

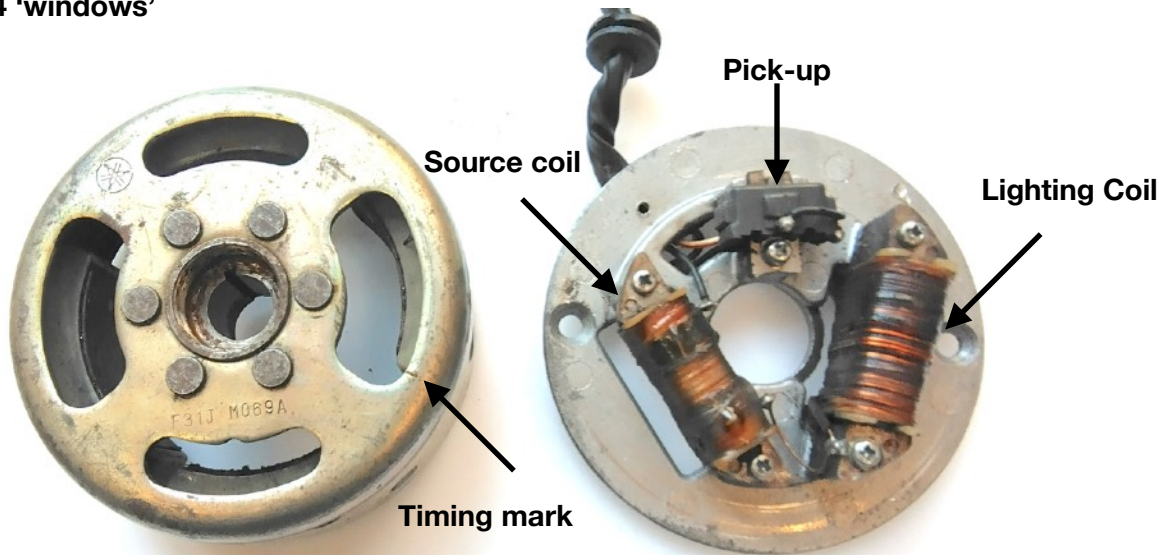
Rex's Speed Shop
Guide Y-10: CDI Ignition Generator Checks Troubleshooting
 Yamaha RXS100 1983 ~



Introduced in 1983, the Yamaha RXS100 quickly earned a reputation as a simple, economical and remarkably durable motorcycle. The European model is known as the RXS100, while in other markets, the closely related machine was sold as the RX100. Although there are differences between them, the ignition and charging systems are fundamentally very similar. More than forty years later, many are still in regular use, although time and age inevitably take their toll on the original electrical components. On younger machines, replacing a single plug-in component may restore reliable running. On older motorcycles a more thorough approach is often needed. Many CDI ignition problems are not explained by the workshop manual, and because the CDI unit itself cannot be tested directly with normal workshop equipment, diagnosis can sometimes be frustrating. This guide explains the most common faults and how to identify them.

The the generator is extremely robust on these models, often it only suffer as a result of poorly modified parts where internal wires have been cut, often leading to loss of integrity of the windings. Age-related deterioration of the generator windings or CDI unit is creeping in as well, which commonly results in no spark, difficult starting, misfiring when hot, or a weak yellow spark.

Flywheel has 4 'windows'



The CDI generator is based on earlier Mitsubishi technology but the flywheel is marked by Yamaha. The ignition provides essentially fixed timing, similar to a conventional points system, with a small amount of advance as the engine reaches idle speed. Beyond this, the ignition timing changes very little as engine speed increases.

