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Reciprocating internal combustion engines — Vocabulary of components and systems —

Part 10: Ignition systems

Moteurs alternatifs à combustion interne — Vocabulaire des composants et des systèmes —

Partie 10: Systèmes d'allumage

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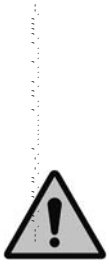

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Foreword

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For an explanation on the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the WTO principles in the Technical Barriers to Trade (TBT) see the following URL: Foreword - Supplementary information

The committee responsible for this document is ISO/TC 70, *Internal combustion engines*.

ISO 7967 consists of the following parts, under the general title *Reciprocating internal combustion engines — Vocabulary of components and systems*:

— *Part 1: Structure and external covers*

— *Part 2: Main running gear*

— *Part 3: Valves, camshaft drives and actuating mechanism*

— *Part 4: Pressure charging and air/exhaust gas ducting systems*

— *Part 5: Cooling systems*

— *Part 6: Lubricating systems*

— *Part 7: Governing systems*

— *Part 8: Starting systems*

— *Part 9: Control and monitoring systems*

— *Part 10: Ignition systems*

— *Part 11: Fuel systems*

— *Part 12: Exhaust emission control systems*

Reciprocating internal combustion engines — Vocabulary of components and systems —

Part 10: Ignition systems

1 Scope

This part of ISO 7967 establishes a vocabulary for ignition systems of reciprocating internal combustion engines.

ISO 2710-1 gives a classification of reciprocating internal combustion engines and defines basic terms and definitions of such engines and their characteristics.

In this part of ISO 7967, the terms are classified as follows:

a) types of ignition systems;

b) conventional ignition systems;

c) electronic ignition systems;

d) computer-controlled ignition systems;

e) parameters for ignition systems.

2 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

2.1 Types of ignition systems

2.1.1
ignition system
ignition device system to ignite the fuel-air mixture in the cylinder

2.1.2
battery coil ignition system
ignition system (2.1.1) by battery and ignition coil

Note 1 to entry: See Figure 1.

