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भारतीय मानक प्रारूप

संपीडित प्राकृतिक गैस (सीएनजी) / जीविक संपीडित प्राकृतिक गैस (बायो सीएनजी) ईंधन प्रणाली के घटक - सिरा कनेक्शनों सहित उच्च दाब ईंधन लाईन (द्रढ) [2.15 मैगापास्कल (21.5 बार) से अधिक दाब की]
(आई एस 15716: 2006 का संशोधन)

Draft Indian Standard

**ROAD VEHICLES — COMPRESSED NATURAL GAS (CNG) / BIO-COMPRESSED NATURAL GAS (BIO-CNG) FUEL SYSTEM COMPONENTS - HIGH PRESSURE FUEL LINE (RIGID) WITH END CONNECTIONS [HAVING PRESSURE EXCEEDING 2.15 MPA (21.5 BAR)]
(REVISION OF IS 15716: 2006)**

ICS : 43.060.40

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

FOREWORD

(Formal Clause to be added later)

This standard was first published in 2006 to specify the definitions, test methods and requirements of CNG high pressure fuel line (Rigid) with end connections having pressure exceeding 2.15 MPa (21.5 bar), of CNG on board fuel system component intended for use on motor vehicles as 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.

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).

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

<i>IS No.</i>	<i>Title</i>
15710: XXXX	Road vehicles - Compressed natural gas (CNG) /Bio-Compressed natural gas (Bio-CNG) fuel system components – General requirements & definition.
15711: XXXX	Road vehicles - Compressed natural gas (CNG) /Bio-Compressed natural gas (Bio-CNG) fuel system components – Performance and general test methods

- 15712: XXXX Road vehicles - Compressed natural gas (CNG) /Bio-Compressed natural gas (Bio-CNG) fuel system components – Automatic valve
- 15713: XXXX Road vehicles - Compressed natural gas (CNG) /Bio-Compressed natural gas (Bio-CNG) fuel system components – Pressure regulator
- 15714: XXXX Road vehicles - Compressed natural gas (CNG) /Bio-Compressed natural gas (Bio-CNG) fuel system components – Gas Air mixer
- 15715: XXXX 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)
- 15717: XXXX Road vehicles - Compressed natural gas (CNG) /Bio-Compressed natural gas (Bio-CNG) / Liquefied Petroleum Gas (LPG) Fuel system components – Petrol valve (Automatic/Manual)
- 15718: XXXX 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: XXXX Road vehicles - Compressed natural gas (CNG) /Bio-Compressed natural gas (Bio-CNG)/ Liquefied Petroleum Gas (LPG) fuel system components – Electrical Wiring kit
- 15720: XXXX Road vehicles - Compressed natural gas (CNG) /Bio-Compressed natural gas (Bio-CNG) /Liquefied Petroleum Gas (LPG) fuel system component – Compartments sub- Compartments
- 15721: XXXX 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: XXXX 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: XXXX Road vehicles - Compressed natural gas (CNG) /Bio-Compressed natural gas (Bio-CNG) /Liquefied Petroleum Gas (LPG) fuel system components – Current Limiting devices

The composition of the Committee responsible for the formulation of this standard is given at Annex A (Will be added later).

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 a test or analysis. Shall be rounded off in accordance with IS 2: 1960 'Rules for rounding off numerical values (revised)'.

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) FUEL SYSTEM COMPONENTS - HIGH PRESSURE FUEL LINE (RIGID) WITH END CONNECTIONS [HAVING PRESSURE EXCEEDING 2.15 MPA (21.5 BAR)]****1 SCOPE**

1.1 This draft standard specifies definitions, test methods and requirements of CNG / Bio - CNG high pressure fuel line (Rigid) with end connections having pressure exceeding 2.15 MPa (21.5 bar), of CNG / Bio- CNG on board fuel system components, intended for use on motor vehicles defined in IS 14272.

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

1.3 This draft 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 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>
9000 (Part 11):1983	Basic environmental testing procedures for electronic and electrical items : Part 11 Salt mist test
14272:2011	Automotive Vehicles - Types - Terminology
15320 : Part 1:2012	Natural gas - Natural gas for use as a compressed fuel for vehicles: Part 1 designation of the quality (First Revision)
IS 15710: XXXX	Road Vehicles - Compressed Natural Gas (CNG) / Bio-Compressed Natural Gas (Bio-CNG) Fuel System Components - General Requirements And Definitions

3 DEFINITIONS

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

4 TYPE TESTS (FOR TYPE APPROVAL)

4.1 Material

Rigid piping and its end connections for use with pressures exceeding 2.15 MPa (21.5 bar) shall be made up of Cold Drawn Steel/SS for use with CNG/Bio-CNG.

4.2 Burst Pressure

Rigid piping and its end connections shall have a minimum burst test pressure of 70 MPa (700 bar).

4.3 Salt Mist Test

CNG/ Bio-CNG high pressure fuel line with end connections shall be effectively protected against corrosion. When tested for 24 h in accordance with the procedure given in IS 9000 (Part 11) (except damp heat test), the piping with fittings shall not show any sign of corrosion.

5 ACCEPTANCE TEST (CONFORMITY OF PRODUCTION)

For the purpose of acceptance test, rigid piping manufactured shall conform to requirements as specified in **4.1** to **4.3**.

6 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) Pipe inner diameter (ID);
- e) Pipe outer diameter (OD); and
- f) Drawings with relevant dimensions and materials.

7 NUMBER OF SAMPLES FOR TESTING

Minimum 3 numbers of 1 m length CNG / Bio-CNG high pressure fuel line (Rigid) with end connections shall be submitted to the test agency for testing.

8 CHANGES IN TECHNICAL SPECIFICATIONS OF A TYPE APPROVED / CERTIFIED COMPONENT AND EXTENSION OF APPROVAL/CERTIFICATION

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

9 MARKING

9.1 Each CNG/Bio-CNG high pressure fuel line (Rigid) with end connections shall be legibly and indelibly marked with the following for every 1-meter length:

- a) Manufacturers name, trade-mark or symbol;
- b) Part number or unique identification mark;
- c) Working Pressure; and
- d) Date of manufacture or batch number.

9.2 BIS Certification Marking

The product(s) conforming to the requirements of the standard may be certified as per the conformity assessment schemes under the provisions of the *Bureau of Indian Standard Act, 2016* and Rules and Regulations framed thereunder, and the products may be marked with the standard mark.