



# SLOVENSKI STANDARD

## SIST EN 15273-2:2010

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### Železniške naprave - Profili - 2. del: Nakladalni profil (profil vozila)

Railway applications - Gauges - Part 2: Rolling stock gauge

Bahnanwendungen - Lichtraum - Teil 2: Fahrzeugebegrenzungslinien

Applications ferroviaires - Gabarits - Partie 2: Gabarit du matériel roulant

Ta slovenski standard je istoveten z: **EN 15273-2:2009**

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#### **ICS:**

45.060.01      Železniška vozila na splošno      Railway rolling stock in  
general

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## Railway applications - Gauges - Part 2: Rolling stock gauge

Applications ferroviaires - Gabarits - Partie 2: Gabarit du matériel roulant

Bahnanwendungen - Begrenzungslinien - Teil 2: Fahrzeugbegrenzungslinien

This European Standard was approved by CEN on 3 October 2009.

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.

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## Contents

Page

Foreword.....	8
Introduction .....	9
<b>1</b> <b>Scope</b> .....	<b>9</b>
<b>2</b> <b>Normative references</b> .....	<b>9</b>
<b>3</b> <b>Terms and definitions</b> .....	<b>10</b>
<b>4</b> <b>Symbols and abbreviations</b> .....	<b>10</b>
<b>5</b> <b>Common requirements</b> .....	<b>15</b>
<b>5.1</b> <b>Static and kinematic gauges</b> .....	<b>15</b>
<b>5.1.1</b> <b>Description of the calculation method</b> .....	<b>15</b>
<b>5.1.2</b> <b>Applicability of static and kinematic gauges depending on running gear of the vehicle</b> .....	<b>15</b>
<b>5.1.3</b> <b>Limitations for the use of static gauges</b> .....	<b>16</b>
<b>5.1.4</b> <b>Requirements for use of kinematic gauges</b> .....	<b>16</b>
<b>5.1.5</b> <b>Dimensional tolerances on vehicles</b> .....	<b>17</b>
<b>5.2</b> <b>Dynamic methods</b> .....	<b>17</b>
<b>5.2.1</b> <b>General principles</b> .....	<b>17</b>
<b>5.2.2</b> <b>Dynamic method based on a reference profile</b> .....	<b>17</b>
<b>Annex A</b> (normative) <b>Gauge G1</b> .....	<b>19</b>
<b>A.1</b> <b>General</b> .....	<b>19</b>
<b>A.1.1</b> <b>Vehicle classes</b> .....	<b>19</b>
<b>A.1.2</b> <b>Bogie classes</b> .....	<b>20</b>
<b>A.1.3</b> <b>Rail-wheel adhesion coefficient</b> .....	<b>20</b>
<b>A.2</b> <b>Static gauge G1</b> .....	<b>20</b>
<b>A.2.1</b> <b>Reference profiles of upper and transverse parts</b> .....	<b>20</b>
<b>A.2.2</b> <b>Reference profiles of the lower part of static gauge G1</b> .....	<b>21</b>
<b>A.2.3</b> <b>Rules associated with static gauge G1</b> .....	<b>23</b>
<b>A.2.4</b> <b>Reduction formulae</b> .....	<b>24</b>
<b>A.3</b> <b>Kinematic gauge G1</b> .....	<b>24</b>
<b>A.3.1</b> <b>General</b> .....	<b>24</b>
<b>A.3.2</b> <b>Reference profiles of the upper and transverse parts of gauge G1</b> .....	<b>25</b>
<b>A.3.3</b> <b>Reference profiles of the lower part of kinematic gauge G1</b> .....	<b>25</b>
<b>A.3.4</b> <b>Determination of the vehicle heights</b> .....	<b>28</b>
<b>A.3.5</b> <b>Contact ramps</b> .....	<b>41</b>
<b>A.3.6</b> <b>Use of shunting devices on curved tracks</b> .....	<b>42</b>
<b>A.3.7</b> <b>Conditions for embarkation onto ferries</b> .....	<b>43</b>
<b>A.3.8</b> <b>Taking account of the transverse displacements of vehicles</b> .....	<b>45</b>
<b>A.3.9</b> <b>Formulae</b> .....	<b>47</b>
<b>A.3.10</b> <b>Reduction formulae applicable to wagons (dimensions in metres)</b> .....	<b>54</b>
<b>A.3.11</b> <b>Formulae to be applied for bogies and associated parts</b> .....	<b>56</b>
<b>A.3.12</b> <b>Pantograph gauge verification</b> .....	<b>56</b>
<b>A.3.13</b> <b>Pantograph gauge verification for tilting body vehicles or running with <math>I_p &gt; I_C</math></b> .....	<b>60</b>
<b>A.3.14</b> <b>Specific rules for doors and steps in the open position</b> .....	<b>66</b>
<b>A.3.15</b> <b>Step position</b> .....	<b>66</b>
<b>A.3.16</b> <b>Tilting vehicles</b> .....	<b>67</b>
<b>A.4</b> <b>Track position of the vehicles: angular displacement coefficient (A)</b> .....	<b>75</b>
<b>Annex B</b> (normative) <b>Gauges GA, GB, GC</b> .....	<b>80</b>
<b>B.1</b> <b>Common elements with gauge G1</b> .....	<b>80</b>
<b>B.2</b> <b>Static gauges GA, GB, and GC (loading gauges)</b> .....	<b>80</b>
<b>B.2.1</b> <b>Reference profiles of upper parts</b> .....	<b>80</b>