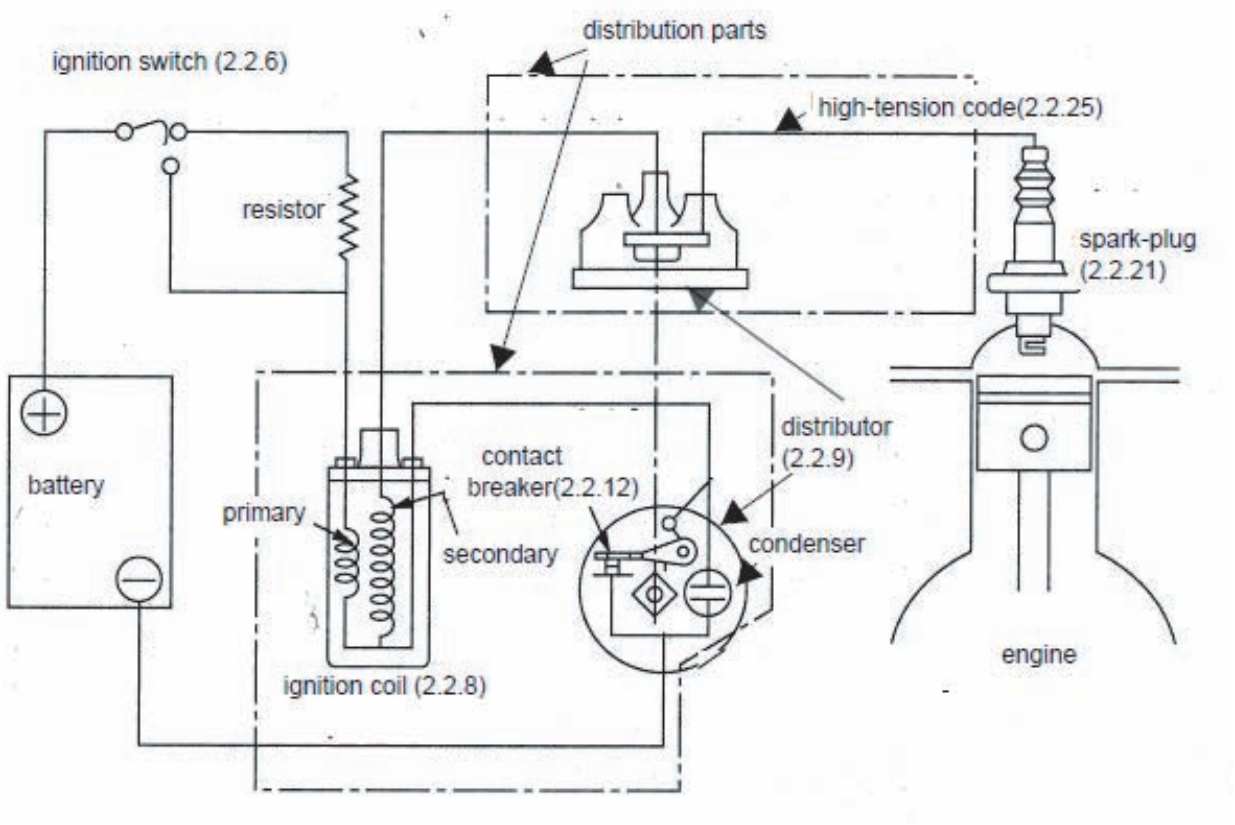

Figure 1 — Typical configuration of battery coil ignition system

2.1.3
magneto ignition system
ignition system (2.1.1) by *magneto* (2.2.1)

2.1.4
high-tension ignition system
ignition system (2.1.1) by high voltage electricity of secondary circuit of ignition coil produced by intermitting the current in the primary circuit

2.1.5
dual ignition system
ignition system (2.1.1) with duplicate lines for redundancy

2.1.6
multi-point ignition system
ignition system (2.1.1) with more than two igniters installed on one cylinder

Note 1 to entry: Ignition system with two igniters is called a two-point ignition system.

2.1.7
electronic ignition system
ignition system (2.1.1) with ignition timing control by electronic device or circuit

2.1.8
conventional ignition system
ignition system (2.1.1) with mechanical ignition timing control by the *contact breaker* (2.2.12) of the *distributor* (2.2.9)

2.1.9
electronic ignition system with breaker
electronic ignition system (2.1.7) with *contact breaker* (2.2.12)

2.1.10
breakerless electronic ignition system
electronic ignition system (2.1.7) without *contact breaker* (2.2.12)

2.1.11
computer-controlled ignition system
digital ignition system
computer-based ignition system which is usually a part of the electronic engine control unit (ECU)

Note 1 to entry: ECU consists of a central control unit (CPU) or a microprocessor, random access memory (RAM), read only memory (ROM), and input/output interfaces. Based on information from input sensors (engine air flow, coolant temperature, crank position, throttle position, etc.), ECU determines optimum settings for the output actuators of fuel injection, ignition timing, idle speed, etc..

2.1.12
micro-pilot ignition system
ignition system (2.1.1) for gas engines, in which ignition takes place by the flame made in the small sub-combustion chamber (pre-chamber) provided on the cylinder head

2.2 Conventional ignition systems

2.2.1
magneto
electric generator for ignition using permanent magnet

2.2.2
two-point ignition magneto
magneto (2.2.1) for two-point ignition which has one rotor and two sets of electric circuits

2.2.3
flywheel magneto
magneto (2.2.1) with the rotor which also works as a flywheel for the engine

2.2.4
starting vibrator
electromagnetic vibrator which supplies intermittent electric current starting from the battery to the primary circuit of the *magneto* (2.2.1) directly connected with the engine to assist ignition

2.2.5
permanent magnet circuit
magnetic circuit which includes the components such as permanent magnets and armatures

2.2.6
ignition switch
switch which opens and closes the primary circuit of the *ignition system* (2.1.1)

2.2.7
earth switch
stop switch
switch to short-circuit the primary circuit of the *magneto* (2.2.1) to shut-down the engine

2.2.8
ignition coil
ignition armature
coil which produces high voltage for ignition in the *battery coil ignition system* (2.1.2) or the *magneto ignition system* (2.1.3)

Note 1 to entry: See Figure 2.