Manufacturer	Yamaha	Item	Notes
Flywheel:	F31J -XXXXX	Source coil	37A-85520-M2
OEM CDI P/N	3M5-85540-M1 (UK/EU) 36L-H5540-10-00 (ROW)	Brown ~ Black	200Ω @ 20°C RX 220Ω @ 20°C
REX CDI Unit P/N	RXS1 -UK & EU RXS2 - R.O. W	White/red ~ Black 4U5-85580-M0	20Ω @ 20°C
IGN TIMING	20° BTDC	HT Coil PRI / SEC	1.6Ω/ 6.6KΩ

We cannot accept responsibility for incorrect diagnosis of faults within the system. New parts returned for re-testing, that are found to be fully functional will incur standard workshop inspection charges.

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Testing the CDI generator windings

The measurements are carried out using a multimeter, following the procedures described in the Yamaha workshop manual, so we have not repeated those step-by-step instructions here. If you are not confident using a multimeter, it is worth asking someone with experience to help, as incorrect testing can easily lead to misleading results. If you are able to take accurate readings, measure the wires from the stator as below and write down your results, our techs can give an opinion.

Your Test Results:

Ambient Temperature:.....C or F (please circle which units)

Measure Resistance:	Standard reading @ 20°C	Your Readings (un-corrected):
Black/red ~ Black	RXS - 200Ω (RX Versions 220Ω)	
White/red ~ Black	20.0Ω	
HT Coil PRI / SEC	0.6 ~ 1.5Ω / 4KΩ ~ 8KΩ	

To accurately measure the resistance of a winding, you must first know its temperature. Copper resistance changes predictably with temperature, so the expected resistance also changes. We have therefore created a table showing the correct resistance values across a range of ambient temperatures. This is not fully explained in the Yamaha workshop manual. The specified resistance values are given at 20°C, and a relatively large measurement tolerance is suggested. In practice, however, CDI windings are precision components and accurately respond to changes in temperature. Select the nearest temperature to you local ambient temperature then look at the table which will tell you the correct reading for that temperature. Any significant difference is a clear indication that the winding is beginning to fail internally. Only a small variation is allowable, caused by normal meter accuracy. Variations of up to around 2% are generally acceptable, but once the discrepancy reaches 5% or more, the winding is showing signs of distress and will need repair. Likewise, any winding that gives no reading or a resistance that changes while being measured has also failed.

Correct for Ambient Temperature		
Temp (C)	Source Coil Ω	Pick-up Ω
-10	176.42	17.64
-5	180.35	18.04
0	184.28	18.43
5	188.21	18.82
10	192.14	19.21
15	196.07	19.61
20	200.00	20.00
25	203.93	20.39
30	207.86	20.79
35	211.79	21.18
40	215.72	21.57

An often-overlooked fact is that a multimeter cannot assess the condition of the insulation between closely packed winding wires. This insulation naturally deteriorates with age and, because it is difficult to test directly, the age of the component is often the best guide to its overall condition. Even if the temperature-corrected winding resistance is exactly to specification, the ignition may still fail to operate correctly if deteriorated insulation allows the voltage used to power or trigger the CDI unit to leak away. The unpredictable nature of insulation breaking down is one reason why many CDI ignition faults appear intermittent or seemingly random in nature.

If your stator gives perfect, stable resistance readings but the engine still does not run correctly, look for other symptoms. Does the fault worsen as the engine warms up? Is there an intermittent misfire or problems only under load? Is the bike difficult to start, perhaps needing to be bump started? Has fitting a replacement CDI unit caused it to stop working altogether? A new CDI places the windings under their full design load, charging more quickly and often to a higher voltage than an ageing CDI unit is able to. This frequently exposes weaknesses in old windings. If heat or electrical load triggers the fault, it is a strong indication of insulation failure that a multimeter cannot detect. Either condition, IE a failed resistance test or load induced failure will require that part to be rewound, or if a well made part is available, replaced.

