SLOVENSKI STANDARD
oSIST prEN 16019:2010

01-marec-2010

Železniške naprave - Avtomatska spenjalna - Zahtevane lastnosti, geometrijske posebnosti in preskusna metoda

Railway applications - Automatic coupler - Performance requirements, specific interface geometry and test method

Bahnanwendungen - Automatische Kupplung - Leistungsanforderungen, spezifische Schnittstellengeometrie und Prüfverfahren

Applications ferroviaires - Attelage automatique - Exigences concernant la performance, la géométrie des interfaces et les méthodes d'essai

Ta slovenski standard je istoveten z: **prEN 16019**

ICS:

45.040	Materiali in deli za železniško tehniko	Materials and components for railway engineering

oSIST prEN 16019:2010 **en,fr,de**

EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

DRAFT
prEN 16019

November 2009

ICS

English Version

Railway applications - Automatic coupler - Performance requirements, specific interface geometry and test method

Applications ferroviaires - Attelage automatique - Exigences concernant la performance, la géométrie des interfaces et les méthodes d'essai

Bahnanwendungen - Automatische Kupplung - Leistungsanforderungen, spezifische Schnittstellengeometrie und Prüfverfahren

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 Management Centre has the same status as the official versions.

CEN members are the national standards bodies of Austria, Belgium, Bulgaria, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland 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

Management Centre: Avenue Marnix 17, B-1000 Brussels

Ref. No. prEN 16019:2009: E

Contents

Page

Figures

Foreword

This document (prEN 16019:2009) 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.

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 the EU Directive, see informative Annex ZA, which is an integral part of this document.

1 Scope

The European standard specifies the requirements for the end coupler for train sets compliant with the technical specification for Interoperability High Speed Rolling stock.

It defines the minimum interface requirements in order to allow automatic coupling (mechanical and pneumatical) of two interoperable train sets of different types.

The herein specified interfaces of the end coupler enable the rescue of a train set in an event of a breakdown by another interoperable trainset of different type, without the need to use an intermediate coupler adapter, accessories or component.

2 Normative references

The following referenced documents are indispensable for the application 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.

ISO 2768-1, *General tolerances — Part 1: Tolerances for linear and angular dimensions without individual tolerance indications*

3 Terms and definitions

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

3.1
automatic coupler
latch-type automatic coupler allowing the mechanical, pneumatic and in some cases electrical connection between two train units or train sets without manual assistance, also known as “Scharfenberg system type 10” automatic coupler

3.2
coupler head
part of couplers, consisting of coupler head casing with gathering elements, coupler lock, uncoupling device, air pipe couplers and an appropriate interface towards the rear part of the coupler

3.3
main reservoir pipe
pipe containing air pressure at a value which is sufficient to supply subsystems including the brake system

[EN 14478:2005]

3.4
brake pipe
pipe containing and conveying air, enabling train brake control

[EN 14478:2005]

3.5
uncoupling pipe
pipe containing and conveying air, enabling uncoupling of the coupler locks

4 Product requirements

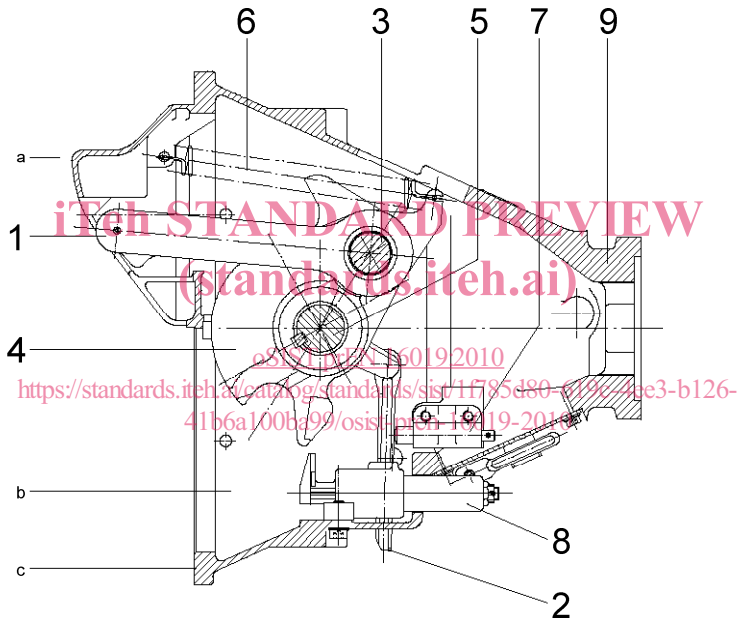
4.1 General requirements

The stroke requirements and the coupler length shall be taken into consideration.