B.2.2	Reduction calculation formulae for static gauges GA and GB.....	81
B.2.3	Reduction calculation formulae for static gauges GC .....	82
B.3	Kinematic gauges GA, GB, and GC .....	82
B.3.1	Upper part reference profiles .....	82
B.3.2	Lower part reference profiles .....	83
B.3.3	Formulae for traction units (except motor coaches) .....	83
B.3.4	Formulae for motor coaches .....	85
B.3.5	Formulae for coaches and vans .....	86
B.3.6	Formulae for wagons .....	89
Annex C	(normative) Gauges GB1, GB2.....	92
C.1	Static gauges GB1 and GB2.....	92
C.1.1	Reference profile of static gauge GB1 .....	92
C.1.2	Kinematic gauges GB1 and GB2 .....	94
Annex D	(normative) Kinematic gauge GIC3 .....	96
D.1	Reference profile GIC3.....	96
Annex E	(normative) Gauge G2.....	97
E.1	Static gauge G2 .....	97
E.1.1	Reference profile of static gauge G2.....	97
E.1.2	Reference profile of kinematic gauge G2.....	98
Annex F	(normative) Finnish gauge FIN1 .....	99
F.1	General .....	99
F.2	Associated rules.....	99
F.2.1	Vertical position of the vehicle .....	99
F.2.2	Lower parts of the vehicle .....	99
F.2.3	Vehicle parts close to the wheel flanges .....	99
F.2.4	Vehicle width.....	100
F.2.5	Movable steps and access doors opening outwards for coaches and motor coaches .....	100
F.2.6	Pantographs and non-insulated roof-mounted parts .....	100
F.2.7	Rules and subsequent instructions.....	100
F.3	Reduction formulae.....	100
F.3.1	General rules.....	100
F.3.2	Reduction formulae.....	101
F.3.3	Reduction values.....	102
F.4	Reference profiles of gauge FIN1 .....	103
F.5	Increase in the minimum height of the lower part of the vehicle able to pass over marshalling humps and rail brakes .....	104
F.6	Increase in the minimum height of the lower part of the vehicle unable to pass over marshalling humps and rail brakes .....	104
F.7	Passage over transitions and humps.....	105
F.7.1	Position of rail brakes and other shunting devices.....	105
F.7.2	Running over marshalling hump passing track.....	106
F.8	Gauge of the vehicle lower step .....	106
F.8.1	General .....	106
F.8.2	Requirements for the distance between the step and the platform in the transverse plane ....	107
F.8.3	Gauge check .....	107
F.8.4	Presentation of results.....	107
F.9	Gauge of outwards opening doors and of folded down steps for coaches and motor coaches .....	107
F.9.1	General .....	107
F.9.2	Requirements for the distance between the door and the fixed equipment in the transverse plane .....	109
F.9.3	Gauge check .....	109
F.9.4	Presentation of results.....	109
F.10	Pantographs and non-insulated parts.....	110
Annex G	(normative) French gauge FR 3.3 .....	111
G.1	General .....	111
G.2	Reference profile of kinematic gauge F3.3 .....	111

