ANNEXURE 1
(Item 2.3)

COMPOSITION OF AUTOMOTIVE ELECRICAL EQUIPMENT AND INSTRUMENTSSECTIONAL COMMITTEE, TED 11

SCOPE – Standardization relating to electrical and optical equipment, instruments and their related components including electronics for automotive vehicles.

Co-ordination of work with ISO/TC 22 and its sub-committees SC 32 and SC 35.

Meeting No.	**Date**	**Venue**
29th Meeting	07th July 2023	Webex
30th Meeting	21 November 2023	Webex
31st Meeting	3rd May 2024	Webex

Sl. No.	**Name of the Organization**	**REPRESENTED BY** *Principal member (P)* *Alternate member (A)* *Young professional (YP)*	**Attendance**			
			29th	**30th**	**31st**	**Total**
1)	Vehicle Research and Development Establishment, Ahmednagar	Shri G.R.M. Rao (**chairperson**)	**Y**	**Y**	**Y**	**3/3**
2)	Ashok Leyland Limited, Chennai	Shri Faustino V (P) Shri Jaisingh Pandian S (A) Shri Arumugasamy M (YP)	N	Y	Y	**2/3**
3)	Association of State Road Transport Undertakings, New Delhi	Shri R R K Kishore (P) Shri M Trinath Babu (A)	N	Y	N	**1/3**
4)	Automotive Component Manufactures Association of India, New Delhi	Shri Seema Babal (A) Shri Sanjay Tank (P)	Y	Y	Y	**3/3**
5)	Automotive Research Association of India, Pune	Shri A. A. Deshpande (P) Shri B V Shamsundra (A)	Y	Y	Y	**3/3**
6)	Bajaj Auto Limited, Pune	Shri Arvind V. Kumbhar (A) Shri Milind J Pagare (P) Shri Abhay Kumar (YP)	Y	Y	Y	**3/3**
7)	Castmaster Mobitec India Private Limited, Faridabad	Shri Raju Aggarwal (A) Shri Rahul Jain (A)	N	Y	Y	**2/3**
8)	Central Institute of Road Transport, Pune	Shri Rajkumar Malajure (P) Shubhangi Dalvi (A) Shri Santosh Desai (YP)	N	Y	Y	**2/3**
9)	Denso International India Private Limited, Gurugram	Shri Alok Kumar (P) Ms. Alka Sharma (A)	Y	N	Y	**2/3**
10	Directorate General of Quality Assurance, New Delhi	Mr DS Kelkar (P) Lt Col NS Kulkarni (A)	Y	Y	Y	**3/3**
11	Hero Motocorp Limited, New Delhi	Shri Feroz Ali Khan (P) Shri Piyush Chowdhry (A) Shri Varun Kumar Sharma (YP)	Y	Y	Y	**3/3**
12	Honda Cars India Research and Development Limited, Noida	Mr S. MUTHU KUMAR (P) Shri Gagan Manral (A) Ms. Neha Gaba (YP)	Y	Y	Y	**3/3**
13	Honda Motorcycle and Scooter India Private Limited, Gurgaon	Shri Vipin Sharma (P) Shri Arpan shukla (A)	—	Y	Y	**2/2**
14	Hyundai Motor India Engineering Private Limited, Hyderabad	Shri Ananthakrishna S L (P) Shri Satyanarayana Gupta Bolisetty (A)	—	Y	Y	**2/2**

Sl. No.	Name of the Organization	REPRESENTED BY *Principal member (P)* *Alternate member (A)* *Young professional (YP)*	Attendance			
			29th	30th	31st	Total
15	international Centre for Automotive Technology, Manesar	Shri Sonu Kumar Sudrania (P) Shri Udit Kaul (A)	N	N	Y	**1/3**
16	India Yamaha Motor Private Limited, Noida	Shri Sanjeev Chugh (P) Shri Mohit Kansal (A) Shri Navneet Kaushik (YP)	—	Y	Y	**2/2**
17	Indian Society of Lighting Engineers, New Delhi	Shri Arshi Krishnachar (P) Dr Prakash Barjatia (A) Dr Vidya H A (YP)	Y	Y	Y	**3/3**
18	Indication Instruments Limited, Faridabad	Shri Vishal Lalani (P) Shri Anuj Garg (A)	—	—	—	**-**
19	International Copper Association India, Mumbai	Mr. K N Hemanth Kumar (P) Mr. Shri Amol Kalsekar (A)	—	—	Y	**1/1**
20	Jay Ushin Limited, Gurugram	Shri Anil Kumar (A) Shri Ramesh Yadav (P)	Y	Y	N	**2/3**
21	Lear India Engineering LLP, Pune	Shri Tushar Yadav (P) Shri Kiran Deosarkar (A) Shri Rohit Talekar (YP)	—	Y	Y	**2/2**
22	Lumax Industries Limited, Gurugram	Shri Randhir Kumar (A) Shri Virendra Kumar Sachdav (P)	Y	N	N	**1/3**
23	Mahindra and Mahindra Limited, Mumbai	Shri S Sakthivelan (A) Shri Kumar Meganathan (P) Shri Pathak Pushpanajali (YP)	N	Y	Y	**2/3**
24	Malhotra Cables Private Limited, New Delhi	Shri Rajeev Malhotra (P) Shri Rahul Singh (A) Shri Mithalesh Kumar (YP)	Y	Y	Y	**3/3**
25	Maruti Suzuki India Limited, Gurugram	Shri Gururaj Ravi (P) Shri Sumit Kumar (YP) Ms. Buvaneswari M (A)	Y	Y	Y	**3/3**
26	Minibis Tech India, New Delhi	Shri Iqbal Singh Sabharwal (A)	Y	N	N	**1/3**
27	Ministry of Heavy Industries and Public Enterprises, New Delhi	Shri R K Jaiswal (P)	N	Y	N	**1/3**
28	Ministry of Micro, Small and Medium Enterprises, New Delhi	Shri M Baskar (A) Shri L Kandan (P)	Y	Y	Y	**3/3**
29	Ola Electric Technologies Private Limited, Bengaluru	Shri Subrat Kumar Dash (P) Shri Shivayogi B.A (A)	—	—	N	**0/1**
30	Renault India Private Limited, Mumbai	Shri Rajendra Khile (P) Shri Vijay Dinakaran (A) Shri Jebin Jowhar (YP)	—	Y	Y	**2/3**
31	Roots Industries India Limited, Coimbatore	Shri K. Saravan Sundaram (P) Shri R. Selvaraj (A)	Y	Y	Y	**3/3**
32	Skoda Auto Volkswagen India Private Limited	Shri Makarand Brahme (P) Shri Milind Jagatp (A) Saily Smarth (YP)	Y	Y	Y	**3/3**
33	Society of Indian Automobile Manufacturers (SIAM), Delhi	Kartike Karwal (A) Prashant Kumar Banerjee (P)	N	Y	Y	**2/3**
34	Suzuki Motorcycle India Private Limited, Gurugram	Shri Avinash Khot (P) Shri Ramkrishna Ahire (A)	N	Y	Y	**2/3**
35	Tata Motors Limited, Pune	SHRI GOWRISHANKAR PS (P) Sankar (P)	Y	Y	Y	**3/3**
36	Toyota Kirloskar Motor Private Limited, Bidadi	Shri Raju. M (P) Shri Vijeth Gatty (A) Shri Kiran T N (YP)	-	-	Y	**1/3**

Sl. No.	Name of the Organization	REPRESENTED BY *Principal member (P)* *Alternate member (A)* *Young professional (YP)*	Attendance			
			29th	**30th**	**31st**	**Total**
37	Tractor and Mechanization Association, New Delhi	Shri PRADEEP SHINDE (A) Shri Philip Koshy (P)	Y	N	Y	**2/3**
38	Uno Minda, Gurugram	Ms. Rutuja Raverkar (P)	-	-	Y	**1/1**
39	Vehicle Research and Development Establishment, Ahmednagar	Shri Manish Sahoo (P) Shri Narendra Malviya (A)	Y	Y	Y	**3/3**

ANNEXURE 2

(*Sl No 3 of ITEM 3*)

COMMENTS ON DOCUMENT TED 11 (20542)W

A-2.1 Comments from Rohit Talekar(Lear): Vide BIS portal dated 20.10.2024

Sl No	Clause	Type of Comment	**Comments/Suggestions along with Justification for the Proposed Change**	**Proposed Change/Modified Wordings**
1	4	Ed	There are types of Turn indicator operations for turning left: 1. First option is Turn Light -Left 2. Second option is Turn Light -Left during lane change. Will we specify that SELF-CANCELLING DIRECTION INDICATOR SWITCHES is only applicable to option 1? You will not mode steering wheel by huge angle when you are using option 2 in high speed during highway operations. And lane change blinking depend on OEM to OEM..	The mechanism of self-cancelling direction indicator switch shall be so arranged that if the lever is shifted manually in particular position for turning the vehicle,..... to The mechanism of self-cancelling direction indicator switch shall be so arranged that if the lever is shifted manually in particular position for turning the vehicle *excluding lane change operations*,.....
4	7.2	Ed	Instead of using headlight switch, wite light side combi switch. The light side combination switch in most cars have mutiple operations like even fog lights. So using headlight switch might be incorrect.	he headlight switch may also be marked with the Standard Mark to The light side combination switch may also be marked with the Standard Mark

A-2.2 Comments from Tushar Yadav and Kiran Deosarkar (Lear) : Do not have expertise the area of this proposed standard. So, I cannot comment.

A-2.3 Comments from MSIL:
Not CMVR item, ACMA to further comment

ANNEXURE 3

(*Sl No 5 of ITEM 3*)

DRAFT TED 11 (22534)

BUREAU OF INDIAN STANDARDS

DRAFT FOR COMMENTS ONLY
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Draft Indian Standard

RECOMMENDATION FOR POLARITY OF EARTH CONNECTIONS AND MARKING OF ELECTRICAL EQUIPMENT FOR AUTOMOBILES

(First Revision of IS 7471)

ICS: 43.040.10

Last date for receipt of comments is XX/XX/XXXX

Automotive Electrical Equipment and Instruments Sectional Committee, TED 11

FOREWORD
(Formal Clause to be added later)

This Indian standard was first published in 1974. This first revision of the standard is being undertaken to update the standard and to incorporate latest technological advancement/ development that has taken place and to draft Indian Standard as per latest grafting guidelines.

This standard refers to electrical installations on automobiles having an earth return system.

All vehicle manufactures in this country, with one or two exceptions, have been used to positive battery earthing. Meanwhile, the rest of the world's automobile manufactures retained or changed to negative earth. Technical developments over this period, such as the introduction of semiconductor and electronic components in vehicle electrical equipment have eliminated any advantages that positive earthing may have had over negative earthing. This standard has been prepared in keeping with the trend of world-wide standardization.

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

Draft Indian Standard

RECOMMENDATION FOR POLARITY OF EARTH CONNECTIONS AND MARKING OF ELECTRICAL EQUIPMENT FOR AUTOMOBILES

(*First Revision*)

1 SCOPE

This standard specifies the system of earthing and marking of electrical equipment for automobilehaving an earth return system.

2 EARTHING

2.1 Negative Earthing of Battery — Negative Earthing shall be the recommended practice for the automobiles having earth return system.

3 IDENTIFICATION OF COMPONENTS

3.1 When an automobile manufacture introduces a change from positive to negative earth, it will be necessary to identify electrical components affected, to avoid incorrect fitting in assembly andservice, and to clearly mark the automobile itself.

3.2 It is important that standard means of component identification are used and understood, particularly in service.

3.2.1 The marking of components for negative earth system shall be as given in Table 1.

3.2.2 The marking of components for positive earth system shall be as given in Table 2.

NOTES ─

1) Table 2 provides polarity marking for electrical equipment using positive earth system only for replacement market.

2) Normally the same regulator may be applied for both systems. However, if any regulator is unsuitable for any particular system, it should be marked separately.

Table 1 Polarity Marking of Electrical Equipment for Automobiles using Negative Earth System
(*Clause* 3.2.1)

Sl. No. (1)	**TYPE OF EQUIPEMENT** (2)	**POLARITY MARKING** (3)	**REMARKS** (4)
i)	dc generator	Main terminal identification a) Red and/ or '+' for main (armature) terminal b) Black or '—' for earth terminal	
ii)	dc generator control unit	Not marked	Suitable for either polarity
iii)	dc generator control unit incorporating semiconductor device	Cover marked '—' earth	
iv)	Alternator	Main terminal identification: a) Red and / or '+' for positive supply b) Black and/ or '—' for earth terminal	
v)	Alternator control unit	'+' and '—' marked on the cover	Correct connection to unit ensured by inhibited connector
vi)	*Ignition coil	'+' and '—' moulded on the cover	Terminal variation as required by automobile manufacturers
vii)	Permanent magnet motor	Not marked	Correct connections to unit ensured by inhibited connectors which are marked appropriately
viii)	Fuel gauge	Marked '—' earth	
ix)	Ammeters	Not marked	Connect as necessary
x)	Batteries	'+' and '—'	
xi)	Clocks, electrical speedometer, electrical tachometer, radio	Where appropriate '+' and '—'	

* In the negative earth system internal connection of ignition coils should be such that when negative o the primary winding is connected to contact breaker of distribution, high tension terminal of ignition coil will be at negative potential. The only advantage of positive earthling for ignition voltage is longer spark plug life and it reduces the break-down voltage.

