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Technical Specification of Operation Safety and Maintenance Guarantee for Electric Passenger Cars

电动乘用车运行安全和维护保障技术规范

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Foreword

This Document was drafted as per the rules specified in GB/T 1.1-2020 *Directives for Standardization – Part 1: Rules for the Structure and Drafting of Standardizing Documents*.

This Document replaced DB31/T 634-2012 *Technical Specification of Operation Safety and Maintenance Guarantee for Electric Passenger Cars*. Compared with DB31/T 634-2012, the major technical changes of this Document are as follows besides the structural adjustments and editorial modifications:

a) Delete the “ratio of battery pack weight to vehicle curb weight”;

b) Delete the “rescue information card”;

c) Delete the “power and economy requirements”;

d) Delete the “reliability test”;

e) Add the “voltage level” (see Clause 4 of this Edition);

f) Modify the “remote monitoring system” (see 5.2 of this Edition);

g) Modify the “vehicle safety requirements” (see 5.3 of this Edition);

h) Modify the “requirements for energy storage devices” (see 5.4 of this Edition);

i) Add the “requirements for charging and swapping systems” (see 5.5 of this Edition);

j) Modify the “after-sales service system” (see 5.6 of this Edition).

Please note some contents of this Document may involve patents. The issuing agency of this Document shall not assume the responsibility to identify these patents.

This Document was proposed, organized and implemented by Shanghai Municipal Commission of Economy and Informatization.

This Document shall be under the jurisdiction of Shanghai Technical Committee on New Energy Vehicle and Application Standardization.

Drafting organizations of this Document: Shanghai Motor Vehicle Testing and Certification Technology Research Center Co., Ltd.; SAIC Motor Corporation Limited; Shanghai Volkswagen Automotive Co., Ltd.; Pan-Asia Technical Automotive Center Co., Ltd.; BYD Automobile Industry Co., Ltd.; Geely Automotive Research Institute (Ningbo) Co., Ltd.; Shanghai Jieneng Auto Technology Co., Ltd.; Viridi E-Mobility Technology (Ningbo) Co., Ltd.; Contemporary Amperex Technology Co., Ltd.; Shenzhen BYD Lithium Battery Co., Ltd.; and Hefei Guoxuan High-Tech Power Energy Co., Ltd.

Technical Specification of Operation Safety and Maintenance Guarantee for Electric Passenger Cars

1 Scope

This Document specifies the technical requirements and test methods for the operation safety and maintenance guarantee of electric passenger car products sold and registered in Shanghai.

This Document applies to pure electric passenger cars and plug-in hybrid electric passenger cars. Fuel cell electric passenger cars shall be implemented by reference.

2 Normative References

The provisions in following documents become the essential provisions of this Document through reference in 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) is applicable to this Document.

GB/T 4208-2017 Degrees of protection provided by enclosure(IP code)

GB 18384-2020 Electric vehicles safety requirements

GB/T 19596 Terminology of electric vehicles

GB/T 31484-2015 Cycle life requirements and test methods for traction battery of electric vehicle

GB/T 32960 (all parts) Technical specifications of remote service and management system for electric vehicles

GB 38031-2020 Electric vehicles traction battery safety requirements

DB31/T 845 Public data acquisition technical specifications for new energy vehicles

3 Terms and Definitions

For the purposes of this Document, the terms and definitions given in GB/T 19596 and the following apply.

3.1 Remote monitoring system

5.2 Remote monitoring system

5.2.1 The on-board terminal shall collect and store the vehicle state parameters in real time. The vehicle state parameters shall at least include the vehicle data specified in GB/T 32960 (all parts) and DB31/T 845, and the data collection time interval shall be no greater than 1s.

5.2.2 The on-board terminal shall be able to collect and store vehicle safety-related status parameters in real time before the thermal runaway of the vehicle power battery causes thermal diffusion; and send them to the enterprise platform in real time.

5.2.3 The installation position of the on-board terminal on the vehicle shall be far away from the heat radiation area after the vehicle power battery catches fire; and it shall take fire protection, heat insulation and waterproof protection measures.

