



China-Brake System Performance for Power-Driven Vehicles Operating on Roads

1 Introduction

Note: Nothing in this standard supercedes applicable laws and regulations.

Note: In the event of conflict between the English and domestic language, the English language shall take precedence.

1.1 Purpose. This standard specifies the basic technical requirements and inspection methods for operating safety of complete vehicles, as well as main assemblies, safety protection devices, etc., of power driven vehicles. The testing in this standard is consistent with the requirements of the National Standard of the People's Republic of China, GB 7258-2012 and GB 21861-2014.

1.2 Applicability. This standard applies to motor driven, four-wheeled vehicles operating on roads in China.

1.3 Remarks. This standard contains the brake performance requirements for motor driven, four-wheeled vehicles marketed in the People's Republic of China. Test is performed on a motor driven roller-type braking test bed. For other vehicles, such as motorcycles, refer to the regulation GB 7258 for modifications or additions to these requirements. GB 7258 section 2 lists other China documents that are informative for brake system design for vehicles marketed in China.

2 References

Note: Only the latest approved standards are applicable unless otherwise specified.

2.1 External Standards/Specifications.

GB 7258-2012 GB 21861-2014 GB/T 13564-2005

2.2 GM Standards/Specifications.

None

3 Resources

3.1 Facilities.

3.1.1 Calibration. The test facilities and equipment shall be in good working order and shall have a valid calibration label.

3.1.2 Alternatives. Alternative test facilities and equipment may also be used. However, all measuring variables as specified in this standard shall be determined correctly with respect to their physical definition.

3.1.3 The roller dynamometer shall be a motor driven, constant speed dynamometer that generates enough torque to allow each tire to reach peak traction. An example roller-type braking test bed is shown in Figure 1.

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Figure 1: Roller Type Brake Test Bed

3.1.3.1 Requirements.**3.1.3.1.1 Roller Dynamometer.**

3.1.3.1.1.1 Brake inspection of motor vehicle shall select roller-type braking test bed of relevant loading capacity in accordance with axle load of the test vehicle.

3.1.3.1.1.2 Table 1 defines additional roller dynamometer requirements. See GB/T 13564-2005 for detailed information.

Table 1: Technical Parameters

Item	Rated loading capacity		
	3t	10t	13t
Maximum Static Load Offset (N)	± 22.5 N	± 75 N	± 97.5 N
Maximum Dynamic Zero Offset (N)	± 0.6% Full Scale (FS)	± 0.2% FS	± 0.2% FS
Test speed (km/h)	≥ 2.2, 2.5 is recommended		
Roller diameter (mm)	≥ 240, 245 is recommended		
Center distance of driving roller and driven roller (mm)	430 mm ± 10 mm is recommended	450 mm ± 10 mm is recommended	470 mm ± 10 mm is recommended
Height difference between driving roller and driven roller (mm)	Approximately 0 mm to 30 mm		
Slipping adhesion coefficient of roller	≥ 0.70 μ		
Roller Surface Runout (mm)	≤ 2 mm		
Roller Surface Parallelism between Driving and Driven Roller (mm/m)	≤ 1 mm/m		

3.1.3.1.2 Digital display.

3.1.3.1.2.1 The maximum indicated value of braking force shall be no less than 60% of rated load capacity of roller on one (1) wheel.

3.1.3.1.2.2 Display time of the maximum indication value of braking force shall be not less than 8 s.

3.1.3.1.2.3 Resolution shall be not more than 0.1% FS.

3.1.3.1.3 Data Acquisition

3.1.3.1.3.1 The data shall be recorded at 100 Hz.

3.1.3.1.3.2 Data shall be recorded for no less than 3 s, except under the condition of shutdown for protection.

3.1.3.1.3.3 The maximum braking force shall be selected among all data collected during entire process of braking inspection and shall be displayed.

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3.1.4 Vehicle weighing facility with ballast is required.

3.2 Equipment.

3.2.1 Roller dynamometer as described in 3.1.3.

3.2.2 Service brake pedal force transducer.

3.2.3 Parking brake apply force transducer.

3.3 Test Vehicle/Test Piece. As specified in test request. Vehicle should be tested at curb plus driver mass unless the results indicate that additional testing at gross vehicle mass condition should be done.

3.4 Test Time.

Calendar time: 0.5 days

Test time: 0.5 hours

Coordination time: 0.5 hours

3.5 Test Required Information. Not applicable.

3.6 Personnel/Skills. An experienced brake technician or engineer trained to complete the instruction in Section 4 is required.

4 Procedure

4.1 Preparation.

4.1.1 Build vehicle as requested in test request.

4.1.2 Brake dynamometer rollers shall be clean, dry, and free from foreign body and any form of contamination (such as oil stain).

4.1.3 For vehicles with pneumatic actuated brakes, air pressure of reservoir shall ensure that, when the brake force test of each axle is performed, air pressure of the reservoir shall not be less than the minimum air pressure of the moving vehicle (in case of no marking of minimum air pressure, it shall be deemed as 400 kPa).

4.1.4 Install pedal force transducer on the service brake pedal and park brake pedal or lever.

4.2 Conditions.

4.2.1 Environmental Conditions. Not applicable.

4.2.2 Test Conditions. Deviations from the requirements of this standard shall have been agreed upon. Such requirements shall be specified on component drawings, test certificates, reports, etc.

4.3 Instructions.

4.3.1 Design Verification. Complete the brake system design verification sign-off sheets in Appendix A, Data Sheet A1. Make any necessary measurements to verify the design in accordance to GB7258 section 7 brake system.

4.3.2 Drive the vehicle under test onto the roller dynamometer and align wheels in the straightforward position.

4.3.3 Place transmission in neutral gear and release the brake pedal. For full-time, four-wheel drive vehicle, wheels that are not under test shall be located on auxiliary free rollers meeting requirements of the coefficient of adhesion.

4.3.4 Measure the static load of each corner on the test bed.

4.3.5 Start roller motor and allow it to spin for 3 s to measure brake drag.

4.3.6 As indicated on the dynamometer, depress the brake pedal rapidly and smoothly to the target pedal force. The target pedal force is ≤ 400 N for curb mass plus driver and ≤ 500 N for gross vehicle mass.

4.3.7 Maintain the pedal force until the roller dynamometer motor shuts down due to a 70 N drop of braking force from peak force or test reaches 5 s maximum duration.

4.3.8 Measure and record the values of left and right brake force during the whole process of the pedal force apply. Report the maximum braking force of left and right wheel.

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