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AUTOMOTIVE INDUSTRY STANDARD
OF THE PEOPLE'S REPUBLIC OF CHINA

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QC/T 566-2024

Replacing QC/T 566-1999

External protection for passenger car

乘用车外部防护

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Foreword

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

This document replaces QC/T 566-1999 *External protection of cars*. Compared with QC/T 566-1999, in addition to structural adjustments and editorial changes, the main technical changes are as follows:

- Change “Scope” (see Chapter 1; Chapter 1 of the 1999 edition);
- Change “Terms and definitions” (see Chapter 3; Chapter 2 of the 1999 edition);
- Change “Requirements” (see Chapter 4; Chapter 6 of the 1999 edition);
- Change “Test methods” (see Chapter 5; Chapters 3 and 4 of the 1999 edition);
- Delete “Repair and replacement conditions” (see Chapter 5 of the 1999 edition);
- Delete “Maneuvering test” (see Chapter 7 of the 1999 edition).

Please note that some of the contents of this document may involve patents. The issuing organization of this document is not responsible for identifying patents.

This document shall be under the jurisdiction of National Technical Committee of Auto Standardization (SAC/TC 114).

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The previous versions of this document and the documents which are replaced by this document are as follows:

- This document was first published in 1999, and this is the first revision.

External protection for passenger car

1 Scope

This document specifies terms and definitions, requirements and test methods for the exterior protection for passenger car.

This document is applicable to M₁ vehicles, and as a reference to other vehicles.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the version corresponding to that date is applicable to this document; for undated references, the latest version (including all amendments) is applicable to this document.

GB/T 18385, Electric vehicles - Power performance - Test method

GB/T 31498-2021 Post crash safety requirement for electric vehicle

3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

3.1

bumper beam

Structural device used to mitigate damage caused by frontal and rear impacts on the vehicle.

Note: Usually installed at the ends of the left and right longitudinal beams of the vehicle.

3.2

protection system

Internally mounted components and devices used to restrain occupants.

3.3

vehicle width

Width of the vehicle measured at the fenders.

4 Requirements

4.1 Static requirements for bumper

4.1.1 Effective height of bumper beam

After completing the static tests for bumper in 5.2.1 ~ 5.2.3, the effective overlap dimension of the bumper beam shall not be less than 75 mm; if the effective overlap dimension of the bumper beam is less than 75 mm, the effective height of the bumper beam shall not be less than 100 mm.

4.1.2 Effective width ratio of bumper beam

After completing the static tests for bumper in 5.2.4 ~ 5.2.6, the effective width ratio of the bumper beam shall not be less than 70%.

4.2 Bumper dynamic and low-speed collision requirements

After the vehicle has completed the bumper dynamic test and low-speed collision test specified in 5.3 and 5.4 respectively, it shall meet the following requirements:

- a) The front and rear windshields and the left and right door glasses shall be free of damage;
- b) The door shall open normally;
- c) The vehicle's fuel supply system and cooling system shall be leak-free, and its sealing devices and oil and water tank covers shall work properly; for hybrid and battery electric vehicles, after the collision test, the vehicle's power high-voltage system including the rechargeable electrical energy storage system (REESS) and the high-voltage components connected to it shall comply with the anti-electric shock protection requirements, electrolyte leakage requirements and REESS requirements in GB/T 31498-2021;
- d) The left and right longitudinal beams shall not be bent or crushed, and damage to the end surface of the longitudinal beam is allowed;
- e) The protection system (seat belts, airbags) and active engine hood shall not be in an irrecoverable state.

5 Test methods

5.1 Test preparation

5.1.1 Test facilities

The test area shall be large enough to accommodate the runway, barriers and technical equipment necessary for the test. The runway at least 5 m in front of the barrier shall be flat, dry and clean.

5.1.2 Test vehicle mass

5.1.2.1 The fuel tank (if any) shall be filled with fuel accounting for 90% ~ 95% of the total capacity or with water accounting for 90% of the fuel mass when the fuel tank is full as specified by the manufacturer, with a tolerance of $\pm 1\%$.

5.1.2.2 The air conditioning system is drained and other fluids in the vehicle (such as power steering fluid, brake fluid, washer fluid, antifreeze, etc.) are at the highest level.

5.1.2.3 The spare tire and on-board tools (if any) shall be in place; any items not related to the vehicle shall be cleared out; the vehicle mass and the axle loads of the front and rear axles shall be measured and recorded. The vehicle mass is the complete vehicle kerb mass.

5.1.2.4 The test vehicle mass is the vehicle curb mass plus the mass of a dummy or counterweight of $75\text{ kg} \pm 5\text{ kg}$ installed on the driver's seat. The dummy or counterweight is fixed to the driver's seat through the vehicle's own three-point seat belt.

5.1.2.5 The mass of any on-board test equipment shall be compensated by removing counterweights or parts. The change in the final mass caused by adding counterweight or on-board test equipment, or removing parts, shall not exceed 5% of the vehicle's front and rear axle load.

5.1.3 Test vehicle status

5.1.3.1 Adjust the tire pressure to the pressure value specified by the manufacturer.

5.1.3.2 Devices used to protect vulnerable road users such as pedestrians shall be in the inactive state.

5.1.3.3 Battery electric vehicles or hybrid electric vehicles shall be fully charged in accordance with the provisions of GB/T 18385 and the test shall be carried out within 24 hours after the completion of charging or when the SOC is not less than 95%.

5.1.3.4 If adjustable, the brake pedal, accelerator pedal, seat belt anchorage points and steering column shall be located at the midpoint or as close to the midpoint of their range of travel.

5.1.3.5 The front seats are adjusted to the middle position of the front and rear and up and down travel; the seat back angle is adjusted to 25° or the position specified by the manufacturer; the headrest is at the highest position of the travel.

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