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Technical specifications for safety of power-driven vehicles operating on roads

机动车运行安全技术条件

[Including 2019XG1, 2021XG2 Amendment Lists]

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Technical specifications for safety of power-driven vehicles operating on roads

1 Scope

This standard specifies the basic technical requirements on the running safety such as motor vehicle main assembly and safety protection devices, as well as the additional requirements for the fire engines, ambulances, engineering rescue vehicles and police cars and vehicles for handicapped driving.

This standard applies to all motor vehicles traveling on the road in China. However, it does not apply to trams and wheeled special purpose mechanical vehicles which are not designed and manufactured for use on the road and mainly for the operation and construction in closed roads and places.

Note: Tram refers to the motor-driven, overhead power supply, track carrying road vehicles.

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 standard.

GB 811 Helmets for motorcyclists

GB 1589 Limits of dimensions, axle load and masses for motor vehicles, trailers and combination vehicles

GB/T 2408-2008 Plastics - Determination of burning characteristics - Horizontal and vertical test

GB/T 3181 Color standard for paint film

GB 4094 Motor vehicles - Symbols for controls, indicators and tell-tales

GB/T 4094.2 Electric vehicles - Symbols for controls, indicators and tell-tales

GB 4599 Motor vehicle headlamps equipped with filament lamps

GB 4785 Prescription for installation of the external lighting and light-

for motorcycles and mopeds

GB 17578 Requirements and test methods of strength for the superstructure of bus

GB/T 17676 Natural gas vehicle and liquefied petroleum gas vehicle Identification marks

GB 18100.1 Provisions for installation of lighting and light-signaling devices for motorcycles - Part 1: Two wheels motorcycle

GB 18100.2 Provisions for installation of lighting and light-signaling devices for motorcycles - Part 2: Two wheels moped

GB 18100.3 Provisions for installation of lighting and light-signaling devices for motorcycles - Part 3: Three-wheel motorcycles

GB/T 18411 Road Vehicle - Manufacturer's Plate

GB 18447.1 Safety requirements for tractors - Part 1: Wheeled tractors

GB 18564.1 Road tanker for dangerous liquid goods transportation - Part 1: Technical requirements of atmospheric pressure metal tank

GB 18564.2 Road tanker for dangerous liquid goods transportation - Part 2: Technical requirements of atmospheric pressure non-metal tank

GB/T 18697 Acoustics - Measurement of noise inside motor vehicles

GB/T 19056 Vehicle travelling data recorder

GB 19151 Warning triangles for motor vehicle

GB 19152 Motor vehicle headlamps emitting a symmetrical passing beam or a driving beam or both

GB 20074 External projections for motorcycles and mopeds

GB 20075 Passenger hand-holds on motorcycles

GB 20300 Safety specifications for road transportation vehicle of explosive substance and chemical toxic substance

GB 21259 Headlamps equipped with gas - discharge light sources for motor vehicle

GB 21668 Provisions of vehicles for the carriage of dangerous goods with regard to their specific constructional features

identification codes (or vehicle identification numbers) for wheeled mobile machinery for special purposes shall be engraved on the structural part at right front of vehicle, or on other vehicle structural parts if restricted by structure. For other power-driven vehicles (except for motorcycles and mopeds), it shall engrave the vehicle model and exit-factory number at the corresponding eye-catching position, with the model in front of the exit-factory number, at both ends of the exit-factory number shall be engraved with the start and end marks.

Parts engraved with a vehicle identification number (or product identification code, complete vehicle model and serial number) shall not be ground, cut and repaired, cushioned, chipped, repainted (except for the painting technology used to protect the engraved vehicle identification number during design and manufacture), there shall not be any covering on the surface of a sufficiently large area around the engraved area; if there is a covering, the surface of the covering shall be clearly marked with "vehicle identification number" or "VIN", and the covering can be directly removed (or uncovered) and restored without using any special tools, to easily observe a surface that is large enough to include the engraved area.