Table 2 Polarity Marking of Electrical Equipment for Automobiles using Positive Earth Return System

(*Clause* 3.2.2)

Sl. No. (1)	**TYPE OF EQUIPEMENT** (2)	**POLARITY MARKING** (3)	**REMARKS** (4)
i)	dc generator	Main terminal identification a) Black and/ or '—' for main (armature) terminal b) Red or '+' for earth terminal	
ii)	dc generator control unit	Not marked	Suitable for either polarity
iii)	dc generator control unit Incorporating semiconductor device	Cover marked '+' earth	
iv)	Alternator	Main terminal identification: a) Black and/or '—' for negative supply b) Red and /or '+' for earth terminal	
v)	Alternator control unit	'+' and '—' marked on the cover	Correct connection to unit ensured by inhibited connector
vi)	Ignition coil	'+' and '—' moulded on the cover	Terminal variation as required by automobile manufacturers
vii)	Permanent magnet motor	Not marked	Correct connections to unit ensured by inhibited connectors which are marked appropriately
viii)	Fuel gauge	Marked '+' earth	
ix)	Ammeters	Not marked	Connect as necessary
x)	Batteries	'+' and '—'	
xi)	Clocks, electrical speedometer, electrical tachometer, radio	Where appropriate '+' and '—'	

ANNEXURE 4

(Sl No 6 and 7 of Item 3)

AGENDA AND MINUTES OF PANEL 1 MEETING

A-4.1 Agenda-

For IS-1884 (AUTOMOTIVE VEHICLES — ELECTRIC HORNS — SPECIFICATION) & IS-15796 (AUTOMOTIVE VEHICLES — HORN INSTALLATION — REQUIREMENTS)

Members Comments After the 1st Panel Meeting Dt: 17th Apr 2024

- M/s BAL: To align the Indian standard with ECE R28 (Annexure-01)
- M/s Skoda: "Electronic Horn" Definition addition (Annexure-02)
- M/s Roots Industries: (Annexure-03)
  - Introduction of new Class III (36V, 48V, 72V & 80V) horn for A&C category vehicles
  - Amalgamation of IS-14813 (Automative Vehicles-Air Horns-Specification) in IS-1884
  - Testing requirements changes.
- M/s ARAI: Recertification based on the new classification & CoP tests need to be identified. (Annexure-04)
- M/s OLA: (Annexure-05)
  - Introduction of 48V horn
  - Changes in the testing requirements (operating voltage range test, sound pressure level test etc.) with respect to the 48V Horn requirements
- M/s Hero: Responded to the ARAI's Feedback on 48V horn component. (Annexure-06)
- M/s Ashok Leyland Limited proposal (Annexure 07)

Annexure-01

Proposal:

M/s BAL Proposed to have complete alignment of IS-1884 & IS-15796 with UN ECE R28 for technical requirements.

Justification

This is similar to the alignment of Indian lighting standards in line with ECE regulations done in the past.

For sound pressure limit we propose the following text in IS-15796 (Clause no 6.1):
"Sound Pressure Level Test for Horns Mounted on Vehicles Maximum sound pressure level when determined in accordance with method of test given in 6.2, shall be at least:
(a) Equal to 83 dB (A) and not more than 112 dB (A) for the signals of vehicles of categories **L** ~~L3 to L5~~ of a power less than or equal to 7 kW;
(b) Equal to 87 dB (A) and at most 112 dB (A) for the signals of vehicles of categories M, N and **L** ~~L3 to L5~~ of a power greater than 7 kW."

Annexure-02

M/s SKVWL Comments

Addition of definition for "Electronic Horn"

"Electronic" means a principle of operation by electric or electro-magnetic force with amplifier and speaker or resonator.

Annexure-03

M/s ROOTS Comments

OMMENTS	**JUSTIFICATION**
equest To add “Class-III” for Vehicle A & C category	& C category vehicles - These vehicles requires higher sound level requirements with respect to their operating field. For e.g.. If it is used in mining. it requires higher decibel to provide an audible warning, because of high ambient noise.
equest to include 36V, 48 V, 72 V & 80V DC AWDs in addition to 6, 12 and 24V DC	onsidering C Category vehicles & Electrical vehicles — Other rated voltages also to be added
equest to add “c)105dB-125dB (A) for AWD of Class-III	& C category vehicles — These vehicles requires higher sound level requirements with respect to their operating field.
Existing IS 1884 — Reliability test conditions to be included 1. Endurance test— 100,000 cycles 2. Vibration test 3. Corrosion resistance test 4. Water Spray test 5. Dust test 6. Temperature cycle test	• ECE R28 has only Endurance test requirement for 50,000 cycles. • Existing IS 1884 addresses comprehensive product requirements and ensure better reliability considering usage scenario in India • Few test requirements can be modified in-line with other standards. For e.g. Corrosion resistance test in IS 1884 mentioned different test pattern, for the same test IS 9844 details the test requirements inline with international standard ASTM Bl 17, so IS 9844 can be linked for this Corrosion resistance test • Acceptance criteria can be refined as "The difference in sound pressure level shall not exceed 5 dB that measured before the test" instead of "The drop in sound pressure level shall not exceed 5 dB below that measured before the test.
e warning device shall be mounted rigidly, by means of the equipment recommend by the manufacturer, on a support whose mass is at least ten times that of the warning device under test and not less than 30 15 kg. In addition, arrangements shall be made to ensure that reflections on the sides of the	aintaining 30 kgs mass for horn mounting is too heavy. We can consider existing IS 1884 (ten times or 15 kgs) - clause 8.6.1 of IS 1884

support and its own vibrations have no appreciable effect on the measuring results.	Pls refer clause no. 5.3.1 of TED 11 23335 P document
ecify " Room temperature" instead of "20 ± 5 °C" considering Indian ambient conditions	ere is no specific Room temperature specifications. Hence, we request to mention as "Room temperature" instead of mentioning 20±5°C, because our ambient conditions are different
2.6 : PIs specify as "The warning device shall be mounted rigidly, by means of the equipment recommend by the manufacturer; on a support whose mass is at least ten times that of the warning device under test and not less than 15 kg" instead of "The warning device shall be mounted rigidly, by means of the equipment recommend by e manufacturer, on a support whose mass is at least ten times that of the warning device under test and not less than 30 kg"	ıring & after testing, adjustments are permitted. After adjustment, the sound level may increase (higher than initial value), so considering this we requested to change this as " The difference in sound pressure level shall not exceed 5dB that measured before the endurance test". This statement addresses both increase and drop in sound pressure level, after the test.
S-1884 and IS 14813 (Automotive vehicles - Air horns — Specification) are to be amalgamated in IS-1884 as per the TED/11/23335 doc.	• Specific BIS standard (IS 14813) available for the Air horns. • IS 1884 and IS 14813 (Automotive vehicles - Air horns – Specification) are amalgamated in TED/11/23335 doc. • CMVR restricted the use of harsh and loud sound devices. And this IS 14813 regulates the part level requirements for this air horn with due concern of standard sound level • ECE R28 also addresses the requirements for the Air horns • There is no change in vehicle level requirements (IS 15796) – i.e. 87 dBA to 112 dBA at 7 meters distance.

Annexure-04

M/s ARAI comments and Feedback

COMMENTS	JUSTIFICATION
Considering horn classification and Sound Pressure Level requirements, for Type 2B and Type 3 horns recertification will be required.	
Actual usage of horn on vehicle is not known during application for Type approval. Requires more clarification	OPTIONAL TESTS: 1. Corrosion Resistance Test (cl. no. 5.6) 2. Water Spray Proof Test (cl. No. 5.8) NOTE — This is an optional test and is to be required to be carried out only when the switch is intended to be exposed directly to open air conditions in actual usage.
CoP Tests as per AIS:037- • Tests required to be identified , amendment in AIS:037 is required accordingly • Quantity for CoP tests to be defined	
Word - "Horn Switch" to be replaced by "Audible Warning Device"	

ARAI Comments & Query on 48V Architecture

After going through the documents, please find the existing comparative study between IS, ECE & SANS. JASO is at par with ECE. As of today, there is no provision for rated voltage or test voltage beyond 6V/12V/24V or 6.5V/13V/26V respectively in any of the standards.

Also, as discussed with our Automotive Electronics Department-Vehicle team, most of the EV 2-wheelers operate at 48V, 60V or 72V and they then use a step-down convertor to run the auxiliary systems. In case we use 48V/60V/72V to run all the auxiliary components, for the operation of contactor (ignition) 12V supply is necessary as otherwise the vehicle will be in constant energized state.

We need to ask OLA and other EV 2 Manufacturer what is the provision rated voltage for auxiliary systems viz; horn, lighting, ignition etc. accordingly the proposal may be considered

Sr. No.	Parameters	IS 1884:1993 (Re-affirmed in 2019) (for horn as a component)	ECE R – 28 Aug 2001 (Latest Version 30.10.2020) (for horn as a component as well as horn installation requirements)	SANS 20028:1972 (for horn as a component as well as horn installation requirements)
1.	Classification	**Type 1 :** AC horns for mopeds, scooters and motor cycles based on magneto system **Type 2A :** dc horns for two and three wheelers **Type 2B :** dc horns for passenger cars and commercial vehicles	**Class I :** used in motorcycles of power less than or equal to 7 kW, **Class II :** used in M and N category vehicles and motor cycles of power greater than 7 kW	**2 categories: AWD and ASD** **Class I :** used in motorcycles of power less than or equal to 7 kW, **Class II :** used in M and N category vehicles and motor cycles of power greater than 7 kW

		Type 3 : dc horns of wind tone type for passenger cars and commercial vehicles		
2.	Test Site	An **anechoic room** or in an **open space** in which there is no obstacle within **a radius of 12m** and no acoustical focusing effects on nearby parallel walls Distance between the horn and Diaphragm of the Microphone = 2m Height of Microphone and Horn mounting = 1.2 m	An **anechoic or semi-anechoic chamber or in open space.** In open space compliance with the spherical divergence of 1 dB within a hemisphere of not less than **5m radius.** Distance between the horn and Diaphragm of the Microphone = 2m Height of Microphone and Horn mounting = 1.15 to 1.25 m	An **anechoic or semi-anechoic chamber or in open space.** In open space compliance with the spherical divergence of 1 dB within a hemisphere of not less than **5m radius.** Distance between the horn and Diaphragm of the Microphone = 2±0.01m Height of Microphone and Horn mounting = 1.15 to 1.25 m
3.	Sound Pressure level requirements	**Type 1 :** 85 to 105 dB **Type 2A :** 90 to 115 dB **Type 2B :** 100 to 125 dB **Type 3 :** 105 to 125 dB	**Class I :** 95 to 112 dB, **Class II :** 105 to 118 dB	**Class I :** 95 to 112 dB, **Class II :** 105 to 118 dB
4.	Sound Spectrum Requirements : SPL in frequency band 1800 to 3550 Hz shall be greater than that of each component of a frequency exceeding 3550 Hz and in any case equal to or greater than	**Type 1 : 85 dB** **Type 2A : 90 dB** **Type 2B : 100 dB** **Type 3 : 105 dB**	**Class I : 95 dB,** **Class II : 105 dB**	**Class I : 95 dB,** **Class II : 105 dB**
5.	Performance tests	**1. Current drawn test,** **2. High voltage test,** **3. Operating voltage test and** **4. Continuous operation test**	**Not included in ECE**	**Not included in ECE**
6.	Environmental tests	**1. Insulation resistance test** **2. Vibration Test,** **3. Corrosion Test,** **4. Dust Test,**	**Not included in ECE**	**Not included in ECE**

		5. Damp heat Cyclic test, **6. Water Spray Proof test,** **7. Temperature stability test (Hot and Cold test)**		
7.	Endurance Test	1,00,000 cycles of 1sec ON and 3 sec OFF, maximum three adjustments	10,000 cycles for Class I and 50,000 cycles for Class II of 1 sec ON and 4sec OFF, no limit on no. of adjustments	10,000 cycles for Class I and 50,000 cycles for Class II of 1 sec ON and 4sec OFF, no limit on no. of adjustments

Annexure-05

M/s OLA Electric Comments & Responses
IS-1884

IS Standard	Clause/ Subclause	Paragraph/ Figure / Table/	Type of comment1	Proposed change	Justification
IS 1884:1993	NA	FOREWARD	ge	Add a clause (e) after exisinting clause (d) e) 48V d.c. horns of high frequency type horns included.	For better clarity that now the standard includes 48V dc horn in the component standard.
IS 1884:1993	Cl. No 1	-	ge	**1.SCOPE** This standard specifies the mechanical, electrical and acoustical requirements, methods of tests for 6, 12 ~~and~~ 24 V and 48V electric horns for use in motor vehicles including those intended for two and three wheelers.	Added 48V horn in the scope
IS 1884:1993	Cl. No 6	-	te	**6. RATED VOLTAGE AND MAXIMUM CURRENT** The values of current ratings for electric horns shall be as follows Rated Voltage. Maximum rated current Amperes Type 1. Type 2 Type 3 . 2A 3B 48 V dc ---- 0.5 ---- ---- 24 V dc ---- ---- 3 6 12 V dc ---- 2.5 4 10 6 V dc ---- 2.5 4 10 6 V ac rms 3.5 ---- ---- ---- 22 V ac rms 3.5 ---- ---- ----	Incorporated Maximum rated current basis trial on 5 samples.
IS 1884:1993	Cl. No 8.5	-	te	**8.5 OPERATING VOLTAGE RANGE TEST** 8.5.1 The horn at ambient temperature shall operate satisfactorily over the following voltage. Rated Voltage of horn V (1) Performance limits of voltages Maximum V (2) Minimum V (3)	Incorporated Maximum & Minimum Operating basis trial on 5 samples

				48 54.0 42.0 24 30.0 22.0 12 14.5 10.0 6 8.0 5.5	
IS 1884:1993	Cl. No 8.6.2	-	te,ed	8.6 SOUND PRESSURE LEVEL TEST 8.6.2 The supply voltage shall be 6.5±0.1, 13±0.1 or 26 ±0.1 V or 50 ±0.1 V at the terminals of the source of electrical energy corresponding respectively to rated voltage of 6, 12 or 24 V or 48V The resistance of the connecting leads excluding any switch contact in circuit shall be not greater than 0.05, 0.10, and 0.20 and 0.40 ohm for rated voltage of 6, 12, and 24 V and 48V respectively.	Incorporated supply voltage level & maximum resistance basis trial on 5 samples to ensure the required SPL to meet the standard requirement.
IS 1884:1993	Cl. No 8.8.2		te,ed	8.8 ENDURANCE TEST 8.8.2 The voltage at the horn terminals shall be 6.5 ± 0.2, 13±0.3 and 26.0± 0.5 V and 50 ± 1 V., for rated voltages 6, 12and 24 V and 48V respectively. For Type 1 ac horns operation the power shall be supplied by the generator of the vehicles for which the horn is intended or the test shall be carried out with a generator of similar design with speeds agreed mutually between the manufacturers and the purchasers. The resistance in the systems including the resistance at terminals and contacts shall be less than 0.05, 0.10 and 0.20 and 0.40 ohms for rated valtages voltages of 6,12 and 24 V and 48V respectively.	Incorporated the voltage at terminal of horn and maximum resistance of system basis trial on 5 samples for endurance testing
IS 1884:1993	Cl. No 8.11	-	te,ed	8.11 CONTINUOUS OPERATION TEST With a terminal voltage of 6.5 ±0.1 V, 13 ± 0.2 V for 26 ±0.4 V or 50 ± 1 V as appropriate, the horn shall be continuously operated for a period of five minutes and then allowed to cool to ambient temperature.	Terminal voltage for continuous operation test incorporated.

