
**Reciprocating internal combustion
engines — Vocabulary —**

**Part 2:
Terms for engine maintenance**

Moteurs alternatifs à combustion interne — Vocabulaire —

Partie 2: Termes relatifs à la maintenance du moteur

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Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular, the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received (see www.iso.org/patents).

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For an explanation of the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT) see www.iso.org/iso/foreword.html.

This document was prepared by Technical Committee ISO/TC 70, *Internal combustion engines*.

This second edition cancels and replaces the first edition (ISO 2710-2:1999), which has been technically revised.

The main changes compared to the previous edition are as follows:

- new terms and definitions have been added;
- French and Russian expressions in ISO 2710-2:1999 have been deleted;
- index has been deleted.

A list of all parts in the ISO 2710 series can be found on the ISO website.

Any feedback or questions on this document should be directed to the user's national standards body. A complete listing of these bodies can be found at www.iso.org/members.html.

Reciprocating internal combustion engines — Vocabulary —

Part 2: Terms for engine maintenance

1 Scope

This document defines terms relating to the characteristics of engines and their components relevant to maintenance activities.

This document gives a classification of terms according to reasons for their use and defines typical means, failures and procedures resulting in or from engine maintenance.

2 Normative references

There are no normative references in this document.

3 Terms and definitions

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

- ISO Online browsing platform: available at <http://www.iso.org/obp>
ISO 2710-2:2019
https://standards.iteh.ai/catalog/standards/sist/b1b7e16b-0c7f-4ca5-9aba-0e66705f9f5a/iso-2710-2-2019
- IEC Electropedia: available at <http://www.electropedia.org/>

3.1 Main definitions

3.1.1

failure

premature malfunction or *breakdown* (3.5.7) of a function, a component or the whole engine

3.1.1.1

critical failure

failure (3.1.1) that may cause personal casualty, engine scrap or breaking the laws or regulations

3.1.1.2

major failure

failure (3.1.1) that causes remarkable degradation of engine performance or *breakdown* (3.5.7) of main components, and cannot be repaired by replacing the *spare part* (3.3.15) with common tools in a short time

Note 1 to entry: The short time is generally 30 min.

3.1.1.3

minor failure

failure (3.1.1) that affects the performance of the engine, but does not cause *breakdown* (3.5.7) of main components, and can be repaired by replacing the part with spare with common tools, usually in a short time

Note 1 to entry: The short time is generally 30 min.

**3.1.1.4
mild failure**

failure (3.1.1) that does not affect the performance of the engine and can be repaired by replacing the *spare part* (3.3.15) with common tools in 5 min

**3.1.1.5
failure cause**

reason or factor that causes *failure* (3.1.1) of the engine or a component

EXAMPLE Design, manufacture, performance and maintenance, etc.

**3.1.1.6
failure mechanism**

mechanism that causes the *failure* (3.1.1) of the engine or a component

EXAMPLE Physical, chemical, biological or other processes.

**3.1.1.7
failure mode**

manifestation of the engine or a component *failure* (3.1.1)

EXAMPLE Crack, wear and function recession, etc.

**3.1.1.8
mean time between failures
MTBF**

mean time between two *failures* (3.1.1), which is the predicted elapsed time between inherent failures of the engine during operation

Note 1 to entry: It is expressed in hours (h).

**3.1.1.9
mean time to first failure
MTTFF**

mean accumulated working time to the first *failure* (3.1.1), which initiates engine shut-down for the first time

Note 1 to entry: It is expressed in hours (h).

**3.1.2
inspection**

assessment of the condition of the engine or a component

**3.1.3
maintenance**

means or activities designed to assure the service life of the engine

**3.1.3.1
repair**

maintenance (3.1.3) implemented to restore the engine malfunction to its original state

**3.1.3.2
repair time**

time spent on repairing the engine

**3.1.3.3
off-site maintenance**

maintenance (3.1.3) implemented not on the site where the engine is used

**3.1.3.4
on-site maintenance**

maintenance (3.1.3) implemented on the site where the engine is used

3.1.3.5**preventive maintenance**

predetermined service or *maintenance* (3.1.3) implemented on the engine in scheduled intervals to reduce the *failure* (3.1.1) probability or prevent function degeneration

3.1.3.6**preventive maintenance time**

time spent on the *preventive maintenance* (3.1.3.5) of the engine

3.1.4**maintainability**

ability of the engine to maintain or restore its original state after the *maintenance* (3.1.3) implemented in accordance with the specified procedure and method, while the engine is used with the specified condition and time

