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GB/T 18343-2001

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### Technical Specifications for Motor Vehicle Brake System

汽车制动系统修理竣工技术规范

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## Foreword

This Standard was drafted as per the rules specified in GB/T 1.1-2009.

This Standard replaced GB/T 18274-2000 Technical Specifications for Motor Vehicle Drum Brake Being Overhauled, GB/T 18275.1-2000 Specifications for Automobile Braking Transmission Device Being Overhauled – Air Braking, GB/T 18275.2-2000 Specifications for Automobile Braking Transmission Device Being Overhauled – Hydraulic Braking, and GB/T 18343-2001 Specification for Automobile Disk Brakes Being Overhauled; this Standard has the major technical changes as follows besides the editorial modifications:

- Add the technical requirements for brake's parking brake devices (see 4.6);
- Add the requirements for warranty period of brake maintenance (see 6.2).

This Standard was proposed by Ministry of Transport of the PRC.

This Standard shall be under the jurisdiction of National Technical Committee for Standardization of Automobile Maintenance (SAC/TC 247).

Drafting organizations of this Standard: Research Institute of Highway of Ministry of Transport, Hangzhou Changyun Transport Group Co., Ltd., and Zhejiang Institute of Communication.

Chief drafting staffs of this Standard: Liu Jiannong, Jin Baizheng, Zhu Guojun, Zhao Jinxiang, Zhan Yuanwu, and Zhang Mingjian.

The historical editions replaced by this Standard are as follows:

- GB/T 18274-2000;
- GB/T 18275.1-2000;
- GB/T 18275.2-2000;
- GB/T 18343-2001.

# Technical Specifications for Motor Vehicle Brake System

## 1 Scope

This Standard specifies the technical requirements and test rules for the completion of disk brake, drum brake, air braking transmission device, hydraulic braking transmission device and parking brake device being overhauled.

This Standard is applicable to the overhaul of brakes and brake transmission devices for automobiles and trailers; the overhaul of brakes for other types of vehicles can refer to.

## 2 Normative References

The following documents are essential to the application of this document. For the dated documents, only the versions with the dates indicated are applicable to this document; for the undated documents, only the latest version (including all the amendments) are applicable to this document.

GB/T 5624 Motor Vehicle Maintenance and Repair Terms

GB 5763 Brake Linings for Automobiles

GB 7258 Safety Specifications for Motor Vehicles Operating on Roads

## 3 Terms and Definitions

The following terms and definitions and those ones stipulated in GB/T 5624 are applicable to this document.

### 3.1 Safety repair size

The minimum size allowed for cutting after wear of the surface of the friction pair element in the brake.

**4.2.3.2** After wearing, the thickness of the brake friction block of vehicle shall meet the original technical requirements of the manufacturer; if there is no specified thickness value, and the value is less than 1.5mm, then it shall be replaced.

**4.2.3.3** After wearing, the thickness of brake friction block of large passenger car shall meet the original technical requirements of the manufacturer; if there is no specified thickness value, and the value is less than 2.0mm; then it shall be replaced.

**4.2.3.4** When the flat groove of the brake friction block is flattened completely, it shall be replaced.

**4.2.3.5** When the brake friction block doesn't meet the original technical requirements of the manufacturer; the wheels on both sides of the coaxial shaft must be replaced at the same time.

**4.2.3.6** When installing, it shall be kept clean and dry. For floating caliper brake, after installing the internal friction block, check that the dirt-proof boot not to contact with the brake friction block.

#### **4.2.4 Maintenance data**

**4.2.4.1** The maintenance reference data of the common brake disc and brake friction block of the vehicles can see Table A.1.

**4.2.4.2** The maintenance reference data of the common brake disc and brake friction block of the large passenger car can see Table A.2.