## EN 15273-2:2009 (F)

G.3	Reference profiles for lower parts .....	112
G.3.1	Rules associated with the reference profile to determine the maximum construction gauge .....	112
G.3.2	Reduction formulae applicable to traction units (dimensions in metres) .....	113
G.3.3	Reduction formulae applicable to motor coaches (dimensions in metres) .....	114
G.3.4	Reduction formulae applicable to coaches and passenger vehicles (dimensions in metres) .....	115
Annex H	(normative) Belgian gauges BE1, BE2 and BE3.....	118
H.1	General.....	118
H.2	Associated rules .....	118
H.2.1	Rules for the lower parts.....	118
H.2.2	Upwards vertical displacements .....	118
H.2.3	Side doors in the open position .....	119
H.2.4	Movable step rules.....	119
H.2.5	Pantograph rules .....	119
H.3	Kinematic reference profiles for upper parts.....	119
H.4	Reduction formulae .....	121
H.4.1	Reduction formulae for traction units .....	121
H.4.2	Reduction formulae for hauled vehicles .....	123
H.5	Kinematic gauge of the 3 kV and 25 kV pantograph in the collection position on the Belgian network .....	126
H.5.1	General principles.....	126
H.5.2	Verification of pantographs located between the end axles or between the bogie centres (verification of stationary vehicle on a canted track).....	126
H.5.3	Verification of pantographs located beyond the end axles or beyond the bogie centres (verification in operation on an insufficiently canted track) .....	127
H.5.4	Pantographs in the lowered position .....	127
H.5.5	Other non-insulated roof-mounted parts .....	127
Annex I	(normative) Portuguese gauges PTb, PTb+, PTc.....	129
I.1	General.....	129
I.2	Kinematic reference profiles .....	130
I.3	Reference profiles for the lower part .....	132
I.4	Associated rules for PT gauges .....	133
I.4.1	Vertical displacements.....	133
I.4.2	Transverse displacements.....	133
I.4.3	Associated rules for the parts of height $h < 400$ mm above the running surface.....	134
I.4.4	Reduction formulae .....	134
I.5	Associated rules for pantographs and other roof-mounted parts .....	139
I.5.1	Reference profile for pantographs.....	139
I.5.2	Pantograph in collecting position.....	139
I.5.3	Pantograph in the lowered position and other roof-mounted parts.....	141
I.6	Associated rules for tilting body vehicles .....	141
I.6.1	Quasi-static displacements ( $z_p$ ).....	141
I.6.2	Calculation of the reductions .....	142
I.6.3	Requirement for adjusting the tilting system for vehicles fitted with active systems.....	143
I.6.4	Limits related to the speed of tilting body vehicles .....	144
Annex J	(normative) Swedish gauges SEa and SEc .....	145
J.1	Swedish dynamic gauges SEa and SEc: general.....	145
J.2	Reference profiles.....	146
J.3	Reference profile of gauge SEa.....	146
J.4	Reference profile for lower part of gauges SEa and SEc .....	147
J.5	Pantograph reference profile for gauge SEa .....	147
J.6	Dynamic reference profile for gauge SEc .....	148
J.6.1	Reference profile for parts below 0,15 m of gauge SEc .....	149
J.6.2	Reference profile for pantograph for gauge SEc.....	149
J.7	Methodology for calculating movements by means of geometric formulae .....	149
J.7.1	Curves in the horizontal plane .....	150
J.7.2	Straight track.....	152

