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**NATIONAL STANDARD OF THE
PEOPLE'S REPUBLIC OF CHINA**

GB/T 47315-2026

**Road simulation rig test method for the structural durability of
motor vehicles**

汽车结构耐久性道路模拟台架试验方法

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1 Scope

GB/T 47315-2026 is the Chinese national standard covering shaking a whole vehicle on a rig until it fails - the road load data collected on a proving ground, the target signals reproduced by hydraulic actuators and the acceleration factor that compresses a vehicle's life into weeks. First edition, 17,000 words, in force since 1 October 2026. It was issued on 31 March 2026 and takes effect on 1 October 2026, as a first edition. The document is under the responsibility of the Ministry of Industry and Information Technology. This page is published from the official record of the 2026 edition; the clause text of a standard this recent is not yet in circulation, and the figures, limits and tables it contains are those of the document itself, delivered in full with the English translation.

This document specifies the test conditions, instruments, equipment, test vehicle, test procedures, test data processing, and test report for the road simulation rig test method for motor vehicles structural durability. This document applies to spindle-coupled and tire-coupled tests of vehicle structural durability based on road load signals. Spindle-coupled and tire-coupled tests of vehicle structural durability based on other input

load signals shall be performed with reference to this document. This document applies to Category-M and N vehicles; other vehicle types may refer to this document for reference.

2 Normative References

The contents of the following documents constitute indispensable clauses of this document through the normative references in the text. 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/T 12534 Motor Vehicles - General Rules of Road Test Method

GB/T 12674 Motor Vehicles, Trailers and Combination Vehicles Mass Parameters Measurement Method

GB/T 12678 Reliability Running Test Method for Motor Vehicles QC/T

34 Fault Modes and Classification for Vehicles

3 Terms and Definitions

The following terms and definitions are applicable to this document.

3.1 spindle-coupled test A road simulation test that applies load to the vehicle via the spindle head. The ratio of the pseudo damage value of the response signal within the control bandwidth to the pseudo damage value of the desire signal.

4 Test Conditions

The ambient temperature should ideally be 10 C to 35 C. For special environmental adaptability tests, environmental conditions can be set as needed.

5 Instruments and Equipment

5.1 Instruments and equipment include spindle-coupled rig system/tire-coupled rig system, data acquisition system, axle (wheel) weight meter for motor vehicle testing, six-axis wheel force transducer and accessories, acceleration sensors and displacement sensors, etc.

5.2 Instruments and equipment shall be regularly calibrated to ensure measurement traceability.

5.3 The main measurement parameters, their units, and accuracy requirements shall conform to the provisions of Table 1. Table 1 -- Main Measurement Parameters, Their Units and Accuracy

6 Test Vehicle

6.1 The test vehicle and its dimensions, mass parameters, and wheel alignment parameters shall conform to the technical specifications stipulated by the manufacturer.

6.2 All systems, assemblies, accessories, and auxiliary devices shall conform to the technical requirements stipulated by the manufacturer.

6.3 It is advisable to select a representative vehicle configuration related to structural durability.

6.4 The test vehicle and the road load spectrum acquisition vehicle shall be of the same configuration, preferably the same prototype vehicle, or determined by the manufacturer.

6.5 Before the test, the categories of test objects shall be determined based on factors such as the development stage of the test vehicle, the condition of the test vehicle, and the adequacy of the test object assessment in this document. These categories include primary test objects, secondary test objects, and non-test objects. Statistics on each category of test objects are provided in Appendix A. Each category of test object can be considered from the perspective of the whole vehicle, system, or component.

7.1 Vehicle Preparation

7.1.1 Vehicle condition check Based on the test demands, check and confirm the key parameters, critical parts, and components of the vehicle. Relevant records and results shall be filled in accordance with Table B.1 in Appendix B.

7.1.2 Parameter measurement and adjustment

7.1.2.1 Tire pressure measurement and adjustment During the tire-coupled test, the tire pressure of the entire vehicle shall be measured and adjusted to match the condition at the time of road load spectrum acquisition and meet the technical conditions specified by the manufacturer. Relevant records and results shall be filled in accordance with Table B.2.

7.1.2.2 Wheel alignment parameter measurement and adjustment In accordance with the manufacturer's wheel alignment specifications, measure and adjust the wheel alignment parameters. Relevant records and results shall be filled in accordance with Table B.3.

7.1.2.3 Mass parameter measurement In accordance with the manufacturer's design requirements, determine the test load. The form and position of the counterweight should be consistent with the condition at the time of road load spectrum acquisition. The load error shall meet the requirements of Table 2. In accordance with GB/T 12534, perform loading; in accordance with GB/T 12674, measure the overall vehicle mass parameters. Relevant records and results shall be filled in accordance with Table B.4. Table 2 -- Load Error constraints. Refer to Table B.6 for other preparatory work.

7.2 Rig Preparation

7.2.1 System status confirmation Confirm that the rig system is safe, reliable, and functionally normal.

7.2.2 On-site layout of rig system In accordance with the wheel track and wheelbase parameters of the test vehicle, adjust the test rig to meet vehicle installation requirements. During the spindle-coupled test, the wheel offset in the rig status shall be consistent with the wheel offset of the actual vehicle. Before vehicle installation, configure all parameters of the six-axis wheel force transducer. In the rig status, the coordinate system of the six-axis wheel force signal shall be consistent with the coordinate system of the six-axis wheel force signal during road load spectrum acquisition. Zero all channel signals and check the polarity of each channel.

7.2.3 Test vehicle installation Install the test vehicle; all sensor connections shall be normal.

7.2.4 Cooling device arrangement Arrange a cooling device to ensure that the temperature of components, for example, vibration dampers, remains within the normal operating range during the test.

7.2.5 Test system adjustment Adjust the PID values of the spindle-coupled rig system/tire-coupled rig system, and it shall be ensured that the system is in the optimal state. NOTE. PID adjustment is a system control mode, including proportional control, integral control and differential control.

7.3 Data Preparation

7.3.1 Data import The data required for the rig test comes from the preliminary road load spectrum acquisition work. The road load spectrum acquisition scheme includes the determination of working conditions and road load signals. Working conditions include, but are not limited to, the enhanced durability test conditions at the test site. The design of specific specifications is determined by the manufacturer or testing institution.

7.4.5 Generate drive file program

7.4.5.1 In accordance with the requirements of the manufacturer or testing institution, edit the sequence and number of loops of each drive file to generate the drive file program. In accordance with the method in GB/T 12678, determine the number of loops corresponding to the test conditions in the test field.

7.4.5.2 It is advisable to have test field durability mileage and user usage mileage corresponding to the rig test duration, and the correspondence shall comply with the provisions of the manufacturer's or testing institution's test specifications.