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

GB/T 7928-2025

Replacing GB/T 7928-2003

General technical specification for metro vehicles

地铁车辆通用技术条件

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Table of Contents

Foreword...	3
1 Scope...	7
2 Normative References...	7
3 Terms and Definitions...	10
4 Use Conditions...	10
5 Vehicle Types...	11
6 General Requirements...	14
7 Vehicle Types and Train Formation...	17
8 Vehicle Body and Interior Equipment...	18
9 Bogies...	21
10 Braking System...	22
11 Electrical System...	24
12 Air Conditioning and Ventilation System...	26
13 Train Control and Management System...	27
14 Communication and Passenger Information System...	28
15 Electromagnetic Compatibility...	28
16 Safety Facilities...	29
17 Interfaces with Other Disciplines...	30
18 Test and Acceptance...	31
19 Markings...	31

1 Scope

GB/T 7928-2025 is the Chinese national standard covering the metro car as a whole - the dimensions and the axle load, the traction and braking performance, the car body strength and the fire behaviour, the doors and the interior, the ride quality and noise, and the type tests before entry into service. This is the parent specification for every metro car built in China. It replaces GB/T 7928-2003, a standard twenty-two years old, under the Ministry of Housing and Urban-Rural Development. In force from 1 May 2026. Issued on 31 October 2025, it has been in force since 1 May 2026, replacing GB/T 7928-2003.

This Document specifies the technical requirements for the use conditions, vehicle types, general requirements, vehicle configuration and train formation, vehicle body and internal equipment, bogies, braking systems, electrical systems, air conditioning and ventilation

systems, train control and management systems, communication and passenger information systems, electromagnetic compatibility, safety facilities, interfaces with other disciplines, testing and acceptance, markings, transportation, and warranty periods of metro vehicles. This Document applies to the design, manufacture, and acceptance of metro vehicles with a maximum operating speed not exceeding 120 km/h.

2 Normative References

The provisions in following documents become the essential provisions of this Document through reference in 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) is applicable to this Document.

GB 146.1 Gauge for standard gauge railways - Part 1.rolling stock gauge

GB/T 1402 Railway applications - Supply voltages of traction systems

GB/T 2423.17 Environmental testing - Part

3 Terms and Definitions

For the purposes of this Document, the following terms and definitions apply.

3.1 Metro vehicle On metro line, single-unit vehicle that can be arranged in a row for running.

3.2 Metro train Organized into a column, the combination of several metro vehicles that can carry passengers.

3.3 Train communication network A data communication network that connects the onboard programmable electronic devices of each vehicle in a train.

3.4 Train control and management system; TCMS A control system that enables functions such as train communication management, logic control, fault diagnosis, safety protection, data processing, status display, and data recording, etc.

4 Use Conditions

4.1 Environmental conditions Metro trains (hereinafter referred to as "trains") shall operate normally under the following environmental conditions.

a) Normal operating altitude not exceeding 1400 m;

b) Ambient temperature of -25°C ~ 45°C;

c) Average monthly relative humidity of the wettest month not exceeding 90% (average monthly minimum temperature of that month is 25°C);

d) The trains shall be able to withstand wind, sand, rain, snow; and the effects of cleaning agents during vehicle washing.

4.2 Track conditions Trains shall operate normally under the following track conditions.

a) Track gauge 1435 mm;

b) Minimum horizontal curve radius conforming to the provisions of GB 50157;

c) Minimum vertical curve radius 2000 m;

d) Maximum gradient of the main line should not exceed 30 per mille; 35 per mille may be used in difficult sections; and maximum gradient of connecting lines and access lines should not exceed 40 per mille.

4.3 Power supply conditions

4.3.1 Current collection methods may include pantograph current collection and collector shoe power supply.

4.3.2 The power supply voltage may be DC 1500 V (fluctuation range DC 1000 V~DC 1800 V) or DC 750 V (fluctuation range DC 500 V~DC 900 V).

4.3.3 The traction substation, contact network, and power supply protection devices in the power supply system shall comply with the provisions of GB/T 10411; the main characteristic parameters of the power supply voltage shall comply with the provisions of GB/T 1402.

5 Vehicle Types

Vehicles should adopt two main types. Type A and Type B. Their main technical specifications are shown in Table 1.

6 General Requirements

6.1 Vehicle gauge shall comply with the provisions of both CJJ/T 96 and GB 146.1.

6.2 Wheel diameter shall be 840+3 0 mm. For newly manufactured vehicles, the difference in wheel diameter between two wheels on the same axle shall not exceed 1 mm; and the difference in wheel diameter between wheels on the same bogie shall not exceed 2 mm.

6.3 The inner wheel distance shall be 1353 mm $\pm$ 2 mm.

6.4 The vehicle mass in its curb weight shall not exceed 3% of the specified value.

6.5 The difference BETWEEN the axle load measured on each driving axle AND the actual average axle load of all driving axles of the same high-speed train shall be within $\pm 2\%$ of the actual average axle load of all driving axles of the train.

6.6 The difference between the actual wheel load of each wheel and the average wheel load of the two wheels on that axle shall be within $\pm 4\%$ of the average wheel load of the two wheels on that axle.

6.7 The height of the passenger compartment floor from the rail surface shall be coordinated with the station platform surface. The empty-loaded car height adjustment device shall ensure that the vehicle floor height does not change significantly due to changes in passenger capacity. The height difference between the vehicle floor and the station platform surface shall comply with the provisions of GB 55033.

6.8 The train shall be able to safely pass through minimum radius curve sections at the specified speed and perform normal coupling and uncoupling operations on the specified small radius curves.

6.9 The traction-speed characteristics and braking-speed characteristics of the train shall meet the design requirements.

6.10 The maximum test speed of the train shall be

1.1 times the maximum operating speed or plus 10 km/h, whichever is greater. The maximum operating speed should select as 80 km/h, 100 km/h, or 120 km/h.

6.11 When the train is in a maximum capacity condition, on a straight and dry track, with wheels in a semi-worn state, and at the rated power supply voltage, the average acceleration of the train at startup shall meet the following requirements.

a) When the maximum operating speed is 80 km/h, the average acceleration of the train from 0 to 40 km/h shall be no less than

1.0 m/s^2 ; and when the motor-to-trailer ratio is 1.1, it shall be no less than