Rex's Speed Shop

CDi Ignition Generator Checks & Ignition Timing

Yamaha DT125MX 1986-89, DT125MX 1991, DT125 1980-81
DT175 1980-81

A simple plug-in unit may be all that is required to restore relatively new ignition systems, however older systems are often suffering age related degradation of all their components. The generator is an often overlooked but key component to consider, as it too can cause symptoms such as: no spark, poor starting, misfiring when hot, or a weak, yellow spark. It can stop the engine running when hot or cause a failure to run after fitting a new CDI unit.

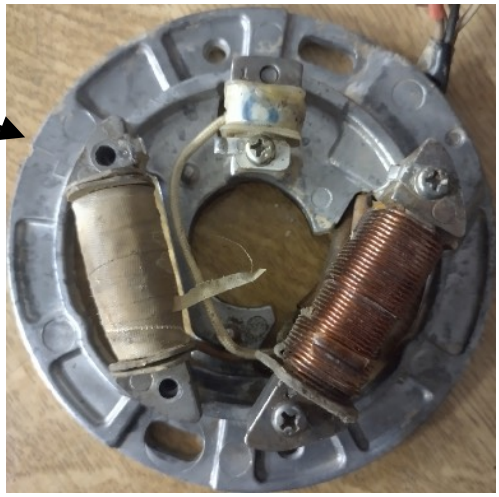
The condition of the generator can usually be assessed with a careful visual inspection and basic multimeter tests, bearing in mind the age of the system. If fitting a new component changes the fault or stops the ignition working, this normally indicates additional faults within the system. This guide does not replace or alter any instructions or warnings given in the Yamaha workshop manual and assumes the work is being carried out by someone competent to interpret readings and complete the work to a high automotive standard.

Identify the system:

Firstly there are many subtle variations of this Mitsubishi system, carefully check you have the one this document refers to.

F3T251 Flywheel has 4 'windows'

Timing mark, aligns with flywheel mark



Single source coil, mounted on the **LEFT** of the pick-up.

Manufacturer	Mitsubishi	Item	Notes
Flywheel: (never mix flywheels and stators)	F3T251	Source coil ~ 4.0mm thick at mounting points	3J0-85512-20
OEM CDi P/N	3J0-85540-20-00	Brown ~ Black	300Ω @ 20ºC
REX CDI P/N	DT1	White/red ~ Black	10Ω @ 20ºC
IGN TIMING	DT175 ~1.45mm BTDC. 17.5º @3,000 RPM	HT Coil PRI / SEC	0.6 ~ 1.5Ω / 4KΩ ~ 8KΩ

Testing the CDi generator windings

This guide brings together the key information needed assess the bike's stator and interpret the results. The measurements themselves are carried out using a multimeter, following the procedures described in the Yamaha workshop manual. For that reason we do not repeat those step-by-step test procedures here. If you are unfamiliar with using a multimeter to take these readings, we recommend seeking assistance from someone experienced in electrical testing.

We cannot accept responsibility for incorrect diagnosis of faults within the system. Parts returned for testing that are found to be fully functional may incur standard workshop inspection charges.

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Your Test Results:

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

Measure Resistance:	Standard reading @ 20ºC	**Your Readings (un-corrected):**
Brown ~ Black	300Ω	
White/red ~ Black	10.0Ω	
HT Coil PRI / SEC	0.6 ~ 1.5Ω / 4KΩ ~ 8KΩ	

Important: Many manuals suggest accepting a large tolerance of 10 or even 20% on measured coil resistance readings, yet this is entirely misleading as CDi windings are precision components. The key point is that copper's resistance changes in a predictable way with temperature, therefore once a correction for ambient temperature has been applied, any difference between specification and a measured value gives a clear warning that the coil is breaking down internally. There is only a very small allowable tolerance due to copper being highly temperature-sensitive and meters varying slightly in accuracy. Small variations of up to 2% are normal, but once the discrepancy reaches 5% or more, the winding has failed. Any winding that gives no reading or one that does not remain steady has also failed.

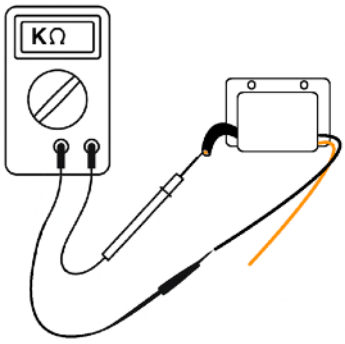
The low-speed source coil is by far the hardest-working coil and the one most likely to fail, but as these bikes age, faults begin appearing throughout the ignition system. If your stator gives perfect, stable resistance readings but the bike still does not run properly, look further for other symptoms. Does the fault worsen when the bike is hot? Is there a mysterious misfire or problems only under load? Is the bike difficult to start, perhaps needing bump starting? Has fitting a new CDI caused it to stop working altogether? New CDI units load the windings to their full design power, charging much faster and to a higher voltage than an old CDI can achieve, which highlights weaknesses in ageing windings. If heat or load triggers problems, this clearly indicates insulation failure that a multimeter test will not detect.

