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Technical requirements for vehicle body repair

汽车车身修理技术条件

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Technical requirements for vehicle body repair

1 Scope

This document specifies the general requirements, process requirements, completion inspection and quality assurance for vehicle body repair.

This document applies to vehicle body repair of M_2, M_3 passenger vehicles and N trucks specified in GB/T 15089.

2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. 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 4780, Terms for motor vehicle body

GB 4785, Prescription for installation of the external lighting and light-signaling devices for motor vehicles and their trailers

GB/T 5624, Motor vehicle maintenance and repair terms

GB 7258, Technical specifications for safety of power-driven vehicles operating on roads

GB 9656, Safety technical specification for glazing materials used in power-driven vehicles

QC/T 476, Rain Proof Performance Limit and Test Method for Bus

QC/T 484, Automobile Paint Coating

3 Terms and definitions

Terms and definitions defined in GB/T 4780 and GB/T 5624 apply to this document.

4 General requirements

4.1 Cutting

4.1.1 When cutting components that are severely deformed and difficult to correct, cold cutting or plasma cutting should be used; oxyacetylene shall not be used for cutting high-strength steel plates.

4.1.2 The cutting position shall be taken away from strength support points and stress concentration areas. Where there is a cutting line mark, the cutting shall be performed along the mark.

4.2 Welding and bonding

4.2.1 Before welding, the oil, rust and coating on the surface of the plate shall be removed, and the steel plate inside the weld shall be subjected to the anti-rust treatment.

4.2.2 The appropriate welding method shall be selected according to the type and structural characteristics of the material and with reference to the technical information of vehicle repair disclosed by the motor vehicle manufacturer.

4.2.3 For the welding of aluminum products, argon arc welding or inert gas shielded welding shall be used, and the reverse welding method shall be adopted. For vertical welding, it shall be performed from bottom to top.

4.2.4 The surface of welding seam and welding point shall be smooth and uniform, and there shall be no welding defects such as welding penetration, desoldering, welding leakage and slag inclusion.

4.2.5 Structural parts such as the vehicle body frame shall be inspected with a flaw detector to check the welding parts, and the welds shall be free of cracks.

4.2.6 The driver's seat shall not be fixed and repaired by welding; the leaf spring support, the lifting lug seat and the frame shall not be welded together.

4.2.7 After welding, anti-corrosion and anti-rust treatment shall be carried out on the welding and exposed parts.

4.2.8 Parts with bonding requirements shall be carried out in accordance with the requirements of automobile maintenance technical information disclosed by the automobile manufacturer.

4.3 Riveting

4.3.1 The riveting shall be solid and firm; all rivets shall be flat and fastened, neatly arranged, and evenly spaced.

4.3.2 The rivet head shall be free of phenomena such as damage, deflection, crush injury, incomplete head.

4.4 Bolting

5.1.6 The upper planes of the left and right longitudinal beams of the frame assembly shall be in the same plane, and the flatness tolerance shall be 0.15% of the length of the measured plane.

5.1.7 The perpendicularity of the side of the longitudinal beam of the frame to the upper plane of the frame shall not be greater than 1% of the height of the longitudinal beam; the perpendicularity of the main beam to the longitudinal beam shall not be greater than 0.20% of the length of the beam.

5.1.8 For the check of the frame segment (front leaf spring front bracket pin hole axis - front leaf spring rear bracket pin hole axis - rear leaf spring front bracket pin hole axis - rear leaf spring rear bracket pin hole axis), the difference in the length of the diagonal lines of each segment shall not be greater than 5 mm, and the distance between the intersection of the diagonal lines and the center line of the frame shall not be greater than 2 mm.

5.1.9 Where the corroded area of the lower end of the vehicle body pillar reaches more than 1/3 of its total area, the local corroded part shall be cut off and replaced.

5.1.10 Both the distance between the vehicle body pillars and the distance between the adjacent frames on both sides shall meet the requirements of automobile maintenance technical information which is disclosed by the automobile manufacturer.

