भारतीय मानक **IS 15719 : 2024**

Indian Standard

सड़क वाहन — संपीड़ित प्राकृतिक गैस (सीएनजी)/जैव-संपीड़ित प्राकृतिक गैस (जैव-सीएनजी) — ईंधन प्रणाली के घटक — इलेक्ट्रिकल वायरिंग किट

(पहला पुनरीक्षण)

Road Vehicles — Compressed Natural Gas (CNG)/Bio-Compressed Natural Gas (Bio-CNG) — Fuel System Components — Electrical Wiring Kit

(First Revision)

ICS 43.060.40

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November 2024 **Price Group 5**

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

FOREWORD

This Indian Standard (First Revision) 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 definitions, test methods and requirements of electrical wiring kit of CNG onboard fuel system components, intended for 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-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 and heavy motor vehicles

AIS 027 (Version 3) — Code of practice for use of LPG fuel in internal combustion engine to power 2 & 3 wheeled vehicles

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)

JIS C 3406 : 1993 — Low voltage cables for automobiles

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:

IS No.	*Title*
IS 15710 : 2024	Road vehicles — Compressed natural gas (CNG) /bio-compressed natural gas (bio-CNG) fuel system components — General requirements and definitions
IS 15711 : 2024	Road vehicles — Compressed natural gas (CNG) /bio-compressed natural gas (bio-CNG) fuel system components — Performance and general test methods (*first revision*)
IS 15712 : 2024	Road vehicles — Compressed natural gas (CNG) /bio-compressed natural gas (bio-CNG) fuel system components — Automatic valve (solenoid valve) (*first revision*)

(Continued on third cover)

Indian Standard

ROAD VEHICLES — COMPRESSED NATURAL GAS (CNG)/ BIO-COMPRESSED NATURAL GAS (BIO-CNG)/LIQUEFIED PETROLEUM GAS (LPG) — FUEL SYSTEM COMPONENTS — ELECTRICAL WIRING KIT

(First Revision)

1 SCOPE

1.1 This standard specifies definitions, test methods and requirements of electrical wiring kit of CNG/ bio-CNG/ LPG onboard 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 be used 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 standards given below 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 edition of these standards.

IS No	*Title*
IS 2465 : 1984	Specification for cables for motor vehicles (*second revision*)
IS 10810 : 1984	Methods of test for cables:
(Part 5) : 1984	Conductor resistance test
(Part 44) : 1984	Spark test
IS 14272 : 2011	Automotive vehicles — Types — Terminology
IS 15710 : 2024	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 REQUIREMENTS OF ELECTRICAL WIRING KIT

4.1 General

All wiring shall be properly installed, taped, clipped or contained in a loom along its length.

4.2 Conductor Resistance Test

The wiring cables for motor vehicles when tested as per **13** of IS 10810 (Part 5) for conductor resistance test shall comply with the requirements specified in Table 1.

Table 1 Conductor Resistance of Cables

(*Clause* 4.2)

Sl No.	Nominal Sectional Area (mm^2)	Conductor Resistance (20 °C) Ω/m, *Max*
(1)	(2)	(3)
i)	0.5 f[1)]	0.036 9
ii)	0.5	0.032 7
iii)	0.75 f[1)]	0.024 4
iv)	0.85	0.020 8
v)	1.25 f[1)]	0.014 7
vi)	1.25	0.014 3
vii)	2	0.008 81
viii)	3	0.005 59
ix)	5	0.003 52
x)	8	0.002 32
xi)	15	0.001 38
xii)	20	0.000 887
xiii)	30	0.000 520
xiv)	40	0.000 428
xv)	50	0.000 337
xvi)	60	0.000 287
xvii)	85	0.000 215
xviii)	100	0.000 168

4.3 Spark Test

4.3.1 The cable when tested for spark test as per IS 10810 (Part 44) shall withstand 5 000 V for 0.15 s or more.

4.3.2 Immersion Test

For the immersion test the following procedure shall be followed:

A test specimen about 600 mm in length shall be taken for the immersion test from a lot of cable which has passed the spark test. The insulator at both the ends for a length of about 25 mm of the specimen shall be torn off and the bare conductor twisted and as shown in Fig. 1, the central part of the specimen for a length of 300 mm shall be immersed in 5 percent salt solution.

After immersion for 5 min, an a.c. voltage of 50 Hz to 60 Hz cycles/sec and nearly sinusoidal wave shall be applied between the conductor and earth. The voltage shall be gradually increased up to 1 000 V and cable shall withstand this voltage for 1 min.

