



**SLOVENSKI STANDARD**  
**oSIST prEN 15955-2:2009**  
**01-september-2009**

Railway applications - Track - Demountable machines and associated equipment - Part  
 2: General safety requirements

Bahnanwendungen - Oberbau - Ausgleisbare Maschinen und zugehörige Ausstattung -  
 Teil 2: Allgemeine Sicherheitsanforderungen

Applications ferroviaires - Voie - Machines dérailables et éléments associés - Partie 2:  
 Prescriptions générales de sécurité

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**Ta slovenski standard je istoveten z: prEN 15955-2**

**ICS:**

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EUROPEAN STANDARD  
NORME EUROPÉENNE  
EUROPÄISCHE NORM

**DRAFT**  
**prEN 15955-2**

June 2009

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ICS

English Version

## Railway applications - Track - Demountable machines and associated equipment - Part 2: General safety requirements

Applications ferroviaires - Voie - Machines dérailables et éléments associés - Partie 2: Prescriptions générales de sécurité

Bahnanwendungen - Oberbau - Ausgleisbare Maschinen und zugehörige Ausstattung - Teil 2: Allgemeine Sicherheitsanforderungen

This draft European Standard is submitted to CEN members for enquiry. It has been drawn up by the Technical Committee CEN/TC 256.

If this draft becomes a European Standard, 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.

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## Foreword

This document (prEN 15955-2:2009) has been prepared by Technical Committee CEN/TC 256 “Railway applications”, the secretariat of which is held by DIN.

This document is currently submitted to the CEN Enquiry.

For relationship with EC Directive(s), see informative Annex ZA and ZB, which are integral parts of this document.

“Railway applications – Track – Demountable machines and associated equipment” consists of the following parts:

Part 1: Technical requirements for running and working;

Part 2: General safety requirements.

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## Introduction

This European Standard is a type C standard as stated in EN ISO 12100.

The machinery concerned and the extent to which hazards, hazardous situations and hazardous events are covered are indicated in the scope of this European Standard.

When provisions of this type C standard are different from those which are stated in type B standards, the provisions of this type C standard take precedence over the provisions of the other standards, for machines that have been designed and built according to the provisions of this type C standard.

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## 1 Scope

This European Standard deals with the significant hazards, hazardous situations and events, common to demountable machines, as defined in prEN xxxzz-1, intended for construction, maintenance inspection of the railway infrastructure, shunting and emergency rescue vehicles, when they are used as intended by the manufacturer, see clause 4. The manufacturer shall give warning of the risks concerning the conditions of misuse which are reasonably foreseeable .

This European Standard deals with the common hazards during transport, assembly and installation, commissioning, running on track, use including setting, programming, and process changeover, operation, cleaning, fault finding, maintenance and de-commissioning of the machines.

NOTE Specific measures for exceptional circumstances are not dealt with in this European Standard. They can be subject of negotiation between manufacturer and the operator.

The common hazards dealt with include the general hazards presented by the machines, and also the hazards presented by the following specific machine functions:

- excavation;
- ballast tamping, ballast cleaning, ballast regulating, ballast consolidating;
- track renewal;
- rail maintenance;
- craning;
- catenary renewal / maintenance;
- maintenance of the components of the infrastructure;
- inspection and measurement of the components of the infrastructure;
- tunnel inspection / ventilation;
- shunting;
- emergency rescue and recovery

during commissioning, use, maintenance and servicing.

This European Standard applies to self propelled machines that are not intended to operate signalling and control systems. Other similar machines are dealt with in other European Standards, see Annex D.

It is assumed that a finished standard automotive chassis used as a host for a demountable machine will offer an acceptable safety level for its designed functions before conversion. This specific aspect is not dealt with in this European Standard.

This European Standard does not deal with:

- requirements with regard to the quality of work and the performance of the machine;
- machines that utilise the catenary for traction purposes;

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- specific requirements established by a railway infrastructure manager;
- negotiations between the manufacturer and the machine operator for additional or alternative requirements;
- hazards due to air pressure caused by the passing of high-speed trains at more than 190 km/h;
- requirements which could be necessary in case of use in extreme conditions, such as:
  - extreme ambient temperatures (tropical or polar);
  - highly corrosive or contaminating environment, e.g. due to the presence of chemicals;
  - potentially explosive atmospheres.

