BS EN 15877-2:2013

BSI Standards Publication

Railway applications — Markings of railway vehicles

Part 2: External markings on coaches, motive power units, locomotives and on track machines

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National foreword

This British Standard is the UK implementation of EN 15877-2:2013.

The UK participation in its preparation was entrusted to Technical Committee RAE/3/-/9, Railway Applications - Wagons (Tank/Freight).

A list of organizations represented on this committee can be obtained on request to its secretary.

This publication does not purport to include all the necessary provisions of a contract. Users are responsible for its correct application.

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Compliance with a British Standard cannot confer immunity from legal obligations.

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Bahnanwendungen - Kennzeichnungen von Schienenfahrzeugen - Teil 2: Außenanschriften an Personenfahrzeugen, Triebwagen, Lokomotiven und Gleisbaumaschinen

This European Standard was approved by CEN on 24 August 2013.

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

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

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Foreword

This document (EN 15877-2:2013) 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of an identical text or by endorsement, at the latest by April 2013, and conflicting national standards shall be withdrawn at the latest by April 2013.

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.

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

The series of European Standards, *Railway applications — Marking on railway vehicles*, consists of the following parts:

— *Part 1: Freight wagons*;

— *Part 2: External markings on coaches, motive power units, locomotives and on track machines*.

Some markings in Part 1 may also be used for on track machines as appropriate.

According to the CEN-CENELEC Internal Regulations, the national standards organisations of the following countries are bound to implement this European Standard: 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 the United Kingdom.

Introduction

This standard has been developed to provide a European standard for external markings used on railway vehicles. These markings are used to provide various items of information to railway staff relating to the technical and operational characteristics and intended use of vehicles in a clear and concise manner. Among those markings are safety markings used to alert equipment operators to hazards that may be encountered in the use or maintenance of the vehicles and markings relevant to emergency and rescue.

The standard is applicable to coaches, motive power units, locomotives and on track machines operating within the European Union, the European Free Trade Association Member States and States which are member of OTIF (Intergovernmental Organisation for International Carriage by Rail) and it satisfies the legal requirements within these institutions.

The standard is consistent with:

a) the Technical Specification for Interoperability Subsystem:

   1) Rolling Stock Scope for Conventional and High Speed Locomotives and Passenger rolling stock;

   2) Traffic Operation and Management;

b) the Convention Concerning International Carriage by Rail (COTIF) of 9th May 1980 in the Version of the Protocol of Modification of 3rd June 1999 which entered into force on 1st July 2006.

It therefore supports the essential requirements of:

— Directive 2008/57/EC on the Interoperability of the Railway System;

— COTIF 1999, Appendix F, Annex 1-A.

It is intended to be used by all parties concerned with the marking of railway vehicles.

1 Scope

This part of the European Standard identifies the information required or recommended to be marked on coaches, motive power units, locomotives and On Track Machines, relating to their technical and operational characteristics. It defines the characteristics of these markings, the requirements pertaining to their presentation, their shape and position on a vehicle and their meaning. Some markings are accompanied with note(s) where appropriate.

Service markings relating to passenger information are not addressed by this standard.

The provisions of this standard cover external markings on vehicles as required by:

- the TSIs;
- the COTIF regulations.

In addition to the markings shown in this European Standard, there might be other markings and text applied to these vehicles, e.g. instructions and warnings concerning the use of equipment specific to the vehicle. Such additional markings are not in contravention of this standard provided they do not interfere with, create ambiguity or in any other way affect the markings in this standard.

This European Standard is applicable to all railway motive power units, coaches, baggage and mail vans and car carrying coaches intended to be included in passenger trains, locomotives and On Track Machines operating within and between Member States of the European Union, the European Economic Area Member States and States which are member of OTIF (Intergovernmental Organisation for International Carriage by Rail) and it satisfies the legal requirements within these institutions.

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.

EN 15663, *Railway applications — Definition of vehicle reference masses*

ISO 3864-4:2011, *Graphical symbols — Safety colours and safety signs — Part 4: Colorimetric and photometric properties of safety sign materials*

3 Terms, definitions and abbreviations

3.1 Terms and definitions

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

3.1.1
decal
picture or design printed on special material for the purpose of adherence to a vehicle

3.1.2
Light Reflectance Value
LRV

- total quantity of visible light that is reflected by a surface at all wavelengths and directions when illuminated by a light source, or
- proportion of visible light reflected by a surface, weighted for the sensitivity to light of the human eye

Note 1 to entry: This is equivalent to CIE Tristimulus Y10 when viewed under Illuminant D65 and when measured with the appropriate specimen and measurement geometry. Further details of the CIE Tristimulus values are given in CIE 15:2004 and further details of the measurement of reflection are given in CIE 130:1998.

3.1.3
contrast
K
perception of a difference visually between one surface or element of a railway vehicle and another by reference to their light reflectance values (LRV)

Note 1 to entry: When applying colour to two adjacent surfaces, to provide sufficient contrast, the contrast between the colours will be determined by the light reflectance value.

For the purposes of this standard, “contrast” will be assessed by the diffused light reflectance value.

Contrast by the diffused light reflectance value’ will mean contrast of surfaces described in the following formula:

$$K = \frac{(L_0 - L_h)}{L_0 + L_h}$$

where

K is the contrast;

L_0 is the diffused light reflectance value of the object;

L_h is the diffused light reflectance value of the background or adjacent surface.

3.1.4
marking
lettering or symbols applied to a vehicle by means of decals, hand painting or by another agreed method with the purpose of providing information concerning the vehicle

3.1.5
retro-reflecting material
material which reflects radiation (light) in a direction close to the opposite of the direction from which it came

3.1.6
stencil
template for the required lettering

3.1.7
vehicle
in this standard, smallest part in a train (a single vehicle) which features an individual bodyshell lying on its own sets of bogies or wheels or sharing them with adjacent vehicles

3.1.8
railway vehicle
vehicle suitable for circulation on its own wheels on railway lines with or without traction

3.1.9
motive power unit
self-propelled unit capable of carrying passengers and/or luggage/mail

3.1.10
train
operational formation consisting of one or more vehicles

3.1.11
fixed formation train set
formation of vehicles that can only be reconfigured within a workshop environment

3.1.12
On Track Machines
OTMs
vehicles specially designed for construction and maintenance of the track and infrastructure including Infrastructure inspection vehicles

3.1.13
locomotive
traction vehicle (or a combination of several vehicles) that is not intended to carry a payload and has the ability to uncouple in normal operation from a train and to operate independently. This definition also covers shunting locomotives

3.1.14
coach
in this standard, non traction vehicle in a fixed or variable formation capable of carrying passengers, including restaurant cars, sleeping cars, couchettes cars, etc., and luggage / mail

3.2 Abbreviations

Term	Definition
ATMF	Appendix G to COTIF (Admission procedures)
CEN	European Committee for Standardisation
CIE	International Commission on Illumination, Vienna, Austria. http://www.cie.co.at
COTIF	Convention concerning International Carriage by Rail (COTIF) in the version of the Protocol of Modification of 3 June 1999
EBO	Emergency Brake Override
ECM	Entity in Charge of Maintenance
EN	European Standard
ep	Electropneumatic brake
ERA	European Railway Agency
EU	European Union
OTIF	Intergovernmental Organisation for International Carriage by Rail
RAL	colour standardisation system of the German Institute for Quality Assurance and Certification
RIC	(Regolamento Internationale delle Carrozze) Agreement governing the exchange and use of coaches in international traffic.
RID	RID means the Regulations concerning the International Carriage of Dangerous Goods (Appendix C to COTIF 1999) (RID is also Annex to EU Council Directive 96/49/EC)
TSI	Technical Specification for Interoperability: the specifications by which each subsystem or part subsystem is covered in order to meet the essential requirements and ensure the interoperability of the trans-European rail system
TEN	Trans European Network
UIC	International Union of Railways
VKM	Vehicle Keeper Marking

4 Markings

4.1 General principles

4.1.1 The markings and the content of information are as given in 4.5.

Where a marking is defined in this standard, then other markings indicating the same function/facility shall not be applied.

4.1.2 A marking shall be located on the vehicle at a position easily visible by staff standing and presented in a way clearly understandable to persons concerned. If the marking is intended to be read by a person standing at ground level, it should not be located at a level higher than 2 000 mm above the rail surface[1)]. The visibility shall also be ensured if the marking needs to be read from a position other than ground level or if it is placed on a non-vertical surface. Hazard Markings, e.g. the warning marking for live catenary, shall be located in such a position that they can be seen before the hazard zone is actually reached.

4.1.3 Advertising, designs or other text or pictures not relating to markings applied to a vehicle shall not affect the visibility and the clear and unambiguous understanding of the marking. Such advertising or markings shall not encroach within 100 mm of the markings defined in this standard.

4.1.4 Unless otherwise indicated in the diagrams, the markings shall be placed on both sides of the vehicle.

4.1.5 A marking shall ensure durable, non-degraded marking for a period of at least 6 years under a temperature range of -40 °C to +90 °C. It shall be weather-resistant and resistant to cleaning agents, high pressure water or air cleaning and cleaning machines with brushes.

4.1.6 Markings shall use Latin characters and Arabic numerals. The font to be used shall be non-italic, sans serif and of a type such as Univers 67, Helvetica, Arial.

4.1.7 The dimensions indicated in this document may have a tolerance of plus or minus 10 % when the marking is hand produced.

4.2 Colour

4.2.1 Colours used shall conform to ISO 3864-4:2011. Examples are given in Annex E of that standard. A combination of the colours Red and Green is not allowed for contrast.

NOTE For the colour Orange, which is not included in Table E.1 of ISO 3864-4:2011 but is specified in RID, RAL 2003 or NCS S 0570-Y50R or equivalent can be used. RAL® and NCS® are not normative for colour matching, but are examples from industry colour order systems to indicate what the respective colours look like.

4.2.2 Unless otherwise indicated in the diagrams, the colours need not be made of retro reflecting material.

4.2.3 The luminance contrast *K* shall be greater than 0,6.

4.2.4 If there is no colour specification indicated with the specification of a marking, the colour of the informative part (the symbol, letters/numbers, borders and lines) shall be black on a light uniform background or white on a dark uniform background. The background for decals, stencils and painted markings may be

1) For the assessment of the location criteria, the ground level should not be lower than 200 mm below the rail surface; in accordance with anthropometric data, the eye level of the reading person should not be less than 1 500 mm above ground; and the reading distance should be minimum 700 mm from the side of the vehicle. Tilting the head back, it should be possible to look up at an angle of 45 degrees above horizontal; a calculation using these parameters gives the limitation 2 000 mm.

transparent and thereby represented by the colour of the material on which the marking is placed, i.e. the bodyside of the vehicle.

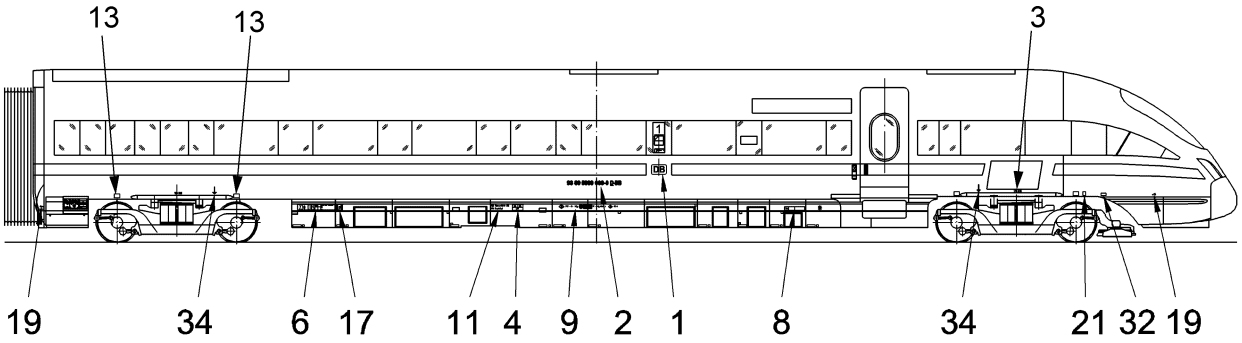
4.3 Positioning

The list of markings is contained in the table under 4.4 and their position and meaning described in 4.5.

If no specific position for a marking is prescribed in 4.5, the following general rules are to be followed:

A marking indicating a lever, a button, a nozzle, an indicator, hidden equipment or a point for action (e.g. a lifting point) shall be located next to that item (normally above, beneath or on the cover concealing the item) and may not lead to any misunderstanding or confusion. Other markings shall be logically grouped (e.g. vehicle number, operational capability and braking characteristics etc.); these other markings shall, unless otherwise indicated in the diagrams, be placed on the vehicle body side either in a line on the lower part of it (above the skirt) or within a notional rectangle close to the end of the vehicle body.

Markings should be positioned generally according to the examples given in the position diagrams of Figures 1 to 3.



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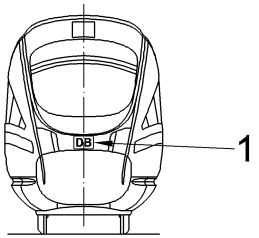
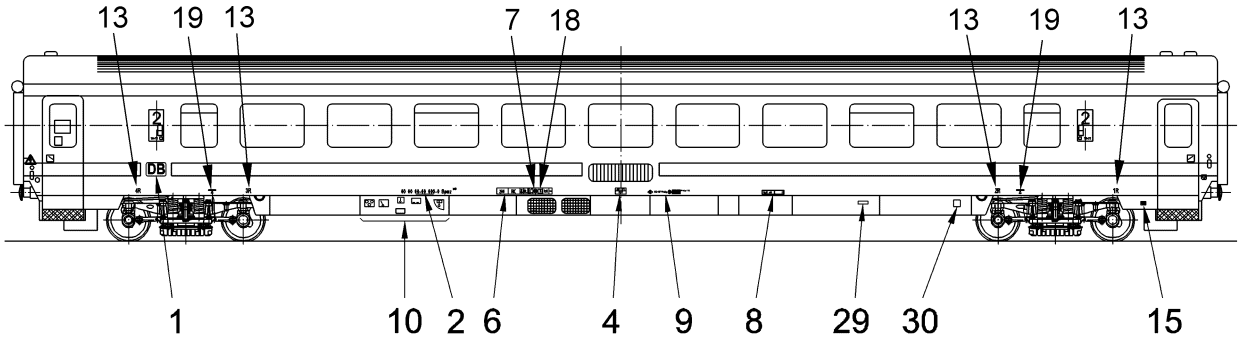


b)

Key

See 4.4.

