



National Standard of the People's Republic of China

GB 24407—2025  
Replace GB 24407—2012

---

# Safety technical specifications of special school bus

专用校车安全技术条件

(English Translation)



Issue date 2025 - 12 - 31

Implementation date 2027 - 07 - 01

---

Issued by State Administration for Market Regulation of the People's Republic of China

National Standardization Administration of the People's Republic of China

# Contents

Foreword.....	III
1 Scope.....	1
2 Normative references.....	1
3 Terms and definitions.....	2
4 Classification of special school bus.....	4
5 Technical requirements.....	4
5.1 Appearance identification and main structural dimensions.....	4
5.2 Power performance.....	5
5.3 Mass and maximum number of passengers and crew.....	5
5.4 Steering system.....	5
5.5 Braking system.....	5
5.6 Drive train.....	5
5.7 Driving system.....	6
5.8 Front and rear bumpers.....	6
5.9 Roll stability.....	6
5.10 Body structure and strength.....	6
5.11 Exit, step, access passage and gangway.....	7
5.12 Interior layout.....	14
5.13 Signal system.....	24
5.14 Fire prevention and fire control measures.....	25
5.15 Driver's field of vision.....	28
5.16 Interior air quality.....	28
5.17 Bus travelling data recording and processing system.....	28
5.18 Stopping reminder sign on the rear wall panel.....	29
6 Determination of the same type.....	29
7 Implementation.....	31
Annex A (Normative) Test method for strength of roof structure.....	32
A.1 Test conditions.....	32
A.2 Test process.....	32
Annex B (Normative) Stopping signal plate.....	33
B.1 Installation requirements.....	33

B.2	Technical requirements .....	33
B.3	Control requirements .....	34
Annex C	(Normative) Requirements and test methods for driver's field of vision .....	35
C.1	Vision requirements .....	35
C.2	Test conditions .....	35
C.3	Test method .....	35
Bibliography	.....	38

## Foreword

SAC/TC 114 is in charge of this English translation. In case of any doubt about the contents of English translation, the Chinese original shall be considered authoritative.

This document was drafted in accordance with the rules of the *GB/T 1.1—2020 Directives for standardization—Part 1: Rules for the structure and drafting of standardizing documents*.

This document replaces the GB 24407—2012 *The safety technique specifications of special school buses* in whole. In addition to structural adjustments and editorial changes, the following technical deviations have been made with respect to the GB 24407—2012:

- Modified the definitions of special school bus, special school bus for infants, special school bus for primary students, special school bus for primary and junior middle school students, and passengers and crew (see 3.1, 3.1.1, 3.1.2, 3.1.3 and 3.3 herein, and 3.1, 3.2, 3.3, 3.4 and 3.12 in 2012 version);
- Deleted the terms and definitions of exit, emergency exit, emergency door, emergency window, escape hatch and "front" and "rear" (see 3.6, 3.7, 3.8, 3.9, 3.10 and 3.11 in 2012 version);
- Added the term and definition of "mass of the vehicle in running order" (see 3.4 herein);
- Modified the requirements for the appearance identification of special school bus (see 5.1.1 herein, and 5.1.1 in 2012 version);
- Modified the requirements for the height of special school bus (see 5.1.4 herein, and 5.1.4 in 2012 version);
- Modified the requirements for the mass of attendant (see 5.3.1 herein, and 5.3.1 in 2012 version);
- Modified the requirements for special school bus equipped with disc brake (see 5.5.2 herein, and 5.5.2 in 2012 version);
- Added the requirements for advanced emergency braking system (AEBS) (see 5.5.4 herein);
- Modified the requirements for the speed limitation system (see 5.6.1 herein, and 5.6.1 in 2012 version);
- Modified the requirements for tire emergency safety device (TESD) (see 5.7.3 herein, and 5.7.3 in 2012 version);
- Modified the exemption conditions for the roof structural strength test on the clear height at the footrest floor of seated passenger at rear seat (see 5.10.2 b) herein,

- and 5.10.2 b) in 2012 version);
- Modified the requirements for dimensions of service door (see 5.11.1.1.1 herein, and 5.10.4.1.1.1 in 2012 version);
  - Modified the requirements for the position of escape hatch (see 5.11.1.1.3 herein, and 5.10.4.1.1.3 in 2012 version);
  - Added the requirements for setting emergency switch on power-operated service door (see 5.11.1.3.5 herein);
  - Modified the technical requirements for retractable step (see 5.11.2.2 herein, and 5.10.4.2.2 in 2012 version);
  - Added the requirement that the attendant seat shall be equipped with a two-point seat-belt when it is arranged laterally (see 5.12.1.2.3 herein);
  - Added the requirements for side-facing attendant seat and its anchorages (see 5.12.1.2.4 herein);
  - Modified the types and requirements of the seat-belt for primary and junior middle school students, and primary students (see 5.12.1.3.3 herein, and 5.10.5.1.3.3 in 2012 version);
  - Modified the requirements for infant and student seat backrest (see 5.12.1.3.5 herein, and 5.10.5.1.3.5 in 2012 version);
  - Modified the requirements for seat spacing of primary students (see 5.12.1.4.1 herein, and 5.10.5.1.4.1 in 2012 version);
  - Modified the condition that the height of upward free space at the footrest floor for seated passengers can be reduced (see 5.12.1.4.3 herein, and 5.10.5.1.4.3 in 2012 version);
  - Modified the requirements for restraining barrier in front of seats and the distance between the lower edge of special school bus for infants and the floor (see 5.12.2.2 herein, 5.10.5.2.2 in 2012 version);
  - Modified the requirements for service door handrail (see 5.12.3 herein, and 5.10.5.3 in 2012 version);
  - Modified the requirements for First-Aid Kit and its general symbols (see 5.12.5 herein, 5.10.5.5 in 2012 version);
  - Modified the requirements for the stopping signal plate (see 5.13.1 herein, and 5.11.1

- in 2012 version);
- Modified the installation requirements for warning sound device for vehicle reversing (see 5.13.3 herein, and 5.11.3 in 2012 version);
  - Modified the requirements for the master power switch (see 5.14.2.2 herein, and 5.12.2.3 in 2012 version);
  - Modified the requirements for flame retardancy of interior materials (see 5.14.6.1 herein, and 5.12.6.1 in 2012 version);
  - Modified the requirements for fire extinguishing equipment (see 5.14.6.2 herein, and 5.12.6.2 in 2012 version);
  - Modified the requirements for interior air quality (see 5.16 herein, and 5.14 in 2012 version);
  - Added the determination of the same type (see Chapter 6 herein);
  - Added the requirements for signal lights on the stopping signal plate (see B.2.6 herein);
  - Added the test conditions for determining the eye point position of the driver's field of vision (see C.2.1 herein).

Attention is drawn to the possibility that some of the elements of this document may be the subject of the patent rights. The issuing body of this document shall not be held responsible for identifying any or all such patent rights.

This document was proposed and prepared by the Ministry of Industry and Information Technology of the People's Republic of China.

The document was first issued in 2009 as GB 24407—2009, and was revised in 2012. This is the second revision.

# Safety technical specifications of special school bus

## 1 Scope

This document specifies the classification, technical requirements and determination of the same type for special school bus.

This document applies to special school bus.

## 2 Normative references

The contents in the following documents constitute essential clauses of this document through normative references. Among them, for dated references, only the version corresponding to the date is applicable to this document; For undated references, the latest version (including all amendments) is applicable to this document.

GB 5768.2—2022, *Road traffic signs and markings – Part 2: Road traffic signs*

GB 8410—2006, *Flammability of automotive interior materials*

GB/T 12428, *Laden mass calculating method for bus*

GB 12676—2014, *Technical requirements and testing methods for commercial vehicle and trailer braking systems*

GB 13057, *Strength of seats and their anchorages of passenger vehicles*

GB 13094, *Safety requirements for bus construction*

GB/T 13594, *Performance requirements and test methods of anti-lock braking system for commercial vehicle and trailer*

GB 13954—2009, *Warning lamps for police cars, fire engines, ambulances and engineering rescue vehicles*

GB 14166, *Safety-belts and restraint systems for occupants of power-driven vehicles*

GB 14167, *Safety-belt anchorages and restraint systems anchorages for occupants of power-driven vehicles*

GB/T 14172, *Bench test methods of static roll stability for motor vehicles, trailers and combination vehicles*

GB 15083, *Strength requirement and test method of automobile seats, their anchorages and any head restraints*

GB 15084, *Motor vehicles—Devices for indirect vision—Requirements of performance and installation*

GB 17578, *Requirements and test methods of strength for the superstructure of bus*

GB/T 17729, *Hygienic standard and detect methods for the air quality inside interurban bus*

GB/T 18833—2012, *Retroreflective sheeting for traffic control*

GB/T 19056, *Vehicle travelling data recorder*

GB 24315, *The marker for school bus*

GB 24406, *Strength of student seat and their anchorages of special school bus*

GB 24545, *Requirements and test methods of speed limitation system for motor vehicles*

GB 30678, *Safety signs and information symbols for the use of bus*

GB 34655, *Specifications for extinguishing equipment arrangement in bus*

GB/T 38186, *Performance requirements and test methods for advanced emergency braking system (AEBS) of commercial vehicles*

GB 38262, *Flammability of interior materials for buses*

GB/T 38796, *Performance requirements and test methods of automobile blow-out emergency safety device*

GB/T 44038, *Requirements and testing methods of warning sound for vehicle reversing*

### **3 Terms and definitions**

For the purposes of this document, the terms and definitions given in GB/T 12428, GB 13094 and the following apply.