This European Standard applies to all machines that are ordered one year after the publication date by CEN of this standard.

**2 Normative references**

The following referenced documents are indispensable for the application of this European Standard. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

CEN/TR 15172-1:2005, *Whole-body vibration — Guidelines for vibration hazards reduction — Part 1: Engineering methods by design of machinery*

EN 280, *Mobile elevating work platforms — Design calculations, stability criteria, construction, safety, examinations and tests*

EN 294, *Safety of machinery; safety distances to prevent danger zones being reached by the upper limbs*

EN 349, *Safety of machinery; minimum gaps to avoid crushing of parts of the human body*

EN 474 series, *Earth-moving machinery — Safety*

EN 474-1:2006, *Earth-moving machinery — Safety — Part 1: General requirements*

EN 547-1, *Safety of machinery — Human body measurements — Part 1: Principles for determining the dimensions required for openings for whole body access into machinery*

EN 547-2, *Safety of machinery — Human body measurements — Part 2: Principles for determining the dimensions required for access openings*

EN 547-3, *Safety of machinery — Human body measurements — Part 3: Anthropometric data*

EN 614-1, *Safety of machinery — Ergonomic design principles — Part 1: Terminology and general principles*

EN 614-2, *Safety of machinery — Ergonomic design principles — Part 2: Interactions between the design of machinery and work tasks*

EN 618, *Continuous handling equipment and systems — Safety and EMC requirements for equipment for mechanical handling of bulk materials except fixed belt conveyors*

EN 619, *Continuous handling equipment and systems — Safety and EMC requirements for equipment for mechanical handling of unit loads*

- EN 620, *Continuous handling equipment and systems — Safety and EMC requirements for fixed belt conveyors for bulk materials*
- EN 811, *Safety of machinery — Safety distances to prevent danger zones being reached by the lower limbs*
- EN 842, *Safety of machinery — Visual danger signals — General requirements, design and testing*
- EN 894-1, *Safety of machinery — Ergonomic requirements for the design of displays and control actuators — Part 1: General principles for human interactions with displays and control actuators*
- EN 894-2, *Safety of machinery — Ergonomics requirements for the design of displays and control actuators — Part 2: Displays*
- EN 894-3, *Safety of machinery — Ergonomics requirements for the design of displays and control actuators - Part 3: Control actuators*
- EN 953, *Safety of machinery — Guards — General requirements for the design and construction of fixed and movable guards*
- EN 981, *Safety of machinery — System of auditory and visual danger and information signals*
- EN 982, *Safety of machinery — Safety requirements for fluid power systems and their components — Hydraulics*
- EN 983, *Safety of machinery — Safety requirements for fluid power systems and their components — Pneumatics*
- EN 999, *Safety of machinery — The positioning of protective equipment in respect of approach speeds of parts of the human body*
- EN 1032, *Mechanical vibration — Testing of mobile machinery in order to determine the vibration emission value*
- EN 1088, *Safety of machinery — Interlocking devices associated with guards — Principles for design and selection*
- EN 1837, *Safety of machinery — Integral lighting of machines*
- EN 12077-2, *Cranes safety — Requirements for health and safety — Limiting and indicating devices*
- EN 12096:1997, *Mechanical vibration — Declaration and verification of vibration emission values*
- EN 12999, *Cranes — Loader cranes*
- EN 13000, *Cranes — Mobile cranes*
- EN 13001-1, *Cranes — General design — Part 1: General principles and requirements*
- EN 13135-1:2003, *Cranes — Safety; Design; Requirements for equipment — Part 1: Electrotechnical equipment*
- EN 13135-2:2004, *Cranes — Equipment — Part 2: Non-electrotechnical equipment*
- EN 13478:2001, *Safety of machinery — Fire prevention and protection*
- EN 13557, *Cranes — Controls and control stations*

**prEN 15955-2:2009 (E)**

prEN 14033-1:2008, *Railway applications — Track — Railbound construction and maintenance machines — Part 1: Technical requirements for running*