Engraved vehicle identification number (or product identification code, vehicle model and serial number) from above (front) side shall be easy for observation and rubbing; for motor vehicles and trailers, it shall also be able to be photographed. The height of the letter and number of the engraved vehicle identification number shall be greater than or equal to 7.0 mm, the depth shall be greater than or equal to 0.3 mm (for passenger cars and enclosed goods vehicles having a total mass of less than or equal to 3500 kg, the depth shall be greater than or equal to 0.2 mm), but the motorcycle and moped word height shall be greater than or equal to 5.0 mm, the depth shall be greater than or equal to 0.2 mm. Engraved vehicle model and exit-factory number height shall be 10.0 mm, depth shall be greater than or equal to 0.3 mm. The total length of engraved vehicle identification number (or product identification code, complete vehicle model and serial number) shall be less than or equal to 200 mm, the font and size of the letter and number shall be the same (except for the vehicle identification number engraved in different parts); when there is start and end marks at both ends of the engraved vehicle identification number, the space between the start and end marks and the letter and number shall be close and uniform.

Vehicle identification number (or product identification code, vehicle model and exit-factory serial number) shall not be changed or altered after being engraved, except for the re-marking or change as specified in GB 16735. On the frame of the same power-driven vehicle (or on the unremovable parts of the vehicle body which are mainly for load bearing purposes for the frameless power-driven vehicles), it shall not engrave both the vehicle identification number (or product identification code) and the vehicle model and serial number at the same time. All vehicle identification numbers on the same vehicles shall be the same.

compartment with the vehicle identification number at a position which cannot be observed from the outside but can be directly observed after opening, and at least five major components shall be marked of the vehicle identification number; however, if the manufacturer uses the production management system which allows to trace the vehicle uniqueness information such as the vehicle identification number from the component number, the major components can be marked of the component number.

Vehicle identification number or part number shall be engraved directly or use the label which can be permanently maintained to attach in the target area of the major component as specified by the manufacturer, the character and code height shall ensure that the content can be clearly identified.

4.1.8 In addition to the vehicle identification number engraved in accordance with 4.1.2, 4.1.3, 4.1.5, as for the fence type, storage/stack type, auto-dumping type, and tank type goods vehicles having a total mass greater than or equal to 12000 kg as well as the fence type, storage/stack type, auto-dumping type, and tank type trailers having a total mass greater than or equal to 10000 kg, it shall also engrave at least two vehicle identification numbers on the goods container or atmospheric pressure tank (or on the structural parts designed and manufactured to fix onto the goods container or atmospheric pressure tank and used to connect the frame). Engraved vehicle identification number shall be located at the right and left sides of the goods container (atmospheric pressure tank) or front end surface at a position which is easy for photography, the depth, height, and total length shall comply with the provisions of 4.1.3; if it is engraved at the left and right sides of the goods container (atmospheric pressure tank), the distance to the front end surface of the goods container (atmospheric pressure tank) shall be less than or equal to 1000 mm; if it is engraved on the connection structural parts at left and right sides, it shall be as close to the front end surface of the goods container (atmospheric pressure tank) as possible.

4.1.9 The markings of the road transportation vehicles for dangerous goods shall comply with the provisions of GB 13392; among them, road transportation vehicles for explosives and highly toxic chemicals shall also comply with the provisions of GB 20300. There shall be a metallic tank nameplate at the right side of the tank body of the tank type road transportation vehicles for dangerous goods or of the support welded to the tank, and the nameplate of the tank body shall be marked with the unique code, tank design code, tank volume and other information.

4.1.10 When modifying or repairing a power-driven vehicle, the vehicle identification number (or the complete vehicle model and the exit-factory number), the engine model and the exit-factory number, the part number, the product nameplate and the engine identification shall not be covered (shielded), ground, cut and repaired, cushion treatment, drilled or other destructive operations, and it shall also not destroy or perform unauthorized modifications

backward seats failing to comply with the provisions of 4.4.2.3, there is no verified number of passengers.

