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

GB/T 45308-2025

Network time synchronization for rail transit rolling stock

轨道交通 机车车辆 网络时间同步技术要求

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Foreword

This document is in accordance with the provisions of GB/T 1.1-2020 "Guidelines for standardization work Part

1. Structure and drafting rules for standardization documents" Drafting. Please note that some of the contents of this document may involve patents. The issuing organization of this document does not assume the responsibility for identifying patents. This document is proposed by the National Railway Administration. This document is under the jurisdiction of the National Rail Transit Electrical Equipment and System Standardization Technical Committee (SAC/TC278). This document was drafted by: CRRC Zhuzhou Electric Locomotive Research Institute Co., Ltd., China Railway Certification and Inspection Zhuzhou Traction Electrical Equipment Inspection Station Co., Ltd. Company, China Academy of Railway Sciences Group Co., Ltd. Locomotive and Rolling Stock Research Institute, CRRC Qingdao Sifang Locomotive and Rolling Stock Co., Ltd., CRRC Zhuzhou Electric Locomotive Co., Ltd. and CRRC Tangshan Locomotive and Rolling Stock Co., Ltd. The main drafters of this document are. Liu Haitao, Zhou Xuexun, Shen Hui, Hao Bo, Cai Wanyin, Ye Pengdi, Ma Guodong, Ye Feng, Ji Yun. Rail transit locomotives and vehicles Network time synchronization technical requirements

1 Scope

China's national standard for network time synchronization on rail transit rolling stock. A modern train is a distributed computer system: traction control, braking, doors, passenger information, CCTV and event recording all run on the train communication network, and every one of them timestamps what it records. When something goes wrong, the investigation is reconstructed from those timestamps across a dozen devices from different suppliers, and if their clocks disagree by more than the events they are recording, the sequence cannot be established - which is precisely the situation in an incident inquiry. Synchronization is also functional rather than merely evidential: coordinated actions across

cars, and any distributed control, need a common time base. The standard specifies the technical requirements and performance tests for network time synchronization of rail transit locomotives and vehicles, and applies to train communication network equipment.

This document specifies the technical requirements and performance tests for network time synchronization of rail transit locomotives and vehicles. This document applies to rail transit locomotive and vehicle train communication network (TCN) equipment.

2 Normative references

The contents of the following documents constitute the essential clauses of this document through normative references in this document. For referenced documents without a date, only the version corresponding to that date applies to this document; for referenced documents without a date, the latest version (including all amendments) applies to This document.

GB/T 17737.1 Coaxial communication cables Part

3 Terms and definitions

The terms and definitions defined in GB/T 28029.1-2020 and the following apply to this document.

3.1 timereference The standard time is based on Beidou time as the initial time reference and atomic time as the time unit (s).

3.2 timeaccuracy The degree of agreement between a local clock and a time reference measured over a certain time interval.

Note. It is expressed as the absolute value of time deviation.

3.3 Time accuracy localtimeaccuracy The degree of consistency between the local clock and the time reference measured within a specified time interval in the punctual state.

Note. It is expressed as the absolute value of time deviation.

4 Ethernet marshaling network (ECN)

GB/T 37943-2019 Beidou satellite timing terminal test method TB/T 1484.3-2017 Rolling Stock Cables Part

3.Communication Cables JJF(Communication)018-2021 Calibration Specification for Time Integrated Tester