

Part #58

Troubleshooting the Ducati Ignition

By Mike Stratman

You've lost fire in your engine. No matter how hard you pull nor how much you crank the starter motor, you can't get a pop. With the price of parts being what it is, just replacing components to troubleshoot your system is not only foolish it can be down right expensive. It never ceases to amaze me how often operators will miss-diagnose an engine problem and then spend major money to replace perfectly good parts. This month we'll show you some simple checks you can do to test each of the components in your Ducati ignition. With the use of an ordinary ohm meter you can systematically find the faulty part.

Testing for Spark: Before you jump to conclusions, step back and consider a few things. First the Dual Ducati ignition is very difficult to defeat. Make absolutely certain you have no spark. At less than 250 rpm the Ducati system produced no spark at all (not a weak spark, no spark). Be sure to pull your cord with a brisk full 6 to 8 foot stroke of the rope. Pulling from between your legs in the cockpit will probably not get it. Also consider if your battery is weak, old, cold, or too small (less than 18 amp/hours) you may not reach the minimum rpm to start. Of course the more you crank the less rpm you'll get from your already drained battery.

Even at higher cranking levels the spark is too weak to see in the direct sunlight. You must be in a darkened hanger or under a blanket to see the spark. If you still convinced you have no spark, grab the electrode end and see if you get bit, yes! It hurts but you won't die. It will hurt a lot less than chasing a non-issue.

Next disconnect the ignition switch to be sure you are not dealing with a faulty switch. With all circuits open the ignition should fire.

As a last resort, remove the prop. Anything that is going to run will run without a load. Could be you're just completely flooded and running no load for a few minutes will clear the lower end and "warm-up" a cold blooded engine.

Try all these tests before concluding you have no spark. You can't believe the number of operators we hear from that chase problems on a perfectly good system. Unlike the old Bosch points systems, Ducati systems do not have a blazing spark at low rpm's

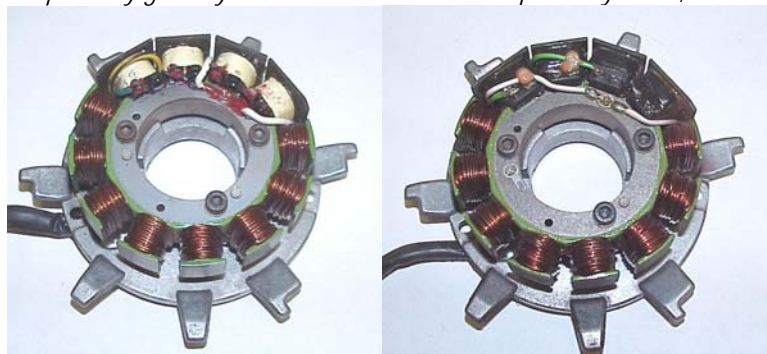


Figure #1 - The Stator at the left is the old style identified with white "taped" ignition poles. The Stator on the right is the new style with a black molded protection on the same 4 ignition poles. Each has a different ohms value when testing.

Finding the Faulty Parts: For these tests you will need an ohm meter, preferably an auto ranging meter that doesn't require you to keep changing the range to accommodate each test. Some of the real cheap ones have only one range, says ohms= x1000 ohms. This makes it impossible to test some circuits because you will need to test from 0.3 ohms to over 5000 ohms. The one used in the photos is an automotive type that had multiple settings which worked OK as long as you know the range of the expected range. In fact the best way to do the tests is to know the range you are looking for first. Set the meter to the proper range, then test the circuit.. If the reading is within the specified range, you're OK. If outside the spec., replace the part. Please don't call and ask me what happens if the part is outside the spec range. I don't know. Replace the part.

Old Style and new style Stator Assemblies: There are two different types of Stator windings. Older types have white tape surrounding the adjacent four ignition poles shown in the photo in figure #_____. The new style have a black molded plastic surrounding the same poles. Either type is fine, but they do have a different ohm range when testing. You may have to pull the flywheel to check which one you have. If you engine is less than five years old, you should have the new style. See chart for specs.