IS-15796

IS Standard	Clause/ Subclause	Paragraph/ Figure/ Table/	Type of comment1	Proposed change	Justification
IS 15796 :2008	Cl. No 6.2.2	-	te,ed	**6.2 METHOD OF TEST** 6.2.2 The sound signalling device shall be operated at test voltages of 6.5V, 13V, ~~or~~ 26V or 49V with tolerance of ± 0.5 V, measured at the terminals of the source and corresponding respectively to rated voltage of 6V,12V/, 24V, 48V.	Requirement for vehicle level horn installation for a 48V d.c. horn incorporated.

Ola Comment On ARAI Feedback: *We thank ARAI for the extensive study done in comparing the different standards , this indeed gives a lot of global perspective of what other standards are following as on date .*

Need of the Amending the standards : *We would like to bring to the kind notice of the ARAI and panel members that these voltages (i.e. 6/12/24 V) are predominantly being used for ICE vehicles for many years . Basically for any auxiliary parts in a vehicle there is a need of stabilized voltage /current flow which gets fulfilled by an auxiliary battery as other sources of voltage (e.g Alternator) generally have fluctuating nature. With technological advancement in in automotive ecosystem and vehicles with dual propulsion systems (hybrids) and EV's, there is a need to evaluate all such standards.*

Drawback of using converter in vehicles*: In EV's using a convertor actually results in conversion efficiency loss almost of range of 8-10% from 48V to 12V , which can be optimized efficiently if this voltage architecture is directly utilized , also we know that (P) = V* I (voltage is function of current i.e. for a 12V system current rating is high therefore thickness of harness has to be more thereby having more copper (The size of copper in harness is reduced by 10-15% compared to the 12V horn system due less current consumption) and resulting is increased weight in vehicle as compared to 48V. In India due the road conditions the usage of horn is very high so to use such system in vehicle where usage the backend architecture needs to highly optimized and for that reason 48V system is most relevant* ***Application , Safety & Global benchmarking*** *In advance vehicles "traction batteries" contribute a dual purpose i.e. 1. propulsion application 2. Provide a more stable performance w.r.t voltage & current, this determines efficiency of the vehicle w.r.t to its performance & simultaneously provide a stable power requirements for auxiliary sub-systems (e.g. Horn ,lighting etc..).*

Today's EV operate indeed operate in 48/60/72 volts, however we have to understand that which is most safe DC voltage that gives stable power requirements within vehicle moreover anything above 60 Vdc is a "high voltage system" and that has very special safety requirements and hence it is very rare (negligible) that at such voltages will be used for auxiliary units. However when it comes to 48Vdc it is actually the safest low voltage DC system that can provide the most stable electrical input for the accessories to perform best to its efficiency. So ola is proposing a safest low DC voltage i.e. 48V also as an option in this standard. Already globally many OEM's are already moving or planning to move to this voltage architecture for various applications

- *Tesla cyber truck is fully built on 48V architecture*
- *CLEPA (European association of automotive supplier) has already being advocating the usefulness of 48V components*

Additionally there have been multiple papers that are available in public forums where various advantages of 48V architecture w.r.t wiring harness are available where use of such architecture helps in reduction in the weight of the vehicle thereby helping the vehicles to be more efficient (improves the range) which is a critical aspect for such advanced technology vehicles. For "Lighting" application in automotive the main criteria is current requirements that more critical for the product design and for that matter this gets recorded in component

certification if drivers are in LED lamp then they run on 12 volt if there are higher voltages it can always be managed by E&E ECU's or by modifying those LED drivers.

For an "ignition system" there is always a feasibility of having a different voltage system other than 12 Volts , technically it is very much possible to strategize in a vehicle to energize and de-energize the 48V System based on Ignition input through ECU. And similar way other E/E components can be taken likewise 24V ignition systems are used Heavy vehicles.

Annexure-06

M/s HMCL Comments: Under Clause no. 6, Please keep the Max. current value of TYPE 2A horn for 48V DC same as 12V horn i.e. 2.5 Amperes.

Justification: As the value proposed by OLA will be based on a specific use case and for other DB values it will get changed.

Annexure 07

M/s. Ashok Leyland Limited Proposal

Reference to Sl. Nos. 6 & 7 of ITEM 3 of 31st TED 11 meeting agenda on Horn specification + installation requirements, kindly find below our views.

1. Currently TED/11/23335 document comprises of only IS 1884 specification & IS 15796 installation requirement is not part of the TED 11 draft

2. We propose to revise TED/11/23335 document amalgamating requirements of both IS 1884 & IS 15796, aligning with ECE R 28 requirements

3. Below listed IS 1884 unique component level test requirements are not part of ECE R 28 req., hence may be included in revised TED/11/23335 document considering component safety

    a. Visual examination and dimensional check
    b. High voltage test
    c. Current draw test
    d. Operating voltage range test
    e. Sound pressure level test
    f. Vibration test
    g. Corrosion resistance test
    h. Continuous operation test
    i. Dust test
    j. Damp heat (cycling) test
    k. Water spray proof test
    l. Water sealing test
    m. Temperature stability test

A-4.2 Minutes of Panel 1 meeting

MOM for TED 11- 2nd Panel Meeting (dt 22-08-2024) For IS-1884 & IS-15796			
Welcome Address 1)The meeting commenced with a welcome address by the panel convenor, Mr. Gururaj Ravi (Maruti Suzuki) 2)MSIL presented a comprehensive compilation of comments and feedback received from various stakeholders.			
Approach	**Proposal**	**Member's views:**	**Panel Convenor Opinion:**
Discussion on Harmonization of Standards	**Comments from M/s BAL:** 1)M/s BAL briefly explained their comments and justified the need for harmonizing both IS-1884 and IS-15796 with ECE R-028, except for the number of cycle tests for endurance testing. 2)They highlighted the inclusion of the complete L Category of vehicles in the sound pressure level requirements of IS-15796.	M/s Yamaha Motor supported the harmonization but OEMs are btter to judge whether ECE R28 is good as per Indian use cases M/s HMCL opposed the harmonization, citing safety concerns and the omission of some test requirements. M/s MSIL proposed to consider the indian horn use cases, threrfore it is better to retain all the testing requirements in the IS standard. M/s Roots was in favour of proposal for harmonization However, testing requirements need to be considered depending on the Indian use cases. **Comments from M/s ARAI:** 1)M/s ARAI emphasized the different environmental and usage requirements for horns in India compared to ECE standards and suggested retaining the current Indian test requirements. 2)They noted that the use of AIR horns is banned as per CMVR, and further discussion with BIS TED 11 committee is needed to determine if they can be incorporated into the current standard.	1)The panel convenor proposed harmonizing the standards at the administrative level, where →Scope would be harmonized with ECE R28 (excluding AIR horns), however, to avoid the inconvenience of updating other standards and the CMVR book, and to maintain industry practice, the terminology will remain 'Horn' instead of 'AWD'. → Definations (excluding AIR horn) would be harmonized →Horn classification would be harmonized (Class I & Class II), →However, the current IS test and all it's testing requirements would be retained. 2)ARAI and most of the panel members agreed with the decision.
Incorporation of New "Class III" Horn	**Proposal from M/s Roots:** M/s Roots proposed adding a new "Class III" horn for A & C category vehicles, as ECE R-	M/s UNO Minda supported this proposal. M/s ARAI had no immediate comments, will revert back with further studies.	The panel convenor suggested that further discussion on this topic is needed and will be addressed in the subsequent meeting.
Incorporation of "Electronic Horn"	M/s SKVWL proposed to addition of "Electronic horn" in the IS standard	–	Panel Convenor agreed with the proposal to incorporate "Electronic Horn" definition inline with the ECE R28.
Addition of 48V Rated Voltage Horn	**Proposal from M/s OLA:** M/s OLA proposed adding a 48V rated voltage horn to the standard, along with the requisite test requirements.	M/s Roots agreed with this proposal and suggested further additions of 36V, 72V, and 80V horns. M/s HMCL also agreed to the proposal with the minute difference in the test requirement for it. (2.5 A under clause no 6 of IS-1884) M/s ARAI proposed conducting further studies and gathering practical data for different voltage criteria horns and their	1)The panel convenor requested M/s OLA and M/s Roots to share test reports and relevent data on these high-voltage horn requirements with all stakeholders and other members aslo may contribute in it. 2) After thoroughly reviewing all reports and relavent data from test agencies, the necessary approach may be decided.

Information Classification :Public

2nd Meeting attendance of Panel 1 (TED 11) – 22nd August 2024

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ANNEXURE 5

(*Sl No 8 of Item 3*)

COMMENTS/INPUT RECEIVED ON DRAFT TED 11 (23075)

A-5.1 Comments received from Hero Motocorp vide mail dated 22.9.2023 and justification received from UNO minda vide mail dt 25.4.24

Sl. No.	Clause/ Sub-clause/ para/ table/ fig. No. commented	Type of Comments (General/ Editorial/ Technical)	Justification	Proposed change	Justification From UNO Minda vide mail dt 25.4.2024
1.	9.9/Dry Heat Test	Technical	1. Temperature relatedtests shall be defined based on application ofcomponents 2. Committee may state why such change has been introduced with a clear justification to understand appropriately	Current text: **"9.9 Dry Heat Test** *The test shall be carried outin accordance with IS 9000 (Part 3/Sec 5). The test chamber temperature shall be 85 ± 2°C. The recovery period shall be 2 hours."* **Proposed Text: 9.9 Dry Heat Test** *The test shall be carried outin accordance with IS 9000 (Part 3/Sec 5). The test chamber temperature shall be ~~85 ± 2°C~~ **55 ± 2°C**. The recovery period shall be 2 hours."*	On proposal of chamber temperature of 85 ± 2°C: *As the environment temperature goes upto 50 Deg C in some parts of india; vehicles, when parked in open parking are exposed to continuous high temperatures. It is observed that the inside cabin temperature in such cases can reach upto 75-80 Deg C. Therefore we had proposed the temperature criteria accordingly. Also many of the OEMs follow this norm*
2.	9.11/Low Temperature Test	Technical	1. Temperature relatedtests shall be defined based on application ofcomponents 2. Temperature specifications for Low Temperature Test have notbeen changed globally as well and changing temperature specification on the lower side will not add much to the performance and durability of the component. 3. Committee may state why such change has been introduced with a clear justification to understand appropriately	Current text: "***9.11 Low Temperature Test*** *The test shall be carried outin accordance with IS 9000 (Part 2/Sec 4). The temperature severity for this shall be -30 ± 3°C and the recovery period shall be 2 hours."* **Proposed Text:** *The test shall be carried out in accordance with IS 9000 (Part 2/Sec 4). The temperature severity for thisshall be ~~-30 ± 3°C~~ **-25 ± 3°C** and the recovery period shall be 2 hours."*	Although -30Deg C is not fully relevant for Indian scenerios, Normally OEMs who supply to colder regions follow same specification.

ANNEXURE 6
(*Sl No 9 of Item 3***)**

MOM | MEETING OF PANEL-2
OF TED 11DATED: 21ST
FEBRUARY 2024

Opening Remarks: Member Secretary, TED 11 explained that during 30th meeting of TED 11, comments were received from M/S Hero MotoCorp Limited on TED 11 (23215) – 2nd revision of IS 4050 – Horn Switches for Automobiles – Method of testing. Committee chair opined that this subject shall be discussed in a separate panel and recommendations are to be submitted to the main committee before the next meetingof TED 11. Hence, Panel-2 was constituted under convenorship of M/S Hero MotoCorp Limited.

Discussion:
Shri Varun Sharma on behalf of panel convener Shri Feroz Khan (Hero MotoCorp Ltd.) convened the meeting. He thanked all the participants for joining the meeting and taking reference of the opening remarks made by the Member Secretary, TED11 further explained that TED 11 (23215) is based on existing IS 4050. While referring to amendment 2 of IS 4050, it was found that 2 & 3 Wheeled vehicles are not in the scope of this standard and since in the draft revision document TED 11 (23215), scope was considered for all automobiles, comments were submitted by HMCL. Following are the recommendations from this panel to the main committee:

- Panel-2 agreed that the revision document should consider provisions of amendment 2 of IS 4050 and hence scope of TED 11 (23215) shall be modified by excluding 2 & 3 Wheeled vehicles from the scope.
- A separate panel may also be created to seek inputs from 4W OEMs to finalize the document TED 11(23215).
- Further, comments received from M/S Uno Minda were also discussed and the panel advised M/S Uno Minda to come back with their inputs on certain clarifications required by the panel within 2 weeks.