4.4.2.5 The verified number of passengers of a motor caravan shall be less than or equal to 9, but the verified number of passengers of a motor caravan having a length less than 6 m shall be less than or equal to 6. For the motor caravan having a length greater than or equal to 6 m which is modified from goods vehicle chassis, when the personnel movement cannot be ensured between the cab and the caravan compartment, there is no verified number of passengers for the caravan compartment; for the motor caravan having a length less than 6 m which is modified from goods vehicle chassis, when there is a through opening of an area greater than or equal to $4.0 \times 10^5 \text{ mm}^2$ and being able to connect to a 500 mm x 700 mm rectangle between the cab and the caravan compartment, it can verify the number of passengers for the caravan compartment. There is no verified number of passengers for the beds (including those converted from tables and chairs) of the motor caravan.

4.4.3 Bus passenger number verification

4.4.3.1 It is verified by the crew mass: determined by GB/T 12428.

4.4.3.2 It is verified in accordance with the seat cushion width and standing passenger valid area: there is 1 person verified per 400 mm of seat cushion of long seat (referring to the seat having a cushion and backrest in a strip for seating of two or more passengers), but when used as a student seat, there is 1 person verified per 280 mm for school bus for infants (or 330 mm for special school bus for infants), 1 person verified per 350 mm for school bus for primary students, 1 person verified per 380 mm for school bus for primary and secondary students; when the single seat cushion width is greater than 400 mm (380 mm for student seats), the verified number of passenger is 1 person. For the passenger cars with standing passenger area, it is calculated as per the standing passenger valid area as established in accordance with GB/T 12428, with 1 standing passenger verified per 0.125 m^2 ; the number of standing passengers is not verified for the upper decker of double-decker bus and other buses.

4.4.3.3 It is verified in accordance with sleeper number: 1 person is verified for each sleeper of the sleeper passenger car, 1 person for the driver's seat, the number of passengers is not verified for passenger seats (including vehicle crew seats).

4.4.3.4 The seats in front of the transverse vertical plane wherein the foldable single seat and driver's seat point R is located shall not be used as student seat for passenger number verification.

4.4.3.5 For the school buses for infants, primary students, and primary and

passengers of road transportation vehicle for dangerous goods shall be less than or equal to 3.

4.4.5 Passenger number verification for motorcycle and moped

4.4.5.1 For the motorcycles with two wheels and the right three-wheeled motorcycles with two front wheels and one rear wheel, in addition to the driver, one more passenger is verified if there is fixed seat.

4.4.5.2 For the motorcycles with sidecar, in addition to the driver, one more passenger is verified for the main vehicle and side car, respectively, if having fixed seats.

4.4.5.3 The verified passenger number is 1 driver for the cab of the right three-wheeled motorcycle; when the passenger compartment has a longitudinally arranged (same as the power-driven vehicle traveling direction) fixed seats (the seat cushion depth of this fixed seat is greater than or equal to 400 mm and its distance to the driver's seat is greater than or equal to 650 mm), one passenger is verified per 400 mm of seat cushion width, but at most 2 passengers; if the above conditions cannot be met, the passenger number is not verified for the passenger compartment.

4.4.5.4 The verified passenger for moped is 1 driver.

4.4.6 Special provisions

4.4.6.1 For the passenger cars designed and manufactured with seating facilities for mobility-impaired passengers (such as wheelchair occupants), ambulances equipped with stretchers, and other motor vehicles for carrying special passengers, if it is equipped with wheelchairs (or stretchers) and other user restraint system, 1 person is verified for each restraint system, and the passenger number for other seats is verified in accordance with 4.4.2.1, 4.4.2.2, 4.4.2.3, 4.4.3 and 4.4.4.

4.4.6.2 The number of passengers for fire engines, medical vehicles, physical examination medical vehicles and other special motor vehicles is verified with reference to 4.4.2.1, 4.4.2.2, 4.4.2.3, 4.4.3 and 4.4.4.

