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NATIONAL STANDARD OF THE PEOPLE'S REPUBLIC OF CHINA

GB/T 12678-2021

Replacing GB/T 12678-1990

Reliability running test method for motor vehicles

汽车可靠性行驶试验方法

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Table of Contents

1 Scope

GB/T 12678-2021 is the Chinese national standard on reliability running test method for motor vehicles, in the field of road vehicles engineering. The /T suffix marks it as a recommended standard: it is not compulsory by itself, but it becomes binding as soon as a contract, a tender or a customer specification calls it up - which in practice is how most foreign buyers meet it. It was issued on 11 October 2021 by the State Administration for Market Regulation; Standardization Administration of China, and has been in force since 1 May 2022. Classification: ICS 43.020, CCS T04. 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 Standard specifies the test conditions, test steps, test data processing and test report for reliability running test of motor vehicles. This Standard is applicable to various vehicles driving on the road. Other types of vehicles refer to this Standard for implementation.

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/T 12534, Motor vehicles. General rules of road test method

GB/T 12548, Motor vehicles speedometer and odometer calibration method

GB/T 12673, Motor vehicle main dimensions measurement method

GB/T 12674, Motor vehicles. Weight parameter. Measuring method

QC/T 900, Automobile product quality inspection and assessment methods

3 Terms and definitions

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

3.1 vehicle reliability the ability of the vehicle to complete the specified functions within the specified conditions and within the specified time

3.2 customer usage correlation reproduce the use load of the target user in the test field or test bench

3.3 general reliability running test the reliability test carried out in accordance with certain specifications on the corresponding conditions (such as high-cold areas, plateau areas, high- temperature dry-heat, high-temperature, humid and hot areas).

4.2 Test vehicle

4.2.1 The vehicle shall meet the technical conditions specified by the manufacturer.

4.2.2 The speedometer and odometer installed on the vehicle shall be inspected and corrected in accordance with the method determined by GB/T 12548.

4.2.3 Number of vehicles: Not less than 3 for passenger vehicles; for commercial vehicles, it is determined by the manufacturer; for electric vehicles, it is determined by the manufacturer.

4.2.4 Model configuration: It is advisable to choose a representative model configuration.

4.3 Test load Determine the test load according to the user's association or the manufacturer's design requirements. Load and unload according to the method determined by GB/T 12534.

5.1 Vehicle parameter measurement and adjustment

5.1.1 Vehicle mass parameter measurement Carry out vehicle mass parameter measurement according to the method determined by GB/T 12674.

5.1.2 Measurement and adjustment of vehicle wheel alignment parameters Measure and adjust wheel alignment parameters in accordance with the manufacturer's wheel alignment

specifications.

5.1.3 Vehicle passability parameter measurement The passability parameters such as approach angle, departure angle, longitudinal pass angle and minimum ground clearance are measured according to the methods determined by GB/T 12673.

5.1.4 Key moment measurement and adjustment According to product instruction manual or design specification requirements, measure and adjust the torque of the fasteners of the key parts. After confirming the fastener torque, the position of the fastener shall be marked.

5.2 Vehicle performance test Before and after the reliability running test, it is advisable to carry out the evaluation of the power performance, economy, braking performance, emission, noise, comfort, handling stability and sealing of the whole vehicle, used to evaluate the attenuation degree of vehicle performance. The test conditions and test methods of the performance test before and after the reliability running test shall be consistent. Before performance evaluation, the test vehicle can be run-in according to the manufacturer's regulations.

5.3.1 General reliability running test

5.3.1.1 Test mileage allocation According to user surveys or vehicle-mounted record data, determine the distribution ratio of mileage of test vehicles on urban roads, expressways, general highways, mountain roads, and non-paved roads (see Annex A).

5.3.1.2 Driving operation 5.3.1.2.1 Select the gear according to the design conditions during the test. Under the premise of ensuring safety, the vehicle shall be driven at the design speed. 5.3.1.2.2 Every 100km, there are at least two accelerations from a standstill at full throttle. Accumulated reverse gear driving is not less than 200m. Brake at least 2 times. The rate of change of vehicle speed before and after braking shall not be less than 30%. 5.3.1.2.3 When driving on mountain roads, make at least one uphill stop and start every 100km. Use the service brake to stop on a ramp of not less than 6%. Transmission is in neutral. Use the parking brake to stop. Then proceed to the ramp start as normal. 5.3.1.2.4 The proportion of night mileage shall be no less than 10% of the total mileage of the test.

5.3.2 Accelerated reliability running test

5.3.2.1 Test mileage allocation According to user association (see Annex B) or testing ground specifications,

5.6.2 Pickup record When picking up the vehicle, record the vehicle information and fill in the failure record form (see Table D.1).

5.6.3 Driving record During the test, the driving information of the vehicle shall be recorded and the driving record form shall be filled in (see Table D.2).

5.6.4 Failure record During the test, after a failure occurs, the vehicle failure, repair and maintenance records shall be filled in. The information recorded includes: - Assembly name: The upper-level assembly to which the faulty component belongs; - Failure mileage: The difference BETWEEN the odometer reading when the failure is found AND the odometer reading when sampling is multiplied by the odometer correction coefficient. NOTE: The odometer reading at the time of sampling refers to the odometer reading of the vehicle at the time of sampling. If the sample is sent to the manufacturer, it is the odometer reading of the vehicle when the tester receives the sample. - Failure description: Use simple and clear language to describe the failure phenomenon and the working conditions when the failure occurs. Write specific values for all possible quantitative descriptions. When necessary, a schematic diagram or a photo shall be drawn, and the shape and size of the failure location shall be marked; - Analysis of failure cause: Determine the cause of the failure through observation and analysis of the failure phenomenon, size measurement. Causes of failure include vehicle factors and human factors. Vehicle factors can be further divided into design issues, quality issues, and production issues; - Failure consequences: Parking, performance degradation, traffic accidents; - Treatment measures: Specific fault repair methods; - Failure parking time: Including waiting time, diagnosis time, fault repair time, debugging time.

5.6.5 Maintenance and repair record During the test, when the vehicle is being maintained and repaired, the vehicle information and the maintenance and repair record form shall be filled in (see Table D.3).

5.6.6 Replacement record If the vehicle needs to replace parts or update software due to repair, maintenance or other reasons, the part number or software version number shall be clearly indicated in the running record.

5.6.7 Vehicle dismantling and inspection records

5.6.7.1 During and after the vehicle test, to check the abrasion and other abnormal phenomena of the internal structure of each assembly, the main assembly (such as body, vehicle energy, engine/drive motor, clutch, transmission, drive axle, steering gear) shall be partially or completely disassembled and recorded in accordance with the provisions of the corresponding test procedures. NOTE: On-board energy refers to the combination of inverters and energy storage devices for electric vehicles and gas-fuel vehicles.

5.6.7.2 The content and operation of the specific items of disassembly and inspection shall be carried out in accordance with the provisions of the product maintenance manual.

5.6.7.3 Failures found during dismantling and inspection shall be included in indicator statistics. The time for disassembly and inspection is included in the repair time.

6 Test data processing