Meeting ended with a vote of thanks from the panel convener and the Member Secretary, TED 11

Participants

Organization	Participants
ACMA	Shri Sanjay Tank
Heromotocorp	Ms Apoorva Tripathi
Heromotocorp	Shri Eshan Gupta
Heromotocorp	Shri Varun Sharma (Convenor)
Heromotocorp	Shri Yash Yadav
SIAM	Shri Lokesh Mittal
UNO Minda	Shri Mohit Chaudhary
BIS	August Dubey

ANNEXURE 7
(*Sl No 11 of Item 3***)**

DRAFT DOCUMENT TED 11 (16959)

ROAD VEHICLES — FUSE-LINKS
PART 3 FUSE-LINKS WITH TABS (BLADE TYPE) TYPE C (MEDIUM), TYPE E (HIGH CURRENT), TYPE F (MINIATURE), TYPE N AND TYPE P (SUB-MINIATURE)

ICS 43.040.10

भारतीयमानकब्यरू ो
BUREAU OF INDIAN STANDARDS
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April 2024 **Price Group**

Automotive Electrical Equipment and Instruments Sectional Committee, TED 11

FOREWORD

This Indian Standard (Part 3) was adopted by Bureau of Indian Standards, after the draft finalized by the Automotive Electrical Equipment and Instruments Sectional Committee had been approved by the Transport Engineering Division Council.

In order to protect the automobile electrical equipment against excessive currents, fuse-links are inserted. Owing to number of circuits and accessories, it might become necessary to insertfuse-links into each circuit depending on the load requirements. This standard is intended to cover such fuse-links for automobiles.

This standard has been brought out in seven parts. Other parts in this series are:
IS 2577

IPart 1: Definitions and general test requirements
Part 2: User Guidelines
Part 4: Fuse-links with female contacts (Type A) and bolt-in contacts (Type B) and theirtest fixtures
Part 5: Fuse-links with axial terminals (Strip fuse-links) Types SF 30 and SF 51 and testfixtures
Part 6: Single-bolt fuse-links
Part 7: Fuse-links with tabs (Type G) with rated voltage of 450 V

This Indian Standard is modified adoption of ISO 8820-3 Road vehicles — Fuse-links — Part3: Fuse-links with tabs (blade type), Type C (medium), Type E (high current) and Type F (miniature). Major modification/ changes between and Indian Standard and ISO standard are:

a) Incorporation of Type N and Type P (sub-miniature) fuse-links.
b) Modification in Table 4, Table 5, Table 6 and Table 7 to incorporate requirements oftype N and type P (sub-miniature) fuse-links.
c) Addition of Fig. 6 and Fig.7 (test dummy for type N and type P fuse-links) and renumbering of all the subsequent Figures.
d) Incorporation of BIS Certification Marking Clause in the Indian Standard.
e) Annex A has been made normative instead of informative.

Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

The composition of the committee responsible for formulation of this standard is given in Annex B.

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: 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.

Indian Standard

ROAD VEHICLES — FUSE-LINKS
PART 3 FUSE-LINKS WITH TABS (BLADE TYPE) TYPE C (MEDIUM), TYPE E (HIGH CURRENT), TYPE F (MINIATURE), TYPE N AND TYPE P (SUB-MINIATURE)

1 SCOPE

This Indian Standard specifies requirements of dimensions, rated current, test procedures and performance requirements of fuse-links with tabs (blade-type), Type C (medium), Type E (high current), Type F (miniature), Type N and Type P (sub-miniature) for use in road vehicles.

This standard is applicable for fuse-links with a rated voltage of 32 V or 58 V, a current rating of less than or equal to 100 A and a breaking capacity of 1 000 A intended for use in road vehicles.

This standard is intended to be used in conjunction with IS 2577 (Part 1) and IS 2577 (Part 2).

2 REFERENCES

The following standards contain provisions which through reference in this text, constitute provision 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 standard indicated below:

IS No.	*Title*
2102 (Part 1):1993	General tolerances — Part 1: Tolerances for linear and angular dimensions without individual tolerance indications (*Third Revision*)
2577 (Part 1): 2018	Road vehicles — Fuse-links — Part 1: Definitions and general test requirements (*Third Revision*)
2577 (Part 2): 2018	Road vehicles — Fuse-links — Part 2: User's Guide (*Third Revision*)

3 TERMS AND DEFINITIONS

For the purposes of this document, the definitions given in IS 2577 (Part 1) shall apply.

4 MARKING, LABELLING, AND COLOUR CODING

The rated current and rated voltage shall be permanently marked to be externally visible on the fuse-link. In addition, the current rating shall be shown by colour coding as specified in Table 1.

The manufacturer's name, trademark, and/or symbol shall be marked on the fuse-link insulator.

Table 1 Fuse-Link Colour Coding

(*Clause* 4)

Currernt rating A (1)	Colour Type C, Type E, Type N, Type P, (2)	Colour Type E (3)
1	black	—
2	grey	—
3	violet	—
4	pink	—
5	tan-light brown	—
7.5	brown	—
10	red	—
15	blue	—
20	yellow	yellow
25	White [a)]	grey or white [a)]
30	green	green
35	dark green	dark green
40	orange	orange
50	—	red
60	—	blue
70	—	brown
80	—	White[a)] or grey
100	—	violet

[a)] For transparent fuse bodies, 'white' means no colour is added to the plastic material. Same colour is not allowed for 25 A and 80 A Type E.

5 TESTS AND REQUIREMENTS

5.1 General

5.1.1 *Test Criteria*

In addition to carrying out the test procedures in accordance with IS 2577 (Part 1), the following criteria apply:

a) Tests shall be performed following the test sequences given in Table 2.

b) The test fixtures for electrical tests shall be designed in accordance with Fig. 1. The connection resistance

shall be less than or equal to 0.8 mΩ for Type C (medium) and Type F (miniature) fuse-links and less than or equal to 0.35 mΩ for Type E (high current) fuse-links to ensure the proper function of the test fixture.

c) Fuse-links conforming to this Indian Standard shall provide for visible evidence of an open-fuse element.

5.1.2 *Test Sequence*

Table 2 Test Sequence
(*Clause* 5.1.1.1)

Sl. No.	Test		Clause	Sample Groups						
	Dimensions		6	x	x	x	—	—	—	—
	Marking, labelling, and colour coding		4	x	x	x	x	x	x	x
	Fuse-link voltage drop		5.2	x	x	x	—	—	—	—
	Strength of terminals		5.8	x	x	x	—	—	—	—
	Environmental conditions		Climatic load		—	—	—	x	—	—
			Chemical load	5.4	—	—	—	—	x	—
			Mechanical load		—	—	—	—	—	x
	Transient current cycling		5.3	—	—	—		—	—	x
	Fuse-link voltage drop		5.2	—	—	—	x	x	x	x
	Current steps		5.6	—	—	x	—	—	—	—
	Breaking capacity		5.7	x	—	—	—	—	—	—
	Operating Time resting test	I_R or 1.10 I_R [a]	5.5		x	—	x	x	x	x
		1.35 I_R [a]		—	y	—	y	y	y	y
		1.60 I_R		—	y	—	y	y	y	y
		2.00 I_R		—	y	—	y	y	y	y
	Strength of terminals		5.8	x	x	x	x	x	x	x

[a] Not required for 100 A fuse-link.

NOTES —

1) Each sample group shall contain a minimum of 10 fuse-links for each rated current rating.

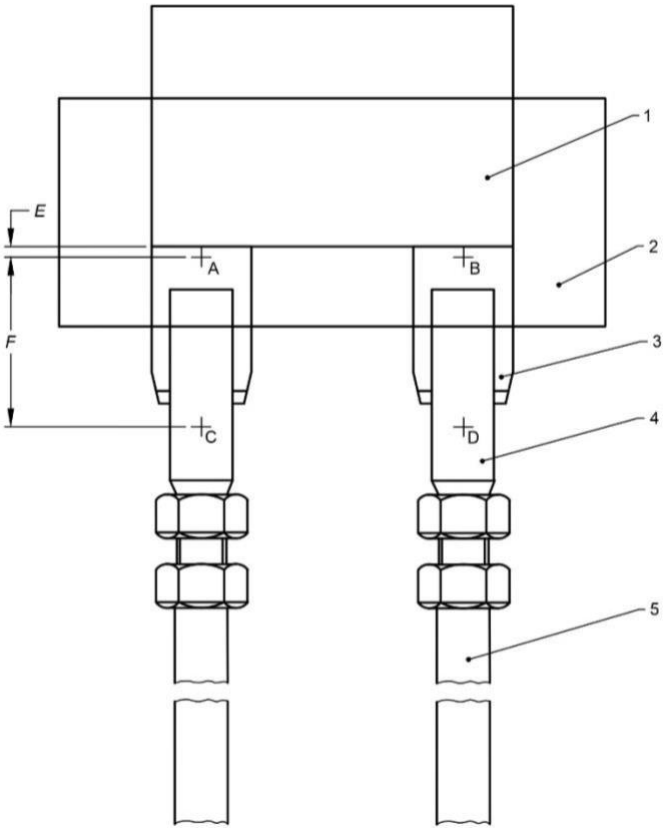
2) For the operating time rating tests marked “Y”, the sample groups 2,4,5,6, and 7 shall be divided equally. These fuse-links are intended to be subjected to a single operating time-rating test only.

3) A dash (—) indicates that the test is not required.

5.2 Voltage Drop

5.2.1 Tests

The voltage drop, UAB, shall be measured at points A and B across the fuse-link tabs as shown in Fig. 1.



Key
1 fuse-link
2 test fixture
3 fuse blade
4 test clip (cantilevered contact system, receptacle to accept tabs as defined in Table 7)
5 cable (size according to Table 6)E
= (1.5 ± 0.5) mm
F =(15.5 ± 1) mm for miniature and medium fuse-links;
= (28.0 ± 1) mm for high current fuse-links

NOTE —Points A and B are the measuring points for the voltage drop. Points A, C and B, D are the measuring point for connection resistance. For sub-miniature fuse-link of type P (that is, fuse-link with 3 tabs), the figure shows Middle (common) tab and one side tab. All applicable tests shall be repeated for fuse between middle (common) tab and the other side tab.

FIG. 1 TEST SCHEMATIC (TYPES C, E,F , N AND P)

5.2.2 *Requirements*

The voltage drop values shall not exceed the values as given in Table 3.

Table 3 Voltage Drop

(*Clause* 5.2.2)

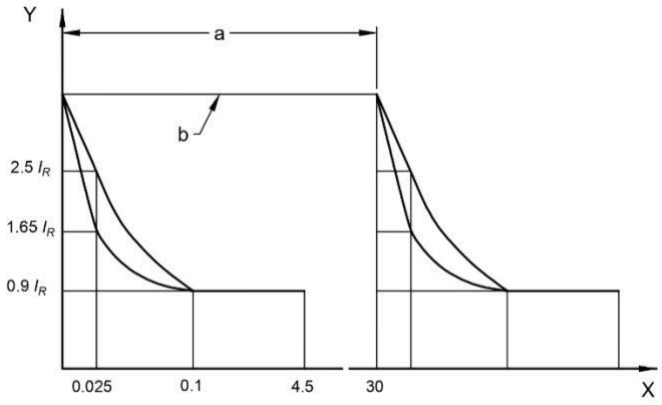
Sl. No.	Fuse rating A	Voltage Drop Max, mV
(1)	(2)	(3)
i)	1	250
ii)	2	225
iii)	3	200
iv)	4	200
v)	5	175
vi)	7.5	150
vii)	10	140
viii)	15	125
ix)	20	125
x)	25	125
xi)	30	120
xii)	35	120
xiii)	40	120
xiv)	50	120
xv)	60	120
xvi)	70	110
xvii)	80	110
xviii)	100	110

5.3 Transient Current Cycling

5.3.1 *Test*

The test shall be carried out as given in **5.3** of IS 2577 (Part 1) and Fig. 2.

At an elapsed time of 0.025 s on-time, the current shall fall to a value between 1.65 I_R and 2.5I_R. The steady-state current shall not fall below 0.9 I_R at no time during the first 4.5 s of each cycle.



Key

X Axis: Time (s)
YAxis: Current (A)
a: One cycle
b= (5.6...6) IR for IR >5 A
= (4.6...5) IR for IR ≤ 5 A

FIG. 2 TRANSIENT CURRENT CYCLING

5.3.2 *Requirements*

The requirements shall conform to **5.3.3** of IS 2577 (Part 1).

5.4 Environmental Conditions

The environmental conditions shall conform to **5.4** of IS 2577 (Part 1).

5.5 Operating Time-Rating

5.5.1 *Test*

The operating time –rating shall be as per **5.5** of IS 2577 (Part 1). The test duration shall be 100 h for I_R.

5.5.2 *Requirement*

The requirements shall be as given in Table 4. After activation, the current through the fuse- link shall not exceed 0.5 mA at the rated voltage of the fuse-link.

Table 4 Operating Times
(*Clause* 5.5.2)

Sl No.	Test Current	Operating times			
	A	Type C, F, N & P		Type E	
		Min	*Max*	*Min*	*Max*
(1)	(2)	(3)	(4)	(5)	(6)
i)	I_R	—	—	360 000	∞
ii)	1.1 I_R	360 000	∞	—	—
iii)	1.35 I_R [a)]	0.75	600	60	900
iv)	1.6 I_R	0.25	50	10	200
v)	2.0 I_R	0.15	5	2	60
vi)	3.5 I_R	0.04	0.5	0.2	7.0
vii)	6 I_R	0.02	0.1	0.04	1.0

[a)] Not required for 100 A high current fuse-links.

NOTE 1 —A dash (—) indicates that no value is specified

5.6 Current Steps

5.6.1 *Test*

The requirements shall conform to **5.6** of IS 2577 (Part 1).

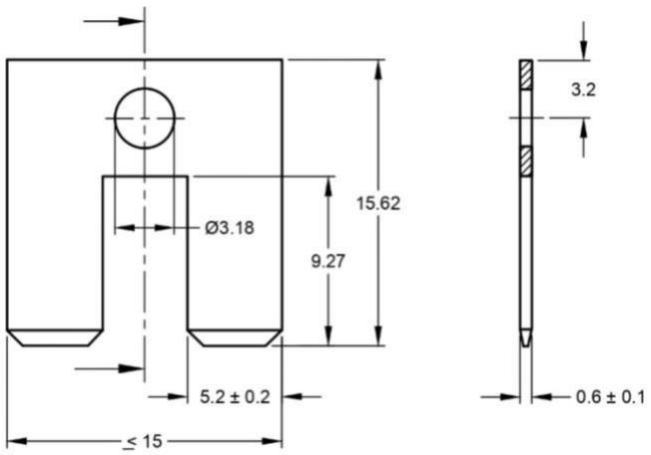
5.6.2 *Requirement*

The requirements shall conform to **5.6.3** of IS 2577 (Part 1). After activation, the current through the fuse-link shall not exceed 0.5 mA at the rated voltage of the fuse-link.

