

AMENDMENT NO. 1
TO
AIS-047 / 2009
Automotive Vehicles - Interior Fittings –
Specifications for other than M1 Category Vehicles

1. Page No. 1/12

Add following Clause 2.3 after Clause 2.2:

“2.3 IS 13749:1993-Automotive vehicles-Determination of H-point-Method of Test.”

2. Page No. 2/12, Clause 4.1.1

Substitute following text for existing text:

“4.1.1 At the R or H point at the choice of the vehicle manufacturer;”

3. Page No. 2/12, Clause 4.1.2,4.1.2.1

Substitute “.....R or H point.....” for “.....R point.....”

4. Page No. 2/12, Clause 4.1.4

Substitute following text for existing text:

“4.1.4 In the case of fixed seats, the zone shall be determined only at its R or H point, at the choice of the vehicle manufacturer.”

5. Page No. 3/12, Clause 4.4

Substitute following text for existing text:

“4.4 All points of contact situated forward of the R or H point, at the choice of the vehicle manufacturer, shall be determined for each dimension from the pivoted point to the top of the head capable of being measured by the measuring apparatus within the interior dimension of the vehicle.”

6. Page No. 3/12, Clause 5.1

Substitute following text for existing text:

“5.1 Forward interior parts of the passenger compartment above the level of the instrument panel in front of the front seat R or H point, at the choice of the vehicle manufacturer, excluding the side doors (up to a limit of 1000 mm between the pivot point and the top of the head of the apparatus)”

7. Page No. 3/12, Clause 5.1.1

Substitute following text for existing text:

“5.1.1 The reference zone shall not contain any sharp edges, which may cause injury to the occupants.”

8. Page No. 3/12, Clause 5.1.1.1

Substitute following text for existing text:

“5.1.1.1 Grills, AC louvers are considered to comply with the standard if they meet the requirements of the following table:.....”

9. Page No. 4/12, clause 5.1.2

Substitute following text for existing text:

“5.1.2 Switches, pull-knobs etc and the like, made of rigid material, which measured in accordance with the method prescribed in Annex C of IS 15223, project from 3.2mm to 9.5mm from the panel, shall have cross sectional area of not less than 2cm^2 measured 2.5 mm from the point projecting furthest and shall have a rounded edges with a radius of curvature of not less than 2.5 mm.”

10. Page No. 4/12

Add following Clause 5.1.2.1 after Clause 5.1.2:

“5.1.2.1 If the components project more than 9.5mm from the surface of the instrument panel, they shall be so designed and constructed as to be able, under the effect of a longitudinal horizontal force of 37.8 daN delivered by a flat-ended ram of not more than 50 mm diameter, either to retract into the surface of the panel until they do not project by more than 9.5 mm or to become detached; in the later case, no dangerous projections of more than 9.5 mm shall remain; a cross-section of not more than 6.5mm from the point of maximum projection shall be not less than 6.5cm^2 in area.”

11. Page No 6/12, Annexure A, Clause A.3, 3rd column explanatory note.

Substitute “.....material of 85 shore D maximum hardness.....” for “.....material of between 60 and 80 shore A hardness....”

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THE AUTOMOTIVE RESEARCH ASSOCIATION OF INDIA
P. B. NO. 832, PUNE 411 004
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

November 2011

AUTOMOTIVE INDUSTRY STANDARD

**Automotive Vehicles -
Interior Fittings - Specifications
for other than M1 Category Vehicles**

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(DEPARTMENT OF ROAD TRANSPORT & HIGHWAYS)

GOVERNMENT OF INDIA

March 2009

Status chart of the Standard to be used by the purchaser for updating the record

Sr. No.	Corr-igenda.	Amend-ment	Revision	Date	Remark	Misc.
General remarks :						

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 permanent CMVR Technical Standing Committee (CMVR-TSC) has approved the standards prepared by AISC. After approval, the Automotive Research Association of India, (ARAI), Pune, being the secretariat of the AIS Committee, has published this standard. For better dissemination of this information, ARAI may publish this document on their website.

