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

GB/T 25340-2026

Replacing GB/T 25340-2010

**Technical specification for the automatic equipment
identification of railway rolling stock**

铁路机车车辆自动识别设备技术条件

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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 supersedes GB/T 25340-2010 "Technical Conditions for Automatic Identification Equipment for Railway Locomotives and Rolling Stock" and is consistent with GB/T 25340-2010. Compared to previous versions, aside from structural adjustments and editorial changes, the main technical changes are as follows:

- a) Added terms and definitions (see Chapter 3);
- b) Added abbreviations (see Chapter 4);
- c) The basic structure and functions of centralized data management, monitoring, and replication equipment have been removed (see sections 3.5 of the 2010 version);
- d) Added support for wireless writing of electronic tags (see 5.2.1);
- e) The requirement for ground-based automatic identification equipment to upload ground information to the locomotive's electronic tag has been removed (see 3.3 in the 2010 version);
- f) Increased the protection level of the electronic tag casing, and the requirements for shock and vibration (see 6.2.2, 6.2.3);

- g) Added technical requirements for electronic tags to adapt to vehicle speed (see 6.2.7);
- h) The ambient temperature requirements for Automatic Identification System (AIS) ground-based devices have been changed (see 7.1, 4.1 of the 2010 edition);
- i) Increased environmental humidity requirements for ground-based automatic identification equipment (see 7.1);

1 Scope

GB/T 25340-2026 is the Chinese national standard covering the tag under every Chinese wagon and locomotive and the trackside readers that record it - the system by which a railway knows which vehicle passed which point, at speed and in any weather. It replaces GB/T 25340-2010 and has been in force since 1 October 2026, under the National Railway Administration. It was issued on 31 March 2026 and takes effect on 1 October 2026, replacing GB/T 25340-2010. 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 basic structure and functions of Automatic Identification (All) equipment for railway locomotives and rolling stock, the classification and technical requirements of electronic tags, and the AEI design. Technical requirements for equipment, label programming equipment, and installation requirements. This document applies to the design, manufacture, and inspection of automatic identification equipment for railway locomotives, passenger cars, freight cars, and EMU trains.

4. Abbreviations The following abbreviations apply to this document.

5 Basic Components and Functions

5.1 Basic Components Automatic identification equipment for locomotives and rolling stock shall consist of the following components.

- a) Electronic tags;
- b) AEI equipment, including train detection modules, antennas, microwave radio frequency modules, readout modules, and low-speed detection modules, etc.;
- c) Tag programming device.

5.2 Basic Functions

5.2.1 Electronic Tags Electronic tags should have the following basic functions.

- a) Store basic information such as train number, car number, and type of locomotive and rolling stock;
- b) Transmit tag data information to the AEI device via microwave reflection modulation;
- c) Write relevant information via a tag programming device, and support wireless writing.

5.2.2 AEI Equipment AEI equipment should have the following basic functions.

- a) Utilizing radio frequency identification (RFID) technology to automatically identify electronic tag information on locomotives and rolling stock;
- b) Automatically determine the position of locomotives and rolling stock within the train;
- c) Automatically determine the train's direction of travel;
- d) Automatically calculate train speed;
- e) Automatic axle and vehicle counting when vehicle speed exceeds 5 km/h;
- f) Automatically determine the end position of locomotives and rolling stock;
- g) Equipment status self-detection and fault self-diagnosis;
- h) Message data storage, analysis, processing, and transmission;
- i) Enable remote maintenance functions such as setting device parameters, monitoring status, upgrading software, and downloading data via network.

5.2.3 Tag Programming Device

5.2.3.1 Locomotive and EMU tag programming equipment shall have the following functions.

- a) Portable tag programming devices can program, write, read, and verify fixed information on electronic tags for locomotives and EMUs;
- b) The vehicle-mounted tag programming device can receive dynamic information transmitted by the vehicle-mounted device in real time and write it into the electronic tag via a wired method.

5.2.3.2 The label programming equipment for trucks and buses should be able to program, write, read, and verify electronic tag information via wired or wireless means.

6.1 Electronic Tag Classification

6.1.1 Electronic tags are divided into active tags and passive tags. Locomotives and EMUs should use active tags, while freight cars and passenger cars should use passive tags.

6.1.2 The content of the electronic tag information shall comply with the provisions of TB/T 3443.1, TB/T 3443.2, and TB/T 3443.3, and the data format shall comply with... According

to the provisions of Appendices A to D, the 6-bit ASCII code should conform to the provisions of Appendix E, and the data format can be supplemented and defined according to the application needs.

6.2 Technical Requirements

6.2.1 Electronic tags should be suitable for environments such as rain, snow, wind, sand, fog, smoke, dust, oil, and chemical corrosion.

6.2.2 The protection level of the electronic tag housing shall comply with the IP67 requirement in GB/T 4208-2017.

6.2.3 The impact and vibration resistance of electronic tags shall comply with the provisions of GB/T 21563.

6.2.4 The operating frequency band of the electronic tag is 902MHz~928MHz.

6.2.5 Under the operating frequency of the electronic tag, with a maximum peak electric field strength of 100V/m, continuous wave duration of 60s, the electronic tag should be able to maintain its position. The integrity of stored data must be ensured. Electromagnetic compatibility should comply with GB/T 24338.4.

6.2.6 The operating temperature of the electronic tag is -40°C to 85°C; the data storage temperature of the electronic tag is -70°C to 125°C. Electronic tags within the scope should maintain the integrity of the stored data.

6.2.7 Electronic tags for freight cars should be automatically identifiable at speeds not exceeding 160 km/h; electronic tags for locomotives, passenger cars, and EMUs should be automatically identifiable at speeds not exceeding 160 km/h. It should be able to be automatically recognized when the speed is no greater than 350 km/h.

6.2.8 Electronic tags shall use amplitude shift keying modulation (ASK) and shall use modified FSK encoding or binary spatial encoding (FMO).

6.2.9 Modified FSK codes shall comply with the following provisions.

a) The modified FSK encoding uses two harmonic correlation frequencies, 20kHz and 40kHz, with a frequency error of $\pm 10\%$;

b) User bit "1" consists of two cycles of a 40kHz rectangular wave followed by a one-cycle 20kHz rectangular wave; user bit "0"... It consists of a 20kHz rectangular wave with one cycle and a 40kHz rectangular wave that follows with two cycles;

c) All transition phases are continuous, and the waveform generated by the electronic tag has a nominal rise or fall time of 1 μ s within one cycle. The rectangular waves of 20kHz and 40kHz each account for 50%, and the deformed FSK encoded waveform should conform to the specifications in Figure 1.