AMENDMENT NO. 3 (08/2019)

TO

AIS-119 (Rev 1): 2016 Specific Constructional Requirements for Sleeper Coaches

1. Page 2/15, Add New clause No. 4.1.5 after clause No. 4.1.4:

"4.1.5 The minimum height of window aperture for fixed /sliding glass windows shall be 550 mm in lower tier/berth and for upper tier/berth 350 mm (min) excluding the rigid structure"

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

ON BEHALF OF
AUTOMOTIVE INDUSTRY STANDARDS COMMITTEE
UNDER

CENTRAL MOTOR VEHICLES RULES - TECHNICAL STANDING COMMITTEE
SET-UP BY

MINISTRY OF ROAD TRANSPORT & HIGHWAYS

(DEPARTMENT OF ROAD TRANSPORT & HIGHWAYS)
GOVERNMENT OF INDIA

22nd August 2019

AMENDMENT NO. 2 (02/ 2019)

TO

AIS-119 (Rev 1): 2016 Specific Constructional Requirements for Sleeper Coaches

1. Page 2/10, Clause No. 4.1.4

Substitute following text for existing text of clause No. 4.1.4

"4.1.4 The minimum height of lower edge of the sliding part of the window aperture shall be 200 mm from the top of berth in the uncompressed state. In case of fixed glass type windows, rigid structure shall be provided till 200 mm height from the top of berth in the uncompressed condition."

2. Page 3/10, Clause No. 4.4.1.2

Substitute following text for existing text of clause No. 4.4.1.2

"4.4.1.2 Berth layout shall be 1x2 type or 1x1 type for berth orientation along the longitudinal axis of the vehicle. Pictorial illustration is given in Fig.1 of Appendix I. In case of rear engine buses, the lower berth lay out shall ensure that, no berth will be located on top of the engine compartment to avoid safety against fire risk and discomfort from noise and vibration."

3. Page 4/10, Modify clause No. 4.4.4.7

Substitute following text for existing text of clause No. 4.4.4.7

"4.4.4.7 Height of lower berth including uncompressed cushion from the floor shall be 200 - 400 mm."

4. Clause No. 5.2.1

Substitute following text for existing text of clause No. 5.2.1

"5.2.1 Minimum Number of Emergency Exits shall be four. One of them shall be emergency door as per clause 2.2.4.1 and two of them shall be escape hatches as per 2.2.4.16 of AIS-052 (Rev. 1), as amended from time to time. Emergency door with collapsible steps shall be permitted. Remaining emergency exit can be window or door meeting the requirements of clause 2.2.4 of AIS-052 (Rev.1), as amended from time to time.

Location of Emergency door shall be provided at the rear face in line with the gangway of the Bus (at the end of the gangway) or at the middle of the bus in opposite side of the service door or as per clause no. 2.2.4.5.1 of AIS-052 (Rev. 1), as amended from time to time.

In case of rear engine buses, emergency door on rear face shall not be permitted. The location of emergency door shall be on opposite side of the service door and as per one of the options mentioned below:

a) If the service door is located at front half or rear half the emergency door shall be at middle.

Or

b) If the service door is located at front half, then emergency door shall be at rear half of the bus or vice a versa.

5. Page 7/10, Add new clause No. 5.3

"5.3 Fire Detection and Suppression System (FDSS):

All Sleeper coaches shall be fitted with the FDSS meeting the requirements of AIS-135:2016, as amended from time to time, from date of implementation of AIS-153.

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ON BEHALF OF
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UNDER

CENTRAL MOTOR VEHICLES RULES - TECHNICAL STANDING COMMITTEE
SET-UP BY

MINISTRY OF ROAD TRANSPORT & HIGHWAYS

(DEPARTMENT OF ROAD TRANSPORT & HIGHWAYS)
GOVERNMENT OF INDIA

6th February 2019

AMENDMENT NO. 1 28 September, 2016

TO

AIS-119 (Rev 1): 2016 Specific Constructional Requirements for Sleeper Coaches

1. Page 4/15, clause No. 4.4.4.2.5 shall be substituted with following text:

"4.4.4.2.5 Clear distance between uncompressed lower berth and lower face of upper berth shall be 800 mm minimum. In case of ACX (air conditioned) Sleeper Coaches it will be minimum 600 mm near the sidewall and 800 mm at gangway side."

2. Page 7/15, clause No. 5.2.1 shall be substituted with following text:

"5.2.1 Minimum Number of Emergency Exits shall be four. One of them shall be emergency door as per clause 2.2.4.1 and two of them shall be escape hatches as per 2.2.4.16 of AIS-052 (Rev. 1), as amended from time to time. Emergency door with collapsible steps shall be permitted**.** Remaining emergency exit can be window or door meeting the requirements of clause 2.2.4 of AIS-052 (Rev.1), as amended from time to time. Location of Emergency door shall be provided at the rear face in line with the gangway of the Bus (at the end of the gangway) or emergency door shall be provided as per clause no. 2.2.4.5.1 of AIS-052 (Rev. 1), as amended from time to time."

