AUTOMOTIVE INDUSTRY STANDARD

Type Approval Requirement for vehicle of category L2 – 5 of Electric Power Train

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ON BEHALF OF
AUTOMOTIVE INDUSTRY STANDARDS COMMITTEE

UNDER
CENTRAL MOTOR VEHICLE RULES – TECHNICAL STANDING COMMITTEE

SET-UP BY
MINISTRY OF ROAD TRANSPORT and HIGHWAYS
(DEPARTMENT OF ROAD TRANSPORT and HIGHWAYS)
GOVERNMENT OF INDIA

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INTRODUCTION

The Government of India felt the need for a permanent agency to expedite the publication of Standards and development of test facilities in parallel when the work of preparation of Standards is going on, as the development of improved safety critical parts can be undertaken only after the publication of the Standard and commissioning of test facilities. To this end, the Ministry of Road Transport & Highways (MoRT&H) has constituted a permanent Automotive Industry Standard Committee (AISC) vide order no. RT-11028/11/97-MVL dated September 15, 1997. The Standards prepared by AISC was approved by the permanent CMVR Technical Standing Committee (CTSC). After approval, The Automotive Research Association of India, (ARAI), Pune, being the secretariat of the AIS Committee, will published this Standard. For better dissemination of this information, ARAI may publish this document on their website.

This Standard prescribes the requirements for the construction and functional safety of vehicles of category L2 – 5 of Electric Power Train.

The AISC panel and the Automotive Industry Standards Committee (AISC) responsible for preparation of this standard are given in Annex 1 and Annex 2 respectively.

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1.0 Scope

1.1 This standard lays down the type approval requirements applicable to vehicles of category L2 – 5 of Electric Power Train.

2.0 References

2.1 IS 14272: 2011 – Automotive Vehicles – Types – Terminology

2.2 AIS – 065- Statutory Plates and Inscriptions for Motor Vehicles, their Location and Method of attachment – Vehicle Identification Numbering System

3.0 Definitions

3.1 "Category L2 – 5 of Electric Power Train" means a 2-Wheeler-3Wheeler Combi Module of a three wheeled motor vehicle constructed in such a way that a two-wheeled vehicle of category L2 is combined with a non-self-propelled rear module unit. It can be separated or combined, as and when required;

At any point of time, either of a two-wheeler of Category L2 or a three-wheeled vehicle of Category L5 can only be used.

3.2 "Non-self-propelled rear module" is a unit having two wheels at rear and cannot be self-propelled until it will be combined with two-wheeled vehicle of category L2 by mechanical and electronic means."

4.0 Type Approval Requirements

4.1 Vehicles of category L2 – 5 of Electric Power Train shall comply with the generic provisions specified under clause 4.2 and 4.3 of this standard.

4.2 CMVR Requirements for 2Wheeler-3Wheeler Combi Module Vehicles

4.2.1 Vehicles of category L2 – 5 of Electric Power Train defined in this standard shall comply with the requirements of CMVR, as amended from time to time as given in Table - 1 of this standard.

4.2.2 The two-wheeler separated from category L2 – 5 of Electric Power Train vehicles shall meet the CMVR requirements of L2 category of vehicles as specified in column (5) of Table-1 ; and

4.2.3 Vehicles of category L2 – 5 of Electric Power Train shall meet the CMVR requirements L5 category of vehicles as specified in column (6) of Table-1.

4.2.4 Notwithstanding the requirements listed in this standard all vehicles of category L2 – 5 of Electric Power Train shall meet the CMVR requirements as notified till the date of type approval granted.

4.3 General Requirements

4.3.1 Embossment of the chassis number

4.3.1.1 Vehicles of "Category of L2 – 5" of Electric Power Train shall bear the single and similar vehicle identification number including month and year of manufacture in accordance with AIS 065, as amended from time to time, for both the configurations i.e. separated two-wheeled vehicle of L2 Category or combined three wheeled vehicles of L5 Category.

4.3.1.2 The identification number including month and year of manufacture shall be embossed or etched or punched separately on both two-wheeled vehicle of category L2 and a non-self-propelled rear module unit.

