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**Road vehicles — Compressed natural  
gas (CNG) fuel systems —**

**Part 1:  
Safety requirements**

*Véhicules routiers — Systèmes d'alimentation en gaz naturel  
comprimé (GNC) —*

*Partie 1: Exigences de sécurité*



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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 15501-1 was prepared by Technical Committee ISO/TC 22, *Road vehicles*, Subcommittee SC 25, *Vehicles using gaseous fuels*.

This second edition cancels and replaces the first edition (ISO 15501-1:2001), which has been technically revised.

ISO 15501 consists of the following parts, under the general title *Road vehicles — Compressed natural gas (CNG) fuel systems*:

- *Part 1: Safety requirements*
- *Part 2: Test methods*

## Introduction

For the purposes of this part of ISO 15501, all fuel system components in contact with natural gas have been considered suitable for natural gas as defined in ISO 15403.

When applying this part of ISO 15501, it is to be understood that a safety device that prevents overfilling of the vehicle's fuel system is part of the refuelling station. The pressure gauge is not considered a safety component.

Where necessary, technical solutions to functional requirements are given in Annex A.

This part of ISO 15501 makes reference to a service pressure of 20 MPa<sup>1)</sup> [200 bar<sup>2)</sup>] for natural gas used as fuel, settled at 15 °C. It is possible to accommodate other service pressures by adjusting the pressure using the appropriate factor (ratio). For example, a 25 MPa (250 bar) service pressure system will require pressures to be multiplied by 1,25.

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1) 1 MPa = 1 N/mm<sup>2</sup>.

2) 1 bar = 0,1 MPa = 10<sup>5</sup> Pa.



# Road vehicles — Compressed natural gas (CNG) fuel systems —

## Part 1: Safety requirements

### 1 Scope

This part of ISO 15501 specifies the minimum safety requirements applicable to compressed natural gas (CNG) on-board fuel systems intended for use on the types of motor vehicles defined in ISO 3833. This part of ISO 15501 is applicable to vehicles using compressed natural gas as defined in ISO 15403, including bi-fuel, original-production and converted vehicles.

Matters relating to the skills of installers and converters are outside the scope of this part of ISO 15501.

### 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 1176, *Road vehicles — Masses — Vocabulary and codes*

ISO 11439, *Gas cylinders — High pressure cylinders for the on-board storage of natural gas as a fuel for automotive vehicles*

ISO 14469-1, *Road vehicles — Compressed natural gas (CNG) refuelling connector — Part 1: 20 MPa (200 bar) connector*

ISO 14469-2, *Road vehicles — Compressed natural gas (CNG) refuelling connector — Part 2: 20 MPa (200 bar) connector, size 2*

ISO 14469-3, *Road vehicles — Compressed natural gas (CNG) refuelling connector — Part 3: 25 MPa (250 bar) connector*

ISO 15500 (all parts), *Road vehicles — Compressed natural gas (CNG) fuel system components*

ISO 15501-2, *Road vehicles — Compressed natural gas (CNG) fuel systems — Part 2: Test methods*

IEC 60079-10-1, *Explosive atmospheres — Part 10-1: Classification of areas — Explosive gas atmospheres*

### 3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 15500-1, ISO 1176, and the following apply.

#### 3.1

##### **service pressure**

settled pressure of vehicle fuel system at a uniform natural gas temperature of 15 °C

#### 3.2

##### **CNG on-board fuel system**

compressed natural gas fuel system comprising a cylinder, or cylinders, mounting hardware, a refuelling receptacle or more than one of each of these, in accordance with ISO 14469, and the components described in ISO 15500-3 to ISO 15500-20