AIS-166

AUTOMOTIVE INDUSTRY STANDARD

Automotive Vehicles – Protective Devices for Two Wheeled Motor Vehicles – Requirements

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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 & HIGHWAYS
(DEPARTMENT OF ROAD TRANSPORT & 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 on the preparation of the 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 erstwhile Ministry of Surface Transport (MoST) has constituted a permanent Automotive Industry Standards Committee (AISC) vide order No. RT-11028/11/97-MVL dated September 15, 1997. The standards prepared by AISC will be 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 publish this standard.

That the subject of fitment of protective devices on the left side of the rear wheel of two wheeled motor vehicles for the protection of the pillion rider from the entanglement of clothes in the rear wheel of the vehicle was reviewed in the Hon'ble High Court of Madhya Pradesh, Jabalpur and the court found consonance with the current practices being followed by the Test Agencies and the automotive industry.

Based on the discussions in the 60th AISC held on 1st August, 2018 it was agreed to form a new panel to work on the new AIS of Protective Devices for Two Wheeled Motor Vehicles – Requirements.

This AIS would add more clarity to the protective device coverage measurement procedure.

Subsequently the matter was discussed in the 54th meeting of the CMVR-TSC held on 8th September, 2018 and the 55th meeting of the CMVR-TSC held on the 6th February, 2019. Considering the judgement of the Hon'ble High Court of Madhya Pradesh, Jabalpur this standard is formulated with focus on the areas such as coverage requirements, measurement methods and administrative provisions for certification of protective devices under CMV Rule 123.

It is to be noted that the pictures/ diagrams given in this standard are indicative in nature and for illustration purposes only. The intent is to focus on the wheel coverage area.

The AISC panel responsible for formulation of this standard is given in Annexure C.

The Automotive Industry Standards Committee (AISC) responsible for approval of this standard is given in Annexure D.

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Automotive Vehicles – Protective Devices for Two Wheeled Motor Vehicles – Requirements

1. SCOPE

1.1 This standard specifies requirements of protective device to be fitted on two-wheeled motor vehicles of category L1 and L2 which have provision for pillion rider.

1.2 The requirements of this standard do not apply to:

1.2.1 "Special Purpose Vehicles (SPV)" as defined in CMV Rule 2 (zd), as amended from time to time.

1.2.2 Vehicles of:

a. Engine capacity greater than 500 cc in case of IC engine vehicles;

b. Motor power exceeding 11 kW in case of battery operated vehicles.

1.2.3 Vehicles in which the total distance of the wheel stroke measured is:

a. Exceeding 140 mm in case of Front Wheel; and

b. Exceeding 160 mm in case of Rear Wheel

For the purpose of this standard, wheel stroke for front and rear wheels means the difference between distance measured in vertical direction of a suitable reference point on the vehicle to the ground, when suspension is in fully extended and fully compressed condition.

1.2.3.1 For the vehicles exempted under clause 1.2.3, the manufacturer shall place a suitable warning (text and/or pictorial) in the form of permanent and legible sticker/ label on the vehicle in clear view intending for a pillion rider that it is not advisable to sit with both legs on left side of the vehicle wearing loose clothes. i.e. sitting facing left wearing loose clothes.

1.3 For the vehicles exempted under clauses 1.2.2 and 1.2.3, the vehicle manufacturer shall:

a. Submit a declaration to the Test Agency during type approval, specifying that it is not advisable for the pillion rider to sit with both legs on left side of the vehicle wearing loose clothes. i.e. sitting facing left wearing loose clothes including but not limited to saree, lungi, dhoti, burkha etc. while riding the vehicle. The same shall be included as a warning (text and/or pictorial) in the owner's manual.

The warning information in the owner's manual is optional in case of vehicles exempted under clause 1.2.2.

b. Educate the customer at the point of sale.

1.4 For vehicles claiming exemption under clause 1.2.2 and 1.2.3, in case the manufacturer chooses to provide a protective device which is complying with the requirements of this standard, then the requirements mentioned in clause 1.2.3.1 and 1.3 are not applicable.