For M1 category of the vehicles the requirements of interior fittings are specified in IS 15223 which is already in force. The need for the similar requirements for vehicles other than M1 category was identified in safety road map. There is no equivalent standard available internationally for these categories of vehicles. Therefore this standard was decided to be formed in two phases. This standard covers the requirements of phase 1 seeking assistance from IS:15223 for the dimensional requirements. Phase 2 of this standard will address the accident data collection leading to laboratory bench tests for the occupant safety. The contents of this phase are being evolved by the panel currently.

While preparing this AIS considerable assistance is derived from IS : 15223 Automotive Vehicles- Interior Fittings- Specifications.

The Automotive Industry Standards Committee responsible for preparation of this standard is given in Annex : E

Automotive Vehicles - Interior Fittings- Specifications for other than M1 Category Vehicles

1 SCOPE

- 1.1 This standard covers the requirements of interior fittings of vehicles of category M2, M3, N1, N2, and N3 as defined in AIS-053 in respect of the following.
 - 1.1.1 The interior parts of the passenger compartment other than rear view mirrors contactable by the seated occupants in the front (first) row of forward facing seats when likely to be impacted during frontal impacts only.
 - 1.1.2 The protrusions of controls.
- 1.2 This standard shall not apply to parts contactable by occupants of :
 - 1.2.1 Vehicles intended for special applications such as ambulances and security vehicles where fittings not compliant with the requirements of the standard may be necessitated.
- 1.3 Vehicles derived from M1 or their variants approved to IS:15223-2002, shall be deemed to have met the requirements of this standard.

2 REFERENCES

- 2.1 IS 15223: 2002 - Automotive Vehicles-Interior Fittings-Specification
- 2.2 AIS-053 - Automotive Vehicles - Types - Terminology

3 DEFINITIONS

The following definitions shall apply.

- 3.1 **“Vehicle Type”** Vehicle type with regard to the interior fittings of the passenger compartment (Other than rear view mirror) means power driven motor vehicles, which do not differ in such essential respect as:
 - 3.1.1 The protrusions of controls; and
 - 3.1.2 The lines and constituent materials of the bodywork of the compartment limited to the front row occupants.
- 3.2 **“Reference Zone”** (See A.1)

The reference zone when determined as per the procedure described in Clause 4, shall comprise all the non – glazed surfaces of the interior of a vehicle which are capable of entering into static contact with the spherical head 165 mm diameter which is an integral part of a measuring apparatus whose dimensions from the pivotal point of the apparatus to the top of the head is continuously adjustable between 736 mm and 840 mm, when positioned at the front row occupant R point, except:

- 3.2.1 The area bounded by the forward horizontal projection of a circle circumscribing the outer limits of the steering control, increased by a peripheral band 127 mm in width; the area is bounded below by the horizontal to the lower edge of steering control when the latter is in the position for driving straight ahead;
- 3.2.2 The part of the surface of the instrument panel comprised between the edge of the area specified in 3.2.1 above and the nearest inner front row side – wall of the vehicle; this part of the surface is bounded below by the horizontal plane tangential to the lower edge of the steering control;
- 3.3 **“Level of Instrument Panel”** (See A.2)
The line defined by the points of contact of vertical tangents to the instrument panel.
- 3.4 **“Belt Line”**
It is the line constituted by the transparent lower contour of the side windows of the vehicle.
- 3.5 **“R’ point”, or “seating reference point”** means a design point defined by the vehicle manufacturer for each seating position and established with respect to the three-dimensional reference system;
- 3.6 **“Sharp edge”** It is an edge of rigid material having a radius of curvature of less than 2.5 mm, if the projections are more than 3.2mm, measured from the panel, for parts in the reference zone.