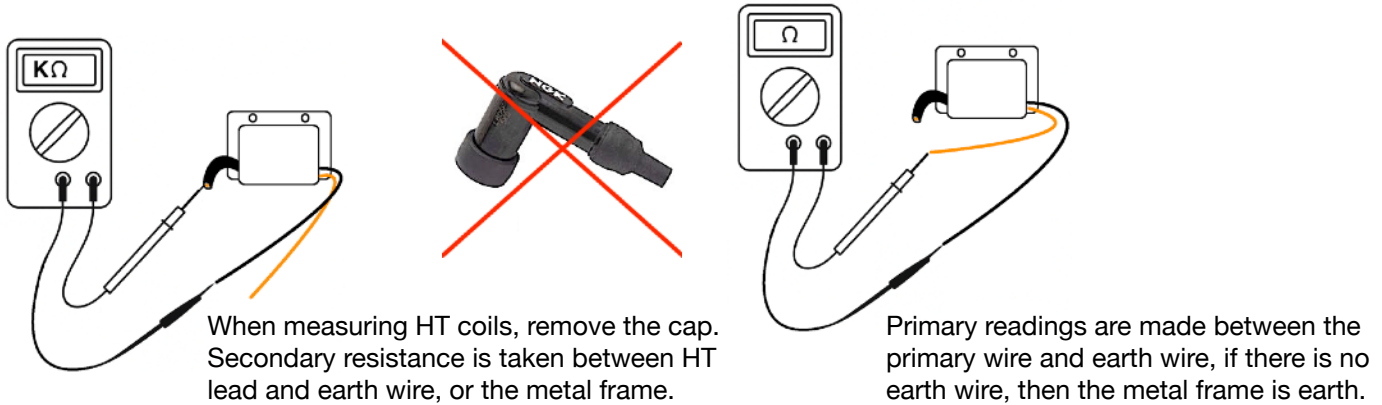
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Testing the HT coil

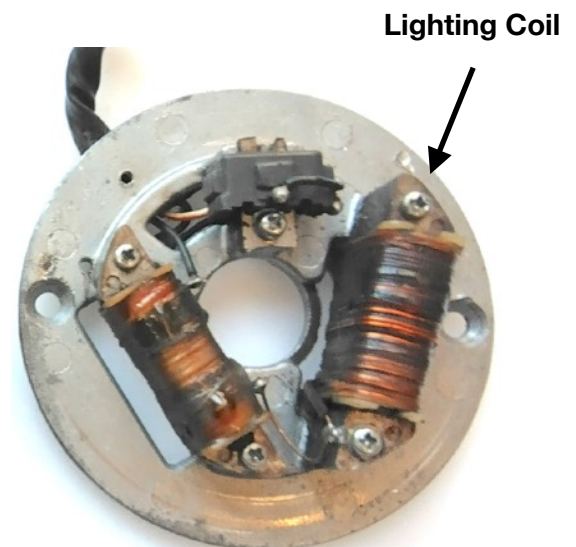
OEM HT coils have the resistance specified in the manual, the same temperature rule applies. Aftermarket ones may vary, there are factors that manufacturers balance differently which gives rise coils with slightly different resistances when new. Therefore in the case of HT coil resistance, sensible values are more important than exact ones, especially where after market parts have been fitted. Readings that are very different, no reading or one that is not steady are a cause for concern, for example a primary resistance of around 4-5 ohms shows that a battery and contact breaker ignition coil has been fitted by accident, this should be replaced with the CDI type.



Checking the lighting coil:

The lighting coil is wound from much heavier wire than the CDI source coil, it operates at a much lower voltage and hence it is more robust, it is also easier to assess by visual inspection.

Check for: General condition, signs mechanical damage to the copper, discolouration due to overheating. The winding on the right has distinct areas that have darkened showing overheating. Look at the insulating pieces at each end of the copper, these form part of the mechanical support for the winding, if missing or damaged, the winding is no longer properly supported or sealed. Check also the copper is tight on the steel former, firmly hold it with your fingers and attempt to move it back and forth towards the mounting screws, also attempt to twist it. Any movement of copper on the former, even slight shows a failure.



On these bikes It is not unusual to find the lighting coil wiring has been cut and modified, sometimes resulting in a lot of damage to the winding itself. Modification in this area requires very high temperature materials and a great deal of experience to make a reliable connection.