EN 14033-2:2008, *Railway applications — Track — Railbound construction and maintenance machines — Part 2: Technical requirements for working*

EN 28662-1:1992, *Hand-held portable power tools — Measurement of vibrations at the handle — General*

EN 50102, *Degrees of protection provided by enclosures for electrical equipment against external mechanical impacts (IK code)*

EN 50153:2002, *Railway applications — Rolling stock — Protective provisions relating to electrical hazards*

EN 50239, *Railway applications — Radio remote control system of traction vehicle for freight traffic*

EN 60204-1:2006, *Safety of machinery — Electrical equipment of machines — Part 1: General requirements*

EN 60204-32, *Safety of machinery — Electrical equipment of machines — Part 32: Requirements for hoisting machines*

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

EN 61310-1, *Safety of machinery — Indication, marking and actuation — Part 1: Requirements for visual, auditory and tactile signals*

EN 61310-2, *Safety of machinery — Indication, marking and actuation — Part 2: Requirements for marking*

EN 61310-3, *Safety of machinery — Indication, marking and actuation — Part 3: Requirements for the location and operation of actuators*

EN 61496-1, *Safety of machinery — Electro-sensitive protective equipment — Part 1: General requirements and tests*

prEN xxxzz-1:2009, *Railway applications — Track — Demountable machines — Technical requirements for running and working*

EN ISO 2860, *Earth-moving machinery — Minimum access dimensions*

EN ISO 2867, *Earth moving machinery — Access systems*

EN ISO 3411:2005, *Earth moving machinery — Human physical dimensions of operators and minimum operator space envelope*

EN ISO 3744:1995, *Acoustics — Determination of sound power levels of noise sources using sound pressure — Engineering method in an essentially free field over a reflecting plane*

EN ISO 4871:1996, *Acoustics — Declaration and verification of noise emission values of machinery and equipment*

EN ISO 6682, *Earth moving machinery — Zones of comfort and reach for controls*

EN ISO 7096:2000, *Earth-moving machinery — Laboratory evaluation of operator seat vibration*

EN ISO 7731, *Ergonomics — Danger signals for public and work areas - Auditory danger signals*

EN ISO 11201:1995, *Acoustics — Noise emitted by machinery and equipment — Measurement of emission sound pressure levels at a work station and at other specified positions — Engineering method in an essentially free field over a reflecting plane*

- EN ISO 11688-1, *Acoustics — Recommended practice for the design of low-noise machinery and equipment — Part 1: Planning*
- EN ISO 11688-2, *Acoustics — Recommended practice for the design of low-noise machinery and equipment — Part 2: Introduction to the physics of low- noise design*
- EN ISO 12001, *Acoustics. Noise emitted by machinery and equipment — Rules for the drafting and presentation of a noise test code*
- EN ISO 12100-1:2003, *Safety of machinery — Basic concepts, general principles for design — Part 1: Basic terminology, methodology*
- EN ISO 12100-2:2003, *Safety of machinery — Basic concepts, general principles for design — Part 2: Technical principles*
- EN ISO 13732-1, *Ergonomics of the thermal environment — Methods for the assessment of human responses to contact with surfaces — Hot surfaces*
- EN ISO 13849-1, *Safety of machinery — Safety-related parts of control systems — General principles for design*
- EN ISO 13850, *Safety of machinery — Emergency stop. Principles for design*
- EN ISO 14122-2, *Safety of machinery — Permanent means of access to machinery — Part 2: Working platforms and walkways*
- ISO 3795, *Road vehicles and tractors and machinery for agriculture and forestry — Determination of burning behaviour of interior materials*
- ISO 3864 series, *Safety colours and safety signs*
- ISO 4305, *Mobile cranes — Determination of stability*
- ISO 4310, *Cranes — Test code and procedures*
- ISO 5006:2005, *Earth-moving machinery — Operator's field of view — Test method and performance criteria*
- ISO 5353, *Earth-moving machinery and tractors and machinery for agriculture and forestry — Seat index point*
- ISO 6405-1, *Earth-moving machinery — Symbols for operator controls and other displays — Part 1: Common symbols*
- ISO 7000:1989, *Graphical symbols for use on equipment — Index and synopsis*
- ISO 10263-2, *Earth-moving machinery — Operator enclosure environment — Part 2: Air filter test*
- ISO 10263-3, *Earth-moving machinery — Operator enclosure environment — Part 3: Operator enclosure pressurisation test method*
- ISO 10263-5, *Safety of earth-moving machinery — Operator enclosure environment — Windscreen defrosting system test method*
- ISO 10567, *Earth-moving machinery — Hydraulic excavators — Lift capacity*
- ISO 11112:1995, *Earth-moving machinery — Operator's seat — Dimensions and requirements*
- ISO 12508, *Earth-moving machinery — Operator station and maintenance areas — Bluntness of edges*

