



## Ignition module (Trigger box)

### General

The ignition module contains the closed-loop primary current control circuit and the dwell-angle control. They are built with hybrid technology. This has the benefit that they can be built together with the ignition coil or distributor as one unit due to the compact construction. Because of the high power output, enough cooling and a good thermal contact to the vehicle body is necessary.



### Function

A pulse generator provides correctly-timed electrical pulses for the amplifier to trigger the ignition by switching off the coil negative terminal. The pulse generator can be an inductive magnet located inside the distributor or adjacent to the flywheel, it may use a Hall-effect generator to produce this pulse.

The voltage of the generated pulse is too weak to operate the switching transistor and must be amplified. The amplifier senses the trigger pulse, and amplifies the voltage to the correct level to operate the switching transistor. The coil is thus switched on by the amplifier circuitry to build the magnetic field, and switched off by the switching transistor to collapse the magnetic field and induce the secondary spark. A safety circuit is used to prevent coil overheating. The primary current is switched off after (typically) one second if the ignition is switched on and the engine not started. The amplifier also contains the constant energy limiting circuitry.



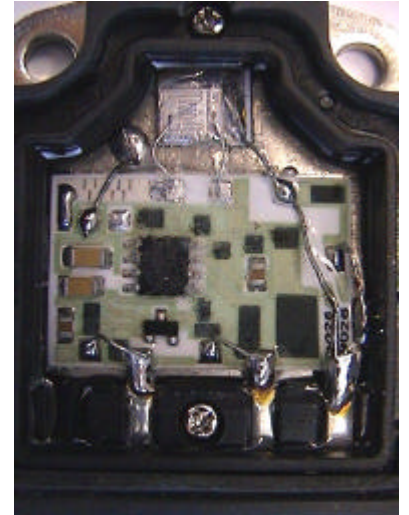
## Effects of failure

### A faulty ignition module can cause the following:

- engine doesn't start due to a missing spark
- engine is misfiring
- Engine starts when it is cold and stops at operating temperature and will not restart

### Causes of failure:

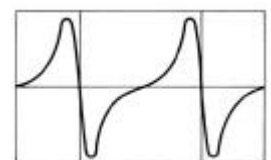
- internal short/open circuit
- wire short/open circuit
- bad electrical connections at the plug
- intermittent
- failure
- overheating



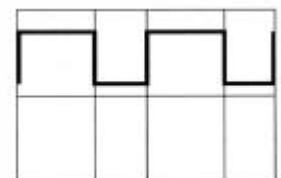
## Diagnostics

For fault recognition carry out the following system tests:

- disconnect the plug at the ignition module, check the supply voltage between terminal 15(ignition live) and 31(earth/ground), the measured voltage must be the same as the battery voltage.
- check the primary circuit for an open circuit between the ignition coil terminal 15 and ignition switch, ignition coil terminal 1 and ignition module terminal 16, and earth.
- voltage value between terminal 1 ignition coil and terminal 16 ignition module plug, ignition on, voltage value = battery voltage.
- check the switching operation of the ignition module with the oscilloscope. Pay attention to the terminals for the different types of ignition system control signal. (See illustrations)



Inductive signal



Hall signal