This document is a preview generated by EVS

RAUDTEEALASED RAKENDUSED. RATTA JA RATTAPAARI VERTIKAALJÕU MÕÕTMINE. OSA 1: RÖÖBASTEEL MÕÕTMISKOHAD KASUTUSES RAUDTEEVEEREMILE

Railway applications - Measurement of vertical forces on wheels and wheelsets - Part 1: On-track measurement sites for vehicles in service

EESTI STANDARDIKESKUS
ESTONIAN CENTRE FOR STANDARDISATION

EESTI STANDARDI EESSÕNA

NATIONAL FOREWORD

This document is a preview generated by EVS

See Eesti standard EVS-EN 15654-1:2018 sisaldab Euroopa standardi EN 15654-1:2018 ingliskeelset teksti.	This Estonian standard EVS-EN 15654-1:2018 consists of the English text of the European standard EN 15654-1:2018.
Standard on jõustunud sellekohase teate avaldamisega EVS Teatajas.	This standard has been endorsed with a notification published in the official bulletin of the Estonian Centre for Standardisation.
Euroopa standardimisorganisatsioonid on teinud Euroopa standardi rahvuslikele liikmetele kättesaadavaks 17.01.2018.	Date of Availability of the European standard is 17.01.2018.
Standard on kättesaadav Eesti Standardikeskusest.	The standard is available from the Estonian Centre for Standardisation.

Tagasisidet standardi sisu kohta on võimalik edastada, kasutades EVS-i veebilehel asuvat tagasiside vormi või saates e-kirja meiliaadressile standardiosakond@evs.ee.

ICS 45.060.01

Standardite reprodutseerimise ja levitamise õigus kuulub Eesti Standardikeskusele

Andmete paljundamine, taastekitamine, kopeerimine, salvestamine elektroonsesse süsteemi või edastamine ükskõik millises vormis või millisel teel ilma Eesti Standardikeskuse kirjaliku loata on keelatud.

Kui Teil on küsimusi standardite autorikaitse kohta, võtke palun ühendust Eesti Standardikeskusega:
Koduleht www.evs.ee; telefon 605 5050; e-post info@evs.ee

The right to reproduce and distribute standards belongs to the Estonian Centre for Standardisation

No part of this publication may be reproduced or utilized in any form or by any means, electronic or mechanical, including photocopying, without a written permission from the Estonian Centre for Standardisation.

If you have any questions about copyright, please contact Estonian Centre for Standardisation:

Homepage www.evs.ee; phone +372 605 5050; e-mail info@evs.ee

EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

EN 15654-1

January 2018

ICS 45.060.01

English Version

Railway applications - Measurement of vertical forces on wheels and wheelsets - Part 1: On-track measurement sites for vehicles in service

Applications ferroviaires - Mesurage des forces verticales à la roue et à l'essieu - Partie 1 : Sites de mesure en voie des véhicules en service

Bahnanwendungen - Messung von vertikalen Rad- und Radsatzkräften - Teil 1: Gleisseitige Messeinrichtungen für fahrende Fahrzeuge

This European Standard was approved by CEN on 29 October 2017.

CEN members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration. Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the CEN-CENELEC Management Centre or to any CEN member.

This European Standard exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CEN member into its own language and notified to the CEN-CENELEC Management Centre has the same status as the official versions.

CEN members are the national standards bodies of Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, Former Yugoslav Republic of Macedonia, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and United Kingdom.

EUROPEAN COMMITTEE FOR STANDARDIZATION
COMITÉ EUROPÉEN DE NORMALISATION
EUROPÄISCHES KOMITEE FÜR NORMUNG

CEN-CENELEC Management Centre: Rue de la Science 23, B-1040 Brussels

© 2018 CEN All rights of exploitation in any form and by any means reserved worldwide for CEN national Members.

Ref. No. EN 15654-1:2018 E

This document is a preview generated by EVS

Contents

Page

European foreword 4

Introduction 5

1 Scope 6

2 Normative references 7

3 Terms, definitions, symbols and abbreviations 7
3.1 Terms and definitions 7
3.2 Abbreviations 10
3.3 Symbols 10

4 Measured and derived quantities 11
4.1 Measured quantities 11
4.2 Mandatory derived quantities 11
4.3 Optional derived quantities 11

5 Metrological characteristics 14
5.1 General 14
5.2 Accuracy classes 14
5.3 Measurement and calibration range 16
5.4 Influence quantities 17
5.5 Condition of use 17

6 Technical requirements 17
6.1 Train and vehicle related capability 17
6.2 Environmental 18
6.3 Inputs and Outputs 18
6.4 Descriptive markings 21
6.5 Measuring device specific 22
6.6 Measuring site specific 23

Annex A (informative) Device assessment frame work 24

A.1 Introduction 24

A.2 Type approval test 24

A.3 Initial verification 24

A.4 In-service verification 24

A.5 Adjustment and verification methods 24

Annex B (informative) Measurement site selection criteria 25

B.1 Introduction 25

B.2 Measurement site 25

B.3 Criteria for site selection 26

Annex C (informative) Data exchange format 30

C.1 Introduction 30

This document is a preview generated by EVS

C.2 Example 1 ..... **30**
C.3 Example 2: mandatory values **34**
Annex D (informative) Usage of data and accuracy classes **36**
D.1 Introduction **36**
D.2 Typical applications **36**
Annex ZA (informative) Relationship between this European Standard and the Essential Requirements of EU Directive 2008/57/EC aimed to be covered **39**
Bibliography **41**

This document is a preview generated by EVS

European foreword

This document (EN 15654-1:2018) 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 2018, and conflicting national standards shall be withdrawn at the latest by July 2018.

