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Replacing GB 13057-2003

Strength of the Seats and Their Anchorage of Passenger Vehicles

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Issued by: General Administration of Quality Supervision, Inspection and Quarantine of the People's Republic of China;
Standardization Administration of the People's Republic of China.

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Foreword

Article 4 and Article 5 of this Standard are compulsory; the others are voluntary.

This Standard was drafted in accordance with the rules given in GB/T 1.1-2009.

This Standard replaces GB 13057-2003, *The Strength of the Seats and Their Anchorages of Passenger Vehicles*.

Compared with GB 13057-2003, the major technical differences of this Standard are as follows, in addition to editorial changes:

-- it changes the application scope of the standard (from “seats” to “passenger seats”, and adds the content that “it also applies to the restraining barriers and their vehicle anchorages installed in front of seats in such categories of passenger vehicles”) (See Article 1);

-- it changes part of normative references (See Article 2);

-- it adds the terms and definitions of “forward-facing seat”, “anchorage” and “restraining barrier” (See 3.2, 3.6, 3.14);

-- it deletes “requirements for static test” (See 4.1.2 of edition 2003) and “static test for the seat” (See 5.1 of edition 2003).

This Standard was redrafted by modifying and adopting ECE R80, *Uniform Provisions Concerning the Approval of Seats of Large Passenger Vehicles and of These Vehicles with Regard to the Strength of the Seats and Their Anchorages* (Revision 1), English version.

Compared with ECE R80 (Revision 1), this Standard has many adjustments in structure. Annex C gives the table comparing the specific article numbers of this Standard with those of ECE R80 (Revision 1).

Compared with ECE R80 (Revision 1), the major technical difference of this Standard is that it specifies that each type of seats shall satisfy the requirements for dynamic test. The articles concerning these technical differences are marked with vertical single lines in the page margin. Annex D gives the list of technical differences and their reasons.

This Standard was proposed by the Ministry of Industry and Information Technology of the People’s Republic of China.

This Standard shall be under the jurisdiction of the National Technical Committee of Auto Standardization (SAC/TC114).

The drafting organizations of this Standard: China Highway Vehicle and Machinery Co., Ltd., National Passenger Vehicle Quality Supervision and Test Centre, Danyang

Strength of the Seats and Their Anchorage of Passenger Vehicles

1 Application Scope

This Standard specified the requirements and test methods for the strength of the seats and their anchorage of passenger vehicles.

This Standard applies to forward-facing passenger seats in vehicles of class II, III and B, categories M_2 and M_3, as well as the anchorage of all passenger seats of such categories of passenger vehicles and the installation of their seats. It also applies to the restraining barriers and their vehicle anchorages installed in front of seats in such categories of passenger vehicles.

This Standard does not apply to back-facing seats, side-facing seats and foldable seats, as well as driver seats.

2 Normative References

The following referenced documents are indispensable for the application of this document. For dated references, only the edition dated applies to this document. For undated references, the latest edition of the referenced documents (including all amendments) applies to this Standard.

GB 11552-2009, *The Interior Fittings of Passenger Car*

GB 14166, *Safety-belts, Restraint Systems, Child Restraint Systems and ISOFIX Child Restraint Systems for Occupants of Power-driven Vehicles*

GB 14167, *Safety-belt Anchorages, ISOFIX Anchorages Systems and ISOFIX Top Tether Anchorages for Vehicles*

GB 24406-2012, *The Strength of Student Seat Systems and Their Anchorages of Special School Bus*

ISO 6487, *Road Vehicles – Measurement Techniques in Impact Tests – Instrumentation*

3 Terms and Definitions

For the purposes of this document, the following terms and definitions and those

defined in GB 24406-2012 apply.

3.1

seat type

a category of seats which do not differ essentially with respect to the following characteristics likely to affect their strength and nociceptive:

a) Structure, shape, dimensions and materials of the load bearing parts;

b) Types and dimensions of the seat back adjustment and locking system;

c) Dimensions, structure and materials of the attachments and supports (e.g. legs);

3.2

forward-facing seat

a structure likely to be anchored forwards to form an included angle -10° ~ + 10° between the seat parallel vertical plane and the vehicle heading direction.

3.3

adjustment system

the device by which the seat or its parts can be adjusted to a position suited to the seated occupant.

3.4

displacement system

a device enabling the seat or one of its parts to be displaced laterally or longitudinally without a fixed intermediate position of the seat or one of its parts, to facilitate access by passengers.

3.5

locking system

a device ensuring that the seat and its parts are maintained in the position of use.

3.6

anchorage

a part of the floor or of the body of a vehicle to which a seat may be fixed.

3.7

All fittings forming part of the back of the seat or accessories thereto shall be such as to be unlikely to cause any bodily injury to a passenger during impact.

The requirements for fittings and accessories are as follows:

a) Any part contactable by a sphere 165 mm in diameter presents a radius of curvature of at least 5 mm. If any part of the fittings and accessories referred to above is made of a material of hardness less than 50 shore A on a rigid backing, then the requirements set out in this article shall apply only to the rigid backing.

b) The parts of the back of the seat such as adjustment devices for the seat AND accessories, situated below a horizontal plane that is 400 mm above the reference plane, can be exempted from the requirements of this article.

4.2 Requirements for vehicle anchorages

4.2.1 The anchorages for the seats on the vehicle shall be capable of withstanding the test described in 5.1 (if the test seat is anchored to the testing platform representing the vehicle structure).

4.2.2 Permanent deformation, including breakage, of an anchorage or the surrounding area shall be permissible provided the prescribed force has been sustained throughout the prescribed period.