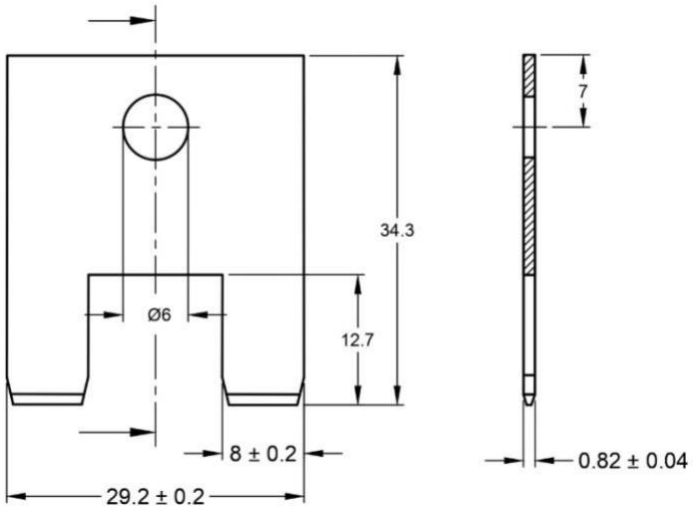
5.7 Breaking Capacity

5.7.1 *Test*

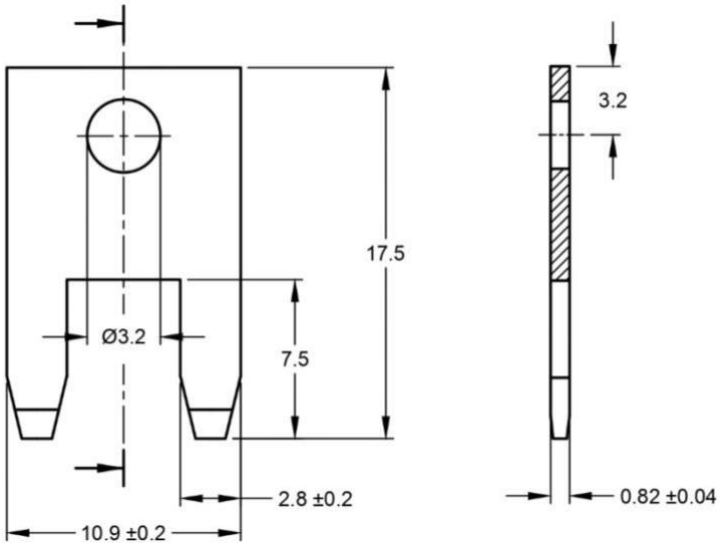
The test shall be carried out as per **5.7.2** of IS 2577 (Part 1). Cable sizes as shown in Table 6 shall be tested at 1 000 A. An appropriate test dummy, as shown in Fig. 3 to Fig. 7, may be used. The common tolerances, where not specified in Fig., shall conform to class M as specified in IS 2102 (Part 1).



All dimensions in millimeters
FIG. 3 TEST DUMMY FOR TYPE C FUSE- LINK

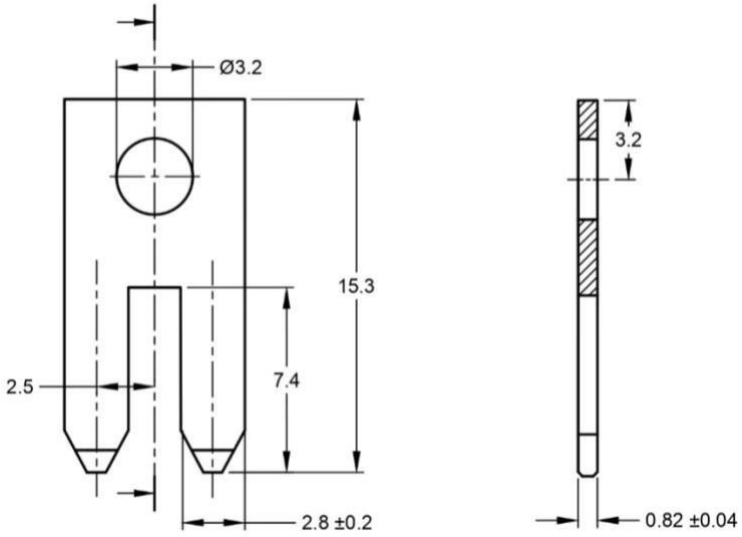


All dimensions in millimeters
FIG. 4 TEST DUMMY FOR TYPE E FUSE-LINKS



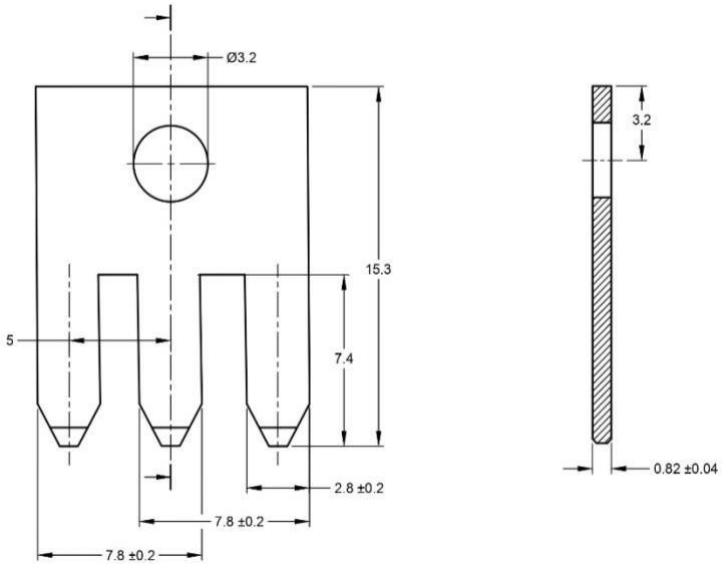
All Dimensions in millimetres

FIG. 5 TEST DUMMY FOR TYPE F FUSE-LINKS



All Dimensions in millimetres

FIG. 6 TEST DUMMY FOR TYPE N FUSE-LINKS



All Dimensions in millimetres
FIG. 7 TEST DUMMY FOR TYPE P FUSE-LINKS

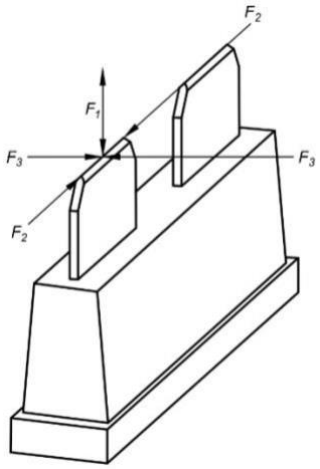
***5.7.2** Requirement*

The requirements shall conform to **5.7.3** of IS 2577 (Part 1). After the test, the current through the fuse-link shall not exceed 0.5 mA at the rated voltage of the fuse- link.

5.8 Strength of Terminals

Table 5 Terminal Forces
(*Clause* 5.8.1)

Sl No.	**Fuse-link size**	**Force F_1 N**	**Force F_2 N**	**Force F_3 N**
(1)	(2)	(3)	(4)	(5)
i)	Type C	70 ± 1	15 ± 1	7,5 ± 1
ii)	Type E	90 ± 1	20 ± 1	10 ± 1
iii)	Type F, N and P	50 ± 1	10 ± 1	5 ± 1



NOTE − The arrow indicate the direction of applied forces F_1 ..... F_3

FIG. 8 APPLICATION OF FORCES

5.8.1 *Test*

A force (F_1 … F_3) shall be applied to each of the tabs the fuse-link in accordance with Fig. 8. The force shall be held for 2 s. The test force shall not be applied abruptly.

5.8.2 *Requirements*

The deformation of the test sample shall not exceed 0.5 mm after the test, the insulator shall be intact and the terminals shall not be removed from the insulator.

5.9 Test Cable Sizes

Test cable sizes shall be as given in Table 6. All tests for a particular fuse-link rating shall be performed using the same cable size. Test cable sizes are specified to allow comparative fuse- link tests to be carried out. The cable size specified herein does not necessarily indicate the size of cable to be used in the vehicle application

Table 6 Test Cable Sizes
(*Clause* 5.7.1, 5.9)

Sl No.	**Rated current, I_R** A	**Conductor cross-sectional area** [a]			**Length**
		Type F, N, P mm^2	Type C mm^2	Type E mm^2	mm
(1)	(2)	(3)	(4)	a.	(5)
i)	1	0.35	0.35	—	500 ± 50 for all cases
ii)	2	0.35	0.35	—	
iii)	3	0.35	0.35	—	
iv)	4	0.35	0.35	—	
v)	5	0.5	0.5	—	
vi)	7.5	0.75	0.75	—	
vii)	10	1.0	1.0	—	
viii)	15	1.5	1.5	—	
ix)	20	2.5	2.5	—	
x)	25	2.5	2.5	—	

xi)	30	4.0	4.0	—	
xii)	35	—	6.0	—	
xiii)	40	—	6.0	—	
xiv)	50	—	—	6.0	
xv)	60	—	—	6.0	
xvi)	70	—	—	10.0	
xvii)	80	—	—	10.0	
xviii)	100	—	—	16.0	

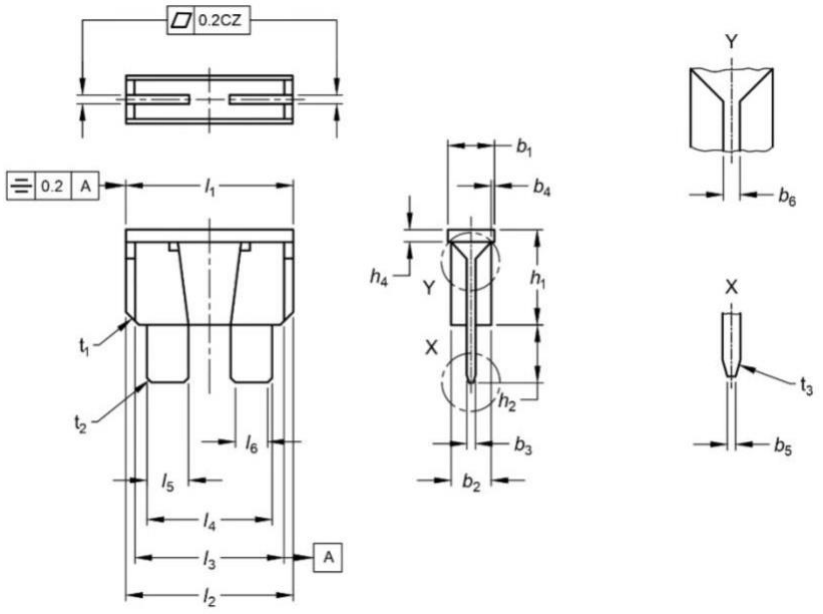
[a] Conductor material according IS/ ISO 6722-1.

5.10 Temperature Rise

The test shall be carried out as given in Annex A.

6 DIMENSIONS

6.1 Fuse-links Types C, E, F, N and P

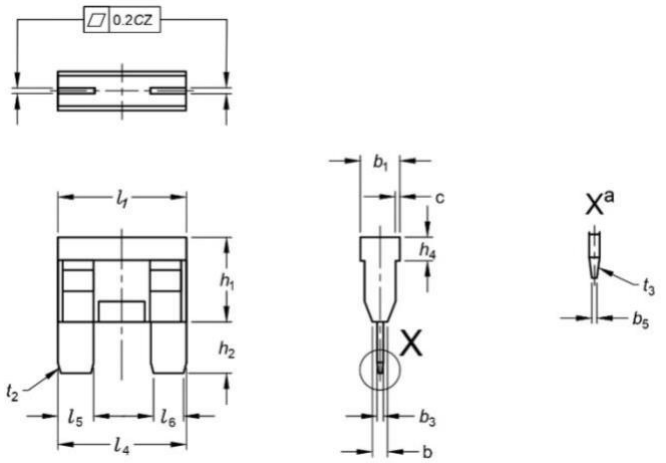


Key

t_1,t_2,t_3: Taper

All Dimensions in millimetres

FIG. 9 FUSE-LINK TYPE C (MEDIUM)

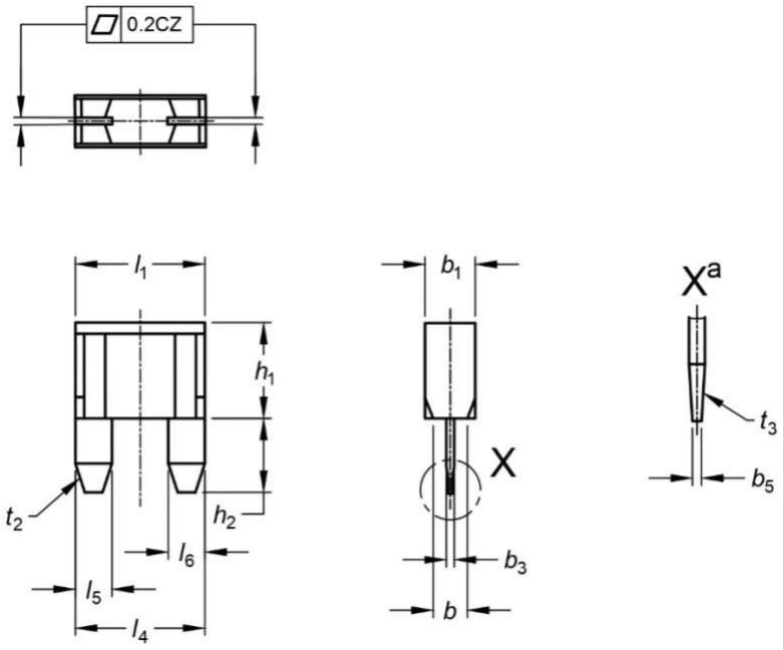


Key

t_2, t_3: Taper
a: Detail of X.
b: Within the outline of fuse-link housing, the tabs shall be insulated.
C: Access area for the extraction tool according to manufacturer's choice.