3. Clause Nos. 5.1, 6.1, 7.1, 8.1 and 8.2

Substitute word "DLX" for "DCX"

4. Clause Nos. 4.4.1.2, 4.4.1.3 and 4.4.4.2.2

Substitute "2X1" for "1X2"

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UNDER

CENTRAL MOTOR VEHICLES RULES - TECHNICAL STANDING COMMITTEE
SET-UP BY

MINISTRY OF ROAD TRANSPORT & HIGHWAYS

(DEPARTMENT OF ROAD TRANSPORT & HIGHWAYS)
GOVERNMENT OF INDIA

28 September, 2016

AUTOMOTIVE INDUSTRY STANDARD

Specific Constructional Requirements for Sleeper Coaches

PRINTED BY
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

April 2016

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

Sr. No.	Corrigenda.	Amendment	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 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.

The Code of Practice for Bus Body Design and Approval, i.e. AIS-052 (Rev.1) as amended from time to time has been formulated and published. The testing and approval for body building of buses shall be in accordance with AIS-052 (Rev.1) as amended from time to time, which has been implemented. The AIS-052 (Rev.1) as amended from time to time has provided details about construction of buses suitable for seating and standee passengers. At the same time, there is an urgent need for framing guidelines for the construction of Sleeper Coaches in India, especially for the safety and comfort of sleeping passengers. In absence of a standard on sleeper coaches, presently some of the States are having their own guidelines on this subject. Under the circumstances, the CMVR - Technical Standing Committee at its 16th meeting, decided that suitable guidelines for sleeper coaches be drawn involving all the concerned stakeholders. The CMVR-TSC at its 18th meeting directed to collect available information on sleeper coaches from SIAM and also to go through different state rules available on the subject before finalizing the standard on sleeper coaches. Consequently, the CMVR-TSC at its 19th meeting broadly guided as under:

i) Sleeper coaches would be considered as a special category under Type IV of the Bus Body Code Classification.

ii) CIRT would also explore other options of foldable berth arrangement as existing in railways.

iii) SIAM members would get written comments from their Body builders.

iv) The safety corridors provided in the sleeper coaches should not be utilized for carriage of passengers.

v) Fitment of air-conditioners to be made compulsory for sleeper coaches considering all aspects of safety of passengers during night travel, etc.

vi) CIRT to continue the work and put up the recommendations.

It was discussed and decided in 32nd meeting of AISC to have a separate

standard for Sleeper Coaches in line with that of AIS-063, i.e. Requirements of School Buses. The Bus Body Code - AIS-052 (Rev.1) as amended from time to time is the basic standard and only special requirements would be covered in specific standard for sleeper coaches pertaining to the layout, dimensions, safety requirements, strength requirements and other technical requirements. However, the bus body building meant for sleeping passengers will have to be carried out as per the Bus Body Code, AIS-052 (Rev.1) as amended from time to time along with the CMVR provisions made in the subject standard.

Proposed standard for sleeper coaches was discussed in CMVR-TSC meetings as well as AISC meetings. Suggestions given by CMVR-TSC as well as AISC were discussed in the several panel meetings of the subject standard. Subject standard was drafted to ensure that the maximum benefit is achieved with respect to safety requirements.

AIS-119 was discussed for implementation in 43rd and 44th CMVR-TSC meetings. During the 43rd meeting it was concluded to relook into safety parameters like strength of superstructure, restraint system, berth layout etc. In 44th CMVR-TSC meeting progress was reported and requested panel to allow only longitudinal layout of berths and remove the transverse layout provision from current standard to consider the same in future revisions. Further, suggestions received from SIAM, VMs and Sleeper Coach Manufacturers, Test agencies and Bus Body Builders associations were studied and put up to the special panel meeting held on 13th Feb 2016. Revised standard AIS-119 was put up to the 45th CMVR – TSC meeting along with draft notification. 45th CMVR-TSC concluded to release the standard as Revision 1.

The AISC panel and Automotive Industry Standards Committee (AISC) responsible for preparation of this standard are given in Annexure II and Annexure III respectively.

Specific Constructional Requirements for Sleeper Coaches

Appendix- I

Specific Constructional Requirements of Sleeper Coaches

1.0 SCOPE

The standard lays down the Specific Constructional Requirements for Sleeper Coaches over and above the requirements laid for buses in "AIS-052 (Rev.1), as amended from time to time - Code of Practice for Bus Body Design and Approval". This will apply to vehicles with equivalent seating capacity of 13 passengers and above excluding driver meant for sleeper coach application. These Specific Constructional Requirements are being laid down for the following reasons.

(i) To maximize safety and minimize severity of injuries.
(ii) To take care of specific needs related to sleeping passengers.

1.1 REFERENCES

1.1.1	AIS-052 (Rev.1)	Code of Practice for Bus Body Design & Approval
1.1.2	IS 15061-2002	Automotive Vehicles - Flammability Requirements
1.1.3	AIS-023	Automotive Vehicles - Seats, their Anchorages and Head Restraints for Passenger Vehicles of Categories M2, M3 and Goods Vehicles of Category N – Specifications

2.0 DEFINITIONS

For the purpose of this standard definitions given in AIS-052 (Rev. 1) as amended from time to time, shall be applicable. In addition, the following definitions shall also apply.

2.1 **Sleeper Coach** means vehicles designed and constructed with additional provision/berth for passengers to sleep while travelling.

2.2 **Sleeper Berth** means berth intended to facilitate passengers for sleeping.