5.1.11 The radian of the roof beam shall be the same as the original shape and shall be bilaterally symmetrical.

5.1.12 After the framework is reshaped, the shape shall be flat and the curved surface connection and change shall be even. The lower edge of the side window and the floor lining shall be checked with a sample plate, and the tolerance value of the surface profile shall be 4 mm.

5.1.13 The difference in the diagonal length of the frame in the cross-section of the vehicle body shall not be greater than 8 mm.

5.1.14 The difference in the diagonal length of the passenger door frame shall not exceed 4 mm, or shall be measured with a special inspection tool; the tolerance shall meet the requirements of automobile maintenance technical information disclosed by the automobile manufacturer.

5.1.15 The driver's door frame shall be checked with a template, and the tolerance value of its line profile shall be 4 mm.

5.1.16 After the front and rear windshield window frames are reshaped, the shape, size, seam allowance radian, and seam allowance depth shall comply with the requirements of automobile maintenance technical information disclosed by the automobile manufacturer. The seam allowance radian shall be checked with a template, and the tolerance value of its surface profile shall be 4 mm.

5.1.17 The windshield window frame without framework is allowed to be excavated and repaired in sections, which shall be inspected in accordance with the provisions of 5.1.16.

5.1.18 The difference in the diagonal length of the side window frame shall not be greater than 3 mm.

5.2 Inner and outer skins and trims

5.2.1 The outer skin of the vehicle body shall be smooth in appearance, and the outer curved surface shall have a uniform transition, without cracks or serious corrosion.

5.2.2 The following requirements shall be met when replacing the outer skin:

a) The outer skin shall be subjected to prestressed stretching and rust removal, anti-rust and anti-corrosion treatment in accordance with the requirements of automobile maintenance technical information disclosed by the automobile manufacturer;

b) For outer skin with reinforced fold lines, the fold lines shall be flush and consistent;

c) The inner surface of the outer skin perimeter shall be closely attached to the pillar frame and the lining plate, and shall be treated with heat and sound insulation.

5.2.3 The skin rivets shall be arranged flatly and neatly, and spaced uniformly; the position tolerance value shall be ϕ4 mm.

5.2.4 The outer decorative tape and the skin shall be fitted well, straightly and smoothly; the segmented joints shall be flush; the joint gap shall not be greater than 0.50 mm.

5.2.5 The inner skin (hoarding) shall be free from cracks and warping. The soft inner canopy shall be free from wrinkle, slack and breakage.

5.2.6 The fire-resistant properties of interior materials shall meet the requirements of GB 7258.

5.2.7 The appearance of interior trim panels and interior and exterior trim parts shall be smooth and fit, the curved surfaces shall transition evenly, and the surface shall be free of convex and concave deformation, cracks, wrinkles, scratches, etc. The surface profile tolerance value of interior trim panels shall be 1.5 mm. The trim strip and each plate shall be closely connected; the fasteners shall be neatly arranged.

5.2.8 The local cracks of glass fiber-reinforced plastic parts should be repaired with FRP materials.

5.2.9 Electroplated trims and stainless-steel parts shall be free of rust spots, delamination, unevenness and scratches.

5.4.1.5 The bumper and radiator cover shall be reliable and installed firmly.

5.4.1.6 The fuel tank shall be installed firmly; there shall be pads between the brackets, clamps and the fuel tank, and there shall be no friction or collision.

5.4.1.7 The number, installation position and fixing point strength of the seat belt shall meet the requirements of automobile maintenance technical information disclosed by the automobile manufacturer.

5.4.2 Electrical appliances

5.4.2.1 The installation of electrical equipment and lines shall comply with the requirements of automobile maintenance technical information disclosed by the automobile manufacturer; the installation shall be firm.

5.4.2.2 Electrical equipment such as instruments, audio-visual devices, signal monitoring devices, alarm devices and various adjustment and control devices shall be complete and intact, installed firmly and work effectively.

5.4.2.3 The insulation layer on the outer surface of the wiring harness shall be free of aging and damage; the wiring harness shall be installed firmly and reliably, and there shall be protective devices at the holes passing through.

5.5 Additional requirements

5.5.1 The floor shall be installed tightly, arranged evenly, with a smooth surface and no cracks. It shall not have interference with the operating parts; dust covers or dust pads shall be provided at the perforations of each operating mechanism and the floor.

