

norm**NEN-EN 13232-4**

Railtoepassingen - Bovenbouw - Wissels
en kruisingen voor Vignole rails - Deel 4:
Bediening, vergrendeling en detectie

Publicatie uitsluitend voor commentaar

Railway applications - Track - Switches and crossings for Vignole rails -
Part 4: Actuation, locking and detection

juni 2014
ICS 93.100

Commentaar vóór 2014-10-05

Zal vervangen NEN-EN 13232-4:2005+A1:2011

Als Europees normontwerp is gepubliceerd: prEN 13232-4:2014, IDT

Definitief vastgestelde normen zullen als Nederlandse norm gelden. Daarom wordt dit normontwerp in Nederland voor commentaar gepubliceerd. Op het ontwerp ingebracht commentaar zal aan de bevoegde normcommissie worden voorgelegd die hiermee rekening zal houden bij de bepaling van de Nederlandse stem. Indien er geen bezwaar bij NEN wordt gebracht, kan dat leiden tot ongewijzigde definitieve vaststelling van het ontwerp als norm.

Van Europese normen bestaan drie officiële versies: Engels, Frans en Duits. Voor Nederland zal de Engelse versie gelden. Daarnaast kan er gekozen worden voor een andere geautoriseerde versie in het Nederlands.

Normcommissie 345051 "Spoorwegen"



THIS PUBLICATION IS COPYRIGHT PROTECTED

DEZE PUBLICATIE IS AUTEURSRECHTELIJK BESCHERMD

Apart from exceptions provided by the law, nothing from this publication may be duplicated and/or published by means of photocopy, microfilm, storage in computer files or otherwise, which also applies to full or partial processing, without the written consent of the Netherlands Standardization Institute.

The Netherlands Standardization Institute shall, with the exclusion of any other beneficiary, collect payments owed by third parties for duplication and/or act in and out of law, where this authority is not transferred or falls by right to the Reproduction Rights Foundation.

Auteursrecht voorbehouden. Behoudens uitzondering door de wet gesteld mag zonder schriftelijke toestemming van het Nederlands Normalisatie-instituut niets uit deze uitgave worden veeleenvoudigd en/of openbaar gemaakt door middel van fotokopie, microfilm, opslag in computerbestanden of anderszins, hetgeen ook van toepassing is op gehele of gedeeltelijke bewerking.

Het Nederlands Normalisatie-instituut is met uitsluiting van ieder ander gerechtigd de door derden verschuldigde vergoedingen voor veeleenvoudiging te innen en/of daartoe in en buiten rechte op te treden, voor zover deze bevoegdheid niet is overgedragen c.q. rechtens toekomt aan de Stichting Reprorecht.

Although the utmost care has been taken with this publication, errors and omissions cannot be entirely excluded. The Netherlands Standardization Institute and/or the members of the committees therefore accept no liability, not even for direct or indirect damage, occurring due to or in relation with the application of publications issued by the Netherlands Standardization Institute.

Hoewel bij deze uitgave de uiterste zorg is nagestreefd, kunnen fouten en onvolledigheden niet geheel worden uitgesloten. Het Nederlands Normalisatie-instituut en/of de leden van de commissies aanvaarden derhalve geen enkele aansprakelijkheid, ook niet voor directe of indirecte schade, ontstaan door of verband houdend met toepassing van door het Nederlands Normalisatie-instituut gepubliceerde uitgaven.

Voorbeeld
Preview

June 2014

ICS 93.100

Will supersede EN 13232-4:2005+A1:2011

English Version

Railway applications - Track - Switches and crossings for Vignole rails - Part 4: Actuation, locking and detection

Applications ferroviaires - Voie - Appareils de voie - Partie
4: Manœuvre, blocage et contrôle

Bahnanwendungen - Oberbau - Weichen und Kreuzungen
für Vignolschienen - Teil 4: Umstellung, Verriegelung und
Lageprüfung

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.

This draft European Standard was established by CEN 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, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and United Kingdom.

Recipients of this draft are invited to submit, with their comments, notification of any relevant patent rights of which they are aware and to provide supporting documentation.

Warning : This document is not a European Standard. It is distributed for review and comments. It is subject to change without notice and shall not be referred to as a European Standard.



