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**Testing methods for the adhesion coefficient of motor vehicle
inspection equipment and sites**

机动车检验设备及场地附着系数检测方法

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1 Scope

China's national test methods for the adhesion coefficient of vehicle inspection equipment and sites. Brake testing at an inspection station measures the force a vehicle's brakes develop, and on a roller brake tester that force is limited by the grip between tyre and roller rather than by the brakes themselves. If the roller surface is worn, contaminated or wet, the wheel slips before the brake reaches its capability, and a vehicle with perfectly adequate brakes fails the test. The same applies to a plate tester and to the road surface used for a

decelerometer test. So the adhesion coefficient of the equipment and the site is a calibration property that has to be measured and maintained, and it is the one most often neglected - a station whose rollers have polished smooth over years produces systematically low readings that nobody questions because the equipment is otherwise calibrated.

This document describes the testing methods of adhesion coefficient for motor vehicle inspection equipment and sites, and specifies the technical requirements for test conditions, test equipment and processing of test results. This document applies to the testing of adhesion coefficient for inspection equipment and sites of motor vehicle inspection and testing institutions.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. 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 8170-2008, Rules of rounding off for numerical values & expression and judgment of limiting values

GB/T 42685-2023, Terminology of power-driven vehicle inspection

3 Terms and definitions

For the purposes of this document, the following terms and definitions, as well as those given in GB/T 42685-2023, apply.

3.1 road test lane Test lane used for road testing of motor vehicle service braking performance. [Source: GB/T 42685-2023, 3.4.13]

3.2 parking ramp Ramp used for road testing of motor vehicle parking braking performance. Description of indexing numbers: 1 - object being tested; 2 - rubber layer; 3 - counterweight; 4 - tension sensor; 5 - traction rope; 6 - fixed pulley; F - horizontal tension. Figure 2 - Schematic diagram of the test device for traction adhesion coefficient

5.2.2 Technical requirements

5.2.2.1 The sum of the masses of the counterweight, rubber layer and tension sensor is (40 ± 2) kg.

5.2.2.2 Rubber layer: The rubber tires are of specification 225/50R18, which are cut, laid flat and pasted together.

5.2.2.3 Tire rubber material: conventional tire (BR) butadiene rubber, Shore hardness 60

HA ~ 75 HA.

5.2.2.4 Tire pattern: The longitudinal pattern shall be consistent with the traction direction (i.e., the direction of vehicle travel), and the tire pattern depth shall be no less than

5.2.2.5 Rubber layer contact area: 200 mm x 140 mm.

5.2.2.6 Tension sensor measurement range: 0 N ~ 500 N, indication error: no more than $\pm 1\%$.

5.2.2.7 The maximum value holding time of the display device shall not be less than 5 s.

6.1 Roller surface adhesion coefficient of roller reaction brake test bench

6.1.1 Place the test wheel of the wheel adhesion coefficient test device on the upper generatrix of the roller to be tested and apply a normal force to the test wheel in accordance with the provisions of 5.1.2.1.

6.2.4 Repeat the test 6 times according to the method specified in

6.2.3 and calculate the adhesion coefficient according to Formula (1).

6.2.5 Test the center and both ends (about 100 mm from the edge of the roller) of the roller. For equipment in use, test the commonly used positions and the most severely worn positions, and take the minimum value as the adhesion coefficient test result.

6.3 Flat-plate brake test bench brake plate surface adhesion coefficient

6.3.1 Place the rubber layer and counterweight of the traction adhesion coefficient test device on the brake plate to be tested. Along the braking force test direction, gradually apply a tensile force (F) parallel to the longitudinal geometric center line of the surface of the plate to be tested to the tension sensor (see Figure 2). Read the maximum value measured by the tension sensor when the rubber layer and the counterweight go from static to relative slippage, which is the adhesion force.

6.3.2 Repeat the test 6 times according to the method specified in

6.3.1 and calculate the adhesion coefficient according to Formula (3). Where: m - the sum of the masses of the counterweight, rubber layer and tension sensor, in kilograms (kg); g - acceleration due to gravity, taken as

6.3.3 Test the front, middle and rear positions of the brake plate surface. For equipment in use, test the commonly used positions and the most severely worn positions, and take the minimum value as the adhesion coefficient test result.

6.4 Slide plate parking brake test device slide plate surface and inspection station ground adhesion coefficient

6.4.1 Test the adhesion coefficient according to the methods specified in

6.3.1 and 6.3.2.

6.4.2 Test the surface of the slide plate and the front, middle and rear positions of the inspection station. For equipment in use, test the commonly used positions and the most severely worn positions, and take the minimum value as the adhesion coefficient test result.

6.5.1 Test the adhesion coefficient according to the methods specified in

6.3.1 and 6.3.2.

6.5.2 Test the front, middle and rear positions of the ground in front of and behind the workstation. For the workstations in use, the commonly used positions and the positions with the most severe wear shall be tested, and the minimum value shall be taken as the adhesion coefficient test result.

6.6.1 Test the adhesion coefficient according to the methods specified in

6.3.1 and 6.3.2.

6.6.2 Divide the road test lane into left and right sides; test the front, front-center, center, center-rear and rear positions. For the road test lane in use, the commonly used positions and the most severely worn positions shall be tested, and the minimum value is taken as the adhesion coefficient test result.

6.7.1 Test the adhesion coefficient according to the methods specified in

6.3.1 and 6.3.2.

6.7.2 Divide the road surface of the inspection station into left and right sides, and test the front, middle and rear positions. For the working stations in use, the commonly used positions and the most severely worn positions shall be tested, and the minimum value shall be taken as the adhesion coefficient test result.