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English Version

**Railway applications - Measurement of vertical forces on wheels and wheelsets - Part 3: Approval and verification of on track measurement sites for vehicles in service**

Applications ferroviaires - Mesurage des forces verticales à la roue et à l'essieu - Partie 3 : Approbation et vérification des sites de mesure en voie des véhicules en service

Bahnanwendungen - Messung von vertikalen Rad- und Radsatzkräften - Teil 3: Zulassung und Prüfung von gleisseitigen Messeinrichtungen für Fahrzeuge im betrieblichen Einsatz

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## European foreword

This document (CEN/TR 15654-3:2019) has been prepared by Technical Committee CEN/TC 256 “Railway applications”, the secretariat of which is held by DIN.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CEN shall not be held responsible for identifying any or all such patent rights.

This document is the third part of the EN 15654 series, *Railway applications — Measurement of vertical forces on wheels and wheelsets*, which consists of the following parts:

- *Part 1: On-track measurement sites for vehicles in service;*
- *Part 2: Test in workshop for new, modified and maintained vehicles;*
- *Part 3: Approval and verification of on track measurement sites for vehicles in service* [this CEN/TR].

This document describes the acceptance and verification of devices defined in Part 1.

## **Introduction**

This document has been developed to provide approval and verification procedures to ensure that measurement systems according to EN 15654-1 meet the functional and metrological characteristics. The goal is to achieve metrologically traceable and reproducible measurement results.

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## 1 Scope

This document is related to EN 15654-1, *Railway applications — Measurement of vertical forces on wheels and wheelsets — Part 1: On-track measurement sites for vehicles in service*, which lays down minimum technical requirements and the metrological characteristics of a system for measuring and evaluating a range of vehicle loading parameters during operation in service.

The aim of this document is to describe approval and verification procedures to validate the functional and metrological characteristics of measurement systems and confirm them over time.

The goal is to obtain the comparability and reproducibility of measurement results under different boundary conditions. To minimize the number of tests, the approval and verification procedures are divided into:

- type approval,
- initial verification,
- in-service verification.

The accuracy class of a measurement system depends on the measurement device, vehicle and track characteristics. Test procedures covering these influences are described to ensure reproducibility in all networks.

The procedures described in this document do not impose any restrictions on the design of measurement sites, on the types of vehicles that can be monitored, or on which networks or lines the measuring system can be installed.

The annexes include examples for test procedures, calculation of maximum permissible errors and statistical test methods.

## 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 15654-1:2018, *Railway applications — Measurement of vertical forces on wheels and wheelsets — Part 1: On-track measurement sites for vehicles in service*

## 3 Terms and definitions

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

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

- IEC Electropedia: available at <http://www.electropedia.org/>
- ISO Online browsing platform: available at <http://www.iso.org/obp>

### 3.1 calibration

operation that establishes a relationship between the reference value and the indicated measurement result from the device under test

Note 1 to entry: The reference value is a quantity value with known uncertainties provided by measurement standards.