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

GB/T 21561.1-2025

Replacing GB/T 21561.1-2018

**Railway applications - Rolling stock - Pantographs
characteristics and tests - Part 1: Pantographs for vehicles**

轨道交通 机车车辆 受电弓特性和试验 第1部分：机车车辆受电弓

(English Translation)

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Foreword

This document complies with the provisions of GB/T 1.1-2020 "Standardization Work Guidelines Part 1: Structure and Drafting Rules of Standardization Documents".

Drafting.

This document is Part 1 of GB/T 21561 "Characteristics and Tests of Pantographs for Rail Transport Vehicles and Rolling Stock". GB/T 21561 has been...

The following sections were published.

- Part 1: Pantographs for Locomotives and Rolling Stock;
- Part 2: Pantographs for Metro and Light Rail Vehicles;
- Part 3: Pantograph-to-Mainline Locomotive and Rolling Stock Interface;
- Part 4: Pantograph interface with subway and light rail vehicles.

This document replaces GB/T 21561.1-2018 "Characteristics and Tests of Pantographs for Rail Transit Vehicles and Rolling Stock - Part 1: Mainline Locomotives" Compared with GB/T

21561.1-2018, the main technical changes in "Pantograph for Vehicles" are as follows, except for structural adjustments and editorial modifications.

- The definition of the term "skateboard length" has been changed (see 3.2.10, 2018 version);
- The term "skateboard working length" and its definition have been added (see 3.2.11);
- The usage environment has been changed (see Chapter 4, Chapter 6 in the 2018 edition);
- General requirements have been added (see 5.1);
- The clearance requirements have been changed (see 5.2, 5.1 in the 2018 version);
- Added technical requirements for distributed power EMUs (see 5.4, 5.5, 5.7.3, 5.8, 5.10, 5.12, Chapter 6, 7.3, 7.7, 7.14, and Appendix).

Record A);

- The corrosion protection requirements have been changed (see 5.11, 5.10 in the 2018 edition);
- Added salt spray performance requirements and tests (see 5.13, 7.15);
- Wind tunnel testing has been added (see 7.16).

This document is modified to adopt IEC 60494-1:2013 "Characteristics and tests of pantographs for rail transport vehicles and rolling stock - Part 1: Mainline".

Pantograph for locomotives and rolling stock.

Compared with IEC 60494-1:2013, this document has undergone the following structural adjustments.

- Sections 3.3.8 and 3.4 of IEC 60494-1:2013 have been deleted, and section 3.2.10 has been added. The affected section numbers have been adjusted accordingly.
- Chapter 4 has been added; subsequent chapter numbers will be adjusted accordingly.
- Figure 2 corresponds to Figure A.1 in Annex A of IEC 60494-1:2013, with the addition of sections 5.1.1~5.1.3, 5.12, 5.13, and 5.14;
- Added versions 7.14 to 7.16;
- Appendix D of IEC 60494-1:2013 has been deleted. Appendix A of this document corresponds to Appendix C of IEC 60494-1:2013.

The technical differences between this document and IEC 60494-1:2013, and the reasons therefor, are as follows.

- The term "target static contact force" has been deleted, and the term "slide working

length" has been changed to reflect the current situation in my country (see Chapter 3);

---A new chapter on "Usage Environment" has been added (see Chapter 4) to make the content clearer;

---The technical requirements and related tests for distributed power EMUs have been revised, and GB/T 24338.4 has been added as a normative reference to comply with our...

Current status of the country (see 4.1.1, 5.1, 5.4, 5.5, 5.7.3, 5.8, 5.10, 5.12, 5.14, Chapter 6, 7.3, 7.7, 7.14, 7.15, Appendix A);

---The general technical requirements have been changed, and the normative reference to IEC 62498-1 has been removed to conform to the current situation in my country (see 5.1);

---IEC 62486 (see sections 5.1, 5.2, 5.4, 5.5, 5.7.1, 5.7.3, 5.10) has been replaced by the normatively referenced GB/T 43790-2024.

7.10, 7.11), to adapt to my country's technical conditions and increase operability;

---The clearance requirements have been revised, and GB 146.1, a normative reference, has been added to conform to the current situation in my country (see 5.2);

---IEC 60850 (see 5.4) has been replaced with the normatively referenced GB/T 1402 to adapt to my country's technical conditions and increase operability.

Actual nature;

---The requirements for the bow head length have been changed to conform to the current situation in my country (see 5.7.1);

---The technical requirements for skateboards have been revised, and normative references to TB/T 1842.1, TB/T 1842.2, and TB/T 1842.3 have been added, making the internal...

The content is more clearly defined (see 5.7.4);

---The technical requirements and test methods for the automatic pantograph lowering device have been revised to conform to the current situation in my country (see 5.9, 7.2.6);

---The corrosion protection requirements have been revised to suit my country's current situation (see 5.11);

---Added salt spray performance requirements and tests, and added the normative reference GB/T 2423.17 to adapt to coastal environments.

Use the requirements (see 5.13, 7.15);

---The requirements for type testing, factory inspection, research testing, and field testing have been revised to conform to the current situation in my country (see 7.1.2~7.1.5);

---The inspection requirements for visual inspection and dimensions have been revised to conform to the current situation in my country (see 7.2.1 and 7.2.3);

---The content on "Measuring Static Contact Force at Room Temperature" has been revised to include requirements for the nominal static contact force of the pantograph, facilitating inspection (see...).

7.3.1);

---The climate tests for the pantograph riser and airtightness performance have been modified; the test temperatures have been changed from "-25 °C" and "40 °C" to...

"-40°C" and "70°C" are suitable for my country's national conditions (see 7.3.3 and 7.7.3);

---The lifting operation between the lowering position and the maximum working height has been modified, and the normative reference to IEC 60077-3 has been removed to comply with...

Current situation in my country (see 7.4.1.1);

---IEC 60077-1 (see 7.4.1.1) has been replaced with the normatively referenced GB/T 21413.1 to adapt to my country's technical conditions, and has been expanded.

Increase operability;

---IEC 60077-2 (see 7.4.1.1) has been replaced with the normatively referenced GB/T 21413.2 to adapt to my country's technical conditions, and has been expanded.

Increase operability;

---The content of vibration testing has been revised, adding "shock and vibration testing" and specifying it as a type test, and adding acceptance criteria.

This makes the test requirements more specific, clear, and operable (see 7.4.3.1);

---IEC 61373 (see 7.4.3.1) has been replaced with the normatively referenced GB/T 21563-2018 to adapt to my country's technical requirements.

Add components to increase operability;

---The wording, agreed upon in consultation with users, has been revised to reflect the current situation in my country (see 7.5, 7.8, and 7.12.3);

---The total average lift force has been modified to align with GB/T 43790-2024 (see 7.10);

---The current collection test method has been modified to suit the current situation in my country (see 7.11);

---The current temperature rise test has been modified. The "rated and maximum current when the locomotive and rolling stock are stationary" test has been expanded to include "the contact wire and sliding plate requirements".

To standardize test conditions, "supplementary type test" should be changed to "type inspection" (see 7.12.1 and 7.12.2).