4.4 Flammability Test

The fire-retardant material of the electrical wiring when tested as per **13** of IS 2465 shall conform to **22** of IS 2465.

5 MARKING

5.1 Each electrical wiring kit shall be legibly and indelibly marked with the following:

a) Manufacturer’s name or trade-mark or symbol;

b) Part No. or unique identification mark; and

c) Date of manufacturer or batch no.

5.2 BIS Certification Marking

The product(s) conforming to the requirements of this standard may be certified as per the conformity

[1)] indicates ‘f in nominal sectional area indicates flexible.

assessment schemes under the provisions of the *Bureau of Indian Standards Act*, 2016 and the Rules and Regulations framed thereunder, and the product may be marked with the Standard Mark.

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 of the wiring kit;
b) Wiring kit manufacturing plant address;
c) Part number of wiring kit (as allotted by the manufacturer);
d) Batch number;
e) Identification code number (allotted by the supplier/trader, if any);
f) Details of the vehicles for which the wiring kit is intended for use such as 2 W, 3 W, 4 W goods/passenger, HCV/LCV/CEV/AT, etc;
g) Make and model of the vehicle for which the wiring kit is intended for use;
h) Name of the manufacturer of the wires used in the wiring kit;
j) Wire manufacturing plant address;
k) Name of the material of the conductor and wire insulation;
m) Manufacturing date and batch number of the wires; and
n) Drawings with relevant dimensions.

7 NUMBER OF SAMPLES FOR TESTING

Minimum one electrical wiring kit sample shall be submitted to the test agency for testing. In case any wire in the kit is less than 2 m long then manufacturer shall submit additional sample of the same wire 2 m in length, declaring it as a representative sample.

8 TYPE TEST (TYPE APPROVAL)

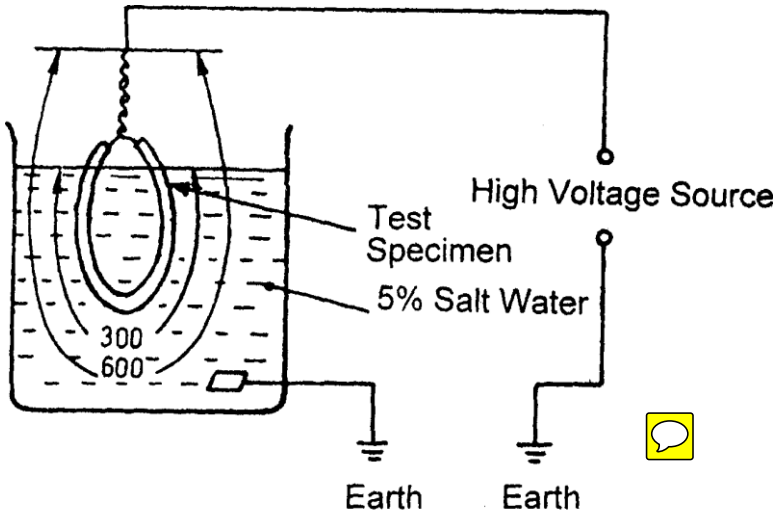
Electrical wiring kit shall meet the requirements of this standard for type approval.

9 ACCEPTANCE TEST (CONFORMITY OF PRODUCTION)

Electrical wiring kit approved under this standard shall be so manufactured as to conform test requirements as specified in 4.

10 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 certification authority, based on the justification provided by the component manufacturer and reviewed by the certification authority which has granted type approval.



All dimension in millimetres.

FIG. 1 IMMERSION TEST PLAN

ANNEX A

(*Foreword*)

