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

GB/T 39132-2020

**Fuel cell electric vehicle engineering approval evaluation
programme**

燃料电池电动汽车定型试验规程

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1 Scope

China's national evaluation programme for the engineering approval of fuel cell electric vehicles. It specifies the terms and definitions, the implementation conditions, and the test items, methods and criteria. Engineering approval is the stage between a prototype that works and a product that can be sold: it establishes that the design is complete, that it performs as claimed, and that it is safe in the conditions it will meet. For a fuel cell vehicle the programme has to cover what is unlike a battery vehicle. Hydrogen is stored at seventy megapascals and leaks readily, so the tests address containment, detection and ventilation as much as performance. The fuel cell stack itself has a warm-up behaviour, a response lag and a freezing problem - the water it produces can freeze in the stack overnight and prevent starting. And refuelling is an interaction with an external system, which means the vehicle's communication with the dispenser is part of what has to be approved.

This Standard specifies implementation conditions, test items, test methods, judgment basis, test procedures and test report content for new product engineering approval evaluation program of fuel cell electric vehicle. This Standard is applicable to fuel cell electric vehicle that uses compressed gaseous hydrogen.

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 1495, Limits and measurement methods for noise emitted by accelerating motor vehicles

GB/T 12538, Road vehicles with two axles - Determination of centre of gravity

GB/T 12673, Motor vehicle main dimensions measurement method

GB/T 12674, Motor vehicles - Weight parameter - Measuring method

GB/T 19750-2005, Hybrid electric vehicles - Engineering approval evaluation program

GB/T 19752, Hybrid electric vehicle - Power performance - Test method

GB 20890-2007, Test Procedures and Requirement of Durability of Emission Control Systems for Heavy-duty Vehicles

GB/T 24548, Fuel cell electric vehicles - Terminology

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

GB/T 26779, Fuel cell electric vehicles - Refueling receptacle

- a) Major changes are required to meet the requirements of national standard inspection items;
- b) The effectiveness of steering and braking systems cannot ensure driving safety;
- c) There is a big gap between test vehicle performance indicators and product technical conditions;

5.1 General rules

5.1.1 The test vehicle shall be subjected to three tests: compulsory national standards and related regulations inspection, whole-vehicle performance test and whole-vehicle reliability driving test.

5.1.2 The test items of the modified vehicles shall be determined according to the specific changes. All items that change due to the modification shall be tested (inspected).

5.2 Compulsory national standards and related regulations inspection

5.2.1 Overview Vehicles shall meet the requirements of relevant mandatory national standards and related regulations. See 5.2.2~

5.2.4 for the three test methods of external noise, hydrogenation port, and vehicle hydrogen system.

5.2.2 Test of external noise a test site authorized by the state.

5.4.2 The total mileage of the reliability driving test is 15000km. Test in the hybrid drive mode. For the vehicle of which the total mass is not greater than 3500kg, the mileage is allocated as follows: strengthened bad road -- 3000km, flat road -- 2000km, high-speed runway -- 5000km, durable working condition - - 5000km (in accordance with Annex B of

GB/T 19750-2005). For the vehicle of which the total mass is greater than 3500kg, the mileage is allocated as follows: strengthened bad road -- 3000km, flat road -- 2000km, high-speed runway -- 5000km, durable working condition -- 5000km (in accordance with Annex A of GB 20890-2007).

5.4.3 The main assembly shall not have types 1, 2 failures during the test. After the test, the insulation performance, hydrogen leakage and idling exhaust emissions of the vehicle shall meet the requirements of GB/T 24549. NOTE 1: Type 1 failure refers to a failure that has occurred or will have a destructive situation, which leads to the loss of system functions and may cause personal danger or the main assembly of the vehicle to be scrapped; it needs to take emergency stop and issue warning measures. Type 2 failure refers to a failure that seriously degrades the performance of the system or damages the main assembly and cannot continue to operate but does not constitute a personal danger; it may take normal shutdown and issue warning measures.

6 Test procedures

6.1 Receive and check the test sample vehicle. Register it.

6.2 Conduct run-in driving in accordance with the manufacturer's regulations.

6.3 Carry out the tests such as compulsory national standards and related regulations inspection, whole-vehicle performance test, reliability driving test, and whole-vehicle performance retest.

7 Test report

The test report shall contain the following information:

- b) Test purpose;
- c) Basis for determining the test plan;
- d) Main standards for test basis;