4 DETERMINATION OF REFERENCE ZONE

The following procedure or its graphic equivalent shall be used to determine the zone.

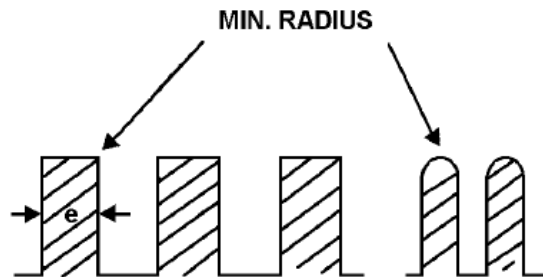
- 4.1 The pivotal point of measuring apparatus shall be placed as follows for each front row seating position:
- 4.1.1 At the R point; and
- 4.1.2 At a point situated horizontally 127mm forward of the R point
- 4.1.2.1 Either at a height resulting from the variation of the R point caused by a forward shift of 127 mm;
- OR
- 4.1.2.2 At a height, 19 mm in case the seat has been provided with an independent height adjustment.
- 4.1.3 Where a seat has been provided with travel less than 127 mm, the requirements shall be met with the seat at its most forward position.
- 4.1.4 In the case of fixed seats, the zone shall be determined only at its R point.

- 4.2 The possible points of contact shall be determined with the measuring apparatus vertical and by pivoting it forward and downward through all arcs of the vertical planes as far as 90° on either side of the longitudinal vertical plane of the vehicle passing through the R point and tangential to the horizontal plane situated 25.4 mm above the R point (Refer fig. 1 and 2)
- 4.3 Each excursion shall start from a vertical position and the length of the arm of the measuring apparatus shall not be changed during any given excursion.
- 4.4 All points of contact situated forward of the R point shall be determined for each dimension from the pivoted point to the top of the head capable of being measured by the measuring apparatus within the interior dimension of the vehicle.

5 SPECIFICATIONS

- 5.1 Forward Interior Parts of the Passenger Compartment above the Level of the Instrument Panel in front of the Front Seat R point, excluding the Side Doors:
 - 5.1.1 The reference zone shall not contain any dangerous roughness or edges, which may cause injury to the occupants.
 - 5.1.1.1 Grills are considered to comply with the standard if they meet the requirements of the following table:

Gap between elements (mm)	Flat elements		Rounded elements min. radius (mm)
	e/min. (mm)	min. radius (mm)	
0-10	1.5	0.25	0.5
10-15	2.0	0.33	0.75
15-20	3.0	0.50	1.25



- 5.1.2 Switches, pull-knobs etc made of rigid material - shall have cross sectional area of not less than 2cm^2 measured 2.5 mm from the furthest projecting point, and shall have a rounded edges with a radius of curvature of not less than 2.5 mm.
- 5.1.3 Parts in the exempted area defined in 3.2.1 and 3.2.2 shall be exempted from the requirements of 5.1.1 to 5.1.2.
- 5.1.4 In case of projection consisting of a component made of non- rigid material of hardness less than 50 shore A mounted on a rigid support, the requirements of 5.1.1 to 5.1.3 shall apply only to the rigid support.
- 5.2 Forward Interior Parts of the Passenger Compartment below the level of the Instrument Panel and in the Front of the Front Seat R point, Excluding the side Doors and the Pedals
- 5.2.1 A component that can be contacted by the device described in Annex B and used in procedure described there, shall comply with the requirements of 5.1.1 to 5.1.4. (See A.3).
- 5.2.2 Hand Brake control and the gear lever in the first gear condition if mounted on or under the instrument panel shall be so placed that, when it is in the position of rest, there is no possibility of occupants of the vehicle striking against it in the event of frontal Impact. If this condition is not met, the surface of the control shall have a surface area at least 6.5 cm^2 measured 6.5 mm from the point projecting furthest, and shall have a rounded edges with a radius of curvature of not less than 3.2 mm. (See A.4)
- 5.2.3 Shelves including luggage racks and other similar items shall be so designed and constructed that the part facing the vehicle shall present a surface not less than 25 mm high with edges rounded to a radius of curvature of not less than 3.2 mm and the supports in no case have protruding edges. (See A.5)
- 5.2.4 If the item considered above comprises a component made of non- rigid material of less than 50 shore A hardness mounted on a rigid support, the above requirements shall apply only to the rigid support.