If you find off-specification resistances or suspect failing insulation, the cure is to have the generator overhauled back to its 'as new' specification.

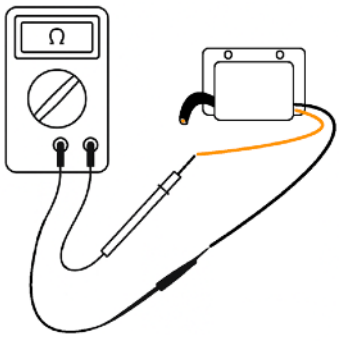
Correct for Ambient Temperature		
Temp (C)	Source Coil Ω	Pick-up Ω
-10	265	8.8
-5	270	9.0
0	276	9.2
5	282	9.4
10	288	9.6
15	294	9.8
20	300	10.0
25	305	10.2
30	311	10.4
35	317	10.6
40	323	10.8

Testing the HT coil

When measuring HT coils, remove the cap. Secondary resistance is taken between HT lead and earth wire, or the metal frame.



Primary readings are made between the primary wire and earth wire, if there is no



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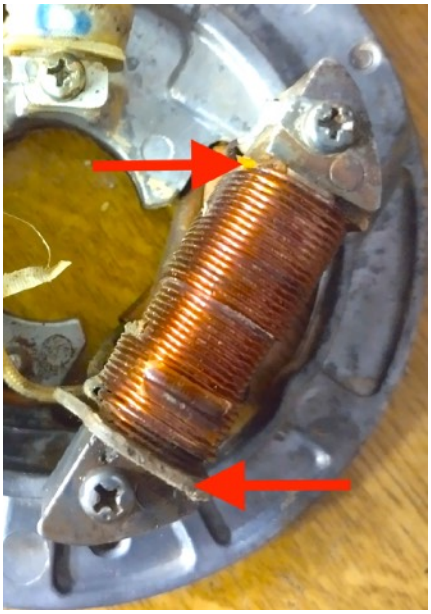
Checking the lighting coil:

The lighting coil is wound from much heavier wire than the CDi source coil, it operates at a much lower voltage and it is more robust, it is also easier to assess by inspection. Signs of burning or mechanical damage to the copper will be obvious, however patchy discolouration, usually lighter in colour due to overheating maybe less easy to spot. The copper will be an even colour over the entire winding if it is still in good condition. Age of the lighting coil, and hence it's insulation is again a significant factor.



Check for:

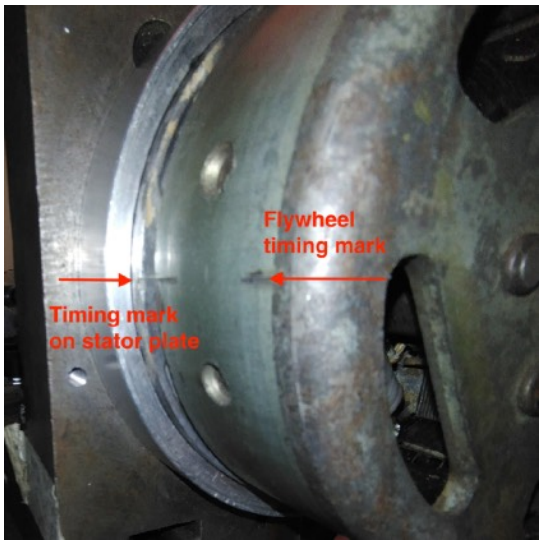
General condition, the winding on the right has an end piece missing, a common issue on older generators. The insulating end pieces must be intact at both ends of the winding as these prevent the copper from contacting the steel winding slot. They also form part of the mechanical support for the winding, 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.

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 different lighting coil configurations, but all are grounded, so readings are taken to the black ground wire or directly to the stator plate.



Setting the Ignition Timing

This is covered fully in the shop manual, however it maybe helpful to understand that Yamaha instruct you to set the timing to the fully advanced point. At idle therefore, the marks do not align. By far the best method is using a strobe and ensuring that at 3,000 RPM the line on the flywheel aligns with the timing index. The stator plate is adjustable to allow this. Remove the flywheel to access the stator retaining screws.

If setting timing is not something you are familiar with we suggest this task is deferred to an experienced person.

At Rex's Speed Shop we have years of experience rebuilding classic motorcycle ignition systems, we design and manufacture modern replacement CDI units and generator parts developed to meet the extremely high standards set by the original manufacturers.

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