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Methods of test for full-flow lubricating oil filters for internal combustion engines —

Part 7: **Vibration fatigue test**

*Méthodes d'essai des filtres à huile de lubrification à passage intégral
pour moteurs à combustion interne —*

Partie 7: Essai de fatigue aux vibrations



Reference number
ISO 4548-7:1990(E)

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.

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.

International Standard ISO 4548-7 was prepared by Technical Committee ISO/TC 70, *Internal combustion engines*.

ISO 4548 consists of the following parts, under the general title *Methods of test for full-flow lubricating oil filters for internal combustion engines*:

- Part 1: Pressure drop/flow characteristics
- Part 2: Element by-pass component characteristics
- Part 3: Resistance to high pressure drop and to elevated temperature
- Part 4: Initial particle retention efficiency, life and cumulative efficiency (gravimetric method)
- Part 5: Cold start simulation and hydraulic pulse durability test
- Part 6: Static burst pressure test
- Part 7: Vibration fatigue test
- Part 8: Inlet anti-drain valve test
- Part 9: Outlet anti-drain valve tests
- Part 10: Presence of water in oil

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- *Part 11: Filters with self cleaning*
- *Part 12: Particle retention ability and contaminant holding capacity using particle counting*

Annex A of this part of ISO 4548 is for information only.

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Introduction

ISO 4548 establishes standard test procedures for measuring the performance of full-flow lubricating oil filters for internal combustion engines. It has been prepared in separate parts, each part relating to a particular performance characteristic.

Together the tests provide the information necessary to assess the characteristics of a filter but, if agreed between the purchaser and the manufacturer, the tests may be conducted separately.

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Methods of test for full-flow lubricating oil filters for internal combustion engines —

Part 7:

Vibration fatigue test

1 Scope

This part of ISO 4548 specifies a method of testing the constructional integrity of full-flow lubricating oil filters to withstand engine or installation vibration.

This test is intended for application to spin-on type filters and detachable filters with disposable elements with a maximum flow rate of 100 l/min. The test may also be applied to other filters if thought applicable by agreement between the filter manufacturer and the purchaser.

2 Normative reference

The following standard contains provisions which, through reference in this text, constitute provisions of this part of ISO 4548. At the time of publication, the edition indicated was valid. All standards are subject to revision, and parties to agreements based on this part of ISO 4548 are encouraged to investigate the possibility of applying the most recent edition of the standard indicated below. Members of IEC and ISO maintain registers of currently valid International Standards.

ISO 4548-1:1982, *Methods of test for full-flow lubricating oil filters for internal combustion engines — Part 1: Pressure drop/flow characteristics*.

3 Definitions and graphical symbols

3.1 Definitions

For the purposes of this part of ISO 4548, the definitions given in ISO 4548-1 apply.

3.2 Graphical symbols

The graphical symbols used in this part of ISO 4548 are in accordance with ISO 1219 [1].

4 Operational characteristics to be tested

Integrally mounted oil filter assemblies, including filter heads, adaptors, mounting brackets, etc., are subjected to forcing frequencies due to engine or installation vibration. The test establishes the ability of the filter assembly to withstand vibration under pressure, for a predetermined number of cycles.

5 Test rig

The test rig shall comprise the following components, together with the necessary tubing, connectors and supports (see figure 1):

- electro-mechanical vibrator, together with sinusoidal oscillator and frequency controller, amplifier and display unit to indicate displacement, velocity and acceleration;
- oil pressure source, which may be manually or mechanically operated;
- oil pressure gauge 0 to 7 bar (0 to 700 kPa);
- two accelerometers, featuring linear calibration over a minimum range of -100 m/s^2 to $+100 \text{ m/s}^2$;
- filter to be tested, together with filter head or adaptor.