



SLOVENSKI STANDARD

SIST EN 15179:2008

01-maj-2008

Železniške naprave - Zavore - Zahteve za zavorne sisteme potniških vagonov

Railway applications - Braking - Requirements for the brake system of coaches

Bahnanwendungen - Bremsen - Anforderungen für die Bremsausrüstung von Reisezugwagen

Applications ferroviaires - Freinage - Exigences concernant le système de freinage des voitures voyageurs

ITeH STANDARD PREVIEW
(standards.iteh.ai)

Ta slovenski standard je istoveten z: **EN 15179:2007**

<https://standards.iteh.ai/catalog/standards/sist/4d29d9ab-2eb4-412e-8af2-b7547d3e66f0/sist-en-15179-2008>

ICS:

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

SIST EN 15179:2008

en,fr,de

iTeh STANDARD PREVIEW
(standards.iteh.ai)

SIST EN 15179:2008

<https://standards.iteh.ai/catalog/standards/sist/4d29d9ab-2eb4-412e-8af2-b7547d3e66f0/sist-en-15179-2008>

EUROPEAN STANDARD

EN 15179

NORME EUROPÉENNE

EUROPÄISCHE NORM

September 2007

ICS 45.060.20

English Version

Railway applications - Braking - Requirements for the brake system of coaches

Applications ferroviaires - Freinage - Exigences concernant le système de freinage des voitures voyageurs

Bahnwendungen - Bremsen - Anforderungen für die Bremsausrüstung von Reisezugwagen

This European Standard was approved by CEN on 3 August 2007.

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 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 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.

[SIST EN 15179:2008](https://standards.iteh.ai/catalog/standards/sist/4d29d9ab-2eb4-412e-8af2-b7547d3e66f0/sist-en-15179-2008)

<https://standards.iteh.ai/catalog/standards/sist/4d29d9ab-2eb4-412e-8af2-b7547d3e66f0/sist-en-15179-2008>



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

Management Centre: rue de Stassart, 36 B-1050 Brussels

Contents

Page

Foreword.....	4
Introduction	5
1 Scope	6
2 Normative references	6
3 Terms and definitions	8
4 Symbols and abbreviations	10
5 Requirements	11
5.1 General.....	11
5.2 Climatic conditions.....	11
5.3 Brake control.....	11
5.3.1 Basic principles	11
5.3.2 Components of the basic system	12
5.3.3 Additional braking devices	16
5.4 Thermal capacity.....	17
5.4.1 Principles.....	17
5.4.2 Disc brake.....	17
5.4.3 Tread brake.....	18
5.4.4 Dynamic brakes	18
5.5 Brake performance	18
5.5.1 General.....	18
5.5.2 Brake positions (basic system).....	18
5.5.3 Brake positions and additional brake system	19
5.6 Other brake components	19
5.6.1 Parking brake	19
5.6.2 Arrangement of components at the end of the coach	20
5.6.3 Brake inscriptions and braked weight inscriptions	20
5.7 Other specifications	21
5.7.1 Maintenance, accessibility.....	21
5.7.2 Fault finding	21
5.7.3 Operating conditions.....	21
5.7.4 Special requirements for multi-section coaches (modular passenger train).....	22
5.7.5 Requirements for equipment fitted at driving positions in driving trailers	22
5.8 Requirements for internal traffic in the United Kingdom	22
Annex A (normative) Brake system of vehicles with UIC air brake	23
Annex B (normative) Common train configurations	25
Annex C (informative) Drainage devices, valves	26
Annex D (informative) Equipment fitted at driving positions in driving trailers	30
Annex E (normative) Requirements for internal traffic in the United Kingdom.....	32
E.1 General.....	32
E.2 Normative references	32
E.3 Brake systems other than those covered by the requirements of UIC	32
E.4 Functions at train level.....	33
E.5 Functions at vehicle level	33
E.5.1 Brake command and control	33
E.5.2 Brake force application system.....	34
E.6 Braking performance.....	34

E.6.1	General	34
E.6.2	Braking performance of trains operating on UK infrastructures	35
Annex F	(informative) Functional representation of the EBO system of the DB.....	36
F.1	Introduction.....	36
F.2	Design of the emergency brake override in conjunction with electro-pneumatic brake control.....	36
F.2.1	Electro-pneumatic brake control (ep).....	36
F.2.2	Emergency brake override (EBO)	36
F.3	Transmission systems for information and control commands in the DB system.....	37
Annex G	(informative) Emergency brake handles	40
Annex H	(informative) Basic arrangement of the brake system and arrangement of the brake pipes	41
Bibliography	47

iTeh STANDARD PREVIEW (standards.iteh.ai)