6 CRITERIA FOR EXTENSION OF TYPE APPROVALS

- 6.1 Every modification of the vehicle type shall be notified to the test agency which approved the vehicle type. The test agency may then either:
- 6.1.1 Consider that the modifications made are unlikely to have an appreciable adverse effect and that in any case the vehicle still complies with the requirements. While deciding this, guidelines given in Annex D shall be followed.
- OR
- 6.1.2 Require a further test report from the testing agency responsible for conducting the tests.

- 6.2 In case of modifications in the technical specifications submitted and type approved, assessment shall be restricted for the changes carried out only .

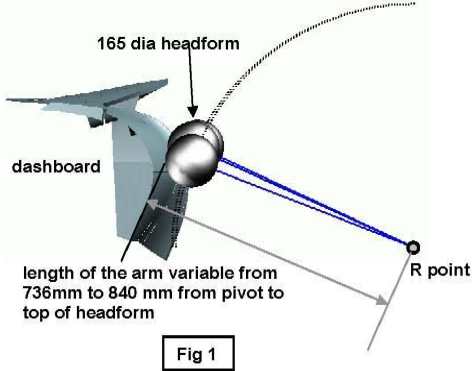
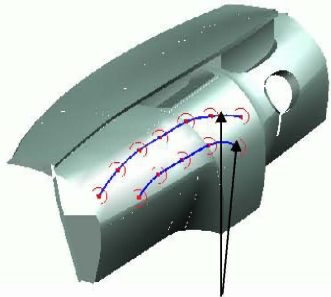
7 CONFORMITY OF PRODUCTION

- 7.1 The CoP procedure shall be applicable when Whole vehicle CoP will be implemented through notification.
- 7.2 During CoP, requirements of 5 shall be verified.

8 TECHNICAL INFORMATION TO BE SUBMITTED BY VEHICLE MANUFACTURER

Technical information to be submitted by vehicle manufacturer along with the application for type approval is as per Annex C

ANNEX A
(See 3.2)

Paragraph No.	Reference of para of main standard	Explanatory note
A.1	3.2	The reference zone is outlined without rear view mirror.
A.1.1	3.2	The exempted area behind the steering wheel as defined by these paragraphs is also valid for the head impact area of the front passengers. In the case of adjustable steering, the zone shall be established at median position of the steering wheel unless and otherwise specified by the manufacturer,
<div style="display: flex; justify-content: space-around; align-items: flex-start;"> <div style="text-align: center;">  <p>Fig 1</p> </div> <div style="text-align: center;">  <p>Fig 2 : contours generated with the head contact points on the dashboard for co driver position. these head contact points have to be established for 2 positions of pivot point & 2 lengths of the marking apparatus (ref. 3.0 & 4.1)</p> </div> </div> <p>This figure illustrates the reference zone marking from co driver position. Similar activity has to be performed for driver position considering the exemption around the steering wheel as explained in cl 3.2.1).</p>		
A.2	3.3	The level of the instrument panel extends over the entire width of the passenger compartment and is defined by the rearmost points of contact of a vertical line with the surface of the instrument panel when the line is moved across the width of the vehicle. Where two or more points of contact occur simultaneously, the lower point of contact shall be used to establish the level of the instrument panel. In the case of consoles, if it is not possible to determine the level of the instrument panel by reference to the points of contact of a vertical line the level of the instrument panel shall be where a horizontal line 25.4 mm above the R point of the front seats intersects the console.
A.3	5.2.1	Foot pedals, their arms and immediate pivotal mechanism, but not the surrounding support metal, shall be excluded from consideration. The ignition key is deemed to satisfy the requirements of this Paragraph if the protruding part of its shank consists of a material of between 60 and 80 shore A hardness and a thickness of at least 5 mm, or is covered with such a material of 2 mm minimum thickness on all surfaces