2.2.1 **Lower Berth** means sleeper berth which is on the lower side/deck.

2.2.2 **Upper Berth** means sleeper berth which is on the upper side/deck.

2.3 **Restraint System** means a device or system used to prevent occupants of the vehicle falling from berth.

3.0 CATEGORISATION OF SLEEPER COACHES

Sleeper coaches are special purpose buses which are designed and constructed specially to accommodate passengers to sleep, and are placed in category "Type IV" as per clause No. 2.0 of AIS-052 (Rev. 1) as amended from time to time. Sleeper Coaches can be of following configurations:

Special Type as per Bus Code (as per clause. No. 2.0 of AIS-052 (Rev.1) as amended from time to time)	General Type as per Bus Code (as per clause. No. 2.0 of AIS-052 (Rev.1) as amended from time to time)	Type of comfort (as per clause. No. 2.0 of AIS - 052 (Rev.1) as amended from time to time)
Type IV	Type III	DLX (Non Air Conditioned)
		ACX (Air Conditioned)

4.0 GENERAL SAFETY REQUIREMENTS

All the general safety requirements shall be as described and stipulated in Bus Body Code, AIS-052 (Rev.1), as amended from time to time. Besides this the following specific requirements are applicable to Sleeper Coaches.

4.1 Windows

4.1.1 The window panes shall be of sliding type for DLX (non-air conditioned) Sleeper Coaches. In case of ACX (air conditioned) Sleeper Coaches window panes can be sliding type or fixed glass windows.

4.1.2 Separate windows on sides of the bus for upper and lower berths shall be provided. Lower tier and upper tier shall have sliding windows for DLX (non-air conditioned) Sleeper Coaches. ACX (air conditioned) Sleeper Coaches can be fitted with fixed glass windows or separate split type glass windows as above.

4.1.3 The minimum width of window aperture shall be 700 mm (along the longitudinal axis).

4.1.4 The minimum height of lower edge of the sliding part of the window aperture shall be 200 mm from the top of berth in the uncompressed state.

4.2 **Gangways**

The gangways for sleeper coaches shall be designed and constructed as per clause No. 2.2.8 of AIS-052 (Rev. 1) as amended from time to time, applicable for Type III buses with diameter of Lower Cylinder (A) = 450 mm.

4.3 **Hand Rails and Hand Holds**

4.3.1 For sleeper coaches, provision of hand rails and hand holds in passage (gangways) is not applicable.

4.4 **Seats and Berths**

4.4.1 **Layout**

4.4.1.1 Upper tier shall be for the passengers intended to sleep and lower tier (floor tier) shall be for the passengers intended to sleep or sit.

4.4.1.2 Berth layout shall be 1x2 type or 1x1 type for berth orientation along the longitudinal axis of the vehicle. Pictorial illustration is given in Fig.1 of Appendix I.

4.4.1.3 Sleeper as well as seating layout shall be 1x2 type or 1x1 type.

4.4.2 The seating and sleeping passenger capacities shall be indicated in the Type Approval certificate for the bus body.

4.4.3 **Seats**

The seats specification stipulated in Bus Body Code AIS-052 (Rev.1), as amended from time to time, shall be followed. In case of differences between the values specified in Bus Body Code, AIS-052 (Rev.1), as amended from time, to time and that of AIS-023, the values specified in AIS-023, as amended from time to time, shall be considered as final and binding.

4.4.3.1 Seats, if fitted in sleeper coaches, shall be installed facing forward, on the floor.

4.4.3.2 Seats, if fitted in Sleeper Coaches, shall be in accordance with clause No. 2.2.11 of AIS-052 (Rev. 1), as amended form time to time, applicable for ACX (air conditioned) and DLX (non-air conditioned) Type III buses along with the requirements stipulated in this standard.

4.4.3.3 **Seat base height (T)**

In case of sleeper coaches, if lower tier is used for seating and upper tier is used as a Sleeper, the height of the uncompressed seat cushion (T) i.e. the distance from the floor to the horizontal plane tangent to the front upper surface of the seat cushion shall be between 400 ± 50 mm.

4.4.3.4 **Free height over seating position (Head room)**

In case of sleeper coaches free height over seating position (Head Room) shall be 900 mm minimum between uncompressed seat cushion and lower face of upper berth.

4.4.4 **Berths**

4.4.4.1 In sleeper coaches the berth structure shall be welded/bolted or interlocked by suitable means in such a way that during the operation there shall not be any rattling or dislodging of berths. There shall not be any sharp edges causing injury to the occupants.

4.4.4.2 **Dimensions of berth**

Dimensions of the berth and clearances in case of sleeper-coaches shall be as specified below:

4.4.4.2.1 Length of the berth shall be minimum 1800 mm.

4.4.4.2.2 Width of the berth shall be minimum 600 mm for 1x2 layout and 560-750 mm for 1x1 layout.

4.4.4.2.3 The minimum thickness of berth cushion shall be 75 mm.

4.4.4.2.4 Height of lower berth including uncompressed cushion from the floor shall be 200 - 350 mm.

4.4.4.2.5 Clear distance between uncompressed lower berth and lower face of upper berth shall be 800 mm minimum at gangway side for all type of sleeper coaches and 600 mm minimum at side wall for ACX (air conditioned) Sleeper Coaches.

