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Replacing GB/T 19596-2004

Terminology of electric vehicles

电动汽车术语

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Foreword

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

This standard replaces GB/T 19596-2004 “Terminology of electric vehicles”. As compared with GB/T 19596-2004, in addition to editorial changes, the main technical changes are as follows:

- ADD the electric vehicle terminology classified in accordance with the off-vehicle charging capability and driving mode selection (see 3.1.1.2);
- ADD such drive and driving device terms as electric drive system, high pressure system, and so on (see 3.1.2.1);
- ADD the terms on the safety performance and economic performance of electric vehicles (see 3.1.3.2 and 3.1.3.3);
- DELETE the terms of the motor maximum operating speed (see 3.2.5 of 2004 version);
- ADD the rechargeable energy storage device terms classified in accordance with packaging and performance (see 3.3.1.3 and 3.3.1.4)
- ADD the terms on rechargeable energy storage system power performance (see 3.3.3.6);
- MODIFY the term of charger (see 3.4).

This standard was proposed by the Ministry of Industry and Information Technology of the People's Republic of China.

This standard shall be under the jurisdiction of the National Automotive Standardization Technical Committee (SAC/TC 114).

The drafting organizations of this standard: China Automotive Technology Research Center, BYD Automotive Industry Co., Ltd., Anhui Ankai Automobile Co., Ltd., China First Automobile Co., Ltd. Technology Center, Shanghai Automotive Group Co., Ltd. Technology Center, Zhengzhou Yutong Bus Co., Ltd. , Zhejiang Younet Motor Co., Ltd., Southeast (Fujian) Automotive Industry Co., Ltd., Anhui Jianghuai Automobile Co., Ltd., Pan Asia Automotive Technology Center Co., Ltd., Chery New Energy Vehicle Technology Co., Ltd., Dongfeng Motor Corporation Technology Center, Hunan CRRC Times Electric Vehicle Co., Ltd., SAIC-GM-Wuling Automobile Co., Ltd.

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Terminology of electric vehicles

1 Scope

This standard defines the terms and definitions related to electric vehicles.

This standard applies to electric vehicle, drive motor system, rechargeable energy storage system and charger.

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) are applicable to this document.

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

GB/T 19752 Hybrid electric vehicle - Power performance - Test methods

GB/T 24548 Fuel cell electric vehicles - Terminology

GB/T 30038 Road vehicles - Degrees of protection (IP-code) - Protection of electrical equipment against foreign objects, water and access

3 Terms and definitions

The terms and definitions as defined in GB/T 2900.41, GB/T 19752, GB/T 24548 and GB/T 30038 as well as the following terms and definitions apply to this document.

3.1 Vehicle

3.1.1

Electric vehicle; EV

The following vehicles are collectively called electric vehicles.

3.1.1.1

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3.1.1.2.2.2

Non off-vehicle-chargeable hybrid electric vehicle; NOVC-HEV

Hybrid electric vehicles that obtains full energy from on-vehicle fuel under normal use.

3.1.1.2.3 In accordance with selection method of driving mode

3.1.1.2.3.1

Hybrid electric vehicle with selective switch

Hybrid electric vehicles with manual driving mode selection. Vehicle selectable driving modes include pure electric mode, thermal mode and hybrid mode.

3.1.1.2.3.2

Hybrid electric vehicles without selective switch

Hybrid electric vehicles without manual driving mode selection functions. The vehicle driving mode can be automatically switched based on different working conditions.

3.1.1.2.4

Range extended electric vehicle; REEV

An electric vehicle capable of achieving all of its power performance in a purely electric mode, but when the on-vehicle rechargeable energy storage system cannot meet the requirements of the cruising range, the vehicle auxiliary power supply device is turned on to provide electric power for the power system to extend the range of the electric vehicle. The on-vehicle auxiliary power supply device and the drive system do not have drive-connections such as drive shaft (belt).

3.1.1.3

Fuel cell electric vehicle; FCEV

Electric vehicles using the fuel cell system as a single power source or using both the fuel cell system and the rechargeable energy storage system as a hybrid power source.

3.1.1.3.1

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3.1.2.1.4.2

Electric power train

Electric power train composed of electric driving system and drive system.

3.1.2.1.4.3

Hybrid power train

Power train of a hybrid electric vehicle, composed of a power source that can add fuel and an electric power train.

3.1.2.1.5

Drive direction control

A special device for selecting the direction of the vehicle travel (forward or reverse) by the driver's operation. For example: joystick or button switch.