All dimensions in millimeters

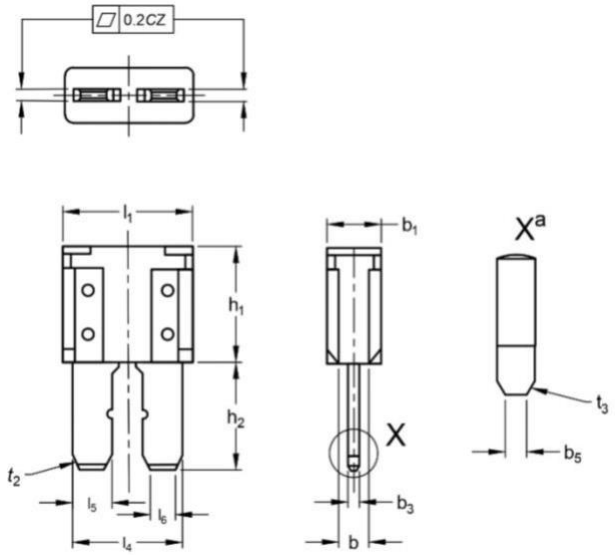
FIG. 10 FUSE-LINK TYPE E (HIGH CURRENT)



Key
t_2, t_3: Taper
a: Detail of X
b: Within the outline of the fuse-link housing, the tabs shall be insulated.

All Dimensions in millimetres

FIG. 11 FUSE-LINK TYPE F

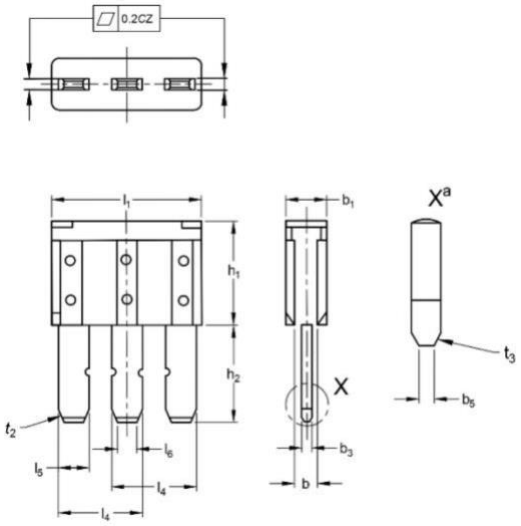


Key

t_2, t_3: Taper
a: Detail of X.
b: Within the outline of the fuse-link housing, the tabs shall be insulated.

All dimensions in millimeters

FIG. 12 FUSE-LINK TYPE N



Key

t_2, t_3: Taper
a: Detail of X.
b: Within the outline of the fuse-link housing, the tabs shall be insulated.

All dimensions in millimeters

FIG. 13 FUSE-LINK TYPE P

Table 7 — Dimensions of Fuse-Links with Tabs, Type C, E, F, N and P

(*Clause* 6.1)

Sl No.	Dimensions	Type C		Type E		Type F		Type N		Type P	
		Value	Tolerance	Value	Tolerance	Value	Tolerance	Value	Tolerance	Value	Tolerance
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
i)	l_1	19.1	± 0.3	29.5	± 0.5	11.2	± 0.8	9.1	Max	14.4	Max
ii)	l_2	18.9	± 0.5	—	—	—	—	—	—	—	—
iii)	l_3	16.6	+ 0.3	—	—	—	—	—	—	—	—
iv)			- 0.8								
v)	l_4	14.5	± 0.3	29.0	+ 0.4	10.8	± .4	7.8	± 0.3	7.8	± 0.3
vi)					- 0.5						
vii)	l_5	5.2	± 0.2	8.0	± 0.2	2.8	± 0.2	2.8	± 0.2	2.8	± 0.2
viii)	l_6	4	± 0.5	6.8	± 0.5	1.3	± 0.5	1.8	± 0.5	1.8	± 0.5
ix)	b_1	5.5	Max	9.0	± 0.3	3.8	± 0.4	3.8	± 0.4	4.2	± 0.4
x)	b_2	3.0	Min	-a	n.s.	-a	n.s.	-a	n.s.	-a	n.s.
xi)	b_3	0.65	± 0.05	0.82	+ 0.05	0.82	+ 0.05	0.82	+ 0.05	0.82	+ 0.05
xii)					- 0.04		- 0.04		- 0.04		- 0.04
xiii)	b_4	0.6	± 0.3	-b	—	-b	—	-b	—	-b	—
xiv)	b_5	0.51	Max	0.6	0	0.6	Max	0.6	Max	0.6	Max
xv)					- 0.3						
xvi)	b_6	1.0	± 0.2	—	—	—	—	—	—	—	—
xvii)	h_1	15	Min	22.0	Max	9	Max	7.9	Max	10.6	Max
xviii)	h_2	6.5	± 0.5	12.6	± 0.5	7.5	± 0.5	7.5	± 0.5	7.5	± 0.5
xiv)	h_4	2.5	+ 0.7	-b	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.
xv)			- 0.1								

NOTES —

1) n.s. indicates that the value or tolerance is not specified.

2) A dash (—) indicates that the value or tolerance is not applicable.

a : Within the outline of the fuse-link housing, the tabs shall be insulated.

b : Access area for the extraction tool according to manufacturer's choice.

6.2 Designation

The designation of a fuse-link Type C for a nominal current of 25 A shall be as follows:
Fuse-link IS 2577 (Part 3) - C – 25

7 BIS CERTIFICATION MARKING

The fuse-links may also be marked with the Standard Mark.

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

ANNEX A
(*Clause* 5.10)

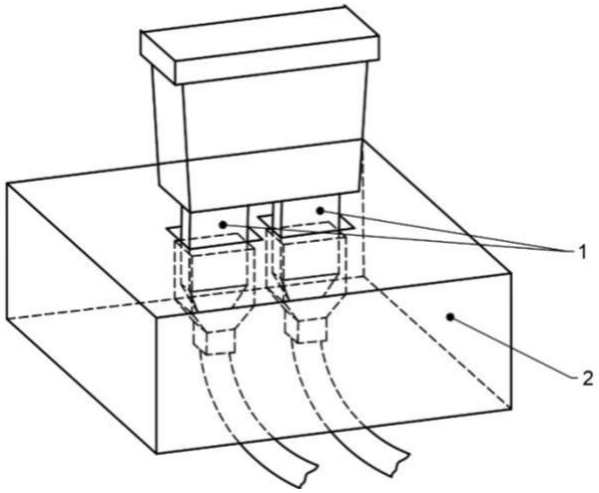
TEMPERATURE RISE TEST

A-1 TEST

The test may be carried out using fuse-links, fuse holders, and connections as specified by the vehicle manufacturer. Test cable sizes shall be in accordance with Table 6. The test shall be performed in an oven with a test current of 0.7 IR at an ambient temperature of 60°C. The temperature shall be measured at the point the fuse-link terminals protrude from the base of the insulator using thermocouples as specified by the vehicle manufacturer (*see* Fig. 14).

A-2 REQUIREMENT

After thermal equilibrium has been achieved, the temperature of the connections shall not exceed 80°C.



Key

1: Test points
2: Test fixture

FIG. 14 TEMPERATURE RISE TEST SET UP

ANNEX B

(*Foreword*)

COMMITTEE COMPOSITION

AUTOMOTIVE ELECTRICAL EQUIPMENT AND INSTRUMENTS SECTIONAL COMMITTEE, TED 11

Organization	*Representative(s)*
Vehicle Research & Development Establishment,	*SHRI G.R.M. RAO (CHAIRMAN)Ahmednagar*
Ashok Leyland Ltd, Chennai	*SHRI GOPALAKRISHNAN S* *MS. SUCHISMITA C (Alternate)MS. SAI ANKITHA (YP)*
Association of State Road Transport Undertakings, New Delhi	*SHRI R.R.K. KISHORE* *DR.M. TRINATH BABU (Alternate)*
Automotive Research Association of India, Pune	*SHRI A.A. DESHPANDE* *SHRI B.V. SHAMSUNDARA (Alternate)*
Automotive Components Manufacturers Association, New Delhi	*SHRI UDAY HARITE* *MS. SEEMA BABAL (Alternate)*
Bajaj Auto Ltd, Pune	*SHRI R. NARSIMHAN* *SHRI A.V. KUMBHAR (Alternate)*
Bosch Electrical Drives India Private Ltd, Chennai	*SHRI ULLAL SUBRAHMANYA* *SHRI N. J. DEVAPRASAD (Alternate)*
Cast Master Mobitech India, Faridabad	*SHRI RAHUL JAIN* *SHRI RAJU AGARWAL (Alternate)*
Central Institute of Road Transport, Pune	*SHRI RAJ KUMAR MALAJURE* *MS. SHUBHANGI DALVI (Alternate) SHRI SANTOSH YASHWANT DEASI (YP)*
Controller of Quality Assurance Vehicles,	*CONTROLLER (CQA - OFV) JABALPUR Jabalpur (MP)* *SHRI SATYAPAL LAKHTAKIA (Alternate)*
Daimler India Commercial Vehicles, Chennai	*SHRI RAVI KUMAR SAMATHIRAM* *SHRI RAMA MANI KANDAN (Alternate)*
Denso India, Gurgaon	*SHRI NOEL ALEXANDER PETERS* *SHRI ALOK KUMAR (Alternate)MS. ALKA SHARMA (YP)*
Fiem Industries Ltd, Distt. Sonepat	*SHRI G.V. GEORGE* *SHRI ARSHAD JAMEEL (Alternate)*
Force Motors Ltd, Pune	*SHRI ANIRUDDHA KULKARNI* *SHRI R. M. KANITKAR (Alternate)*
Hero Moto Corp Ltd, Dharuhera	*SHRI FEROZ ALI KHAN* *SHRI SUBRAT KUMAR DASH (Alternate)*
Honda Cars R & D India	*SHRI ADISH AGGARWAL* *SHRI S MUTHU KUMAR (Alternate)*

Indian Society of Lighting Engineers (ISLE), Gurugram	*SHRI ARSHI KRISHNACHAR* *SHRI PRATESH BARJATIA (Alternate)DR. VIDYA H A (YP)*
International Centre for Automotive Technology (ICAT), Gurugram	*SHRI MADHUSHUDAN JOSHI* *SHRI MAHENDER PAL (Alternate)* *MS. VIJAYANTA AHUJA (YP)*
Indication Instruments Ltd, Faridabad	*SHRI VISHAL LALANI* SHRI ANUJ GARG (*Alternate*)
Jay Ushin Ltd, Gurgaon	SHRI RAMESH YADAV SHRI ANIL KUMAR (*Alternate*)
John Deere India Pvt Ltd, Pune	SHRI ANAND RAJ SHRI PRASHANT PULLIWAR (*Alternate*)
Lucas TVS Ltd, Chennai	SHRI S. KRISHNA KUMAR SHRI O. MURIGEPPA (*Alternate*)
Lumax Industries Ltd, Gurgaon	SHRI VIRENDRA KUMAR SACHDEV SHRI RANDHI KUMAR (*Alternate*)
Mahindra & Mahindra Ltd, MRV Chennai	SHRI KUMAR MEGHANATHAN SHRI S SAKTHIVELAN (*Alternate*)
Malhotra Cables, Delhi	SHRI RAJEEV MALHOTRA SHRI VIKAS PRASAD (*Alternate*)
Maruti Suzuki India Ltd, Gurgaon	SHRI SANDEEP RAINA SHRI GURURAJ RAVI (*Alternate*)MS. M. BUANESHWARI (*YP*)
MINIBIS Tech India, New Delhi	WG CDR I. S. SABHARWAL
Ministry of Heavy Industries & Public Enterprises,	SHRI R K JAISWALNew Delhi
Ministry of Micro Smalls Medium Enterprises, New Delhi	SHRI ANUJ KANSEL SHRI S.V. SHARMA (*Alternate*)
National Highway Authority of India, New Delhi	SHRI R.C. PALEKAR SHRI SANJAY KUMAR AGGARWAL (*Alternate*)
National Test House, Mumbai	SHRI D.G. BASUMATRY SHRI B.R. MANDAL (*Alternate*)
Roots Auto Products Pvt Ltd, Coimbatore	SHRI K. SARAVANA SUNDARAM SHRI R. SELVARAJ (*Alternate*)
Skoda Volkswagen	SHRI MAKARAND R. BRAHME SHRI MILIND JAGTAP (*Alternate*)SHRI ADITI DESHPANDE (*YP*)
Society of Indian Automobile Mfrs, New Delhi	SHRI P.K. BANERJEE SHRI SAURABH ROHILLA (*Alternate*)
Tata Motors Ltd, Pune	SHRI ASHISH WADHWA SHRI GOWRISHANKAR P S (*Alternate*)

Toyota Kirloskar Motor Ltd, Bidadi	SHRI RAJU M SHRI DINESH G M (*Alternate*)SHRI VIJETH R GATTY (*YP*)
Tractor Manufacturers Association, New Delhi	SHRI PHILIP KOSHY SHRI MADHAV BHADE (*Alternate*)
UNO Minda Industries, Haryana	SHRI V. J. RAO SHRI NIRMAL KUMAR MINDA (*Alternate*)
Vehicles Research & Dev. Estt. (VRDE), Ahmednagar	SHRI MANISH SAHOO SHRI NARENDRA MALVIYA (*Alternate*)
BIS Directorate General	SHRI R R SINGH, SC 'F' & HEAD (TED) [Representing Director General (*Ex-officio)*]

MEMBER SECRETARY
SHRI SHARAD KUMAR
SCIENTIST 'D' / JOINT DIRECTOR
(TRANSPORT ENGINEERING), BIS

ANNEXURE 8

(*Sl No 18,19 and 20 of Item 6.2***)**

INPUT RECEVIED FROM MSIL IS 15802, IS 15804, AND IS 7827 PART 3/ SEC 1

Subject	Recommendation
IS 15804: 2008 : Automotive vehicles - Windscreen wiping and washing system for M1 category of vehicles - Requirements	Please refer attached the detailed review document prepared on the subject.
IS 7827 (Part3/Sec1) : 1993 -AUTOMOTIVE VEHICLES ELECTRICAL Wind SCRBEN WIPERS PART 3 WIPER ARMS AND BLADES Section 1 Wiper Arms - Specification	This standard is based on JIS D 5710 : 1982 and IS0 9259 : 1991. There is NO further revision in these reference standards. Therefore, we recommend IS 7827 (Part3/Sec1) : 1993 standard to be reaffirmed.