Note: In case of any wrong punching, the procedure for making the correction as indicated in AIS-065, as amended from time to time, shall be followed.

4.3.2 Registration Plate Requirement

4.3.2.1 In case of "Category L2 – 5 of Electric Power Train vehicles" single registration mark shall be allotted for both the configurations, separated two-wheeled vehicle of L2 Category or combined three wheeled vehicle of L5 Category; and

4.3.2.2 The total number of four high security registration plates (HSRP) shall be affixed in the case aforesaid; two on two-wheeled vehicle of L2 Category and the other two on combined three wheeled vehicle of L5 Category; and

4.3.2.3 At any point of time there should be only one registration mark displayed on the front and one on the rear of the vehicle irrespective of the configuration.

4.3.3 Requirements for Joining and separation arrangements

4.3.3.1 The category "L2 – 5 of Electric Power Train vehicle" shall be combined in such a way that,

4.3.3.1.1 a rigid frame / Chassis of a two-wheeled vehicle of L2 Category shall be joined with the rigid frame / Chassis of a non-self-propelled rear module unit to form a unified rigid frame / chassis of a three-wheeled vehicle of Category L5 and there will not be any relative movement between these two frames

post-unification and at any point of time it shall not dis-engage unless otherwise intended; and

4.3.3.1.2 Rear wheel of a two-wheeled vehicle of L2 Category shall be retracted or repositioned and locked above the ground during usage as combined three wheeled vehicle of L5 Category; and

4.3.3.1.3 Two-wheeled vehicle of L2 Category cannot be separated from the combined three wheeled vehicle of L5 Category until rear wheel of a two-wheeled vehicle of L2 Category is descended to the ground; and

4.3.3.1.4 Three wheeled vehicle of L5 Category cannot be propelled until rear wheel of a two-wheeled vehicle of L2 Category is retracted or repositioned and locked] above the ground; and

4.3.3.1.5 There shall be a at least two locking mechanism, primary & secondary, which shall ensure that at no point of time when the vehicle is Stationary or while the vehicle is in motion the rear wheel of a two-wheeled vehicle of L2 Category shall come down while using as combined three wheeled vehicle of L5 Category;

4.3.3.2 Electrical/Electronic signal/power connection

4.3.3.2.1 There shall be coupler and wiring harness for electrical and signal connection of Two-wheeled vehicle of L2 Category to three wheeled vehicle of L5 Category.

4.3.3.2.2 Electronic throttle of Two-wheeled vehicle of L2 Category shall be electrically connected to three wheeled vehicle of L5 Category in such a way that, throttle of L2 Category vehicle shall operate 2 Wheeler - 3 Wheeler Combi Module Vehicles of electric power train.

4.3.3.2.3 “Non-self-propelled rear module” shall not have its own throttle/ accelerator speed control.

4.3.3.3 Electrical Chassis ground

4.3.3.3.1 All three configuration stages of vehicles namely “L2 Vehicle”, “L2 – 5 Vehicle” and “Non-self-propelled rear module” shall have same scheme of Electrical circuits connections either connected to chassis or not connected to chassis complying to AIS 038 (Rev. 1) or AIS 156 requirements, as the case may be.

5.0 Criteria for Extension of Approval

5.1 Every modification to the type approved 2-3W combi module vehicle shall be intimated by the 2-3W combi module vehicle manufacturer to the Testing Agency.

5.2 On review of the modifications carried out the Test Agency shall grant the extension of type approval or conduct additional tests as required for granting extension of type approval.

Note: In case of additional tests required only those parameters need to be tested which are modified.

5.3 For the purpose of clause 5.2, Changes in parameter affecting performance requirements of CMVR (E.g. brakes, noise etc.) shall be as per details given in the individual standards.

6.0 Technical Information to be submitted

6.1 Information to be submitted by manufacturer shall be as per Table 1, Table 1C, Table 1D, Table 7, Table 11, Table 13, Table 20, Table 21 of AIS-007 (Rev. 5) as amended from time to time, as applicable.