Figure 1 - Leading/Trailing vehicles of fixed formation train sets or motive power units



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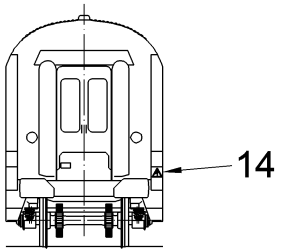
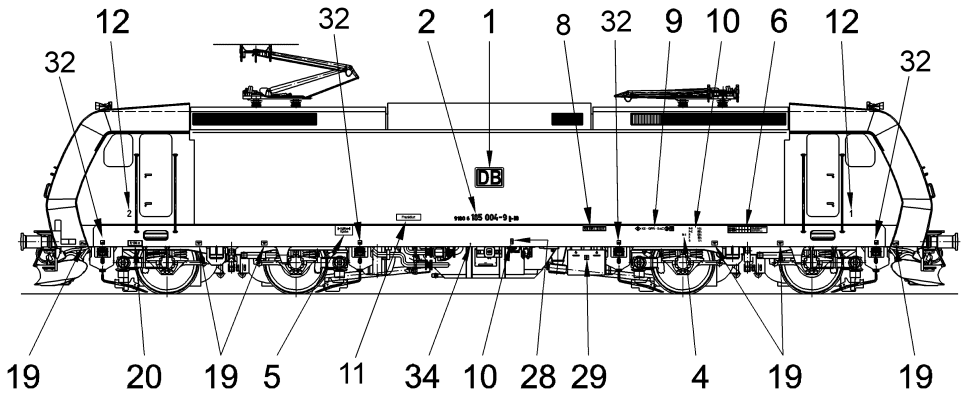


b)

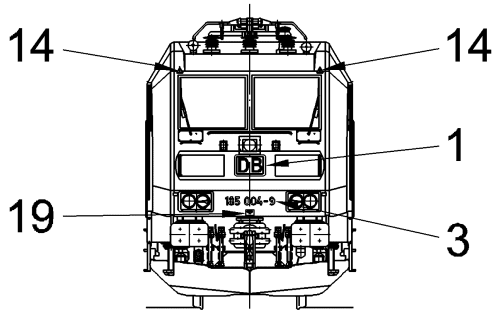
Key

See 4.4.

Figure 2 - Coaches



a)



b)

Key

See 4.4.

Figure 3 - Locomotives

4.4 List of markings — Matrix of markings applicable to the exteriors of all Fixed Formation Train Sets, Coaches, Motive Power Units and Locomotives

The following matrix does not specify On Track Machine markings in particular but any shall be used as required.

Table 1

Position number	Marking title or description	Fixed formation train sets and motive power units		Coaches	Locomotives	Section
		All vehicles	Leading/Trailing vehicles only			
1	Symbol of the Railway Undertaking	-	R	R	R	4.5.1
2	European Vehicle Number (EVN) and Vehicle Keeper Marking (VKM)	O	-	O	O	4.5.2
3	Train set number	C	O	-	-	4.5.3
4	Vehicle mass	-	-	-	-	4.5.4
	Design mass in working order, Operational mass under normal payload and number of seats	-	-	O	-	4.5.4.1
	UNI-Class coaches	-	-	O	-	4.5.4.1.1
	Two-Class coaches	-	-	O	-	4.5.4.1.2
	Baggage and mail vans	-	-	O	-	4.5.4.1.3
	Passenger vehicles with baggage compartment	-	-	O	-	4.5.4.1.4
	Vehicle mass (locomotive only)	-	-	-	O	4.5.4.2
	Design mass in working order of fixed formation train set	C	C	-	-	4.5.4.3
5	Dimensions					4.5.5
	Length over buffers or length between couplers for vehicles fitted with automatic couplers	C	-	O	O	4.5.5.1
	Length of a fixed formation train set	-	O	-	-	4.5.5.2
	Distance between bogie pivots	C	-	O	O	4.5.5.3
	Distance. between outer axles within bogie	O	-	O	O	4.5.5.4
	Distance between end axles on vehicles without bogies	-	-	-	O	4.5.5.5

Position number	Marking title or description	Fixed formation train sets and motive power units		Coaches	Locomotives	Section
		All vehicles	Leading/Trailing vehicles only			
6	Interoperability markings Coaches, baggage and mail vans	-	C	C	-	4.5.6 4.5.6.1
	Maximum speed	-	O	O		
	Approval regime	-	C	C	-	
	Conforming to specific national conditions	-	C	C	-	
	Restrictions asterisk	-	C	C	-	
	Other track gauges	-	C	C	-	
	Ferry capability	-	C	C	-	
	Locomotive or fixed formation train set	-	C	-	C	4.5.6.2
	Approval regime	-	C	-	C	
	Conforming to specific national conditions	-	C	-	C	
	Restrictions asterisk and ferry capability	-	C	-	C	
	Provision of auxiliary electric power	C	R	O	C	4.5.6.3
7	Broadcasting, remote control and train-bus equipment	-	C	C	C	4.5.7
8	Date of last overhaul	C	O	O	O	4.5.8
9	Brake inscriptions	C	C	O	O	4.5.9
10	Braked weight and changeover devices					4.5.10
	Marking for vehicles fitted with a “passenger only” changeover device	C	C	O	O	4.5.10.2
	Markings for vehicles fitted with one “freight-passenger” changeover device	C	C	O	O	4.5.10.3
	Vehicles bearing inscriptions of braked weight values which are not the same under “freight system” and under “passenger system”	C	C	O	O	4.5.10.4
	Vehicles bearing the inscription of a braked weight value which is the same under “freight” system and under “passenger” system	C	C	O	O	4.5.10.5
	Vehicles with only one type of braking system: ”freight” or “passenger”	C	C	O	O	4.5.10.6

Position number	Marking title or description	Fixed formation train sets and motive power units		Coaches	Locomotives	Section
		All vehicles	Leading/Trailing vehicles only			
	Braked-weights for locomotives (Examples)	C	C	O	O	4.5.10.7
	Manually applied parking brake	C	C	O	O	4.5.10.8
	Accumulator spring brake	C	C	O	O	4.5.10.9
	Control for accumulator spring brake	O	-	O	O	4.5.10.9.1
	Position of handle for releasing the accumulator spring brake without compressed air	O	-	O	O	4.5.10.9.2
	Unlocking ring of brake immobilisation equipment	O	-	O	O	4.5.10.9.3
	ON/OFF brake indicator	O	-	O	O	4.5.10.9.4
11	Home Depot	-	R	R	R	4.5.11
12	Designation of driving cabs	-	-	-	R	4.5.12
13	Numbering of axles and wheels (Examples)	O	-	O	O	4.5.13
14	Electricity hazard marking	O	-	O	O	4.5.14
15	Filling and draining devices for sanitary water supply	O	-	O	-	4.5.15
16	Discharge point for sealed toilet systems	O	-	O	-	4.5.16
17	Pressure pulse insensitive vehicles	-	O	O	O	4.5.17
18	Pressure pulse sensitive vehicles with sealed toilet systems	-	O	O	-	4.5.18
19	Lifting and re-railing markings	O	-	O	O	4.5.19
20	Radius curve restrictions					4.5.20
	Minimum radius horizontal curve	-	O	O	O	4.5.20.1
	Shunting prohibited on humps with a small vertical curve radius or not to be hump shunted	-	O	O	O	4.5.20.2
	Maximum ferry ramp angle	-	O	O	O	4.5.20.3
21	Isolation of bogie brake	O	-	O	O	4.5.21

Position number	Marking title or description	Fixed formation train sets and motive power units		Coaches	Locomotives	Section
		All vehicles	Leading/Trailing vehicles only			
22	Isolation of pneumatic suspension	O	-	O	-	4.5.22
23	Isolation of third-rail shoegear	O	-	-	O	4.5.23
24	Control of nose doors or coupling shield	-	O	-	O	4.5.24
25	Emergency Ladder	O	-	O	O	4.5.25
26	Emergency coupler	O	-	-	O	4.5.26
27	Emergency coupler equipment	O	-	-	O	4.5.27
28	Non visible stop cocks	O	-	O	O	4.5.28
29	Location of batteries	O	-	O	O	4.5.29
30	Battery isolation switch	O	-	O	O	4.5.30
31	Engine fuel filling point	O	-	O	O	4.5.31
32	Filling point for sandbox	O	-	-	O	4.5.32
33	Sanding test	O	-	-	O	4.5.33
34	Earthing protection	O	-	O	O	4.5.34
35	Gauge Marking	-	O	O	O	4.5.35
36	Vehicles prohibited from passing through retarders or other stopping devices in service mode	C	C	C	C	4.5.36

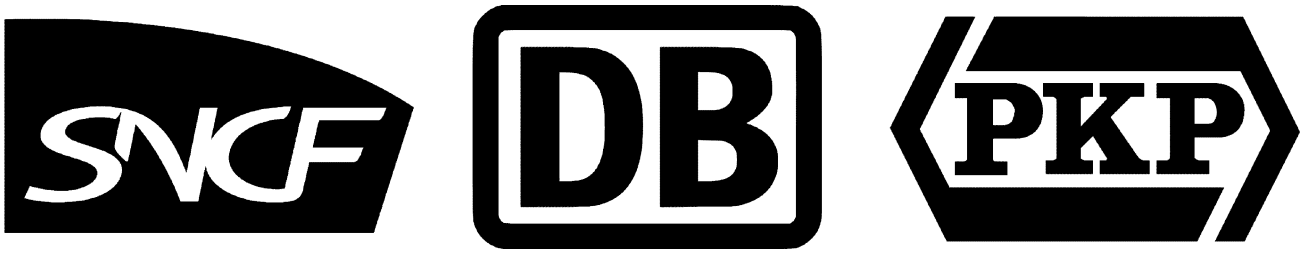
O = Obligatory (if fitted with the particular function).

R = Recommended.

C = Conditional (to be applied when design or operating conditions apply).

4.5 Details of vehicle markings

4.5.1 Symbol of the Railway Undertaking



Position: As required by the Railway Undertaking.

Meaning: Symbol of the Railway Undertaking.

NOTE These are samples only.

Figure 4

4.5.2 European Vehicle Number (EVN) and Vehicle Keeper Marking (VKM)

4.5.2.1 General

The markings shall be inscribed on the vehicle bodywork as in the following examples:

4.5.2.2 Coaches and baggage/mail vans

F-SNCF 61 87 20 – 72 021 -7 B[10] t

or

61 87 20 – 72 021 -7 B10 t F-SNCF

or

61 87 20 – 72 021 -7

B10 t

F-SNCF

Position: The number marking shall be applied to each sidewall of the vehicle.

The vehicle number lettering shall be at least 80 mm in height and shall be located as required by the keeper/Managing Operating Railway Undertaking but not more than 2 000 mm above rail level.

In exceptional circumstances, due to lack of space, it is permissible to split the number marking (but not the 12 digit number itself) over more than one line.

Meaning: (based on the examples above);-

F: Country in which the vehicle is registered, in this example France

SNCF: Vehicle Keeper Marking (VKM); the VKM is compulsory if the keeper has been assigned a VKM code; if not the full name and complete address of the keeper shall be indicated at another place of the vehicle

61: Fitness for interoperability (2 digits)

87: Country in which the vehicle is registered (2 digits)

20-72: Principal technical characteristics (4 digits)

021: Generic number of the vehicle in its registration series

-7: Self-check digit

B[10] t: Letter markings for hauled passenger stock, baggage and mail vans

4.5.2.3 Locomotives, motive power units

The European Vehicle Number shall be marked on each sidewall of the traction stock used in the following manner:

91 87 0001323-1

The keeper may add, in letters of larger size than the standard number, an own marking (e.g. consisting generally of digits of the serial number supplemented by alphabetical coding) useful in operations. The place where the own marking is positioned is left to the choice of the keeper; however it shall always be possible to easily distinguish the EVN from the keeper's own marking.

Position: The vehicle number lettering shall be at least 80 mm in height and shall be located as required by the keeper/Managing Operating Railway Undertaking but not more than 2 000 mm above rail level.

Meaning: (based on the examples above);-

F: Country in which the vehicle is registered, in this example France

SNCF: Vehicle keeper (VKM); this information is compulsory if the full name of the Company complete with address is not given

91: Fitness for interoperability (2 digits)

87: Country in which the vehicle is registered (2 digits)

0001: Principal technical characteristics (4 digits)

323: Generic number of the vehicle in its registration series

-1: Self-check digit

4.5.3 Train set number

170 205

Position: The train set number lettering shall be at least 80 mm in height and shall be located as required by the keeper/Managing Railway Undertaking on the cab area of the leading and trailing vehicles but not more than 2 000 mm above rail level.

Meaning: The identification number of a train set – if used.

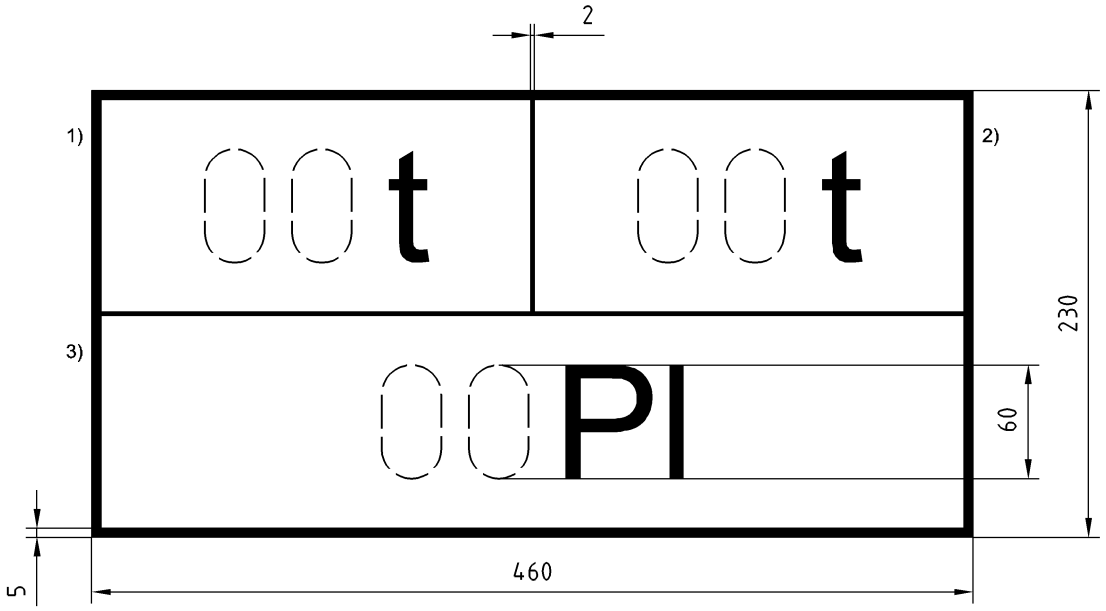
NOTE Example only.

