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**NATIONAL STANDARD OF THE
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**Road vehicles - Air and air/hydraulic braking systems of motor
vehicles test procedures**
(English Translation)

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1 Scope

This document specifies the general requirements and describes the test methods for air and air

/ hydraulic braking systems for road vehicles.

This document applies to Category M2, M3, N2 and N3 vehicles equipped with the air and air / hydraulic braking systems as defined in GB/T 5620 and satisfying the provisions of GB/T

15089.

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 5620 Road Vehicles - Vocabulary and Definition for Braking of Automotive Vehicles and

Their Trailers (GB/T 5620-2020, ISO 611.2003, IDT)

GB 12676-2014 Technical Requirements and Testing Methods for Commercial Vehicle and Trailer Braking Systems

GB/T 13594 Antilock Braking Performance and Testing Procedure for Motor Vehicles and Their Trailers

GB 34660 Road Vehicles - Requirements and Test Methods of Electromagnetic Compatibility

ISO 11992 (all parts) Road Vehicles - Interchange of Digital Information on Electrical Connections between Towing and Towed Vehicles

ISO 21069-1 Road Vehicles - Test of Braking Systems on Vehicles with a Maximum Authorized

Total Mass of over 3.5 t Using a Roller Brake Tester - Part 1. Pneumatic Braking Systems

ISO 21069-2 Road Vehicles - Test of Braking Systems on Vehicles with a Maximum Authorized

Total Mass of over 3.5 t Using a Roller Brake Tester - Part 2. Air over Hydraulic and Purely Hydraulic Braking Systems

3 Terms and Definitions

The terms and definitions defined in GB/T 5620, GB 12676-2014 and GB/T 13594, and the following are applicable to this document.

3.1

pressure indicated by manufacturer

The pressure in the energy storage device specified by the manufacturer.

NOTE: this is generally the cut-in pressure specified in GB/T 5620.

3.2

maximum pressure

The pressure available for normal vehicle operation.

- a) If a pressure regulating device is installed, then, it is the cut-out pressure of the device;
- b) For air compressors equipped with a pressure limiting function, then, it is 90% of the ultimate pressure.

3.3

minimum pressure

The pressure available for normal vehicle operation.

- a) If a pressure regulating device is installed, then, it is the re-energizing pressure of the device;
- b) For air compressors equipped with a pressure limiting function, then, it is 90% of the limiting pressure indicated by the manufacturer.

4 Symbols

The following symbols apply to this document.

am. average braking deceleration.

E. wheelbase.

F. actuation force.

Fi. normal reaction force of the road surface on the ith axis under static conditions (the value of i is 1, 2, 3, etc.).

FMd. total normal static reaction force of the road surface on the unbraked and driven axles of a motor vehicle.

FMnd. total normal static reaction force of the road surface on the unbraked and non-driven axles of a motor vehicle.

FWm. rolling resistance, $0.01 FMnd + 0.015 FMd$.

g. acceleration of gravity.

h. height of center of mass.

kHpeak. maximum value on the "adhesion coefficient vs. slip ratio" curve on a high-adhesion road surface.

kLpeak. maximum value on the "adhesion coefficient vs. slip ratio" curve on a low-adhesion road surface.

n. number of braking operations.

PM. vehicle mass.

p1.65% of p2.

p2.pressure specified by the manufacturer to achieve the specified performance of the service brake system.

t0.average test time.

t1, t2, t3.pumping time.

v. vehicle speed.

vmax. maximum vehicle speed.

v1.speed at the start of braking.

v2.speed at the end of braking.

Deltat. duration of the braking cycle (the time elapsed between the start of one braking operation and the start of the next).

5.1 Test Site

The test site should be sufficiently open and free of obstacles to ensure safety.

The test site shall have an acceleration path of sufficient length before the test area to allow vehicles to reach the test vehicle speed.

The test site should have.

- a) Sufficient length to ensure that vehicles with poor braking performance can complete the test;
- b) Sufficient width to ensure the safety of vehicles with poor directional stability during braking.

5.2.1 Road surface

The test area shall be dry, flat and hard. Unless otherwise specified, the coefficient of adhesion shall not be less than 0.8.

5.2.2 Slope

5.2.2.1

The slope over any 50 m longitudinal length of the test road shall be less than $\pm 1\%$.

5.2.2.2

Type II and Type IIA road surface conditions are shown in Table 1.

5.2.2.3

The parking brake system hill-hold test may be conducted on the slope specified in 10.3 and 15.1 or on a level surface.