### **4.3 Drum brake**

#### **4.3.1 Brake drum**

**4.3.1.1** The brake drum shall be replaced timely in the following cases:

- a) Measure the amount of wear of the brake drum at both the narrow and wide sides of the friction surfaces at right angles to each other; measure the diameter of the brake drum at every 45° point on the circumference and at the bottom of deepest groove; when the diameter of brake drum exceeds the rejection size or although it is not exceeding the rejection size, after the cutting process, its diameter exceed the safe repair size;
- b) The cylindricity error of the brake drum friction surface shall be no greater than 0.05mm; the roundness error shall be no greater than 0.155mm; surface roughness shall be no less than Ra1.6; the radical run-out of the cylinder surface and the plane combined the friction surface of the brake drum with the hub shall be no greater than 0.10mm; the wall thickness difference of the brake drum shall be no greater than 1.00mm; the diameter difference between he right and left

**4.4.1.4** After repairing, the air compressor shall be worn out according to the wearing specification; the post-repairing air compressor shall meet the original technical requirements of the manufacturer.

#### **4.4.2 Brake valve**

##### **4.4.2.1 Brake valve parts**

The brake valve parts shall be replaced timely in the following cases:

- a) When the diaphragm, valve rubber, seal ring have deformation, crack or aging phenomena;
- b) When the valve or valve seat have scratches, dents or excessive wear;
- c) When brake valve housing and valve cover have cracks, deformations and defects;
- d) When the elasticity of balance spring and return spring of brake valve doesn't meet the original technical requirements of the manufacturer.

##### **4.4.2.2 Assembly and adjustment of brake valves**

**4.4.2.2.1** The preload of the balance spring shall meet the original technical requirements of the manufacturer; after the balance spring is assembled, both ends of the balance spring shall be perpendicular to its central axis; the permissible error shall not exceed  $2^\circ$ .

**4.4.2.2.2** Before the intake valve is assembled, check the distance between the intake valve seat and the end of valve stem, which shall meet the original technical requirements of the manufacturer.

**4.4.2.2.3** The distance between end face of the exhaust valve housing and the end of the valve stem shall meet the original technical requirements of the manufacturer.

**4.4.2.2.4** The free stroke of the brake valve pull arm shall be adjusted to 1mm~3mm; the maximum stroke of the brake pedal shall ensure the stable working air pressure of the brake air chamber.

##### **4.4.2.3 Inspection of sealing performance of brake valve**

**4.4.2.3.1** The brake valve is in the de-braking state; under the rated air pressure, the sealing index shall not exceed 10kPa.

**4.4.2.3.2** The brake valve is in full braking condition. Under the rated air pressure, the sealing index shall not exceed 20kPa.

hydraulic brake shall meet the original technical requirements of manufacturer.

**4.5.1.2** The surface roughness of the cylinder of the master cylinder and wheel cylinder in the stroke of the piston and on the outer cylindrical surface of the piston shall be no greater than  $Ra$  0.8.

**4.5.1.3** The tolerance BETWEEN cylinder of master cylinder and wheel cylinder AND outer diameter of piston shall meet the original technical requirements of the manufacturer; The dimensional tolerance of the inner hole of the cylinder of the wheel cylinder shall be selected as per Table 2.

**Table 2 – Dimensional Tolerance Form of the Inner Hole of the Cylinder of Wheel Cylinder**

Inner hole diameter of wheel cylinder	Tolerance grade
$D_i \leq 29$ mm	H9
$D_i > 29$ mm	H8

**4.5.1.4** If the master cylinder and wheel cylinder seals are deformed or aged, they shall be replaced.

**4.5.1.5** The installation position of the return spring of master cylinder and wheel cylinder shall be correct; its elasticity shall meet the original technical requirements of the manufacturer.

**4.5.1.6** Before assembling, the parts shall be cleaned; the master cylinder compensation hole, oil inlet, and vent hole of the fuel cap shall be kept clear.

**4.5.1.7** The sealing performance of the master cylinder and wheel cylinder shall meet the following requirements:

- a) When the brake fluid is added to the upper limit position of the reservoir, the master cylinder assembly shall not leak oil during the braking period.
- b) Connect the drain hole of the master cylinder to the wheel cylinder; fill the master cylinder, wheel cylinder and reservoir with brake fluid as per specification; discharge the air completely from the system; press the brake pedal to the end; establish the maximum working pressure in the brake chamber; after stabilizing for 30s, the pressure drop of each brake chamber shall be no greater than 300kPa.