A.4	5.2.2	<p>The criterion to determine whether the parking brake control can be contacted is the use of:</p> <ul style="list-style-type: none">• the simulated head specified in para 3.2, if the control is located above or on the level of the instrument panel (to be tested in accordance with Paragraph 5.1 and within the impact zone);• the knee specified in Annex B if the control element is located below the level of the instrument panel (in this case the control lever is tested in accordance with Paragraph 5.2.2).
A.5	5.2.3	<p>The technical specifications listed in 5.2.3 apply also to shelves and those parts of consoles below the level of the instrument panel located between the front seats, provided that these are located in front of the R point. If a cavity is closed it will be treated as a glove compartment and not be subject to these specifications.</p>

ANNEX B
(See 5.2.1)

**APPARATUS AND PROCEDURE FOR
APPLICATION OF 5.2 OF SPECIFICATION**

B.1 Those parts (switches, pull knobs etc.) which can be connected using the apparatus and procedure described below shall be considered as being likely to be contacted by the knees of an occupant. Foot operated controls are fitted as foot pedals.

B.2 APPARATUS

B.2.1 Diagram of Apparatus

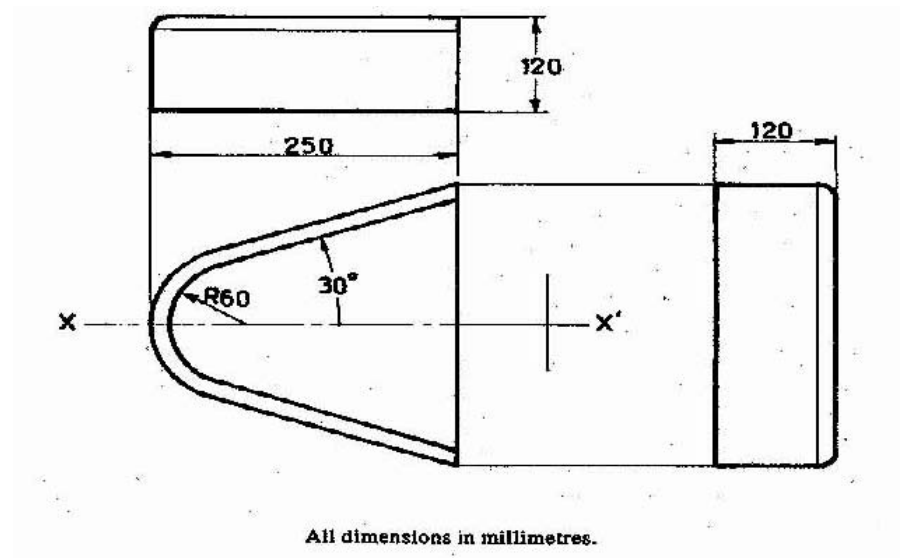


Fig. 3

Apparatus for checking Knee Contact of Occupant

B.3 PROCEDURE

B.3.1 The apparatus may be placed in any position below the instrument panel so that:

- a) the plane XX' remains parallel to the median longitudinal plane of the vehicle, and
- b) the axis X can be rotated above and below the horizontal through angles up to 30°.

B.3.2 In carrying out the above test, all materials of less than 50 shore A hardness shall be removed.