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

CEN-CENELEC Management Centre: Avenue Marnix 17, B-1000 Brussels

Contents

	Page
Foreword.....	3
1 Scope.....	4
2 Normative references.....	4
3 Terms and definitions.....	4
3.1 General.....	4
3.2 Actuation forces.....	6
3.3 Geometrical parameters.....	7
3.4 Movement and retention of switches and crossings with moveable parts.....	9
3.5 Kinematics and dynamics.....	11
3.5.1 Movement of switch rails.....	11
3.6 Dynamics of the wheel.....	12
3.7 Dynamics of switches.....	12
4 Design criteria.....	13
4.1 Parameters required.....	13
4.2 Calculations and verifications.....	13
4.2.1 Object detection between stock rail and switch rail.....	13
4.2.2 Calculation of minimum flangeway.....	13
4.2.3 Correct closing.....	14
4.2.4 Neutral position.....	15
4.2.5 Negative force.....	15
4.2.6 Mechanical integrity.....	15
5 Test methods.....	15
5.1 Obstacle detection.....	15
5.2 Minimum flangeway / free passage of wheel.....	15
5.3 Correct closing.....	16
5.4 Actuation force, F_a	16
5.5 Neutral position.....	16
5.6 Negative force.....	16
5.7 Trailability.....	16
5.7.1 General.....	16
5.7.2 Factory testing.....	17
5.7.3 Track testing.....	17
6 Acceptance.....	17
6.1 General.....	17
6.2 Standard testing (no prototypes).....	17
6.3 Prototype testing.....	17
6.4 Testing requirements for change in flexibility.....	18
Annex A (informative) Commonly used values for obstacle detection.....	19
Annex B (informative) Commonly used values for flangeway.....	20

Foreword

This document (prEN 13232-4:2014) 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.

This document will supersede EN 13232-4:2005+A1:2011.

This series of standards "*Railway applications – Track – Switches and crossings for Vignole rails*" covers the design and quality of switches and crossings in flat bottomed rail. The list of Parts is as follows:

- *Part 1: Definitions*
- *Part 2: Requirements for geometric design*
- *Part 3: Requirements for wheel/rail interaction*
- *Part 4: Actuation, locking and detection*
- *Part 5: Switches*
- *Part 6: Fixed common and obtuse crossings*
- *Part 7: Crossings with moveable parts*
- *Part 8: Expansion devices*
- *Part 9: Layouts*

Part 1 contains terminology used throughout all parts of this series. Parts 2 to 4 contain basic design guides and are applicable to all switch and crossing assemblies. Parts 5 to 8 deal with particular types of equipment including their tolerances. These use Parts 1 to 4 as a basis. Part 9 defines the functional and geometric dimensions and tolerances for layout assembly.

The following terms are used within to define the parties involved in using the EN as the technical basis for a transaction:

Customer the Operator or User of the equipment, or the Purchaser of the equipment on the User's behalf.

Supplier the Body responsible for the use of the EN in response to the Customer's requirements.

prEN 13232-4:2014 (E)**1 Scope**

This European Standard determines the interface between moveable parts and the actuation, locking and detection equipment, and defines the basic criteria of switches and crossing with moveable parts in respect of the interface.

It concerns:

- rules parameters and tolerances for alternative positions of the moveable parts;
- criteria and limits for the forces which move and restrain the moveable parts.

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.

prEN 13232-1:2013, *Railway applications – Track – Switches and crossings for Vignole rails – Part 1: Definitions*

prEN 13232-3:2014, *Railway applications – Track – Switches and crossings for Vignole rails – Part 3: Requirements for wheel/rail interaction*

prEN 13232-5:2014, *Railway applications – Track – Switches and crossings for Vignole rails – Part 5: Switches*

prEN 13232-6:2014, *Railway applications – Track – Switches and crossings for Vignole rails – Part 6: Fixed common and obtuse crossings*

prEN 13232-9:2014, *Railway applications – Track – Switches and crossings for Vignole rails – Part 9: Layouts*

3 Terms and definitions

For the purposes of this European Standard, the terms and definitions given in prEN 13232-1:2013 and the following apply.

3.1 General**3.1.1****actuation system**

system that ensures the correct movement of the moveable parts of the switch and crossing. The actuation system includes the rods, links and actuators needed to ensure the operation. The actuation system may be either electric, hydraulic, manual, etc.

3.1.2**locking device**

device that ensures the moveable part of the switches and crossings stays in the desired position. It guarantees the correct position of the moveable part during the passage of the vehicle.