Table -1

CMVR requirements for Type Approval of 2-3W Combi Module Vehicles

(Clause 4.2)

(1)	(2)	(3)	(4)	(5)	(6)
S. No.	**Parameters**	**CMV Rule**	**Reference Standard**	**Test Applicability**	
				2W Mode	**3W Mode (Combi Mode)**
1	Overall Dimensions of Motor Vehicles	93 (1), (2), (4), (6), & (7)	-	✓	✓
2	Condition of tyres	94 (1), (2) & (3)	-	✓	✓
3	Size & Ply ratings of Tyres	95 (1)	IS:15627:2005 & AIS- 050	✓	✓
4	Brake test	96 (1), (2), (3), (4)(i), (4) (A), 5, 7(a)/(b), (c), & (8)	IS: 14664: 2010	✓	✓
(a)	Application with ABS or CBS if vehicle's Net power ≤ 11kW, and power / weight ratio ≤ 0.1 kW/kg			✓	✗
(b)	Application with ABS only if vehicle's Net power > 11kW, and power / weight ratio > 0.1 kW/kg			✓	✗

5	Use of Red or White lights	108 (1)	-	✓	✓
6	Prohibition of spot light	111	-	✓	✓
7	Speedometer calibration	117 (1) & (2)	IS:11827:2008	✓	✓
8	Horn Installation	119 (1) & (2)	IS:15796:2008	✓	✓
9	Horn Performance		IS:1884:1993	✓	✓
10	Vehicle Identification Number (VIN) & Motor Number	122 (1) & (2)	AIS-065	✓	✓
11	Pillion Hand holds	123	IS:14495:1998	✓	✗
12	Brake hose (if fitted)	124 (1) (2)	IS : 7079:2008	✓	✓
13	Brake fluid (if fitted)	124 (1) (3)	IS : 8654 :1986	✓	✓
14	Gradeability	124 (1) (23)	AIS-003	✓	✓
15	Spray Suppression System (less than 11kW)	124 (1) (48)	AIS-103	✓	✗
16	Rear View Mirror - Specification	125 (2)	AIS-001 (Rev.1)	✓	✓
17	Rear View Mirror - Installation	125 (2)	AIS-002 (Rev.1)	✓	✓
18	Turning circle diameter	98 (2)	IS 12222:2011	✗	✓
19	Safety measures for occupants	125 (11)	AIS-134	✗	✓

20	External projection	123, 124 (1) (11)	IS 13942:1994 (3W) / AIS 147 (wef 1st Jan'22- 2W only)	✓	✓
21	Stands	123	AIS 146 (w.e.f 1st Jan'22)	✓	✗
22	Foot rests	123	AIS 148 (wef 1st Jan'22)	✓	✗
23	Windscreen Wiping System	124 (1) (39)	AIS-045	✗	✓
24	Hand hold	124 (1) (42)	AIS-046	✗	✓
25	Safety Glass	100 (1), (2) & (3)	IS 2553 (Part 2) (Rev. 1): 2019 (Windows may be of acrylic or plastic transparent sheet)	✗	✓
26	Accelerator control system	124 (1) (15)	IS 14283:1995	✗	✓
27	Construction & functional safety	124 (1) & (26)	AIS-038 (Rev.1)/ AIS-156	✓	✓
28	Wheel Rims	124(1) (43)	AIS- 073 / IS 16192	✓	✓
29	Electric Power Train Vehicles - CMVR Type Approval for Electric Power Train Vehicles		AIS-049 (Rev. 1)	✓	✓