ANNEX C
(See 8.0)

**INFORMATION TO BE SUBMITTED BY VEHICLE
MANUFACTURER FOR TYPE APPROVAL**

Sr. No.	Parameter	
C.1	General:	
C.1.1	Name of the Model(s)	
C.1.2	Vehicle category(s)	
C.1.3	Variant(s)	
C.1.4	Name and address of vehicle manufacturer	
C.1.5	Name and Address of manufacturers of instrument panel, audio/video system, seats, air bag (if provided) etc.	
C.2	Specifications:	
C.2.1	R point Co-ordinates for all front row seats	
C.2.2	Drawings of contactable portions of instrument panel parts, showing relevant dimensions of cross section and radius.	
C.2.3	Seating Layout Drawing for front row of seats.	
C.2.4	Hardness levels of the all interior fittings at contactable points, except rear view mirror.(see 5.1 and 5.2)	
C.2.5	Steering wheel diameter	

ANNEX D

(See 6.1.1)

CRITERIA FOR EXTENSION OF APPROVAL

- D-1 This Annex gives factors to be considered :
- while selecting a vehicle, to represent a range of variants, for testing the vehicle for type approval as per this standard and
 - the extension of type approval certificate of one model to changes in technical specification/its variant/(s).
- D-2 In general, when changes in technical specifications of vehicle do not affect the compliance adversely, and it still within the stipulated limits, the type approval certificate shall be extended. If the changes affect some of the parameter, test shall be carried out only for those parameters.
- D-3 The changes that affect the compliance adversely and the test to be conducted (if any), for extending the type approval, are listed in Table D1.
- D- 4 The changes other than those specified in the Table D1 are not likely to have adverse effect on compliance.
- D-5 any other parameter can be considered as criteria for extension of approval if it is mutually agreeable to the testing agency and the vehicle manufacturer,

Table D-1

**Parameters for deciding Tests for
Extension of Type Approval**
(See paragraph D-3 above)

	Parameter	Necessity for test
1.0	Change in R point co-ordinates:	
	Towards rear and lower side	No tests required
	Towards front and upper side, if new edges are contactable.	Checks as per para. 5 required.
	Sideways as in case of additional seat in the front row.	Checks as per para. 5 required for affected seat locations.
2.0	Changes in the : radius at edges, reinforcing rods and other specified locations in contactable area, : cross sectional area of the reinforcing rods, : width, of a part	
	Increase	No tests required
	Decrease to lower than + 50 % of the design specifications but meeting the regulatory requirements.	Checks as per para 5 required.
3.0	Change in projection of the parts: -	
	Decrease	No tests required
	Increase	Checks as per para 5 required.
4.0	Change in Steering wheel diameter: -	
	Increase	No tests required
	Decrease	Checks as per para 5 required.

ANNEX E

(See Introduction)

COMMITTEE COMPOSITION ***Automotive Industry Standards Committee**

Chairman	
Shri Shrikant R. Marathe	Director The Automotive Research Association of India, Pune
Members	Representing
Representative from	Ministry of Shipping, Road Transport & Highways (Dept. of Road Transport & Highways), New Delhi
Representative from	Ministry of Heavy Industries & Public Enterprises (Department of Heavy Industry), New Delhi
Shri Chandan Saha	Office of the Development Commissioner, Small Scale Industries, Ministry of Small Scale Industries, New Delhi
Shri Rakesh Kumar	Bureau of Indian Standards, New Delhi
Director Shri D. P. Saste (Alternate)	Central Institute of Road Transport, Pune
Dr. M. O. Garg	Indian Institute of Petroleum, Dehra Dun
Dr. C. L. Dhamejani	Vehicles Research & Development Establishment, Ahmednagar
Representatives from	Society of Indian Automobile Manufacturers
Shri T.C. Gopalan Shri Ramakant Garg (Alternate)	Tractor Manufacturers Association, New Delhi
Shri K.N.D. Nambudiripad	Automotive Components Manufacturers Association of India, New Delhi
Shri Arvind Gupta	Automotive Components Manufacturers Association of India, New Delhi

Member Secretary
Mrs. Rashmi Urdhwareshe
Deputy Director

The Automotive Research Association of India, Pune

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