3.1.2.1.6

Vehicle control unit

Powertrain controller, which collects the accelerator pedal signal, brake pedal signal and other component signals, makes the appropriate judgments, controls the actions of each underlying component controller, to realize the vehicle drive, brake, and energy recovery.

3.1.2.1.7

Electric power system

Circuit systems that generate, transport, and use electrical energy, including power supplies.

3.1.2.1.8

Regenerative braking

The system that converts (or partially converts) the kinetic energy and potential energy of the vehicle in the driving process into the energy of the on-board rechargeable energy storage system and store it when the vehicle slides, slows down or descends.

3.1.2.1.9

Power battery system

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The device on the vehicle body to accommodate a charging socket (conductive charging) or charging port (inductive charging).

3.1.2.2.5

Passenger compartment

The space that accommodates the occupants, enclosed by the roof, floor, side walls, doors, glass windows and front wall, back wall or rear seat back support plate, and electrical protection bar to prevent occupants from touching live parts, and enclosure.

3.1.2.3 Electrical installations and components

3.1.2.3.1

Energy storage

Devices installed in the electric vehicles to store electric energy, including a variety of power batteries, supercapacitors and flywheel batteries, etc., or a combination of them.

3.1.2.3.2

Live part

Conductors or conductive parts that are energized during normal use.

3.1.2.3.3

Conductive part

The portion that allows current to pass, which is not energized during normal operation, but can become a live part in the event of a basic insulation failure.

3.1.2.3.4

Exposed conductive part

The conductive part touched by the joint test finger of IPXXB (protection level code).

Note: This concept is for a specific circuit, the live part of a circuit may be the exposed conductor of another circuit. For example, the passenger vehicle body may be a live part of the auxiliary circuit, but it is an exposed conductor to the power circuit.

3.1.2.3.5

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3.1.3.2.1

Unintended starting

The starting movement of vehicle in an unexpected situation.

3.1.3.2.2

Creepage distance

The shortest distance along the surface of the solid insulating material between the two electrically conductive parts.

3.1.3.2.3

Direct contact

Contact of human or animal with live parts.

3.1.3.2.4

Indirect contact

Contact of human or animal with a part which becomes into an exposed conductive part in the event of a failure of basic insulation.

3.1.3.2.5

Basic insulation

Insulation on live parts for basic protection against electric shock (in the absence of a fault).

Note: The basic insulation need not include functional insulation.

3.1.3.2.6

Supplementary insulation

Independent insulation used outside of basic insulation for protection against electric shock in the event of a basic insulation failure.

3.1.3.2.7

Double insulation

Insulation that have the basic insulation and supplementary insulation at the same time.

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Electric shock

Physiological effects caused by current passing through the body.

3.1.3.2.15

Enclosure

Components used to prevent equipment from being exposed to some external influence or direct contact in any direction.

Note: External influences may include the ingress of water or dust, to prevent mechanical damage.

3.1.3.2.16

Potential equalization

The minimization of potential difference between the exposed conductive parts of the electrical equipment.

3.1.3.2.17

Maximum working voltage

The AC voltage r.m.s. or DC voltage maximum value that may occur in the power system under normal working state, ignoring transient peaks.

3.1.3.2.18

Voltage class A electric circuits

The power components or circuits that have the maximum working voltage less than or equal to 30 V a.c. (r.m.s.) or less tan and equal to 60 V d.c.

3.1.3.2.19

Voltage class B electric circuits

Electrical components or circuits with a maximum operating voltage greater than 30V a.c. (r.m.s.) and less than or equal to 1000 V a.c. (r.m.s.), or greater than 60 V d.c. and less than or equal to 1500 V d.c.

3.1.3.2.20

Single point failure

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The convertor that turns on/off the input DC voltage at certain frequency, thereby changing the average output voltage.

3.2.4 Related devices

3.2.4.1

DC / DC convertor (converter)

Convertor that converts a certain DC power supply voltage into any DC voltage.

3.2.4.2

Cooling equipment

Device for cooling the motor and controller.

3.2.5 performance parameters

3.2.5.1

Rated power

Output power at rated conditions.

3.2.5.2

Continuous power

Prescribed maximum, long-term working power.

3.2.5.3

Peak power

The maximum permissible output power of the motor for the specified duration.

3.2.5.4

Rated speed

The minimum motor speed at rated power.

3.2.5.5

Rated torque

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PWM control

The method of control to achieve voltage change through the pulse width modulation (PWM).

3.2.5.13

Torque control

The method of control using the torque as the target value and the control command as the torque value.