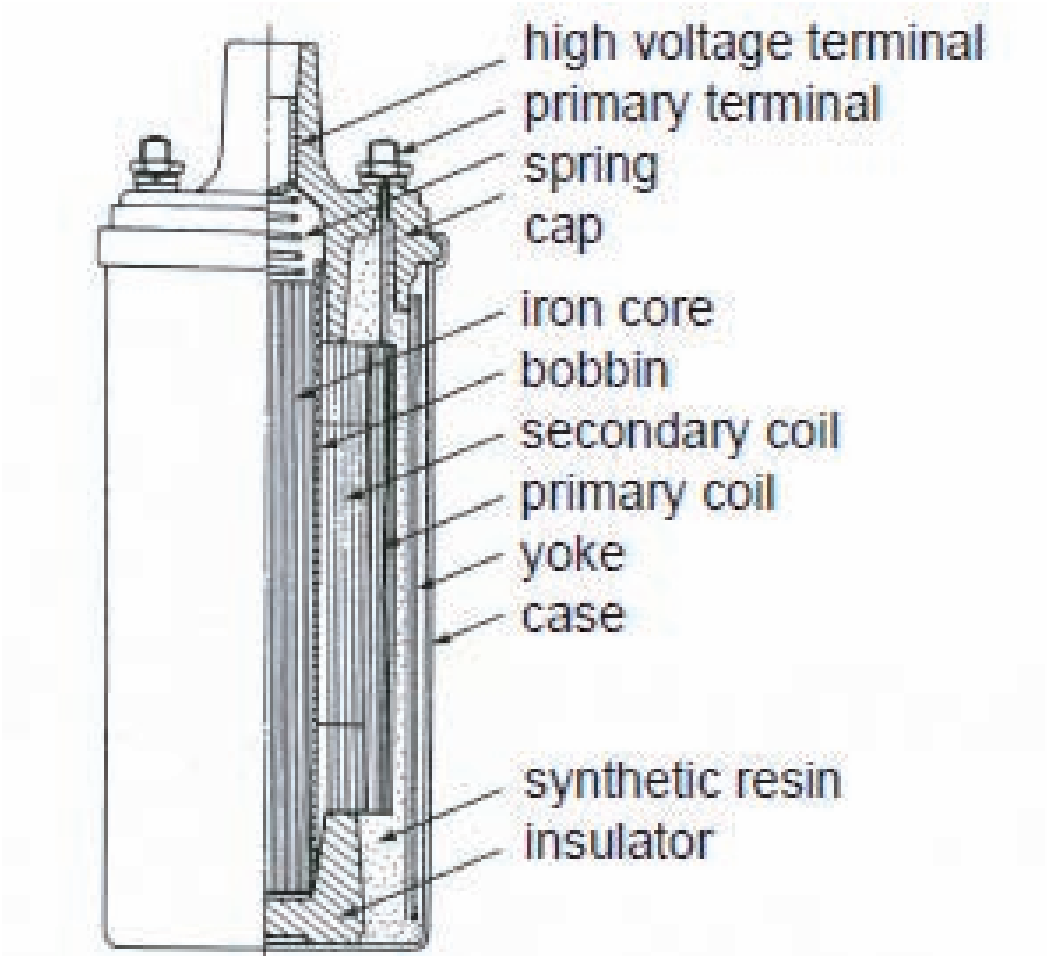

Figure 2 — Typical ignition coil

2.2.9
distributor
device which distributes high voltage electricity for ignition to cylinders of multi-cylinder engine in the proper order

Note 1 to entry: See Figure 3.