J.7.3	Vertical curves, calculation of upper parts.....	153
J.7.4	Calculation of the lower parts .....	154
J.7.5	Marshalling humps.....	155
J.7.6	Ferry ramps.....	155
J.7.7	Pantograph.....	156
J.7.8	Swept envelope .....	157
J.8	Methodology for calculating movements by simulation .....	157
J.8.1	Modelling and simulations .....	159
J.8.2	Parameters to be considered in the simulations .....	159
J.8.3	Cases of simulation.....	160
J.8.4	Horizontal curves .....	160
J.8.5	Straight track .....	161
J.8.6	Running over points.....	161
J.8.7	Track parameters.....	161
J.8.8	Calculation parameters.....	162
J.8.9	Statistical post-processing.....	162
J.8.10	Geometric overthrow in a horizontal curve .....	163
J.8.11	Vertical geometric movement towards the upper part of the profile .....	163
J.8.12	Vertical geometric movement towards the lower part of the profile.....	163
J.8.13	Marshalling humps.....	164
J.8.14	Ferry ramps.....	165
J.8.15	Pantographs.....	166
J.8.16	Swept envelope .....	166
J.9	Checking relative to the permitted reference profile .....	166
J.10	Dynamic gauging method: verification .....	167
J.10.1	Verification by simulation.....	167
J.10.2	Verification by static testing .....	168
J.10.3	Verification by on-line running tests.....	168
J.10.4	(Informative) Dynamic gauge: track defects.....	169
J.11	(Informative) Two-dimensional statistical post processing.....	169
J.12	(Informative) Input data catalogue.....	170
Annex K	(normative) RZD static gauges.....	173
K.1	Static reference profiles of the upper parts (for rolling stock).....	173
K.2	Associated rules.....	175
K.2.1	Additional overthrows for $h \geq 3,220$ m .....	175
K.2.2	Reduction formulae.....	175
K.3	Determination of the allowable vertical dimensions .....	177
K.4	Static reference profiles of the lower parts .....	178
Annex L	(normative) German gauges DE1, DE2, DE3.....	180
L.1	Gauge DE1 .....	180
L.1.1	Kinematic reference profile .....	180
L.1.2	Associated rules.....	180
L.2	Kinematic gauge DE2.....	182
L.2.1	Kinematic reference profile .....	182
L.2.2	Associated rules.....	183
L.3	Kinematic gauge DE3.....	184
L.3.1	Kinematic reference profile .....	184
L.3.2	Associated rules.....	184
L.4	Absolute gauging of pantographs.....	185
L.4.1	General .....	185
L.4.2	Associated rules.....	185
L.4.3	Contact wire .....	187
L.4.4	Responsibility for input data.....	187
Annex M	(normative) Netherlands gauges NL1 and NL2.....	190
M.1	Reference profiles for kinematic gauges NL1 and NL2.....	190
M.2	Associated rules.....	191
Annex N	(normative) UK gauges W6a, UK1 .....	193