30	Pass by Noise	120 (2)	IS:3028 :1998 MoEF G.S.R 849 (E) dt. 30.12.2002.	✓	✓
31	Measurement of Electrical Energy Consumption	124 (1) & (27)	AIS-039 (Rev.1)	✓	✓
32	Method of Measuring the Range	124 (1) & (28)	AIS-040 (Rev.1)	✓	✓
33	Measurement of Net Power and Maximum 30 Minute Power	124 (1) & (29)	AIS-041 (Rev.1)	✓	✓
34	Lighting and Light Signaling Devices (Installation)	102 (1), (2) & (3)	AIS-009 (Rev.1)	✓	✓
35	Lighting and Light Signaling Devices (Performance)	124(1) (32)	AIS-010 (Rev.1) (Lamps) & AIS 057 (Rev.1) (Reflector)	✓	✓
36	Position of the indicator	103 (1)	-	✓	✓
37	Fitment of reflectors	104 (1) (4)	AIS -057 (Rev.1)	✓	✓
38	Fitment of Lamps	105 (1) (b) & (1) (bb) & 2 (1) & (4)	-	✓	✓
39	Deflection of Lights	106 (1)	-	✓	✓
40	Automobile lamps (bulbs)	124 (1)	AIS-034 (Rev.1)	✓	✓

41	Tell tale symbols	124 (1) (18-A)	AIS-126 & AIS-071 (Part 1 & Part 2)	✓	✓
42	EMC	124 (1) (21) (ii)	AIS-004 (Part 3)	✓	✓
43	Anti-Theft device	124 (1) (44)	AIS-074	✓	✓
44	Traction batteries	124 (1), (43) & (49)	AIS-048 / AIS 156	✓	✓
45	Vehicle Weighment	-	IS: 11825 :1986	✓	✓
46	Protective Head Gear (Helmets) (To be taken care at Sales Point)	138	IS:4151 :2015	✓	✗
47	Tool Kit & first aid kit	138	-	✓	✓
48	Light Weight Container (If fitted)	123	-	✓	✗
49	Automotive Vehicles-Types-Terminology	-	IS: 14272	✓	✓
50	Protective Devices for two wheeler (e.g. Saree guard)	123(c)	AIS 166	✓	✗

ANNEX 1

PANEL COMPOSITION*
(See Introduction)

Chairman	
Mr. A. A. Badusha	ARAI
Members	**Representing**
Dr. Abhijeet Marathe	ARAI
Mr. Manoj Desai	ARAI
Mr. Kamalesh B. Patil	ARAI
Mr. Sai Ganesh	ARAI
Mr. Vishal Rawal	ARAI
Mr. Pratik Nayak	ARAI
Ms. Vijayanta Ahuja	ICAT
Mr. Tarun Sharma	ICAT
Mr. Feroz A Khan	Hero MotoCorp Ltd.
Mr. Mohd. Danish Gazali	Hero MotoCorp Ltd.
Mr. Piyush Chowdhary	Hero MotoCorp Ltd.
Mr. Arvind Kumbhar	Bajaj Auto Ltd.
Mr. Adish Aggarawal	Bajaj Auto Ltd
Mr. MS Anand Kumar	TVS Motor Company Ltd.
Mr. Navneet Kaushik	Honda Motorcycle & Scooter India Pvt. Ltd.
Mr. Venusuresh	SIAM (Yamaha)
Shri Uday Harite	ACMA

ANNEX 2
(See Introduction)
COMMITTEE COMPOSITION *

Automotive Industry Standards Committee

Chairperson	
Dr. Reji Mathai	Director, The Automotive Research Association of India
Members	**Representing**
Representative from	Ministry of Road Transport and Highways
Representative from	Ministry of Heavy Industries
Representative from	Office of the Development Commissioner, MSME, Ministry of Micro, Small and Medium Enterprises
Shri Shrikant R. Marathe	Former Chairman, AISC
Shri R.R. Singh	Bureau of Indian Standards
Director	Central Institute of Road Transport
Director	Global Automotive Research Centre
Director	International Centre for Automotive Technology
Director	Indian Institute of Petroleum
Director	Vehicles Research and Development Establishment
Director	Indian Rubber Manufacturers Research Association
Representatives from	Society of Indian Automobile Manufacturers
Representatives from	The Tractor and Mechanization Association
Shri Uday Harite	Automotive Components Manufacturers Association of India
Shri K. V. Krishnamurthy	Indian Construction Equipment Manufactures' Association (ICEMA)
Member Secretary	
Shri Vikram Tandon	The Automotive Research Association of India

* At the time of approval of this Automotive Industry Standard (AIS)