INTERNATIONAL STANDARD

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Road vehicles — Cleanliness of components of fluid circuits —

Part 5:
Method of extraction of contaminants on functional test bench

Véhicules routiers — Propreté des composants des circuits de fluide —

Partie 5: Méthode d'extraction des contaminants sur banc d'essai fonctionnel

Reference number
ISO 16232-5:2007(E)

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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.

International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 2.

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.

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.

ISO 16232-5 was prepared by Technical Committee ISO/TC 22, *Road vehicles*, Subcommittee SC 5, *Engine test*.

ISO 16232 consists of the following parts, under the general title *Road vehicles — Cleanliness of components of fluid circuits*:

- *Part 1: Vocabulary*
- *Part 2: Method of extraction of contaminants by agitation*
- *Part 3: Method of extraction of contaminants by pressure rinsing*
- *Part 4: Method of extraction of contaminants by ultrasonic techniques*
- *Part 5: Method of extraction of contaminants on functional test bench*
- *Part 6: Particle mass determination by gravimetric analysis*
- *Part 7: Particle sizing and counting by microscopic analysis*
- *Part 8: Particle nature determination by microscopic analysis*
- *Part 9: Particle sizing and counting by automatic light extinction particle counter*
- *Part 10: Expression of results*

Introduction

The presence of particulate contamination in a liquid system is acknowledged to be a major factor governing the life and reliability of that system. The presence of particles residual from the manufacturing and assembly processes will cause a substantial increase in the wear rates of the system during the initial run-up and early life, and may even cause catastrophic failures.

In order to achieve reliable performance of components and systems, control over the amount of particles introduced during the build phase is necessary, and measurement of particulate contaminants is the basis of control.

The ISO 16232 series has been drafted to fulfil the requirements of the automotive industry, since the function and performance of modern automotive fluid components and systems are sensitive to the presence of a single or a few critically sized particles. Consequently, ISO 16232 requires the analysis of the total volume of extraction liquid and of all contaminants collected using an approved extraction method.

The ISO 16232 series has been based on existing ISO International Standards such as those developed by ISO/TC 131/SC6. These International Standards have been extended, modified and new ones have been developed to produce a comprehensive suite of International Standards to measure and report the cleanliness levels of parts and components fitted to automotive fluid circuits.

This part of ISO 16232 defines procedures for the removal and collection of contaminants from components using a flow of test liquid in conditions as close as possible to the ones components are actually used in so that their cleanliness can be evaluated.

The cleanliness level of a component, as determined according to this method, depends to a large extent on the parameters of the test such as the capacity of the test bench to reproduce the operating conditions and the requirements of the component (e.g. flow conditions, duration of flowing, etc). All parameters are included in the cleanliness specification and in the inspection document and it is advisable that they be rigorously followed by the test staff.

Road vehicles — Cleanliness of components of fluid circuits —

Part 5:
Method of extraction of contaminants on functional test bench

1 Scope

This part of ISO 16232 describes the principles of extraction of contaminants by test on a laboratory functional test bench with the test liquid flowing under pressure or under vacuum. It is applicable to both active and passive components through which the fluid can easily flow.

Unless otherwise specified, this part of ISO 16232 deals with particulate contamination only. It does not, therefore, cover appearance defects or contamination by liquid or gaseous materials. It covers the amount and the nature of residual particles resulting from manufacturing processes and from the environment.

2 Normative references

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 16232-1, *Road vehicles — Cleanliness of components of fluid circuits — Part 1: Vocabulary*

ISO 16232-2, *Road vehicles — Cleanliness of components of fluid circuits — Part 2: Method of extraction of contaminants by agitation*

ISO 16232-3, *Road vehicles — Cleanliness of components of fluid circuits — Part 3: Method of extraction of contaminants pressure rinsing*

ISO 16232-4, *Road vehicles — Cleanliness of components of fluid circuits — Part 4: Method of extraction of contaminants by ultrasonic techniques*

ISO 16232-6, *Road vehicles — Cleanliness of components of fluid circuits — Part 6: Particle mass determination by gravimetric analysis*

ISO 16232-7, *Road vehicles — Cleanliness of components of fluid circuits — Part 7: Particle sizing and counting by microscopic analysis*

ISO 16232-8, *Road vehicles — Cleanliness of components of fluid circuits — Part 8: Particle nature determination by microscopic analysis*

ISO 16232-9, *Road vehicles — Cleanliness of components of fluid circuits — Part 9: Particle sizing and counting by automatic light extinction particle counter*

ISO 16232-10:2007, *Road vehicles — Cleanliness of components of fluid circuits — Part 10: Expression of results*