4.4.6.3 The passenger number is not verified for the caravan.

4.4.6.4 The passenger number is not verified for the seats and sleepers provided outside the goods vehicle cab (area).

4.5 Specific power

The specific power of low-speed vehicles and tractor towing trailer for transportation shall be greater than or equal to 4.0 kW/t, and the specific power of other vehicles than the trolleybus and battery electric vehicles shall be

(except for low-speed vehicles and bus with standing passenger areas) shall be sprayed / affixed to the rear of the vehicle with Arabic numerals representing the maximum design speed (unit: km/h); Arabic numerals height shall be greater than or equal to 200 mm, surrounded by a red circle in matched size.

4.7.12 Training vehicle shall be sprayed on both sides of the body and the rear of the characters such as “training vehicle” and so on at a height greater than or equal to 100 mm.

4.7.13 Motor vehicles other than police cars, fire engines, ambulances and engineering rescue vehicles shall not be sprayed or installed with the graphic signs and lamps same or similar as police cars, fire engines, ambulances and engineering rescue vehicles.

4.8 Appearance

4.8.1 Motor vehicle parts shall be intact, strongly connected, without defect.

4.8.2 The body shall be regular, the height difference between the symmetric parts at left and right sides of the body periphery shall be less than or equal to 40 mm.

4.8.3 The height difference above ground between the left & right symmetric parts such as the handle bar and baffles of the motorcycle with two wheels and mopeds shall be less than or equal to 10 mm; the height difference above ground between the left & right symmetric parts such as the cab and passenger compartment of the right three-wheeled motorcycles shall be less than or equal to 20 mm.

4.9 Water leakage inspection

In the engine operation and parking, radiator, water pump, cylinder, cylinder head, heater and all connections shall be free from water dripping or leakage.

4.10 Oil leakage inspection

After the power-driven vehicle continuous driving for not less than 10 km, observe it after parking for 5 min, there shall be free from water dripping or leakage.

4.11 Speedometer indication error (except for power-driven vehicles having a maximum design speed not more than 40 km/h)

The relationship between the speedometer indicated speed v_1 (unit: km/h) and the actual speed v_2 (unit: km/h) shall comply with the following requirements:

$$0 \leq v_1 - v_2 \leq (v_2 / 10) + 4$$

brake, speed limit function or speed limit device, electronic stability control systems and other safety devices; for the motor vehicles equipped with airbags, the product manual shall also define the airbag position, extension conditions, and circumstances.

4.15.3 For motor vehicle with an electronic control unit (ECU) or electronic data interface, it shall describe in the product manual how to read the vehicle identification number information from the ECU.

4.15.4 For the motor vehicles equipped with an event data recording system (EDR), the product manual shall have:

- The descriptions on such contents as “this vehicle is equipped with an event data recording system (EDR)”;
- The descriptions on the meaning and possible uses of the data items recorded by EDR;
- The descriptions on how to obtain the EDR data reading tools.

4.15.5 Product manual for passenger cars and motor caravan shall describe the type and fixation method of the child seat which is suitable for installation.

4.15.6 For passenger cars with traction function, it shall describe the following items in the product manual:

- Maximum allowable traction quality (described respectively for center axle trailer with and without braking);
- National standard or international standard number corresponding to the equipped electric connection joint, as well as the functions of each wiring;
- National standard or international standard number corresponding to the equipped ball joint;
- Additional rear-view mirror and bracket installation location;
- Dimensional limit of center axle trailer allowed to be towed;
- Braking system connection requirements and installation and operation instructions for passenger cars and center axle trailers;
- Driver requirements of passenger/car trailer combination;
- Precautions of passenger/car trailer combination during driving.

4.15.7 Trailer's product manual shall indicate the corresponding national standard or international standard number of the connecting device, and expressly indicate that no person is allowed in the living compartment in the

- b) The center axle trailer shall be equipped with connecting devices meeting the standards;
- c) The center axle trailer with a total mass greater than 750 kg shall be equipped with a braking system.

