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**Performance requirements and testing methods for the rear
cross traffic alert systems of passenger cars**

乘用车后方交通穿行提示系统性能要求及试验方法

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1 Scope

China's national performance requirements and test methods for rear cross traffic alert systems on passenger cars. The system watches for vehicles approaching from the side while a car reverses out of a parking space or a driveway, using rear-corner radar, and warns the driver of what they cannot see. The geometry is what makes it necessary: reversing out between two parked vehicles, the driver's view along the lane is blocked until the car is already in it, and by then a vehicle approaching at thirty kilometres an hour is seconds away. It is a common and consequential collision type, particularly in the crowded parking of Chinese cities. Specifying it means fixing the detection zone, the warning timing and the false alert rate - the last being what determines whether drivers keep the system switched on, since a system that cries wolf in every car park is disabled within a week.

This document specifies the performance requirements for the rear cross traffic alert system of passenger cars and describes the corresponding test methods. This document

applies to M1 vehicles equipped with a rear traffic alert system. NOTE: Without causing confusion, the "rear cross traffic alert system" in this document is referred to as the "RCTA system".

2 Normative references

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

GB 34660 Road vehicles - Requirements and test methods of electromagnetic compatibility

GB/T 39263 Road vehicles - Advanced driver assistance systems - Terms and definitions

3 Terms and definitions

For the purpose of this document, the terms and definitions defined in GB/T 39263 and the following apply.

3.1 rear cross traffic alert system A system that monitors other road users approaching laterally from behind the vehicle in real time when the vehicle is reversing, and issues warning information when there is a risk of collision.

3.2 subject vehicle

b) When the vehicle is reversing, the Type II RCTA system shall at least monitor the cars, motorcycles, bicycles and pedestrians approaching laterally from behind the vehicle in real time, and issue a warning message when there is a risk of collision.

4.2 Self-check requirements

4.2.1 The RCTA system shall at least perform a self-check after power-on.

4.2.2 The RCTA system shall at least have the following self-check functions:

- a) Check whether the relevant electrical components are operating normally;
- b) Check whether the relevant sensor elements are operating normally.

4.2.3 When an electronic or electrical fault occurs, the fault prompt information shall be clearly observed by the driver and clearly distinguished from the collision prompt.

4.3 Status prompt requirements The RCTA system shall allow the driver to actively turn it on/off, and its on/off status shall be visually visible.

4.4 Electromagnetic compatibility requirements The electromagnetic compatibility of the RCTA system shall comply with the provisions of GB 34660.

5 Performance requirements

5.1 Collision prompt form requirements The collision prompt form of the RCTA system shall meet the following requirements:

- a) At least one among the senses of sight, hearing, and touch;
- b) Prompt information that is easily perceived by the driver and clearly distinguished from other systems in the vehicle;
- c) Clearly indicate the direction in which the target appears.

5.2 Collision prompt condition requirements The Type I RCTA system shall be tested in accordance with

6.4 and 6.5, and the Type II RCTA system shall be tested in accordance with 6.4, 6.5, and 6.6. When the target approaches the subject vehicle from the left and/or right, the RCTA system shall issue a collision prompt when the time to collision (TTC) is not less than 1.7 s, and the collision prompt form meets the requirements of 5.1.

6.1 Test environment conditions

6.1.1 The test road shall be a level, dry, concrete or asphalt road surface with good adhesion.

6.1.2 The ambient temperature shall be $-20\text{ }^{\circ}\text{C} \sim 45\text{ }^{\circ}\text{C}$.

6.1.3 The horizontal visual range shall ensure that the target can be clearly observed throughout the test.

6.2 Test equipment

6.2.1 The target vehicle shall be a common mass-produced M1 vehicle or a flexible target of which the characterization parameters can represent the vehicle.

6.2.2 The target bicycle shall be a common mass-produced bicycle or a flexible target of which the characterization parameters can represent the bicycle. The length of the bicycle shall be (1.8 ± 0.2) m, and the height (including an adult rider) shall be (1.7 ± 0.2) m.

6.2.3 The target pedestrian shall be an adult target dummy and a child target dummy. The height of the adult target dummy shall be (1.8 ± 0.1) m (excluding the track), and the height of the child target dummy shall be (1.1 ± 0.1) m (excluding the track).

6.2.4 The blocking vehicle shall be a common mass-produced M1 vehicle or a flexible target of which the characterization parameters can represent the vehicle, and shall meet the following requirements:

- a) The minimum ground clearance of the vehicle shall not exceed 150 mm;

b) The departure angle of the vehicle shall not exceed 25°. NOTE: A flexible target refers to a target that can reduce the collision damage of the subject vehicle during the test, usually including flexible target vehicles, flexible target bicycles, etc.

6.3 Measurement system

6.3.1 The measurement system shall be completely independent of the RCTA system to be tested.

6.3.2 The accuracy of the measurement system shall meet the following requirements:

a) The distance measurement accuracy shall be at least
0.02 m;