[SIST EN 15179:2008](https://standards.iteh.ai/catalog/standards/sist/4d29d9ab-2eb4-412e-8af2-b7547d3e66f0/sist-en-15179-2008)

<https://standards.iteh.ai/catalog/standards/sist/4d29d9ab-2eb4-412e-8af2-b7547d3e66f0/sist-en-15179-2008>

Foreword

This document (EN 15179:2007) 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 March 2008, and conflicting national standards shall be withdrawn at the latest by March 2008.

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, 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 the United Kingdom.

iTeh STANDARD PREVIEW (standards.iteh.ai)

SIST EN 15179:2008

<https://standards.iteh.ai/catalog/standards/sist/4d29d9ab-2eb4-412e-8af2-b7547d3e66f0/sist-en-15179-2008>

Introduction

Currently, in the standard gauge area, there are EU regulations in the form of interoperability directives and the associated TSI that also contain specifications for the braking of railway vehicles. Before this time, brake engineering regulations only existed as internal railway documents in the form of UIC leaflets.

Agreements based on these govern the conditions for vehicle transfers between the individual railways. The relationship between the infrastructures and the minimum brake engineering requirements on trains and their individual vehicles is defined in EN 14198. This covers mainly generic vehicle regulations that should be assigned to individual vehicles by corresponding specifications.

With this European Standard, all suppliers will in future be able to offer in a Europe-wide tender invitation passenger coaches that have a defined basic brake engineering system and meet the minimum brake engineering requirements, taking into account the vehicle types

iTeh STANDARD PREVIEW (standards.iteh.ai)

[SIST EN 15179:2008](#)

<https://standards.iteh.ai/catalog/standards/sist/4d29d9ab-2eb4-412e-8af2-b7547d3e66f0/sist-en-15179-2008>

EN 15179:2007 (E)**1 Scope**

This European Standard defines basic requirements for the braking of passenger coaches in trains hauled by locomotives as described in EN 14198, using UIC air brakes (RIC traffic) operating on routes of the European railways and their infrastructure systems.

Normative Annex E is provided for passenger coaches limited to internal use in the UK.

This European Standard covers:

- all new vehicle designs of the passenger coach type of construction (day coaches, restaurant cars, sleeper coaches, driving trailers, baggage cars, couchette coaches);
- all new constructions of existing vehicle types;
- other vehicles (e.g. motorail vehicles) that may also be included in passenger trains;
- all major overhauls of the above-mentioned vehicles if they involve redesigning or extensive alteration to the brake system¹ of the vehicle concerned.

The vehicles meet the following technical criteria:

- inclusion in trains in accordance with EN 14198 in regular railway operation is possible (coupling capacity);
- the maximum speed is between 100 km/h and 200 km/h;
- the lower vehicle limitations of prEN 15273-1, prEN 15273-2, prEN 15273-3 are adhered to.

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.

EN 286-3, *Simple unfired pressure vessels designed to contain air or nitrogen — Part 3: Steel pressure vessels designed for air braking equipment and auxiliary pneumatic equipment for railway rolling stock*

EN 286-4, *Simple unfired pressure vessels designed to contain air or nitrogen — Part 4: Aluminium alloy pressure vessels designed for air braking equipment and auxiliary pneumatic equipment for railway rolling stock*

EN 10220, *Seamless and welded steel tubes — Dimensions and masses per unit length*

EN 10305-4, *Steel tubes for precision applications — Technical delivery conditions — Part 4: Seamless cold drawn tubes for hydraulic and pneumatic power systems*

EN 10305-6, *Steel tubes for precision applications — Technical delivery conditions — Part 6: Welded cold drawn tubes for hydraulic and pneumatic power systems*

¹ or alterations to the vehicle weight also.