## EN 15273-2:2009 (F)

N.1	General.....	193
N.1.1	Purpose.....	193
N.1.2	Maintenance .....	193
N.1.3	Tolerances .....	193
N.1.4	Multiple operation .....	193
N.1.5	Configuration .....	193
N.1.6	Reference axis.....	194
N.1.7	Vehicle data .....	194
N.2	Static gauging .....	194
N.2.1	Principles.....	194
N.2.2	Vehicle geometry .....	194
N.2.3	Suspension displacements .....	195
N.3	Dynamic gauging .....	196
N.3.1	Principles.....	196
N.3.2	Geometric gauging .....	197
N.3.3	Absolute gauging.....	198
N.3.4	Comparative gauging .....	200
N.3.5	Vehicle shape and size.....	203
N.3.6	Range of operating conditions.....	204
N.3.7	Suspension movements .....	206
N.3.8	Calculating swept envelopes.....	207
N.3.9	Dynamic reference profiles.....	213
N.3.10	Assessing the vehicle .....	215
N.4	UK geometric gauges .....	216
N.4.1	List of UK geometric gauges .....	216
N.4.2	W6a gauge.....	217
N.4.3	Gauge UK1.....	227
Annex O	(informative) Recommended practice for dynamic gauging.....	241
O.1	Vehicle models.....	241
O.1.1	Principles.....	241
O.1.2	Vehicle conditions .....	241
O.1.3	Masses .....	241
O.1.4	Suspension modelling .....	242
O.1.5	Stiffness.....	242
O.1.6	Dampers.....	242
O.1.7	Air springs .....	242
O.1.8	Swing links .....	243
O.1.9	Friction.....	243
O.1.10	Active devices .....	243
O.1.11	Inter-vehicle connections .....	243
O.1.12	Suspension component tolerances .....	244
O.1.13	Suspension maintenance allowances .....	244
O.1.14	Suspension failure modes .....	244
O.1.15	Vehicle modelling accuracy.....	244
O.2	Validation of vehicle modelling.....	244
O.2.1	General notes on validation tests .....	244
O.2.2	Simulation model.....	246
O.2.3	Matching accuracy.....	247
O.2.4	Weighbridge test.....	247
O.2.5	Bogie rotation test .....	248
O.2.6	Sway test .....	248
O.2.7	Dynamic ride test.....	249
O.3	Simulation method.....	250
O.3.1	Principles.....	250
O.3.2	Dynamic analysis.....	251
O.3.3	Track data .....	251
O.3.4	Cant, speed and curve radius: general cases .....	251
O.3.5	Cant, speed and curve radius: specific cases .....	252
O.3.6	Application of cant and curvature.....	252



O.3.7	Side wind loads .....	252
O.3.8	Transient outputs .....	253
O.3.9	Curving analysis.....	254
O.4	Example of a virtual route.....	255
O.5	Example of a drawing showing vehicle size and shape.....	258
O.6	Presentation of swept envelope data .....	258
O.6.1	Presentation of results.....	259
O.6.2	Heading format .....	259
Table O.6	— Heading formats .....	259
O.6.3	Transient results matrix.....	260
O.6.4	Curving results matrix .....	261
<b>Annex P</b>	<b>(normative) Vehicle widening depending on the available spaces of the infrastructure .....</b>	<b>262</b>
<b>Annex Q</b>	<b>(normative) Static and kinematic gauges: list of documents for a vehicle gauge conformance certification.....</b>	<b>263</b>
Q.1	List of documents to be produced for design control.....	263
Q.2	List of documents to be taken into account to verify conformity to the gauge.....	263
<b>Annex R</b>	<b>(informative) A-deviations .....</b>	<b>265</b>
<b>Annex ZA</b>	<b>(informative) Relationship between this European Standard and the Essential Requirements of EU Directive 2008/57/EC.....</b>	<b>267</b>
<b>Bibliography</b>	.....	<b>270</b>

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<https://standards.iteh.ai/catalog/standards/sist/7ae0ef46-4f47-482f-bd60-63763cebc85b/sist-en-15273-2-2010>

## Foreword

This document (EN 15273-2:2009) 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 June 2010, and conflicting national standards shall be withdrawn at the latest by June 2010.

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(s), 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, 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.

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## Introduction

EN 15273 comprises three parts, namely

- EN 15273-1 that covers general definitions and the rules applicable to rolling stock and structure gauges;
- EN 15273-2 that gives the rules for calculating the rolling stock gauges and the associated rules for the various profiles;
- EN 15273-3 that gives the rules for the structure gauges. It explains the parameters concerned and gives a possible methodology for determining the structure gauges and the distances between centres of the tracks.

## 1 Scope

This document is applicable by the authorities involved in all types of railway operation.

This European Standard is applicable to new designs, to modifications and to the checking of the gauge for vehicles already in use.

The application of the rules of this European Standard makes it possible to determine the maximum dimensions of vehicles related to the structures.

The rules given in this standard are not applicable to vehicles guided by a single rail.

This European Standard contains:

- the associated rules for all the gauges for rolling stock;
- the requirements for composing the technical gauge report to submit to the Acceptance Authority in order to confirm vehicle conformity to this standard;
- the requirements for maintaining the vehicle characteristics influencing gauging throughout its operational life.

