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NATIONAL STANDARD OF THE PEOPLE'S REPUBLIC OF CHINA

GB/T 47136-2026

Specification for the assessment of the health and safety state of traction batteries for battery electric vehicles

纯电动汽车动力蓄电池健康与安全状态评估规范

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Preview: page 1 of 5 shown, 26 in the full document. Complete English PDF, instant download:
https://chinastandards.org/standards/gb-t-47136-2026

Table of Contents

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1 Scope

GB/T 47136-2026 is the Chinese national standard covering judging a used EV battery - the remaining capacity and power, the internal resistance and the cell-to-cell spread, the history recorded by the management system, and the safety indicators that decide whether a pack may be reused, repurposed or must be recycled. This is the document that will decide the residual value of a second-hand electric car. First edition, in force since 1 May 2026, with GB/T 47591-2026 on battery identification. It was issued on 28 January 2026 and has been in force since 1 May 2026, as a first edition. The document is under the responsibility of the Standardization Administration of China. This page is published from the official record of the 2026 edition; the clause text of a standard this recent is not yet in circulation, and the figures, limits and tables it contains are those of the document itself, delivered in full with the English translation.

This document specifies the assessment process, assessment index system, calculation method, assessment results, applications for the health and state-of-safety assessment of power batteries for pure electric vehicles. This document applies to activities conducting health and state-of-safety assessments of power batteries for in-service pure electric vehicles based on operational data. Activities conducting health and state-of-safety assessments of power batteries used in other scenarios shall refer to this document. This document applies to ternary lithium batteries and lithium iron phosphate batteries; other

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types of power batteries shall refer to this document for further information.

2 Normative references

The following documents, through normative references within this document, constitute essential provisions 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/T 19596-2017 Terminology of electric vehicles

GB/T 32895-2025 Communication protocols for swapping battery pack of electric vehicle

GB/T 32960.3-2025 Technical specifications for remote service and management system for electric vehicles - Part

3 Terms and definitions

The terms and definitions defined in GB/T 19596-2017 and GB/T 45415-2025, as well as the following terms and definitions, apply to this document.

3.1 State-of-health (SOH) A parameter measuring the health of a power battery, calculated by considering changes in its capacity, voltage, internal resistance, usage behavior.

3.2 State-of-safety (SOS) A parameter measuring the risk level of a power battery, calculated by analyzing the degree of abnormality in its state-of-health, electrical safety, thermal safety.

3.3 Stage-of-charge (SOC) [translator's note. should be state-of-charge] The percentage of usable capacity that can be released under specified discharge conditions in the current power battery. [Source: GB/T 19596-2017, 3.3.3.2.5, modified]

3.4 Capacity retention rate The percentage of the current usable capacity of the power battery relative to the manufacturer's stated rated capacity.

3.5 Voltage deviation mean value change The amount by which the average voltage deviation of each smallest parallel unit of the power battery increases or decreases.

3.6 Voltage range root mean square The square root of the average square of the voltage differences between the highest and lowest voltages of the smallest parallel units of the power battery. battery.

3.13 Highest alarm level The highest level of general alarm faults specified in GB/T 32960.3 or GB/T 32895.

3.14 Second-highest alarm level The general alarm fault level second only to the highest alarm level (3.13).

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Preview: page 3 of 5 shown, 26 in the full document. Complete English PDF, instant download:
https://chinastandards.org/standards/gb-t-47136-2026

3.15 Defect analysis The technical analysis activities conducted by the manufacturer, recall authority, or recall technical organization regarding product defects. [Source: GB/T 45415-2025, 3.4]

4 Assessment process

The assessment process for the health and state-of-safety of power batteries is shown in Figure 1 and includes the following. - Determine the assessment object and clarify the health and state-of-safety assessment indicator system. If significant deformation or cracking of the power battery casing is found during the determination of the assessment object, the health and state-of-safety assessment shall be stopped; a risk assessment and defect analysis of the power battery shall be conducted. - State-of-health assessment. Calculate the state-of-health assessment indicator values; calculate the total state-of-health score; generate a state-of-health assessment result report. - State-of-safety assessment. Based on the total state-of-health score, calculate the state-of-safety assessment indicator values and assess whether there are any high- risk safety conditions. If a high-risk condition exists, a state-of-safety assessment result report is generated directly; if no high-risk condition exists, the total state- of-safety score is calculated; a state-of-safety assessment result report is generated.

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5 Assessment indicator system

5.1 The state-of-health assessment indicator system consists of four assessment dimensions. capacity, voltage, internal resistance, usage behavior. It includes six assessment indicators. capacity retention rate, voltage deviation mean value change, voltage range root mean square, internal resistance consistency, cumulative charge/discharge cycles/cumulative service life, average monthly charge/discharge cycles. The indicators and their weights are shown in Table 1.

5.2 The state-of-safety assessment indicator system consists of three assessment dimensions. state-of-health, electrical safety, thermal safety. It includes seven assessment indicators. annual decline rate of SOH, minimum parallel unit overvoltage, minimum parallel unit undervoltage, insulation resistance failure, poor voltage consistency, high battery temperature, battery temperature difference. See Table 2 for each assessment indicator.

5.3 The assessment indicator system for the state-of-health and state-of-safety of power batteries in pure electric vehicles can be used for the development of power battery analysis systems.

6.1 General requirements

6.1.1 Except for the calculation method marked as applicable to battery swapping models, the calculation methods specified in Chapter 6 are applicable to all types of pure electric

Preview: page 4 of 5 shown, 26 in the full document. Complete English PDF, instant download:
https://chinastandards.org/standards/gb-t-47136-2026

vehicles.

6.1.2 The data required for calculation in Chapter 6 shall meet the following requirements.

a) The data acquisition frequency should not be less than

0.1 Hz.

b) The data acquisition period shall not be less than 1 month and not more than 2 months, ensuring that the data acquisition object does not change within the period, meanwhile the time interval between the data acquisition cutoff time and the assessment time shall not exceed 7 days.

c) The required data accuracy for each assessment indicator shall meet the following requirements. - Total current measurement accuracy shall meet the requirements of

5.4.2 in GB/T 38661-2020; - Minimum parallel unit voltage detection accuracy shall meet the requirements of

5.4.3 in GB/T 38661-2020; - Temperature detection accuracy shall meet the requirements of

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Preview: page 5 of 5 shown, 26 in the full document. Complete English PDF, instant download:
https://chinastandards.org/standards/gb-t-47136-2026