

AUTOMOTIVE INDUSTRY STANDARD

**Automotive Vehicles -
The Arrangement of
Foot Controls of Vehicles**

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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

November 2022

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 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, has published this standard. For better dissemination of this information ARAI may publish this document on their web site.

Foot controls in a vehicle do not require the driver to see them while driving. The driver needs to be familiar with the foot controls of different makes of vehicles. In this regard the arrangement of the foot controls is important for safety. Revision of AIS-035 is carried out to introduce optional provisions related to foot rest.

While preparing this AIS considerable assistance is derived from UN R 35 (Revision 1, Amendment 2 - 01 series of amendments – Date of entry into force: 9 June 2021) – Uniform provisions concerning the approval of Vehicles with regard to the Arrangement of Foot Controls

The AISC panel and Automotive Industry Standards Committee responsible for preparation of this standard are given in Annex 4 and 5 respectively.

**Automotive Vehicles -
The Arrangement of Foot Controls of Vehicles**

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Automotive Vehicles - The Arrangement of Foot Controls of Vehicles

1.0 SCOPE

This standard applies to vehicles of category M1 and L7-M with regard to the arrangement and mode of operation of the foot controls.

2.0 REFERENCES

- | | | |
|-----|-----------------------------|--|
| 2.1 | AIS-053 /
IS 14272: 2011 | Automotive Vehicles - Types - Terminology |
| 2.2 | IS 13749 :1993 | Automotive Vehicle - Determination of H - Point Method of Test |

3.0 DEFINITIONS

For the purpose of this standard:

- | | |
|-----|---|
| 3.1 | “ Approval of a vehicle ” means the approval of a vehicle type with regard to the foot controls as specified in clause 1. |
| 3.2 | “ Vehicles of category M1 ” means a motor vehicle as defined in AIS-053 / IS 14272: 2011. |
| 3.3 | “ Vehicle type ” means a category of motor vehicles which do not differ in respect of the structure and internal arrangements which may affect the location and operation of the foot controls; |
| 3.4 | “ Accelerator pedal ” means a foot control by which the engine power output can be varied. |
| 3.5 | “ Service-brake pedal ” means a foot control by which the service-braking device can be operated. |
| 3.6 | “ Clutch pedal ” means the foot control of the device designed to engage the engine with or disengage it from the transmission and the road wheels. |
| 3.7 | “ Transverse plane ” means a plane perpendicular to the median longitudinal plane of the vehicle. |
| 3.8 | “ Longitudinal plane ” means a plane parallel to the median longitudinal plane of the vehicle |
| 3.9 | “ Reference Plane ” “ P ” (See Figure 1) means a transverse plane passing through point “A” and perpendicular to the orthogonal projection of the line joining point “R” to point “A” when projection is taken on a longitudinal plane passing through the “R” point. |

- 3.9.1 "A" is a point on the surface of the accelerator pedal 200 mm from point "B".
- 3.9.2 "B" is the fixed point on the vehicle corresponding to the heel point, as established by the vehicle manufacturer.
- 3.10 "Walls" means fixed structural members (e.g. transmission tunnel; wheel arches; side trim panels).
- 3.11 Vehicles of category L7-M means a motor vehicle as defined in AIS-053.

4.0 TECHNICAL INFORMATION TO BE SUBMITTED BY THE VEHICLE MANUFACTURER

- 4.1 The application for approval of a vehicle type with regard to the arrangement of foot controls shall be submitted by the vehicle manufacturer.
- 4.2 It shall be accompanied by the following documents in triplicate, and by the following particulars:
 - 4.2.1 Drawings, on an appropriate scale and in sufficient detail, of the parts of the structure considered to be referred to by the requirements of this Standard.
- 4.3 A vehicle representative of the type to be approved shall be submitted to the test agency responsible for conducting the approval tests.
- 4.4 Vehicle manufacturer shall submit reference data concerning seating positions of driver as per Annex 2 to testing agency.

5.0 REQUIREMENTS (See Annex 3)

- 5.1 The foot controls shall be arranged in the following order from left to right, as observed from the driver's seat: clutch pedal if any; service-brake pedal; accelerator pedal.
- 5.2 It shall be possible to place the left foot normally in a position of rest on the floor surface or footrest such that it is not trapped by the pedals.
- 5.3 It shall be possible to actuate any pedal over its full travel without inadvertently operating floor-switches or other foot controls.
- 5.4 The seating reference point "R" shall be measured by the procedure for determining the "H" point and actual torso angle for seating position in motor vehicles as per IS:13749-1993. The three-dimensional reference system shall be as given in Annex 1.
- 5.5 The distance, shown at "E" in Annex 3, between the contour points of the orthogonal projections on to plane "P" of the accelerator-pedal and service-brake-pedal bearing surfaces shall be ≤ 100 mm and ≥ 50 mm.

