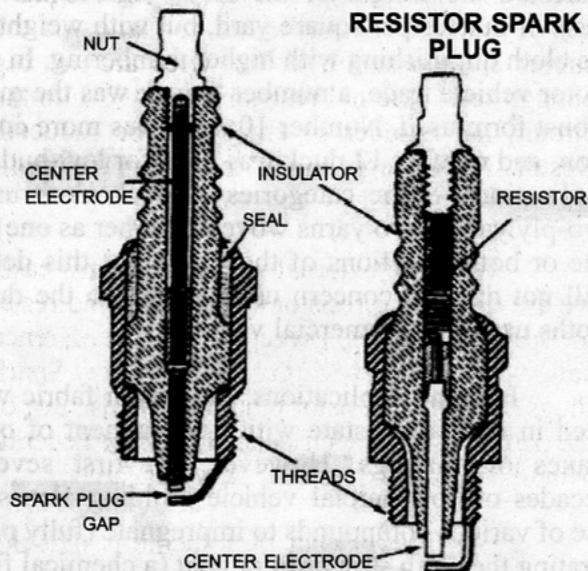
Essentially what he told me is that the performance of an older car - 6 volt or 12 volt, but pre-electronic ignition - depends on the amount of voltage reaching the spark plug.

The coil jumps the voltage from 6/12 volts up to about 12,000 - 18,000 volts, but, at



the same time, reduces the amperage. If the coil and all connections are in good condition, that voltage/current should be more than adequate to produce a hot spark at the plug.

But add resistor wires, with a resistance of between 1,000 - 5,000 ohms per foot, and resistor spark plugs with a resistance of about 3,000 - 15,000 ohms (the resistance further reduces the current - the amperage) and you have a pretty tough job getting an intense enough spark to jump the gap.



NON-RESISTANCE SPARK PLUG

A non-resistor spark plug has a center electrode extending from the nut or top tip down through the insulator. There is virtually no resistance. A resistor spark plug interrupts the center electrode with a measured resistor which could restrict current flow by 3,000 to 15,000 ohms each.

Metal core spark plug wires have essentially no resistance, so if the coil is good, the metal-core wires aren't leaking and losing current along the way, and all connections are good, there should be enough current to provide the spark intensity necessary for ignition.

With too much resistance though, although the voltage is enough for the spark to jump the gap, with the significantly reduced current (amperage), starting might be hard, and acceleration sluggish.

Bottom line is for the entire electrical system to be in top-notch condition, the connections must be clean and corrosion-free, and the insulation on wires must be good. With metal-core wires (and virtually no resistance) resistor spark plugs could be used with a minimum loss of performance. But with our older six-volt ignition cars, adding too much resistance is going to result in poor performance.

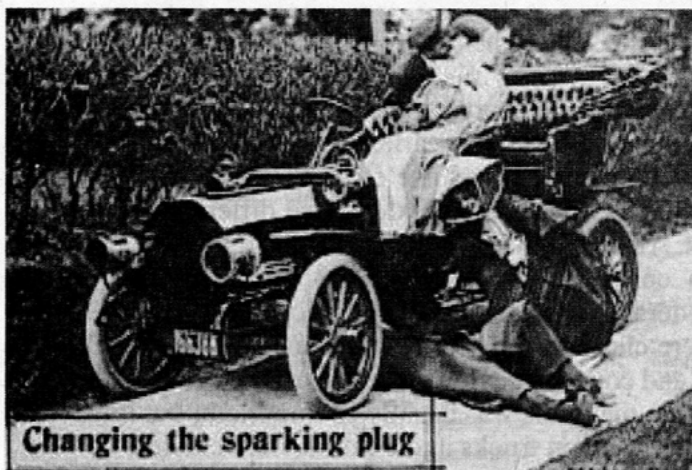
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Although possible, it is often more difficult to fabricate carbon core wire into spark plug wires. The terminals must be clamped firmly against the wires; they cannot be soldered.

With metal core wire, the terminals can be clamped against the center wire, or soldered to it for even a more positive contact.

When fabricating a set of spark plug wires, don't neglect to install the rubber boots on the wires before the terminals are connected. Once the terminals are connected, it is very difficult to get the boots on. If the boots are too tight a fit when trying to get them onto the wire, use a drop of liquid soap. It is a great lubricant and will wash off when everything is in place. Never use a petroleum-based lubricant. It could cause deterioration of the rubber insulation.

Another word of warning: when removing a resistor wire and boot, don't pull on the wire in an attempt to get the terminal/boot off. There's a really good chance that you will pull the wire out of the terminal, causing a bigger job for yourself later.



Changing the sparking plug

Circa 1910 postal card