4.4.4.2.6 Clear distance between uncompressed upper berth and inner panel of the roof of the bus shall be minimum 800 mm. In case of ACX (air conditioned) Sleeper Coaches it will be minimum 500 mm near the sidewall and 800 mm at gangway side.

4.4.4.2.7 The berth shall be able to withstand a total load of 300 kg, wherein 100 kg load is applied on the area of 400 mm x 400 mm at three places namely one at center and two at extreme ends. After the test, there shall not be any visual deformation of the berth structure as well as breakage of berth anchorages. Computer simulation can be considered as an optional method for verification.

4.4.4.2.8 Each berth may be provided with a pillow. The pillow may be an integral part of the berth. The pillow shall be made of fire retardant material.

4.5 **Access to Upper Berths**

4.5.1 There shall be provision for the passengers to reach the upper berth with ease from the floor, for which a ladder shall be provided with at least two steps. The height of first step from the floor shall be at a distance of 250 mm to 350 mm and the second step shall be at a distance of $\leq$ 250 mm from the first step.

4.5.2 At least one handhold at suitable height along with ladder shall be provided for easy reach to upper berth. Handhold shall be rounded and free from sharp edges to reduce risk of injury to the occupants of the vehicle.

4.6 **Restraint Systems**

4.6.1 In case of sleeper coaches the restraint system shall be provided for both lower and upper berths to prevent occupants falling from the berth while bus is in motion. Restraint system provided shall cover at least 60% of the length of the berth. The restraint system shall be sufficiently rigid and shall withstand a normal force of at least 100 kgf when applied at the center of the restraint system. Computer simulation of restraints system rigidity can be accepted.

4.6.2 The restraint system shall not have any sharp corners, edges, causing any injury to the occupants.

4.6.3 Few illustrations of restraint system are given for reference as described in Fig. 2 at Appendix I.

4.7 **Cabin Luggage**

4.7.1 For sleeper coaches cabin luggage-keeping arrangement shall be provided under the sleeper berths of lower tier in such a way that, it is prevented from slipping in to the gangways. In case if lower tier is meant for sitting and upper tier meant for sleeping then separate suitable arrangement shall be provided for keeping the cabin luggage.

4.8 **Design Seating and Sleeping Passenger Capacities**

4.8.1 The design berth capacities shall be calculated based on the available floor area and the area required for individual berth.

4.8.2 The design seating capacity shall be calculated based on the available floor area and as per the requirements of individual passenger seat described in clause No. 2.2.11.4 of AIS-052 (Rev. 1) as amended from time to time.

4.9 **Provisions for Differently Abled Passengers**

4.9.1 At least one berth on lower tier nearer to the service door shall be reserved for Differently Abled Passengers.

4.9.2 A call bell shall be provided on the berth which is reserved for Differently Abled Passengers.

4.10 **Pad Material**

4.10.1 The pad materials shall be fire retardant Polyurethane Foam molded or plain.

4.11 **Upholstery**

4.11 .1 The upholstery materials for sleeper coaches shall be fire retardant.

4.12 **Flammability Requirements**

4.12.1 Flammability requirements for the materials used in the construction of Sleeper Coaches such as plywood, pad material, upholstery, curtains, ABS, flooring material, side lining material, etc. shall be as per IS 15061:2002, as amended from time to time.

4.13 **Other Features**

The recommended features for Sleeper Coaches are given in the table below. However, features superior to the ones indicated in this table shall also be permitted.

Feature	Applicability
Head rest	✓*
Seat arm	✓*
Seat back –Reclining	✓*
Magazine pouch	✓
Folding table for food tray	✓*
Water bottle holding fixture	✓
Reading light for each berth	✓
***** Applicable only when seating provided on lower tier	

5.0 TECHNICAL AND SAFETY REQUIREMENTS

5.1 Technical and safety requirements shall be as per Chapter 3 of AIS-052 (Rev.1), as amended from time to time, applicable for ACX (air conditioned) and DCX (non-air conditioned) buses of Type III category in addition to the following specific requirements applicable for Sleeper Coaches.

5.1.1 **Body structure strength**

5.1.1.1 Body structure strength test shall be carried out as per the clause 3.1 of Chapter 3 of AIS-052 (Rev.1), as amended from time to time, by referring to the special provision of survival space applicable for the longitudinal layout sleeper coaches by using the template given at Appendix I Fig. 3. However in case of provision for seating arrangement at lower tier, test condition and procedure shall be as per the clause 3.1 of Chapter 3 of AIS-052 (Rev.1) as amended from time to time.

5.1.2 **Stability Test:**

5.1.2.1 Test procedure shall be as applicable as per Chapter 3 clause. No. 3.2 of AIS-052 (Rev. 1), as amended from time to time. Each sleeper berth/ seat will be loaded with standard passenger weight of 75 kg, applied uniformly, while carrying out stability test.

5.2 **Emergency Exit**

5.2.1 Minimum Number of Emergency Exits shall be four. One of them shall be emergency door as per clause 2.2.4.1 and two of them shall be escape hatches as per 2.2.4.16 of AIS-052 (Rev. 1), as amended from time, to time. Collapsible emergency door shall be permitted.

Remaining emergency exit can be window or door meeting the requirements of clause 2.2.4 of AIS-052 (Rev.1), as amended from time to time.