## 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 12299, *Railway applications — Ride comfort for passengers — Measurement and evaluation*

EN 12663, *Railway applications — Structural requirements of railway vehicle bodies*

EN 14363:2005, *Railway applications — Testing for the acceptance of running characteristics of railway vehicles — Testing of running behaviour and stationary tests*

EN 15273-1:2009, *Railway applications — Gauges — Part 1: General — Common rules for infrastructure and rolling stock*

**EN 15273-2:2009 (F)**EN 15273-3:2009, *Railway applications — Gauges — Part 3: Structure gauges*EN 50119, *Railway applications — Fixed installations — Electric traction overhead contact lines***3 Terms and definitions**

For the purposes of this document, the following terms and definitions apply to differentiate between the various types of vehicle:

**3.1****empty vehicle**

definition according to EN 12663

**3.2****vehicle construction tolerance**

tolerance on the external nominal dimensions of the vehicle, as specified in the design documents

**3.3**[.....]<sub>>0</sub>

value to be considered only when it is positive; negative values are regarded as being equal to zero

**3.4**

|.....|

mathematical absolute value

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**4 Symbols and abbreviations**

For the purposes of this European Standard, the symbols and abbreviations given in Table 1 are applicable.

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**Table 1 — Symbols and abbreviations**

Symbol	Designation	Unit	Symbol number
<i>a</i>	Distance between end axles of vehicles not fitted with bogies or between bogie centres	m	1.001
<i>A</i>	Coefficient of displacement		1.003
<i>b</i>	Semi-width or distance parallel to the running surface, relative to the centreline of the track or of the vehicle	m	1.007
<i>b<sub>G</sub></i>	Semi-spacing of side bearers	m	1.017
<i>b<sub>w</sub></i>	Semi-width of the pantograph head	m	1.033
<i>b<sub>1</sub></i>	Semi-width of the primary suspension springs	m	2.001
<i>b<sub>2</sub></i>	Semi-width of the secondary suspension springs	m	2.002
<i>C</i>	Roll centre		1.035

Table 1 (continued)

Symbol	Designation	Unit	Symbol number
$d$	Dimension over wheel flanges	m	1.037
$dg_a$	Geometric overthrow of the vehicle on the outside of the curve	m	1.038
$dg_{av}$	Vertical geometric overthrow of the vehicle on the outside of the curve	m	1.040
$dg_i$	Geometric overthrow of the vehicle on the inside of the curve	m	1.041
$dg_{iv}$	Vertical geometric overthrow on the inside of the curve	m	1.043
$D$	Cant	m	1.044
$Dpl$	Transverse displacement	m	1.051
$e_a$	Vertical reduction on the outside of the curve	m	1.065
$e_i$	Vertical reduction on the inside of the curve	m	1.066
$e_p$	Offset of the pantograph due to the vehicle characteristics	m	1.067
$e_{po}$	Offset of the pantograph at the upper verification point	m	1.068
$e_{pu}$	Offset of the pantograph at the lower verification point	m	1.071
$E$	Transverse reduction relative to the reference profile	m	1.074
$E_a$	Transverse reduction relative to the reference profile for cross-sections beyond the axles or beyond the bogie centres	m	1.075
$E_i$	Transverse reduction relative to the reference profile for cross-sections between the axles or between the bogie centres	m	1.076
$f$	Vertical sag	m	2.003
$G$	Centre of gravity of the body		1.087
$h$	Height in relation to the running surface	m	1.088
$h_c$	Roll centre height	m	1.091
$h_t$	Installation height of the lower pantograph joint relative to the running surface	m	2.004
$I$	Cant deficiency	m	1.107
$I'_c$	Intermediate cant deficiency value between 0 and $I_c$	m	1.108
$I'_p$	Intermediate cant deficiency value taken into account for tilting body vehicles	m	1.109
$I_c$	Maximum cant deficiency used by the infrastructure manager for his routes	m	1.110
$I_{max}$	Maximum cant deficiency	m	1.114
$I_p$	Cant deficiency of tilting body vehicles	m	1.117

