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Road vehicles — Ignition systems — Test methods and requirements for high voltage boots on plug-top coils and pencil coils

Véhicules routiers — Systèmes d'allumage — Méthodes d'essai et exigences en «boots» haute tension sur des bobines droites et des bobines crayons

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Foreword

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The main task of technical committees is to prepare International Standards. Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

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ISO 19813 was prepared by Technical Committee ISO/TC 22, *Road vehicles*, Subcommittee SC 1, *Ignition equipment*.

Road vehicles — Ignition systems — Test methods and requirements for high voltage boots on plug-top coils and pencil coils

1 Scope

This International Standard specifies tests and requirements for all types of high voltage boots on plug-top coils and pencil coils.

2 Tests and requirements

2.1 General

2.1.1 General test conditions

If not otherwise specified all tests shall be carried out at room temperature (RT) (23 ± 5) °C.

Each test sequence shall be started with unused test samples.

Spark-plug insulator shall be manufactured in accordance with the customer's requirements.

The boot shall be positioned on the spark-plug insulator as defined by the customer.

During the whole test sequence, the boot shall be in the specified condition (with/without grease) as defined by the customer.

2.1.2 Visual examination

2.1.2.1 Test

Before and after the tests in 2.2.1 and 2.2.2 respectively, carry out the visual examination with naked eye, corrected, if necessary, to give normal strength of vision and normal colour perception, at the most favourable viewing distance and with suitable illumination.

2.1.2.2 Requirement

Visual examination as in 2.1.2.1 shall allow identification, appearance, workmanship and finish of the item to be checked against the relevant specification.

During visual examination, special care shall be taken to ensure that as a minimum requirement no cracking, significant discoloration, deformation and, where applicable, no ingress of water is in evidence.

2.2 Electrical insulation tests

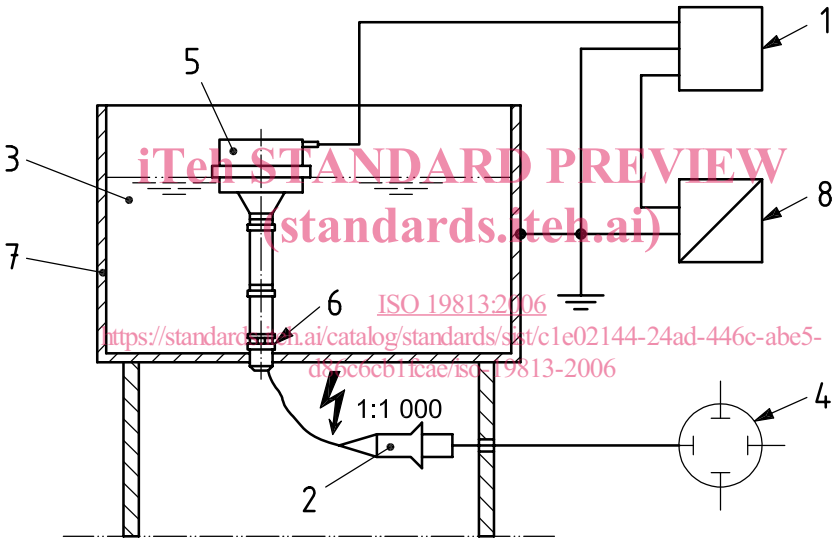
2.2.1 Sealing test

2.2.1.1 Arrangement of the samples

Install a spark-plug in the test fixture shown in Figure 1. Fit the coil with the high tension boot and connect it with the spark-plug in accordance with the application. Do not disconnect the components throughout the entire test.

Expose the arrangement to a preconditioning of (120 ± 5) °C and 10 % to 95 % relative humidity for at least 100 h before starting the test sequence.

Allow the arrangement to cool down to RT after the preconditioning, then fill saltwater into the container until the surface of the saltwater bath is at least 10 mm above the lower end of the high tension boot. Other fluid levels may be defined by agreement between customer and supplier.



Key

1 control unit
2 high voltage probe
3 NaCl/water solution (3 %) or steel balls ∅ 3 mm, level see 2.1.2.1 or 2.2.2.1
4 oscilloscope
5 ignition coil
6 spark-plug insulator (as agreed between customer and supplier)
7 container with grounded liquid or steel balls
8 power supply

NOTE An option is to control the voltage by the use of an external gap.

Figure 1 — Electrical insulation test arrangement

2.2.1.2 Test conditions

The ignition coil shall be operated under the conditions specified by the coil manufacturer (voltage, current and charge time):

— Pulse rate: 50 Hz or 60 Hz;

— Secondary voltage: 25 kV minimum;

— Test duration: > 10 min;

— Temperature: RT;

— Start of test: immediately after immersion of the sample in the liquid.

2.2.1.3 Requirement

During the entire test no flash-over or breakdown shall occur.

2.2.2 Breakdown test

2.2.2.1 Arrangement of the samples

Install a spark-plug in the test fixture shown in Figure 1. Fit the coil with the high tension boot and connect it with the spark-plug in accordance with the application. Do not disconnect the components throughout the entire test.

Expose the arrangement to a preconditioning of (120 ± 5) °C and 10 % to 95 % relative humidity for at least 100 h before starting the test sequence.

Allow the arrangement to cool down to RT after the preconditioning, then fill steel balls into the container until the surface of the steel ball is on the upper end of the high tension boot. Other levels may be defined by agreement between customer and supplier.

2.2.2.2 Test conditions

The ignition coil shall be operated under the conditions specified by the coil manufacturer (voltage, current and charge time):

— Pulse rate: 50 Hz or 60 Hz;

— Secondary voltage 25 kV minimum;

— Test duration: > 10 min;

— Temperature: RT;

— Start of test: after insertion of the sample in the steel ball bath.

2.2.2.3 Requirement

During the entire test no flash-over or breakdown shall occur.

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