DRAFT INDIAN STANDARD

ROAD VEHICLES — COMPRESSED NATURAL GAS (CNG/BIO-CNG) FUEL SYSTEM COMPONENTS — CNG/BIO-CNG HIGH PRESSURE FUEL LINE (RIGID) WITH END CONNECTIONS [HAVING PRESSURE EXCEEDING 2.15 MPa (21.5 BAR)]

1 SCOPE

1.1 This 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 component intended for use on motor vehicles as defined in IS 14272 (Part 1), two wheelers and construction equipment vehicles (CEV).

1.1.1

1.1.2 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) refueling receptacles; and
d) CNG/Bio-CNG fuel systems components for the propulsion of marine craft.

1.1.3 This standard is based upon a service pressure for compressed natural gas as a fuel at 20 MPa (200 bar) settled at 15°C. Other service pressures could 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. All references to pressure are to be considered gauge pressures unless otherwise specified.

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:

IS No.	*Title*
9844 (Part 11) : XXXX	Basic environmental testing procedures for electronic and electrical items : Part 11 Salt mist test
14272 (Part 1) : 2011	Automotive vehicles — Types — Terminology: Part 1 Three and four wheelers

15710 : XXXX	Road vehicles — Compressed natural gas (CNG/Bio-CNG) fuel system components — General requirements and definitions

3 DEFINITIONS

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

4 TYPE TESTS (FOR TYPE APPROVAL)

4.1 Tests applicable for CNG/Bio-CNG high pressure fuel line (Rigid) are indicated in Table 1

Table 1 – Applicable Tests

Test	Applicable	Test procedure as required by IS 15711:XXXX	Specific test requirements of this standard
Hydrostatic Strength	**X**	**X**	**TBD**
Leakage	**X**	**X**	
Excess torque resistance			
Bending moment			
Continued operation	**X**	**X**	**TBD**
Corrosion resistance	**X**	**X**	
Oxygen ageing			
Ozone ageing	**X**	**X**	
Heat ageing	**X**	**X**	
Automotive fluids	**X**	**X**	
Electrical over-voltages			
Non-metallic material immersion			
Vibration resistance			
Brass material compatibility			
Bending	**X**	**X**	**TBD**
Conductivity			

4.2 Burst Pressure

The CNG/Bio-CNG high pressure fuel line (Rigid) and its end connections shall have a minimum burst test pressure of 70 MPa (700 bar).

4.3 Salt Mist Test

The CNG/Bio-CNG high pressure fuel line (Rigid) with end connections shall be effectively protected against corrosion. When tested for 24 h in accordance with the procedure given in IS 9844 (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 tubing manufactured shall conform to requirements as specified in **4.1** to **4.3**.

6 MARKING

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

a) Manufactures name, trade-mark or symbol,
b) Part No. or unique identification mark,
c) Size,
d) Working pressure,and
f) Date of manufacture or batch number or traceable heat number, lot number.

6.2 BIS Certification Marking

Each CNG/Bio-CNG high pressure fuel line (Rigid) with end connections may also be marked with the Standard Mark.

6.2.1 The use of the Standard Mark is governed by the provisions of the *Bureau of Indian Standards Act,* 1986 and the Rules and Regulations made thereunder. The details of conditions under which the license for the use of the Standard Mark may be granted to manufacturers or producers may be obtained from the Bureau of Indian Standards.

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,
d) Tube inner diameter (ID),
e) Tube outer diameter (OD), and
f) Drawings with relevant dimensions and materials

8 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.

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 test agency, based on the justification provided by the component manufacturer and reviewed by the test agency, which has granted type approval.