#### **3.1**

##### **special school bus**

special bus for picking up and dropping off preschool infants over 3 years old or students in compulsory education stage in batches.



[SOURCE: GB/T 3730.1—2022, 5.6.1]

### 3.1.1

#### **special school bus for infants**

special school bus for picking up and dropping off preschool infants over 3 years old.

### 3.1.2

#### **special school bus for primary students**

special school bus for picking up and dropping off primary students.

### 3.1.3

#### **special school bus for primary and junior middle school students**

special school bus for picking up and dropping off the students in the nine-year compulsory education stage (primary and junior middle school students).

## 3.2

#### **stopping signal plate**

plate used to warn other vehicles not to overtake a school bus which is parked and waiting for students to get on or off.

## 3.3

#### **passengers and crew**

general term for passengers, drivers and attendants on the special school bus.

[SOURCE: GB/T 12428—2023, 3.1, modified]

## 3.4

#### **mass of the vehicle in running order**

the mass of the special school bus in operational state without carrying passengers and luggage.

NOTE: It includes the curb mass of the whole vehicle, the mass of driver and attendant.

[SOURCE: GB 13094—2025, 3.20, modified]

## 4 Classification of special school bus

Table 1 shows the classification of special school bus according to vehicle structure and purpose.

**Table 1 – Classification and basic characteristics of special school bus**

Structure type	Purpose	Basic characteristics
Light special school bus	Special school bus for infants	Vehicle length greater than 5 m and less than or equal to 6 m
	Special school bus for primary students	
	Special school bus for primary and junior middle school students	
Large and medium-sized special school bus	Special school bus for infants	Vehicle length greater than 6 m and less than or equal to 12 m
	Special school bus for primary students	
	Special school bus for primary and junior middle school students	

## 5 Technical requirements

### 5.1 Appearance identification and main structural dimensions

**5.1.1** The appearance identification of special school bus shall comply with GB 24315, and it is allowed not to spray the school bus number when leaving the factory.

**5.1.2** The front of a special school bus shall be provided with a collision safety structure. In the case of front transverse engine, the centerline of the engine crankshaft shall be located in front of the foremost point of windscreen; in the case of front longitudinal engine, the centerline of the 1<sup>st</sup> and 2<sup>nd</sup> cylinders of the engine shall be located in front of the foremost point of windscreen. If the front collision performance is superior to above structures, there is no engine arrangement limitation in large and medium-sized special school bus.

NOTE: The centerline of the 1<sup>st</sup> and 2<sup>nd</sup> cylinders of the engine refers to the centerline of the center distance between the 1<sup>st</sup> and 2<sup>nd</sup> cylinders of the engine.

**5.1.3** Special school bus shall not be articulated bus or double-deck bus.

**5.1.4** The height of special school bus shall not be greater than 3.5 m.

**5.1.5** If there is a side luggage compartment, the distance from the top of the luggage compartment to the ground shall be less than 1.0 m.

**5.1.6** Special school bus shall not be equipped with external luggage rack.

**5.1.7** There shall be no holes inside and outside the bus which easily cause infants and primary students' finger stuck , and there shall be no defects that may cause personal injury such as protrusions, dents, sharp corners, etc.

## **5.2 Power performance**

The specific power of the special school bus shall not be less than 9.0 kW/t.

NOTE: The specific power means the ratio of the maximum net power of the engine (or 0.9 times of the engine's rated power or 0.9 times of the engine's nominal power) to the maximum authorized total mass of the special school bus.

## **5.3 Mass and maximum number of passengers and crew**

**5.3.1** The mass of each infant on the special school bus for infants is calculated as 30 kg, the mass of each student on the special school bus for primary students is calculated as 48 kg, the mass of each student on the special school bus for primary and junior middle school students is calculated as 53 kg, the mass of each attendant is calculated as 69 kg, and the mass of the driver is calculated as 75 kg.

**5.3.2** The maximum number of passengers and crew on special school bus for infants shall not exceed 45, the maximum number of passengers and crew on other special school bus shall not exceed 56.

## **5.4 Steering system**

Special school bus shall be equipped with power assisted steering equipment.

## **5.5 Braking system**

**5.5.1** Special school bus shall be equipped with anti-lock brake system(ABS) complying with GB/T 13594.

**5.5.2** All wheels of the special school bus shall be equipped with disc brakes.

**5.5.3** Special school bus with a length greater than 8 m shall be equipped with retarder or other auxiliary braking device, and the performance of the auxiliary braking device shall meet the requirements of Type IIA test specified in GB 12676—2014.

**5.5.4** Special school bus equipped with advanced emergency braking system (AEBS) shall comply with GB/T 38186.

## **5.6 Drive train**

**5.6.1** Special school bus shall be equipped with a speed limitation system that complies with GB 24545, and the maximum speed limited at the completion of their manufacturing processes shall not exceed 80 km/h.

**5.6.2** The drive shaft shall be equipped with protective devices to prevent danger caused by faults such as detachment or breakage of its sliding connection (spline or other similar devices).

## **5.7 Driving system**

**5.7.1** Special school bus shall be equipped with tubeless radial tires.

**5.7.2** For special school bus with a total mass greater than 4,500 kg, double tires shall be installed on the rear wheels.

**5.7.3** The steered wheels shall be equipped with tire emergency safety device complying with GB/T 38796.

## **5.8 Front and rear bumpers**

**5.8.1** Special school bus shall be equipped with front and rear bumpers.

**5.8.2** The bumper shall be attached to the frame or body frame. The front bumper extends forward to the front of the radiator grille, headlights and hood, and extends outward to the outer edge of the wheel housing; the rear bumper shall wrap around the rear corner of the vehicle body.

## **5.9 Roll stability**

According to the method specified in GB/T 14172, each seat shall be loaded according to the passengers and crew mass specified in 5.3.1 (if there is a luggage compartment, the luggage compartment shall not be loaded), and the load shall be firmly fixed on the seat, the measured stable roll angle shall not be less than 32°. When the bus is unladen, the measured stable roll angle shall not be less than 35°.

## **5.10 Body structure and strength**

### **5.10.1 Body structure**

**5.10.1.1** Large and medium-sized special school bus shall be of body frame structure; The top beam, pillar and main cross member of body understructure in the same cross section shall form a closed loop (except at the location of wheel housing and roof hatch); The body pillar from the upper longitudinal beam of side window to the bottom cross member shall adopt an integral structure and shall not be connected by tailor welding in the middle. If the light special school bus body structure does not adopt the above structure, a structure in which the cover panel and reinforcing beams are jointly supported shall be adopted.

**5.10.1.2** The passenger compartment of the special school bus for infants shall adopt a flat floor structure. There shall be no steps on the floor except for local structural protrusions such as wheel housings and access covers.

**5.10.1.3** Floor coverings in the seating areas, aisle areas and access passage areas shall be non-slip and wear-resistant.

## **5.10.2 Strength of roof structure**

Special school bus shall be tested according to Annex A and meet the following requirements:

a) During the test, the vehicle body structure shall be able to withstand the specified load, and the door shall not be opened, and the vehicle body shall not be detached from the body understructure;

b) From the beginning to the end of the test, there shall be a clear height which is equal or greater than 900 mm above each seat cushion (measured upward from the plane that the highest point of the undepressed seat cushion is located); there shall be a clear height which is equal or greater than 1,350 mm upward from the footrest floor for seated passengers (there shall be a clear height equal or greater than 1,200 mm upward from the floor for wheel housings, rear seats and special school bus with total mass less than or equal to 3,500 kg and number of seats less than or equal to 12); the clear height of the gangway for light special school bus shall be equal or greater than 1,440 mm, and that for large and medium-sized special school bus shall be equal or greater than 1,670 mm.

c) From the beginning to the end of the test, the service door, emergency door and emergency window shall be opened easily, and the escape hatch located on the roof shall be opened easily after testing.

## **5.10.3 Superstructure strength**

The passengers and crew mass on each seat is specified in 5.3.1. Loading and testing are carried out according to the provisions of GB 17578. The survival space of passengers and crew during and after rollover test shall comply with the provisions of GB 17578.

## **5.11 Exit, step, access passage and gangway**

### **5.11.1 Exit**

#### **5.11.1.1 Type, location, quantity and size of exits**

**5.11.1.1.1** Special school bus shall be equipped with only one service door and be located between the front and rear wheels on the right side. The size of the service door shall comply with GB 13094.

**5.11.1.1.2** There shall be at least one exit on each of the left and right sides of the vehicle. There shall be at least one exit each in the front and rear halves of the passenger compartment. The rear wall shall have at least one exit.

**5.11.1.1.3** The type, location and minimum number of emergency exits shall comply with the provisions listed in Table 2. If there is an escape hatch on the roof, it shall be located within the middle of the vehicle (the length of this range is equal to 1/2 of the vehicle length); if there are two escape hatches, the distance between their adjacent sides (measured parallel to the longitudinal axis of the vehicle) shall be at least 2 m. Emergency doors and windows shall not be located above the outlet of the exhaust pipe, and emergency windows shall not be located above the stopping signal plate. The minimum dimensions of emergency doors, emergency windows and escape hatches shall comply with GB 13094.