Table 1 (continued)

Symbol	Designation	Unit	Symbol number
$j$	Minimum vertical reference clearances at the level of the side bearers	m	1.119
$j'_a$	Additional transverse clearances, towards the outside of the curve, relative to those of the reference vehicle	m	1.120
$j'_i$	Additional transverse clearances, towards the inside of the curve, relative to those of the reference vehicle	m	1.121
$J$	Actual vertical clearance at the level of the side bearers	m	1.122
$l$	Track gauge, distance between the rail running edges	m	1.126
$l_{\max}$	Maximum track gauge	m	1.130
$L$	Standard distance between the centrelines of the rails of the same track	m	1.134
$n$	Distance from the section under consideration to the adjacent end axle or to the closest pivot	m	1.157
$n_a$	$n$ for the sections outside the axles or bogie centres	m	1.158
$n_i$	$n$ for the sections between the axles or bogie centres	m	1.160
$n_{\mu}$	Distance from the section under consideration to the motor bogie centre of motor coaches	m	2.005
$p$	Bogie wheelbase	m	1.163
$p'$	Carrying bogie wheelbase of motor coaches	m	2.006
$P_o$	Reduction at the upper verification point of the pantographs	m	1.164
$P_{oa}$	Reduction at the upper verification point (6,5 m) of the pantographs beyond the bogie centres	m	1.165
$P_{oi}$	Reduction at the upper verification point (6,5 m) of the pantographs between the bogie centres	m	1.166
$P_u$	Reduction at the lower verification point (5,0 m) of the pantographs	m	1.169
$P_{ua}$	Reduction at the lower verification point (5,0 m) of the pantographs beyond the bogie centres	m	1.170
$P_{ui}$	Reduction at the lower verification point (5,0 m) of the pantographs between the bogie centres	m	1.171
$q$	Transverse clearance between wheelset and bogie frame, or wheelset and body for vehicles not fitted with bogies	m	1.172
$Q$	Displacement due to the complete quasi-static roll	m	1.176
$R$	Horizontal curve radius	m	1.178
$R_{\min}$	Minimum curve radius	m	1.182

Table 1 (continued)

Symbol	Designation	Unit	Symbol number
$R_p$	Radius corresponding to the maximum roll of a tilting body vehicle	m	1.183
$R_v$	Vertical curve radius	m	1.185
$S$	Flexibility coefficient		1.187
$s_0$	Flexibility coefficient taken into account in the agreement between the vehicle and the infrastructure		1.188
$s_n$	Flexibility coefficient of the pantograph carrying structure		2.007
$s'_0$	Flexibility coefficient taken into account in the agreement between the vehicle and the infrastructure for the pantograph gauge		1.189
$S$	Allowed additional overthrow	m	1.192
$S_0$	Standard value of additional overthrow linked to the reference profile	m	1.193
$T$	Pantograph flexibility coefficient	m	1.209
$v$	Vehicle speed	m/s	1.219
$V$	Vehicle speed	km/h	1.220
$V'_c$	Intermediate value of the standard train speed	km/h	1.221
$V'_p$	Intermediate value of the tilting train speed	km/h	1.222
$W$	Transverse clearance between bogie and body	m	1.228
$w_\infty$	Transverse clearance between bogie and body on a straight track	m	2.008
$w_i$	Transverse clearance between bogie and body on the inside of the curve	m	2.009
$w_a$	Transverse clearance between bogie and body on the outside of the curve	m	2.010
$w_{a(R)}$	Transverse clearance between bogie and body towards the outside of the curve varying as a function of the track curve radius	m	1.230
$w_{i(R)}$	Transverse clearance between bogie and body towards the inside of the curve varying as a function of the track curve radius	m	1.231
$x$	Distance taken into account from the point of origin O for the calculation of the swept envelope	m	1.233
$x_a$	Additional reduction for long vehicles beyond the bogie centres	m	2.011
$x_i$	Additional reduction for long vehicles between the bogie centres	m	2.012
$y$	Distance between the theoretical centre and the geometric centre of the bogie	m	2.013