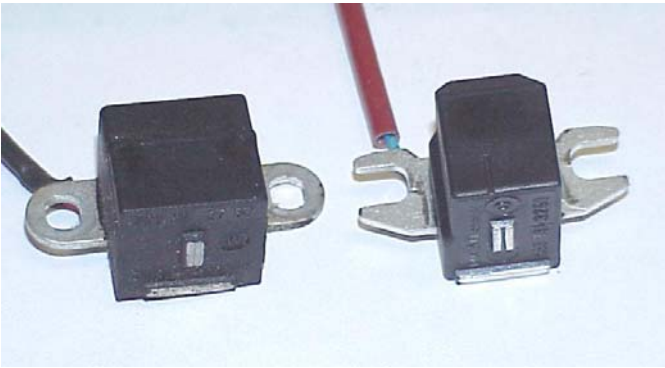


Figure #2 – The very earliest Ducati ignitions came with a “non-adjustable” type trigger pick-ups as shown of the left. New engines have the slotted ears on the right. . Each has a different ohms value when testing.

Old Style and new Style Pick-up Triggers: On the first release of the Ducati Ignition the triggers had an “unadjustable” round holes in the mounting ears. The newer units had slotted ears as shown in photo. Either unit is fine, but hey do have a different ohm range when testing. You will have to remove the starter only to check which one you have. If you engine is less than 10 years old or after serial # 4017191, you should have the new style. See chart for specs.



Figure #3 – Shows the test for a new style stator output leads across the white and green leads. The chart shows an expected value of 280 to 330 ohms. Meter shows 294 ohms. The part checks good.



Figure #4 – Shows the test for an old style trigger assembly from the red lead wire to the mounting ear (or engine ground). The chart shows an expected value of 50 to 70 ohms. Meter shows 56 ohms. The part checks good.

Chart for Ohms Resistance Values Stators, Triggers, Tach Leads, and Spark Plug Caps

Part Description	Wire Color or connection route	Resistance Value
Lighting Coils	Yellow and Yellow/ black	0.3 ohms to 0.35 ohms
Charging Coils (old sytle stator)	Green and white	230 to 280 ohms
Charging Coils (new style stator)	Green and white	280 ohms to 330 ohms
Tach wire (old style stator)	Grey to engine ground	30 to 35 ohms
Tach wire (new style stator)	Grey to engine ground	35 to 40 ohms
Triggers (old style) .016” – .020” air gap	Red to engine ground	50 to 70 ohms
Triggers (new style) .016” – .020” air gap	Red to engine ground	140 to 180 ohms
Metal Spark Plug Cap 1K (#983-409)	Both ends	800 to 1200 ohms
Metal Spark Plug Cap 5K (#9007)	Both ends	4500 to 5500 ohms
Magenta Resistor Plug Cap #866-705	Both ends	4500 to 5500 ohms

Testing Electronic Boxes: The transducers or Black boxes are another expensive component we can run a full set of checks on to determine if we are working with a faulty part. The chart shown here gives you the ohms values when testing any of the colored leads as well as across the spark plug wires. One thing you need to consider is that you can under certain circumstances damage the E-Boxes by running the engine or without the spark plug caps attached. The stator produces voltage that is stored in the E-Boxes waiting for a signal from the triggers to fire the plugs at the proper moment. If **both** of the spark plug leads from the same E-box are not connected the voltage will heat the circuit until the Silicone Control Rectifiers or SCR in the E-box fail. This takes anywhere from 20 seconds to 2 minutes to happen. Don't be overly concerned about doing spark tests where plugs are not attached. Do them one at a time to assure the voltage has a place to go and you should have no problems. Blown SCR's can be spotted by running the tests in the chart.



Figure #5 – Here we test the output leads of our E-Box. The range is from 5100 to 6300 ohms. With our meter set to the 20K ohms range we find 5580 ohms. The circuit test good. You can do this with the plug wires attached and the plug caps removed.

Electronic Black Box Test

	Green	White	Red	Yellow/Black
Green		>1000 ohms	open	open
White	>100,000 ohms		open	open
Red	>100,000 ohms	500 to 3000 ohms		open
Yellow/Black	1000 to 5000 ohms	>100,000 ohms	>100,000 ohms	
Across output leads		5100 to 6300 ohms		

Installing plug wires: One component that doesn't get enough attention is plug wires. Poor continuity in plug wires can lead to all kinds of hair pulling when trying to diagnose an engine problem. For far less than a buck a foot you can install new plug wires in a matter of minutes. The plug caps are simply threaded onto a threaded post inside the plug cap and the E box output boss.



Figure #6 – Installing new plug wires is a simple as threading the new wire onto the threaded post inside the plug cap or the E-box. Use a little di-electric grease to help prevent rust and corrosion.