**Table 2 – Type, minimum number and location of emergency exits**

Vehicle length $L/m$	Basic emergency exits	Additional emergency exits corresponding to basic emergency exits
$L < 6$	"Emergency door of rear wall", or "Emergency door on the left side + emergency window on the rear wall"	1 left emergency window + 1 right emergency window
$6 \leq L < 9$	"Emergency door of rear wall", or "Emergency door on the left side + emergency window on the rear wall"	1 left emergency window + 1 right emergency window + 1 roof escape hatch
$9 \leq L \leq 12$	"Emergency door of rear wall", or "Emergency door on the left side + emergency window on the rear wall"	2 left emergency windows + 2 right emergency windows + 2 roof escape hatches

#### **5.11.1.2 Structure of side window**

The structure of the window in the passenger compartment of special school bus shall be such that from the bottom, the window is closed at least by 1/2 in the height direction. All window glasses shall have a visible light transmittance of not less than 50%, and shall be free from opaque tinted or thermally insulated paper with any specular reflective material.

#### **5.11.1.3 Technical requirements for exits**

**5.11.1.3.1** The emergency door on the rear wall of the vehicle shall be hinged at the side and open outward.

**5.11.1.3.2** Service doors and emergency doors shall be equipped with glass windows, which shall be safety glass.

**5.11.1.3.3** When the height of service doors and emergency doors is less than

1,700 mm, crash pads with a width of not less than 75 mm, a thickness of not less than 20 mm and a Shore hardness of not more than 50 HA shall be installed within the entire width range on the inner side of the top of the door opening.

**5.11.1.3.4** The locking device of the emergency exits shall be able to unlock and open manually from inside and outside the vehicle, and the unlocking force and opening force shall not exceed 178 N.

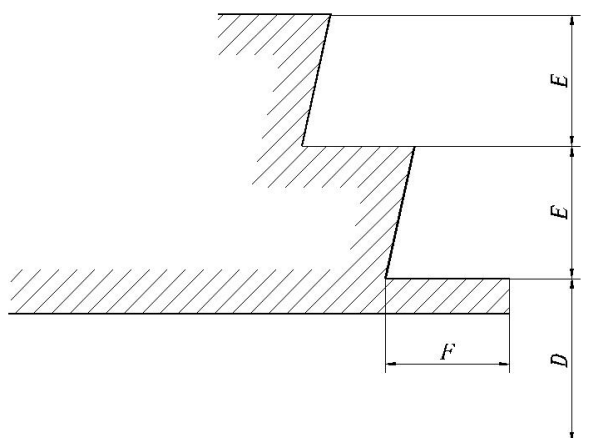
**5.11.1.3.5** If a power-operated service door is used, a service door emergency switch shall be installed in an easily operable position near the driver seat.

**5.11.1.3.6** Other technical requirements for exits shall comply with the relevant provisions of GB 13094.

## **5.11.2 Steps**

### **5.11.2.1 Service door steps**

When the vehicle is unladen, the height ( $D$ ) of the first step of service door to the ground shall not be greater than 350 mm, and retractable steps are allowed to meet the requirements. The height ( $E$ ) of other steps shall not be greater than 250 mm. The first step depth ( $F$ ) shall not be less than 230 mm for light special school bus, and 300 mm for large and medium-sized special school buses, as shown in Figure 1. Other requirements for steps shall comply with GB 13094.



**Figure 1 service door step dimensions**

### **5.11.2.2 Technical requirements for retractable steps**

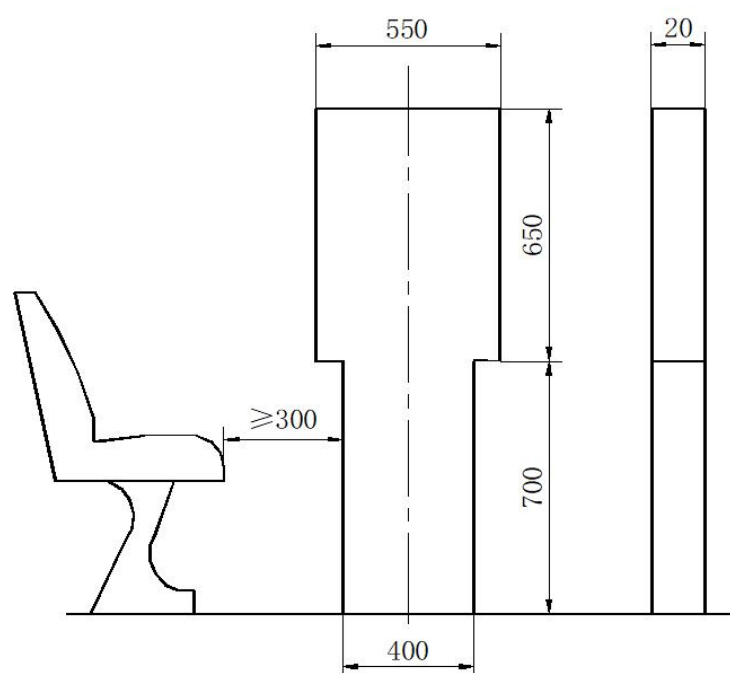
The technical requirements for retractable steps shall comply with GB 13094.

## **5.11.3 Access passage**

### **5.11.3.1 Service door access passage**

**5.11.3.1.1** The extension space from the service door to the inside of the vehicle shall allow a vertical plate 1 (see Figure 2) with a thickness of 20 mm to pass freely. When the vertical plate 1 is in the starting position, the plate surface near the inner side of the vehicle shall be tangent to the outermost edge of the door opening. The plate surface shall be kept perpendicular to the passenger access direction when moving, and its moving direction shall be consistent with the passenger access direction.

Dimensions in millimeters

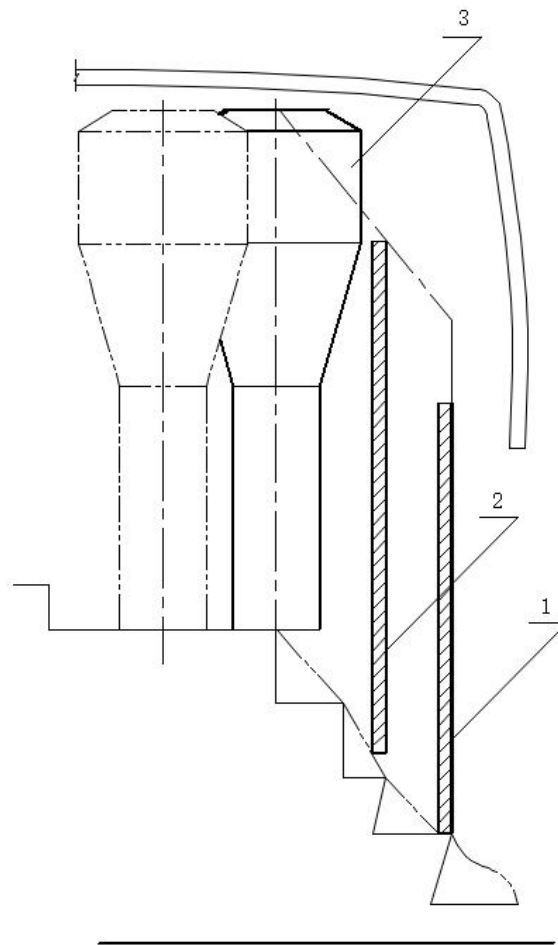


**Figure 2 service door access passage and vertical plate 1**

**5.11.3.1.2** When the center line of the vertical plate 1 moves 300 mm from the starting position, keep the bottom of the plate in contact with the step surface and maintain it in this position.

**5.11.3.1.3** The cylinder used to check the gangway space (see Figure 5 and Table 3) moves from the gangway in the direction of movement of passengers leaving the vehicle until its centerline reaches the vertical plane where the outer edge of the uppermost step is located or the upper cylinder contacts the vertical plate 1 and keeps in this position (see Figure 3).





Key  
 1—Vertical plate 1;  
 2—Vertical plate 2;  
 3—Gangway measuring device

**Figure 3 service door access passage**

**5.11.3.1.4** Vertical plate 2 shall be allowed to pass freely between the cylinder at the position described in 5.11.3.1.3 and vertical plate 1 at the position described in 5.11.3.1.2 (see Figure 3). The vertical flat plate 2 shall have the same shape and dimensions as the central section of the cylinder described in 5.11.4.1, and its thickness shall not be greater than 20 mm. The vertical plate 2 moves from a position tangent to the cylinder to its outer plate surface contacting the vertical plate 1, and its bottom contacts the plane formed by the outer edge of the step, and the moving direction is consistent with the passenger access direction.

**5.11.3.1.5** The clear space freely passed by the above measuring device shall not include the space from the floor to the highest point of the seat cushion within 300 mm in front of the uncompressed seat cushion of the forward-facing seat.

**5.11.3.1.6** 5.11.3.1.1 to 5.11.3.1.5 are not applicable to special school bus equipped with only one step for the service door.

**5.11.3.1.7** If the attendant's folding seats meet the following requirements, it is allowed to measure in their folded position:

- a) Clearly mark on the vehicle that this seat is for attendant only;
- b) The seat shall be able to fold automatically when not in use, so as to meet the requirements of 5.11.3.1.1 to 5.11.3.1.5;
- c) Regardless of whether the seat is in use or folded, no part of it shall be located in front of the vertical plane where the line connecting the center of the upper surface of the seat cushion of the driver seat (when in the rearmost position) and the center of the right rearview mirror outside the bus is located.

**5.11.3.1.8** The gradient of the floor at the access passage shall not exceed 5% when the vehicle is at its mass in running order and the kneeling system is inactive.

### 5.11.3.2 Emergency door access passage

**5.11.3.2.1** The free space between the gangway and the emergency door shall allow the stacked cylinders (see Figure 4) to pass freely.