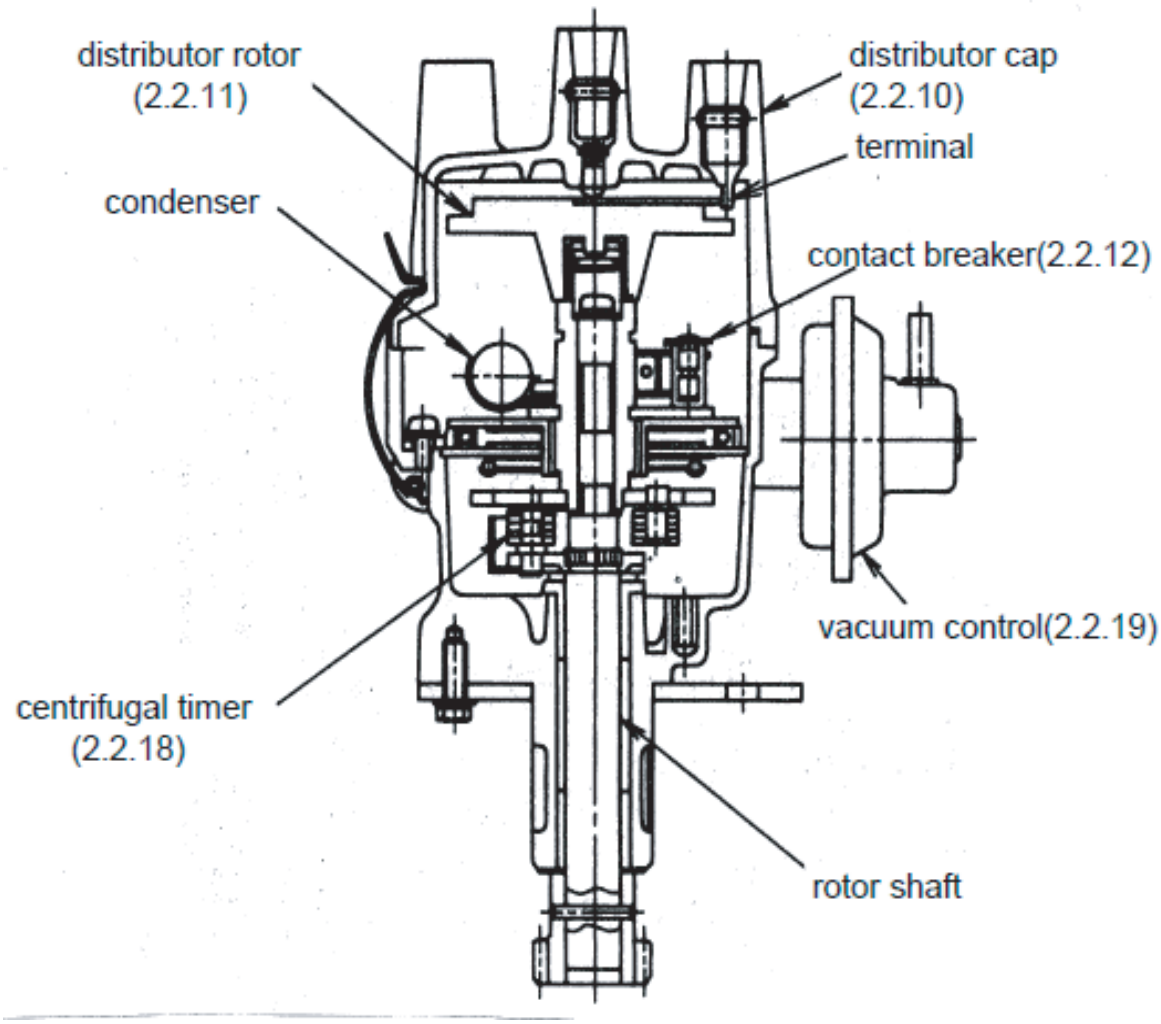

Figure 3 — Typical construction of distributor

2.2.10
distributor cap
distributor cover
part of *distributor* (2.2.9) which has the arrangement of terminals for proper distribution of high voltage electricity for ignition

2.2.11
distributor rotor
distributor arm
rotating part of *distributor* (2.2.9) which distributes high voltage electricity to the terminals of *distributor cap* (2.2.10)

2.2.12
contact breaker
device which opens and closes the primary circuit of the *distributor* (2.2.9)

2.2.13
breaker points
contact points
electric terminal in the *distributor* (2.2.9) for opening and closing of primary circuit

2.2.14
timing cam
distributor cam
contact breaker cam
cam which controls a contact breaker lever