4.5.4 Vehicle mass

4.5.4.1 Design mass in working order, Operational mass under normal payload (Gross Laden Weight) and Number of seats

4.5.4.1.1 Uni-class coaches

Dimensions in millimetres



Key

1 Design mass in working order including 50 % of consumables.

2 Operational mass under normal payload (Gross Laden Weight (GLW)).

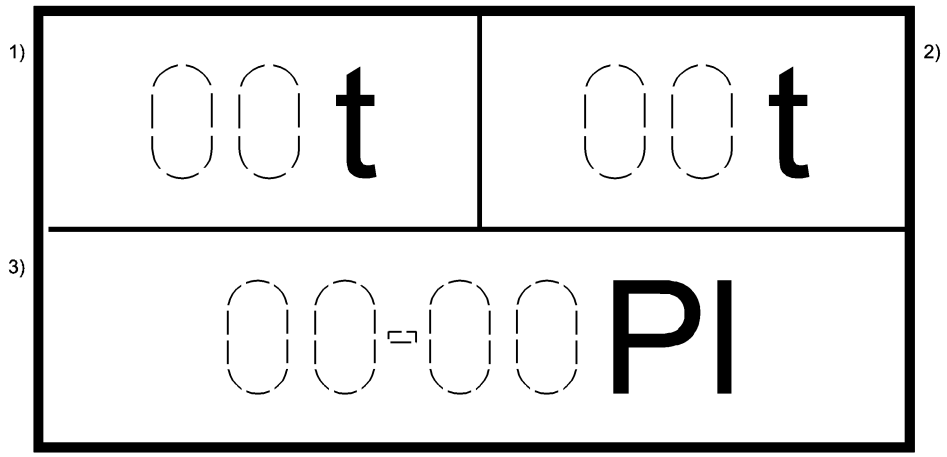
3 The number of seats.

Position: Low down on the centre of the body side in proximity to the brake markings.

Meaning: For definitions of vehicle weight refer to EN 15663.

Figure 5

4.5.4.1.2 Two-class coaches



Key

1) Design mass in working order including 50 % of consumables.

2) Operational mass under normal payload (Gross Laden Weight (GLW)).

3) The number of seats (The number on the left side indicating the number of seats in 1st class and higher).

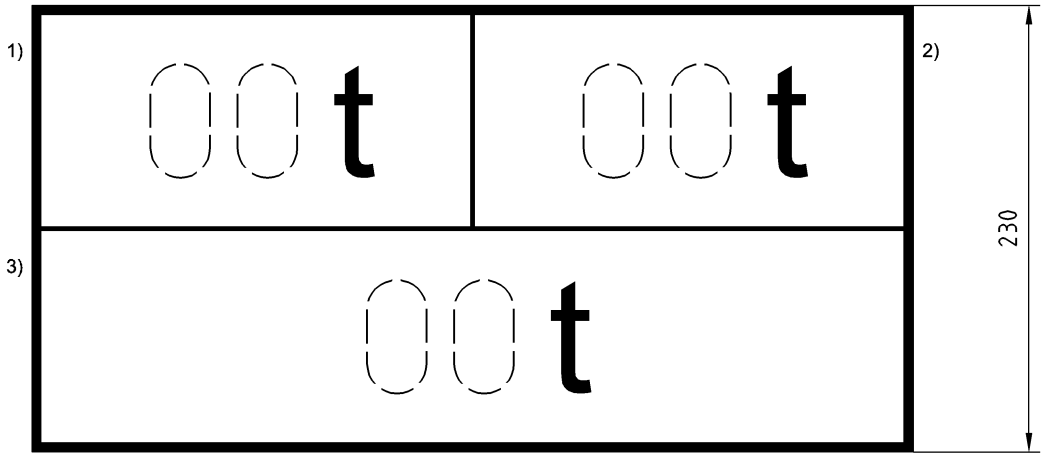
Position: Low down on the centre of the body side in proximity to the brake markings.

Meaning: For definitions of vehicle weight refer to EN 15663.

Figure 6

4.5.4.1.3 Baggage and mail vans

Dimensions in millimetres



Key

1) Design mass in working order including 50 % of consumables.

2) Operational mass under normal payload (Gross Laden Weight (GLW)).

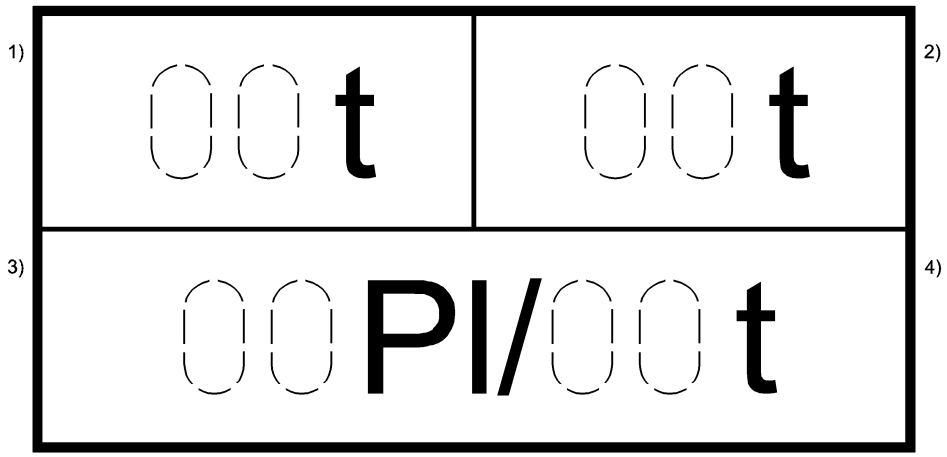
3) The maximum permitted load.

Position: Low down on the centre of the body side in proximity to the brake markings.

Meaning: For definitions of vehicle weight refer to EN 15663.

Figure 7

4.5.4.1.4 Passenger vehicles with baggage compartment



Key

1 Design mass in working order including 50 % of consumables.

2 Operational mass under normal payload (Gross Laden Weight (GLW)).

3 The number of seats.

4 The maximum permitted load of the baggage.

Position: Low down on the centre of the body side in proximity to the brake markings.

Meaning: For definitions of vehicle weight refer to EN 15663.

Figure 8

4.5.4.2 Vehicle Mass (locomotive only)

XXX t

Position: In 60 mm characters in proximity to the brake markings.

Meaning: The design mass in working order. For definitions of vehicle weight refer to EN 15663.

4.5.4.3 Design mass in working order of fixed formation train set

XXX t

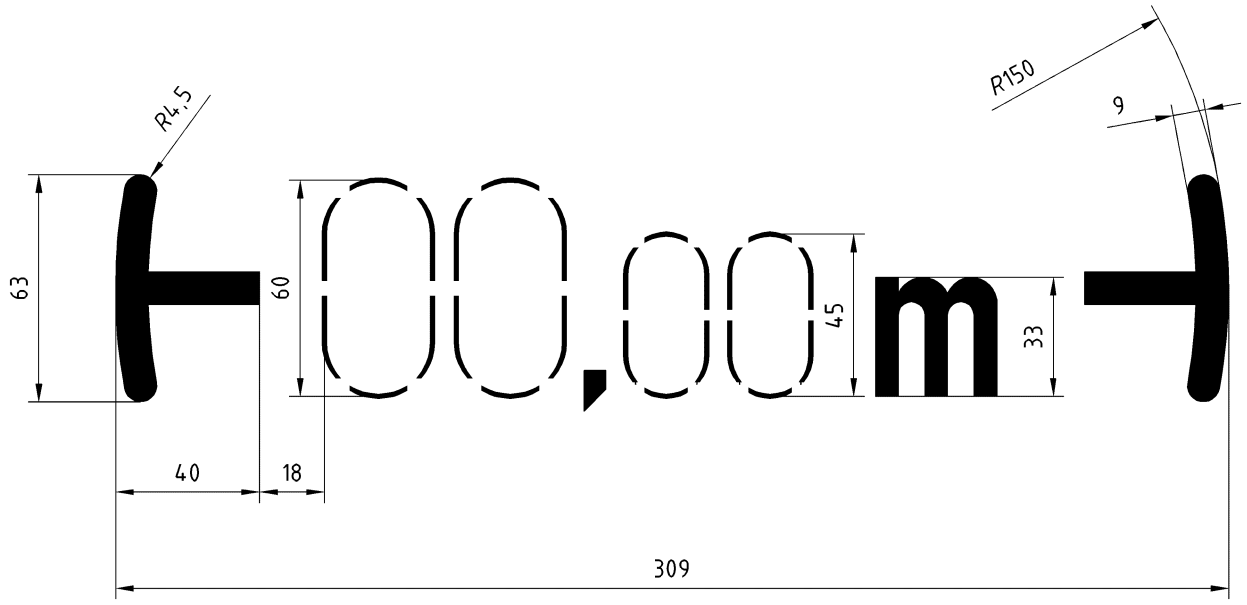
Position: In 60 mm characters in proximity to the brake markings.

Meaning: For definitions of vehicle weight refer to EN 15663.

4.5.5 Dimensions

4.5.5.1 Length over buffers

Dimensions in millimetres



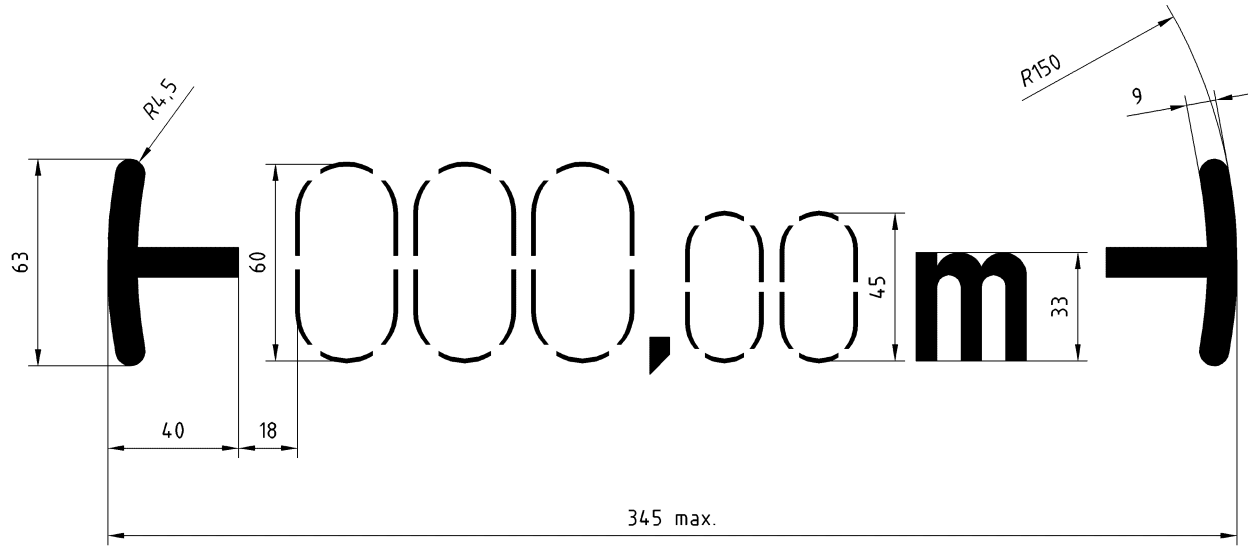
Position: In accordance with position diagram Figure 1 to Figure 3.

Meaning: The length in metres over buffers or the length between couplers for vehicles fitted with automatic couplers.

Figure 9

4.5.5.2 Length of a fixed formation train set

Dimensions in millimetres



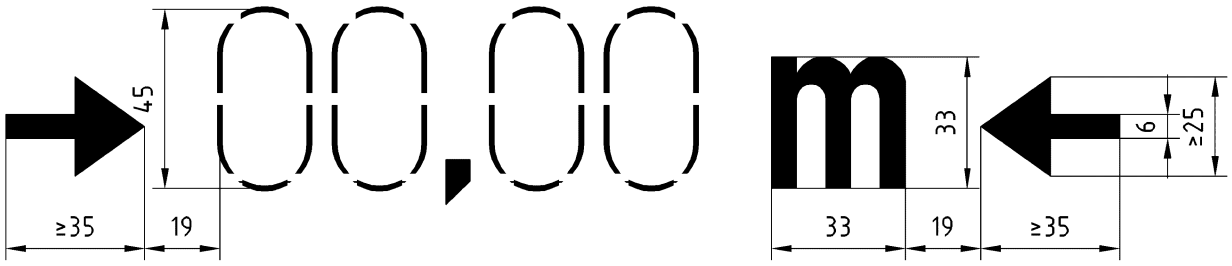
Position: In accordance with position diagram Figure 1 to Figure 3.

Meaning: The total length in metres of the train set over buffers or over end couplers for trains fitted with automatic couplers.

Figure 10

4.5.5.3 Distance between bogie pivots

Dimensions in millimetres



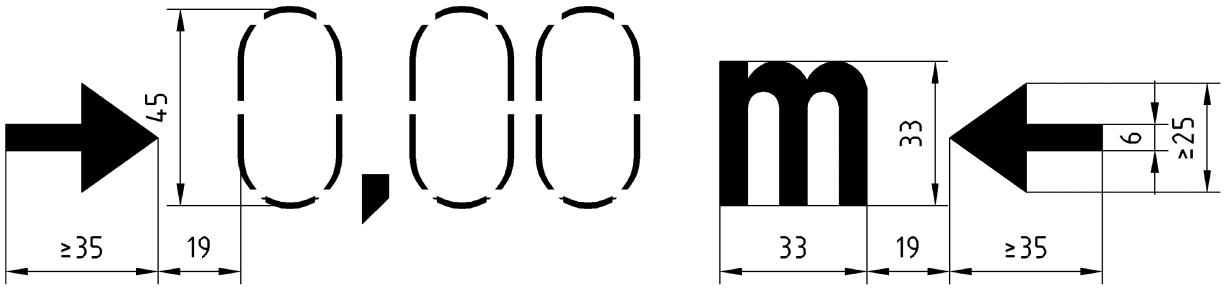
Position: In accordance with position diagram Figure 1 to Figure 3.

Meaning: The distance in metres between bogie pivots.

Figure 11

4.5.5.4 Distance between outer axles within bogie

Dimensions in millimetres



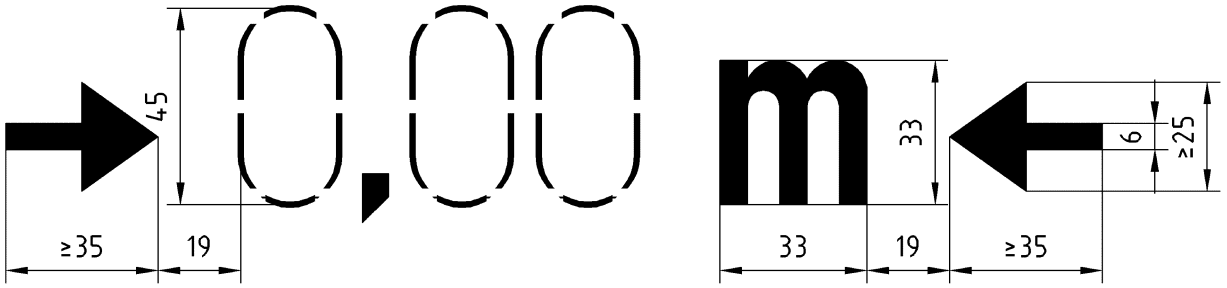
Position : In accordance with position diagram Figure 1 to Figure 3.

Meaning : The distance in metres between outer axles within bogie.

Figure 12

4.5.5.5 Distance between end axles on vehicles without bogies

Dimensions in millimetres



Position : In accordance with position diagram Figure 1 to Figure 3.

