

High RPM engine misfires when DCCDIP2 ignition units are used on some older Rotax 912 and 914 engines.

A description of the ignition system of these engines, the DCCDIP2 ignition units and some physical principles are given here in order to understand the reason for high rpm misfires and their solution.

The original ignition units on Rotax 912/914 engines are powered by AC voltage direct from the alternator. Our DCCDIP2 units operate internally on DC. In order for DCCDIP2 units to be powered from the alternator a small module (a small white box connected to the cabling) is supplied with the unit. This module rectifies and regulates the AC voltage from the AC alternator to approximately 18 V DC.

At the same time 12 V DC can be connected to the module from the battery (via a switch). The ignition unit is then powered by the battery when the AC voltage from the alternator is too low (eg when starting). While the motor is running the AC voltage should always sufficient to power the unit. As the DC supply from the white module is at 18V the unit is always powered from the alternator while the motor is running (even if a 12 V DC supply is connected). Most users use 12 V DC only at start-up (ie from the start button).

The ignition unit draws current that increases with speed. This is logical - more speed = more current. The unit also draws more current when the supply voltage drops. This is also logical - power = current x voltage. The unit tries to maintain the same spark energy (same power), so less voltage must compensate for more current. The alternator is in principle a source of constant current (current is the same at both low speeds and high speeds).

Unfortunately, we have found that some alternators on these motors are weak. As the current required by the ignition unit increases with speed it may demand more current than a weak alternator can provide. Typically, this results in a misfire above about 5000 RPM.

Solution:

- 1) Leave the 12 V DC supply from the battery connected while the engine is running (not only when starting).
- 2) Install the new ignition unit firmware. The new firmware reduces the power supply needs of the unit so that the current that the alternator is able to provide is not exceeded.

The new firmware is here: http://www.ignitech.cz/zdroj/temp/210825c_dccdip2_v105_menic_1ms_uploader.exe

Use SHIFT+click to link for download.

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