Dimensions in millimeters

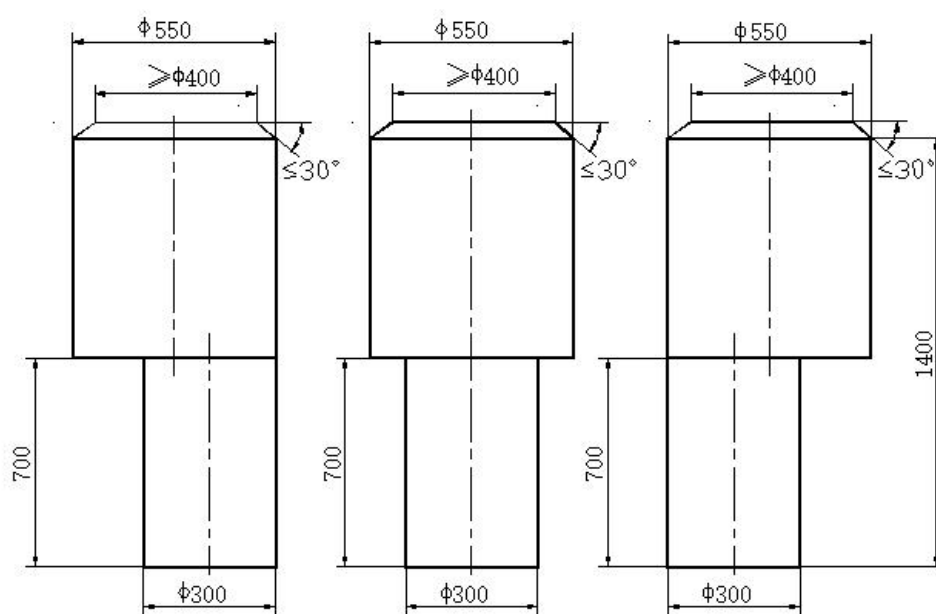


Figure 4 emergency door access passage measuring device

**5.11.3.2.2** The bottom of the lower cylinder shall be within the projection of the upper cylinder, and the two cylinders may be moved relatively to each other.

**5.11.3.2.3** Where a folding seat is provided along the side of an access passage, the free space through which the stacked cylinders pass shall be measured when the seat is opened. If the seat can be automatically folded when not in use, it is allowed to measure in its folded position.

**5.11.3.2.4** It is allowed to replace the stacked cylinders with the cylinder specified in 5.11.4.1 (see Figure 5).

### **5.11.3.3 Passability of emergency window**

**5.11.3.3.1** Each emergency window shall enable the test device which meets the requirements in 5.11.3.3.3 to be moved from the gangway through the emergency window to the outside of the vehicle freely.

**5.11.3.3.2** The motion direction of the test device shall be consistent with the direction in which passengers are withdrawn from the vehicle, and its front face (maximum end face) shall remain perpendicular to the direction of motion.

**5.11.3.3.3** The test device shall be a thin plate with a size of 600 mm × 400 mm and a fillet radius of 200 mm. However, if the emergency window is at the rear wall of the bus, the test device size of 1,400 mm × 350 mm and the fillet radius of 175 mm are allowed.

### **5.11.3.4 Passability of escape hatch**

The passability of escape hatches for large and medium-sized special school bus shall comply with GB 13094.

## **5.11.4 Gangway**

**5.11.4.1** For light special school bus, the gangway shall allow Type I gangway measuring device to pass freely; for large and medium-sized special school bus with a length of less than 8 m, the gangway shall allow Type II gangway measuring device to pass freely; for large and medium-sized special school bus with a length greater than or equal to 8 m, the gangway shall allow Type III gangway measuring device to pass freely (see Figure 5 and Table 3 for gangway measuring device).

Dimensions in millimeters

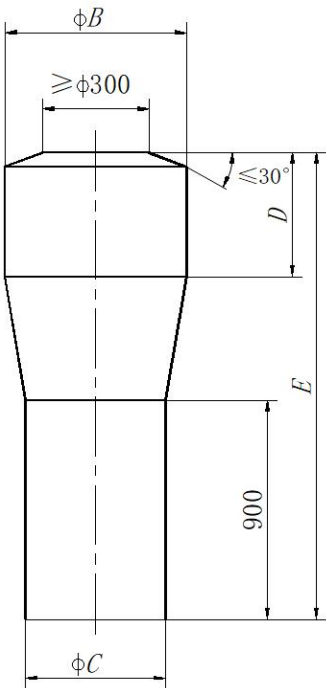


Figure 5 gangway measuring device

Table 3 – Gangway measuring device dimensions

Item	Dimensions in millimeters		
	Type I gangway measuring device	Type II gangway measuring device	Type III gangway measuring device
Lower cylinder diameter ( $\phi$ )	300	300	350
Upper cylinder diameter ( $\phi$ )	450	450	550
Upper cylinder height ( $D$ )	300	300	300
Total height ( $E$ )	1,500	1,800	1,800

5.11.4.2 There shall be no steps in the gangway, the gangway shall be non-slip, and the cover plate in the gangway shall not be more than 8 mm above the surface of the gangway

5.11.4.3 When the bus is at the mass of the bus in running order and the kneeling system is inactive, the longitudinal gradient of the gangway shall not be greater than 8% and the transverse gradient (on the plane perpendicular to the longitudinal axis of the bus) shall not be greater than 5%.

5.12 Interior layout

5.12.1 Seat

**5.12.1.1 Driver seat**

**5.12.1.1.1** The driver seat shall be equipped with a three-point seat-belt, and the seat-belt and its anchorages shall comply with GB 14166 and GB 14167.

**5.12.1.1.2** The strength of the driver seat and its anchorages shall comply with GB 15083.

**5.12.1.2 Attendant seat**

**5.12.1.2.1** Special school bus shall be equipped with at least one attendant seat. When the number of infant seats on the special school bus for infants is greater than or equal to 20 and less than 40, two or three attendant seats shall be installed; when the number is greater than or equal to 40, three or four attendant seats shall be installed. When the number of student seats on the special school bus for primary students and special school bus for primary and junior middle school students is greater than or equal to 40, two attendant seats shall be installed. When there is only one attendant seat, the attendant seat shall be located at the front of the bus gangway and close to the service door; when there is more than one attendant seat, at least one attendant seat shall be close to the emergency door.

**5.12.1.2.2** The attendant seat shall be marked.

**5.12.1.2.3** The attendant seat shall be equipped with a seat-belt; in the case of lateral arrangement, it's a two-point seat-belt. The seat-belt and its anchorages shall comply with GB 14166 and GB 14167.

**5.12.1.2.4** The strength of the facing forward attendant seat and its anchorages shall comply with GB 13057. The strength of the side-facing attendant seat and its anchorages shall comply with GB 15083.

**5.12.1.3 Infant and student seats**

**5.12.1.3.1** Infant and student seats shall be arranged facing forward. The infant and student seats shall not use folding seats. Infant and student seats shall not be set in front of the transverse vertical plane where point R of the driver seat is located. Infant and student seats are arranged in a maximum of "2+3" layout laterally on the bus.

**5.12.1.3.2** The strength of infant and student seats and their anchorages shall comply with GB 24406.

**5.12.1.3.3** Each infant and student seat shall be equipped with a seat-belt that complies with GB 14166. Infant seat shall be equipped with a two-point seat-belt, primary and junior middle school student seat and primary student seat shall be equipped with a two-point or three-point seat-belt. If equipped with a three-point seat-belt, a flexible shoulder height adjuster that complies with

GB 14166 shall be equipped.

**5.12.1.3.4** The seat cushion width of single infant and student seat shall not be less than 380 mm. If it is a long bench for infants or students, it shall comply with Table 4.

**Table 4 – Dimensions of each infant and student seat for bench seats**

Dimensions in millimeters

Items	Special school bus for infants	Special school bus for primary students	Special school bus for primary and junior middle school students
Seat cushion width per person	≥330	≥350	≥380
Seat cushion depth	≥300	≥350	≥350
Seat cushion height <sup>a</sup>	220~300	280~380	300~450
Backrest thickness	≥40	≥40	≥40
Backrest height	600~710	710~860	710~860
<sup>a</sup> Exceptions are allowed for the height of seat cushion at wheel housings due to structural constraints, but it shall not be less than 50% of the lower limit and not more than 30% of the upper limit. If it is greater than 450 mm, a foot step shall be provided.			

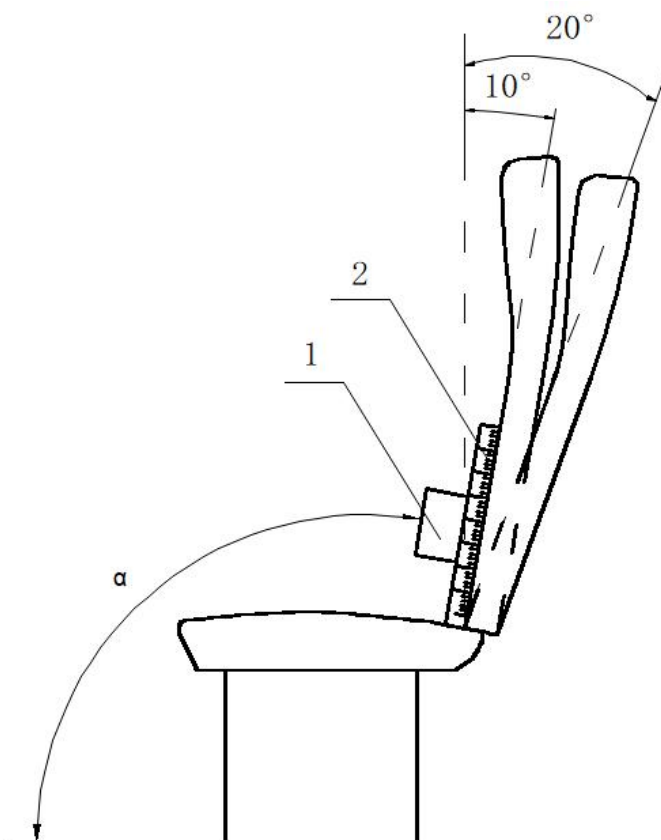
**5.12.1.3.5** Each infant and student seat shall be equipped with a backrest. The height and thickness of the backrest shall comply with Table 4. The width of the backrest shall not be less than that of the seat cushion. The projection area of the part between the upper plane of the seat cushion and the horizontal plane 510 mm above the seat cushion in the transverse vertical plane of the bus body shall not be less than the value calculated by Formula (1). The seat backrest angle shall be 10° to 20° and non-adjustable (compared to the angle of vertical plane; backrest angle is  $\alpha - 90^\circ$ , where  $\alpha$  is the measuring angle). See Figure 6 for the measurement method.

$$S=0.9 \times 510 \times W \qquad \dots\dots\dots (1)$$

where

S is limit of projected area, in square millimeter (mm<sup>2</sup>);

W is seat cushion width, in millimeter (mm); .