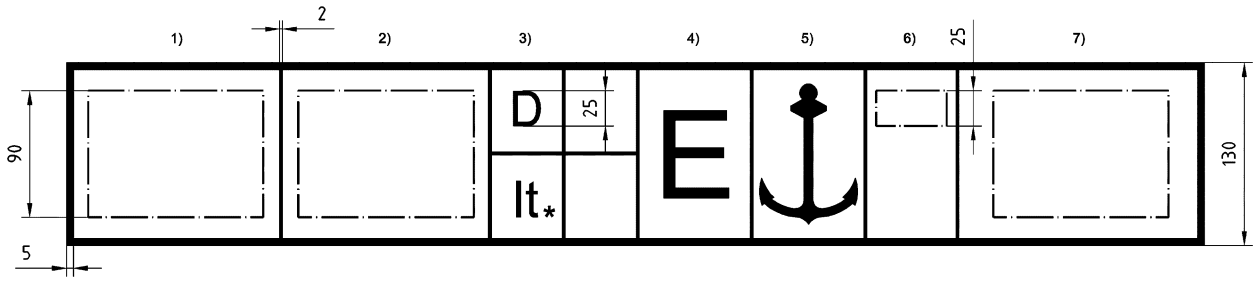
Meaning : The distance in metres between end axles.

Figure 13

4.5.6 Interoperability Markings

4.5.6.1 Coaches, baggage and mail vans

Dimensions in millimetres



Position: In accordance with Position Diagram Figure 1 to Figure 3.

Meaning 1) Maximum permitted operating speed in km/h.

2) **TEN+:** *(all EU and COTIF)* marking for a coach which complies with the following conditions:

- it complies with all relevant TSIs/UTPs which are in force at the moment of "placing in service"/"admission to operation"; **and**
  - o it has been authorised to be placed in service according to Article 22(1) of EU Directive 2008/57/EC or it has been admitted to operation according to Article 6 §§ 1 and 3 of ATMF; **and**
  - o the conditions listed a) and b) in Article 3a §§ 1 or 2 of ATMF are fulfilled;

or

- it has received individual authorisations in all EU Member States **and** individual admissions to operation in all COTIF Contracting States in accordance with Article 6 §§ 1 and 4 of ATMF.

TEN: *(EU only)* marking for a coach which complies with the following conditions:

- it is provided with an authorisation valid in all EU Member States in accordance with article 23(1) EU Directive 2008/57/EC or, as an alternative, it has received individual authorisations by all EU Member States.

or

RIC: marking for a coach which is subject to bi/multilateral agreements.

3) Coaches marked with the Country codes listed in the OPE TSI and/or with Country codes of OTIF Contracting States, may circulate within the whole of the national networks of those countries. Where exceptions occur on the network then the Country code shall be suffixed with an asterisk. Indication of a Country covered by the group marking in box 2 is not to be included in box 3, except if the Country requires the asterisk condition. If marked with RIC the relevant regulations of RIC apply.

4) Additional marking for coaches fulfilling running conditions within the networks of:

1 668 mm track gauge (Spain and Portugal): E

1 520/1 524 mm track gauge (Russia, Ukraine, Finland and other): R.

5) Vehicles complying with the requirements for operating on train ferries listed in box 6.

In cases where tying down points are not readily recognisable or accessible, they shall be marked by means of an upright yellow painted triangle with sides measuring 40 mm.

6) The official abbreviated designation of the train ferries with which the vehicle complies.

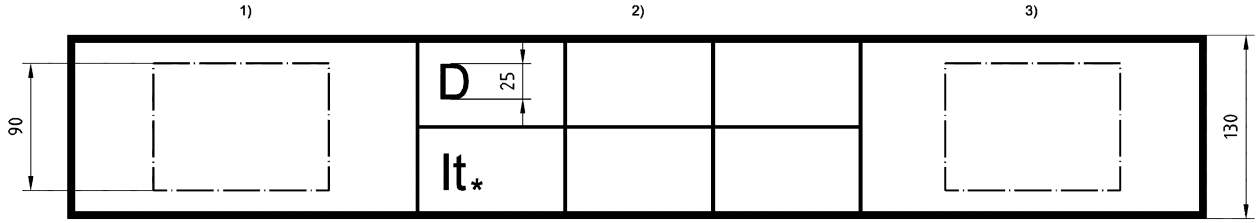
7) This box contains the inscriptions relating to the type of current, the voltage and the maximum permissible current strength in the train line and its type of source supply as defined in 4.5.6.3.

Any boxes may be eliminated from the marking if not required.

Figure 14

4.5.6.2 Locomotive or fixed formation train set

Dimensions in millimetres



Position: In accordance with position diagram Figures 1 to 3.

Meaning: 1) **TEN+:** *(all EU and COTIF)* Marking for a locomotive or fixed formation train sets which complies with the following conditions:

- it complies with all relevant TSIs/UTPs which are in force at the moment of “placing in service”/”admission to operation”; and
  - it has been authorised to be placed in service according to Article 22(1) of EU Directive 2008/57/EC or it has been admitted to operation according to Article 6 §§ 1 and 3 of ATMF; and
  - the conditions listed a) and b) in Article 3a §§ 1 or 2 of ATMF are fulfilled;

or

- it has received individual authorisations in all EU Member States and individual admissions to operation in all COTIF Contracting States in accordance with Article 6 §§ 1 and 4 of ATMF

Or

TEN: *(EU only)* Marking for a locomotive or fixed formation train sets which complies with the following conditions:

It is provided with an authorisation valid in all EU Member States in accordance with article 23(1) EU Directive 2008/57/EC or, as an alternative, it has received individual authorisations by all EU Member States.

or

UIC: Marking for locomotives or fixed formation train sets which are subject to bi/multilateral agreements and which comply with UIC requirements.

2) Locomotives or fixed formation trains marked with the Country codes listed in the OPE TSI and/or with Country codes of OTIF Contracting States, may circulate within the whole of the national networks of those countries. Where exceptions occur on the network then the Country code is suffixed with an asterisk. Indication of a Country covered by the group marking in box 1 is not to be included in box 2, except if the Country requires the asterisk condition and/or the anchor for fixed formation train sets. If marked with UIC the relevant Countries shall always be indicated.

The anchor marking shown next to the Country code indicates that the vehicle complies with the requirements for operating on train ferries of that Country

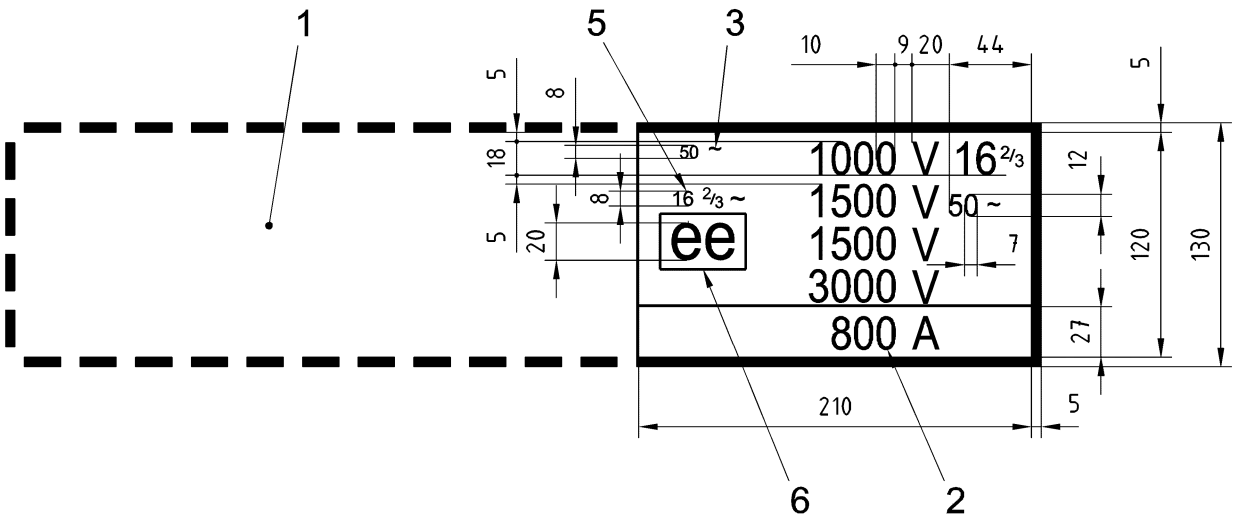
3) This box contains the inscriptions relating to the type of current and the voltage for the train line as defined in 4.5.6.3.

Any boxes may be eliminated from the table if not required.

Figure 15

4.5.6.3 Provision of auxiliary electric power

Dimensions in millimetres

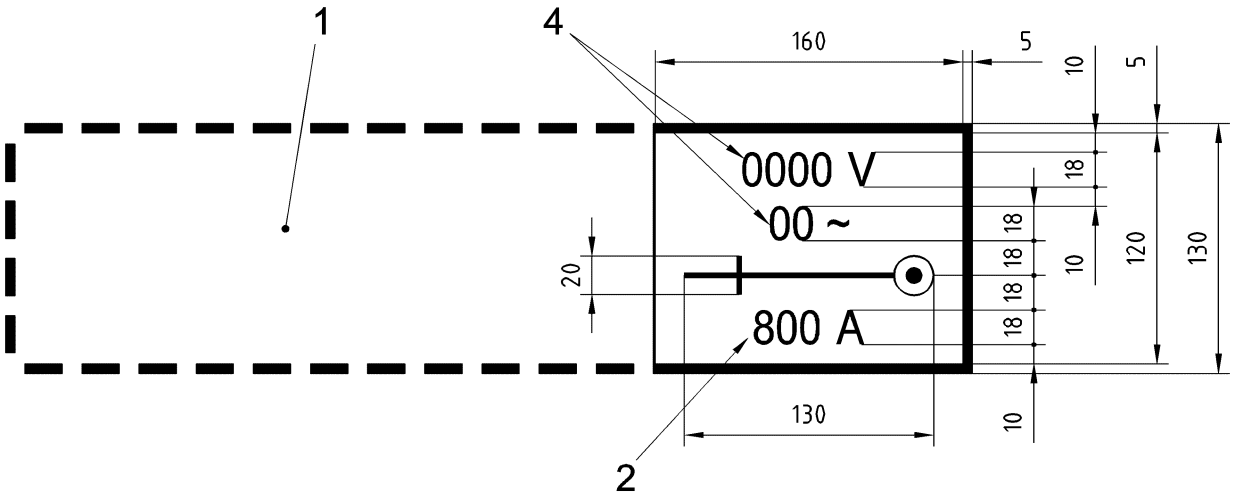


Key

See Figure 17.

Figure 16 — Example

Dimensions in millimetres



Key

1 Content as defined in 4.5.6.1 and 4.5.6.2.

2 For a train line capable of a current of 800 A, the indication shall be “800 A”

3 Only for vehicles capable of also being supplied under 1 000 V, 50 Hz

4 The indication 0000 V concerns the maximum nominal voltage for which the train line is designed. If the vehicle is not designed for 00 ~ (00 Hz alternating current), the indication 00 ~ shall be replaced by a horizontal bar.

If in Figure 16 no frequency is indicated to the right of the voltage, the indication is for DC current.

5 Only for vehicles capable of also being supplied with 1 500 V, 16 2/3 Hz

6 e (to be depicted without a frame) indicates that only the vehicle heating is supplied by the train line whereas the battery is recharged by an axle generator

ee indicates that all consumer loads including the battery are supplied by the train line

Both symbols indicate that the energy supply is possible with both train line or axle generator.

Position: On each side of the vehicle in the designated area of the right-hand section of the frame of the markings 4.5.6.1 and 4.5.6.2.

Meaning: Details of the voltages for which the vehicle’s electrical equipment has been designed.

Details of nominal voltages that cannot be used shall be replaced by a horizontal bar

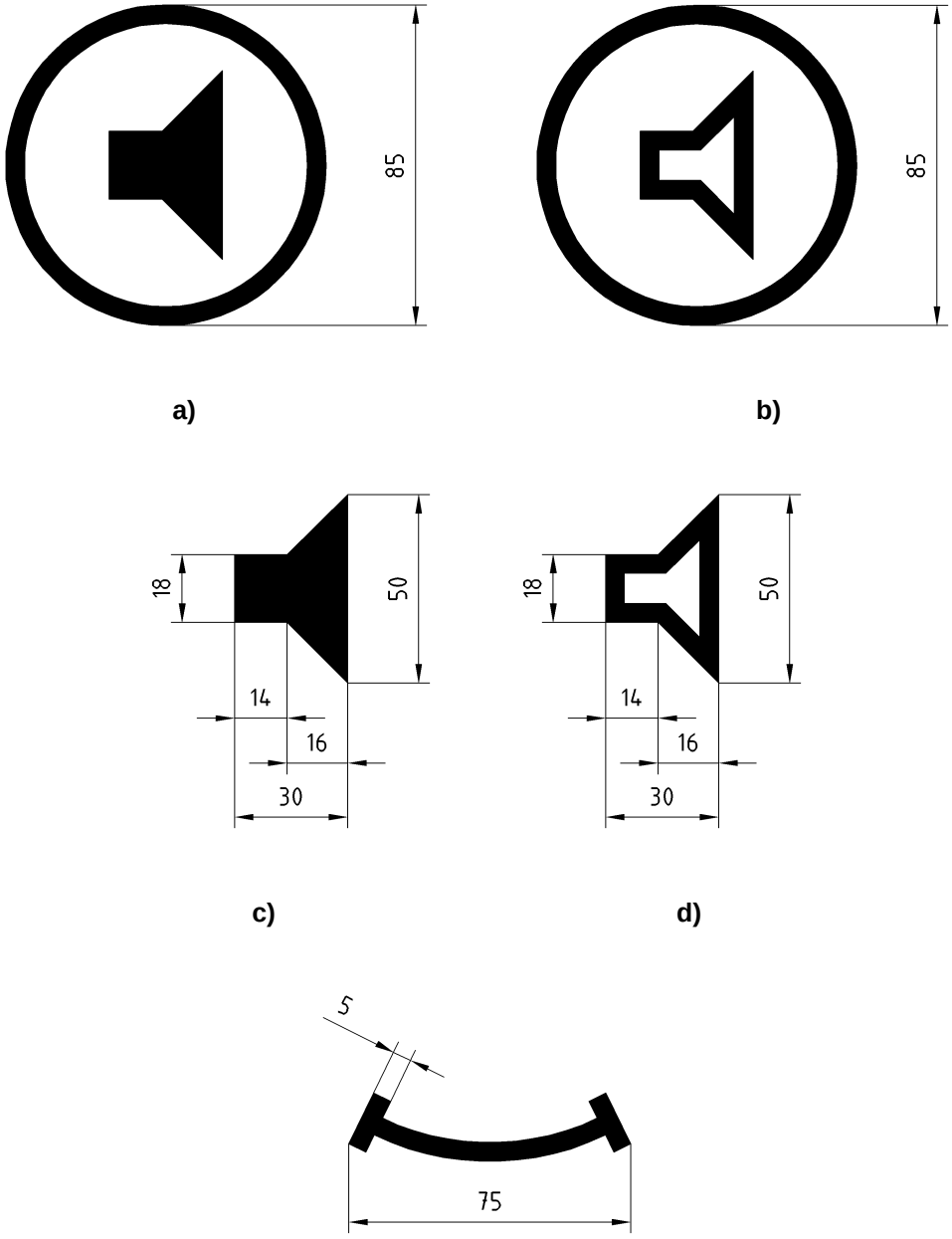
Figure 16 Vehicles with electric energy supply through the train line to power-using installations and, more particularly, to battery-charging equipment

Figure 17 Vehicles fitted only with a continuous train line

Figure 17 — Example

4.5.7 Broadcasting, remote control and train-bus equipment

Dimensions in millimetres

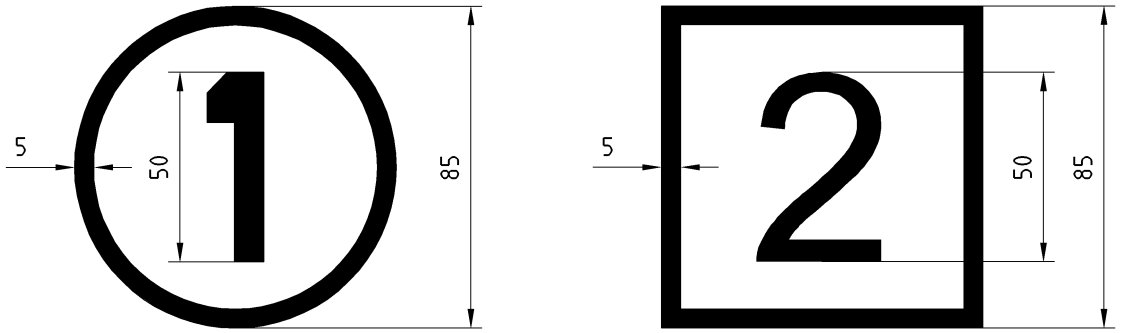


a) **b)**

c) **d)**

e)

Figure 18 *(continued)*



f) **g)**

Position: On each side, near one of the markings depicted in 4.5.6.