EN 14198:2004, *Railway applications — Braking — Requirements for the brake system of trains hauled by a locomotive*

EN 14478:2005, *Railway applications — Braking — Generic vocabulary*

EN 14535-1, *Railway applications — Brake disks for railway rolling stock — Part 1: Brake discs pressed or shrunk onto the axle or drive shaft, dimensions and quality requirements*

EN 14601, *Railway applications — Straight and angled end cocks for brake pipe and main reservoir pipe*

prEN 15220-1, *Railway applications — Brake indicators — Part 1: Pneumatic operation brake indicators*

prEN 15273-2, *Railway applications — Gauges — Part 2: Rolling stock gauge*

prEN 15273-3, *Railway applications — Gauges — Part 3: Obstacle gauge*

prEN 15327-1, *Railway applications — Passenger alarm subsystem — Part 1: General requirements and passenger interface for the passenger emergency brake system*

prEN 15328, *Railway applications — Braking — Brake pads*

prEN 15355, *Railway applications — Braking — Distributor valves*

prEN 15595, *Railway applications — Braking — Wheel slip prevention equipment*

prEN 15611, *Railway applications — Braking — Relay valves*

prEN 15612, *Railway applications — Braking — Brake pipe accelerator valve*

EN 50125-1, *Railway applications — Environmental conditions for equipment — Part 1: Equipment on board rolling stock*

<https://standards.iteh.ai/catalog/standards/sist/4d29d9ab-2eb4-412e-8af2-b7547d3e66f0/sist-en-15179-2008>

prEN 14535-2², *Railway applications — Brake discs for railway rolling stock — Part 2: Brake discs mounted onto the wheel rim, wheel web or wheel hub, dimensions and quality requirements*

UIC 541-1:2003³, *Brakes — Regulations concerning the construction of the various brake components*

UIC 541-3:1984, *Brakes — Disc brakes and their application — General conditions for the approval of brake pads*

UIC 541-5, *Brakes — Electro-pneumatic brake (ep-brake) — Electro-pneumatic emergency brake override (EBO)*

UIC 541-06, *Brakes — Regulations concerning the construction of the various brake components — Magnetic brakes*

UIC 544-1, *Brakes — Braking power*

UIC 545:2003, *Brakes — Inscriptions, marks and signs*

UIC 546, *Brakes — High-power brakes for passenger trains*

UIC 550, *Power supply installations for passenger stock*

² To be published.

³ Available from: UIC Direction Générale, 16 rue Jean Rey, F-75015 Paris.

EN 15179:2007 (E)**3 Terms and definitions**

For the purposes of this document, the terms and definitions given in EN 14198:2004, EN 14478:2005 and the following apply.

3.1**passenger coach**

vehicle without its own traction unit, for conveying people and comprising

- a body;
- running gear (e.g. 2 bogies);
- specific connectors at coach ends (coupling capacity);
- brake installation;
- service installations for passengers (air conditioning, catering, luggage transport etc.);
- a driving cab if the vehicle is a driving trailer.

Passenger coaches may also comprise two or more bodies with associated running gear (modules) forming a functional unit. The connectors (connections) between the modules may be individually designed. The end connectors of the functional unit should be suitable for the interchange conditions. Coaches for which special traction units are mandatory (ICE, TGV) are not considered to be passenger coaches

3.2**automatic train brake**

brake at train level, the action of which is based on the fact that a break in the brake pipe (pipe for control commands) in the two parts of the train automatically leads to application of the brakes

<https://standards.iteh.ai/catalog/standards/sist/4d29d9ab-2eb4-412e-8af2-b7547d3e66f0/sist-en-15179-2008>

3.3**brake release device**

device operable from each side of the coach which, when operated, releases the brake

NOTE In UIC distributors, this equalizes the pressure in the control chamber to the value of the pressure in the brake pipe or below

3.4**brake release**

device operable from each side of the coach which, when operated, releases the brake

3.5**load-proportional brake**

control device for automatically matching the brake force to the specific vehicle load, whereby the adjustment may be in steps or continuous

3.6**indicating and warning devices**

devices that show the status of the brake system or sub-systems. The information is given by windows, position of handles, analogue gauges, digital displays, lamps or buzzers

NOTE For indicating the status in service, a binary indication (on/off) is used. Analogue gauges (dials or digital displays) are for maintenance purposes

3.7**end cock**

device according to EN 14601

3.8**brake hose couplings**

flexible hose connections at the end of the coach with brake-hose coupling head to UIC 541-1, of different shapes for brake pipe and main reservoir pipe

NOTE A European Standard is in preparation for this (WI 00256241)

3.9**auxiliary tread brake**

tread brake acting generally on one side of the wheels to support the power of the disc brake.

3.10**release time**

on brake release, the time taken for the brake cylinder pressure to fall in accordance with prEN 15355

3.11**maximum mass**

sum of the operating load of the coach and the maximum payload

NOTE 1 In contrast to the total mass, it takes into account extreme occupancy

NOTE 2 A European Standard is in preparation for this (WI 00256224).