4.1.1 Automatic coupler head characteristics

The coupler head (see Figure 1) of the automatic coupler shall be equipped with a pivoting coupler lock, enabling the mechanical connection of two vehicles. The coupler lock consists of the following parts: hooked plate, coupling link, central pivot, tension springs, spring bearing, and ratchet with stem guide. In order to ensure a maximum gathering range, both vertically and horizontally, the coupler head shall be provided with male cone, female cone and gathering horn, such that the couplers can be aligned and centred also in curves and in case of vertical mismatch. The coupler head dimensions shall be according to Annex A.

Tolerances for dimensions shall be according to ISO 2768-1, tolerance class mH, unless otherwise specified in this standard.



Spring bearing and stem guide may be a combined element.

Key

a	male cone	2	ratchet	6	tension spring
b	female cone	3	coupling link pin	7	spring bearing
c	coupler face	4	hooked plate	8	stem guide
1	coupling link	5	central pivot	9	coupler head casing

Figure 1 — Principle arrangement of coupler head

When coupled, the coupler lock elements are subjected to tensile load and form a parallelogram ensuring an equilibrium of forces and an equal load distribution onto both coupling links. The equilibrium of forces prevents involuntary unlocking of the coupler locks and reduces wear.

Compressive loads are transmitted through the flat coupler faces of the coupler heads.

The automatic coupler shall be designed to withstand the following loads without permanent deformation:

— maximum tensile load = 1 000 kN;

— maximum compressive load = 1 500 kN.

These values are for normal operating conditions. If the coupler is used only for rescue conditions, lower values are allowed.

When coupled, the coupler locks ensure a nearly slack-free connection between the automatic couplers. The coupler lock play is the distance between the coupler faces of two coupled coupler heads. Coupler lock play shall not exceed 0,8 mm per coupler lock.

4.1.2 Coupling system positions

The coupling system has three operating positions:

4.1.2.1 Ready-to-couple position

In the ready-to-couple position, the coupling link shall be retracted and lie close to the edge of the male cone and the ratchet shall hold the hooked plate. In this position, the ratchet shall project over the side of the coupler head casing and shall be engaged with the catch of the stem guide. In the ready-to-couple position, the tension springs are loaded. See Figure 2.

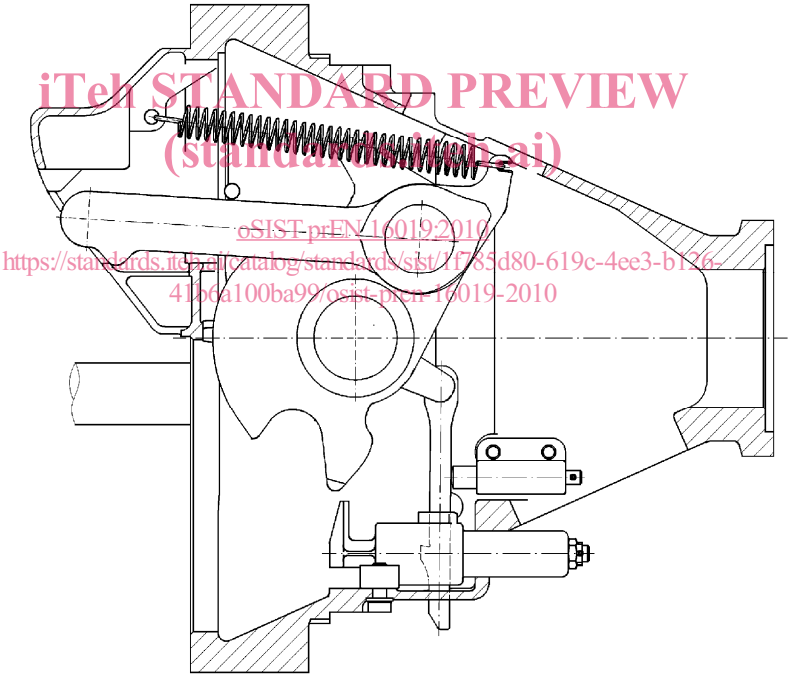


Figure 2 — Ready-to-couple position

4.1.2.2 Coupled position

As the coupler faces mate, the male cones entering the female cones shall press the stems backwards, in order for the ratchets to be released. After the ratchets have been released, the tension springs shall turn the hooked plates counterclockwise until they reach the stops in the coupler head casings. In the coupled position, the coupler locks are engaged. See Figure 3.