4.2.3 When there is more than one type of anchorage on a vehicle, each variant shall be tested.

4.2.4 When the combination of one type of seat and one type of anchorage can satisfy the requirements of 4.1, then only the different types of anchorages can be tested in accordance with 5.2 when this type of seat is combined with other types of anchorages.

4.2.5 If the anchorage points of safety belt for corresponding seats positions are directly fixed to the seats and these anchorage points fully conform to GB 14167, then it is deemed that the strength of the anchorages of seats satisfies the requirements of 4.2.1 and 4.2.2.

4.3 Requirements for seat installation

4.3.1 All front-facing seats shall satisfy the requirements of 4.1 and meet the following conditions:

a) The seat shall have a reference height of 1 m at least;

b) The height difference between the H point of the seat just behind and the H point of the test seat shall not be greater than 72 mm. If it is greater than 72 mm, then the test shall be conducted at the actual installation height.

4.3.2 Test 1 and test 2 can be carried out in accordance with 5.1.2 and 5.1.3, except in the following situations:

5.1.2.1 The testing platform shall be mounted on a trolley.

5.1.2.2 Auxiliary seat

The auxiliary seat shall be the same type as the seat being tested and shall be located parallel to and directly behind the seat being tested (or restraining barrier), the two seats (or the auxiliary seat and restraining barrier) being at the same height, adjusted identically and on a pitch of 75 cm.

5.1.2.3 Manikin

5.1.2.3.1 The manikin shall be placed on the auxiliary seat so that its plane of symmetry corresponds to the plane of symmetry of the seating position in question.

5.1.2.3.2 The manikin's hands shall rest on their thighs with their elbows touching the seat back; the legs shall be extended to the maximum and shall, if possible, be parallel; the heels shall touch the floor.

5.1.2.3.3 Each manikin required shall be installed on a seat in accordance with the following procedure:

a) the manikin shall be placed on the seat as close as possible to the desired position;

b) a flat rigid surface 76 mm x 76 mm in area shall be placed as low as possible against the front of the manikin's torso;

c) the flat surface shall be pressed horizontally against the manikin's torso at a load of between 25 and 35 daN: the torso shall be drawn forward by the shoulders to the vertical position, then laid back against the seat back. This operation shall be performed twice. Without the torso moving, the head shall be placed in a position such that the platform supporting the measuring instruments contained in the head is horizontal and that the median sagittal plane of the head is parallel to that of the vehicle;

d) the flat surface be carefully removed;

e) the manikin shall be moved forward on the seat and the installation procedure described above repeated;

f) if necessary, the position of the lower members shall be corrected;

g) the measuring instruments installed shall not in any way affect the movement of the manikin during impact;

h) the temperature of the system of measuring instruments shall be stabilized before the test and maintained so far as possible within a range between 19ºC and 26ºC.

5.1.2.4 Impact simulation

5.2 Vehicle Anchorage Test

5.2.1 Test apparatus

5.2.1.1 A rigid structure sufficiently representative of the pedestal of the seat is fixed by the means of fixation (bolts, etc.) provided by the manufacturer to the parts of the structure submitted to the tests.

5.2.1.2 If several seat types differing from one another in respect of the distance between the front and back ends of their feet can be mounted on the same anchorage, the test shall be carried out with the shortest footing.

5.2.2 Test procedure

5.2.2.1 A force F shall be applied:

a) at a height of 0.75 m above the reference plane and on the vertical line containing the geometrical centre of the surface bounded by the polygon having the different anchorage points as apexes or, if applicable, the extreme anchorages of the seat, by the rigid structure as defined in 5.2.1.1;

b) in the horizontal direction and directed to the front of the vehicle;

c) in a delay as short as possible and while a duration of at least 0.2 s.

5.2.2.2 The force F shall be determined by the following formula:

$$F = (5\ 000 \pm 50) \times i \qquad \cdots\cdots(1)$$

where,

F – acting force, in N;

i – number of seating positions of the seat for which the anchorages to be tested are to be approved.

If it is required by the manufacturer, the test can be carried out in accordance with the typical load measured in the dynamic test specified in 5.1.

6 Requirements for the Transitional Period of Standard Implementation

For the products which have been approved or passed the certification, this Standard will be implemented from the 13th month of the implementation date of this Standard.

	Deletes “Approval” of ECE R80, Article 4	Because of the differences of different systems of standards, laws and regulations
	Deletes the requirements for static test of ECE R80, 5.1	Make dynamic test as the only test method to improve the design, manufacture and use safety of passenger vehicle seats
	Deletes “Conformity of Production” of ECE R80, Article 8	Because of the differences of different systems of standards, laws and regulations
	Deletes “Penalties for Non-conformity of Production” of ECE R80, Article 9	Because of the differences of different systems of standards, laws and regulations
	Deletes “modification and extension of approval of the seat type and/or the vehicle type” of ECE R80, Article 10	Because of the differences of different systems of standards, laws and regulations
	Deletes “production definitely discontinued” of ECE R80, Article 11	Because of the differences of different systems of standards, laws and regulations
	Deletes “transitional provisions” of ECE R80, Article 12	Because of the differences of different systems of standards, laws and regulations
	Deletes “names and addresses of technical services responsible for conducting approval tests and of administrative departments” of ECE R80, Article 13	Because of the differences of different systems of standards, laws and regulations
	Deletes “requirements and procedures for static test” of ECE R80, Annex 5	Make dynamic test as the only test method to improve the design, manufacture and use safety of passenger vehicle seats
	Deletes “energy absorption characteristics of the seat back” of ECE R80, Annex 6	Make dynamic test as the only test method to improve the design, manufacture and use safety of passenger vehicle seats

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