

Ignition Coil Troubleshooting

July 2008 / Tom Benford

The discrete ignition coil in older 12V vehicles is an amazing little pulse transformer that multiplies low voltage received from the battery or alternator to many thousands of volts when the breaker points open and close.

The coil contains a primary winding, a slot iron core, and a secondary winding. The high voltage output of the coil is directed to the appropriate spark plug by the distributor. Without this high voltage, there is no spark and, consequently, internal combustion cannot take place within the engine. The bottom line, simply put, is this: without spark, the engine doesn't run. So if your collector vehicle keeps cranking but won't start, a bad coil may be the culprit.

After making sure that fuel is entering the engine, the next thing to check is that there is spark to ignite the fuel. Ignition coils are black cylindrical devices that are located close to the distributor. (Note: in 1975 the coil *per se* as a discrete cylindrical device was abandoned by GM when it switched to HEI breakerless ignition systems; other manufacturers also made similar changes around this time as well.)

Checking for spark is pretty easy to do. You simply pull a spark plug from the engine (or use a spare plug if you have one in your parts box, snap one of the plug wires onto it and make sure the shank of the plug is grounded against the engine block. (Do not hold onto the spark with your bare hands unless you want to get a really nasty jolt. Spark plug boot pulling pliers or other insulated-handle pliers are a good thing to use for this purpose.) Have someone crank the engine and observe the center electrode of the plug. If there's sufficient voltage reaching the plug, you should see a bright blue spark jump across the gap of the electrode every time that cylinder fires. If you see no spark, the coil is a good thing to suspect next.

You'll need a digital multimeter to check the resistance levels of your coil. The side terminals of the coil are marked positive (+) and negative (-) and these are where you can measure the resistance of the primary windings. Set the multimeter to the 200-ohm setting and attach the meter's leads corresponding to the terminal markings, red being positive and black being negative. The normal primary reading on the primary side is 1.6, although a range of 1.5 to 1.7 is acceptable.

Next, you'll want to measure the resistance of the secondary coil, and this is the real business-end of the spark-producer. Switch the meter's resistance range to the 20K-ohm setting and attach the negative (black) meter lead to the center terminal of the coil. The reading here should be 11.00 or better, with 13.49 being about normal. If your coil reads under 11.00, then chances are pretty good that this is the reason you're not getting any spark or a very weak one.

Replace the coil with a good quality new one making sure you attach and tighten the leads correctly, plug in the top cable that goes to the distributor, turn the key and you should be good to go!

Here I'm using the coil in my 1963 Corvette Split Window Coupe for example.



1 – Use a nut driver or a small wrench to loosen the securing nuts on the coil terminals and remove the leads; the positive side of the coil has a condenser lead attached in addition to a positive lead. Then loosen the bottom clamp screw, pull out the center cable that goes to the distributor and remove the coil. Alternatively, you can check the coil right in the car with your multimeter if you remove all three leads first.



2 – This is the bad aftermarket coil that was in my '63. Normal reading on the primary windings is 1.6, but 1.5 is still within the acceptable range, so this by itself doesn't necessarily indicate a problem.



3 – This reading of 8.84 does indicate that the coil's secondary windings are not putting out as much voltage as they should; the minimum acceptable resistance reading here should be 11.00, with approximately 13.5 being normal.



4 – Here's the primary reading on the replacement GM Delco coil. The 1.6 reading is exactly what it should be but, again, the real telling is what the secondary resistance reading is.



5 – Ah, yes – 13.49 is more like it. Now there should be plenty of fire in the hole! All that remains is to put it back in the car, connect the leads to the terminals, plug in the distributor cable and start her up!

[CONTACT US](#) | [ABOUT US](#) | [PRESS](#) | [LEGAL](#) | [PRIVACY](#) |
[CAREERS](#)

800.922.4050