2. REFERENCES

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

3. DEFINITIONS

For the purpose of this standard, the following definitions shall apply:

3.1 **"Protective device"** means a structure or a part or combination of parts or a design element as declared by the manufacturer fitted on the upper portion of the left side of the rear wheel of the vehicle.

3.2 **"Rider"** is a person who is riding and controlling the vehicle.

3.3 **"Pillion rider"** means a person seated behind the rider on the pillion seat provided on the vehicle.

3.4 **"Left side"** means the side of the vehicle, when facing the direction of forward movement, lies on the left side of the longitudinal median plane of the vehicle.

4. VEHICLE PREPARATION

4.1 The test/ verification shall be conducted in GVW condition.

4.2 The tyres shall be inflated to the appropriate pressures for the load condition, as specified by the vehicle manufacturer.

5. REQUIREMENTS

5.1 Vehicle with pillion rider provision shall be fitted with a protective device on the left side of the rear wheel.

The protective device shall be fitted on the left side of the rear wheel, such that it covers an area not less than half (50 %) of the rear wheel considering the tyre outer diameter.

For calculation of 50 % coverage area, all the parts specified in clause 5.4 shall be considered.

5.2 The perpendicular gap measured between the bars / elements of protective device as shown in Figures 1, 2 and 3 (illustrative examples) shall not exceed 70 mm.

Measurement shall be carried out in case of:

a) non-parallel bars / elements: the maximum gap between the bar / elements (see dimension A in Figure 1).

b) parallel bars / elements: the perpendicular distance between the two bars / elements (see figure dimension A in Figure 2 and Figure 3).

Figure 1

Figure 2

Figure 3

5.3 The coverage area calculated as per clause 5.1 shall include the upper portion of the rear wheel at least up to the horizontal line passing through the centre of the wheel. The protective device may form an angle up to a maximum of 15 degrees above the horizontal line passing through the centre of rear wheel axle towards rear of the vehicle (see Figure 4).

Note: The angle shall be measured between the intersection of the horizontal line passing through the centre of the wheel and the line formed by the lower most element of the protective device passing through the centre of the wheel.

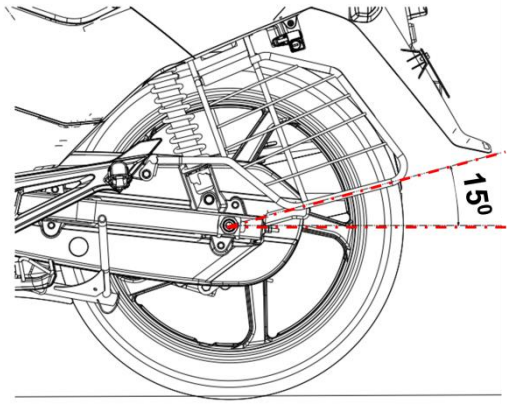

Figure 4

5.4 For the purpose of calculation of coverage area specified in clause 5.1, the area covered by any component(s) / structure(s) / frame, (e.g. suspension parts, chain case, swing arm, hugger, side panel, exhaust muffler, etc.) shall be considered as a part of protective device (see Figure 5).

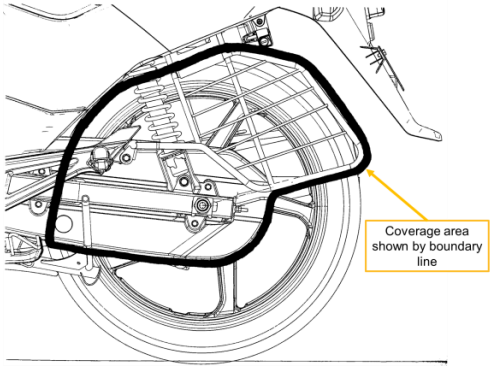

Figure 5:
Example of coverage area

5.4.1 The spaces in coverage area up to rear wheel (tyre) outer diameter/ other than those included in clause 5.2 and 5.4, which are practically not possible to be covered due to fixed / movable vehicle parts, shall be deemed to comply to the requirements of this standard, if a ball / solid circle / sphere of diameter of 120 mm (see Figure 6 and Figure 7) does not pass through such spaces in a direction perpendicular to the longitudinal plane of the vehicle. The above check shall be restricted to spaces up to rear wheel (tyre) design outer diameter (see Figure 5).