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 has been prepared under a mandate given to CEN by the European Commission and the European Free Trade Association, and supports essential requirements of EU Directive 2008/57/EC.

For relationship with EU Directive 2008/57/EC, see informative Annex ZA, which is an integral part of this document.

This document is the first part of a three part series collectively referred to as “*Railway applications — Measurement of vertical forces on wheels and wheelsets*”. The series consists of:

— *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* (CEN/TR)

According to the CEN-CENELEC Internal Regulations, the national standards organisations of the following countries are bound to implement this European Standard: Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, Former Yugoslav Republic of Macedonia, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.

This document is a preview generated by EVS

Introduction

This European Standard has been developed to provide a common procedure for determining the axle load, wheel force and the mass of rail vehicles operating (in-service) in Europe.

This standard also details the evaluation of derived quantities such as asymmetric loading, overloading, vehicle mass and train mass. These quantities are obtained while the train is in-service and in motion.

This document is a preview generated by EVS

1 Scope

The scope of this European Standard is restricted to the measurement of vertical wheel forces and calculation of derived quantities on vehicles in service. Measurements of a train in motion are used to estimate the static forces.

Derived quantities can be:

— axle loads;

— side to side load differences of a wheel set, bogie, vehicle;

— overall mass of vehicle or train set;

— mean axle load of a vehicle or train set.

This standard is not concerned with the evaluation of:

— dynamic wheel force or derived quantities;

— wheel condition (i.e. shape, profile, flats);

— lateral wheel force;

— combination of lateral and vertical wheel forces.

The standard defines accuracy classes for measurements to be made at any speed greater than 5 km/h within the calibrated range, which may be up to line speed.

The aim of this standard is to obtain measurement results that give representative values for the distribution of vertical wheel forces of a running vehicle, which under ideal conditions will be similar to those that can be obtained from a standing vehicle.

This standard does not impose any restrictions on the types of vehicles that can be monitored, or on which networks or lines the measuring system can be installed.

The standard lays down minimum technical requirements and the metrological characteristics of a system for measuring and evaluating a range of vehicle loading parameters. Also defined are accuracy classes for the parameters measured and the procedure for verifying the calibration.

The measuring system proposed in this standard should not be considered as safety critical. If the measuring system is connected to a train traffic command and control system then requirements that are not part of this standard may apply.

Measuring systems complying with this standard have the potential to enhance safety in the railway sector. However, the current operating and maintenance procedures rather than this standard are mandatory for ensuring safety levels in European rail networks.

This document is a preview generated by EVS

2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

EN 50121-4, *Railway applications — Electromagnetic compatibility — Part 4: Emission and immunity of the signalling and telecommunications apparatus*

EN 50121-5, *Railway applications — Electromagnetic compatibility — Part 5: Emission and immunity of fixed power supply installations and apparatus*

EN 50122-1, *Railway applications — Fixed installations — Electrical safety, earthing and the return circuit - Part 1: Protective provisions against electric shock*

EN 50122-2, *Railway applications — Fixed installations — Electrical safety, earthing and the return circuit - Part 2: Provisions against the effects of stray currents caused by d.c. traction systems*

EN 50124-1, *Railway applications — Insulation coordination — Part 1: Basic requirements — Clearances and creepage distances for all electrical and electronic equipment*

EN 60529, *Degrees of protection provided by enclosures (IP Code) (IEC 60529)*

EN 15273-3, *Railway applications - Gauges - Part 3: Infrastructure gauge*

3 Terms, definitions, symbols and abbreviations

3.1 Terms and definitions

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

NOTE They are listed in the order in which they appear in the standard.

3.1.1
static vertical wheel force
$Q_{F0,j,k}$
representation of the vertical part of the static wheel force vector obtained from the dynamic measurement process of a vehicle in motion

Note 1 to entry: Where the symbol Q_{F0jk} is used, j is the axle number and k is the vehicle side, $k = R$ denotes the right hand side in the direction of travel and $k = L$ denotes the left hand side in the direction of travel.

3.1.2
axle load
sum of the static vertical wheel forces exerted on the track through a wheelset or a pair of independent wheels divided by acceleration of gravity

3.1.3
quantity
property of a phenomenon, body, or substance, where the property has a magnitude that can be expressed as a number and a reference

[SOURCE: ISO/IEC GUIDE 99]

This document is a preview generated by EVS