

BUREAU OF INDIAN STANDARDS

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भारतीय मानक प्रारूप

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(प्रथम संशोधन)

Draft Indian Standard

**ROAD VEHICLES — COMPRESSED NATURAL GAS (CNG) / BIO- COMPRESSED
NATURAL GAS (BIO- CNG) /LIQUEFIED PETROLEUM GAS (LPG) FUEL
SYSTEM COMPONENTS — PETROL SOLENOID VALVE (AUTOMATIC /
MANUAL)
(First Revision)**

ICS: 43.060.40

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FOREWORD

This Indian Standard was adopted by the Bureau of Indian Standards, after the draft finalized by the Automotive Vehicles Running on Non-conventional Energy Sources Sectional Committee had been approved by the Transport Engineering Division Council.

This standard was first published in 2006 to specify tests and requirements of Petrol Solenoid Valve (Automatic / Manual) of CNG on board fuel system components, intended to use on motor vehicles defined in IS 14272. In this Revision, Bio- CNG is added to the scope of this standard keeping in view the technological advancements that have taken place since its last Publication. The revised version also incorporates the Amendments issued to the standard.

In the formulation of this standard considerable assistance has been derived from the following AIS Standards issued by the Automotive Research Association of India:

AIS 024(Rev.1) (Part A):- Safety and Procedural Requirements for Type Approval of Gaseous Fuelled Vehicles - Part A (Automotive Application).

AIS 024(Rev.1) (Part B):- Safety and Procedural Requirements for Type Approval of Gaseous Fuel Agricultural Tractors - Part B (Agricultural Tractors Application).

AIS 024(Rev.1) (Part C):- Safety and Procedural Requirements for Type Approval of Gaseous Fuel Vehicles - Part C (CEV's Application).

AIS 028(Rev.1) (Part A):-Code of Practice for Use of Gaseous Fuels in Internal Combustion Engine Vehicles - Part A (Automotive Application)

AIS 028(Rev.1) (Part B):-Code of Practice for Use of Gaseous Fuels in Internal Combustion Engine Agricultural Tractors - Part B (Agricultural Tractors Application)

AIS 028(Rev.1) (Part C):-Code of Practice for Use of Gaseous Fuels in Internal Combustion Engine Construction Equipment Vehicles (CEV's) - Part C (CEV's Application).

AIS-025 (Version 3): Safety and Procedural requirements for Type Approval of LPG Operated Vehicles

AIS 026 (Version 3): Code of Practice for use of LPG Fuel in Internal Combustion Engine to Power 4 Wheeled Vehicles

AIS 027 (Version 3): Code of Practice for use of LPG Fuel in Internal Combustion Engine to Power 2 & 3 Wheeled Vehicles.

This standard is one of the series of Indian Standards published on CNG/Bio-CNG/LPG onboard fuel system components. Other standards in the series are:

<i>IS No.</i>	<i>Title</i>
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- 15710: XXXX¹⁾ Road vehicles - Compressed natural gas (CNG) /Bio-Compressed natural gas (Bio-CNG) fuel system components – General requirements & definition.
- 15711: XXXX¹⁾ Road vehicles - Compressed natural gas (CNG) /Bio-Compressed natural gas (Bio-CNG) fuel system components –Performance and general test methods
- 15712: XXXX¹⁾ Road vehicles - Compressed natural gas (CNG) /Bio-Compressed natural gas (Bio-CNG) fuel system components – Automatic valve
- 15713: XXXX¹⁾ Road vehicles - Compressed natural gas (CNG) /Bio-Compressed natural gas (Bio-CNG) fuel system components–Pressure regulator
- 15714: XXXX¹⁾ Road vehicles - Compressed natural gas (CNG) /Bio-Compressed natural gas (Bio-CNG) fuel system components – Gas Air mixer
- 15715: XXXX¹⁾ Road vehicles - Compressed natural gas (CNG) /Bio-Compressed natural gas (Bio-CNG) / Liquefied Petroleum Gas (LPG) Fuel system components – CNG/Bio-CNG/LPG Conduit (Ventilation Hose/Pipe)
- 15716: XXXX¹⁾ Road vehicles - Compressed natural gas (CNG) /Bio-Compressed natural gas (Bio-CNG) fuel system components –CNG / Bio-CNG high pressure fuel line (rigid) with end connections (having pressure exceeding 2.15 MPa)
- 15718: XXXX¹⁾ Road vehicles - Compressed natural gas (CNG) /Bio-Compressed natural gas (Bio-CNG) fuel system components – CNG/Bio-CNG high Pressure fuel line(flexible hose)with end connections (having pressure exceeding 2.15 MPa)
- 15719: XXXX¹⁾ Road vehicles - Compressed natural gas (CNG) /Bio-Compressed natural gas (Bio-CNG)/ Liquefied Petroleum Gas (LPG) fuel system components – Electrical Wiring kit
- 15720: XXXX¹⁾ Road vehicles - Compressed natural gas (CNG) /Bio-Compressed natural gas (Bio-CNG) /Liquefied Petroleum Gas (LPG) fuel system component – Compartments sub- Compartments
- 15721: XXXX¹⁾ Road vehicles - Compressed natural gas (CNG) / Bio-Compressed natural gas (Bio-CNG)/ Liquefied Petroleum Gas (LPG) fuel system components – Fire retardant material for seat, upholstery, roof and side lining
- 15722: XXXX¹⁾ Road vehicles - Compressed natural gas (CNG) / Bio-Compressed natural gas (Bio-CNG) fuel system components - CNG /Bio-CNG flexible fuel line with or without end connections(having pressure not exceeding 2.15 MPa)

15723: XXXX¹⁾ Road vehicles - Compressed natural gas (CNG) /Bio-Compressed natural gas (Bio-CNG) /Liquefied Petroleum Gas (LPG) fuel system components – Current Limiting devices

Note – Standards Marked with superscript '1' are under the process of Revision. The year of publication of these standards will be updated at the time of printing of this draft standard.

