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Road vehicles — Compressed gaseous hydrogen (CGH2) and hydrogen/ natural gas blends fuel systems —

Part 2: Test methods

Véhicules routiers — Systèmes d'alimentation pour hydrogène gazeux comprimé (CGH2) et mélanges d'hydrogène et de gaz naturel —

Partie 2: Méthodes d'essai

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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).

Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

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 22, *Road vehicles*, Subcommittee SC 41, *Specific aspects for gaseous fuels*.

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.

A list of all the parts in the ISO 21266 series, can be found on the ISO website.

Road vehicles — Compressed gaseous hydrogen (CGH2) and hydrogen/natural gas blends fuel systems —

Part 2:
Test methods

1 Scope

This document specifies the test methods for checking the minimum safety requirements specified in ISO 21266-1. It is applicable to the functionality of the fuel systems designed to operate on compressed gaseous hydrogen and hydrogen/natural gas blends of motor vehicles as defined in ISO 3833.

For tests of individual components, refer to the parts of ISO 12619, ISO 16380, ISO 17268, ISO 19881[1)] and ISO/TS 15869 as applicable

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements 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 6487, *Road vehicles — Measurement techniques in impact tests — Instrumentation*

ISO 12619-1, *Road vehicles — Compressed gaseous hydrogen (CGH2) and hydrogen/natural gas blends fuel system components*

ISO 21266-1:2018, *Road vehicles — Compressed gaseous hydrogen (CGH2) and hydrogen/natural gas blends fuel systems — Part 1: Safety requirements*

3 Terms and definition

For the purposes of this document, the terms and definitions given in ISO 12619-1, ISO 21266-1 and the following apply.

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

— ISO Online browsing platform: available at https://www.iso.org/obp

— IEC Electropedia: available at http://www.electropedia.org/

3.1
notified body
government-appointed body mandated to approve or disapprove

1) Under preparation. Stage at the time of publication: ISO/FDIS 19881.

4 Test methods

4.1 Cylinder mounting strength tests

4.1.1 General

When a vehicle is equipped with several cylinders, they should preferably be tested as a unit.

When groups of cylinders are installed on a vehicle such that they are separately anchored to the original structure of the vehicle, then each separate group of cylinders may be tested individually.

When performing these tests, accessories and piping shall not contribute to reinforcing the cylinder mounting.

The requirements of ISO 21266-1:2018, 4.4.3, shall be verified by the test specified in 4.1.2, 4.1.3, 4.1.4 or 4.1.5 of this document.

4.1.2 Inertia test

The cylinder or cylinders to be tested shall be mounted on the vehicle body or a part of the vehicle body, according to the specifications of the original equipment manufacturer (OEM) or after-market converter.

The vehicle body or part of the vehicle body shall be firmly anchored to the test trolley. The method used for anchoring the vehicle body to the test trolley shall not result in reinforcement of the cylinder anchorages or the part of the vehicle structure participating in anchoring the cylinder or cylinders. Testing performed with a trolley shall geometrically match original vehicle conditions.

The test shall be carried out using the following procedure.

a) Fill the cylinder or cylinders with a mass corresponding to at least 90 % of the mass of compressed gaseous hydrogen and hydrogen/natural gas blends capacity at service pressure. The gas density for these conditions shall be considered to be equal to 0,2 kg/l.

b) Measure the trolley deceleration with data channels of channel frequency class (CFC) 60 corresponding to the characteristics given in ISO 6487.

c) Maintain the value of the deceleration as defined in ISO 21266-1, for the vehicle category, for at least 30 ms.

4.1.3 Static test

This test may be carried out on a vehicle body or on a part of a vehicle body.

The cylinder or cylinders to be tested shall be mounted on the vehicle body or on part of the vehicle body, according to OEM or after-market converter specifications.

The method used for anchoring the vehicle body or the part of the vehicle body in this test shall not:

— submit the anchorages and anchorage area (300 mm diameter circle) to abnormal stresses and/or deformation;

— result in reinforcement of the cylinder or cylinders or cylinder anchorages, or the part of the vehicle structure participating in anchoring the cylinder or cylinders.

The traction force is defined by the following formula:

$$F = (M_c + 0{,}9\,\rho V)\,a$$