4.16.3 Passenger/car trailer combination shall meet the following requirements:

- a) The electrical connector and cable model of the passenger cars and center axle trailer match each other;
- b) For all-wheel and rear-wheel driven passenger cars, the ratio of the total mass of the center axle trailer to the curb weight of the passenger car is less than or equal to 1.5; for the front-wheel driven passenger car, the ratio of the total mass of trailer to the curb mass of passenger car is less than or equal to 1.0;
- c) For non-braking center axle trailers, the ratio of the total mass of trailers to the curb weight of passenger car is less than or equal to 0.6;
- d) All vehicle traction brackets are equipped with safety chains, to ensure that the trailer and tractor cannot be separated and the trailer has a certain degree of steering capability before the combination is braked;
- e) The vertical load acting on the connecting device satisfies both:
 - Greater than or equal to 4% of the maximum allowable traction mass of passenger car and greater than or equal to 25 kg;
 - Less than or equal to 10% of the maximum allowable traction mass of the passenger car and the rear axle load of the passenger car is less than or equal to the allowable axle load.
- f) Passenger/car trailer combination has a specific power greater than or equal to 20 kW/t;
- g) Passenger car and center axle trailer can be safely connected or disconnected without using any tools;
- h) The steering and braking signals of the center axle trailer are consistent with the signal of the passenger car.

4.17 Other requirements

4.17.1 The special structures and special devices of special motor vehicles and wheeled mobile machinery for special purposes shall not affect the safe operation of motor vehicles. For the special motor vehicles and other motor vehicles equipped with special instruments or equipment, the equipped special

5.2 Diesel engine shutdown device shall be effective.

5.3 Engine starting, fuel supply, lubrication, cooling and intake and exhaust system components shall be complete.

5.4 The motor system of battery electric vehicle shall be stable in operation.

6 Steering system

6.1 Motor vehicle (except for tri-wheeled vehicles) steering wheel shall be set on the left, the steering wheel of the other motor vehicles shall not be set on the right; special motor vehicles, training vehicles can be set two steering wheels, one left and the other right. If the front three-wheeled motorcycle with two rear wheels and cab has a steering wheel, the horizontal distance from the center column of the steering wheel to the longitudinal center plane of the vehicle shall be less than or equal to 200 mm; other motorcycles shall not be steered using the steering wheel.

6.2 Motor vehicle steering wheel (or handle bar) shall be flexibly rotated, without jamming. Motor vehicles shall be equipped with the steering position limit device. Steering system in any operating position, shall not interfere with other components.

6.3 During normal driving of motor vehicles (except for motorcycles and mopeds, tri-wheeled vehicles and walking tractor towing trailer for transportation), the steering wheel shall have a certain degree of back-turning capability (residual angle allowed) after steering, so that the vehicle has stable straight-line driving capability.

6.4 The maximum amount of freewheeling of the steering wheel of a motor vehicle shall be less than or equal to:

- a) Motor vehicles with a maximum design speed greater than or equal to 100 km/h: 15°;
- b) Tri-wheel vehicle: 35°;
- c) Other motor vehicles: 25°.

6.5 Motor vehicles (except tri-wheel vehicles) shall have a modest lack of steering characteristics.

6.6 The steering wheel leftwards or rightwards turning angle of the tri-wheel vehicle and motorcycles and mopeds shall be less than or equal to:

- a) Tri-wheel vehicle, motorcycles with three wheels, and right three-wheel mopeds: 45°;

7.1.3 The components such as connecting rod between the brake pedals (including the secondary brake pedal of training vehicle) and their brackets, brake master cylinder and its pistons, brake master valve, brake air chamber, wheel cylinder and its pistons, brake arms and camshafts, shall be easy to repair.

7.1.4 Various rods of brake system shall not interfere with or in friction with other parts in the relative displacement, to avoid rod deformation or damage.

7.1.5 The brake pipeline shall be a dedicated, corrosion-resistant, high-pressure pipeline, which shall be installed with a good continuity, sufficient length and flexibility to accommodate the required normal movement of the parts to which it is connected, without causing damage; brake pipeline shall be properly guarded to prevent scratches, twisting or other mechanical damage, and it shall avoid installing it at such positions as possible to be exposed to motor vehicle exhaust pipe or any other high temperature sources. Brake hoses shall not interfere with other components and shall not be aged, cracked, squashed, bulged and so on. Other pneumatic devices in the event of failure shall not affect the normal operation of the brake system.