3.12**laden mass**

sum of the operating load of the coach and the nominal payload

NOTE A European Standard is in preparation for this (EN 00256224).
<https://standards.iteh.ai/SIST/EN/15179/2008>
 SIST EN 15179:2008
 https://standards.iteh.ai/SIST/EN/15179/2008

3.13**constant mass assumption**

fictional value for the mass of the passengers in a coach. It is based on 100 % of seats occupied. The mandatory constant mass assumption is specified in UIC 410 for the different types of vehicles

NOTE A European Standard is in preparation for this (WI 00256224).

EN 15179:2007 (E)**4 Symbols and abbreviations**

For the purposes of this European Standard, the following symbols and abbreviations apply in accordance with existing UIC leaflets:

BP: Air brake pipe

MRP: Main reservoir pipe

DBV: Driver's brake valve

ED: Electro-dynamic brake

EP: Electro-pneumatic brake

ep(UIC): Electro-pneumatic brake as specified in UIC 541-5

BA: Brake pipe accelerator

FRA Federal Railway Authority

RCOR Railways Construction and Operating Regulations

WSP: Wheel slide protection

HD: Hydro-dynamic brake

EP/EBO: Electro-pneumatic emergency brake override

Mg: Magnetic track brake

RGS Railway Group Standard

Wb Eddy-current brake

λ : Effective braking power

R: Air reservoir

On/Off: Brake On/Off controller

G, P, R: Brake positions according to UIC

DV: Distributor valve

AL: Automatic load-proportional brake

SO Top edge of rail

iTeh STANDARD PREVIEW
(standards.iteh.ai)

SIST EN 15179:2008
<https://standards.iteh.ai/catalog/standards/sist/4d29d9ab-2eb4-412e-8af2-b7547d3e66f0/sist-en-15179-2008>

5 Requirements

5.1 General

The Railway Authorities shall include this European Standard as part of the requirements for the brake installation. The manufacturers shall indicate in the tender where the requirements of the standard are not met.

Vehicles as specified in this standard shall totally meet the relevant generic requirements described in EN 14198 for the train and the resulting requirements for the individual vehicles.

These requirements are defined for the individual vehicle in the clauses:

- brake control;
- thermal capacity;
- brake performance;
- other brake components.

The specific requirements are allocated in vehicle classes. The specific brake systems mandatory for the particular vehicle class are contained in Table A.1.

Each vehicle class is divided into subclasses for additional brake devices.

5.2 Climatic conditions (standards.iteh.ai)

In general, the requirements of EN 50125-1 apply. The requirements listed below are minimum requirements. The temperature class according to EN 50125-1 shall be specified by the Railway Authority.

The functional ability of the brake shall be achieved under the following conditions unless deviations have been agreed for the associated vehicle:

- outside temperature – 25 °C to + 40 °C (in sunshine up to + 70 °C);
- altitude up to 1 370 m above sea level;
- relative humidity up to 100 %;
- snowfall, lying snow up to 300 mm above top edge of rail;
- rain, ice;
- gusts of wind up to 30 m/s

The special climatic conditions in tunnels (e.g. Simplon up to 27 °C and 100 % relative humidity in winter also) should be noted.

5.3 Brake control

5.3.1 Basic principles

The brake installation for each vehicle shall meet the requirements of the UIC brake system.

The basic system arrangement is shown in Figure H.1.

EN 15179:2007 (E)

If other brake systems are used, the UIC brake system shall be subordinate as a pneumatic back-up brake (safety level). With the UIC-type brake system, it is allowed to provide electro-pneumatic control support for the BP.

The functional arrangement of the system is shown in Figure H.2.

The brake control system shall be able to provide the passenger train and goods train brake types and the associated brake positions and have the standardized operating and indicating devices on the coach sides.

5.3.2 Components of the basic system

The components described in the following are brake components in the coach that are to be assigned to train level 5 or vehicle level 6 in accordance with Figure H.2.

5.3.2.1 Air brake pipe (BP) and main reservoir pipe (MRP)

All vehicles shall be equipped with a continuous air brake pipe (BP) and a continuous main reservoir pipe (MRP) in a bifurcated connection each with an inside diameter of at least 25 mm. The basic function of the brake system (transmission of braking command and control function, energy supply) shall be possible via the BP alone. The compressed air in the BP shall not be used for other purposes not related to the brake installation.