Attachment 1:

REVIEW ANALYSIS OF INDIAN STANDARD
(To be submitted to the Sectional Committee)

1. **Sectional Committee No. & Title:** TED 11: Automotive Electrical Equipment and Instruments Sectional Committee.

2. **IS No**: IS 15804: 2008

3. **Title in English:** AUTOMOTIVE VEHICLES - WINDSCREEN WIPING AND WASHING SYSTEM FOR Ml CATEGORY OF VEHICLES – REQUIREMENTS

4. **Title in Hindi:** स्वचल वाहन - एम1 श्रेणी के वाहनों की विंडस्क्रीन पोंछने और धुलाई की पद्धति-अपेक्षाएँ

5. **ICS No.**

6. **Date of review: 11-Sep-2024**

7. **Review Analysis**

i) **Amendment to be incorporated, if any:**

ii) Status of standard(s), if any from which assistance had been drawn in the formulation of this IS.

Standard (No. & Title)	Whether the standard has since been revised	Major changes	Action proposed
IS 15804: 2008 is derived from AIS-019/2001 Automotive vehicles - Windscreen wiping and washing system for M1 category of vehicles. AIS-019/2001 was formulated taking reference from EU directive 78/318/EEC. EU directive 78/318/EEC has been replaced by 1008/2010/EEC and subsequently by 535/2021/EEC. However subject technical requirements for wiping system under 1008/2010/EEC and 535/2021/EEC remain same. Since the EU directive is a renowned regulation which is already implemented and referred by many other countries, it is requested to consider alignment of IS 15804: 2008 with technical requirements of latest EU directive.			

iii) Status of standards referred in the IS

Referred standards (No. & Title)	IS No. of this standards since revised	Changes that are of affecting the standard under review	Action proposed
14272 (part 1): 1995 Automotive vehicles — Types —Terminology. However, CMVR refers to latest IS 14272 :2011 for terminologies, which has also been reaffirmed in 2020. Therefore, reference can be updated to IS 14272 :2011 Automotive vehicles — Types —Terminology.			

iv) Any other standards available related to the subject & scope of the standard being reviewed (International/regional/other national/association/consortia, etc or of new or revision of existing Indian Standard)

Standard (No. & Title)	Provisions that could be relevant while reviewing the IS	Action proposed
1008/2010/EEC : Type-approval requirements for windscreen wiper and washer systems of certain motor vehicles		
AIS-019 ; Automotive Vehicles - Wind Screen Wiping and Washing System for M1 Category of vehicles		
ISO 9619 : 1992 : Passenger cars — Windscreen wiping systems — Test method		

v) Technical comments on the standard received, if any

Source	Clause of IS	Comment	Action proposed
Comments from M/s. MSIL 1. IS-15804:2008 was formulated from AIS-019:2001 (Derived from 78/318/EEC). 78/318/EEC migrated to 535/2021/EEC. 2. MSIL evaluated the Harmonization prospectives of IS-15804:2008 with 535/2021/EEC. Detailed Study is enclosed as Annex 1. 3. MSIL opines that IS-15804:2008 can be aligned with 535/2021/EEC, However, as India environmental conditions are different from EU, therefore Temperature (testing & ambient) requirements to be retained as per current IS-15804:2008.			

vi) Information available on technical developments that have taken place (on product/processes/practices/use or application/testing/input materials, etc)

Source	Development	Relevant clause of the IS under review that is likely to be impacted (Clause & IS No.)	Action proposed
-			

vii) Issues arising out of changes in any related IS or due to formulation of new Indian Standard

Related IS and its Title (revised or new)	Provision in the IS under review that would be impacted & the clause no. or addition of new clause/provision	Changes that may be necessary in the Standards under review	Action proposed
-	-	-	-

viii) Any consequential changes to be considered in other IS

Related IS to get impacted	Requirements to be impacted

8. **Any other observation:** CMVR (Central Motor Vehicle Rules) refers IS-15804:2008 as mandatory requirements for M1 category. Therefore, a separate notification is required with suitable lead-time is required for updated IS implementation.

9. **Recommendations:** It is recommended that IS 15804:2008 may be revised to align with EU Regulation 535/2021/EEC except for Temperature (testing & ambient) requirements which can be retained as in current IS 15804:2008 factoring EU and Indian Environmental conditions are different.

   As IS 15804:2008 is already notified in CMVR, Therefore BIS shall ensure concurrent running of both the versions of IS-15804 till the time revised standards is enforced via CMVR change.

Attachment 2: Shared via mail dated 13.9.2024

ANNEXURE 9(*Item 6.4*)

REVIEW OF INDIAN STANDARDS PUBLISHED PRIOR TO YEAR 2000

Sr No	IS NO	Title
1.	IS 1063 : 1997	Automotive vehicles - Ml4 x 1 25 spark plugswith flat seating andtheir cylinder head housing - Specification Second Revision
2.	IS 1606 : 1979	Specification for automobile lamps SecondRevision
3.	IS 1884 : 1993	Automotive vehicles - Electric horns -Specification Third Revision
4.	IS 2081 : 1998	Automotive vehicles - Taper terminal cable connectors for batteries -Specification Second Revision
5.	IS 2325 : 1981	Specification for ignition coils for battery - Coilignition systems forautomobiles First Revision
6.	IS 4050 : 1976	Methods of tests for horn switches forautomobiles First Revision
7.	IS 4060 : 1994	Automotive vehicles - Flashers for directionindicators - SpecificationSecond Revision
8.	IS 4061 : 1967	Specification for headlight switches forautomobiles
9.	IS 4063 : 1982	Specification for fuse box for automobiles FirstRevision
10.	IS 4086 : 1983	Specification for distributors for spark ignitionengines First Revision
11.	IS 4362 : 1979	Specification for number plate lighting devicesfor automobiles FirstRevision
12.	IS 4373 : 1967	Specification for hydraulically operated stoplight switches forautomobiles
13.	IS 4815 : 1982	Specification for self - Cancelling directionindicator switches forautomobiles First Revision
14.	IS 5545 : 1977	Specification for fog lights for automobiles FirstRevision
15.	IS 5546 : 1981	Specification for distribution caps and rotor armsfor automobiles FirstRevision
16.	IS 7471 : 1974	Recommendation for polarity of earth connections and marking ofelectrical equipmentfor automobiles
17.	IS 7827 (Part 1) : 1975	Specification for electrical wind screen wipersPart 1 wiper system
18.	IS 7827 (Part 2) : 1975	Specification for electrical wind screen wipersPart 2 wiper motors
19.	IS 7827 (Part 3/Sec 1): 1993	Automotive vehicles electrical wind screen wipers Part 3 wiper arms andblades section 1 wiper arms - Specification
20.	IS 7827 (Part 3/Sec 2): 1985	Specification for electrical wind screen wiperPart 3 wiper arms andblades section 2 wiper blades
21.	IS 7953 : 1976	Specification for horn rings for automobiles
22.	IS 7998 : 1986	Specification for contact breakers for two wheelers three wheelers andstationary spark ignition engines First Revision

23.	IS 8339 : 1993	Automotive vehicles - Reflex reflectors -Specification First Revision
24.	IS 8395 (Part 1) : 1977	Specification for cable terminations for automobile wiring Part 1 bladetype connectors Male And Female
25.	IS 8395 (Part 2) : 1977	Specification for cable terminations for automobile wiring Part 2 bulletand tube connectors
26.	IS 9264 (Part 1) : 1979	Specification for interior lighting of motor vehicle Part 1 generalrequirements and recommendations
27.	IS 9432 : 1980	Specification for ignition switches forautomobiles
28.	IS 9433 : 1980	Specification for piano key type switches for usein automobiles
29.	IS 9521 : 1980	Specification for push - Button type switches forautomotive vehicles
30.	IS 10250 : 1982	Specification for severities for environmentaltests for automotiveelectrical equipment
31.	IS 11098 : 1992	Automotive vehicles - Steering column mountedcombination switches -Specification First Revision
32.	IS 13226 : 1991	Automotive vehicles - Resistances in startermotorcircuits - Methodsof measurement
33.	IS 13313 : 1991	Automotive vehicles - Electrical wiring - Colourcoding
34.	IS 13509 : 1992	Automotive vehicles - Towing vehicles - Mounting of electricalconnections on rear crossmembers
35.	IS 13654 : 1993	Automotive vehicles - Instrument systems - Electricalspeedometer performancerequirements
36.	IS 13931 (Part 1) :1993	Automotive vehicles - Stoplight switches Part 1specification
37.	IS 13931 (Part 2) :1993	Automotive vehicles - stoplight switches Part 2methods of test
38.	IS 14141 : 1994	Automotive vehicles - Electrical windshieldwashing systems -Performance requiremeNts
39.	IS 14221 : 1995	Automotive vehicles retro - Reflective sheets andtapes - Specification
40.	IS 14380 : 1996	Automotive vehicles - Ignition coils for magnetoignition systems -Specification
41.	IS 14381 : 1996	Automotive vehicles - Electrical circuits -Recommended graphicalsymbols

Annexure 10

(*Item 8.2*)

List of Working Groups/ panel

ISO/TC 22 — Road vehicles

Reference	Title	Remarks
ISO/ TC 22/ AG 2	Automated driving coordination group (ADCG)	
ISO/TC 22/JWG 2	Joint ISO/TC 22 - ISO/TC 204: Governance	
ISO/ TC 22/ SAG	Strategic advisory group	
ISO/ TC 22/ WG 17	Code VIN – Code WMI	
ISO/ TC 22/ WG 18	Exterior protection	

ISO/ TC 22/ SC 32 — Electrical and electronic components and general system aspects

Reference	Title	Remarks
ISO/TC 22/SC 32/JWG 15	Joint ISO/TC 22/SC 32 - IEC/SC 32B WG : Fuses and circuit breakers	
ISO/ TC 22/ SC 32/ WG 1	Ignition Equipment	
ISO/ TC 22/ SC 32/ WG 2	Environmental conditions	
ISO/ TC 22/ SC 32/ WG 3	Electromagnetic compatibility	
ISO/ TC 22/ SC 32/ WG 4	Automotive electrical cables	
ISO/ TC 22/ SC 32/ WG 5	Fuses and circuit breakers	
ISO/ TC 22/ SC 32/ WG 6	On-board electrical connections	
ISO/ TC 22/ SC 32/ WG 8	Functional safety	
ISO/ TC 22/ SC 32/ WG 9	Electrical connections between towing and towed vehicles	

ISO/ TC 22/ SC 32/ WG 10	Optical components - Test methods and requirements	
ISO/ TC 22/ SC 32/ WG 11	Cybersecurity	
ISO/ TC 22/ SC 32/ WG 12	Software update	
ISO/ TC 22/ SC 32/ WG 13	Safety for driving automation systems	
ISO/ TC 22/ SC 32/ WG 14	Safety and Artificial Intelligence	
ISO/TC 22/SC 32/JWG 15	Joint ISO/TC 22/SC 32 - IEC/SC 32B WG : Fuses and circuit breakers	
ISO/TC 22/SC 32/WG 16	Automotive perception sensors	
ISO/IEC JTC 1/SC 27/JWG 6	Joint ISO/IEC JTC1/SC 27 - ISO/TC 22/SC 32 WG: Cybersecurity requirements and evaluation activities for connected vehicle devices	Joint working groups under the responsibility of another committee

ISO/ TC 22/ SC 35 — Lighting and visibility

Reference	Title	Remarks
ISO/ TC 22/ SC 35/ WG 1	Lighting and light - Signalling	
ISO/ TC 22/ SC 35/ WG 2	Safety glazing	
ISO/ TC 22/ SC 35/ WG 3	Visibility	

ANNEXURE 11

(item 8.4.2)

PANEL 5 MEETING MINUTES

<KEY DISCUSSION>

Background, Scope and study approach for Panel 5 has discussed. Please refer attached presentation.
Out of 29 standards, 12 have been identified under the TED 11 scope and have been assigned to panel members for review (3 standards per member).
The description for Category C has been revised based on the panel discussion.

<NEXT ACTION>
Members to provide their feedback on the standards identified within the TED 11 scope and those identified under other TED scopes.(Confirm Column G in Excel sheet) à Target : Before next panel meeting in 2 weeks.
For the standards assigned to each panel members, Members to study the scope and identify any existing standards (IS/AIS) on the same subject (Fill Column H in excel sheet, if any) à Target : Before next panel meeting in 2 weeks.
August Dubey (@ted11@bis.gov.in) to share relevant ISO standards listed in attached excel to initiate the study.
Once standards are shared by TED 11, Members to study the standard for categorize under specified categories (A,B,C) à Timeline for completion will be discussed and decided in next panel meeting.
@varun2.sharma@heromotocorp.com, 3 standards related to lighting have been allocated to HeroMoto Corp. Please confirm if this is OK and provide feedback, if any.

Presentation:

TED 11 Panel 5 – Review of ISO TC 22 SC 35 Standards

- In 31st TED 11 meeting, committee deliberated and decided to constitute panel 5 to review ISO standards under ISO TC 22 SC 35 (Lighting and Visibility).
- Panel was formed under convenorship of Renault, constituting experts from ARAI, MSIL, Hero MotoCorp.