7.1.6 The full release time of motor vehicles (time required from release of brake pedal to brake elimination) shall be less than or equal to 0.80 s for bi-axle vehicles and less than or equal to 1.2 s for tri-axle and above vehicles.

7.1.7 Motor vehicles shall not have their own braking during operation, unless otherwise the braking by its own designed and manufactured to ensure the safe operation of vehicle. When a trailer (except for the trailer towed by a wheeled tractor and having a loading mass less than 3000 kg) is accidentally detached from the tractor, the trailer shall be able to brake by itself, and the braking of the towing vehicle shall still be effective.

7.2 Service brake

7.2.1 Motor vehicles (except for trailers of gross mass less than or equal to 750 kg) shall have a complete service brake system, of which the service brake of motor vehicles other than tri-wheel vehicles shall be double-circuit or multi-circuit.

7.2.2 The service brake shall ensure that drivers can control the vehicle to safely and effectively slow down and stop. Brake service shall be controllable, and except for motor vehicles for handicapped driving, drivers shall be able to brake without leaving their steering wheel (or handle bar) in their seat.

7.2.3 Service brake shall be applied to all wheels of motor vehicles (except for tri-wheel vehicles, tractor towing trailer for transportation, and the trailer having a total mass not more than 750 kg).

the pneumatic pressure control pipeline joint extension pipeline end between the main suspensions shall also be less than or equal to 0.4 s; for the trailer using pneumatic braking, when tested in accordance with the methods as specified in GB 12676, the time (C) from the pneumatic control pipeline joint between main suspensions to the response of the most unfavorable braking air chamber shall be less than or equal to 0.4s. The values of A, B and C (values to 0.01 s, accurate to 0.05 s) shall be clearly marked on the product nameplate (or other permanent markings provided on the vehicle's visible area).

7.2.11 The matching of the service brake system of goods road train and articulated vehicle (except for the combination of goods vehicle with connecting plate and caravan) shall ensure that the ratio of the braking force of the towing vehicle (or trailer) at full load state to the train's braking force is greater than or equal to 90% of the ratio of the mass of the towing vehicle (or trailer) to the mass of the combination of vehicles.

7.2.12 All motor vehicles (except for tri-wheel vehicles, special motor vehicles with five or more axles) and trailers having a total mass greater than 3500 kg shall be equipped with anti-lock braking devices which comply with the provisions. Road transportation vehicles for dangerous goods having a total mass greater than or equal to 12000 kg shall also be equipped with an electric brake system (EBS).

Note: The total mass of the trailer in this article refers to the static load which is vertically applied through all the axles of the semi-trailer onto the ground, excluding the static load that is transferred to the traction seat of the towing vehicle when the semi-trailer is in full load and connected with the towing vehicle.

7.2.13 Any electrical failure in the anti-lock brake device shall not prolong the service brake's brake actuation time and brake release time. On trailers that require power to operate anti-lock brake device, the power supply shall be supplied by a dedicated power line.

7.2.14 The service brakes of training vehicles (except for tri-wheel vehicles) and self-learning vehicles shall be equipped with a secondary brake. The secondary brake device shall be installed firmly and act reliably, to ensure that the trainer in the driving process can effectively control the motor vehicle for deceleration and parking.

Note: self-learning vehicle refers to the small motor vehicles and small automatic transmission motor vehicle for the self-learning personnel to learn the driving skills on the road.

7.2.15 For the motor vehicles and trailers using pneumatic brake, each air cylinder (except for those with pressure gauge and other pressure display

7.4.4 The parking brake control device shall be installed in a suitable position and the control device shall have sufficient reserved travel (except for switch control devices) and shall normally produce the required braking performance within two-thirds of the full travel of the control device; when the parking brake mechanism is equipped with automatic adjustment device, it is allowed for it to achieve the required braking performance within three-fourths of the whole travel. When the parking brake uses electronic control device, the locking device shall be purely mechanical device, which shall still be effective in case of power failure. The ratchet brake control device shall ensure that when the specified parking brake performance is reached, the number of reciprocated pull back and forth of the control rod shall not exceed 3.