Meaning: Vehicles provided with public-address systems and vehicles fitted with a 12-wire or 18-wire cable for the public-address cable shall bear the relevant inscription shown above.

Figure 18a) Marking for vehicles provided with a public-address system with a socket to plug in a mobile transmitter unit for broadcasting announcements and music

Figure 18b) Marking for vehicles provided with a public-address system with a socket to plug in a mobile transmitter unit for broadcasting announcements and music but without a transmitter unit

Figure 18c) Marking for vehicles provided with a public-address system without a socket to plug in a mobile transmitter unit for broadcasting announcements and music

Figure 18d) Marking for vehicles provided with a public-address system without a socket to plug in a mobile transmitter unit for broadcasting announcements and music but without a transmitter unit

Figure 18e) Marking for vehicles with no public-address system but provided with a 12-wire cable or with a 18-wire cable for remote-control and transmission of information

Figure 18f) Marking for vehicles provided with a second conduit and a 12-wire cable

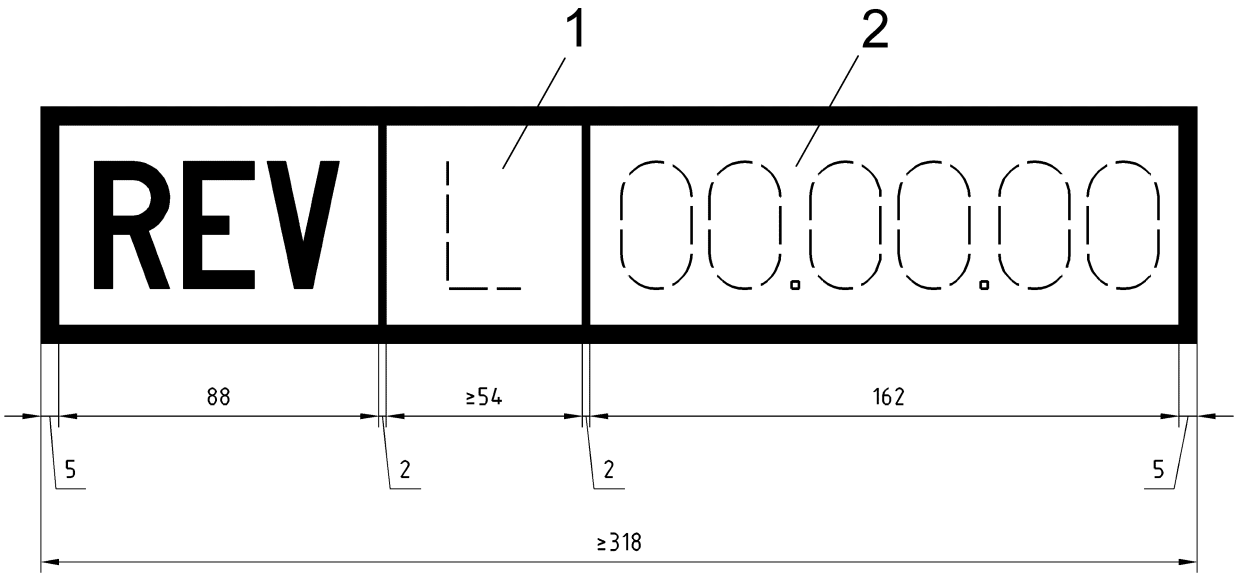
Figure 18g) The example number 2 indicates “electro-pneumatic door closing device and lighting remote control”. The use of numbers 3 to 9 indicate the features of the bus capability of vehicles that run in passenger service.

More detail may be obtained from UIC leaflet 556.

Figure 18

4.5.8 Date of last overhaul

Dimensions in millimetres

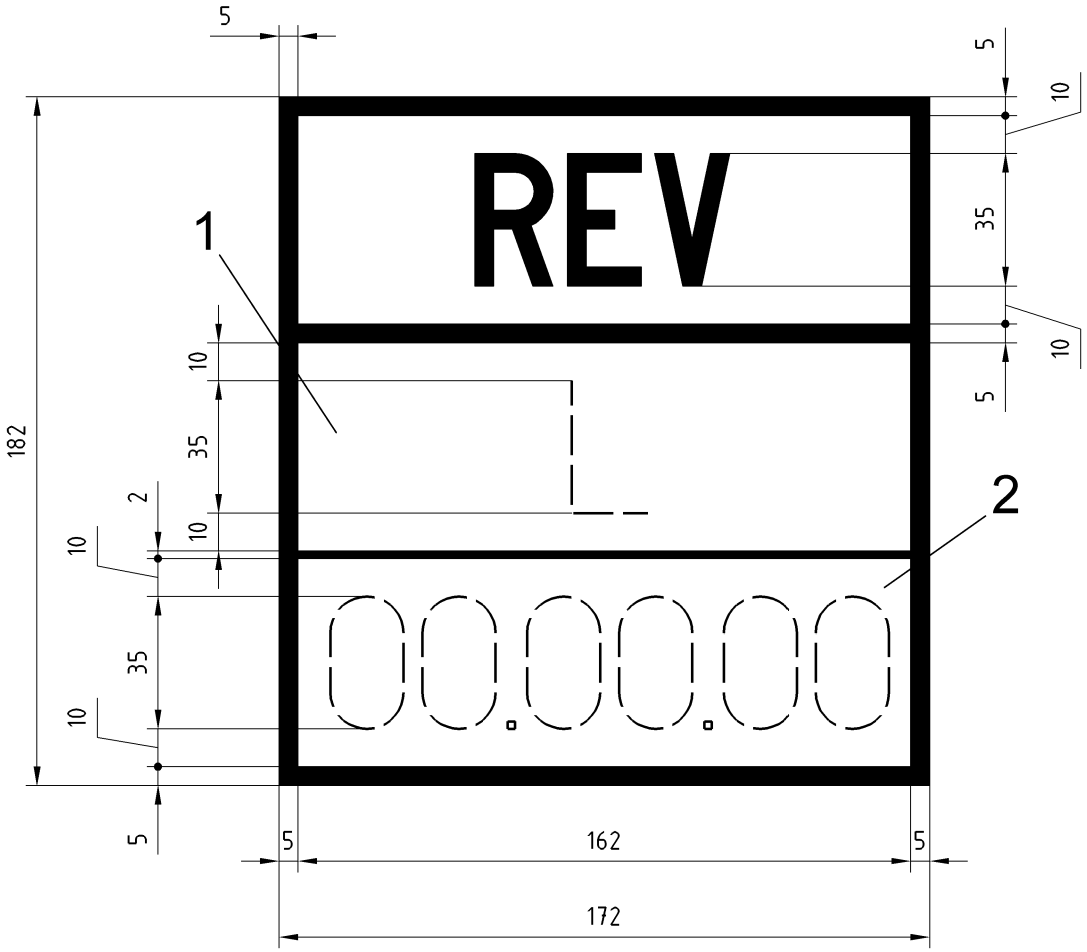


Key

See Figure 20.

Figure 19

Dimensions in millimetres



Key

1 Identification mark of the workshop, according to CWA for location codings, that carried out the maintenance work. The length of the box in Figure 19 can be increased to accommodate the identification mark.

2 Date on which the work was completed (day, month, year).

Position:	In accordance with position diagram Figure 1 to Figure 3.
Meaning:	Date of last overhaul By providing this inscription, the ECM indicates that the vehicle has undergone the regulation maintenance operations which are a prerequisite for its safety of operation and functioning.

Figure 20

4.5.9 Brake inscriptions

4.5.9.1 General

Position In accordance with position diagram Figure 1 to Figure 3.

Meaning According to the following chapters with their explanation :

1) installation of a high power R brake system with brake mode “R” (Reference 4.5.9.3)
2) type of brake distributor (Reference 4.5.9.1)
3) inscriptions denoting the system type of brake (Reference 4.5.9.2)
4) vehicle fitted with disc brakes (Reference 4.5.9.4)
5) vehicles fitted with an EBO system controlled by a remote control line (Reference 4.5.9.7)
6) vehicle fitted with an ep brake controlled by a remote control line system (Reference 4.5.9.6)

Figure 21 — Example

4.5.9.2 Types of brake (Examples only)

Kunze-Knorr	Kk
Drolshammer	Dr
Bozic	Bo
Hildebrand-Knorr	Hik
Breda	Bd
Charmilles	Ch
Oerlikon	O
Knorr, type KE	KE
Westinghouse, type E	WE
Dako	DK
Westinghouse-Brake, type U	WU
Westinghouse-Brake, type A	WA
Davies and Metcalfe, Distributor DMD 3	DM
MZT HEPOS, distributor MH 3f	MH
SAB-WABCO, type SW 4/SW 4C/SW 4/3	SW
Knorr KE- 483	KE – 483

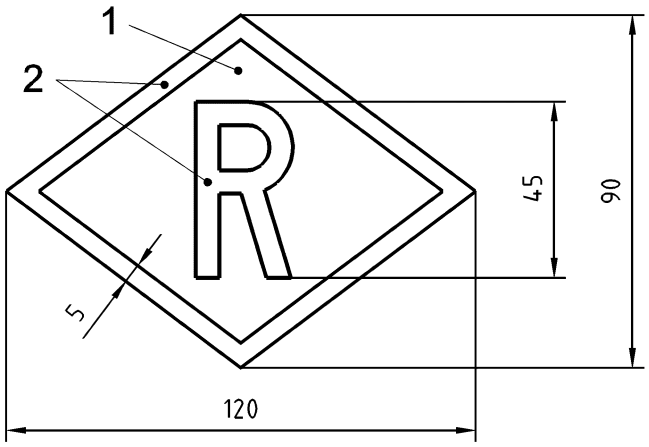
Knorr-Bremse with computer control	KB C

4.5.9.3 Inscriptions denoting the system type of brake

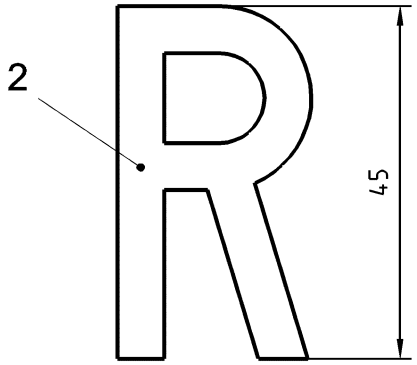
Freight brake	G
Passenger brake	P
High power brake	R
G-P changeover device	GP
P-R changeover device	PR
G-P-R changeover device	GPR
Electrical dynamic brake	E
Hydraulic dynamic brake	H
Automatic load-proportional braking system	A
Electromagnetic rail brake	Mg
Rihosek-Leuchter valve	RL
Eddy current Brake	WB

4.5.9.4 Installation of a high power R brake system with brake mode “R”

Dimensions in millimetres



a)



b)

Key

1 appropriate contrasting background colour

2 yellow

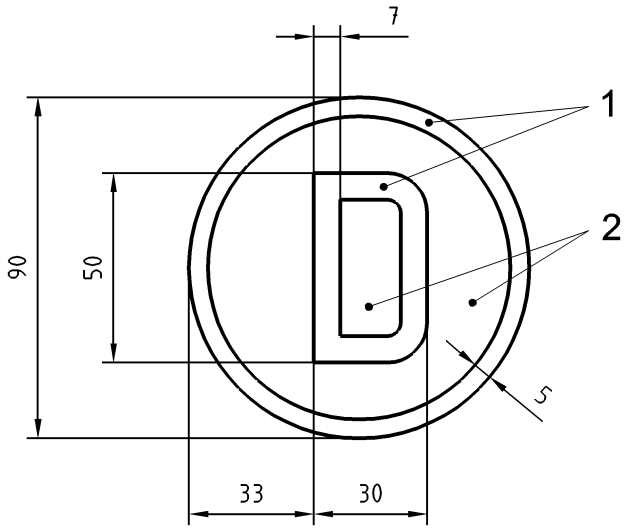
Position:	In front of the other brake markings – see Figure 21.
Meaning:	Vehicles which carry this marking are fitted with a high power R brake system with brake mode “R”, depending on the percentage of braking weight. The “R” is surrounded by a rhombus, as per Figure 22a, when the braking percentage in the braking position R and without an active brake pipe accelerator is: - between 150 % and 170 % referring to the operating weight; and - at least 135 % referring to the total weight. In the case of either falling below or exceeding one of these values the “R” is written without rhombus as per Figure 22b.

The braked weight inscriptions for the system shall show the braked weight without the use of the train pipe emptying accelerator. The braked weight in the latter case shall be shown in red. The braked weights shall also be written in the same manner even if the vehicle is only fitted with a train pipe emptying accelerator without a high power R brake system.

