

**Raudteelased rakendused. Nõuded raudteeveeremi rööbastele tõmbamisele ja tõstmisele**

**Railway Applications - Re-railing and recovery requirements for railway vehicles**

## EESTI STANDARDI EESSÕNA

## NATIONAL FOREWORD

See Eesti standard EVS-EN 16404:2014 sisaldab Euroopa standardi EN 16404:2014 inglisekeelset teksti.	This Estonian standard EVS-EN 16404:2014 consists of the English text of the European standard EN 16404:2014.
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 26.02.2014.	Date of Availability of the European standard is 26.02.2014.
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English Version

## Railway applications - Re-railing and recovery requirements for railway vehicles

Applications ferroviaires - Exigences relatives au  
réenraillement et au rétablissement de véhicules  
ferroviaires

Bahnwendungen - Anforderungen für das Aufgleisen und  
Bergen von Schienenfahrzeugen

This European Standard was approved by CEN on 9 November 2013.

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## Foreword

This document (EN 16404:2014) 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of an identical text or by endorsement, at the latest by August 2014, and conflicting national standards shall be withdrawn at the latest by August 2014.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CEN [and/or CENELEC] 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.

According to the CEN-CENELEC Internal Regulations, the national standards organizations 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, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.

## Introduction

Rail vehicles are designed so that re-railing and recovery operations after a derailment or accident can be safely undertaken without exposing persons to undue risk during lifting and jacking operations.

For rolling stock of interoperable trains there is a need to define common requirements in terms of lifting and jacking operations, equipment space envelopes and lifting accessories.

Foreseeable factors that can influence a re-railing or recovery operation include:

- final vehicle position relative to the track;
- weight transfer due to final vehicle orientation (inclination or roll);
- vehicle load, possible overloading or uneven loading;
- load movement or shifting;
- embedding in ground;
- sinking of jacks (soft ground);
- structural distortion/damage;
- jerking or snatching of lifting equipment.

The majority of these factors cannot be quantified either in advance or during a recovery operation and therefore precise requirements cannot be set out in this European Standard and accordingly design scenarios are used. The resulting requirements together with competent persons undertaking the re-railing or recovery operation using the documentation specified are considered to be sufficient to ensure that the overall objectives are satisfied.

## 1 Scope

This European Standard is applicable to all railway vehicles that will operate under the Interoperability Directives taking into consideration the recommendations given in Annex E on the application of the standard (migration rule).

Rolling stock of the following types are excluded from the scope of this European Standard:

- metros, tramways, and other light rail vehicles;
- vehicles for the operation of local, urban or suburban passenger services on networks that are functionally separate from the rest of the railway system;
- vehicles exclusively used on privately owned railway infrastructure that exist solely for use by the owner for its own freight operations;
- vehicles reserved for a strictly local, historical or touristic use.

On track machines are in the scope of this European Standard only when in transport (running) configuration on their own rail wheels, either self-propelled or hauled.

However, the requirements may be appropriate for other applications that have similar operational conditions. It specifies the principles and processes to be followed to achieve satisfactory arrangements for re-railing or recovery of railway vehicles and to validate the design against the relevant performance and safety requirements.

The interface between the re-railing and recovery equipment and vehicle structure is considered as the interface between the jack contact faces or the lifting bracket contact areas. The structural requirements for the vehicle structures are set out in EN 12663-1 and EN 12663-2.

NOTE Railway vehicles that will operate under the Interoperability Directives correspond to the categories L, P-I, P-II, F-I and F-II defined in EN 12663-1.

## 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 12663-1, *Railway applications - Structural requirements of railway vehicle bodies - Part 1: Locomotives and passenger rolling stock (and alternative method for freight wagons)*

EN 12663-2, *Railway applications - Structural requirements of railway vehicle bodies - Part 2: Freight wagons*

EN 13155, *Cranes - Safety - Non-fixed load lifting attachments*

EN 15663, *Railway applications - Definition of vehicle reference masses*

EN 15877-1, *Railway applications - Marking on railway vehicles - Part 1: Freight wagons*

EN 15877-2, *Railway applications - Markings of railway vehicles - Part 2: External markings on coaches, motive power units, locomotives and on track machines*

EN 22768-1:1993, *General tolerances - Part 1: Tolerances for linear and angular dimensions without individual tolerance indications (ISO 2768-1:1989)*

### 3 Terms and Definitions

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

#### 3.1

##### **articulated vehicle with shared running gear**

system of articulation where each vehicle has its own secondary suspension but shares running gear (often referred to as Jacobs bogies)

Note 1 to entry: Typically each car body is supported at 4 points. Trains made up of vehicles of this type are a particular type of fixed formation train.

#### 3.2

##### **articulated vehicles with three point support**

system of articulation where each vehicle has one bogie complete with its own secondary suspension and at the other end a single point connection to the adjacent vehicle in the train

Note 1 to entry: Trains made up of vehicles of this type are a particular type of fixed formation train.

#### 3.3

##### **fixed formation**

train formation that can only be reconfigured in a workshop environment

Note 1 to entry: A fixed formation train can be made up of either articulated or otherwise conventional vehicles.

#### 3.4

##### **jacking**

action of raising a vehicle or part of a vehicle by pushing upwards from underneath using appropriate equipment such as jacks

#### 3.5

##### **lifting**

action of raising a vehicle or part of a vehicle by pulling upwards from above using appropriate equipment such as cranes

#### 3.6

##### **lifting/jacking point**

particular points provided on the car body and/or running gear to position or locate lifting devices to raise or lower a vehicle using either cranes or jacks

#### 3.7

##### **lifting bracket**

removable item of equipment that provides the functionality of a lifting/jacking point when attached to the vehicle using a lifting pocket

#### 3.8

##### **lifting pocket**

recess or other interface on the vehicle structure intended for the attachment of a lifting bracket

Note 1 to entry: This item interfaces with a lifting bracket to form a lifting/jacking point.