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Requirements and Test Methods of Speed Limitation

System for Motor Vehicles

车辆车速限制系统技术要求及试验方法

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Requirements and Test Methods of Speed Limitation System for Motor Vehicles

1 Scope

This Standard stipulates the terms and definitions, and general requirements of speed limitation system for motor vehicles; the requirements and test methods for motor vehicles with maximum speed limitation system and motor vehicles with adjustable speed limitation system.

This Standard is applicable to:

- Maximum speed limitation device and adjustable speed limitation device.
- Type-M and Type-N vehicles equipped with maximum speed limitation device or adjustable speed limitation device.
- Type-M and Type-N vehicles equipped with maximum speed limitation function or adjustable speed limitation function.

2 Normative References

The following documents are indispensable to the application of this document. In terms of references with a specified date, only versions with a specified date are applicable to this document. In terms of references without a specified date, the latest version (including all the modifications) is applicable to this document.

GB 4094 *Motor Vehicles - Symbols for Controls, Indicators and Tell-tales*;

GB 7258 *Technical Specifications for Safety of Power-driven Vehicles Operating on Roads*;

GB/T 12534 *Motor Vehicles - General Rules of Road Test Method*;

GB/T 15089 *Classification of Power-driven Vehicles and Trailers*;

GB/T 17619 *Limits and Methods of Testing for Immunity of Electrical/electronic Sub-assemblies in Vehicles to Electromagnetic Radiation*;

GB/T 21437.2-2008 *Road Vehicles - Electrical Disturbances from Conduction and Coupling - Part 2: Electrical Transient Conduction along Supply Lines Only*;

GB/T 25978 *Road Vehicle - Plates and Label*;

Maximum speed limitation function refers to a function which limits the speed of a motor vehicle under the set speed through the control of vehicle power plant's power supply, vehicle or engine (or electric motor) management. This function may be implemented by a motor vehicle's original device.

3.6 Adjustable Speed Limitation Device

Adjustable speed limitation device refers to a device which is installed to limit the speed of a motor vehicle under the adjustable limit speed through the control of vehicle power plant's power supply, or engine (or electric motor) management.

3.7 Adjustable Speed Limitation Function

Adjustable speed limitation function refers to a function which limits the speed of a motor vehicle under the adjustable limit speed through the control of vehicle power plant's power supply, vehicle or engine (or electric motor) management. This function may be implemented by a motor vehicle's original device.

3.8 Set Speed

v_{set}

Set speed refers to a motor vehicle's maximum driving speed, which is set up in the maximum speed limitation system.

3.9 Stabilized Speed

v_{stab}

Stabilized speed refers to an average driving speed when the maximum speed limitation system or the adjustable speed limitation system plays its role, and when a motor vehicle is in a stable driving state.

3.10 Maximum Speed

v_{max}

Maximum speed refers to the maximum driving speed that a motor vehicle reaches in the first part of the speed-time curve (see Figure 3) of maximum speed limitation test.

3.11 Adjustable Limit Speed

v_{adj}

Adjustable limit speed refers to the maximum driving speed independently set up by the driver in the adjustable speed limitation system. In addition, it can be unset at any time.

set speed v_{set} will not be temporarily or permanently raised or deleted under any circumstances of operation.

5.2 The maximum speed limitation system shall prevent from unauthorized and arbitrary adjustment, or, break off the power supply to unauthorized and arbitrary adjustment.

5.3 It is not allowed to implement the maximum speed limitation function through service braking. When the maximum speed limitation system has already limited power supply to the power plant to the minimum, if the speed still exceeds the set speed, the driver may adopt other deceleration measures.

5.4 When a motor vehicle is running at the set speed v_{set} , the maximum speed limitation system shall guarantee that even if the operation of acceleration is adopted, the vehicle's running speed will not be affected.

5.5 The maximum speed limitation system is not allowed to affect the normal operation of acceleration pedal when shifting gears.

5.6 In normal driving, in terms of the driver's operation of all the accelerators within an attainable range, the maximum speed limitation system's functions shall all be valid.

5.7 Within an easily visible range from the driver's position, a maximum speed limitation sign shall be pasted; characters on the sign shall be clear and distinguishable. The maximum speed limitation sign shall comply with the stipulations in GB/T 25978. Meanwhile, instruction of vehicle's set speed value shall be added to the instructions for use.