Figure 22

4.5.9.5 Disk brakes

Dimensions in millimetres



Key

1 yellow

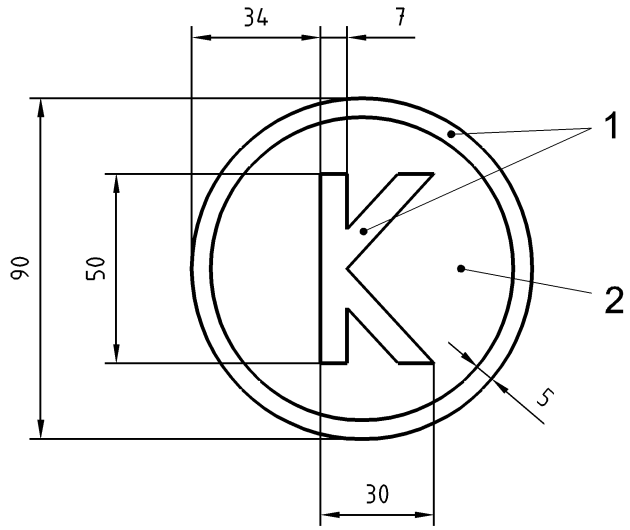
2 appropriate contrasting background colour

Position:	Together with the other brake markings.
Meaning:	Vehicles that carry this marking are fitted with disc brakes.

Figure 23

4.5.9.6 Brake with composite brake blocks

Dimensions in millimetres



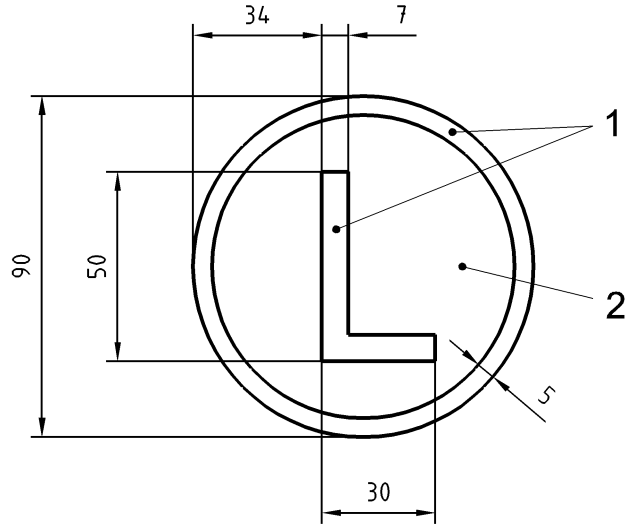
Key

1 yellow

2 appropriate contrasting background colour

Figure 24

Dimensions in millimetres



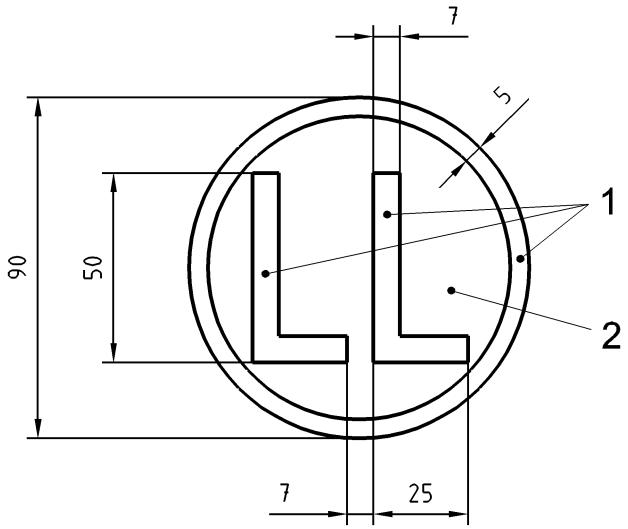
Key

1 yellow

2 appropriate contrasting background colour

Figure 25

Dimensions in millimetres



Key

1 yellow

2 appropriate contrasting background colour.

Position: on the middle of each solebar or on parts covering the solebar or on special boards fitted at the same height as the solebars

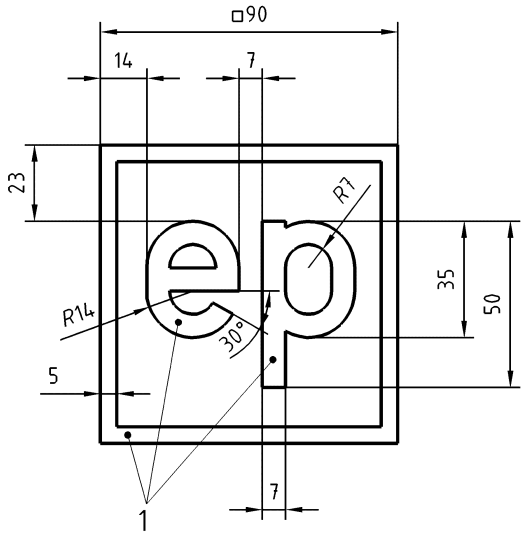
Meaning: vehicles which carry these markings are fitted with brake blocks made from composite material with:

- a high friction value (K);
- a medium friction value (L);
- a low friction value (LL)

Figure 26

4.5.9.7 Electropneumatic brake

Dimensions in millimetres



Key

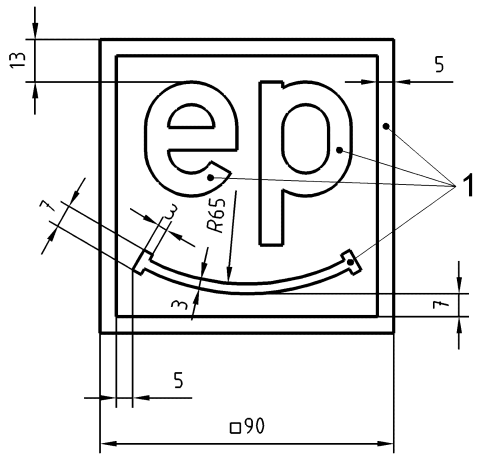
1 yellow: Electropneumatic brake (full equipment)

red: Control line for electropneumatic brake only

(Position and meaning: see Figure 29.)

Figure 27

Dimensions in millimetres



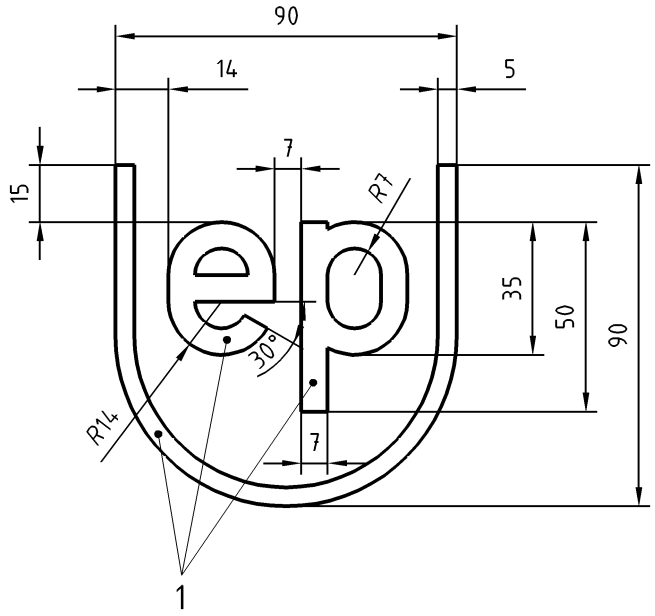
Key

1 yellow: Electropneumatic brake (full equipment)

(Position and meaning: see Figure 29.)

Figure 28

Dimensions in millimetres



Key

1 yellow: Electropneumatic brake (full equipment)

red: Control line for electropneumatic brake only

Position: Both sides of the vehicle and as per position 6 of Figure 21.

Meaning: Figure 27 Vehicles fitted with a simplified ep brake control system (control line with 4 conductors).

When marked in yellow this indicates full equipment.

When marked in red this indicates a control line system only.

Figure 28 Vehicles fitted with an ep brake controlled by a remote control line system

Yellow indicates full equipment.

Figure 29 Vehicles fitted with the ep brake (ep control line with 9 conductors)

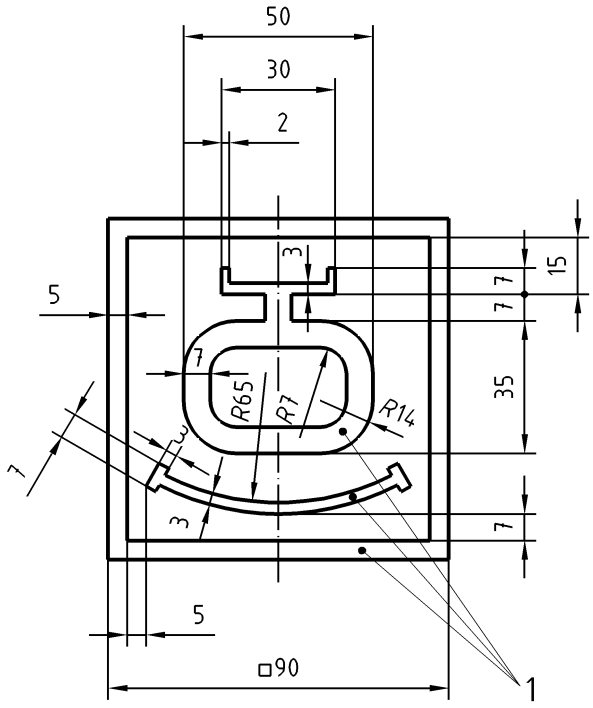
When marked in yellow this indicates full equipment.

When marked in red this indicates a control line system only.

Figure 29

4.5.9.8 Electro-pneumatic emergency brake override

Dimensions in millimetres



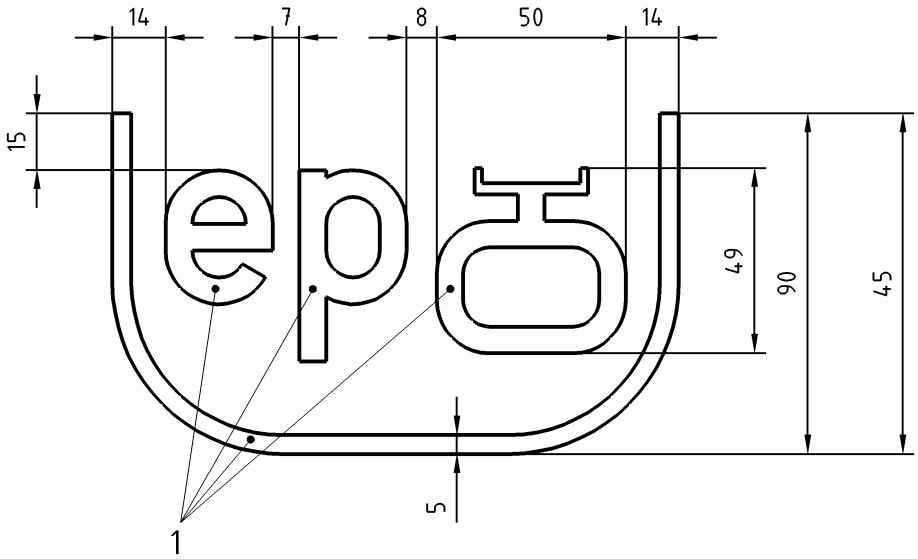
Key

1 yellow

(Position and meaning: see Figure 31.)

Figure 30

Dimensions in millimetres



Key

1 yellow

Position Both sides of the vehicle and as per position 5 of Figure 21.

Meaning: Emergency brake override (EBO) for ep brake controlled via remote control line systems.

Figure 30 Vehicles fitted with an EBO system controlled by a remote control line

Figure 31 Vehicles fitted with an EBO system (ep control line with 9 conductors)

Figure 31

4.5.10 Braked weight and changeover devices

4.5.10.1 General

To follow common practice, “weight” is used as kilogramme or tonne.

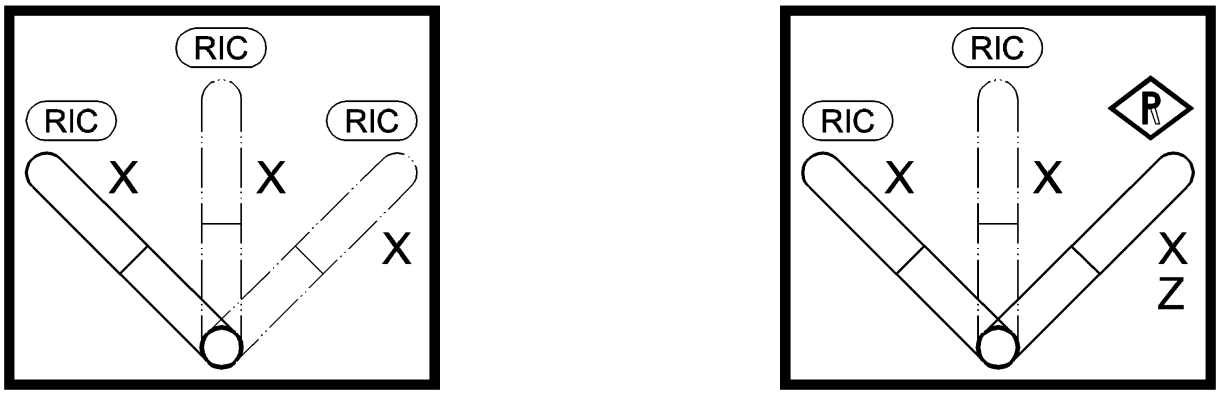
The values of the braked weight and of the changeover weight shall be shown in accordance with this standard.

Remarks concerning the following figures in 4.5.10.2 and 4.5.10.3:

The letter x corresponds to the braked weight in tonnes.

The letter z corresponds to the braked weight in tonnes obtained by using a train pipe emptying accelerator and shall be shown in red.

4.5.10.2 Markings for vehicles fitted with a "passenger only" changeover device



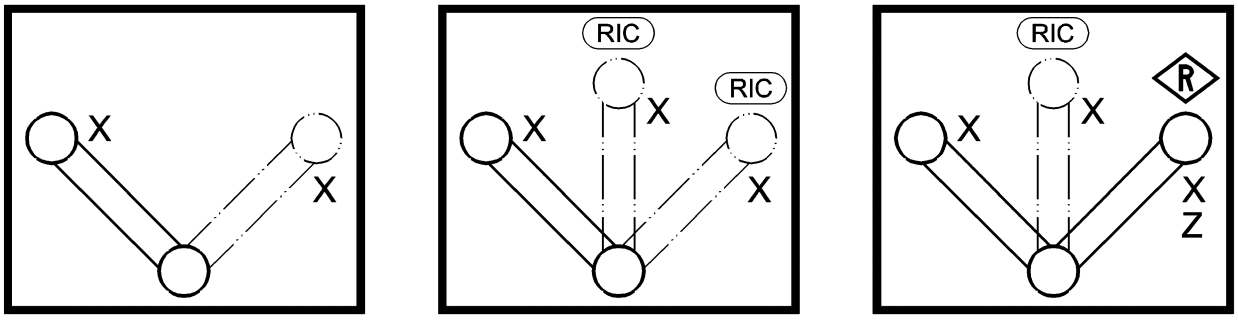
a) **b)**

Position: In accordance with position diagram Figure 1 to Figure 3.

Meaning: Marking indicating the braked weights with several "passenger" positions (for example, three)

Figure 32

4.5.10.3 Markings for vehicles fitted with one "freight-passenger" changeover device



a) b) c)

Position: In accordance with position diagram Figure 1 to Figure 3.