The compressed air in the MRP can be used for supplying energy to other loads in the vehicle (door operating, toilets, air springs etc.) in addition to supplying energy for the brake installation.

The air pipes shall be installed free of water collection pockets and be as straight as possible utilizing large bend radii (minimum dimension for bend radius $5 \times D_a$ = outside diameter). The bifurcation shall be achieved by means of a Y-connection. Filters or other components that would reduce the cross-section of the BP shall not be fitted. If low points are unavoidable in routing the pipes, easily accessible drainage devices shall be fitted.

<https://standards.itech.ai/catalog/standards/sist/4d29d9ab-2eb4-412e-8af2-17547d3e66f0/sist-en-15179-2008>

Free passage through BPs and MRPs shall be capable of being verified by means of a ball test. The diameter of the ball to be used shall be 19 mm. Steel pipes used shall meet the requirements of EN 10220 or EN 10305-4 or EN 10305-6.

The number of pipe fittings used shall be kept to a practical minimum and all fittings shall be accessible without having to disassemble other equipment.

Connections consisting of threads on the pipes are not permitted.

The pipe connections at the coach end shall meet the UIC requirements. A recommended method of fitting is described in 5.3.2.6. This takes account of the installation space for the end cocks and the space requirement of other pipe connections also for the possible counter-movements of the vehicles to be coupled.

5.3.2.2 Controller

Every vehicle shall be equipped with at least one distributor valve which complies with the requirements of prEN 15355. The maximum BP volume of 25 l shall be assigned to any distributor valve.

For connection into the coach brake system, the diagram illustrated in Figure H.2 of this European Standard applies.

The controller indicated as item 10 is connected by its large pipe cross-section to the BP and is connected to the E-store (reserve air tank (R-tank) and the devices generating the brake force thus allowing single-pipe operation (operation without MRP). The supply to the energy store is from the BP through the controller.

Every controller shall be equipped with an isolation device that can be operated from both sides of the vehicle.

Every controller shall be equipped with one or more isolation devices that can be operated from both sides of the vehicle. Operation of these devices shall isolate the controller from the brake pipe and the main reservoir pipe and isolate any other brake related devices (e.g. track brake, etc.) from the main reservoir pipe. The brake cylinders and the auxiliary reservoir shall then be vented, either automatically or manually using another control device that can also be operated from both sides of the vehicle. Free passage of air through the BP and MRP shall be maintained on that vehicle.

Every controller shall also be equipped with a device that allows the brake on that vehicle to be released when it is applied (release valve).

Every controller shall be equipped with a mode switch for the selection of brake positions (e.g. G, P, R, R+Mg) that can be operated from both sides of the vehicle.

Test points shall be fitted for the verification of the correct functioning of the controller; at least the output pressure and the load- and speed-dependent pressures, e.g. brake cylinder pressures.

5.3.2.3 Energy store

Every controller shall be connected to an energy store so that energy can be fed from this store into the devices generating the brake force when a brake command is given. The energy store shall be dimensioned so that, when the brake is applied, the available brake power at each point in the train journey and for all track conditions meets the requirements of the UIC brake system. The inexhaustibility as defined in EN 14198 shall be achieved.

The energy store for pneumatically operated brake systems shall also be fed from the MRP via filter, pressure-reducing valve, isolating cock and non-return valve.

The energy store for compressed air shall be in accordance with EN 286-3 and EN 286-4. Maintenance aspects are covered by UIC 541-07 or other applicable documents, e.g. DIN 5590 and DIN 5580.

Requirements of the energy stores for electrically-operated brake systems shall be according to UIC 550.

5.3.2.4 Passenger emergency brake and emergency brake override

5.3.2.4.1 Basic principles – system interfaces

All passenger vehicles shall be equipped with a passenger emergency brake.

The passenger emergency brake is located in the "Decentralized command initiation for automatic application of brakes" block (see EN 14198 and Figure H.1 of this European Standard) and on actuation of an operating element (emergency brake handle according to prEN 15327-1) initiates the triggering of an emergency brake valve and thus the activation of the automatic brake of the train. Automatic application of the brake at train level is initiated. Activation of the automatic train brake by operation of an emergency brake handle shall also be possible with the vehicle brake isolated.

When a passenger emergency brake handle has been operated, it shall be automatically locked in this position.

An activated emergency brake becomes ineffective with the actuation by the train crew of the resetting device on the applied emergency brake box or activation of the EBO by the train driver in accordance with the operating regulations of the Railway Authorities.