



**NATIONAL STANDARD OF THE
PEOPLE'S REPUBLIC OF CHINA**

GB/T 44510-2024

**Technical requirements for the maintenance and repair of new
energy vehicles**

新能源汽车维修维护技术要求

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1 Scope

GB/T 44510-2024 sets the technical requirements for maintaining and repairing new energy vehicles. Working on an electric vehicle is a different trade from working on a combustion one: the hazard is not fuel but a battery that cannot be switched off, and the workshop, the tools, the training and the procedures all have to change accordingly. This standard states what is required: the requirements on the premises including the high voltage working area

and the storage of removed battery packs, the insulated tools and the personal protective equipment, the qualification and training of the personnel, the procedures for de-energising, isolating and verifying the absence of voltage before work and for re-energising after it, the maintenance and repair operations on the battery, the drive motor, the power electronics and the charging system, the handling of a damaged or thermally abnormal battery, the record keeping and traceability, and the environmental requirements on the waste produced. For a workshop, a fleet operator or an insurer in China, this is the governing text.

This document specifies the general requirements, safety requirements, maintenance work items and requirements, as well as repair and completion technical requirements for maintenance and repair of new energy vehicle. This document is applicable to the repair and maintenance of pure electric vehicles, plug-in hybrid electric vehicles, and fuel cell electric vehicles using gaseous hydrogen. Other types of new energy vehicles shall follow the same procedures.

2 Normative references

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

GB/T 2900.41, Electrotechnical terminology -- Primary and secondary cells and batteries

GB/T 3798, Technical requirements for completion and acceptance of vehicle overhaul

GB/T 5624, Motor vehicle maintenance and repair terms

GB/T 18344, Specification for the inspection and maintenance of motor vehicle

GB 18384, Electric vehicles safety requirements

GB/T 19596, Terminology of electric vehicles

GB/T 24548, Fuel cell electric vehicles -- Terminology

GB/T 24549, Fuel cell electric vehicles -- Safety requirements

3 Terms and definitions

For the purposes of this document, the terms and definitions defined in GB/T 2900.41, GB/T 5624, GB/T 19596, GB/T 24548 as well as the followings apply.

4.3 Routine equipment maintenance shall be carried out in accordance with the provisions of GB/T 18344. Routine equipment repair shall be carried out in accordance with the provisions of GB/T 3798.

4.4 The maintenance cycle of special equipment shall be determined in accordance with the requirements of the maintenance technical information published by the automobile

manufacturer (hereinafter referred to as "automobile maintenance technical information"), combined with the vehicle type, vehicle operating conditions, mileage, road conditions and years of use.

4.5 The daily maintenance items of special equipment and the maintenance items under different maintenance cycles shall be determined according to the automobile maintenance technical information and Chapter 6.

4.6 When performing periodic maintenance, the special equipment shall first be enter-factory inspected using a diagnostic instrument or special testing equipment. The fault code shall be read. The additional operation items of the special equipment shall be determined based on the vehicle technical condition reported by the driver.

4.7 The technical requirements for the maintenance of each system component involved in the maintenance process of the special equipment shall comply with the provisions of Chapter 7. If the automobile manufacturer has special requirements, they shall comply with the provisions in the automobile maintenance technical information.

4.8 The power battery shall be balanced according to the cycle and method specified in the vehicle maintenance technical information.

5 Safety requirements

5.1 New energy vehicle repair and periodic maintenance operations shall be carried out in dedicated sites. The site shall be dry and well ventilated, with warning isolation areas and warning signs. Non-repair and maintenance personnel shall not enter.

5.2 During the repair and periodic maintenance of fuel cell electric vehicles (hereinafter referred to as "hydrogen fuel vehicles") that use gaseous hydrogen, there are places on the top of the site where gas is easily accumulated, and explosion-proof exhaust devices and hydrogen concentration detection alarm devices shall be installed.

5.3 New energy vehicle repair and periodic maintenance operation areas shall be equipped with fire-fighting and electrical high voltage protection emergency equipment according to the vehicle model, including but not limited to gas masks, insulating rods, fire hooks and appropriate fire-fighting facilities and equipment.

5.4 Personnel performing high voltage power system repair and periodic maintenance shall obtain a low voltage electrician special operations operator certificate.

5.5 Personnel who repair and perform periodic maintenance on special equipment shall undergo professional training and be qualified before taking up their posts.

5.6 High voltage power system repair and periodic maintenance operations shall be performed by at least two persons. The operators shall comply with the electrical safety operation regulations.

5.7 Workers who repair and periodically maintain special equipment shall discharge static electricity before operation. They shall wear safety protection equipment. They shall use working tools with insulation protection function. They shall not wear metal accessories when working. Safety protection equipment shall include but not be limited to insulating gloves (with a withstand voltage level of more than 1000 V), insulating shoes (boots), eye protection, and safety helmets. Safety protection equipment and working tools shall be intact and have effective insulation.

5.8 Before high voltage power system repair and periodic maintenance, the vehicle shall be powered off in the following order: turn off the vehicle power main control switch, disconnect the positive and negative poles of the auxiliary battery or turn off the auxiliary battery switch handle, and turn off the high voltage maintenance switch (or the order specified in the vehicle maintenance technical information). Confirm that the positive and negative pole voltages of the power battery high voltage output line system are lower than 36 V. Maintenance can only be performed after the insulation resistance value meets the requirements of the vehicle maintenance technical information.

5.9 After high voltage components are disconnected, the exposed high voltage terminals shall be insulated and protected.

5.10 After high voltage power system repair and periodic maintenance are completed, the vehicle shall be powered on and reset in the reverse order of powering off the vehicle (or the order specified in the vehicle maintenance technical information).

5.11 The repair and periodic maintenance of hydrogen fuel cell vehicles shall also meet the following requirements:

- a) After the fuel cell system is completely shut down;
- b) When tightening, disassembling, or adjusting the hydrogen pipeline of a hydrogen fuel cell vehicle, first power off the vehicle. Close the manual shut-off valve of the gas cylinder. Use explosion-proof tools to drain the fuel from the hydrogen supply pipeline;
- c) During hot work, hydrogen concentration detection shall be carried out to ensure that the hydrogen gas volume in the pipeline or hot work area is within a safe range;

7.2.1 Appearance

7.2.1.1 The power battery shall be securely fixed in the box. The surface shall be flat, dry, free of dirt and leakage, and with clear and correct markings. The battery modules shall be neatly arranged and reliably connected.

7.2.1.2 The positive and negative connectors shall be connected correctly and sealed properly. The high voltage busbar, connectors and wiring harness shall not be deformed, loose, overheated, burned, or damaged.

7.2.1.3 The battery pack safety valve shall be free of damage and blockage.