Location of Emergency door shall be provided at the rear face in line with the gangway of the Bus (at the end of the gangway) or emergency door shall be provided as per clause no. 2.2.4.5.1 of AIS-052 (Rev. 1), as amended from time to time.

6.0 LIGHTING AND ILLUMINATION

6.1 Lighting and illumination requirements shall be as per Chapter 4 of AIS-052 (Rev. 1), as amended from time to time, applicable for ACX (air conditioned) and DCX (non-air conditioned) buses of Type III category, by considering following specific requirements applicable for sleeper coaches.

6.2 **Passenger Compartment Lighting**

6.2.1 Illumination shall be provided for each berth such that illumination level at each berth shall be in accordance with clause 4.1.2.4.1.3.3 of Chapter 4 of AIS-052 (Rev. 1) as amended from time to time, when it is measured at eye level of the occupying passenger i.e. 200 mm above the uncompressed berth surface and 500 mm above the seat base in case of seating passenger, if seats are provided.

7.0 ELECTRICAL EQUIPMENT AND WIRING

7.1 Electrical equipment and wiring requirements shall be as per Chapter 5 of AIS-052 (Rev. 1) as amended from time to time, applicable for ACX (air conditioned) and DCX (non-air conditioned) buses of Type III category.

8.0 TYPE APPROVAL AND COP PROCEDURE

8.1 Type Approval and COP procedure requirements shall be as per Chapter 7 of AIS-052 (Rev.1) as amended from time to time, applicable for ACX (air conditioned) and DCX (non-air conditioned) buses of Type III category.

8.2 Additional information on technical specifications specific to sleeper coaches which is to be furnished by the vehicle manufacturer/bus body builder as per Annexure I of this standard along with Table 22 of AIS-007 Rev. 5, as amended from time to time, applicable for ACX (air conditioned) and DCX (non-air conditioned) buses of Type III category as mentioned in AIS-052 (Rev. 1), as amended from time to time.

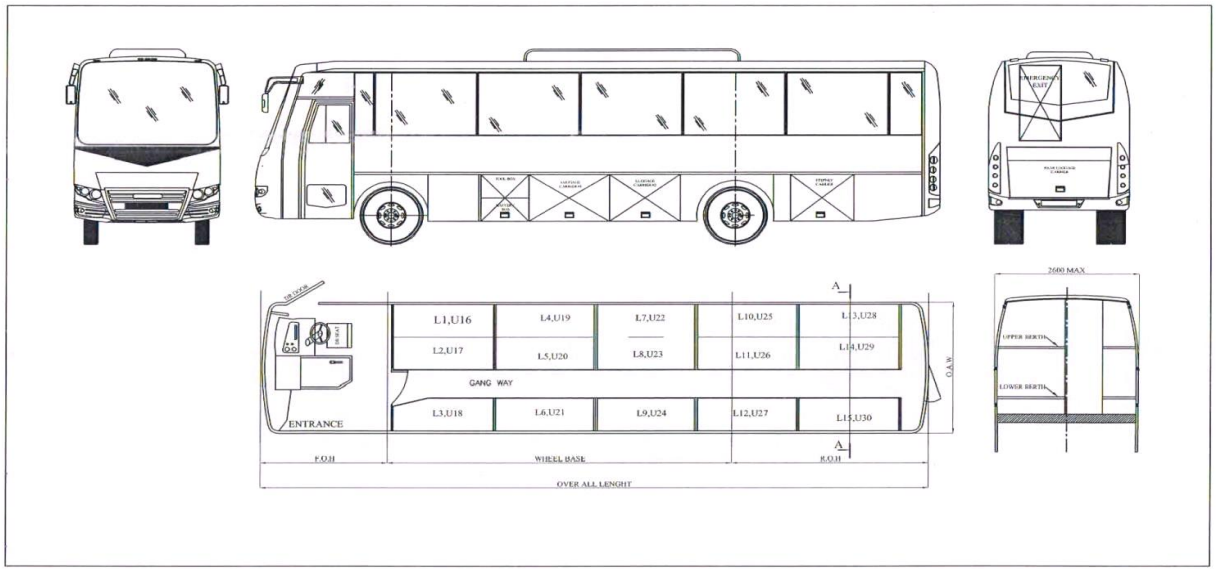
	ANNEXURE I **INFORMATION ON TECHNICAL SPECIFICATIONS SPECIFIC TO SLEEPER COACHES** (See 8.2) (To be submitted by the Vehicle Manufacturer / Body Builder to the Test Agency)	
1.0	**Details of Body**	
1.1	Special Category as per cl. 2.0 of AIS-052 (Rev.1) as amended from time to time	: Type IV
1.2	Basic category as per cl. 2.0 of AIS-052 (Rev.1) as amended from time to time	: Category Type III (Air conditioned (ACX) or Non air conditioned (DLX))
1.3	No. of seats	:
1.4	No. of berths	:
1.5	Berth orientation Along the Longitudinal axis of the Vehicle	:
1.6	Type of Layouts a. All berths b. Combination of berths and seats	:
1.7	Berth layout 1x1 or 1x2	:
1.8	Seat Layout 1x1 or 1x2	:

Test Agency	Vehicle Manufacturer/Body builder	Document No. (indicating also revision status)
Signature	Signature	
Name	Name	
Designation	Designation	
Date	Date	Sheet No. of_