Key  
 1—Angle gauge;  
 2—300 mm ruler.

**Figure 6 seat backrest angle measurement method**

**5.12.1.3.6** Armrests parallel to the seat cushion surface shall be provided on the side of the gangway for infant and student seats near the gangway. The armrest is 150 mm to 230 mm away from the upper plane of the seat cushion. The strength of the armrest shall meet the actual use and shall make it easy for infants and students to grasp, and the surface of each armrest shall be non-slip. There shall be no hard objects such as armrests behind the backrests of infant and student seats.

**5.12.1.3.7** Special school bus seats and their armrests shall be softened, and the Shore hardness of the softened material shall not be greater than 50 HA.

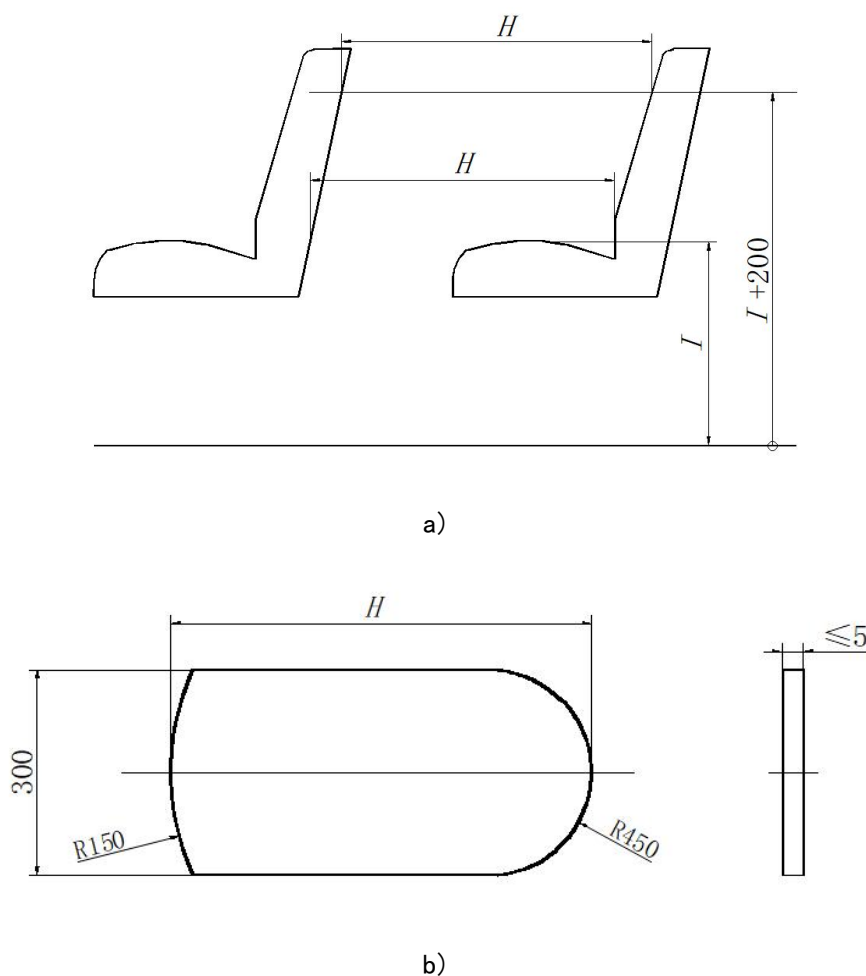
#### **5.12.1.4 Passenger seating space**

##### **5.12.1.4.1 Seat spacing**

The seat spacing is the distance (H) between the front of the seat backrest and the rear of the front seat backrest, measured horizontally within a height range of 200 mm above the horizontal plane where the highest point on the upper surface of the seat cushion is located, as shown in Figure 7a). The seat spacing for

special school bus shall not be less than: 500 mm for infants, 600 mm for primary students, 650 mm for primary and junior middle school students and attendants. The seat spacing is measured in a vertical plane passing through the center line of the (single) seat, and neither the seat cushion nor the backrest is depressed. When measuring, it shall be at the design reference position specified by the manufacturer. The seat spacing shall be checked with an inspection device with a thickness of no more than 5 mm as specified in Figure 7 b).

Dimensions in millimeters



Key

$I$ —Height of the highest point on the upper surface of the undepressed seat cushion;

$H$ —Seat spacing.

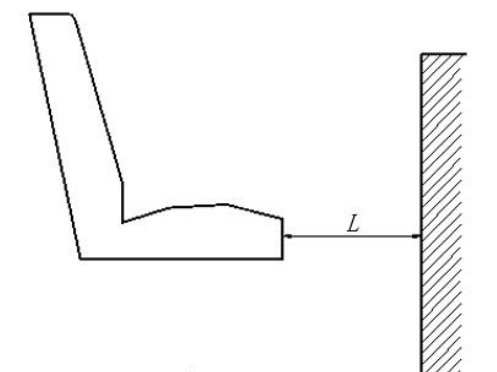
**Figure 7 measurement method for seat spacing**

#### 5.12.1.4.2 Space in front of passenger seats

The front space of passenger seats, specifically the horizontal distance ( $L$ ) between the front edge of the passenger seat cushion located behind partitions or other non-seat rigid structures and the obstacle in front is shown in Figure 8. Its minimum value shall be:



- a) 220 mm for infants;
- b) 250 mm for primary students;
- c) 280 mm for primary and junior middle school students.



**Figure 8 free space in front of seated passengers**

#### **5.12.1.4.3 Free space above the seat**

There shall be a vertical free space above each seat, which shall meet the following requirements:

a) Not less than 900 mm above the plane where the highest point of the undepressed seat cushion is located, and not less than 1,350 mm above the floor where seated passengers rest their feet (see Figure 9). For wheel housing, rear seat and special school bus with a total mass of less than or equal to 3,500 kg and a seat number of less than or equal to 12, it may be reduced to 1,250 mm.

b) The space includes all horizontal areas as follows:

1) Horizontal area: between two longitudinal vertical planes on both sides of the seat center vertical plane: 165 mm each side of special school bus for infants, 175 mm each side for primary students, 190 mm each side for primary and junior middle school students and 200 mm each side for attendant seats (see Figure 9 and Figure 10);

2) Longitudinal area: between two transverse vertical planes: one plane at the rearmost point of the upper part of the seat backrest and the other plane 200 mm (special school bus for infants and primary students) and 280 mm (special school bus for primary and junior middle school students and attendant seats) forward from the front edge of the uncompressed seat cushion.

c) This space is allowed to exclude the following areas:

1) The area above the window seat adjacent to the side wall with a cross section shaped as an inverted right-angled triangle. The vertex of the triangle is located

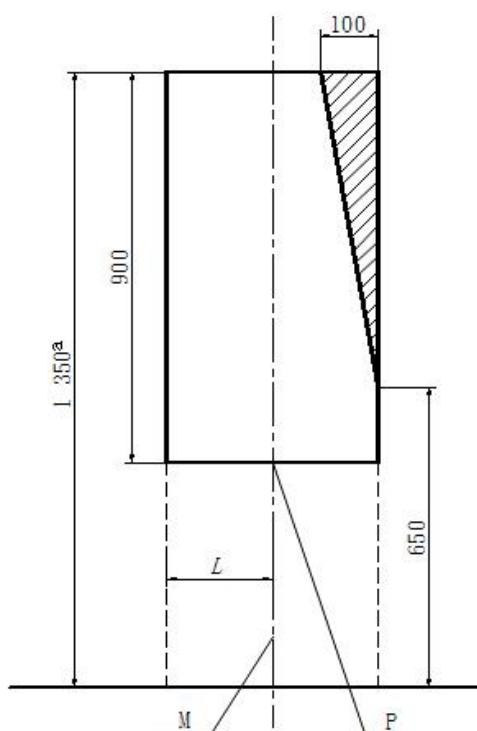
650 mm above the floor, and the base of the triangle is 100 mm wide (see Figure 9);

2) A rectangular area above the window seat adjacent to the side wall with a cross section 150 mm high and 100 mm wide (see Figure 10);

3) The area of the window seat leg adjacent to the side wall, with a cross-sectional area not exceeding  $3 \times 10^4 \text{ mm}^2$  and a maximum width not exceeding 150 mm (see Figure 10).

d) This clear space allows the intrusion of another seat backrest and restraining barrier.