5.8 When a motor vehicle's speed exceeds the set speed, alerting signals shall be sent to the driver in the form of visual signal and auditory signal. Auditory signal shall be distinct and easily identifiable to the driver. Visual signal device shall satisfy the following requirements:

- a) It shall be guaranteed that visual signal is identifiable to the driver in a corresponding position. This corresponding position shall be: when the driver is in the driving position, after certain adjustment in accordance with the manufacturer's instructions for use, a position that allows free activity of the driver under the protection of the constraint system.
- b) Speed limitation signal sign is shown in Figure 2. It shall comply with relevant stipulations in GB 4094.
- c) It shall be yellow or amber.
- d) After a motor vehicle is power on, the visual signal device shall have self-

step length of not more than 10 km/h.

6.5.2 The driver may set up V_{adj} through operation of the device.

6.6 Initiate or Cancel Adjustable Speed Limitation Function

6.6.1 Adjustable speed limitation function shall be able to be initiated or cancelled under the conditions stipulated by the manufacturer.

6.6.2 When engine is shut down, the adjustable speed limitation function shall be automatically cancelled.

6.6.3 When the adjustable speed limitation function is initiated, the initial set V_{adj} value shall be not lower than the current running speed.

7 Test Methods of Motor Vehicles with Maximum Speed Limitation System

7.1 Circumstances Where Test is Unnecessary

Motor vehicles whose maximum running speed is lower than the set speed V_{set} can be excused from the tests below.

7.2 Optional Road Test or Dynamometer Test

It is allowed to choose road test or dynamometer test. When the result of dynamometer test is objectionable, road test shall be conducted; the result of road test shall be subject to.

7.3 Road Test

7.3.1 Preparation of motor vehicles

7.3.1.1 Tire inflation pressure shall comply with the manufacturer's requirements.

7.3.1.2 Motor vehicles shall be no-load.

7.3.2 Road

7.3.2.1 Road shall be suitable for vehicles to maintain at a stable speed. The surface of road shall be flat. Road gradient shall be not more than 2%; road gradient variation shall be not more than 1%.

7.3.2.2 The surface of road shall be dry.

7.3.3 Ambient weather conditions

7.4.1 Features of dynamometer test

The equivalent inertia of a motor vehicle's mass shall be simulated through chassis dynamometer. The accuracy shall be $\pm 10\%$; the deviation of speed test shall be not more than $\pm 1\%$; the time interval of sampling shall be less than 0.1 s.

7.4.2 Acceleration test

7.4.2.1 In the test, braking work shall be set up to be consistent with vehicle's running resistance at a certain test speed. Such braking work may be obtained through calculation; the accuracy shall be set up as $\pm 10\%$. The braking work may also be set up as $0.4 P_{max}$ (P_{max} signifies the maximum power of engine). Start from ($V_{set} - 10$ km/h); press the acceleration pedal to the floor; conduct full throttle acceleration. After vehicle speed becomes stable, the operation of pressing the acceleration pedal to the floor shall at least be maintained for 20 s. When the speed limitation system takes effect, record the transient speed value, so as to draw a speed-time curve graph.

7.4.2.2 The test shall satisfy the requirements in 7.3.5.2.

7.4.3 Stable speed test

7.4.3.1 Place test vehicle on a chassis dynamometer. The power absorbed by the chassis dynamometer shall gradually decrease from P_{max} to $0.2 P_{max}$. Within this power variation range, record the transient speed value. The test shall be conducted for 5 times in total.

7.4.3.2 The test shall satisfy the requirements in 7.3.7.2.

8 Test Methods of Motor Vehicles with Adjustable Speed Limitation System

8.1 Test Conditions

Test conditions shall comply with the requirements in 7.3.1 ~ 7.3.4.

8.2 Alert Test when Speed Exceeds V_{adj}

8.2.1 When speed is ($V_{adj} - 10$ km/h), press the acceleration pedal to the floor, so that the speed exceeds V_{adj} .

8.2.2 Speed shall at least reach ($V_{adj} + 10$ km/h); this speed shall at least be maintained for 30 s.

8.2.3 In the test, record the transient speed value; speed test deviation shall be not more than $\pm 1\%$; the time interval of sampling shall be less than 0.1 s.

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