- 5.6 The distance "F" in Fig.2a and 2b of Annex 3 between the orthogonal projections of the service-brake-pedal and the clutch-pedal bearing surfaces on to the reference plane "P" shall be ≥ 50 mm.
- 5.7 The distance "G" in Fig.2a and 2b of Annex 3, between the contour points of the orthogonal projection of the clutch pedal on to plane "P" and the intersection of the nearest wall with plane "P" shall be ≥ 50 mm.
- 5.8 The distances, respectively shown as "H" and "J" in Annex 3, between the projection of the service-brake pedal on to the reference plane "P" and the intersection of each of the walls with that plane shall be ≥ 130 mm to the right and ≥ 160 mm to the left for vehicles with three pedals (Ref. Fig. 2a of Annex 3), and ≥ 130 mm to the right and ≥ 120 mm to the left for vehicles with two pedals (Ref. Fig. 1a of Annex 3).

In the case of a footrest as declared by the manufacturer, installed for the driver's left foot, the measurements for "J" and "G" in Annex 3 shall ignore the foot rest. The distance, shown at "K" in annex 3, between the contour points of the projection of the left most pedal on to plane "P" and the intersection of the footrest with plane "P" shall be ≥ 50 mm."

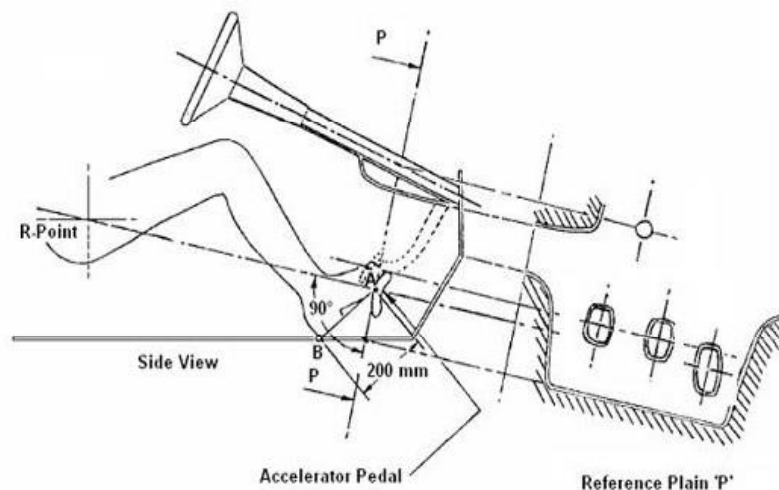


Figure. 1
(See clause 3.9)
Arrangement of Foot Controls

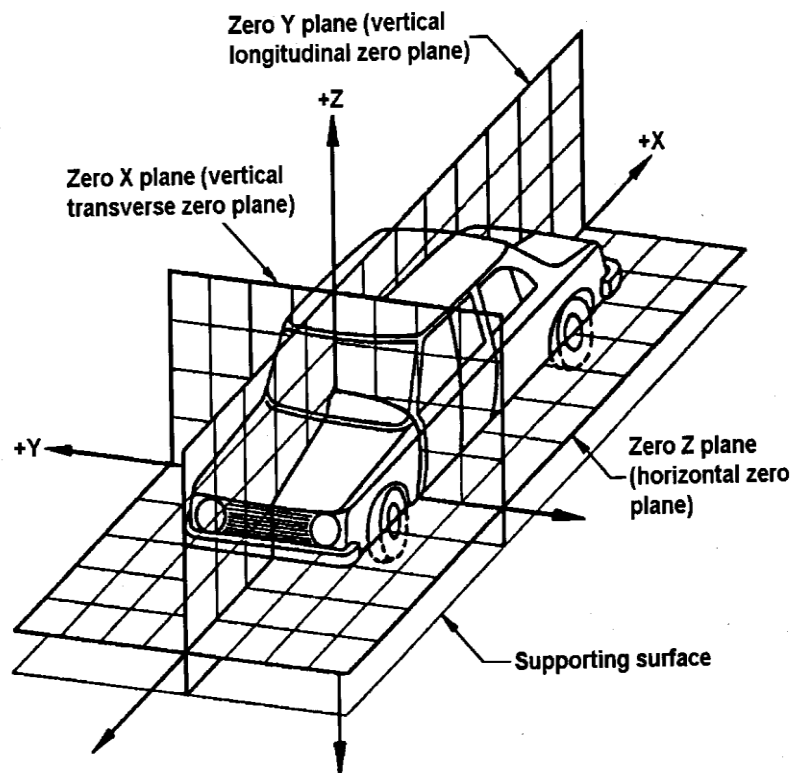
6.0 TRANSITIONAL PROVISIONS:

Administrative provisions on transitional provisions as specified in AIS-000 shall be applicable.

