INTERNATIONAL STANDARD

ISO 12614-19

Second edition

Road vehicles — Liquefied natural gas (LNG) fuel system components —

Part 19: Automatic valve

Véhicules routiers — Composants des systèmes d'alimentation en gaz naturel liquéfié (GNL) —

Partie 19: Valve automatique

PROOF/ÉPREUVE

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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 ISO/TC 22, *Road vehicles*, Subcommittee SC 41, *Specific aspects of gaseous fuels*.

This second edition cancels and replaces the first edition (ISO 12614-19:2017), which has been technically revised.

The main changes compared to the previous edition are as follows:

— editorial changes;

— requirements the insulation resistance (6.5) and minimum opening voltage (6.6).

A list of all parts in the ISO 12614 series can be found on the ISO website.

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.

Road vehicles — Liquefied natural gas (LNG) fuel system components —

Part 19: **Automatic valve**

1 Scope

This document specifies tests and requirements for the automatic valve, a liquefied natural gas fuel system component intended for use on the types of motor vehicles defined in ISO 3833. This document 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) fuel containers;

b) stationary gas engines;

c) container mounting hardware;

d) electronic fuel management;

e) refuelling receptacles.

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

All references to pressure in this document are considered gauge pressures unless otherwise specified.

This document is based upon a working pressure for natural gas as a fuel of 1,6 MPa [16 bar[1)]]. Other working pressures can be accommodated by adjusting the pressure by the appropriate factor (ratio). For example, 2 MPa (20 bar) working pressure system will require pressures to be multiplied by 1,25.

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 12614-1, *Road vehicles — Liquefied natural gas (LNG) fuel system components — Part 1: General requirements and definitions*

ISO 12614-2, *Road vehicles — Liquefied natural gas (LNG) 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 12614-1 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

1) 1 bar = 0,1 MPa = 105 Pa; 1 MPa = 1 N/mm^2.

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

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;

d) the serial number or date code.

The following additional markings are recommended:

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

ii) the type of fuel;

iii) electrical ratings (if applicable);

iv) the symbol of the certification agency;

v) the type approval number;

vi) a reference to this document, i.e. ISO 12614-19.

In addition to the markings specified above, if the valve is compatible with start/stop systems, one of the following additional marks shall be used:

1) "H1"if the valve is to be used with an engine that shuts off automatically when the vehicle comes to a halt;

2) "H2"if the valve is to be used with an engine that, in addition to 1), it also shuts off automatically when the vehicle drives with an electric motor only;

3) "H3"if the valve is to be used with an engine that, in addition to 1) or 2), it also shuts off automatically when the accelerator pedal is released

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

The automatic valve shall comply with the applicable provisions of ISO 12614-1 and ISO 12614-2, and with the tests specified in Clause 6.

The automatic valve shall be closed when de-energized.

The automatic valve with manual by-pass shall meet the minimum requirements of this document.

6 Test

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 12614-2	Specific test requirements of this document
Hydrostatic strength	X	X	X (see 6.2)
Leakage	X	X	X (see 6.3)
Excess torque resistance	X	X	
Bending moment	X[a]	X	
Continued operation	X	X	X (see 6.4)
Corrosion resistance	X	X	
Oxygen ageing	X	X	
Electrical overvoltages	X	X	
Non-metallic synthetic immersion	X	X	
Vibration resistance	X	X	
Brass material compatibility	X	X	
Insulation resistance	X		X (see 6.5)
Minimum operating voltage	X		X (see 6.6)

[a] Applicability depends on the specific installation instructions from the manufacturer.

6.2 Hydrostatic strength

Test the automatic valve according to the procedure for testing hydrostatic strength specified in ISO 12614-2. The test pressure shall be 2,5 times the working pressure.

6.3 Leakage

Test the automatic valve at the temperatures and pressures given in Table 2.

Table 2 — Test temperatures and pressures

Temperature °C	Pressure Factor × working pressure	
	First	Second
Less -60	1,0 × WP	0,25 × WP
20	0,25 × WP	1,5 × WP
85 or 120	0,25 × WP	1,5 × WP

6.4 Continued operation

6.4.1 Test the automatic valve in accordance with the procedure for testing continued operation given in ISO 12614-2 for 7 000 cycles and perform the leakage test in accordance with 6.3.

6.4.2 If the automatic valve is to be used in vehicles with start-stop systems, and closed during commanded stop phases, the valve shall be submitted to the following numbers of operations during test:

a) 200,000 cycles (mark "H1") if the engine shuts off automatically when the vehicle comes to a halt;

b) 500,000 cycles (mark "H2") if, in addition to a), the engine also shuts off automatically when the vehicle drives with the electric motor only;

c) 1,000,000 cycles (mark "H3") if, in addition to a) or b), the engine also shuts off automatically when the accelerator pedal is released.

6.4.3 Following cycling and leakage testing, perform the hydrostatic strength test in accordance with 6.2.

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 metallic part of the automatic valve casing.

Apply a test voltage of 500 V d.c. for a duration of 60 s; for temperature sensors with circuitry of 3,8 mm pitch or below, 100 V d.c. for a duration of 60 s shall be used.

The minimum allowable resistance shall be 240 kΩ.

6.6 Minimum opening voltage

The device shall continue to operate at 9 V for a 12 V system and 18 V for a 24 V system. It shall be tested at room temperature. The component shall be pressurized at 0,75 times the working pressure during the test. For pilot operated valves, the component may be pressurized at 0,5 times the working pressure during the test.

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*

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