Meaning: Marking indicating the braked weights

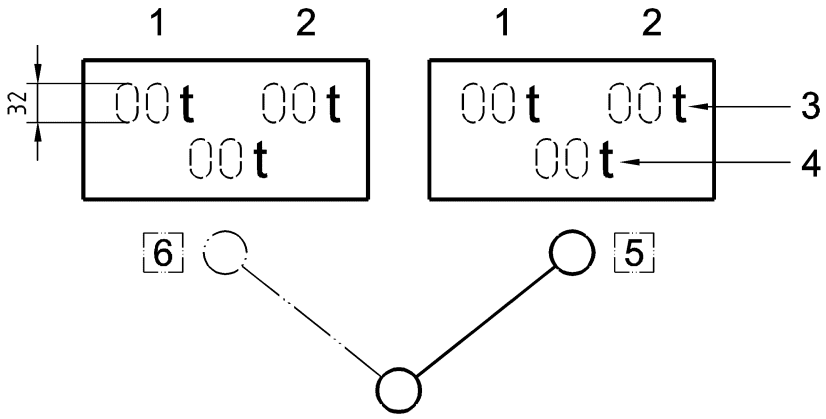
Figure 33 a) "Freight" and one "passenger" positions

Figure 33 b) and Figure 33 c) "Freight" and several (e.g. 2) "passenger" positions

Figure 33

4.5.10.4 Vehicles bearing inscriptions of braked weight values which are not the same under "freight" system and under "passenger" system

Dimensions in millimetres



Key

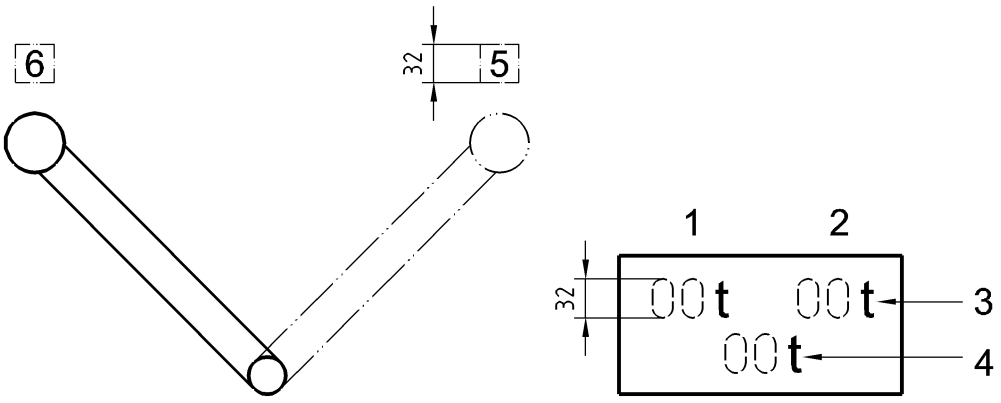
1	empty	4	changeover weight
2	loaded	5	passenger position
3	braked weight	6	goods position

Position: In accordance with position diagram Figure 1 to Figure 3.

Figure 34

4.5.10.5 Vehicles bearing the inscription of a braked weight value which is the same under "freight" system and under "passenger" system

Dimensions in millimetres



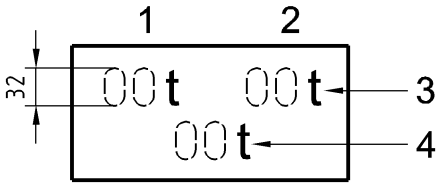
1 empty
2 loaded
3 braked weight
4 changeover weight
5 passenger position
6 goods position

Position: In accordance with position diagram Figure 1 to Figure 3

Figure 35

4.5.10.6 Vehicles with only one type of braking system: "Freight" or "Passenger"

Dimensions in millimetres



1 empty
2 loaded
3 braked weight
4 changeover weight

Position: In accordance with position diagram Figure 1 to Figure 3.

Figure 36

4.5.10.7 Braked-weights for locomotives (Examples only)

R+E160	155t	R	107t	(96t)
R+E	134t	P2	96t	
P+E	118t	P	81t	
		G	67t	

a)

	15kV~	1,5kV-	3kV-
R+E	140t	-	130t
P+E	115t	-	110t
R	120t		
P	100t		
G	70t		

b)

Position: The braked weight information shall be located close to the marking of the vehicle weight.

Dimension Characters shall be minimum 50 mm high.

Meaning: Figure 37 a) The electrodynamic brake performance may differ depending on the speed from which the braking is activated, e.g.: R+E160 155 t. If the locomotive or train set is not running under its own power, a lower brake performance is indicated in brackets, e.g.: R 107 t (96 t).

Figure 37 b) If the performance and availability of the electrodynamic brake differ for a multisystem locomotive or train set on the networks envisaged, a tabular inscription needs to detail these differences as shown in this example. The example indicates that the electrodynamic brake is not to be taken into account on the 1,5 kV DC networks.

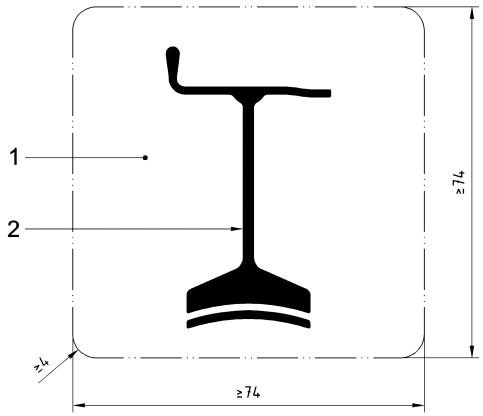
Colours: In accordance with section 4.2.4.

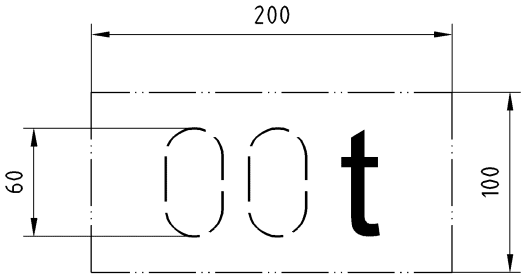
If all conditions in chapter 2 of leaflet UIC 544-2 are met, the brake weight digits for combinations which include the electrodynamic brake shall be in red.

Figure 37

4.5.10.8 Manually applied parking brake

Dimensions in millimetres





Key

1 white or yellow

2 black

Position: Near to the access point for the hand brake (Figure 38). The braked weight of the hand brake is to be written alongside (Figure 39).

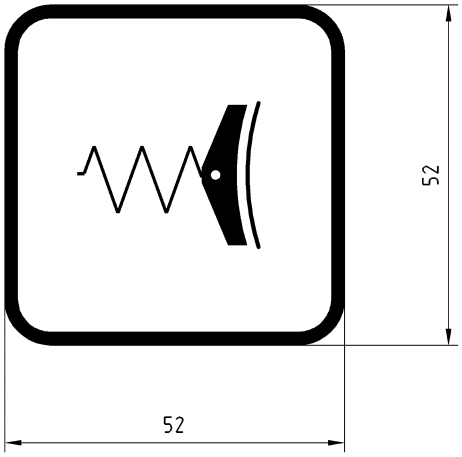
Meaning: For vehicles fitted with a handbrake which is not externally visible.

Figure 38 **Figure 39**

4.5.10.9 Accumulator spring brake

4.5.10.9.1 Control for the accumulator spring brake

Dimensions in millimetres



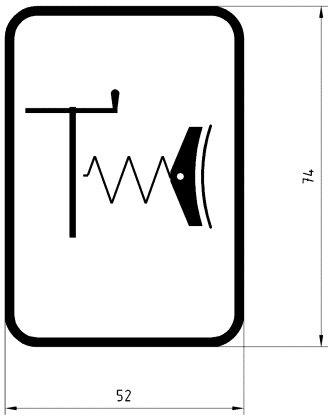
Position: Adjacent to the control for the accumulator spring brake

Meaning: The location of the control for the accumulator spring brake

Figure 40

4.5.10.9.2 Position of handle for releasing the accumulator spring brake without compressed air

Dimensions in millimetres



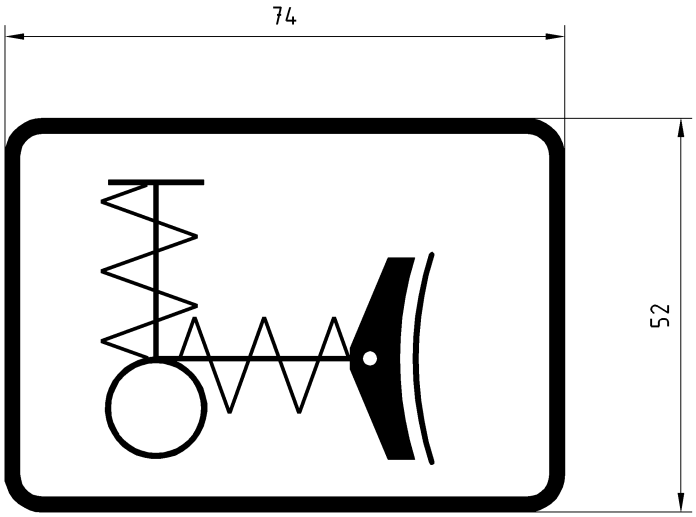
Position: Adjacent to the handle for releasing the accumulator spring brake without compressed air

Meaning: The location of the handle for releasing the accumulator spring brake without compressed air

Figure 41

4.5.10.9.3 Unlocking ring of brake immobilisation equipment

Dimensions in millimetres



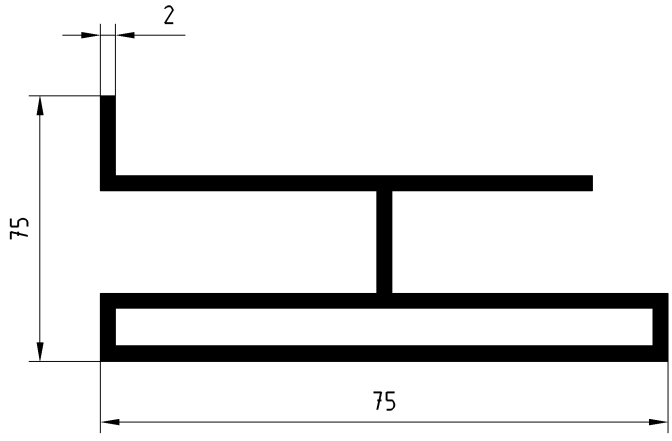
Position: Adjacent to the location of the unlocking ring for (certain types of) brake immobilisation equipment

Meaning: The location of the unlocking ring for (certain types of) brake immobilisation equipment

Figure 42

4.5.10.9.4 ON/OFF brake indicator

Dimensions in millimetres



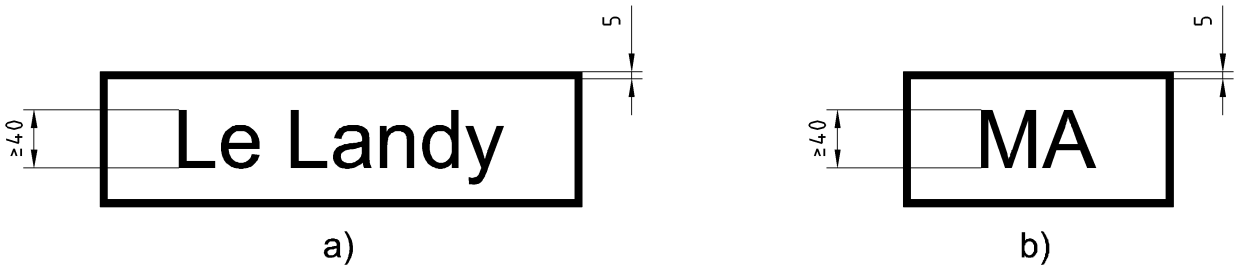
Position: In accordance with position diagram Figures 1 to 3.

Meaning: The indicators showing whether the handbrake is “on or off” shall be marked with this symbol.

Figure 43

4.5.11 Home depot

Dimensions in millimetres



Position: On each side of the vehicle.

Meaning: Name of the home depot of the vehicle – example shows use of full name or code variation.

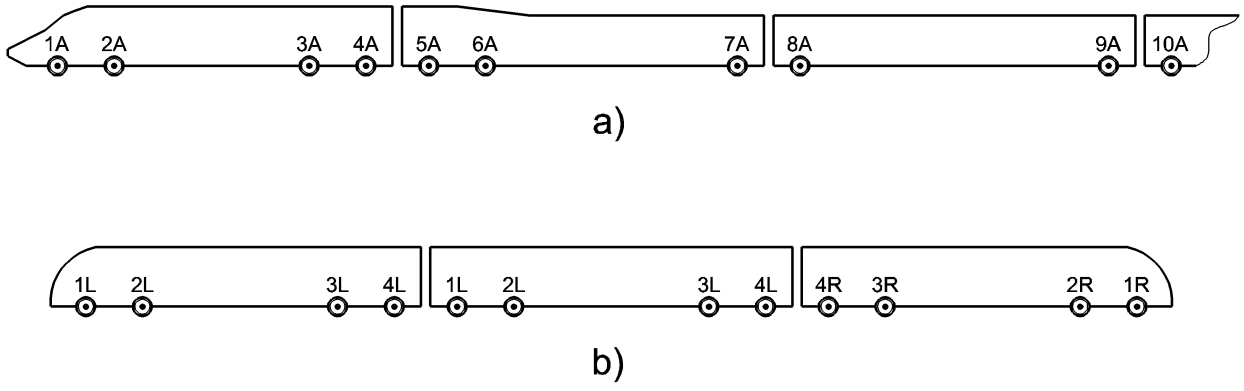
Figure 44

4.5.12 Designation of driving cabs

Position: Number 1 or 2 placed on the doors of the cabs in question or beneath their side windows. Minimum height of 80 mm for the number.

Meaning: Designation of driving cabs.

4.5.13 Numbering of axles and wheels (Examples)



Position: On vehicle side just above the axle location with a height of 50 mm minimum

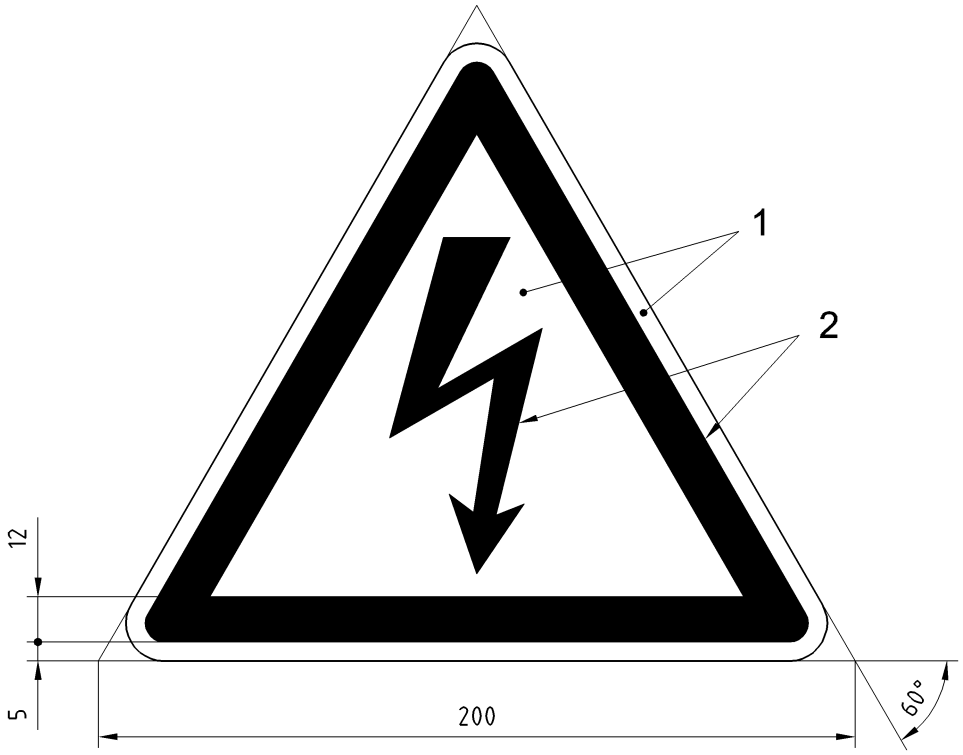
Meaning: Identification of axle position and designation of wheel as per Figures 45a) or 45b).

