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Railway applications - Braking - Definition of ETCS brake curve parameters for Gamma trains

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Bahnanwendungen - Bremsen - Bestimmung der ETCS-Bremskurvenparameter für Gamma-Züge

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European foreword

This document (EN 17997:2025) has been prepared by Technical Committee CEN/TC 256 “Railway applications”, the secretariat of which is held by DIN.

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by July 2025, and conflicting national standards shall be withdrawn at the latest by July 2025.

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Introduction

European Train Control System (ETCS) specifications have become part of, or are referred to the Technical Specifications for Interoperability (TSI) for railway control-command systems, as part of the European legislation, managed by the European Union Agency for Railways (ERA).

The Braking model specification in this document is based on the definition in the System Requirements Specification (SRS) SUBSET-026, Version 3.6.0 of 13/05/2016 [11], published by the European Union Agency for Railways: ETCS B3 R2 GSM-R B1 [10].

Based on a generic “brake system architecture model” a procedure is described to design a train specific software model which is applied for calculating the rolling stock correction factors and a method for determination of the nominal emergency and service braking deceleration for normal and degraded modes is described. Furthermore, the derivation of all the required traction and braking model parameters is specified.

This document describes the different steps to define ETCS emergency and service brake parameters for ETCS gamma braking model trains intended to operate on lines equipped with ETCS Baseline 3 [10].

1 Scope

This document specifies the methodology to define the train related braking model and required emergency and service brake on-board parameters to enable speed and distance monitoring for trains equipped and operated on railway lines using ETCS Baseline 3.

This document is only applicable for ETCS Gamma braking model trains (i.e. the train is said to be a “gamma” train). This document does not specify the way these parameters are transferred to and can be used by the ETCS on-board system (e.g. during start of mission - SoM).

The ETCS “conversion models” are not covered by this document and are described in EN 16834:2019, Annex F. The ETCS “conversion models” are intended for use with trains where the braking performance is expressed using braked weight percentages (“lambda” train).

Any trackside related input parameters, including national values, are not covered in this document. Information can be found in the SUBSET-026 (see [11]).

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements 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.

EN 15595:2018+A1:2023, *Railway applications — Braking — Wheel slide protection*

EN 16834:2019, *Railway applications - Braking - Brake performance*

EN 17343:2023, *Railway applications - General terms and definitions*

EN 50126-2, *Railway Applications - The Specification and Demonstration of Reliability, Availability, Maintainability and Safety (RAMS) - Part 2: Systems Approach to Safety*

EN ISO 24478:2024, *Railway applications — Braking — General vocabulary (ISO 24478:2023)*