5.2.4 Vehicle manufacturers shall have a remote monitoring system.

5.2.5 The remote monitoring system shall collect and display the status data and location of the monitored vehicle in real time, and the relevant data stored in the on-board terminal shall be sent to the enterprise platform in real time.

5.2.6 The remote monitoring system shall have the following functions such as real-time monitoring, alarm prompt, real-time data import and export, historical data query, log management, and authorized user query, etc. According to different vehicle types and driving areas, real-time analysis can be performed on important parameters of vehicle operation, on parameters of new energy power systems, and data of high-voltage power systems.

5.2.7 The data collection of the remote monitoring system shall at least include the vehicle data specified in GB/T 32960 (all parts) and DB31/T845.

5.2.8 The data collection time interval of the remote monitoring system shall be no greater than 10s.

5.2.9 The storage time of remote monitoring system data shall be no less than 6 years.

5.3 Vehicle safety requirements

5.3.1 There shall be clear and visible high-voltage warning signs on the casing or shield of the Level-B voltage circuit; and the sheaths of cables and wire harness of the Level-B voltage circuit shall be marked in orange to distinguish them.

5.3.2 The vehicle shall monitor the disconnection or opening status of the high-voltage connectors and disassembly ports of all Level-B voltage components and circuits on the vehicle. When a Level-B voltage component or circuit is accidentally disconnected or opened, and can cause the Level-B voltage component or circuit to be exposed and accessible, the vehicle shall be able to automatically disconnect the Level- B voltage component or circuit.

5.3.3 The insulation resistance of vehicles and Level-B voltage components shall meet the

5.4 Requirements for energy storage devices

5.4.1 After completing the standard cycle life test in accordance with 5.2 in GB/T 31484-2015, the battery cell shall be subjected to overcharge and short-circuit tests in accordance with 8.1.3 and 8.1.4 in GB 38031-2020; and it shall not ignite or explode.

5.4.2 After the battery pack has completed the vibration test according to the test method in 8.2.1 of GB 38031-2020 and the technical requirements of 5.2.1, the protection performance of the battery pack shall meet the requirements of IP67 in GB/T 4208-2017, and the battery pack shall not enter the water after the waterproof test.

5.5 Requirements for charging and swapping systems

5.5.1 The vehicle charging system shall be equipped with a temperature monitoring device, and the vehicle shall have temperature monitoring and over-temperature protection functions.

5.5.2 The vehicle chassis and the power battery replacement system shall be fixed with a locking operating mechanism, and there shall be the function of preventing locking failure. The locking mechanism shall be able to reliably fasten the battery system to the chassis, and during normal use of the vehicle, there shall be no deformation or structural damage that would lead to failure.

5.5.3 Power replacement connectors (low-voltage harness plug-in quick-change connectors, high-voltage harness plug-in quick-change connectors, liquid-cooled connector plug-in quick-change connectors) meet the wear-resistant and sealing requirements of the full life cycle plug-in, and have guiding positioning function. After the battery replacement operation, ensure that the interface can be reliably connected and maintain the original performance.

5.6 After-sales service system

5.6.1 Vehicle manufacturing and sales enterprises shall have a complete after-sales service system in Shanghai. There shall be more than 5 enterprise-authorized and -qualified electric vehicle maintenance service stations; and they shall be arranged in reasonable service areas to ensure that they can provide customers with 24-hour uninterrupted guarantee service. The warranty period of the vehicle shall be greater than 3 years or 8×10^4km; and the warranty period of energy storage devices such as power batteries, drive motors, and motor controllers shall be greater than 8 years or 12×10^4km.

5.6.2 The enterprise shall clarify the basic requirements for the maintenance measures, items, frequency, etc. of the power battery system during use. Maintenance items include: visual inspection, air tightness test, insulation performance test, equalization charging, etc.

5.6.3 Enterprises shall clarify the decommissioning conditions of power batteries, the traceability management requirements of power batteries and recycling outlets.

5.6.4 For operating vehicles that have been stored for more than 3 months, before they are put

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