7.4.5 When using the spring energy storage brake device to make the parking brake, it shall be ensured that the parking condition can be conveniently released in the failure state. If it is required to use special tools, it shall be equipped in the vehicle.

7.5 Auxiliary brake

7.5.1 Bus with a length greater than 9 m (greater than 8 m for special school bus), goods vehicles having a total mass greater than or equal to 12000 kg, special motor vehicle, road transportation vehicle for dangerous goods having a total mass greater than 3500 kg shall be equipped with retarders or other auxiliary brake. The performance requirements of the auxiliary brake of the buses with standing passenger area having a length greater than 9 m, road transportation vehicle for dangerous goods having a total mass greater than 3500 kg, the semi-trailer tractor shall ensure that the motor vehicles can pass the type IIA test as specified in GB 12676.

7.5.2 For the motor vehicles equipped with eddy current retarder, at the installation location of eddy current retarder it shall be equipped with the temperature alarm system or automatic fire extinguishing device.

7.6 Hydraulic braking special requirements

7.6.1 For the motor vehicles using hydraulic brake, brake pipelines shall not leak (including external leakage and internal leakage), when the pedal force at 700 N (350 N for motorcycles and mopeds) is maintained for 1 min, the pedal shall not slowly move forward.

7.6.2 When the hydraulic service brake reaches the required braking performance, the pedal travel shall be less than or equal to three-fourths of the full travel of the pedal, and the brake pedal travel of the motor vehicle fitted with the automatic gap adjustment device shall be less than or equal to four-fifths of the full travel of the pedal, and it shall be less than or equal to 120 mm for passenger cars, 150 mm for other motor vehicles.

7.8.2 Motor vehicles equipped with air cylinder or vacuum tanks shall be provided with one-way valves or corresponding protective devices, to ensure that, in the event of failure or leakage of connection between the cylinder (tank) and compressed air (vacuum source), the compressed air (vacuum) within the cylinder (tank) will not be completely lost.

7.8.3 The capacity of the gas cylinder shall ensure that at the rated working air pressure without continuing charging air, the air pressure shall be not less than the starting pressure after five full travel braking applied continuously of the power-driven vehicle.

7.8.4 The air cylinder shall have a drain valve.

7.8.5 For air-braked vehicles and trailers with gas cylinders, the value of the rated working air pressure of the air cylinder shall be clearly marked on the product nameplate (or other permanent mark provided on the visible part of the vehicle).

7.9 Brake alarm device

7.9.1 For hydraulically braked power-driven vehicles, the reservoir filling port shall be easy to access, and from the aspect of structural design, it shall ensure that the liquid level can be easily checked without opening the container. If this condition cannot be met, it shall install brake fluid level low alarm device.

7.9.2 For hydraulically braked vehicles (except for tri-wheel vehicles and low-speed goods vehicles equipped with single cylinder diesel engines), the driver shall be warned by means of a red warning light if any part of the hydraulic energy transmission device fails. The signal light shall stay on as long as the failure persists and the ignition switch is in the ON (run) position. The warning lights shall also be eye-catching even during the day, and drivers shall be able to easily observe in their seats whether the warning lights are working properly. Failure of the alarm device shall not result in a complete loss of braking performance of the braking system.

7.9.3 For air-braked motor vehicles, when the brake system pressure is lower than the starting air pressure, the alarm device shall be able to continuously give the driver an easily audible or visible alarm signal.

7.9.4 For the motor vehicles equipped with an anti-lock braking device, the alarm device shall be able to continuously give the driver an easily audible or visible warning signal when the anti-lock braking device fails.

7.9.5 For the buses equipped with brake gap automatic adjusting devices, goods vehicles, and special motor vehicles with a total mass greater than 3500 kg, the optical or acoustic warning devices shall be used to warn the driver at the driver's seat when the service brake linings need to be replaced.

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