3.2 Maintenance procedures**3.2.1****adjusting**

procedure to set a variable control mechanism of the engine to the correct specification

3.2.2**barring**

turning

method of rotating the engine for *inspection* (3.1.2) and *maintenance* (3.1.3) purposes, without firing

3.2.3**debugging**

adjustment and test aimed for restoring the engine to its normal operation condition after *maintenance* (3.1.3)

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3.2.4**fault diagnosis**

diagnosis implemented to confirm whether the condition of the engine is normal, and identify where the fault happens and the reason without disassembling the engine

3.2.5**pressure-testing**

leak testing of a component using pressurized air, water or oil

3.3 Maintenance means**3.3.1****consumable part**

low-cost part which is renewed as a routine matter

3.3.2**glaze-busting**

treatment given to the running surface of the cylinder liners when the engine is fitted with new piston rings to improve the lubricating oil retention properties

3.3.3**maintenance concept**

specific implementation of engine *maintenance* (3.1.3)

Note 1 to entry: The maintenance concept includes the *maintenance* content, surrounding condition, resources, procedure and quality warranty, etc.

**3.3.4
maintenance schedule**

list of *maintenance* (3.1.3) tasks to be performed at predetermined intervals

**3.3.5
overhaul**

maintenance (3.1.3) activity in which the engine is stripped and the main base components are inspected, replaced or reconditioned and then the engine is reassembled for use

Note 1 to entry: The main base components generally include: crankcase, liner, piston package, crankshaft, main bearing, cylinder head, camshaft, connecting rod and bearing, valve train, drive gear, etc.

**3.3.5.1
time to first overhaul**

TTFO

first overhaul period

time or mileage from the start of using the engine to its first *overhaul* (3.3.5)

**3.3.5.2
time between overhaul**

TBO

repair interval

time between two consecutive *overhauls* (3.3.5) of the engine under the required operating condition

**3.3.6
medium repair**

maintenance (3.1.3) activity in which the main outer components are disassembled for cleaning, *adjusting* (3.2.1), renewing and overhauling, and the engine is not stripped to restore the performance and function of the engine

Note 1 to entry: The main outer components generally include fuel pump, supercharger, water pump, damper, starter, generator, lubricating oil pump, after-treatment device, etc.

**3.3.7
minor repair**

maintenance (3.1.3) activity, to restore the performance of the engine, in which only the outer parts are disassembled for cleaning, reconditioning, renewing and *adjusting* (3.2.1) to solve the problems found by daily or regular *inspection* (3.1.2)

**3.3.8
recondition**

rework

overhaul (3.3.5) of single parts, subassemblies, systems or the whole engine

**3.3.9
reconditioned part**

reworked part

single part or subassembly reconditioned (reworked) by mechanical processes

**3.3.10
replacement part**

single part or subassembly used to replace a worn or failed part or subassembly

**3.3.11
retightening**

tightening of screws, bolts and nuts after a period of running-in, in accordance with the requirements of the engine manufacturer

3.3.12**running-in**

running the engine according to a programmed or suitable schedule after production or major *overhaul* (3.3.5) to improve friction conditions and check for leaks

3.3.13**cold running-in**

running a reconditioned engine by external drive

3.3.14**hot running-in**

running a reconditioned engine by operating on its own

3.3.15**spare part**

single part or subassembly that held in stock as a replacement unit

3.3.16**dressing out**

mechanical means of removing small surface defects

3.3.17**welding up**

welding method and process to repair the failed components

3.4 Engine failures**3.4.1****abnormal noise**

noises caused by incorrect valve clearance, ignition timing *adjusting* (3.2.1) or other unknown reasons

EXAMPLE

Rat-tat, dang-dang, cha-cha and cough.

3.4.2**abnormal piston blow-by**

excessive passage of combustion gases past the piston rings into the crankcase or the scavenging room

3.4.3**abnormal vibration**

vibration of components, such as high-pressure oil pump, inter cooler and speed controller that can be seen by naked eyes and felt with hands

3.4.4**abnormal wear**

unusual wear that is too quick on the surface of moving parts

3.4.5**belt sag**

deflection of a belt at the centre of the longest run between two belt pulleys under the application of a specified load

3.4.6**cold fuel filter clogging**

cold fuel filter plugging

blocking (3.5.6) of fuel passage through a fuel filter due to the formation of wax crystals at low fuel temperature

3.4.7**compressor surge**

breakdown (3.5.7) of the regular flow in a turbocharger compressor resulting in a rapid variation of flow rate for a given pressure making a pulsating noise at the turbocharger intake