Panel 5 Deliverables

Reviewing the ISO standards under **ISO TC 22 SC 35** and segregating them in following categories:

Category	Description
Category A	*ISO Standards which can be **directly adopted** as Indian Standards without any change*
Category B	*ISO standards which can be **modified technically** as per our country's needs and then **adopted** as Indian Standards*
Category C	*ISO Standards which **are not at all suitable** for our country needs and **may not be adopted** at all.*

1st panel meeting scheduled to initiate the study, discuss and decide study approach and timeline for completion of activities

Identify the standards under TED 11 scope

ISO TC 22 SC 35 – Lighting and Visibility

- ***Scope :*** *Visibility and Conspicuity; Lighting and light-signalling and safety glazing materials.*

No of Standards in ISO TC 22 SC 35	
Published Standards	29 *(+3 Amends)*
ISO standards under development*	7

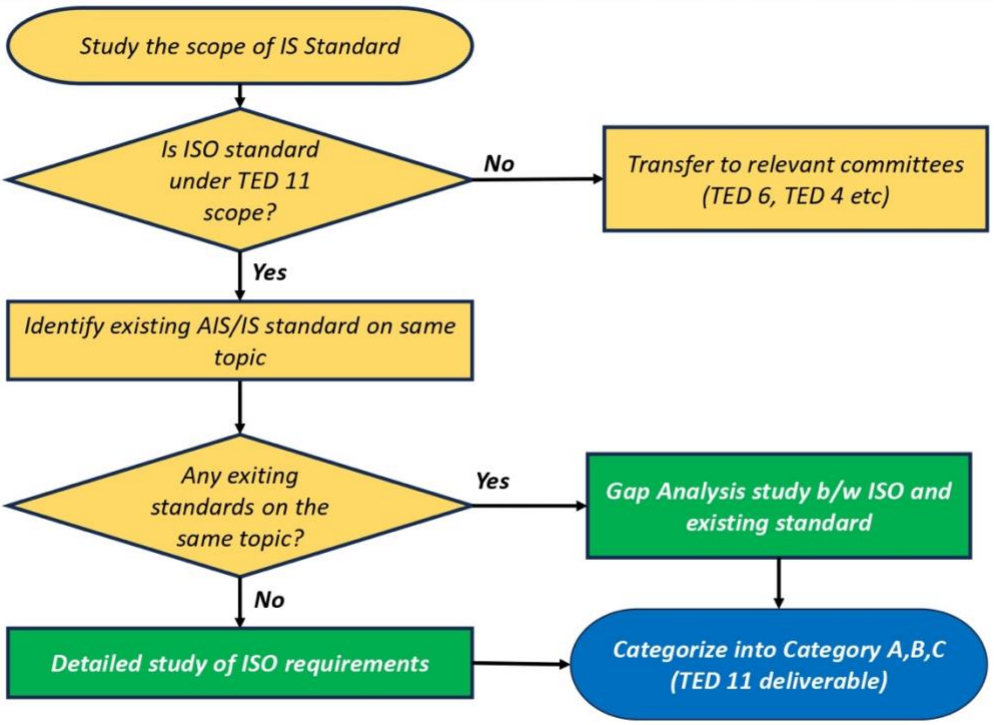
**Not part of this study, will be taken suitably in future*

TED Committees who are participating in ISO TC 22 SC 35 & Their Scope :

Sectional Committee		Scope
TED 04	*Automotive Braking Systems, Vehicle Testing, Steering and performance Evaluation*	*Standardization of automotive braking systems, steering systems and their components, testing of vehicles as a whole for performance evaluation and road worthiness*
TED 06	*Automotive Body, Chassis and Accessories*	*Standardization of chassis assembly, aerodynamics and ergonomic aspects of vehicles and the body, body fittings, seats, vehicle accessories and garage equipment etc*
TED 11	*Automotive Electrical Equipment and Instruments*	*Standardization relating to electrical and optical equipment, instruments and their related components including electronics for automotive vehicles*

As the 1st step, we need to identify the ISO standards which comes under TED 11 committee Scope

Study Approach



TED 11 Member secretary will share the ISO standards for detailed study on these documents.

Categorization –Proposal – For discussion

Category	Description
Category A	*ISO Standards which can be **directly adopted** as Indian Standards without any change*
Category B	*ISO standards which can be **modified technically** as per our country's needs and then **adopted** as Indian Standards*
Category C	*ISO Standards which **are not at all suitable** for our country needs or standards already exists on same subject and **may not be adopted** at all.*

Panel agreed this change in description for category C

Standard	Title	Subject	Responsibility	TED 11 Subject?
ISO 4148:2004	Road vehicles — Special warning lamps — Dimensions	Lighting	ARAI	Yes
ISO/TS 5385:2022	Road vehicles — Anti-fog coating for exterior lighting devices — Specification	Lighting	ARAI	Yes
ISO 10604:1993	Road vehicles — Measurement equipment for orientation of headlamp luminous beams	Lighting	ARAI	Yes
ISO 6797:1982	Road vehicles — Motor vehicles — Production conformity requirements for flasher units	Lighting	HMCL - TBD	Yes
ISO 7591:1982	Road vehicles — Retro-reflective registration plates for motor vehicles and trailers — Specification	Lighting	HMCL - TBD	Yes
ISO 4082:1981	Road vehicles — Motor vehicles — Flasher units	Lighting	HMCL - TBD	Yes
ISO 9259:1991 ISO 9259:1991/Amd 1:2001	Passenger cars — Windscreen wiper systems — Wiper arm-to-blade connections	Windscreen Wiping & Washing	MSIL	Yes
ISO 9619:1992 ISO 9619:1992/Amd 1:2002	Passenger cars — Windscreen wiping systems — Test method	Windscreen Wiping & Washing	MSIL	Yes
ISO 3469:1989 ISO 3469:1989/Amd 1:2006	Passenger cars — Windscreen washing systems — Test methods	Windscreen Wiping & Washing	MSIL	Yes
ISO 9258:1989	Passenger cars — Wiper systems — Wiper blade length	Windscreen Wiping & Washing	RENAULT	Yes
ISO 9704:1990	Passenger cars — Wiper systems — Shaft ends and arm-holes	Windscreen Wiping & Washing	RENAULT	Yes
ISO 6255:1997	Passenger cars — Rear-window washing and wiping systems — Test methods	Windscreen Wiping & Washing	RENAULT	Yes
ISO 3536:2016	Road vehicles — Safety glazing materials — Vocabulary	Safety Glazing		No (TED 6)
ISO 3537:2015	Road vehicles — Safety glazing materials — Mechanical tests	Safety Glazing		No (TED 6)
ISO 3538:1997	Road vehicles — Safety glazing materials — Test methods for optical properties	Safety Glazing		No (TED 6)
ISO 3917:2016	Road vehicles — Safety glazing materials — Test methods for resistance to radiation, high temperature, humidity, fire and simulated weathering	Safety Glazing		No (TED 6)
ISO 17449:2015	Road vehicles — Safety glazing materials — Test methods for properties of electrically heated glazing	Safety Glazing		No (TED 6)

ISO 13837:2021	Road vehicles — Safety glazing materials — Method for the determination of solar transmittance	Safety Glazing		**No (TED 6)**
ISO 15082:2016	Road vehicles — Tests for rigid plastic safety glazing materials	Safety Glazing		**No (TED 6)**
ISO 23013:2016	Road vehicles — Determination of resistance to forced entry of security glass constructions used in vehicle glazing — Test of glazing systems	Safety Glazing		**No (TED 6)**
ISO 5685:2022	Road vehicles — Testing the abrasion resistance of automotive glazing with the windscreen wiper test	Safety Glazing		**No (TED 6)**
ISO 5740:1982	Road vehicles — Rear view mirrors — Test method for determining reflectance	Indirect Vision		**No (TED 6)**
ISO 16505:2019 ISO 16505:2019/Amd 1:2021	Road vehicles — Ergonomic and performance aspects of Camera Monitor Systems — Requirements and test procedures	Indirect Vision		**No (TED 6)**
ISO 4513:2022	Road vehicles — Visibility — Method for establishment of eyellipses for driver's eye location	Forward Vision		**No (TED 6)**
ISO 7397-1:1993	Passenger cars — Verification of driver's direct field of view — Part 1: Vehicle positioning for static measurement	Forward Vision		**No (TED 6)**
ISO 7397-2:1993	Passenger cars — Verification of driver's direct field of view — Part 2: Test method	Forward Vision		**No (TED 6)**
ISO/TS 21957:2023	Road vehicles — Visibility — Specifications and test procedures for head-up displays (HUD)	Forward Vision		**No (TED 6)**
ISO 3468:2014	Passenger cars — Windscreen defrosting and demisting systems — Test method	Defrost & Demist		**TBD**
ISO 5898:1997	Passenger cars — Rear-window defrosting system — Test method	Defrost & Demist		**TBD**

ANNEXURE 12

(item 8.7)

GUIDELINE RECEVIED FROM PNC DEPARTMENT) FOR ADOPTION OF ISO/IEC STANDARDS AND DESIGNATION OF EXPERTS FOR ISO/IEC PROJECTS

(Reference: PNC09/20/2024-PNC-BIS)

Guidelines for strengthening the Standardisation Ecosystem in the country:

ADOPTION OF ISO/IEC STANDARDS

1. Excessive focus on adoption of ISO/IEC standards has two negative implications

   a) It hinders the creation of original work and the development of new indigenous standards.
   b) Fosters the tendency to take rather than make a standard

2. Therefore, unless a Wide Circulation Draft has already been issued and a revision or amendment is required due to changes in the ISO/IEC standard, no ISO/IEC standards or standards from other Standards Development Organizations shall be adopted without prior approval from the DG henceforth.

3. The proposal for taking up the adoption of a standard must elaborate the advantages and relevance of the adoption in the Indian context.

DESIGNATION OF EXPERTS FOR ISO/IEC PROJECTS

1. Focus will now be on participating in the making of ISO/IEC standards on the basis of the Level of Interest established in respect of a NWIP or draft standard.

2. The Member Secretary, in consultation with the Chair of the Sectional Committee and the Head of Department, and if necessary, with the entire Sectional Committee, shall determine and specify the Level of Interest for each NWIP or draft standard received from ISO/IEC in the IRD Portal.

3. The next step is to designate one or two members of the Sectional Committee to represent BIS for standards categorized as Level H (High) and M (Medium). These designated experts will act as face and voice of BIS for the project at the ISO/IEC level.

4. Experts assigned to H-level projects shall be entitled to attend TC/WG meetings with the approval of the Head of the Standardisation Department, and there shall not be the need to take the matter to the Screening Committee.

5. The designated expert shall be responsible for providing detailed feedback on drafts and documents from ISO/IEC, assisting the Sectional Committee in developing the rationale for proposing NWIPs, finalizing proposals for leadership positions and secretariats and briefing the Sectional Committee on discussions at the ISO/IEC level.

6. Representation of BIS at meetings for M-level projects shall be decided by the Screening Committee.

ANNEXURE 13

REVIEW ANALYSIS OF INDIAN STANDARD IS 1606 -SUBMITTED BY ACMA

1. Sectional Committee No. & Title: TED11, Automotive Electrical Equipment And Instruments Sectional Committee

2. IS No: IS 2077 : 2014

3. Title: Automotive Vehicles – Electric Relays - Specification

4. Date of review: 7th September 2024

5. Review Analysis

i) Status of standard(s), if any from which assistance had been drawn in the formulation of this IS.

Standard (No. & Title)	Whether the standard has since been revised	Major changes	Action proposed
1) IS4905 : 1968 Methods for random sampling IS6236 : 1971 Specification for direct recording electrical measuring instruments IS10250 : 1982 Specification for severities for environmental tests for automotive ctrical equipment	1)IS4905 : 2015, reaffirmed 2020 S6236 : 2020 S10250 : 1982, Amd 1 1984, Amd 2 1996, reaffirmed in 2021	IS4905:2015:- revised to harmonize with ISO 24153 : 2009 by adoption under dual numbering system 2) IS6236:2020:- revised align with the latest version of IEC 258 : 1968 + Amend 1 (1976). 3) IS10250: nd 1, 1984: Details of Impact or Shock Test and Simulated Radiation Test added. nd 2 1996: IS9000 (Part8) specified inplace of IS 2106 (part XVI) for Vibration test; IS9000 (part XI :1983) specified for corrosion resistance test inplace of Annexture B; IS9000 (Part 15/Sec9) specified inplace of IS 2106 (part X) for Sealing Test	The IS numbers IS4905:1968 to be replaced by IS4905:2015, IS6236:1971 to be replaced by IS6236:2020 in clause 2, page 1

ii) Status of standards referred in the IS

ferred standards o. & Title)	No. of this standards since revised	anges that are of affecting the standard under review	tion proposed
given in item i) above			

iii) Any other standards available related to the subject & scope of the standard being reviewed (International/regional/other national/association/consortia, etc. or of new or revision of existing Indian Standard)

ndard o. & Title)	ovisions that could be relevant while reviewing the IS	Action proposed
l		

iv) Technical comments on the standard received, if any

urce	ause of IS	mment	tion proposed
be reviewed after the review report circulation to members			

v) Information available on technical developments that have taken place (on product/processes/practices/use or application/testing/input materials, etc)

urce	velopment	levant clause of the IS under review that is likely to be impacted lause & IS No.)	tion proposed
be reviewed after the review report circulation to members			

vi) Issues arising out of changes in any related IS or due to formulation of new Indian Standard

lated IS and its Title vised or new)	ɔvision in the IS under review that would be impacted & the clause no. or addition of new clause/provision	anges that may be necessary in the Standards under review	tion proposed
l			

vii) Any consequential changes to be considered in other IS

lated IS to get impacted	quirements to be impacted
l	

1) Any other observation:
Nil

2) Recommendations:

This IS, IS 2077 : Automotive vehicles - Electric relays - Specification (Third Revision) (reaffirmed in 2019) can be reaffirmed (with IS number updation in clause 2 of page 1 as listed in the table i) of item 5

Prepared by: Sanjay Tank – ACMA
Date: 24.09.2024