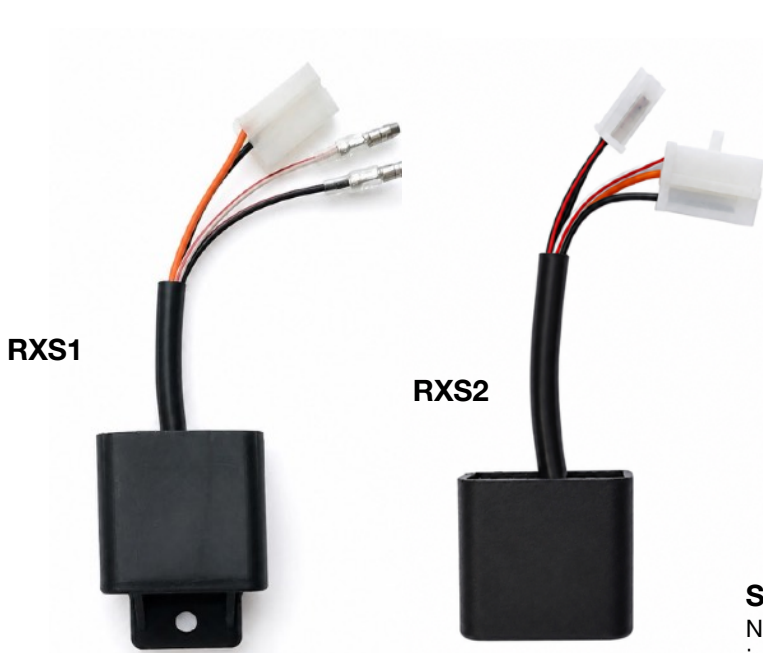
Lighting coil electrical test

Lighting and charging coils use several metres of relatively thick copper wire, so their resistance will always be very low, typically between 0.2 Ω and 2 Ω . Readings within this range should be considered a pass. Obtaining an exact figure can be difficult, as many multimeters are not especially accurate at the very low end of the resistance scale. Do not be concerned if your readings do not exactly match the figures in the manual as sensible, stable readings are more important. Carry out the resistance tests as described in the workshop manual. These models were produced with grounded lighting systems, so readings are taken to the black ground wire or directly to the stator plate.

We hope this guide has been of some help, at Rex's Speed Shop we have years of experience rebuilding classic motorcycle generators and ignition systems. We design and manufacture modern replacement CDI units and generator parts, developed to meet the standards set by the original manufacturers.

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Parts & Services



Ignition Coils: HTC30-4
 Correct type for your RX/RXS100

UK, EU and Rest of World Version CDI Units.

Manufactured in the UK and tested to ensure accurate and reliable ignition timing.

Simple, plug in 12 volt conversion: 12VC-RXS

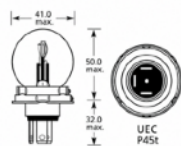
No cutting wires. No modifying the generator. No complicated installation. Simply plug the kit into your bike's existing wiring



Spark plug:



RXS100 Bulbs

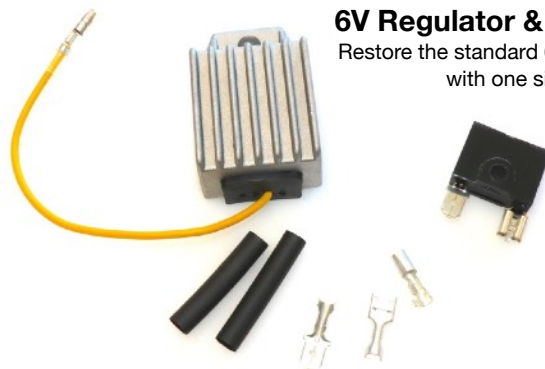


Flywheel Extractor Tool: FWP1



6V Regulator & Rectifier Set

Restore the standard 6V charging system with one simple kit



Electrical Testing & Rewind Services