Appendix 1

Fig. 1
Berth/ Seat Layouts

2 X 1 Layout: UPPER AS WELL AS LOWER TIER BERTHS.



2 X 1 Layout: UPPER TIER BERTHS & LOWER TIER SEATS.

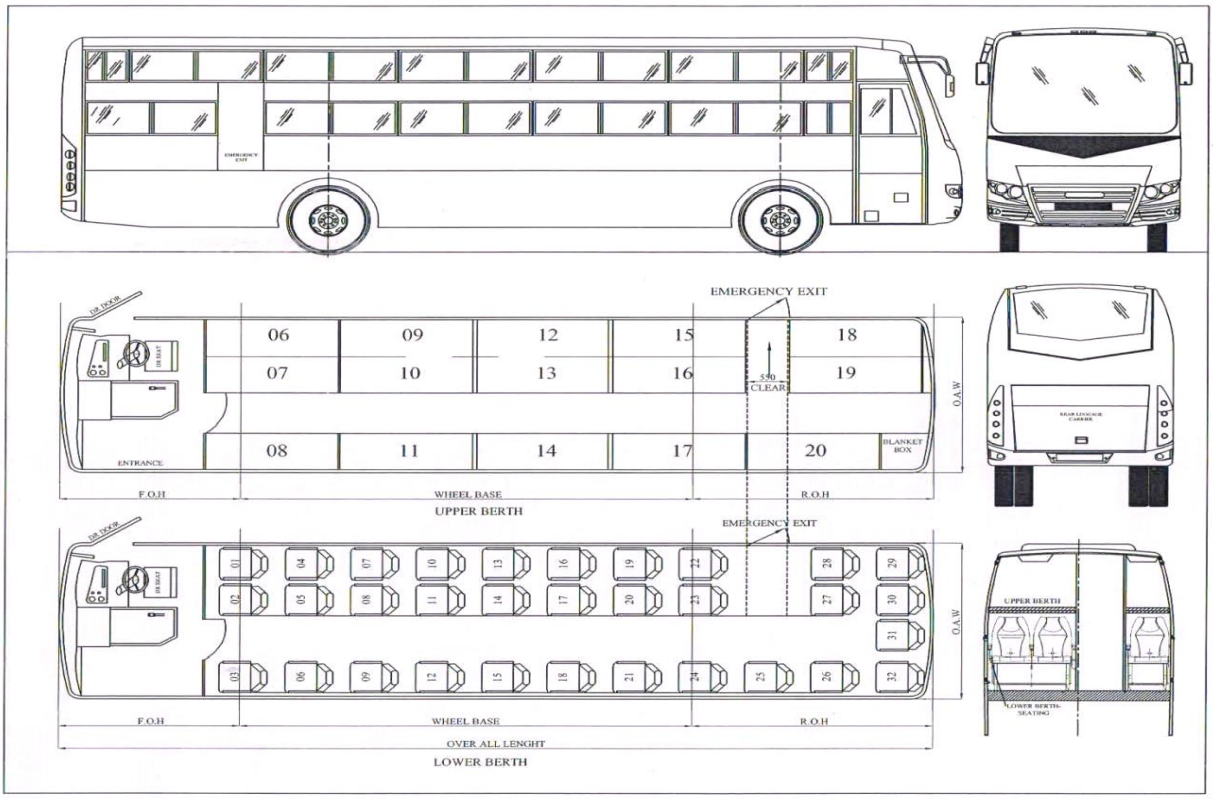


Fig 2:
Pictorial illustrations for Restraint Systems

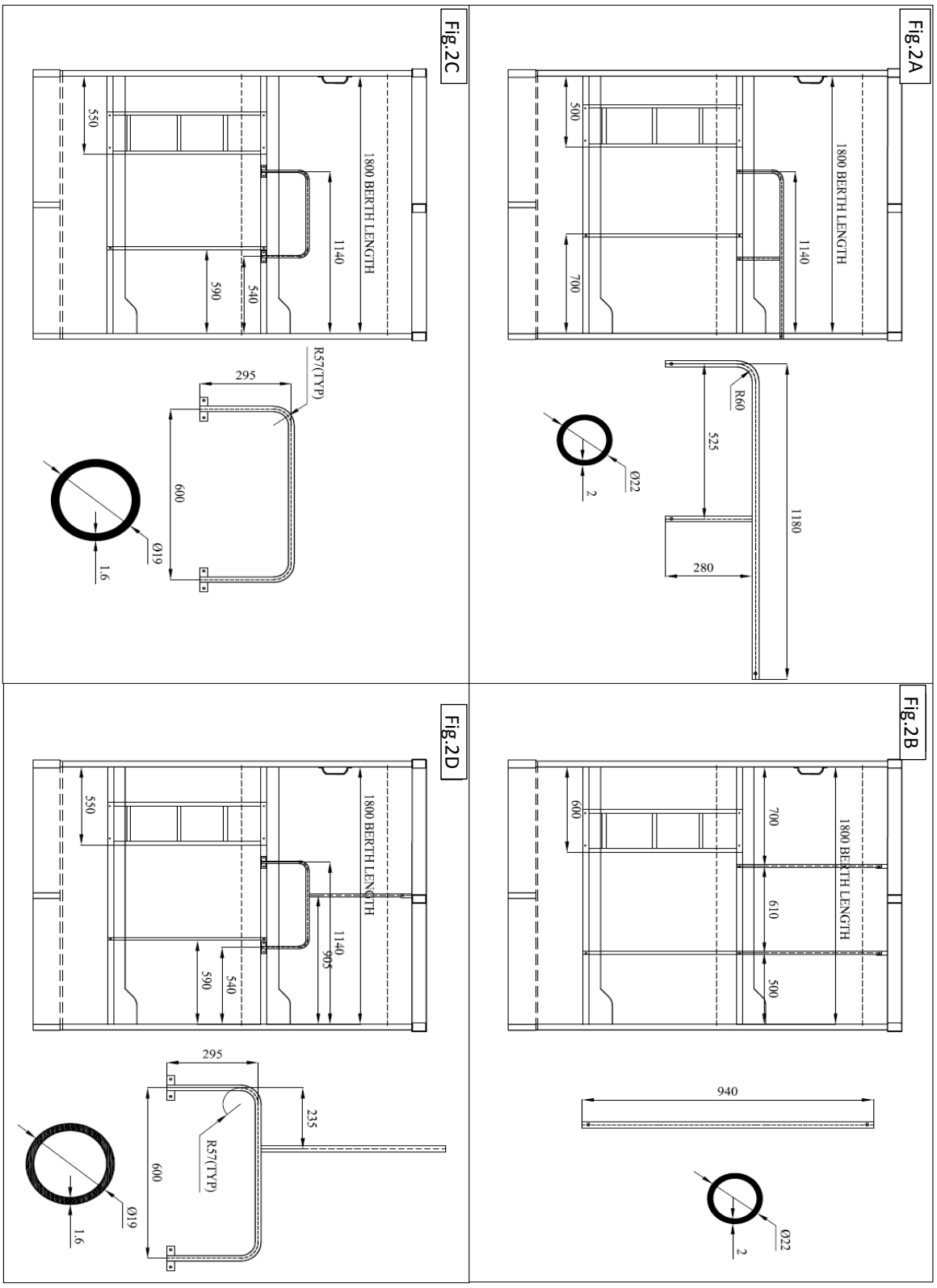
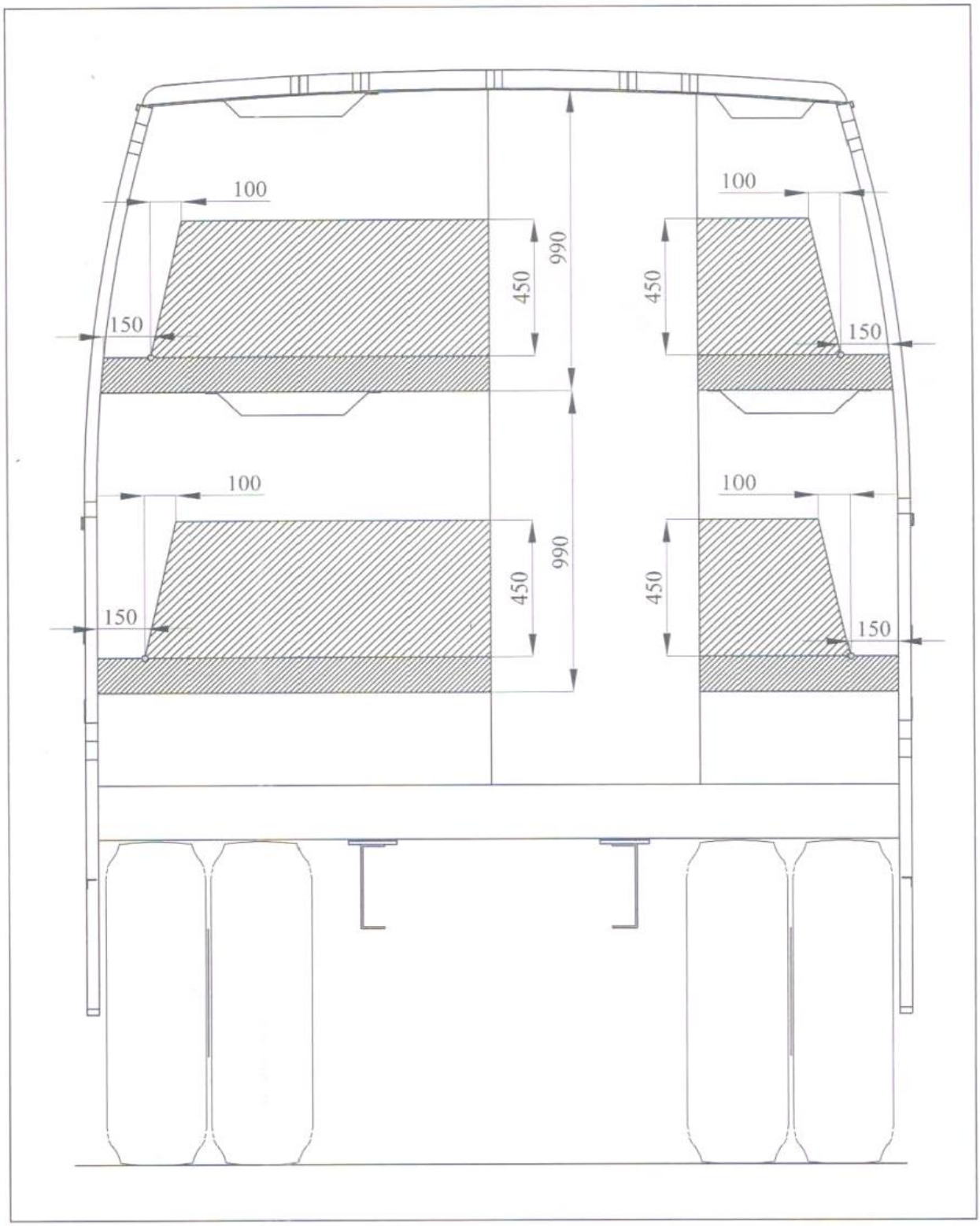