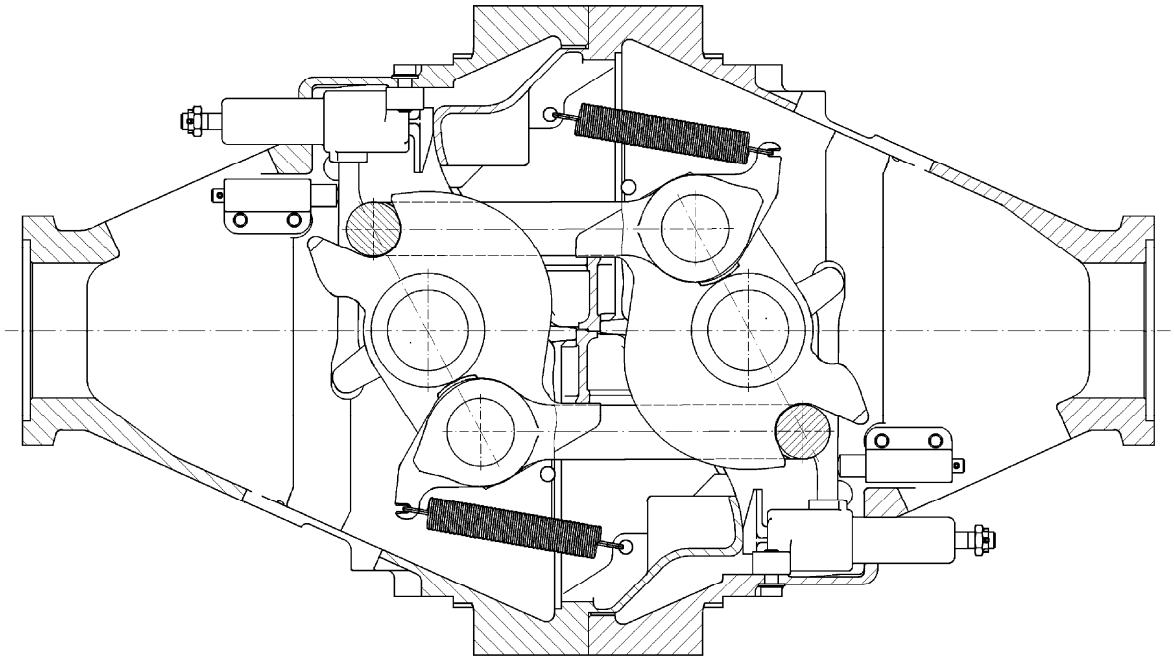


Figure 3 — Coupled position

4.1.2.3 Uncoupled position

In order to uncouple, an appropriate uncouple device shall turn the coupler locks clockwise against the force applied by the tension springs. In this position, the ratchets shall retain the hooked plates by engaging with the mobile stem. As the couplers move apart, the locking system comes back to the ready-to-couple position. The ratchets shall retract into the coupler head casing when they engage with the stem guides. See Figure 4.

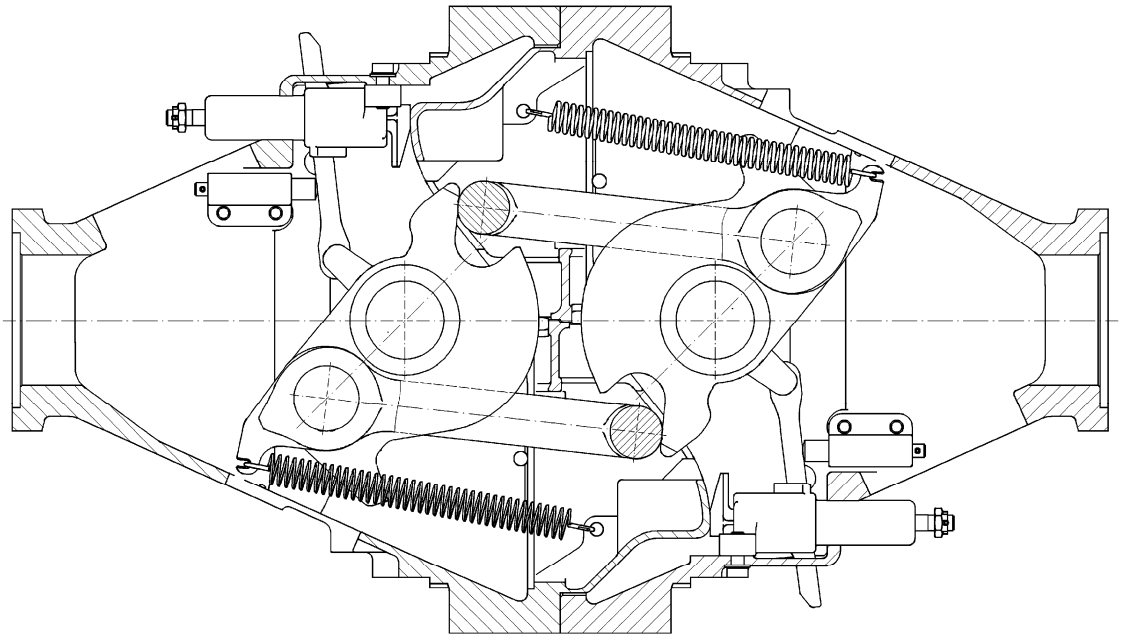


Figure 4 — Uncoupled position

4.2 Coupling requirements

4.2.1 Mechanical coupling

The mechanical coupling procedure between two automatic couplers shall be automatic.