Dimensions in millimeters



Seat type	$L$
Seat of special school bus for infants	165
Seat of special school bus for primary students	175
Seat of special school bus for primary and junior middle school students	190
Attendant seat	200

Key

$L$ —The distance between the vertical plane of the seat center and the longitudinal vertical planes on both sides;

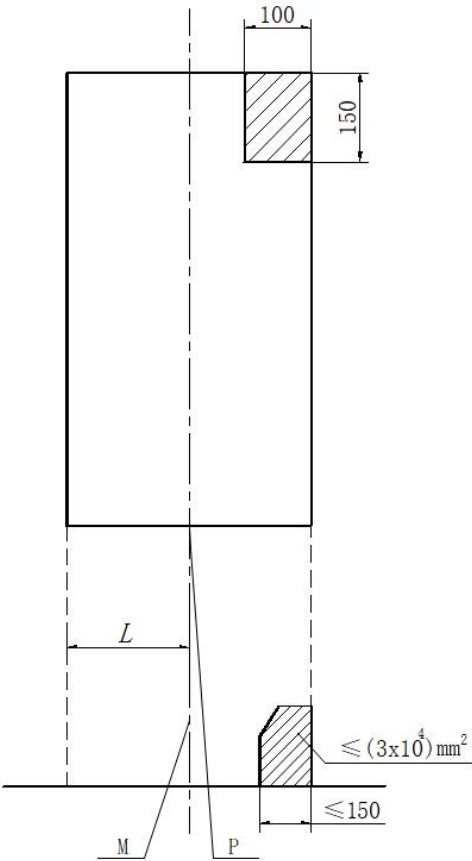
P—The plane where the highest point of the undepressed seat cushion is located;

M—Centerline of outboard seat.

<sup>a</sup> For wheel housings and rear seats, it may be reduced to 1,250 mm.

Figure 9 free space above seat

Dimensions in millimeters



Seat type	<i>L</i>
Seat of special school bus for infants	165
Seat of special school bus for primary students	175
Seat of special school bus for primary and junior middle school students	190
Attendant seat	200

Key

*L*—The distance between the vertical plane of the seat center and the longitudinal vertical planes on both sides;

P—The plane where the highest point of the undepressed seat cushion is located;

M—Centerline of outboard seat.

Figure 10 permissible intrusion into outboard seat space

5.12.2 Restraining barrier in front of seat

**5.12.2.1** When there is no rear surface of another seat within a certain distance (710 mm for seats on the special school bus for infants and seats on the special school bus for primary students, 800 mm for seats on the special school bus for primary and junior middle school students, and 850 mm for attendant seats) forward from point G of the seat along the longitudinal horizontal direction, a restraining barrier shall be installed in front of the seat. The restraining barrier shall be coated with softened materials with a thickness of not less than 20 mm and a Shore hardness of not more than 50 HA. This requirement does not apply to attendant seats located in the step area or located at the rear end of the gangway and facing the gangway.

**5.12.2.2** The effective protective height of the restraining barrier shall not be less than the height of the rear seat. The lower edge of the restraining barrier for special school bus for infants shall not be greater than 5 mm from the floor, and the lower edge of the restraining barrier for special school bus for primary students and special school bus for primary and junior middle school students shall not be more than 200 mm from the floor to avoid getting their feet stuck. The width of the restraining barrier shall not be less than the corresponding width of the seat backrest behind it.

**5.12.2.3** After the test is carried out according to the method specified in GB 24406, the restraining barrier shall meet the following requirements:

- a) The deformation of it shall not affect normal opening and closing of the door;
- b) Any installation point and anchorage of it shall not be disengaged;
- c) No part of it shall be separated.

### **5.12.3 Service door handrail**

High and low handrails shall be installed at service doors of the special school bus. The high handrail shall comply with GB 13094, and the low handrail shall comply with Figure 11 and both shall meet the following requirements:

- a) In the vertical direction: it is between 600 mm and 800 mm above the ground or each step (excluding retractable steps);
- b) In the horizontal direction:
  - 1) For passengers on the ground: it is not more than 250 mm inward from the first step (excluding retractable steps);
  - 2) For passengers on any step (excluding retractable steps): it is not more than 450 mm inward from the outer edge of the step.

Dimensions in millimeters

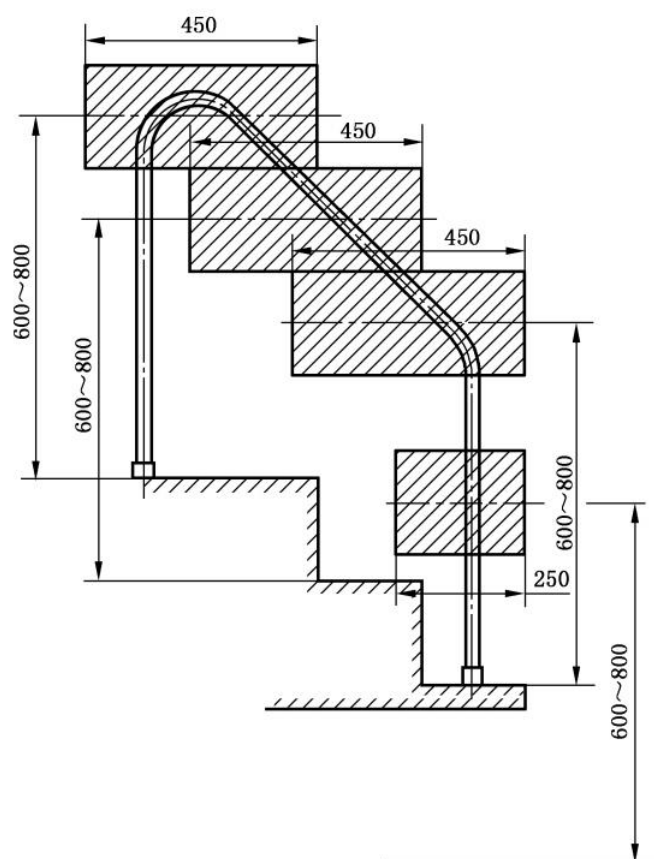


Figure 11 low handrail position

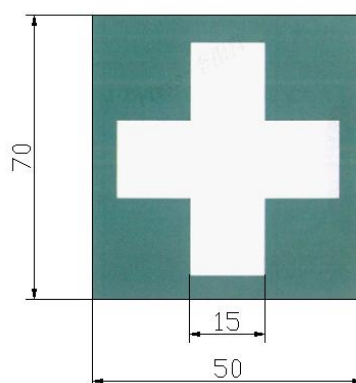
#### 5.12.4 Removable cover plate on the floor

If a removable cover plate (such as an access cover for maintenance) is provided on the floor, but it is not used as a floor exit of an escape hatch, it shall be installed and fastened. It can only be moved or opened with tools or keys. The lifting or closing device shall not protrude more than 8 mm above the floor plane (this requirement may not be met if it is located in a position not used by passengers), and the protruding edges shall have rounded corner transitions.

#### 5.12.5 First-Aid Kit and installation space

At least one First-Aid Kit shall be provided in the special school bus. The dimensions of the First-Aid Kit shall not be less than 240 mm × 200 mm × 200 mm, and its installation position shall be clearly marked with "First-Aid Kit" or a general symbol. The general symbol is a square with a "+" in the center, the background color is green, and "+" is white. It shall comply with GB 30678. The specific style and size are shown in Figure 12. The First-Aid Kit mounting bracket shall ensure that the First-Aid Kit is securely mounted and easily accessible to the attendant or driver.

Dimensions in millimeters



**Figure 12 First-Aid Kit identification**

### **5.12.6 Interior lighting**

**5.12.6.1** The interior lighting shall cover the following areas:

- The whole passenger compartment and attendant areas;
- All steps;
- Access passages to all exits and areas near service doors;
- Internal signs and internal controllers for all exits.

**5.12.6.2** There shall be at least two interior lighting lines, and when one line fails, it shall not affect the other lighting line. Lines for normal lighting at the entrance and exit may be used as one of them.

**5.12.6.3** Protective measures shall be taken to prevent the driver from being affected by interior lighting and reflected light.

### **5.12.7 Interior trims**

The interior trims shall be firmly fixed on the bus, and there shall be no sharp corners, sharp edges or burrs on the parts that are easily accessible to passengers and crew on the bus.

## **5.13 Signal system**

### **5.13.1 Stopping signal plate**

Special school bus shall be equipped with a stopping signal plate according to the provisions of Annex B. When picking up and dropping off students, the stopping signal plate shall extend out to remind rear vehicles to stop and wait. The

protruding part from the bus width after the stopping signal plate is retracted or extended shall not be included in the bus width, but the protruding mounting surface shall not exceed 110 mm when it is retracted. If a red signal light is installed on the stopping signal plate, it shall not flash.

### **5.13.2 Special school bus marker lights**

#### **5.13.2.1 Installation position and quantity**

Special school bus shall be equipped with 2 yellow special school bus marker lights at the front and rear of the top respectively. The distance between the front marker light and the outermost edge of the front part of the roof shall not exceed 400 mm. The distance between the rear marker light and the outermost edge of the rear part of the roof shall not exceed 400 mm. The left and right marker lights shall be as close as possible to the outer edges of the left or right sides of the bus body and symmetrical with the longitudinal centerline of the bus. The marker lights for special school bus shall not be 200 mm higher than the upper surface of the roof skin after installation.

#### **5.13.2.2 Technical requirements**

**5.13.2.2.1** The light shall have a circular transparent shade and illuminate 360° around its vertical axis.

**5.13.2.2.2** The luminous intensity shall meet the requirements for secondary luminous intensity specified in 5.7 of GB 13954—2009.