2.2.15
cam type ignition timing advancer
device for *ignition timing advance* (2.5.3) by varying the relative angle between axis of *distributor rotor* (2.2.11) and *timing cam* (2.2.14)

2.2.16
shaft timing advancer
timing advance system which varies the relative angle between axes of *magneto* (2.2.1) and engine shaft

2.2.17
auto-timer
automatic spark advance
ignition timing advancer which works automatically according to the engine speed and power

2.2.18
centrifugal timer
centrifugal control
centrifugal advance
auto-timer (2.2.17) working by centrifugal force

2.2.19
vacuum control
vacuum advance
auto-timer (2.2.17) working by intake air pressure

2.2.20
multi-contact distributor
distributor (2.2.9) with more than two sets of *contact breakers* (2.2.12) which are switched depending on operating condition of the engine

2.2.21
spark-plug
part which ignites fuel-air mixture with the spark generated between electrodes by high voltage

Note 1 to entry: See Figure 4.

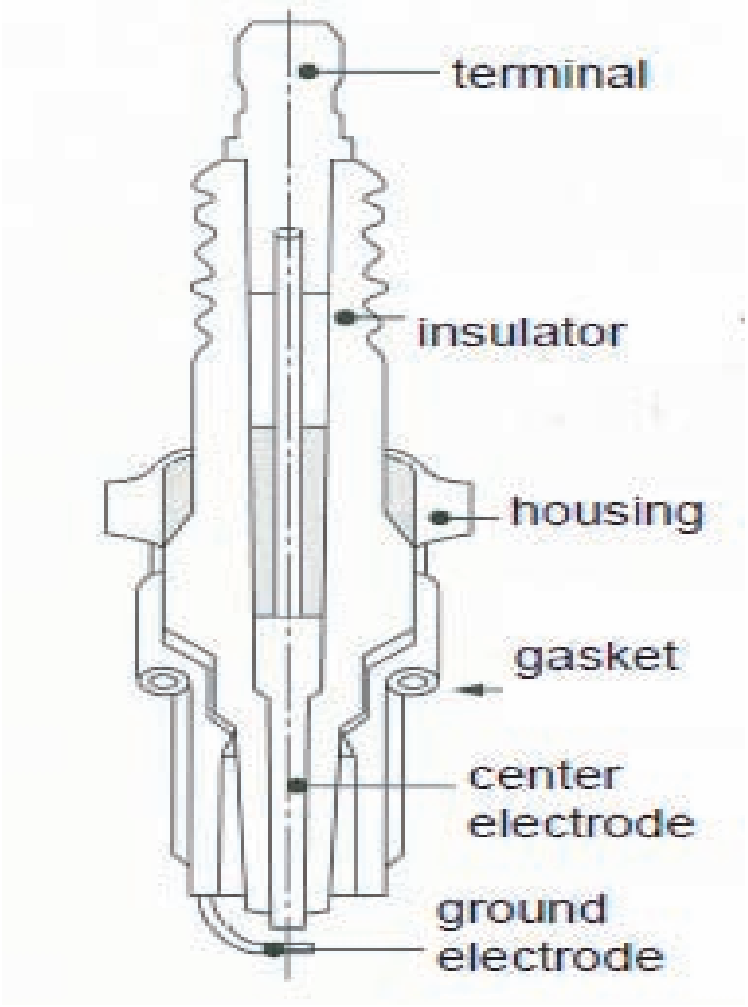

Figure 4 — Cut-out view of spark-plug

2.2.22
spark-gap
gap between two electrodes of the *spark-plug* (2.2.21)

2.2.23
cold type spark-plug
spark-plug (2.2.21) resistible to pre-ignition with high *heat value* (2.5.4)

2.2.24
hot type spark-plug
spark-plug (2.2.21) with low *heat value* (2.5.4) and easily heated

2.2.25
high-tension cord
high-tension cable
cable which connects high voltage terminal of *ignition system* (2.1.1) and *spark-plug* (2.2.21)