3.2.5.14

Speed control

The method of control using the speed as the target value and the control command as the speed value.

3.2.5.15

Power control

The method of control using the power as the target value and the control command as the power value.

3.2.5.16

Regenerative braking control

The method of control to realize speed control by changing the power driving state into the power generation state, via the drive motor, thereby converting the kinetic energy of traveling vehicle into the electrical energy, which is then charged back into the on-board energy storage device.

3.2.5.17

Field weakening control

The control method for motor speed control by weakening the air gap magnetic field.

3.2.5.18

Output characteristics

The relationship between the motor torque, the output power and the speed.

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3.3.1.2.3

Nickel-metal hydride battery

The battery for which the positive electrode active material uses nickel oxide, the negative electrode active material uses hydrogen storage alloy, and the potassium hydroxide is used as the electrolyte.

3.3.1.2.4

Ultra-capacitor

An electrochemical energy storage device for which at least one electrode achieves energy storage by the electric double layer formed through electrode / electrolyte interface or by the pseudo-capacitance formed by a rapid redox reaction on an electrode surface.

3.3.1.3 Classified by packaging shape

3.3.1.3.1

Cylindrical cell

Battery with cylindrical battery case and connection element (electrode).

3.3.1.3.2

Prismatic cell

Battery with rectangular parallelepiped battery case and connection element (electrode).

3.3.1.3.3

Pouch cell

Battery with battery case made of composite film and connection element (electrode).

3.3.1.4 Classified by performance

3.3.1.4.1

High energy traction battery

Power battery featured by high energy density, which is mainly used for high energy output.

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Battery electronics

Electronic devices that collect or simultaneously monitor the electrical and thermal data of the secondary battery or module, which may include, if necessary, electronic components for secondary battery balancing.

Note: Battery electronics may include a single controller. The balance between secondary batteries can be controlled by the battery electronics or by the battery control unit.

3.3.2.1.6

Battery auxiliaries

Battery bracket, cooling system, temperature control system and other components as required for the normal work of the battery system.

3.3.2.1.7

Traction battery enclosure

Assembly used to accommodate the battery pack, battery management system and the corresponding auxiliary components, and contains mechanical connections, electrical connections, protection and other functions, referred to as the battery enclosure.

3.3.2.1.8

Swapping traction battery enclosure

A battery enclosure that can be installed in an electric vehicle in a short period of time (usually not more than 5 minutes) by human or mechanical assistance AND can be used to charge the battery under off-board conditions.

3.3.2.1.9

Battery pack

A unit which is usually includes a battery pack, battery management system, the battery enclosure and the corresponding accessories (cooling components, connecting cables, etc.), obtains electrical energy from outside and outputs electrical energy.

3.3.2.1.10

Battery management system; BMS

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Vent plug

Liquid injection hole plug installed on the secondary battery cover, which has the exhaust, anti-foam structure and explosion-proof function.

3.3.2.2.5

Safety valve; vent valve

Exhaust valve specially designed to release the gas in the battery to avoid excessive internal pressure.

3.3.2.2.6

Terminal

Conductive parts which are used in the external circuit to connect the battery anode and cathode.

3.3.2.2.7

Terminal cover

Cover that is used to prevent short circuit between terminals (poles).

3.3.2.2.8

Ventilation device

The device that is used to discharge the gas generated by the electrochemical reaction out of the battery under the pressure difference between inside and outside of the battery.

3.3.2.2.9

High voltage fuse

High-voltage circuit short-circuit protection device.

3.3.2.2.10

High voltage relay

Appliance which is in the auxiliary control circuit to control the magnetic field generated by the coil current, so that the contacts close and break, with arc suppression capability, with loading on-off, in order to achieve the control of electrical load.

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3.3.3.4.2

Rated capacity

Battery capacity measured under specified conditions and indicated by the manufacturer.

Note: Rated capacity is usually expressed in Ampere hour (Ah) or Milliampere hour (mAh).

3.3.3.4.3

n hour rates capacity

The capacity as released by a fully charged battery when discharging at a discharge rate of n hours and reaching the specified termination conditions.

3.3.3.4.4

Initial capacity

The capacity (Ah) as released by the new exit-factory power battery which discharges at the 1 hour rate discharge current to the discharge termination conditions as specified by the enterprise after being fully charged at room temperature.

3.3.3.4.5

Available capacity

The capacity value as released from the fully charged battery under the specified conditions.

3.3.3.4.6

Theoretical capacity

The capacity value that is able to be released by the battery assuming that the active substance is fully utilized.

