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Total mass monitoring of vehicle

车辆总质量监测

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1 Scope

GB/Z 41599-2022 is the Chinese national standard on total mass monitoring of vehicle, in the field of road vehicles engineering. The /Z suffix marks it as a guiding technical document: it does not prescribe requirements that can be certified against, but sets out the technique, the method or the state of the art that the standards bodies recommend following. It was issued on 11 July 2022 by the State Administration for Market Regulation; Standardization Administration of China. As a guiding technical document it carries no separate date of entry into force: it applies from publication. Classification: ICS 43.080.01, CCS T43. This page is published from the official record of the standard held by the Chinese standards administration: the identification, the dates, the classification and the issuing body are taken from there. The clause text, the tables and the numeric limits are in the document itself, which is delivered complete in English translation.

This document specifies the technical requirements, test methods and instruction manual for the total mass monitoring of vehicle. This document applies to the N3, O4 vehicles - which are installed with the total mass monitoring system of vehicle - and the combination vehicles composed of them; it also applies - as a reference - to the implementation of other vehicles.

2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. 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 3730.1, Motor vehicles and trailers - Types - Terms and definitions

GB/T 3730.2, Road vehicle - Masses - Vocabulary and codes

GB/T 4208, Degrees of protection provided by enclosure (IP code)

GB/T 15089, Classification of power-driven vehicles and trailers

GB 34660-2017, Road vehicles - Requirements and test methods of electromagnetic compatibility

3 Terms and definitions

Terms and definitions determined by GB/T 3730.1, GB/T 3730.2 and GB/T 15089, as well as the following ones, are applicable to this document.

3.1 Total mass of vehicle The sum of each shaft load of the motor vehicle, towed vehicle or combination vehicles under any loading condition.

3.2 Total mass monitoring of vehicle Collection and monitoring of the total mass of vehicle.

3.3 Total mass monitoring system of vehicle A system - installed on the vehicle - to collect and monitor the total mass of vehicle.

3.4 Weighing sensor A component that is used to perceive vehicle mass information and transmit the information to the weighing electronic unit.

3.5 Weighing electronic unit A component that is used to calculate and output the total mass of vehicle.

3.6 Conventional true value of total mass M_{true} The total mass of vehicle that is output by the total mass measuring equipment.

3.7 Indicating value of total mass $M_{indicating}$ The total mass of vehicle that is output by the total mass monitoring system of vehicle.

3.8 Set value of total mass M_{set} The maximum allowable total mass of vehicle set in the total mass monitoring system of vehicle.

3.9 Indicating scale interval vehicle shall be able to receive and process the information sent by the towed vehicle, determine the set value of total mass of the combination vehicles, and receive the fault information transmitted by the total mass monitoring system of towed vehicle. For combination vehicles that use CAN bus for communication between the towing vehicle and the towed vehicle, the electrical connector contacts 14 and 15 specified in GB/T 20717 can be used for signal transmission. See Appendix A for communication conditions.

4.2.5 For externally non-sealed electrical components, the degree of protection provided by enclosure shall comply with level IP67 specified in GB/T 4208. For externally sealed electrical components, the degree of protection provided by enclosure shall comply level IP30 specified in GB/T 4208.

4.2.6 The electromagnetic compatibility of the electrical components of the total mass

monitoring system of vehicle under normal use conditions shall comply with the provisions of 4.5~

4.10 in GB 34660-2017.

4.2.7 The weighing sensor used in the total mass monitoring system of vehicle shall be able to work normally at the ambient temperature of $-40\text{ }^{\circ}\text{C} \sim 80\text{ }^{\circ}\text{C}$.

5 Test methods

5.1 Self-inspection function test When the vehicle is stationary and the ignition switch is in the "OFF"/ "LOCK" state, turn the ignition switch state to "ON"/ "RUN" state, and visually observe the visual signal prompt system to send a signal.

5.2 Error test of the total mass monitoring system of vehicle

5.2.1 The total mass measuring equipment can be floor scale or wheel load meter, etc., of which the maximum allowable error shall not exceed 1/3 of the maximum allowable average relative error of the total mass monitoring system of vehicle under test; it shall be used according to the following requirements (for reference to other measuring equipment).

a) When using the floor scale, the area of the scale platform shall be able to accommodate all the wheels to be tested, and the floor of the entrance and exit of the scale platform shall be kept at the same level as the platform;

b) When using the wheel load meter, it shall be ensured that the upper plane of each wheel load meter is in the same horizontal plane.

5.2.2 Select the total mass measuring equipment in accordance with the requirements of 5.2.1; set one direction where the vehicle drives toward the measuring equipment as the forward direction, and the opposite direction as the reverse direction. Operate according to the requirements of the instruction manual; output M indicating; drive to the measuring equipment from the forward direction at low speed; after the M indicating is stable, record M indicating, forward and M true, forward respectively. Drive the vehicle away from the measuring equipment; operate according to the requirements of the instruction manual again; output M indicating; drive to the measuring equipment from the reverse direction at low speed; after M indicating is stable, record M indicating, reverse and M true, reverse again. Take the average value of M true, forward and M true, reverse as M true; see Table B.1 of Appendix B for the test data recording format.

5.2.3 The test shall be carried out when the vehicle is in an unloaded state, a state of 90% of the maximum allowable total mass and a state of 110% of the maximum allowable total mass; the average value of the errors under the three load states shall be used as the error of total mass monitoring system of vehicle. When recording M true, the vehicle shall stop steadily, all wheels shall be placed on the total mass measuring equipment, the engine

shall be turned off, the drive system of the electric vehicle shall be turned off, the ignition switch shall be placed in the "ON"/ "RUN" state, and the transmission shall be in neutral.

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