**5.13.2.2.3** Appearance, light sources, electrical performance, chromaticity characteristics, flashing characteristics, power supply adaptability, waterproof properties, dustproof properties, high temperature resistance, low temperature resistance, salt spray corrosion resistance, collision resistance, vibration resistance, mechanical strength, surface hardness and artificial accelerated aging resistance shall meet the requirements of GB 13954—2009.

#### **5.13.2.3 Control**

The special school bus marker light shall be controlled by the driver. When it is turned on, it shall alert the driver acoustically or visually to indicate that the light is in working state.

### **5.13.3 Warning sound device for vehicle reversing**

Special school bus shall be equipped with a warning sound device for vehicle reversing complying with GB/T 44038.

## **5.14 Fire prevention and fire control measures**

### **5.14.1 Fuel tank and fuel supply system**

The fuel tank and fuel supply system shall comply with GB 13094.

## **5.14.2 Electrical equipment and wires**

### **5.14.2.1 Emergency switch**

**5.14.2.1.1** An emergency switch shall be installed near the driver seat so that the driver can operate it on his seat. A protective cover or other means shall be used to avoid misoperation, and the operating procedures shall be clearly marked at the emergency switch. Such as "Remove the cover and turn on the switch only when the bus is stopped completely".

**5.14.2.1.2** After the emergency switch is activated, the following functions shall be realized at the same time:

- a) The engine stops working quickly;
- b) The cooling fan of the heater can be turned off with a delay;
- c) The control system for opening and closing the service door can work normally;
- d) The interior emergency lighting (some compartment lights and service door step lights) are activated;
- e) The bus hazard warning signal is turned on;
- f) The electromagnetic master power switch is cut off. If there is no electromagnetic master power switch, all circuits shall be cut off except for the functions meeting the above requirements in a) to e).

**5.14.2.1.3** The functions specified in 5.14.2.1.1 are allowed to be completed through independent operations, but they shall not affect the realization of the emergency switch function.

### **5.14.2.2 Master power switch**

Special school bus shall be equipped with master power switches, and the special school bus with a length greater than or equal to 6 m shall be equipped with electromagnetic master power switches. However, if all power supply lines are equipped with fuses at the storage battery end, or the bus electrical equipment is directly driven by the electronic control unit and the load monitoring function is provided, and the power supply lines of the electronic control unit and individual direct power supply lines are equipped with fuses, it is not necessary to provide the electromagnetic master power switch. Special school bus with a length greater than or equal to 6 m shall be equipped with a manual mechanical power-off switch that can cut off the circuit connected to the battery, except



for the connection circuits of automatic fire extinguishing devices, automatic glass breakers, emergency lighting systems, alarm and monitoring systems.

#### **5.14.2.3 Other requirements**

Other technical requirements for electrical equipment and wires shall comply with GB 13094.

#### **5.14.3 Eddy current retarder**

If an eddy current retarder is installed, thermal insulation materials shall be installed between the eddy current retarder and other parts of the bus. The combustion characteristics of the thermal insulation materials used, fixing clips for connecting the thermal insulation materials, washers, etc. shall meet the Class A requirements specified in GB 8410—2006; a temperature alarm system or automatic fire extinguishing device shall be mounted at the installation area.

#### **5.14.4 Exhaust System**

There shall be no combustible materials within 100 mm around the exhaust system unless it is effectively shielded. The exhaust system shall not be arranged underneath the fuel oil system and shall be suitably shielded from the fuel oil system. The exhaust tailpipe shall not extend from under the refueling port.

#### **5.14.5 Engine compartment**

##### **5.14.5.1 Engine compartment oil circuit**

The preventive measures such as setting oil drain holes shall be taken to avoid the accumulation of fuel, lubricating oil or other flammable substances in the engine compartment.

##### **5.14.5.2 Engine compartment insulation material**

The engine compartment shall be equipped with insulation materials, and shall not use materials which absorb fuel, lubricating oil or other flammable materials easily without an impermeable covering layer; the combustion characteristics of the thermal insulation materials used, fixing clips for connecting the thermal insulation materials, washers, etc. shall meet the Class A requirements specified in GB 8410—2006.

##### **5.14.5.3 Engine compartment fire extinguishing equipment**

The engine compartment shall be equipped with an automatic fire extinguishing device, and the spraying range of its fire extinguishing agent shall include at least two heat sources (such as supercharger and exhaust pipe) with potential fire hazards in the engine compartment. When the system is started, it shall send a visual or acoustic alarm to the driver.

#### **5.14.6 Interior materials and fire extinguishing equipment**

##### **5.14.6.1 Interior material**

The flame retardant requirements of interior material shall comply with GB 38262.

##### **5.14.6.2 Fire extinguishing equipment**

The configuration of fire extinguishing equipment shall comply with GB 34655.

#### **5.15 Driver's field of vision**

##### **5.15.1 Exterior vision device**

The driver's field of vision shall meet the requirements in Annex C. No device affecting the driver's field of vision outside the bus shall be installed; the driver shall be able to observe the situation near the service door outside the bus after the service door is closed.

##### **5.15.2 Auxiliary reversing device**

Special school bus shall be equipped with a rear-view system to ensure that the driver can see clearly within a range of 3.6 m long and 2.5 m wide on the ground directly below the trailing edge of the rear windshield under normal driving conditions.

##### **5.15.3 Interior vision device**

The driver shall be able to observe the whole passenger compartment through the interior view mirror under normal driving conditions.

##### **5.15.4 Front windshield defrosting and defogging device**

Special school bus shall be equipped with front windshield defrosting and defogging device.

#### **5.16 Interior air quality**

The interior air quality shall comply with GB/T 17729. It is allowed to adopt air purification devices with sterilization and harmful gas elimination functions to satisfy the requirements. If natural ventilation could not be achieved, a forced ventilation device shall be installed.

#### **5.17 Bus travelling data recording and processing system**

**5.17.1** Special school bus shall be equipped with travelling data recorder which has the function of satellite positioning and complies with GB/T 19056.

**5.17.2** Special school bus shall be equipped with a video surveillance system which can monitor the conditions inside and outside the bus, and shall be able to monitor the driver's behavior, and the conditions in the gangway inside the bus, in front of the bus, and outside the service door.

## **5.18 Stopping reminder sign on the rear wall panel**

**5.18.1** The outer surface of the rear panel where the area visible to vehicles approaching from behind, shall be clearly marked with red words "Please stop and wait" and "When the stopping signal plate extended".

**5.18.2** The words "When the stopping signal plate extended" shall be below the words "Please stop and wait"; the height of "Please stop and wait" shall not be less than 200 mm. The height of "When the stopping signal plate extended" shall not be less than 130 mm, as shown in Figure 13.



**Figure 13 parking reminder sign on the rear wall panel**

## **6 Determination of the same type**

**6.1** Compared with type-approved models, special school bus shall be deemed as the same type if all of the following structural requirements are met:

——The body structure and manufacturer are the same, and the interior dimensions of the bus are the same or increased;

——The dimensions of seats are the same;

——The seat layout is the same, or the number of seats is reduced so as to facilitate the increase of interior gangways, access passages, and seating space;

——The position of the engine is the same;

——The vehicle structure type and purpose are the same (light special school bus, large and medium-sized special school bus; special school bus for infants, special school bus for primary students, special school bus for primary and junior middle school students).

**6.2** Compared with type-approved models, special school bus shall be deemed as the same type if all of the following top structure strength requirements are met:

—The vehicle body structure type (load-bearing structure type; structural forming methods such as stamping and frame type) and manufacturer are the same;

—The change in vehicle's length is within  $\pm 10\%$ ; the interior height of the vehicle is the same or increased;

—The curb mass of the complete vehicle is the same or reduced, or increased by no more than 5%;

—The material of the body frame is the same or enhanced;

—The maximum spacing of the side pillars is the same or reduced, or increased by no more than 5%;

—The maximum spacing between the longitudinal and transverse beams of the ceiling frame is the same or reduced, or increased by no more than 5%.

**6.3** Compared with type-approved models, special school bus shall be deemed as the same type if all of the following interior air quality requirements are met:

—The vehicle body manufacturer is the same;

—The change in vehicle's length is within  $\pm 10\%$ ; the interior height of the vehicle is the same or increased;

—The number of seats in the bus is the same or reduced, the seat model and manufacturer are the same, and the material of the seat fabric is the same;

—The manufacturers of interior materials (door trim panel, headliner, floor covering, instrument panel, luggage compartment covering) are the same.

**6.4** Compared with type-approved models, special school bus shall be deemed as the same type if all of the following roll stability requirements are met:

—The manufacturer of chassis is the same;

—The suspension type (leaf spring, air suspension, rubber suspension, rigid suspension, composite suspension, etc.) is the same;

- The number of tires is the same;
- The wheel track is the same or increased, or decreased by no more than 5%;
- The height of the center of mass of the complete vehicle is the same or reduced, or increased by no more than 5%;
- The curb mass is the same or reduced, or increased by no more than 5%;
- The mass of the vehicle in running order equals the total passenger mass, or with a variation of no more than  $\pm 5\%$ .

## 7 Implementation

For new vehicles under type approval, the standard shall come into effect starting from the implemented date of this document. For vehicles that have already obtained type approval, the standard shall come into effect starting from the 19th month after its implemented date of this document.

**Annex A**  
**(Normative)**  
**Test method for strength of roof structure**

**A.1 Test conditions**

**A.1.1 Ambient temperature**

The ambient temperature shall be between 0 °C and 40 °C.

**A.1.2 Vehicle conditions**

The test sample is a complete vehicle, or a body frame welded on the underframe according to the actual vehicle structure and including doors and floors (vehicles with frame structure may not be equipped with inner and outer skins, accessories, etc.). The windows, doors and emergency exits are fully closed.

