BS ISO 15500-8:2015

BSI Standards Publication

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

## Part 8: Pressure indicator

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**National foreword**

This British Standard is the UK implementation of ISO 15500-8:2015.

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A list of organizations represented on this committee can be obtained on request to its secretary.

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BS ISO 15500-8:2015

INTERNATIONAL STANDARD

**ISO 15500-8**

Second edition
2015-12-01

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

## Part 8: Pressure indicator

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

*Partie 8: Indicateur de pression*

Reference number
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ISO copyright office
Ch. de Blandonnet 8 • CP 401
CH-1214 Vernier, Geneva, Switzerland
Tel. +41 22 749 01 11
Fax +41 22 749 09 47
copyright@iso.org
www.iso.org

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# Foreword

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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).

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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 15500-8:2001), which has been technically revised.

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*

**INTERNATIONAL STANDARD** **ISO 15500-8:2015(E)**

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

# Part 8: Pressure indicator

## 1 Scope

This part of ISO 15500 specifies tests and requirements for the pressure indicator, a compressed natural gas fuel system component intended for use on the types of motor vehicles defined in ISO 3833.

This part of ISO 15500 is applicable to vehicles using natural gas in accordance with ISO 15403-1 (mono-fuel, bi-fuel, or dual-fuel applications). 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 a fuel of 20 MPa [200 bar[1)]] 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 15500-1, *Road vehicles — Compressed natural gas (CNG) fuel system components — Part 1: General requirements and definitions*

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

## 3 Terms and definitions

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

1) 1 bar = 0,1 MPa = $10^5$ Pa; 1 MPa = 1 N/$mm^2$.

2) To be published. (Revision of ISO 15500-2:2012)

# 4 Marking

Marking of the component shall provide sufficient information to allow the following to be traced:

a) the manufacturer's or agent's name, trademark or symbol;

b) the model designation (part number);

c) the working pressure or pressure and temperature range.

The following additional markings are recommended:

— the direction of flow (when necessary for correct installation);

— the type of fuel;

— electrical ratings (if applicable);

— the symbol of the certification agency;

— the type approval number;

— the serial number or date code;

— a reference to this part of ISO 15500.

NOTE This information can be provided by a suitable identification code on at least one part of the component when it consists of more than one part.

# 5 Construction and assembly

**5.1** Pressure transducers and gauges shall comply with the applicable provisions of ISO 15500-1 and ISO 15500-2 and with the tests specified in Clause 6. Tolerances should follow the specifications of ISO 15500-2.

**5.2** The pressure indicator shall be capable of displaying at least 1,5 times the service pressure.

**5.3** If the pressure indicator is a gauge, it shall be equipped with a shatter-proof lens and possess an external means of pressure relief. Potential release shall not be directed to the front of the gauge.

# 6 Tests

## 6.1 Applicability

The tests required to be carried out are indicated in Table 1.

**Table 1 — Tests applicable**

| Test | Applicable | Test procedure as required by ISO 15500-2 | Specific test requirements of this part of ISO 15500 |
|---|---|---|---|
| Hydrostatic strength | X | X | X (see 6.2) |
| Leakage | X | X | X (see 6.3) |
| Excess torque resistance | X | X | |
| Bending moment | X | X | |
| Continued operation | X | | X (see 6.4) |
| Corrosion resistance | X | X | |
| Oxygen ageing | X | X | |
| Ozone ageing | X | X | |
| Heat ageing | X | X | |
| Automotive fluids | X | X | |
| Electrical over-voltages | X[a] | X | |
| Non-metallic material immersion | X | X | |
| Vibration resistance | X | X | |
| Brass material compatibility | X | X | |
| Insulation resistance | X[a] | | X (see 6.5) |
| Minimum operating voltage | X[a] | | X (see 6.6) |

[a] Applicable only if the pressure indicator has an electrical or electronic component.

## 6.2 Hydrostatic strength

Test the pressure indicator according to the procedure for testing hydrostatic strength specified in ISO 15500-2. The test pressure shall be 2,5 times the working pressure.

## 6.3 Leakage

Test the pressure indicator at the temperatures and pressures given in Table 2.

**Table 2 — Test temperatures and pressures**

| Temperature °C | Pressure MPa (bar) | |
|---|---|---|
| | First Test | Second Test |
| –40 or –20 | 0,75 × WP | 0,025 × WP |
| 20 | 0,025 × WP | 1,5 × WP |
| 85 or 120 | 0,05 × WP | |

## 6.4 Continued operation

**6.4.1** Test the pressure indicator in accordance with the procedure for testing continued operation given in ISO 15500-2:—, Clause 9 for 20 000 cycles; a cycle consists of pressurization to working pressure, followed by depressurization to less than 0,5 times the working pressure.

**6.4.2** Perform the leakage test in accordance with 6.3.

## 6.5 Insulation resistance

This test is designed to check for a potential failure of the insulation between the two-pin coil assembly and the pressure indicator casing.

Apply 1 000 V d. c. between one of the connector pins and the housing of the pressure indicator for at least 2 s. The minimum allowable resistance shall be 240 kΩ.

## 6.6 Minimum operating voltage

The minimum operating voltage at room temperature shall be ≤8 V for a 12 V system and ≤16 V for a 24 V system.

The component shall be pressurized at 0,75 times working pressure during the test and the reading shall be within the manufacturer's specified tolerance.

# Bibliography

[1] ISO 3833, *Road vehicles — Types — Terms and definitions*

[2] ISO 15403-1, *Natural gas — Natural gas for use as a compressed fuel for vehicles — Part 1: Designation of the quality*

[3] ISO/TR 15403-2, *Natural gas - Natural gas for use as a compressed fuel for vehicles — Part 2: Specification of the quality*

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