
**Road vehicles — Compressed natural
gas (CNG) fuel system components —
Part 1:
General requirements and definitions**

*Véhicules routiers — Composants des systèmes de combustible gaz
naturel comprimé (GNC) —*

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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 on the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the WTO principles in the Technical Barriers to Trade (TBT) see the following URL: [Foreword - Supplementary information](#)

The committee responsible for this document is ISO/TC 22, *Road vehicles*, Subcommittee SC 41, *Specific aspects for gaseous fuels*.

This second edition cancels and replaces the first edition (ISO 15500-1:2000), which has been technically revised.

It also incorporates the Amendment ISO 15500-1:2000/AMD 1:2003.

ISO 15500 consists of the following parts, under the general title *Road vehicles — Compressed natural gas (CNG) fuel system components*:

- *Part 1: General requirements and definitions*
- *Part 2: Performance and general test methods*
- *Part 3: Check valve*
- *Part 4: Manual valve*
- *Part 5: Manual cylinder valve*
- *Part 6: Automatic valve*
- *Part 7: Gas injector*
- *Part 8: Pressure indicator*
- *Part 9: Pressure regulator*
- *Part 10: Gas-flow adjuster*
- *Part 11: Gas/air mixer*
- *Part 12: Pressure relief valve (PRV)*

- *Part 13: Pressure relief device (PRD)*
- *Part 14: Excess flow valve*
- *Part 15: Gas-tight housing and ventilation hose*
- *Part 16: Rigid fuel line in stainless steel*
- *Part 17: Flexible fuel line*
- *Part 18: Filter*
- *Part 19: Fittings*
- *Part 20: Rigid fuel line in material other than stainless steel*

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Road vehicles — Compressed natural gas (CNG) fuel system components —

Part 1: General requirements and definitions

1 Scope

This part of ISO 15500 specifies general requirements and definitions of compressed natural gas fuel system components, intended for use on the types of motor vehicles as defined in ISO 3833. It also provides general design principles, and specifies requirements for instructions and marking.

This part of ISO 15500 is applicable to vehicles (mono-fuel, bi-fuel, or dual-fuel applications) using natural gas in accordance with ISO 15403-1. It is not applicable to the following:

- a) liquefied natural gas (LNG) fuel system components located upstream of, and including, the vaporizer;
- b) fuel containers;
- c) stationary gas engines;
- d) container mounting hardware;
- e) electronic fuel management;
- f) refuelling receptacles.

NOTE 1 It is recognized that miscellaneous components not specifically covered herein can be examined to meet the criteria of this part of ISO 15500 and tested according to the appropriate functional tests.

NOTE 2 All references to pressure in this part of ISO 15500 are to be considered gauge pressures unless otherwise specified.

NOTE 3 This part of ISO 15500 is based upon a service pressure for natural gas as fuel of 20 MPa [200 bar¹⁾] settled at 15 °C. Other service pressures can be accommodated by adjusting the pressure by the appropriate factor (ratio). For example, a 25 MPa (250 bar) service pressure system will require pressures to be multiplied by 1,25.

2 Normative references

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

ISO 6722-1, *Road vehicles — 60 V and 600 V single-core cables — Part 1: Dimensions, test methods and requirements for copper conductor cables*

ISO 6722-2, *Road vehicles — 60 V and 600 V single-core cables — Part 2: Dimensions, test methods and requirements for aluminium conductor cables*

ISO 15500-2, *Road vehicles — Compressed natural gas (CNG) fuel system components — Part 2: Performance and general test methods*

ISO 15500-3, *Road vehicles — Compressed natural gas (CNG) fuel system components — Part 3: Check valve*

1) 1 bar = 0,1 MPa = 10⁵ Pa; 1 MPa = 1 N/mm²

3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

3.1

valve

device by which the flow of a fluid may be controlled

3.1.1

manual valve

valve which is operated manually

3.1.2

automatic valve

valve which is not operated manually

3.1.3

automatic cylinder valve

automatic valve rigidly fixed to the cylinder which controls the flow of gas to the fuel system

3.1.4

check valve

automatic valve which allows gas to flow in only one direction

3.1.5

excess flow valve

valve which automatically shuts off, or limits, the gas flow when the flow exceeds a set design value

3.1.6

manual cylinder valve

manual valve rigidly fixed to the cylinder

3.1.7

pressure relief valve (discharge valve)

PRV

self-closing device which opens to prevent a pre-determined pressure being exceeded

3.1.8

service valve

manual valve which is closed only when servicing the vehicle

3.2

compressed natural gas

CNG

natural gas which has been compressed and stored for use as a vehicle fuel

3.3

filter

component containing a screen or media that is intended to remove foreign debris from the gas stream

3.4

fitting

connector used in joining a piping, tubing, or hose system

3.5

flexible fuel line

flexible tubing or hose through which natural gas flows

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3.6**gas/air mixer**

device for mixing the gaseous fuel and intake air for the engine

3.7**gas flow adjuster**

gas flow restricting device, installed downstream of a pressure regulator, controlling gas flow to the engine

3.8**gas-tight housing**

device which vents gas leakage to outside the vehicle including the gas ventilation hose, the clear opening of which is at least 450 mm²

3.9**natural gas vehicle****NGV**

road vehicle powered by natural gas

3.9.1**mono-fuel NGV**

road vehicle which operates on natural gas only

Note 1 to entry: It is also known as “Dedicated Natural Gas Vehicle”.

Note 2 to entry: In Europe and in India, the term mono-fuel also applies to a light duty NGV with maximum 15 litre gasoline tank.

3.9.2**bi-fuel NGV**

vehicle that has two independent fuel systems (one of them for natural gas) and can run alternatively on either fuel, but only on one at a time

3.9.3**dual-fuel NGV**

vehicle that has two independent fuel systems (one of them for natural gas) and can run on both fuels simultaneously; it also may run on one fuel alone

3.10**pressure indicator**

pressurized device which indicates the gas pressure; it can be a gauge or a sensor

3.11**pressure regulator**

device used to control the delivery pressure of gaseous fuel to the engine

3.12**pressure relief device****PRD**

one-time-use device triggered by excessive temperature or temperature and pressure acting in series or in parallel which vents gas to protect the cylinder from rupture

3.13**rigid fuel line**

tubing which has been designed not to flex in normal operation and through which natural gas flows