The composition of the Committee responsible for the formulation of this standard is given at Annex A.

For the purpose of deciding whether a particular requirement of this standard is complied with, the final value, observed or calculated, expressing the result of test or analysis, shall be rounded off in accordance with IS 2:2022 'Rules for rounding off numerical values (*Second Revision*)'. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

Draft Indian Standard

ROAD VEHICLES — COMPRESSED NATURAL GAS (CNG) / BIO- COMPRESSED NATURAL GAS (BIO- CNG) /LIQUEFIED PETROLEUM GAS (LPG) FUEL SYSTEM COMPONENTS — PETROL SOLENOID VALVE (AUTOMATIC / MANUAL)

1 SCOPE

1.1 This standard specifies definitions, test methods and requirements of petrol valve (automatic / manual) CNG / Bio- CNG /LPG on board fuel system components, intended for use on motor vehicles defined in IS 14272.

1.1.1 This standard is applicable to CNG / Bio- CNG /LPG fuel system components intended to use on vehicles using compressed natural gas / Bio- compressed natural gas /Liquefied petroleum gas in accordance with IS 15320 Part 1 (mono-fuel or bi-fuel applications or dual fuel applications).

1.1.2 This standard 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) CNG / Bio- CNG /LPG fuel systems components for the propulsion of marine craft; and
- e) Hydrogen Natural Gas Blend (HCNG) Fuel system components.

2 REFERENCES

The following standards contain provisions which, through reference in this text, constitute provisions of this standard. At the time of publication the editions indicated were valid. All standards are subject to revision and parties to agreements based on this standard are encouraged to investigate the possibility of applying the most recent editions of the standards indicated below:

<i>IS No.</i>	<i>Title</i>
IS 14272:2011	Automotive Vehicles – Types – Terminology
15710: XXXX ²⁾	Road vehicles - Compressed natural gas (CNG) /Bio-Compressed natural gas (Bio-CNG) fuel system components – General requirements & definition.

Note — Standards Marked with superscript '2)' are under the process of Revision. The year of publication of these standards will be updated at the time of printing of this draft standard.

3 DEFINITIONS

For the purpose of this standard definitions given in IS 15710 shall apply.

4 TESTS

4.1 Leakage Test

The leakage test shall be conducted at 1.5 times the working pressure by immersing the device under test in water at room temperature for 2 min. The outlet of the device shall not be plugged during the test. The device shall be bubble free.

4.2 Endurance Test

Petrol valve (automatic/manual) shall meet the following requirements.

4.2.1 It shall be subjected to the endurance test by operating for 6000 'ON' and 'OFF' cycles. The cycle rate shall not be faster than 10 cycles/min. During the test, the device under test shall be pressurized to 1.5 times its working pressure.

4.2.2 Immediately after the endurance test, the leakage test shall be conducted as per **4.1**.

5 MARKING

5.1 Each petrol valve (automatic/manual) shall be legibly and indelibly marked with the following:

- a) Manufacturers name, trade-mark or symbol,
- b) Part number or unique identification mark, and
- c) Inlet or outlet or direction of flow markings.

5.2 BIS Certification Marking

Each petrol valve (automatic/manual) may also be marked with the Standard Mark.

5.2.1 The use of the Standard Mark is governed by the provisions of the *Bureau of Indian Standards Act, 2016* and the Rules and Regulations made thereunder. The details of conditions under which the licence for the use of the Standard Mark may be granted to manufacturers or producers may be obtained from the Bureau of Indian Standards.

6 TYPE TEST AND ACCEPTANCE TEST

6.1 Type Test (Type Approval)

For type approval petrol valve (automatic/manual) shall meet the requirements as specified in this standard.

6.2 Acceptance Test (Conformity of Production)

For the purpose of acceptance test, each petrol (Automatic/Manual) solenoid valve manufactured shall conform to leakage test requirements as specified in **4.1**.

7 TECHNICAL INFORMATION TO BE SUBMITTED BY THE COMPONENT MANUFACTURER

Technical information to be submitted by the component manufacturer for component type approval/type test shall contain at least following information:

- a) Name of the manufacturer,
- b) Manufacturing plant address,
- c) Part number or unique identification mark,
- d) Type No./Model No.,
- e) Working pressure,
- f) Rated voltage of the solenoid coil (if any),
- g) Operating temperature, and
- h) Drawings with relevant dimensions and materials.

8 NUMBER OF SAMPLES FOR TESTING

Minimum 2 numbers of petrol valve (automatic/ manual) assemblies shall be submitted to the test agency for testing.

9 CHANGES IN TECHNICAL SPECIFICATIONS OF A TYPE APPROVED COMPONENT AND EXTENSION OF APPROVAL

Any modification in technical specification of already type approved component shall require re-type test/ extension of approval at the discretion of certifying agency, based on the justification provided by the component manufacturer and reviewed by the certifying agency, which has granted type approval.

ANNEX A
(Foreword)

COMMITTEE COMPOSITION

Automotive Vehicles Running on Non-conventional Energy Sources Sectional Committee, TED 26

Will be Added Later.