5.5.2 Openable doors and windows shall open and close easily, close tightly, lock reliably, with even gaps and not loose; glass lifters and door handles shall be complete, lift or open smoothly; the stroke shall conform to the requirements of automobile maintenance technical information which is disclosed by the automobile manufacturer, and the work shall be reliable without abnormal noise; the electric anti-pinch device shall be complete and effective.

5.5.3 The door pump support plate shall be installed firmly; the cover shall not be warped; the hinge shall rotate flexibly; it shall not vibrate after locking. The door-pump linkage shall move softly.

5.5.4 Handrails and brackets (including tee-junction) shall be free of rust, bending and loosening, and the surface shall be smooth.

5.5.5 The luggage compartment shall maintain the original technical structure; the door shall be free from warping and deformation, close tightly, open and close flexibly, and lock reliably.

5.5.6 The engine compartment door (cover) shall be free from cracks, deformation, and shall be tightly covered; the accessories shall be complete and effective, flexible and reliable, and firmly supported.

5.5.7 The articulated vehicle body articulating device and connecting mechanism shall be firm and flexible; the cross shaft and the ball stud of the articulating mechanism shall be inspected for flaw detection; each matching part shall meet the requirements of automobile maintenance technical information disclosed by the automobile manufacturer.

5.5.8 The safety device of the articulating mechanism shall meet the requirements of automobile maintenance technical information disclosed by the automobile manufacturer. The semicircular plate shall be free from warping, corrosion and serious wear; the maximum gap between the semicircular plate and the moon-shaped rotating guard plate shall not be greater than 6 mm.

5.5.9 The canopy bone shall be free from rust, fracture and distortion. The retractable canopy shall be replaced with a new one, and the installation shall be firm. Dust-proof devices shall be complete; gas spring installation shall be moderate and reliable, and anti-rust and dust-proof measures shall be provided.

5.5.10 The ventilation device and safety top window shall be installed firmly, and shall meet the requirements of automobile maintenance technical information disclosed by the automobile manufacturer.

5.5.11 The pipe joints of the air-conditioning system shall be free of leakage; the condenser shall be clean and unobstructed; the air duct structure and air outlet shall meet the requirements of automobile maintenance technical information disclosed by the automobile manufacturer.

5.6 Special requirements for trucks

5.6.1 Where the cab assembly adopts a turning mechanism, there shall be no abnormal noise during driving, and the vibration reduction shall be effective; the turning shall be light and flexible, and the turning angle shall meet the requirements of automobile maintenance technical information disclosed by the automobile manufacturer; the positioning and locking mechanism shall be reliable, complete, and efficient.

5.6.2 The offset of the cab and the cargo box installed on the frame to the center line of the frame shall be less than 10 mm; the connection between the cab, cargo box, body and the frame shall be tight, safe and reliable.

5.6.3 The frame of the cargo box shall be straight, free from breakage and deformation, and the movable side panels and rear panels shall be free to open and close and reliable to lock.

6.4.2 The quantity and location of external lighting shall comply with the provisions of GB 4785.

6.5 Tightness

The rainproof performance of the repaired vehicle body shall meet the requirements of QC/T 476.

6.6 Doors and windows

6.6.1 The glass of doors and windows shall be made of safety glass and comply with the provisions of GB 9656.

6.6.2 The safety top windows and safety doors shall be complete and shall open and close flexibly.

6.6.3 The emergency door and emergency window shall be easy to open, and the size and quantity shall meet the requirements of automobile maintenance technical information disclosed by the automobile manufacturer.

6.6.4 The window glass shall be clean, intact, and free from looseness. The openable window shall be flexibly opened and closed, and the locking shall be reliable. The stroke shall meet the requirements of automobile maintenance technical information disclosed by the automobile manufacturer.

7 Quality assurance

7.1 A completion inspection shall be carried out after the repair of the vehicle body; the inspection record is shown in Appendix A.

7.2 The quality guarantee period of the finished vehicle body repair shall be calculated from the date of completion of the repair and leave the factory, and shall not be less than 20 000 km or 100 d of vehicle driving, whichever comes first.

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