3.1.3**detection device**

device that enables the verification of the correct positioning of the moveable part of the switch and crossing. It enables the signalling to decide whether safe train passage can be guaranteed

3.1.4**trailability**

ability of actuator and locking systems to permit the trailing of the switches and crossings by a vehicle. There are two different trailing devices – trailable devices and non-trailable devices

3.1.4.1**trailable devices**

devices which permit trailing as non-standard operation:

In this case, parts of the switch may be slightly damaged. The switches and crossings will only be released for further operation after full inspection of switch and actuator.

devices which permit trailing as standard operation:

In this case the actuator and locking system permits the trailing of the switches and crossings by a vehicle, without damaging any part of it.

In both cases the maximum trailing speed is defined

3.1.4.2**non-trailable devices**

devices which do not permit the trailing of the switches and crossings by a vehicle

3.1.5**single or multiple drives****3.1.5.1****single drive**

drive operated at one position, i.e. the switch toe

3.1.5.2**multiple drives**

drives operated at more than one position. In this case there may be either single or multiple locking

3.1.6**lubrication free switch operation****3.1.6.1****non-lubricated slide baseplates**

no lubrication on the slide baseplates is required to ensure the correct actuation of the switch and crossing. This can be assured by special baseplates, roller systems or other devices

3.1.6.2**lubrication free actuator and locking system**

no lubrication is required to ensure the correct actuation and locking of the switch and crossing

Note 1 to entry: Track lubrication may still be required, for other reasons.

3.1.7**open and closed position****3.1.7.1****switches and switch diamond crossings – closed position**

switch rail is applied to its corresponding stock rail

3.1.7.2**switches and switch diamond crossings – open position**

switch rail stands away from its corresponding stock rail by a defined distance (switch toe opening)

prEN 13232-4:2014 (E)

3.1.7.3

common crossings with moveable parts – closed position

running edge (of main line or branch line) is not interrupted

Note 1 to entry: An open position does not exist.

3.2 Actuation forces

3.2.1

actuation force, F_a

maximum value of the force, applied by the actuator in order to operate the moveable parts of the switches and crossings (see Figure 1).

This force is measured at the interface between actuator and the throwing or locking device

3.2.2

actuator capacity, F_{cap}

maximum force the actuator can provide (see Figure 1)

3.2.3

negative force, F_{neg}

force needed to keep the moveable part at its closed position

3.2.4

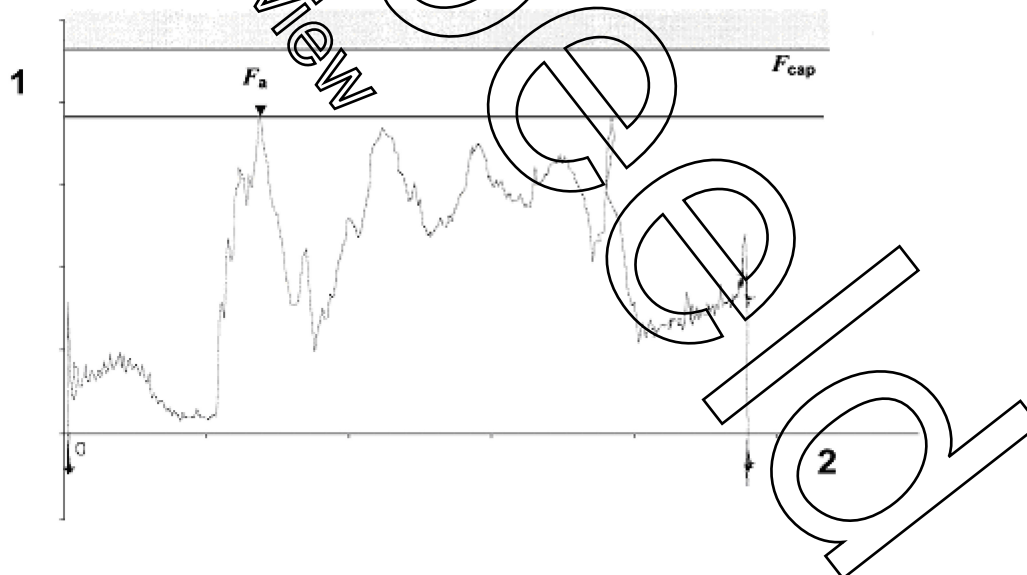
retaining force, F_R

force, provided by the actuator to keep the moveable parts in their positions, during vehicle passage

