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Evaluation and test methods for regenerative braking energy recovery rate of pure electric passenger vehicle (English Translation)

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Foreword

This standard was drafted in accordance with the rules given in GB/T 1.1-2009.

Please note that some elements of this standard may involve patents. The issuing organization of this standard does not assume responsibility for identifying these patents.

Appendix A and B of this standard are normative appendices, and appendices C and D are informative appendices.

This standard was proposed and managed by the China Automotive Engineering Society.

This standard was drafted. China Automotive Engineering Research Institute Co., Ltd., Tsinghua University.

1 Scope

This standard specifies the evaluation and test method for the energy recovery rate of regenerative braking of pure electric passenger vehicles.

This standard applies to the M1 class pure electric passenger car specified in GB/T 15089. Its equipment includes friction braking system and electric braking system.

2 Normative references

The following documents are indispensable for the application of this document. For documents indicating the date of citation, only the dated date applies to this document. For the undated references, the latest edition (including the modified version) applies to this document.

GB/T 15089 Motor vehicle and trailer classification GB/T 12534 General rules for road test methods GB/T 19596-2004 electric vehicle terminology GB/T 5620 Road vehicle and trailer brake terminology and its definition GB 21670-2008 Technical requirements and test methods for passenger car brake systems GB-T 18386-2005 Test method for energy consumption rate and driving range of electric vehicles GB/T 17953-2005 Light-duty hybrid electric vehicle energy consumption test method GB/T 17953-2013 light hybrid electric vehicle energy consumption test method ISO 8715:2001 Measurement of road handling characteristics of electric road vehicles JJF1221-2009 Chassis dynamometer calibration specification for automobile exhaust pollutant detection

3.1 Electric vehicle electric vehicle

Electric vehicles include pure electric, hybrid, plug-in hybrid (including extended program) and fuel cell electric vehicles (GB/T 19596-2004 3.1.1 definition)

3.2 Electric vehicle complete vehicle quality complete electric vehicle kerb mass

The whole vehicle kerb quality including the vehicle energy storage device (defined in GB/T 19596-2004 3.1.4.1).

3.3 Recyclable energy of electric vehicle

In the conditions of taxiing, braking, etc., the total amount of kinetic energy of the vehicle removes the energy remaining after the windage and the energy consumed by the rolling resistance.

3.4 Recyclable energy of electric vehicle

In the conditions of taxiing, braking, etc., the electric motor can be used to convert the recoverable energy of the electric vehicle into electric energy and stored in the energy

storage device.

the amount.

3.5 Electric vehicle regenerative braking regenerative braking of electric vehicle

In the conditions of taxiing, braking, etc., the electric motor is used to convert the recoverable energy of the electric vehicle into electric energy, and is supplied to the energy storage device or His process of using electrical equipment.

3.6 Energy recovery of coasting mode

During the driving process, when the driver releases the throttle and does not step on the brake pedal, the motor converts the recoverable energy of the electric vehicle into electrical energy.

3.7 Braking energy recovery energy recovery of braking mode

During the driving process, when the driver releases the accelerator and depresses the brake pedal, the motor converts the electric vehicle's recoverable energy into electrical energy.

3.8 Regenerative braking energy recovery rate of the single mode

In one braking or taxiing, the energy recovered by the energy storage device accounts for the percentage of energy that can be recovered by the electric vehicle.

3.9 Regenerative braking energy recovery rate of the cycle mode

In a cycle, the energy recovered by the energy storage device accounts for the percentage of energy that can be recovered by the electric vehicle.

5.1.1 Vehicle status requirements

The test vehicle shall be loaded according to the technical requirements of each test.

At ambient temperature, the test vehicle tire pressure should be in accordance with the vehicle manufacturer's regulations.

The viscosity of the lubricating oil for mechanical moving parts should meet the manufacturer's specifications.

The lighting, signalling, and auxiliary electrical equipment on the vehicle should be turned off unless the test and the vehicle are running during the day.

begging.

Except for the drive application, all energy storage systems should be filled to the maximum

values specified by the manufacturer (electrical, hydraulic, pneumatic, etc.).

The test driver shall operate the energy storage device at normal operating temperatures in accordance with the operating procedures recommended by the vehicle manufacturer.

Before the test, the test vehicle should travel at least 300km with the energy storage device installed on the vehicle. (GB/T 18386-2005 4.3.2 definition)

5.1.2 Test quality of electric vehicles

The sum of the quality of the whole vehicle and the additional quality required for the test (defined in GB/T 19596-2004 3.1.4.2).

The additional mass is (defined in GB/T 18386-2005 3.2).

If the maximum allowable loading mass is less than or equal to 180 kg, the mass is the maximum allowable loading quality;

If the maximum allowable loading mass is greater than 180kg but less than 360kg, the mass is 180kg;

If the maximum allowable loading mass is greater than 360 kg, the mass is half of the maximum allowable loading mass.

5.1.3 Status requirements for electric vehicle regenerative braking system

A vehicle regenerative braking system includes a friction braking system and an electric braking system. Its status requirements should meet the requirements of GB/T 21670-2008 Relevant content for friction braking systems and electric regenerative braking systems. (GB/T 21670-2008 4, 5 and Appendix D definition)

5.1.4 Chassis dynamometer test conditions

The test conditions of the chassis dynamometer shall meet the relevant content specified in JJF1221-2009 and be calibrated according to its contents.

5.1.5 Road test conditions

5.1.5.1

The quality status of the vehicle shall comply with the corresponding provisions of the various tests and shall be stated in the test report.

5.1.5.2

All types of tests shall be carried out according to the corresponding prescribed speed; if the maximum designed vehicle speed of the vehicle is lower than the test specified speed, the maximum shall be Design the speed of the vehicle for testing.