**A.2 Test process**

**A.2.1** When the test sample is a complete vehicle, the deformation of suspension and tire shall be eliminated by rigidly supporting the lower plane of the vehicle underframe (chassis). The installation of the test vehicle shall ensure that the underframe (chassis) is fixed firmly. When the test sample is a body frame, the installation of the sample shall ensure that the underframe (chassis) is fixed firmly.

**A.2.2** Place the force-applying plate on the roof (the force-applying plate shall be a rigid flat plate with a length and width not less than that of the test body), and keep its rigid surface perpendicular to the vertical longitudinal plane, and there are no less than two contact points with the roof. If it is projected downward from the roof, its longitudinal center line shall coincide with the longitudinal center line of the vehicle, and the projection of the force-applying plate covers the whole passenger compartment.

**A.2.3** During the test, load in the vertical downward direction is applied with a speed not exceeding 13 mm/s until reaching to the test load of 1.5 times the curb mass, and keep it for no less than 5 s until the deformation is stable.

**A.2.4** Check the deformation of vehicle body structure, door conditions and connections between vehicle body and underframe during the test.

**Annex B**  
**(Normative)**  
**Stopping signal plate**

**B.1 Installation requirements**

A stopping signal plate shall be provided on the left side of the vehicle. Stopping signal plate shall meet the following requirements:

- a) Perpendicular to the vehicle side, with an installation tolerance of  $\pm 5^\circ$  ;
- b) The upper edge of the stopping signal plate is parallel to and below the horizontal plane tangent to the lower edge of the passenger and crew window behind the driver cabin, and the distance between them shall not exceed 150 mm. The longitudinal installation position of the stopping signal plate shall be within the area that the driver can observe;
- c) When the stopping signal plate extended, its outer edge shall not be more than 610 mm away from the installation contact between the vehicle and the stopping signal plate;
- d) When the stopping signal plate retracted, its outer edge shall not be more than 160 mm away from the installation contact between the vehicle and the stopping signal plate, and it shall be retracted to the rear of the vehicle.

**B.2 Technical requirements**

**B.2.1** The color, shape, characters and graphics of the stopping signal plate shall comply with Figure 10 specified in GB 5768.2—2022. The diameter of the circumcircle is 500 mm or 450 mm, the width of the white edge is 20 mm, and there shall be no sharp points, protrusions or corners on the surface that may cause injury.

**B.2.2** The two sides of the stopping signal plate shall be consistent, and the retroreflective material shall meet the requirements of IV or V retroreflective sheeting specified in GB/T 18833—2012.

**B.2.3** When a force of 50 N is applied at the outer edge of the stopping signal plate tangent to the path of rotation, the stopping signal plate shall rotate in the direction of the force. When rotated parallel to the vehicle, the stopping signal plate shall cease rotating. It shall be possible to return the stopping signal plate to its normal position by electric or manual operation after removal of the external force.

**B.2.4** If the stopping signal plate is damaged or its control system fails, it may be manually pushed back to the retracted position.

**B.2.5** The extension or retraction time of the stopping signal plate shall not exceed 10 s.

**B.2.6** If red signal lights are installed on the stopping signal plate, the number of signal lights on each side of the front and rear shall not be less than two, and they shall be located on the vertical center line of the plate, one at the top and the other at the bottom.

### **B.3 Control requirements**

**B.3.1** The extension and retraction of the stopping signal plate is controlled by the driver, and the operating mechanism shall be in a position accessible to the driver sitting on the driver seat. When the stopping signal plate extended, it shall be able to warn the driver through visual or audible signals.

**B.3.2** If the stopping signal plate is not retracted when the vehicle starts, it shall be retracted automatically when the speed exceeds 5 km/h.



**Annex C**  
**(Normative)**  
**Requirements and test methods for driver's field of vision**

### **C.1 Vision requirements**

For special school bus, it shall be ensured that the driver can see the entire top surface of the cylinder clearly as shown in Figure C.1.

### **C.2 Test conditions**

**C.2.1** Test site: A flat ground area, 20 m long and 5 m wide. The test shall be conducted on a clean, straight asphalt concrete or concrete pavement.

**C.2.2** Environmental conditions: The test shall be conducted in weather free of rain, snow, or fog.

**C.2.3** Test bus: The bus shall be in curb weight condition.

**C.2.4** Test equipment: The height and diameter of cylinders A to P are both 0.3 m. The diameter of cylinder P is 0.3 m and its height is 0.91 m. The color of the cylinder shall form a sharp contrast with the road surface where the bus is parked.

### **C.3 Test method**

Place the cylinder in the position specified in Table C.1 (as illustrated in Figure C.1, the distance shown is the center distance from one cylinder to another cylinder in top view). The eye point position of the driver's field of vision shall be determined according to GB 15084, ensuring the driver can clearly see the cylinder's entire top surface as shown in Figure C.1.

**Table C.1 – Cylinder placement and requirements**

Number	Cylinder placement point	Location requirements
1	Place cylinders G, H and I	Keep them tangent to a transverse vertical plane, which is the plane tangent to the frontmost surface of the vehicle front bumper
2	Place cylinders D, E and F	Keep their centers in a transverse vertical plane, which is 1.8 m in front of the transverse vertical plane passing through the centers of cylinders G, H and I
3	Place cylinders A, B and C	Keep their centers in a transverse vertical plane, which is 3.6 m in front of the transverse vertical plane passing through the centers of cylinders G, H and I
4	Place cylinders B, E and H	Keep their centers in a longitudinal vertical plane passing through

Number	Cylinder placement point	Location requirements
		the longitudinal centerline of the vehicle
5	Place cylinders A, D and G	Keep their centers in a longitudinal vertical plane tangent to the left outermost edge of the front bumper of the vehicle
6	Place cylinders C, F and I	Keep their centers in a longitudinal vertical plane tangent to the right outermost edge of the front bumper of the vehicle
7	Place cylinder J	Keep its center in a longitudinal vertical plane 0.3 m to the left of the longitudinal vertical plane passing through cylinders A, D and G, and the center of J is in a transverse vertical plane passing through the center line of the front axle of the vehicle
8	Place cylinder K	Keep its center in a longitudinal vertical plane 0.3 m to the right of the longitudinal vertical plane passing through cylinders C, F and I, and the center of K is in a transverse vertical plane passing through the center line of the front axle of the vehicle
9	Place cylinders L, M, N, O and P	Keep their centers located on a transverse vertical plane passing through the centerline of the rear axle of the vehicle
10	Place cylinder L	Keep its center on a longitudinal vertical plane 1.8 m from the longitudinal vertical plane tangent to the left outermost surface of the vehicle (including the rearview mirror system)
11	Place cylinder M	Keep its center on a longitudinal vertical plane 0.3 m from the longitudinal vertical plane tangent to the left outermost surface of the vehicle
12	Place cylinder N	Keep its center on a longitudinal vertical plane 0.3 m from the longitudinal vertical plane tangent to the right outermost surface of the vehicle
13	Place cylinder O	Keep its center on a longitudinal vertical plane 1.8 m from the longitudinal vertical plane tangent to the right outermost surface of the vehicle
14	Place cylinder P	Keep its center on a longitudinal vertical plane 3.6 m from the longitudinal vertical plane tangent to the right outermost surface of the vehicle

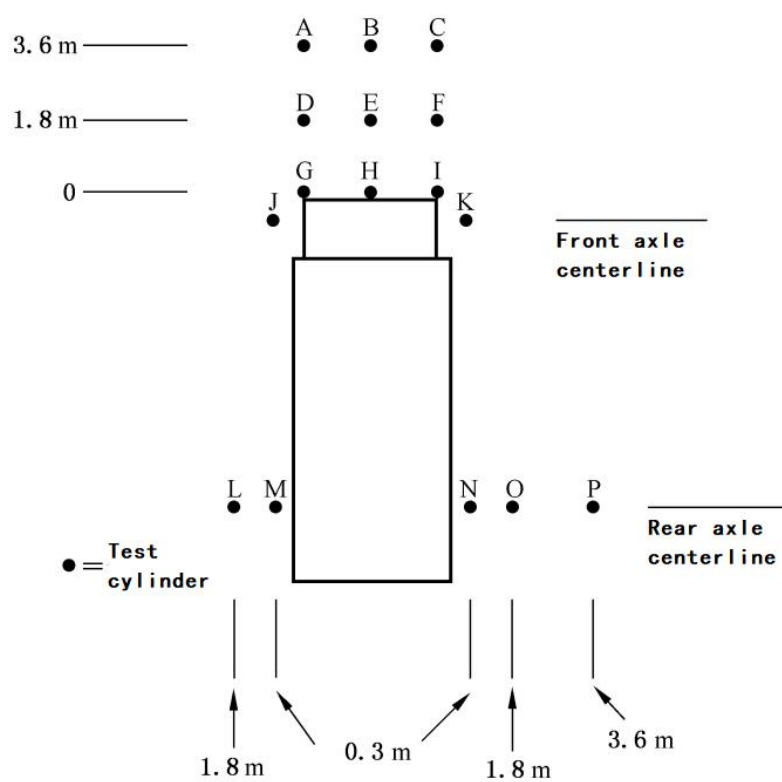


Figure C.1 position of cylinder placement

## Bibliography

- [1] GB/T 3730.1—2022, Terms and definitions of motor vehicles, trailers and combination vehicle—Part 1: Types
  - [2] GB/T 12428—2023, Laden mass calculating method for bus
  - [3] GB 13094—2025, Safety requirements for bus construction
-