Ignition Coils

Components of an ignition coil

An ignition coil normally consists of a primary winding, a secondary winding, the iron core and the body with an insulating material – nowadays a two-component epoxy resin.

Functionality

The primary current causes an energy storage in the magnetic core. A fast shut-down of the current source via the ignition power stage causes, that the magnetic field collapses abrupt and thereby generates a high induced voltage (up to 600 V) on the primary side. This voltage is transformed to the secondary side and converted via the relation between the numbers of secondary windings compared to primary windings. At the same time, a high voltage discharge is generated at the spark plug, which leads to an ionization of the spark gap and creates a current flow, until the stored energy is vanished. The aflame spark ignites the fuel-air-mixture.

Definition

Coil P50, P35, P35-T, PS, and PS-T are passenger car ignition coils. The “P” stands for production (passenger car); the number indicates the maximum spark energy in millijoule (mJ). The “T” stands for an ignition powerstage which is integrated in the ignition coil. The letter “S” stands for Stabspule (pencil coil).

The coil P50-M is based on a production ignition coil, which is modified for motorsport purposes (especially higher vibrations).

In case of the coils P35 and P35-T, the length of the spark plug connector can be adjusted according to the customer’s wishes (max. 225 mm). It’s then called P35-E respectively P35-TE.

The double ignition coils 2x1, 2x2 and 3x2 are also large-scale-production-coils – therefore, the advantage is a high quality related to low prices.

The ignition coils P35, PS, 2x1, 2x2 and 3x2 are specially adjusted to the Bosch’s external powerstages (IM 3.1, IM 3.2 und IM 4).

Motorsports ignition coils

The coil M is the first ignition coil that exclusively was developed and built for motorsports applications. Its biggest advantage is the insensibility towards high surrounding temperatures, due to the usage of high-tech materials.

The ignition coils S16, S19, S22 are the newest generation of motorsport ignition coils. These coils are especially for the application at high-performance racing engines. Their advantage is, amongst others, that they optionally can be equipped with ionic-current-measurement.

The ignition coils S16-T and S22-T have integrated powerstages. These powerstages are special IGBT-transistors with logic-level-entrance (5V). Like in the case of coil Sxx, the Sxx-T can particularly be delivered with ionic-current-surveillance.

The number indicates the external diameter of the ignition coils' outer core (16, 19 or 22 mm). Like in the case of serial ignition coils, the „S“stands for Stabspule (pencil coil).

For all motorsports coils the customer can (within certain limits) freely choose the primary- and secondary-sided ignition coil connector.