2.3 Electronic ignition systems

2.3.1
transistor ignitor system
ignition system (2.1.1) using transistors

2.3.1.1
full-transistor ignitor
transistor ignitor which initiates the primary electric current by electric signals instead of *contact breaker* (2.2.12)

2.3.1.2
semi-transistor ignitor
transistor ignitor using contact breaker signal for initiating the primary electric current

2.3.2
magneto electronic ignition system
ignition system (2.1.1) in which *magneto* (2.2.1) is used to obtain high voltage electric current

2.3.3
condenser discharge ignition system
CDI system
ignition system (2.1.1) which obtains high voltage in the secondary coil by emitting the charge saved in the condenser into the primary coil

2.3.4
Hall type (electronic) ignition system
ignition system (2.1.1) in which ignition timing signal is produced by "Hall effect" switch

Note 1 to entry: When magnetic field is applied to the conductor material with passing current in one direction, at a right angle to its surface, small voltage is generated in the material. This effect is called "Hall effect" after the discoverer of this phenomenon.

2.3.5
photoelectric ignition system
ignition system (2.1.1) in which an infrared sensor triggers *primary current* (2.5.13)when a rotor blade blocks the light path

2.3.6
oscillating electronic ignition system
ignition system (2.1.1) in which ignition timing is produced by eddy current disruption of two coil sensors caused by magnet passing by

2.4 Computer-controlled ignition systems

2.4.1
direct ignition system
ignition system (2.1.1) in which the coil-on-plug is used and ignition is controlled electronically by ECU

2.4.2
crankshaft position sensor
electronic device used to monitor the position of rotational speed of the crankshaft

2.4.3
camshaft position sensor
electronic device used to monitor the position of the camshaft

2.4.4
single spark ignition coil
coil-on-plug which produces one ignition spark

2.4.5
dual spark ignition coil
coil-on-plug which produces two sparks for two cylinders

2.5 Parameters for ignition systems

2.5.1
dwell angle
rotation angle during the *breaker point* (2.2.13) is closing

2.5.2
minimum advance for best torque
MTB
latest ignition timing for maximum engine torque at the same operating condition

2.5.3
ignition timing advance
to advance the ignition timing from the reference or the rotation angle of crankshaft equivalent to the advance in time

2.5.4
heat value (of spark-plug)
numerical value indicating the characteristics against pre-ignition

2.5.5
heat rating
temperature range of the centre electrode of *spark-plug* (2.2.21), usable without malfunction such as pre-ignition

2.5.6
cold fouling rating
criterion of the ability of a *spark-plug* (2.2.21) to resist fouling rate by products of combustion, and for self-cleaning under normal conditions

[SOURCE: ISO 6518-1:2002, 6.5]

2.5.7
supply voltage
d.c. voltage at the input of the system

[SOURCE: ISO 6518-1:2002, 5.30]

2.5.8
required spark-plug voltage
voltage required at the spark-plug terminal necessary to fire the *spark-plug* (2.2.21)

[SOURCE: ISO 6518-1:2002, 5.5]

2.5.9
minimum available voltage
minimum voltage available at the spark-plug terminal when the system is loaded by a capacitor and a resistor in parallel

[SOURCE: ISO 6518-1:2002, 5.4]

2.5.10
spark duration
time during which a spark is present across the *spark-gap* (2.2.22)

[SOURCE: ISO 6518-1:2002, 5.22]

2.5.11
arc voltage
voltage observed at the spark-plug terminal during arcing

2.5.12
ignition voltage reserve
difference between the available voltage and the *required spark-plug voltage* (2.5.8)

[SOURCE: ISO 6518-1:2002, 5.6]

2.5.13
primary current
electrical current flowing through the coil primary winding

[SOURCE: ISO 6518-1:2002, 5.11]

2.5.14
coil interruption
interruption acted on the primary circuit current of the ignition coil by a switch or other signalling device to generate high voltage in the secondary circuit by electromagnetic induction

2.5.15
spark energy
energy discharged between the spark-gap electrodes, including both capacitive and inductive components

[SOURCE: ISO 6518-1:2002, 5.23]

2.5.16
spark current
current passing between the spark-gap electrodes

[SOURCE: ISO 6518-1:2002, 5.20]

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