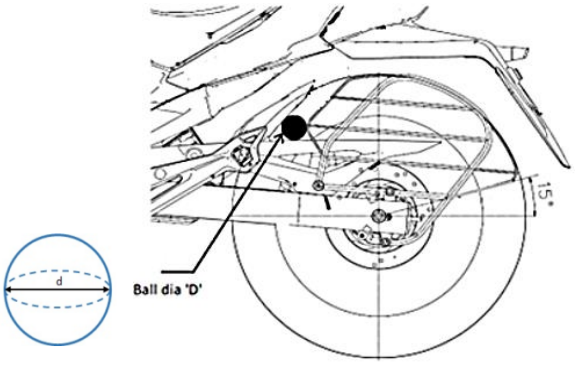

Figure 6:
Example of open spaces between elements of protective device

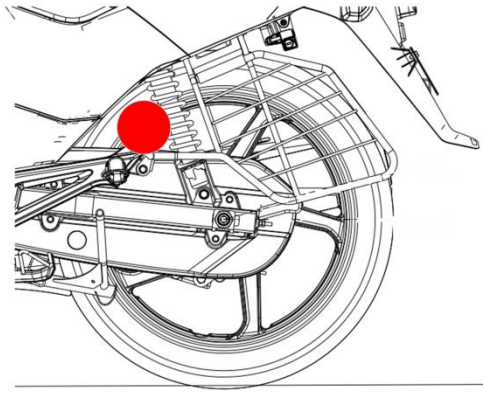

Figure 7:
Example of open spaces near vehicle moving parts

5.5 Coverage area measurement/demonstration method:

5.5.1 The vehicle manufacturer shall demonstrate the coverage area and other requirements of this standard through CAD or Physical verification, based on the discretion of test agency and as mutually agreed by Test Agency and the vehicle manufacturer.

5.6 If the vehicle fulfills any or a combination of any of the following conditions, it shall be deemed to satisfy the requirements of clause 5.1 to 5.4 of this standard.

5.6.1 Two wheeled motor vehicles with Scooter type frame (see Figure 8 and Figure 9) in which:

- foot rests for the rider are integral with platform/ footboard, and
- no exposed part of the rear wheel appears in the cross-sectional area formed by the intersection of the horizontal plane passing through the mounting of pillion footrest / side saddle footrest as applicable and the vertical plane passing through the midpoint of the pillion seat as declared by the vehicle manufacturer and the tyre design outer diameter (see Figure 9).

A step through to mount the vehicle having platform/ footboard may be present.

Figure 8
<for illustration purpose>

Figure 9
<for illustration purpose>

5.6.2 A vehicle fitted with disc type rear wheel rim i.e. rim without wire spoke or otherwise.

Figure 10
<for illustration purpose>

5.6.3 A vehicle fitted with rear wheel rim where the wheel rim is completely covered with hub cap.

6. APPROVAL OF VEHICLE

6.1 If the protective device for a two wheeled motor vehicle model submitted for approval meets the requirements of clause 5 of this standard, approval of that protective device shall be granted.

6.2 The application for type approval of a vehicle with regard to Protective Device shall be submitted by the vehicle manufacturer along with the details given in Annexure A.

Note: If the above details are covered in the table submitted as per AIS-007 for complete vehicle type approval, it is not necessary to submit them separately.

7. MODIFICATION AND EXTENSION OF THE APPROVAL OF THE PROTECTIVE DEVICE FOR TWO WHEELED MOTOR VEHICLE

7.1 Every modification in technical specification affecting type approval declared in accordance with Annexure A, shall be intimated to the testing agency. Testing agency may then consider, whether;

7.1.1 The Protective Device with modifications complies with specified requirements, or,

7.1.2 any further verification is required to establish compliance.

7.2 For considering whether testing is required or not, guidelines given in Annexure B shall be followed.

7.3 In case of clause 7.1.2, tests for only those parameters which are affected by the modifications shall be carried out.