Fig 3:
Survival space template for Longitudinal Layout



ANNEXURE II

Composition of AISC Panel on "Specific Constructional Requirements for Sleeper Coaches"
(At the time of Publication of Revised Standard) *

Convener	
Shri S. N. Dhole	Central Institute of Road Transport (CIRT)
Members	**Representing**
Shri D. P. Saste	Central Institute of Road Transport (CIRT)
Shri A. Akbar Badusha/ Shri V. P. Rawal /Shri K. B. Patil	The Automotive Research Association of India (ARAI)
Shri H N Bhalerao / Shri Ullas babu	Association of State Road Transport Undertakings (ASRTU)
Shri S. A. M. Shaikh	Vehicles Research & Development Establishment (VRDE)
Shri. S. Ravishankar/ Shri V. Faustino	SIAM (Ashok Leyland Ltd.)
Shri K. Naga Raju/ Shri V. G. Kulkarni	SIAM (M & M Ltd , Truck & Bus Division)
Shri Shrikant Joshi/ Shri S. S. Bhole	SIAM (Tata Motors Ltd.)
Shri Girish S. Kodolikar	SIAM (Force Motors Ltd)
Shri Karthik Sarma/ Shri Arun Uchila	SIAM (Volvo Buses India Pvt. Ltd.)
Shri Deepak Vashista/ Shri Sachin Bhat	SIAM (SML Isuzu Ltd.)
Shri Atul Pahade	SIAM (VE Commercial Vehicles Ltd.)
Shri Uday Harite	Automotive Component Manufacturers Association (ACMA)
Shri Z. A. Mujawar	Automotive Consultant (Independent)
Shri Uddhav Kate/ Shri Sunil B.Kolhe	Maharashtra SRTC
Shri M. C. Kelageri/ Shri F. C. Hiremath	Karnataka SRTC, Central office
Shri G. K. Nittali	North West KRTC, Central Office
Shri Shridhar Kalmadi	Corona Bus Manufacturers Pvt. Ltd.
Shri K. Srinivas Reddy / Shri Anudeep Kotte	Veera Vahana Udyog Pvt. Ltd.
Shri K. S. Wilkhu	Indian Association of Bus Manufacturers (IABM)

Shri Prasanna Patwardhan	Maharashtra Rajya Truck, Tempo, Tankers and Bus Vahatuk (MRTTTBV) Mahasangh
Shri Anil Garg/ Shri Deepak Naik/ Shri Ramesh Manien	School Bus Owners Association, Maharashtra
Shri Haresh Tank/ Shri Ashok Kumar Rai	Collaborative Advance Research for Transportation (CART)
Shri Jayant Dixit / Shri G. L. Sharma	Shree Damodar Coach Crafts Pt. Ltd., Goa/ Shree Damodar Coach, Bangalore
Shri V. Radhakrishnan/ Shri A. Martin Raj	S.M. Kannappa Automobiles P Ltd.
Shri P. V. Kamat	M G Automobiles Pvt. Ltd.
Shri Prabhu Salageri	VRL Logistics Ltd.

* At the time of approval of Revision 1 of this Automotive Industry Standard (AIS)

ANNEXURE III
(See Introduction)
COMMITTEE COMPOSITION *
Automotive Industry Standards Committee

Chairperson	
Mrs. Rashmi Urdhwareshe	Director The Automotive Research Association of India, Pune
Members	**Representing**
Representative from	Ministry of Road Transport and Highways (Department of Road Transport and Highways), New Delhi
Representative from	Ministry of Heavy Industries and Public Enterprises (Department of Heavy Industry), New Delhi
Shri S. M. Ahuja	Office of the Development Commissioner, MSME, Ministry of Micro, Small and Medium Enterprises, New Delhi
Shri Shrikant R. Marathe	Former Chairman, AISC
Shri N. K. Sharma	Bureau of Indian Standards, New Delhi
Director/ Shri D. P. Saste (Alternate)	Central Institute of Road Transport, Pune
Director	Indian Institute of Petroleum, Dehra Dun
Director	Vehicles Research and Development Establishment, Ahmednagar
Representatives from	Society of Indian Automobile Manufacturers
Shri T. C. Gopalan	Tractor Manufacturers Association, New Delhi
Shri Uday Harite	Automotive Components Manufacturers Association of India, New Delhi

Member Secretary
Shri A. S. Bhale
General Manager
The Automotive Research Association of India, Pune

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