ANNEX 1
(See clause 5.4)

THREE-DIMENSIONAL REFERENCE SYSTEM

1. The three-dimensional reference system is defined by three orthogonal planes established by the vehicle manufacturer (see figure below) *
2. The vehicle measuring attitude is established by positioning the vehicle on the supporting surface such that the coordinates of the fiducial marks correspond to the values indicated by the manufacturer.
3. The coordinates of the “R” point and the “H” point are established in relation to the fiducial marks defined by the vehicle manufacturer.



Figure

Three-dimensional reference system

* The reference system correspondence to ISO standard 4130-1978.

ANNEX 2

(See 4.4)

REFERENCE DATA CONCERNING SEATING POSITIONS

1. Coding of reference data

Reference data are listed consecutively for each seating position. Seating positions are identified by a two-digit code. The first digit is an Arabic numeral and designates the row of seats, counting from the front to the rear of the vehicle. The second digit is a capital letter which designates the location of the seating position in a row, as viewed in the direction of forward motion of the vehicle; the following letters shall be used:

L = left

C = centre

R = right

2. Description of vehicle measuring attitude

2.1 Coordinates of fiducial marks

X.....

Y.....

Z.....

3. List of reference data

3.1 Seating position:

3.1.1 Coordinates of "R" point

X.....

Y.....

Z.....

3.1.2 Design torso angle:

3.1.3 Specifications for seat adjustment *

horizontal:.....

vertical:.....

angular:.....

torso angle:.....

Note: List reference data for further seating positions under 3.2, 3.3, etc.

* Strike out what does not apply.

ANNEX 3

(See 5.0)

ARRANGEMENT OF FOOT CONTROLS

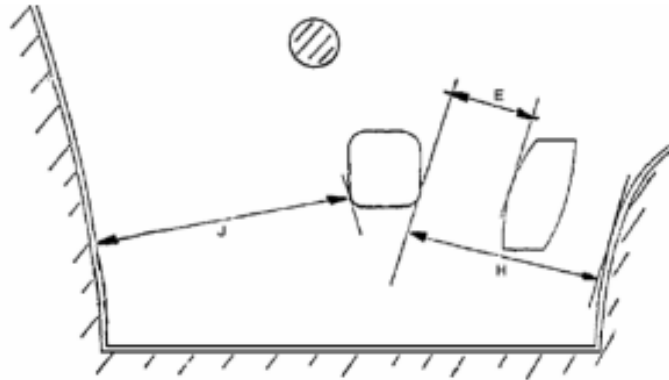
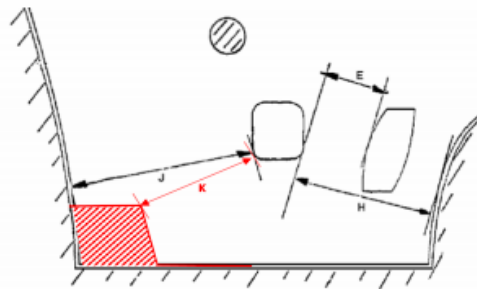