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ISO/DIS 16001, *Earth-moving machinery — Hazard detection systems and visual aids — Performance requirements and tests*

**3 Terms and definitions**

For the purposes of this document, the terms and definitions given in EN ISO 12100-1 and in prEN xxxzz-1:2009 and the following apply.

**3.1****rail configuration**

state of the machine when it is in place on the track ready to work or travel along the track

NOTE Rail configuration does not include the transient state during getting on and off the track.

**3.2****road configuration**

indicates that the machine is on the ground, i. e. not on the track

NOTE It does not imply that the machine is suitable for use on the public highway.

**3.3****working place**

driving cabs, working cabs, combined working and driving cabs, operators places situated outside cabs and places situated at control or maintenance locations

**3.4****operating brake**

braking system to bring machine (and any permitted towed load) to stand in specified distance during normal operation and running of the machine

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**3.5****parking brake**

brake capable of operation and function without power from the machine

**3.6****rated capacity indicator (RCI)**

device which gives, within specified tolerance limits, at least a continuous indication that the rated capacity is exceeded

NOTE For rated capacity, see EN 12077-2.

**4 List of significant hazards**

Table A.1 contains all the significant hazards, hazardous situations and events, as far as they are dealt with in this European Standard, identified by risk assessment as significant for this type of machinery and which require action to eliminate or reduce the risk.

## 5 General safety requirements and/or measures

### 5.1 General

Machinery shall comply with the safety requirements and/or protective measures of this clause. In addition, the machine shall be designed according to the principles of EN ISO 12100 for relevant but not significant hazards, which are not dealt with by this European Standard.

This standard formulates general/common requirements for the equipment in the scope of this standard, therefore the manufacturer will have to carry out a complete risk assessment for identifying the specific hazards for the particular machine and the corresponding measures (including the measures additional to those of clauses 5 and 6 that may be required).

The function(s) of demountable machines which is (are) dealt with in another European Standard for machinery safety shall comply with that standard as far as applicable and taking account of the additional requirements and deviations of the present standard.

NOTE Relevant standards demountable machine functions are e.g.:

- For “road” earth moving machinery: Series EN 474;
- For cranes: EN 13001-1;
- For cranes on trucks: EN 12999;
- For mobile cranes EN 13000;
- For mobile elevating work platforms: EN 280.

Where there is a conflict between the requirements of this European Standard and the other above mentioned European Standard(s), then this Standard shall prevail.

When a choice is necessary for the application of type B standards referred to in this European Standard, e.g. EN 60204-1, EN 982, EN 983 the manufacturer shall carry out a risk assessment for making this choice.

If the machine is constructed on the basis of a host vehicle this host vehicle shall comply with one of the following:

- The European Standard for machinery safety relevant for that host vehicle (as far as not explicitly required otherwise in specific clauses of this European Standard)
- or
- this European Standard.

It is assumed that a finished standard automotive chassis used as a host for a demountable machine will offer an acceptable safety level for its designed functions before conversion. This specific aspect is not dealt with in this European Standard and in this case the manufacturer shall carry out an appropriate risk assessment.

### 5.2 Access and egress to and from working places

#### 5.2.1 Cabs

Except as shown below where a demountable machine is fitted with driving cabs, working cabs and/or combined working and driving cabs access and egress, when on the track, shall be from both sides of the machine or directly into the area between the rails of the working track.

If it is not possible to comply with this requirement and access is only available from one side of the machine then the instruction handbook shall detail the restriction of use, see 8.2.1 (26).