3.2.5

locking force, F_L

force the locking device guarantees and applies to the moveable parts in order to keep them at their locked position

**Key**

- 1 Actuation force
- 2 Displacement

Figure 1 — Actuation forces

3.3 Geometrical parameters

3.3.1

stud gap, d_{stud}

gap between the stud supporting surface and the corresponding surface of the moveable part (i.e. switch rail, point rail, wing rail)

3.3.2

longitudinal displacement

Note 1 to entry: longitudinal displacements may occur in the switch and crossing area due to thermal, acceleration and braking forces. These forces can create differential displacement between the various components of the switch or crossing.

3.3.2.1

switches

differential displacement between switch and stock rail is the most important with regard to the switch actuation, locking and detection system. These displacements will be defined in two main places:

a) differential toe tip displacement (y)

This is the differential longitudinal displacement between the switch rail and the corresponding stock rail. In order to be able to measure the switch toe displacement, a reference point will be placed on the stock rail.

b) differential displacement at the heel block (z)

This is the differential longitudinal displacement between the switch rail and the corresponding stock rail, at the switch heel

3.3.2.2

crossings with moveable parts

differential displacement between point or switch rail and the corresponding housing (wing rail) is the most important with regard to the actuation, locking and detection system. This displacement is defined at the nose point. In order to be able to measure the swing nose or switch toe displacement, a reference point will be placed on the wing rail

3.3.3

maximum gap of closed switch rail, d_{gap}

maximum permissible parallel distance between the two machined contact faces of the switch and stock rail to give detection. A different value applies in front of the first detection position (d_{gap1}) than in the rest of the machined area (d_{gap2}). See Figures 2 and 3.

The same definition applies in principle to crossings with moveable parts

3.3.4

maximum gap at switch toe, d_{toe}

maximum permissible horizontal distance between the two machined contact faces of the switch and stock rail to give safe operation. The dimension is defined at the switch toe. This basic dimension is taken into account during switch point design to avoid derailment

Bestelformulier

Stuur naar:

NEN Standards Products & Services
t.a.v. afdeling Klantenservice
Antwoordnummer 10214
2600 WB Delft



NEN Standards Products & Services

Postbus 5059
2600 GB Delft

Vlinderweg 6
2623 AX Delft

T (015) 2 690 390
F (015) 2 690 271

www.nen.nl/normshop

Ja, ik bestel

__ ex. NEN-EN 13232-4:2014 Ontw. en Railtoepassingen - Bovenbouw -
Wissels en kruisingen voor Vignole rails - Deel 4: Bediening, vergrendeling en
detectie

€ 23.85

**Wilt u deze norm in PDF-formaat? Deze bestelt u eenvoudig via
www.nen.nl/normshop**

Gratis e-mailnieuwsbrieven

Wilt u op de hoogte blijven van de laatste ontwikkelingen op het gebied van normen,
normalisatie en regelgeving? Neem dan een gratis abonnement op een van onze
e-mailnieuwsbrieven. www.nen.nl/nieuwsbrieven

Gegevens

Bedrijf / Instelling

T.a.v. O M O V

E-mail

Klantnummer NEN

Uw ordernummer BTW nummer

Postbus / Adres

Postcode Plaats

Telefoon Fax

Factuuradres (indien dit afwijkt van bovenstaand adres)

Postbus / Adres

Postcode Plaats

Datum Handtekening

Retourneren

Fax: 015 2 690 271

E-mail: klantenservice@nen.nl

Post: NEN Standards Products
& Services,

t.a.v. afdeling Klantenservice
Antwoordnummer 10214,
2600 WB Delft

(geen postzegel nodig).

Voorwaarden

- De prijzen zijn geldig tot 31 december 2018, tenzij anders aangegeven.
- Alle prijzen zijn excl. btw, verzend- en handelingskosten en onder voorbehoud bij o.m. ISO- en IEC-normen.
- Bestelt u via de normshop een pdf, dan betaalt u geen handeling en verzendkosten.
- Meer informatie: telefoon 015 2 690 391, dagelijks van 8.30 tot 17.00 uur.
- Wijzigingen en typfouten in teksten en prijsinformatie voorbehouden.
- U kunt onze algemene voorwaarden terugvinden op: www.nen.nl/leveringsvoorwaarden.