COMMITTEE COMPOSITION

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

Organization	*Representative(s)*
Automotive Research Association of India (ARAI), Pune	DR S. S. THIPSE **(*Chairperson*)** SHRI A. D. DEKATE
A B Process Technologies, Pune	SHRI KUNAL CHOPDE
Ashok Leyland Ltd, Chennai	SHRIMATI SUCHISMITA C. SHRI MUTHUKUMAR N. (*Alternate*)
Automotive Component Manufactures Association of India, New Delhi	SHRI SANJAY TANK MISS SEEMA BABAL (*Alternate*)
Bajaj Auto Ltd, Pune	SHRI MILIND J. PAGARE SHRI ARVIND V. KUMBHAR (*Alternate*)
Bosch Limited, Bengaluru	SHRI BHARADWAJ M. KRISHNAMURTHY SHRI VIKRAM K. (*Alternate*)
Central Institute of Road Transport, Pune	SHRI SAMIR SATTIGERI SHRI V. V. JOSHI (*Alternate*)
Central Pollution Control Board, New Delhi	SHRI A. SUDHAKAR SHRI SUNEEL DAVE (*Alternate* I) SHRI KEDARNATH DAS (*Alternate* II)
CLH Gaseous Fuel Applications Ltd, Gurugram	SHRI SHISHIR AGRAWAL SHRI GAGAN AGRAWAL (*Alternate*)
Delhi Transport Corporation, New Delhi	SHRI VIKAS BATRA
GAIL (India) Limited, New Delhi	SHRI ASHISH KUMAR MITTAL SHRI LOKESH MEHTA (*Alternate*)
Indian Auto LPG Coalition, Faridabad	SHRI SHISHIR AGRAWAL SHRI SUYASH GUPTA (*Alternate*)
Indian Institute of Petroleum, Dehradun	SHRI WITTISON KAMEI SHRI ROBINDRO LAIRENLAKPAM (*Alternate*)
Indian Institute of Science, Bengaluru	PROF R.V. RAVIKRISHNA
Indian Institute of Technology Ropar, Rupnagar	SHRI DHIRAJ KUMAR MAHAJAN DR DEBAPRASAD MANDAL (*Alternate*)
Indian Oil Corporation Ltd, (R & D Centre), Faridabad	DR M. SITHANANTHAN
Indian Rubber Manufacturers Research Association, Thane, Mumbai	DR K. RAJ KUMAR DR BHARAT KAPGATE (*Alternate*)
International Centre for Automotive Technology (ICAT), Manesar	SHRI VAIBHAV PRASHANT YADAV SHRI VIJAYANTA AHUJA (*Alternate*)
Mahindra & Mahindra Ltd, Mumbai	SHRI RAJAMANI PARTHIBAN SHRI SHAILESH KULKARNI (*Alternate*)

Organization	*Representative(s)*
Mahindra & Mahindra Ltd (Truck and Bus Division), Pune	SHRI V. G. KULKARNI
Maruti Suzuki India Limited, Gurugram	SHRI GURURAJ RAVI SHRI ARUN KUMAR (*Alternate*)
Minda Emer Technologies Limited, Gurugram	SHRI VIVEK JAIN SHRI BIBHUTI KUMAR (*Alternate*)
Ministry of New and Renewable Energy, New Delhi	SHRI DIPESH PHERWANI
Petroleum and Explosive Safety Organization, Nagpur	SHRI D. K. GUPTA SHRI VIVEK KUMAR (*Alternate*)
Petronet LNG Ltd, New Delhi	SHRI PANKAJ WADHWA (*Alternate*)
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Renault India Private Limited, Mumbai	SHRI RAJENDRA KHILE SHRI VIJAY DINAKARAN (*Alternate*)
Rohan BRC Gas Equipment Pvt Ltd, Ahmedabad	SHRI STEFANO DE CAROLIS SHRI PARTHIV SHUKLA (*Alternate*)
Society of Indian Automobile Manufacturers, New Delhi	SHRI P. K. BANERJEE DR SANDEEP GARG (*Alternate*)
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SHRI GAURAV JAYASWAL
SCIENTIST 'C'/DEPUTY DIRECTOR
(TRANSPORT ENGINEERING), BIS

(*Continued from second cover*)

IS 15713 : 2024	Road vehicles — Compressed natural gas (CNG)/bio-compressed natural gas (bio-CNG) fuel system components — Pressure regulator (*first revision*)
IS 15714 : 2024	Road vehicles — Compressed natural gas (CNG)/bio-compressed natural gas (bio-CNG) fuel system components — Gas air mixer (*first revision*)
IS 15715 : 2024	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) (*first revision*)
IS 15716 : 2024	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 (21.5 bar)]
IS 15717 : 2024	Road vehicles — Compressed natural gas (CNG)/bio-compressed natural gas (bio-CNG)/ Liquefied petroleum gas (LPG) fuel system components — Petrol valve (automatic/manual)
IS 15718 : 2024	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)
IS 15720 : 2024	Road vehicles — Compressed natural gas (CNG)/bio-compressed natural gas (bio-CNG) /Liquefied petroleum gas (LPG) fuel system component — Compartments sub-compartments
IS 15721 : 2024	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
IS 15722 : 2024	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)
IS 15723 : 2024	Road vehicles — Compressed natural gas (CNG)/bio-compressed natural gas (bio-CNG) /Liquefied petroleum gas (LPG) fuel system components — Current limiting devices (*first revision*)

The composition of the Committee responsible for the formulation of this standard is given in 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.

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Amendments Issued Since Publication

Amend No.	Date of Issue	Text Affected

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