7.4 In case of fulfilment of criterion of clause 7.1.1 or after results of further verification as per clause 7.1.2 are satisfactory, the approval of compliance shall be extended for the changes carried out.

ANNEXURE A

(Clause 6.2)

INFORMATION TO BE SUBMITTED BY THE MANUFACTURER

1.	Make	
2.	Name and address of the manufacturer	
3.	Designed for vehicle category	
4.	GVW of the vehicle (kg)	
5.	Type of design implied (for e.g. bars (vertical/ horizontal), mesh, louver etc.)	
6.	Tyre size	
6.1	Design outer diameter of the tyre	
7.	Tyre pressure	
8.	Pillion seat mid-point reference dimensions (in mm) for vehicles under clause 5.6.1	
9.	Schematic (CAD) diagram of the protective device illustrating the fitment and specifying the coverage area after fitment on the rear wheel	

ANNEXURE B

(Clause 7.2)

CRITERIA FOR EXTENSION OF THE APPROVAL

1 This annexure gives the factors to be considered while selecting a Protective Device to represent a range of variants for type Approval as per this standard and the extension of Type Approval Certificate on one model to its variants.

1.1 In general, when changes in the technical specification of the Protective Device do not affect the requirements given in this standard adversely and is still within the stipulated limits, the type approval certificate shall be extended.

1.2 The type approval testing and/or document verification shall be performed on a model/ variants only in the case of the following changes:

a. An increase in lateral spacing between the bars/ elements of the protective device (See Clause 5.2).

b. Decrease in dimensions of the protective device causing a reduction in the covered area.

c. Deletion of vehicle parts included in the covered area.

d. Reduction in coverage area due to change in tyre size: Increasing the wheel diameter leading to an increase in the covering area requirement (verification to be carried out only if the covering area approved for the base version is less than the new requirement).

e. Changes in other vehicle parts reducing the coverage area.

1.3 Changes other than those listed above, are considered to be having no adverse effect requirements of protective device.

ANNEXURE C
(See introduction)
PANEL COMPOSITION*

Name	
Ms. Vijayanta Ahuja	Convener International Centre for Automotive Technology (ICAT)
Members	**Representing**
Mr. Gurkaran Singh	International Centre for Automotive Technology (ICAT)
Mr. Shakti N. Khanna	International Centre for Automotive Technology (ICAT)
Mr. Mayank Sharma	International Centre for Automotive Technology (ICAT)
Mr. V. P. Rawal	The Automotive Research Association of India (ARAI)
Mr. Konaki Ramu	The Automotive Research Association of India (ARAI)
Mr. Arvind Kumbhar	Bajaj Auto Ltd. (SIAM)
Mr. Adish Aggarwal	Bajaj Auto Ltd. (SIAM)
Mr. Harjeet Singh	Hero Motocorp Ltd. (SIAM)
Mr. Feroz A. Khan	Hero Motocorp Ltd. (SIAM)
Mr. Piyush Chowdhry	Hero Motocorp Ltd. (SIAM)
Mr. Danish Gazali	Hero Motocorp Ltd. (SIAM)
Mr. Vipin Sharma	Honda Motorcycle & Scooter India Pvt. Ltd. (SIAM)
Mr. Ashish Sattikar	India Kawasaki Motors Pvt. Ltd. (SIAM)
Mr. Sanjeev Chuch	India Yamaha Motor Pvt. Ltd. (SIAM)
Mr. Pawan Kumar	India Yamaha Motor Pvt. Ltd. (SIAM)
Mr. Rakesh Sharma	India Yamaha Motor Pvt. Ltd. (SIAM)
Mr. Venu Suresh	Royal Enfield(SIAM) (SIAM)
Mr. S. Avinash Khot	Suzuki Motorcycle India Pvt. Ltd. (SIAM)
Mr. M. S. Anandkumar	TVS Motor Company Ltd. (SIAM)
Mr. Guru Rajan	TVS Motor Company Ltd. (SIAM)
Ms. Divya	Tata Consultancy Services

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

ANNEXURE D
(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
Shri S. M. Ahuja	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)