Figure 1a

Two pedals – Automatic transmission without footrest



	<i>max.</i>	<i>min.</i>
E	100	50
H	-	130
J	-	120
K	-	50

Figure 1b

Two pedals – Automatic transmission with footrest

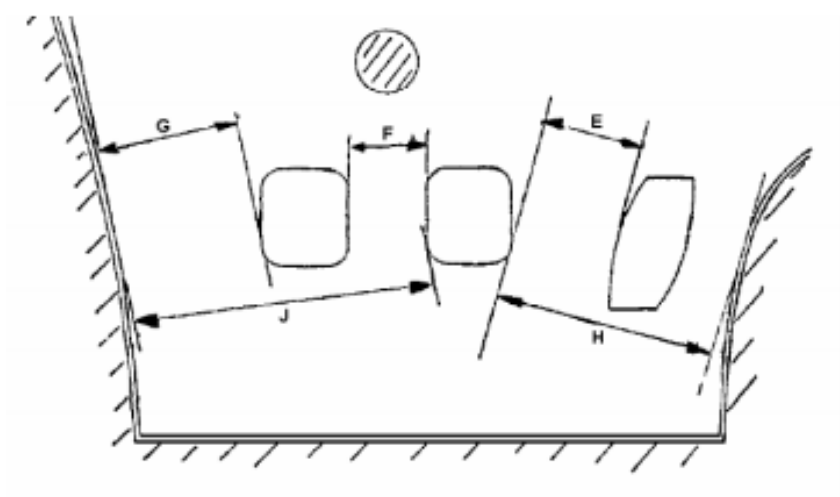


Figure 2a
Three-pedals – Conventional transmission without Footrest

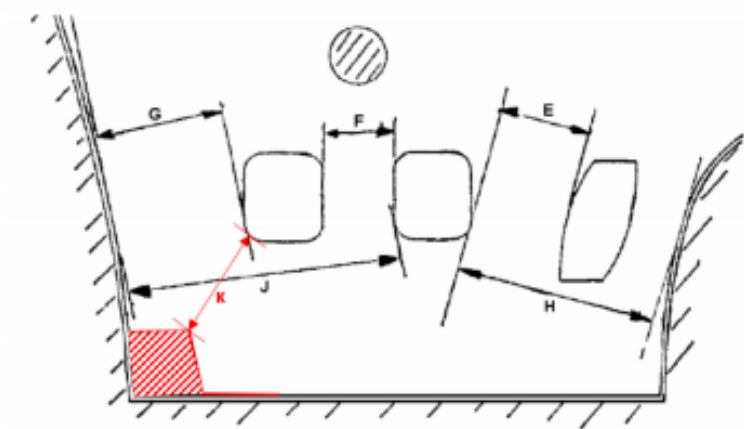


Figure 2b
Three-pedals - Conventional transmission with Footrest

	<i>max.</i>	<i>min.</i>
E	100	50
F	-	50
G	-	50
H	-	130
J	-	160
K	-	50

ANNEX 4
(See introduction)
PANEL COMPOSITION*

Name	
Convener	
Mr. S. Sakthivelan	Mahindra & Mahindra Ltd.
Members	Representing
Mr. A. A. Badusha	The Automotive Research Association of India (ARAI)
Mr. V. P. Rawal	The Automotive Research Association of India (ARAI)
Ms. Vijayanta Ahuja	International Centre for Automotive Technology (ICAT)
Mr. Karan Mahajan	International Centre for Automotive Technology (ICAT)
Mr. V M Dhanasekar	Global Automotive Research Centre (GARC)
Mr. S. Perumal	Global Automotive Research Centre (GARC)
Mr. Mohammed Suhail	Global Automotive Research Centre (GARC)
Mr. N. Muthukumar	SIAM (Ashok Leyland Ltd.)
Mr. Dharmendra Singh	SIAM (BMW Group India)
Mr. Chaitanya Wagh	SIAM (FCA Engineering India Pvt. Ltd.)
Mr. Girish S. Kodolikor	SIAM (Force Motors Ltd.)
Mr. Pankaj Kumar Karn	SIAM (Ford Motor Pvt. Ltd.)
Mr. Praveen Kumar	SIAM (Isuzu Motors India)
Mr. Alauddin Ali	SIAM (Jaguar Land Rover India Ltd.)
Mr. Sudhir Sathe	SIAM (Mahindra & Mahindra Ltd.)
Mr. Shailesh Kulkarni	SIAM (Mahindra & Mahindra Ltd.)
Mr. Arun Kumar	SIAM (Mahindra & Mahindra Ltd.)
Mr. Devinder Tangri	SIAM (Mahindra & Mahindra Ltd.)
Ms. Pushpanjali Pathak	SIAM (Mahindra & Mahindra Ltd.)
Mr. T. Viswanathan	SIAM (Mahindra & Mahindra Ltd.)

Mr. Gururaj Ravi	SIAM (Maruti Suzuki India Ltd.)
Mr. Nitish Seth	SIAM (Maruti Suzuki India Ltd.)
Mr. Nikhil Desai	SIAM (Mercedes Benz India Pvt. Ltd.)
Mr. Rajendra Khile	SIAM (Renault Nissan India Pvt. Ltd.)
Mr. S. Vivekraj	SIAM (Renault Nissan India Pvt. Ltd.)
Mr. Milind K. Jagtap	SIAM (Skoda Auto Volkswagen India Pvt. Ltd.)
Mr. Makarand Brahme	SIAM (Skoda Auto Volkswagen India Pvt. Ltd.)
Mr. P. S. Gowrishankar	SIAM (Tata Motors Ltd.)
Mr. Sharad S. Bhole	SIAM (Tata Motors Ltd.)
Ms. Namrata Deb	SIAM (Tata Motors Ltd.)
Mr. Vijeth Gatty	SIAM (Toyota Kirloskar Motor Pvt. Ltd.)
Mr. Dinesh G. M	SIAM (Toyota Kirloskar Motor Pvt. Ltd.)
Mr. Uday Harite	ACMA (Automotive Components Manufacturers Association of India)

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

ANNEX 5
(See Introduction)
COMMITTEE COMPOSITION *
Automotive Industry Standards Committee

Chairperson	
Dr. Reji Mathai	Director The Automotive Research Association of India, Pune
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 Manufacturers' Association (ICEMA)
Member Secretary	
Shri Vikram Tandon	The Automotive Research Association of India, Pune

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