3.3.3.4.7

Storage characteristics

Characteristics that indicate the change of such parameters as capacity and internal resistance after long-term out-of-service.

3.3.3.4.8

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Starting power at high temperature

The power output from the battery system SOC during constant voltage discharge at 40 °C at 20% or at the lowest SOC allowed by the manufacturer, which sets the upper limit of discharge current in accordance with the parameters provided by the manufacturer.

3.3.3.6.4

Starting power at low temperature

The power output from the battery system SOC during constant voltage discharge at -20 °C at 20% or at the lowest SOC allowed by the manufacturer, which sets the upper limit of discharge current in accordance with the parameters provided by the manufacturer.

3.3.3.7 Density

3.3.3.7.1

Energy density

The electrical energy obtained from the unit mass or unit volume of a battery, expressed in Wh/kg, Wh/L. Also known as specific energy.

3.3.3.7.1.1

Specific energy density

The electrical energy taken from the unit mass of the battery, expressed in Wh/kg. Also known as specific energy or mass specific energy.

3.3.3.7.1.2

Volumetric energy density

The electrical energy taken from the unit volume of the battery, expressed in Wh/L. Also known as specific energy.

3.3.3.7.2

Power density

The output power obtained from the unit mass or unit volume of the battery, expressed in W/kg, W/L, also referred to as specific power or mass specific power.

3.3.3.7.2.1

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3.3.3.8.6

End-of-charge voltage

The terminal voltage of the battery under discharging state after connecting to a load.

3.3.3.8.7

End-of-discharge voltage

The minimum voltage that can be reached when the battery is discharged normally.

3.3.3.9

Discharge current

Current output by the battery during discharge.

3.3.3.10

Internal resistance

The sum of the resistance of the electrolyte, positive and negative pole group, and the diaphragm.

3.3.3.11 Efficiency

3.3.3.11.1

Charge efficiency

The general name of coulombic efficiency and energy efficiency.

3.3.3.11.1.1

Coulombic efficiency

The ratio of the capacity released from the battery during discharge to the charge capacity during the same cycle.

3.3.3.11.1.2

Energy efficiency (Watt-hour efficiency)

The ratio of the energy released from the battery during discharge to the charge energy during the cycle.

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3.3.3.13.2

Internal short circuit

Short circuit occurred between the anode and cathode in the battery.

3.3.3.13.3

Thermal runaway

The overheating, fire and explosion phenomenon of sharp change of battery self-temperature rise rate as caused by the battery thermal release chain reaction.

3.3.3.13.4

Thermal propagation

Continuous temperature-rise of the secondary batteries caused by the thermal runaway of the secondary battery in the battery system.

3.3.3.13.5

Fire

Continuous burning of any part of the battery (duration longer than 1 s), the spark and arc do not belong to burning.

3.3.3.13.6

Explosion

Violent breaking of battery case, accompanied by severe noise and the main component projectile.

3.3.3.13.7

Leakage

Battery electrolyte leaks from inside to the outside of the battery case.

3.3.3.13.8

Venting

The release of the gas through the pre-designed method when the internal pressure of the secondary battery or battery bank increases.

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Charging voltage

The output terminal voltage when the charger is charging.

3.4.1.5

Charger

Electric energy conversion device that controls and adjusts the battery charging.

3.4.1.5.1

On-board charger; OBC

A charger that is fixedly mounted on the vehicle.

3.4.1.5.2

Off-board charger

Chargers all parts of which are not installed on the vehicle.

3.4.2 Charging method

3.4.2.1

Conductive charge

The method of battery charging by the use of electrical conduction.

3.4.2.2

Inductive charge

The method of charging the battery by the use of electromagnetic induction.

3.4.3 Control method

3.4.3.1

Equalizing charge

A continuous charge that is to ensure the uniform charge state of all secondary batteries in the battery.

3.4.3.2

Constant current charge

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The device that mechanically locks the charging connector.

3.4.4.7

Charging controller

Device to control the charging process.

3.4.5 Specifications, performance

3.4.5.1

Rated frequency

Rating of the output frequency of AC power.

3.4.5.2

Rated input capacity

Under specified conditions, the input capacity [AC] of the charger when the charger is working, generally indicated by (VA).

3.4.5.3

Input frequency

AC input power frequency.

3.4.5.4

Frequency fluctuation range

Allowable frequency change range of the AC input power.

3.4.5.5

Efficiency

The ratio of output energy to input energy.

3.4.5.6

Voltage adjustable range

The adjustable range of the charger output voltage.

3.4.5.7

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