**4.5.1.8** The pressure resistance of master cylinder and wheel cylinder shall meet the following requirements:

After  $15s \pm 5s$ , establish 130% of the maximum working pressure in the brake chamber; maintain the position of the push rod unchanged; each position shall be free of leakage

#### **4.5.4 Air pressure booster**

**4.5.4.1** The air pressure booster shall be replaced timely in the following cases:

- a) When the surface of the cylinder is worn, scratched or rusted;
- b) When the push rod has wear, bending and rusty phenomena; push rod in the center hole of the booster body shall be tight and moderate properly, maintain sliding freely; when the oil seal is aged, deformed or broken;
- c) When all springs are deformed or broken; the outlet valve shall be kept sealed if damaged;
- d) When the ball valve and valve seat on the top end of the booster cylinder have scratches, wear; the intake valve and seat are damaged or uneven.

**4.5.4.2** The air filter shall be unblocked; the filter screen shall be cleaned; replace it if it is damaged.

**4.5.4.3** After repair, the characteristics of input hydraulic pressure, compressed air pressure and output hydraulic pressure of the air pressure booster shall meet the original technical requirements of the manufacturer.

**4.5.4.4** Check the airtightness: the booster chamber cup, valves, tubes and joints shall not leak gas.

**4.5.4.5** Check the hydraulic seal: the oil seal of push rod, cup of booster cylinder and cup of control hydraulic cylinder shall not leak oil.

#### **4.5.5 Air pressure servo actuator**

**4.5.5.1** The air pressure servo actuator shall be replaced timely in the following cases:

- a) When the servo air chamber shell is damaged or cracked; the inner surface is scratched, rusted or abnormally worn;
- b) When the springs on the servo actuator are deformed, broken or the elasticity of the spring doesn't meet the original technical requirements of the manufacturer.
- c) When the seal rings and tube joints on the servo actuator are damaged.

**4.5.5.2** The retainer of the servo actuator shall not be damaged; and shall correctly match with its groove; ensure the effective locking of the piston.

**4.5.5.3** Check the airtightness: the booster air chamber, valves, tubes and joints shall not leak gas.

**4.5.5.4** Check the hydraulic seal and seal of hydraulic system, which shall not leak



oil.

#### **4.5.6 Brake fluid**

The added brake fluid shall meet the brand requirements of the original vehicle; different brands of brake fluids shall not be mixed to use. The brake fluid shall be clean, prevent mixing of impurities and moisture.

#### **4.5.7 Braking connections and braking lines**

The braking connections and braking lines shall meet the following requirements:

- a) After the hydraulic brake transmission device is installed; eliminate the air from the hydraulic system; the connection tubes and joints shall not have leakage phenomenon;
- b) The internal part of the tube shall be clean; the tube joints shall be sealed; the connection between the joints and the nuts and threads shall be intact;
- c) The tube installation shall be firm and reliable; the connection tubes and joints shall not interfere with other components.

#### **4.5.8 Brake pedal**

The clearance between the brake pedal bushing and pedal shaft shall not exceed 0.3mm. Under the normal assembly and use conditions, the brake pedal assembly shall ensure the flexible and light operation of the brake. The free stroke of the brake pedal shall meet the original technical requirements of the manufacturer.

### **4.6 Parking brake device**

**4.6.1** Each control device and transmission device of the parking brake system shall have good performance and reliable operation.

**4.6.2** Check and adjust the parking brake clearance and free stroke, so that they meet the original technical requirements of the manufacturer.

**4.6.3** Check the parking brake indicator switch, when the parking brake level is pulled up, it shall be ignited; when it is released, it shall be extinguished.

**4.6.4** Check the parking brake performance, under the no-load conditions, the parking brake device shall be able to ensure the vehicle to maintain motionless in the positive and negative directions on the 20% slope (15% for the vehicles with total mass about 1.2 times less of the unladen mass), or on the slope with the adhesion coefficient between tyre and road greater than or equal to 0.7; the time shall be greater than or equal to 5min; the locking device is reliable.

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Accountable person and shareholder: Wayne Zheng

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Contact: Wayne Zheng, [Sales@ChineseStandard.net](mailto:Sales@ChineseStandard.net)

Linkin: <https://www.linkedin.com/in/waynezhengwenrui/>

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