GB

NATIONAL STANDARD OF THE

PEOPLE'S REPUBLIC OF CHINA

ICS 43.020

T 09

GB/T 24549-2020

Replacing GB/T 24549-2009

Fuel Cell Electric Vehicles - Safety Requirements

燃料电池电动汽车 安全要求

Issued on: September 29, 2020 **Implemented on: April 01, 2021**

Issued by: State Administration for Market Regulation;
Standardization Administration of PRC.

Table of Contents

Foreword....3

1 Scope....4

2 Normative References....4

3 Terms and Definitions....4

4 Safety Requirements....5

5 Manual Requirements....8

Appendix A (Normative) Hydrogen Leakage Test Procedure in Enclosed Space....10

Appendix B (Normative) Functional Verification of Hydrogen Leak Alarm Device....12

Fuel Cell Electric Vehicles - Safety Requirements

1 Scope

This Standard specifies the safety and manual requirements for fuel cell electric vehicles, key systems, etc.

This Standard is applicable to fuel cell electric vehicles using compressed gaseous hydrogen.

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) is applicable to this document.

GB 18384-2020 Electric Vehicles Safety Requirements

GB/T 24548 Fuel Cell Electric Vehicles - Terminology

GB/T 37154-2018 Fuel Cell Electric Vehicles - Test Methods of Hydrogen Emission

GB/T 38117-2019 Electric Vehicles Product Description - Emergency Rescue

3 Terms and Definitions

For the purpose of this document, the terms and definitions given in GB/T 24548 and the following apply.

3.1 Main shut off valve

A valve that is used to shut off the downstream supply of hydrogen from a compressed hydrogen storage system.

3.2 Pressure relief device; PRD

A device that operates under certain conditions and can discharge the hydrogen in the compressed hydrogen storage system to prevent system failure.

3.3 Thermally-activated pressure relief device; TPRD

4.1.2.1.4 When the hydrogen volume concentration in an enclosed or semi-enclosed space reaches or exceeds 2.0% ± 1.0%, a warning shall be issued.

4.1.2.1.5 When the hydrogen volume concentration in an enclosed or semi-enclosed space reaches or exceeds 3.0% ± 1.0%, the hydrogen supply shall be automatically shut off immediately. If the vehicle is equipped with multiple hydrogen storage cylinders, it is allowed to shut off only the hydrogen supply with the leaked hydrogen part.

4.1.2.1.6 When the hydrogen leak detection sensor fails, such as signal interruption, open circuit, short circuit, etc., it shall be able to send a fault warning signal to the driver.

4.1.2.2 Requirements outside the vehicle

For Type-M_1 vehicles, the hydrogen leakage test shall be carried out in an enclosed space in accordance with Appendix A; and the hydrogen volume concentration measured at any time shall not exceed 1%.

4.1.3 Reminder of low hydrogen remaining amount

The meter indicating the hydrogen pressure or the remaining amount of hydrogen in the hydrogen storage tank shall be installed in an area that is easy for the driver to observe. If the pressure or remaining amount of hydrogen affects the driving of the vehicle, an obvious signal (for example: sound or light signal) device shall issue the prompt to the driver.

4.1.4 Electrical safety requirements

The electrical safety of fuel cell electric vehicles shall comply with the provisions of GB 18384-2020.

4.2 Requirements for system safety

4.2.1 Requirements for hydrogen storage cylinders and pipelines

4.2.1.1 Requirements for installation location

Pipeline joints shall not be located in a completely enclosed space. In general, hydrogen storage cylinders and pipelines shall not be installed in the passenger compartment, luggage compartment or other poorly ventilated places; but if it is unavoidable to install them in the luggage compartment or other poorly ventilated places, corresponding measures shall be taken to discharge the hydrogen that may leak in time. The hydrogen storage cylinder shall avoid direct exposure to sunlight.

4.2.1.2 Requirements for thermal insulation

The hydrogen storage cylinders and pipelines that may be affected by heat sources such as exhaust pipes and mufflers, etc. shall be protected by thermal insulation.

specific operation, fuel and safety features of the vehicle. The manual includes at least the following:

a) Automobile safety operating procedures, including operating environment;

b) Precautions for fuel, coolant and other materials stored and used in the automobile;

c) The requirements for parking lots of fuel cell electric vehicles shall be explained;

d) Fuel filling procedures and safety equipment precautions;

e) Explain the maintenance of important parts related to power batteries, fuel cell stacks, hydrogen storage cylinders, etc.;

f) Roadside emergency rescue information;

g) Explain how to deal with emergencies;

h) Explain whether there are places unsuitable for driving.

5.2 Service manual

Fuel cell electric vehicle manufacturers shall compile information related to vehicle repair and maintenance. It should include at least the following:

a) Description of the user's automobile repair site;

b) The chemical and physical properties of hazardous materials used in automobiles;

c) The hazards that may occur to the automobile or system during maintenance;

d) First aid procedures unique to the automobile when a certain danger occurs;

e) Maintenance tools, equipment and personal protective equipment;

f) Methods and procedures for special maintenance work;

g) List of necessary maintenance items and maintenance cycles;

h) Procedures for replacing fuel from fuel cell electric vehicles;

i) Precautions for professional operators to replace parts or release fuel.

5.3 Others

The fuel cell electric vehicle manual shall meet the requirements of 5.1 and 5.2, and shall also meet the requirements of GB/T 38117-2019.

This is an excerpt of the PDF (Some pages are marked off intentionally)

------ The End ------