The automatic coupler shall be designed to ensure that coupling is possible when the vertical and horizontal mismatch is inside the gathering range shown in Figure 5, i.e. when the centre of the opposite coupler is mismatched up to the chain dotted edge of central point M of the coupler in the drawing. If the coupler faces are in an angular position relative to each other, the prolongation of the opposite coupler shall hit inside the framed surface.

The coupling operation shall be conducted securely from a minimum speed of 0,6 km/h.

Dimensions in millimetres

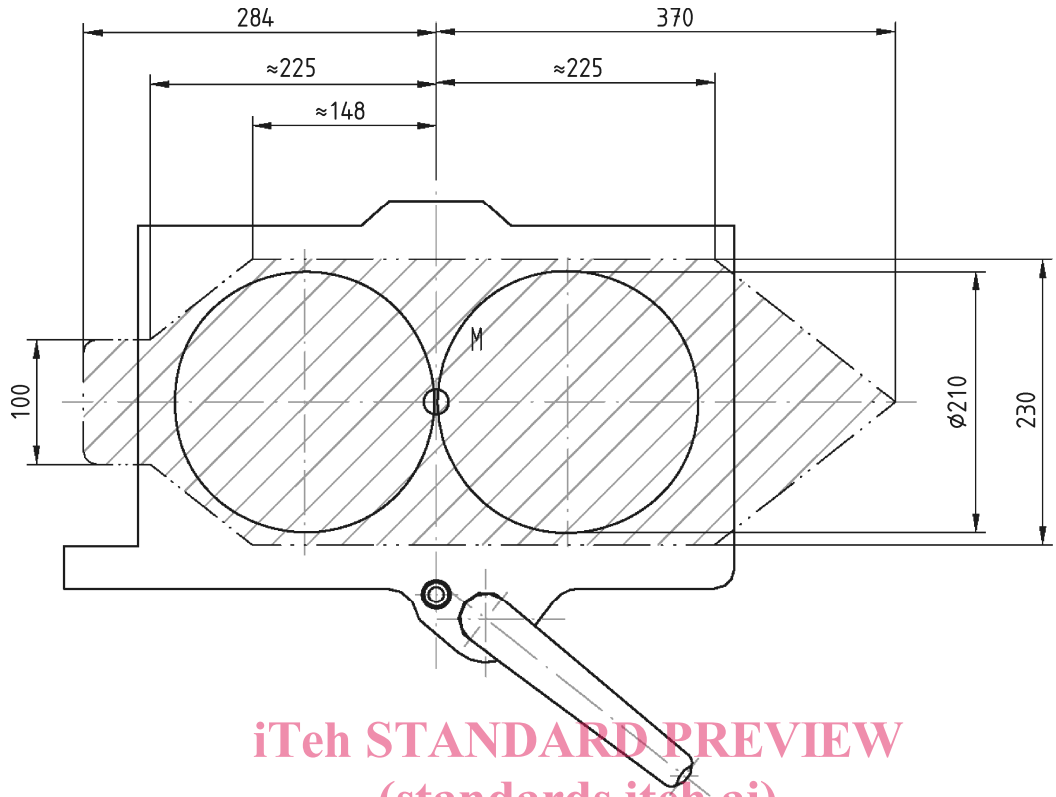


Figure 5 — Minimum gathering range of the type 10 coupler

4.2.2 Pneumatic coupling

The air pipes (brake pipe, main reservoir pipe and uncouple pipe) shall be connected automatically by means of the air pipe couplers in the course of the mechanical coupling operation (see Figure A.1).

The air pipe coupler of the brake pipe is located in the coupler face (see Annex A) and shall ensure reliable sealing of the brake pipe in coupled condition. A valve controlled by the central pivot shall open the brake pipe upon coupling and close it upon uncoupling. As the central pivot will not turn in case of coupler rupture, the brake pipe shall remain open and commence an automatic train stopping.

The air pipe coupler of the main reservoir pipe is located in the coupler face (see Annex A) and shall ensure reliable sealing of the main reservoir pipe in coupled condition. When uncoupled, the main reservoir pipe shall be closed. When coupling, the air pipe couplers shall open.

The air pipe coupler of the uncoupling pipe is located in the coupler face (see Annex A). The uncoupling pipe only conveys compressed air during the uncouple operation.

The dimensions of the air pipe connection interfaces are defined in Annex C.

4.3 Operating conditions

The automatic coupler, when coupled with another automatic coupler, shall be capable of negotiating a 150 m radius curve as well as S-curves with an intermediate straight of at least 6 m without interference to other vehicle elements. The car builder shall demonstrate that this requirement is met.