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

GB/T 29041-2023

Replacing GB/T 29041-2012

Road wear testing methods for motor vehicle tyres

汽车轮胎道路磨损试验方法

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1 Scope

China's national test method for the road wear performance of motor vehicle tyres. It describes the method for testing tyre wear on the road, including the test equipment and its requirements, the test records and the transposition diagrams, and it applies to the comparative wear testing of new passenger car pneumatic tyres, micro and light truck pneumatic tyres, truck pneumatic tyres and their retreads. Tyre wear cannot be measured in a laboratory in any way that predicts the road. A drum machine wears a tyre against a steel surface at a constant load and a constant slip angle, and the rate it produces bears no reliable relationship to what the same tyre does on a real surface, in real traffic, at real temperatures, with a real driver. So the industry measures wear by driving, and the whole difficulty of the method is that the road is not a controlled environment. The answer is comparison rather than absolute measurement, and transposition rather than repetition. The tyres under test and a reference tyre are run on the same vehicles over the same route at the same time, so that the weather, the surface, the traffic and the driver affect all of them equally. And the tyres are moved between wheel positions on a defined schedule - the transposition - because a front tyre and a rear tyre on the same vehicle wear at completely different rates, and a tyre left in one position measures the position rather than itself. That is

why the transposition diagrams occupy three annexes and half the document: for each vehicle class there is a defined rotation pattern, and following it exactly is what makes the result mean anything. The standard also fixes the route, the load, the pressure, the speed, the measurement of tread depth and the calculation of the wear rate. Issued on 28 December 2023 and in force since 1 July 2024, it replaces GB/T 29041-2012.

This document describes the test method for testing the road wear performance of automobile tyres, including test equipment and its requirements, test records, transposition diagrams. This document is applicable to the wear comparison test of new passenger car's pneumatic tyres, micro/light truck's pneumatic tyres, truck pneumatic tyres and their retreaded tyres.

2 Normative references

The contents of the following documents constitute essential clauses of this document through normative references in the text. For reference documents with dates, only the versions corresponding to the dates apply to this document; for reference documents without dates, the latest versions (including all amendments) apply to this document.

GB/T 521 Test methods for measuring peripheral dimensions of tyres

GB/T 2977 Size designation, dimensions, inflation pressure and load capacity for truck tyres

GB/T 2978 Size designation, dimensions, inflation pressure and load capacity for passenger car tyres

GB/T 3730.1 Terms and definitions of motor vehicles, trailers and combination vehicle - Part 1: Types

GB/T 3730.3 Motor vehicles and towed vehicles - Dimensions of vehicles - Terms and definitions

GB/T 6326 Tyre - Vocabulary

GB/T 7037 Truck retread tyres

GB 9743 Passenger car tyres GB 9744 Truck tyres

GB/T 14646 Retreaded tyre for passenger car accuracy of ± 5 kPa.

4.4 Wheel load meter or other mass measuring instrument, which has an accuracy of ± 5 kg.

4.5 Dynamic balancing machine, which has an accuracy of ± 5 g.

4.6 Tread depth gauge or other tread depth measuring instrument, which has an accuracy of $\pm$

0.02 mm.

5.1.1 Test tyre requirements

5.1.1.1 New tyres for testing shall meet the safety performance requirements specified in GB 9743.

5.1.1.2 Retreaded tyres for testing shall meet the safety performance requirements specified in GB/T 14646.

5.1.1.3 The rubber residue on the tyre tread (air vent rubber column, flash) should be removed and trimmed for the test tyres.

5.1.2 Selection of test road The test road can be selected according to the test purpose.

5.1.3 Test vehicle requirements

5.1.3.1 The manufacturers and models of vehicles in the same convoy shall be the same; they shall have the same drive system, brake system, suspension system.

5.1.3.2 The load carried by each tyre for the test shall be 60% ~ 70% of the load capacity specified in GB/T 2978 or relevant industry technical documents.

5.1.3.3 After the vehicle is loaded as required, it shall be parked for at least 24 hours. If the suspension system is abnormal during this period, the vehicle cannot be used for testing.

5.1.3.4 Before starting the test, the test vehicle shall be subjected to complete maintenance. If any abnormality is found, it shall be recorded and corrected, to ensure the normal operation of the vehicle.

5.1.3.5 After each tyre trans-position and before the test, the test vehicle shall be subjected to daily maintenance. If any abnormality is found, it shall be recorded and corrected, to ensure the normal operation of the vehicle.

5.1.3.6 Test tyres of the same brand, specification, structure, pattern shall be installed on the same axle of the test vehicle.

5.1.3.7 Install the test tyre on the rim specified in GB/T 2978 or relevant industry technical documents; inflate it. The inflation pressure of standard tyres is $250 \text{ kPa} \pm 5 \text{ kPa}$; the inflation pressure of reinforced tyres is $290 \text{ kPa} \pm 5 \text{ kPa}$.

5.1.3.8 Before each test after transposition, the tyre-rim assembly shall be subjected to dynamic balancing test; the balance block shall be re-adjusted and recorded.

5.1.4 Test procedure

5.1.4.1 The total test mileage should be $25500 \text{ km} \pm 30 \text{ km}$ (the first 1500 km is the running-in period). After the running-in period, transposition should be performed according

to

5.1.4.3 every 3000 km $\pm$ 30 km.

5.1.4.2 The tread depth shall be measured according to GB/T 521 before the test, after running-in, and at each transposition.

5.1.4.3 The test tyre transposition should be in a rear cross pattern, that is, the tyre on the front axle of the test vehicle shall be trans-positioned to the wheel position on the other side of the rear axle of the vehicle; the tyre on the rear axle shall be trans-positioned to the front axle on the same side of the next vehicle in the convoy; the tyre on the rear axle of the last test vehicle in the convoy shall be trans-positioned to the front axle on the same side of the first test vehicle in the convoy. If there is only one test vehicle, the tyre transposition is only performed on this vehicle during the entire test. The test vehicles shall maintain the same order in the convoy during the entire test.

5.1.4.4 The test vehicle shall travel at a speed of 0 km/h ~ 120 km/h, of which at least 45% of the distance shall be traveled at a speed of 60 km/h ~ 120 km/h. The test vehicles in the same convoy shall travel on the same route and at the same speed as much as possible.

5.2.1 Test tyre requirements

5.2.1.1 New tyres for testing shall meet the safety performance requirements specified in GB 9744.

5.2.1.2 The retreaded tyres used for the test shall meet the safety performance requirements specified in GB/T 7037.

5.2.4.3 The transposition of the test tyres should be rear cross, that is, the tyres on the front axle of the test vehicle shall be trans-positioned to the wheel position on the other side of the rear axle of the vehicle; the tyres on the rear axle shall be trans-positioned to the front axle on the same side of the next vehicle in the convoy; the tyres on the rear axle of the last test vehicle in the convoy shall be trans-positioned to the front axle on the same side of the first test vehicle in the convoy. If there is only one test vehicle, the tyre transposition will be carried out only on that vehicle during the entire test. The test vehicles shall maintain the same order in the convoy during the entire test.

5.2.4.4 The test vehicle shall travel at a speed of 0 km/h ~ 120 km/h, of which at least 45% of the distance shall be traveled at a speed of 60 km/h ~ 120 km/h. Test vehicles in the same convoy shall travel on the same route and at the same speed as far as possible.

5.3.1 Test tyre requirements

5.3.1.1 New tyres for testing shall meet the safety performance requirements specified in GB 9744.

5.3.1.2 The retreaded tyres used for the test shall meet the safety performance