

# Road vehicles — Ignition systems —

## Part 2: Electrical performance and function test methods

ICS 43.060.50

# Committees responsible for this British Standard

The preparation of this British Standard was entrusted to Technical Committee MCE/9, Ignition equipment for spark ignition engines, upon which the following bodies were represented:

Society of Motor Manufacturers and Traders Ltd.  
Coopted members

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## National foreword

This British Standard has been prepared by Technical Committee MCE/9. It is identical with ISO 6518-2:1995 *Road vehicles — Ignition systems — Part 2: Electrical performance and function test methods*, including Technical Corrigendum 1, published by the International Organization for Standardization (ISO).

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### Summary of pages

This document comprises a front cover, an inside front cover, pages i and ii, pages 1 to 10, an inside back cover and a back cover.

This standard has been updated (see copyright date) and may have had amendments incorporated. This will be indicated in the amendment table on the inside front cover.

## 1 Scope

This part of ISO 6518 specifies the methods and test conditions for testing battery-supplied ignition systems for spark-ignited internal combustion engines.

Because of the difficulties in producing repeatable measurements with atmospheric spark gaps and different observers, two methods of obtaining the results necessary for calculating the system output energy are given.

**Method A** — using spark gaps for the energy measurement (test arrangement A).

The output energy obtained by this method is called spark energy,  $E_{sp}$ .

**Method B** — using a Zener diode string for the energy measurement (test arrangement B).

The output energy obtained by this method is called Zener discharge energy,  $E_{zd}$ .

This method is not suitable for systems giving alternating spark current.

Method B is also recommended for the comparative testing of ignition coils and current interruption systems.

## 2 Ignition system description

For the tests described in the following subclauses, the ignition system components used shall be as specified for the application being examined, i.e. to the original equipment specification.

### 2.1 Ignition system with mechanical distributor

The following components shall be interconnected as shown in Figure 1 or in any other circuit which has been proved to be equivalent.

**2.1.1 Single-ended coil** which can be the conventional induction coil or an air or magnetic core transformer.

**2.1.2 Coil ballast resistor or resistors**, if the coil being tested requires a ballast resistor, or any fixed or variable means to make the voltage and/or the current in the ignition circuit vary.

**2.1.3 Distributor** which distributes the ignition impulses to the spark-plugs. It may also contain means of triggering and/or timing adjustment, all of which have a proper angular interrelationship to themselves and to the engine.

**2.1.4 Auxiliary switching device** implicit with the system being tested such as a transistorized control unit.

### 2.2 Static (distributorless) ignition system with single-ended coils

The following components shall be interconnected as shown in Figure 2 or in any other circuit which has been proved to be equivalent.

**2.2.1 Coils** which, depending on the system tested, may be

- single-ended coils as described in 2.1.1, or
- a multiple high-tension terminal assembly formed by single-ended coils, or
- plug-top coils.

**2.2.2 Auxiliary switching device** implicit with the system being tested such as a transistorized control unit.

### 2.3 Static (distributorless) ignition system with double-ended coil(s)

The following components shall be interconnected as shown in Figure 3 or in any other circuit which has been proved to be equivalent.

**2.3.1 Coils** which, depending on the system tested, may be

- double-ended coils, or
- a multiple high-tension terminal assembly formed by double-ended coils.

**2.3.2 Auxiliary switching device** implicit with the system being tested such as a transistorized control unit.

## 3 Test equipment

**3.1 Variable d.c. power supply** having a 10 % to 90 % transient recovery time of not more than 50  $\mu$ s over the load range encountered in use. It shall have no more than 50 mV variation in average voltage from no-load to full ignition system load and no more than 100 mV peak-to-peak ripple over the same load range. This power supply may be substituted by a battery with or without a charging system. The power supply shall be positioned immediately adjacent to the system being tested.

**3.2 Oscilloscope** with a maximum rise time of 35 ns, with a minimum band pass of 10 MHz, shall be used ( $P_1$  and  $P_2$ ). The overall uncertainty of measurement including voltage and current probes (see 3.3 and 3.4) shall be less than 3 %.

**3.3 Voltage probe** ( $R_D$ ) with an input capacitance smaller than or equal to 5 pF and an input resistance of 100 M $\Omega$  or greater.

**3.4 Current probe** ( $P_1$ ) suitable for d.c. to 10 MHz.

**3.5 d.c. ammeter** ( $P_3$ ) with a maximum voltage drop of 100 mV under test conditions.