The wheel shall be designated with either L (or A) or R (or B) for left and right respectively.

Figure 45

4.5.14 Electricity Hazard marking

Dimensions in millimetres



Key

1 yellow retro reflecting

2 black

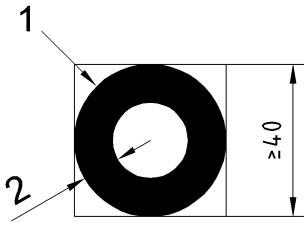
Position:	On all junction boxes and plug receptacles of the train line, as well as on vehicles fitted with external footsteps or seats at a height of more than 2 000 mm above the top of the rails or ladders for which the end exceeds this dimension, close to these items.
Meaning:	Warning against high voltage. Stop! You are entering a particularly dangerous area. Only duly authorised personnel may work in this area having first taken the necessary precautions.
Remark	For markings applied to small area junction boxes and plug receptacles the marking may be suitably downscaled to a minimum height of 80 mm.

Figure 46

4.5.15 Filling and draining devices for sanitary water supply

Variation A:

Dimensions in millimetres



Key

1 yellow

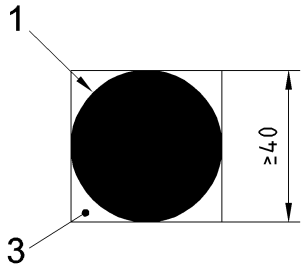
2 25 % of external diameter

Position:	Next to the filling points for water and in the immediate vicinity of the fitting controlling the operation of draining the water system.
Meaning:	Indicates the position of the water supply filling point and/or the system drain cock. Water supply is prevented from freezing in heated vehicles, irrespective of the external temperature.

Figure 47

Variation B:

Dimensions in millimetres



Key

1 yellow

3 white

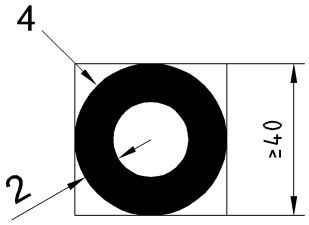
Position: Next to the filling points for water and in the immediate vicinity of the fitting controlling the operation of draining the water system.

Meaning: Indicates the position of the water supply filling point and/or the system drain cock. Water supply is prevented from freezing down to temperatures of –20 °C during continuous use of the vehicle. Furthermore, the vehicle may remain stationary in the open air with the heating system turned off for a continuous period of 12 hours at an ambient temperature down to –10 °C without harmful formation of ice or water supply breakdown assuming a starting temperature within the vehicle of + 20 °C.

Figure 48

Variation C:

Dimensions in millimetres



Key

2 25 % of external diameter

4 green

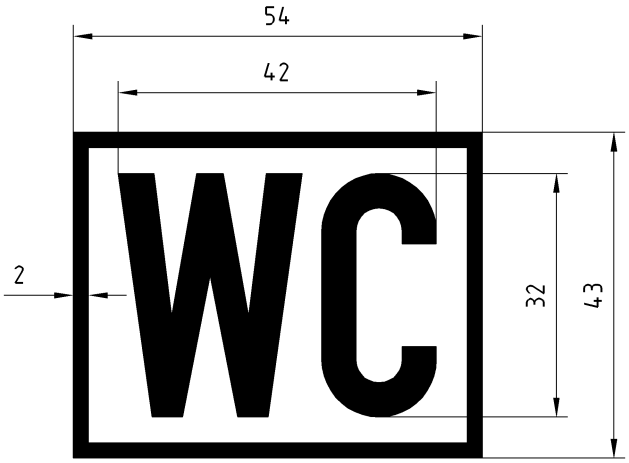
Position: Next to the filling points for water and in the immediate vicinity of the fitting controlling the operation of draining the water system.

Meaning: Indicates the position of the water supply filling point and/or the system drain cock.
Water system has no protection from freezing.

Figure 49

4.5.16 Discharge point for sealed toilet systems

Dimensions in millimetres



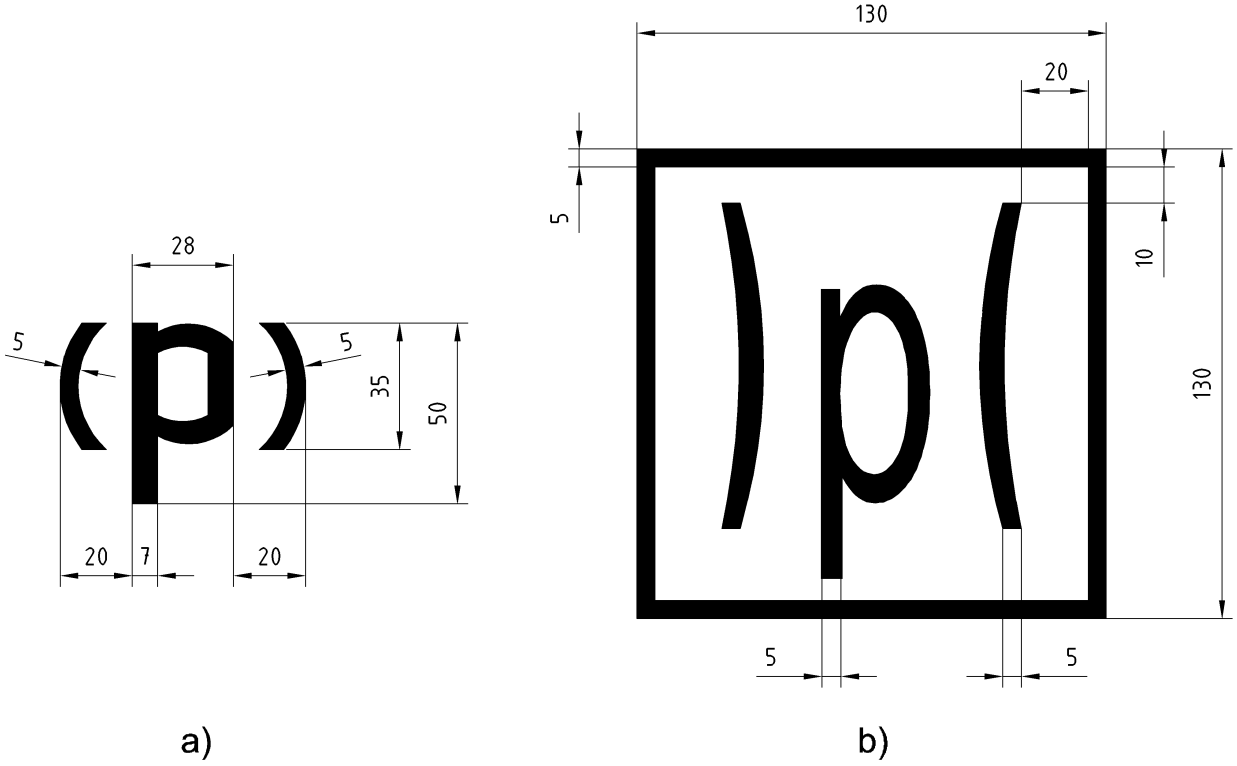
Position: Next to the discharge points for the retention tank for sealed toilets.

Meaning: Vehicles fitted with sealed toilet systems. This marking indicates the position of discharge points for the retention tank.

Figure 50

4.5.17 Pressure Pulse Insensitive Vehicles

Dimensions in millimetres



Position: On each side of the vehicle together with other markings concerning operating restrictions.

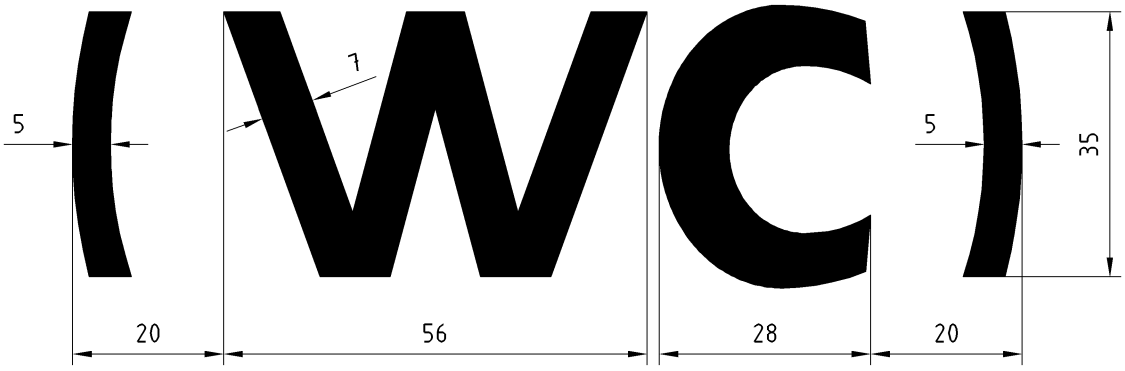
Meaning: Figure 51a) Vehicle is pressure pulse insensitive and fulfils all conditions to operate on lines with a high incidence of tunnels

Figure 51b) Vehicle is not pressure pulse insensitive but fulfils all other conditions to operate on defined lines with a high incidence of tunnels.

Figure 51

4.5.18 Pressure Pulse Sensitive Vehicles with sealed toilet systems

Dimensions in millimetres



Position: On each side of the vehicle together with other markings concerning operating restrictions.

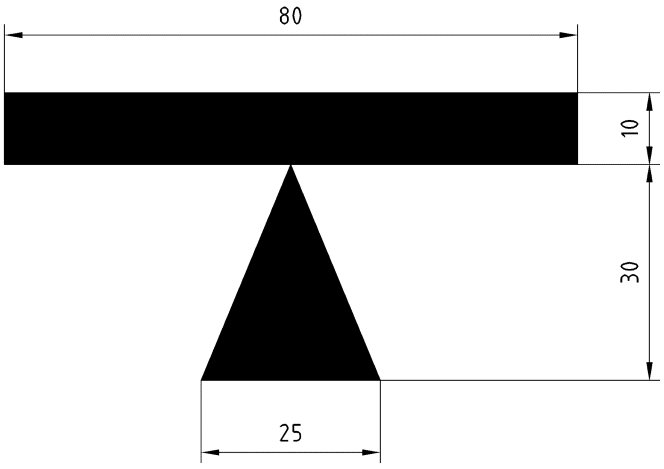
Meaning: Vehicle is pressure pulse sensitive but equipped with sealed toilet systems.

Figure 52

4.5.19 Lifting and re-railing markings

4.5.19.1 Lifting without running gear

Dimensions in millimetres



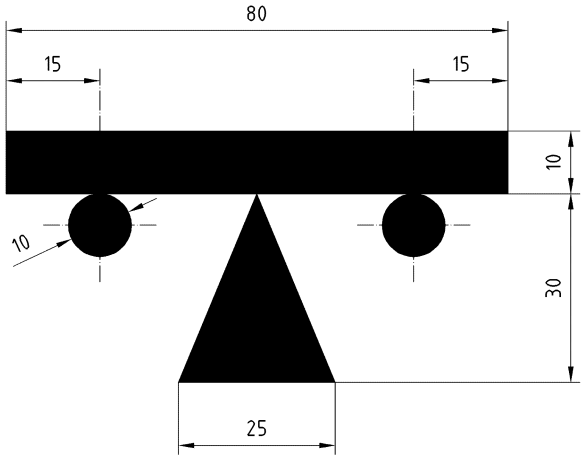
Position: At all designated points.

Meaning: Marking indicating where to place jacks, lifting devices, etc., in order to lift the whole vehicle excluding its running gear.

Figure 53

4.5.19.2 Lifting at 4 points simultaneously with or without running gear

Dimensions in millimetres



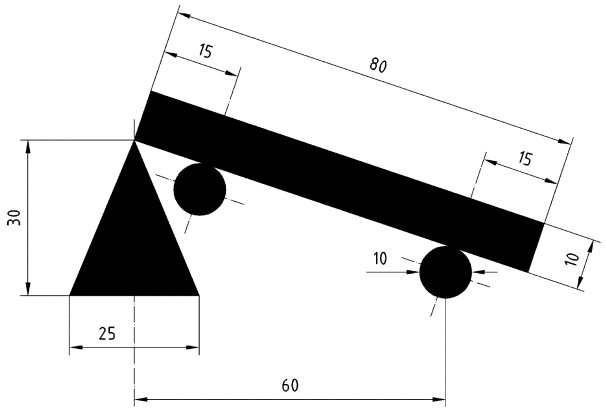
Position: At all designated points.

Meaning: Marking indicating where to place jacks, lifting devices, etc. in order to lift the whole of the vehicle body, including the running gear where appropriate.

Figure 54

4.5.19.3 Lifting or re-railing with or without running gear at one end

Dimensions in millimetres



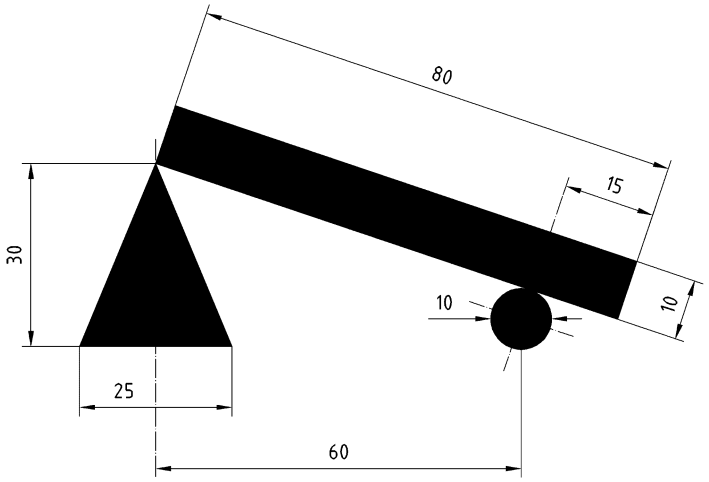
Position: At the designated points.

Meaning: Marking indicating where to place jacks, lifting devices, etc., in order to lift the whole of the vehicle body by one end, or close to the end, including the running gear where appropriate.

Figure 55

4.5.19.4 Lifting one end only without running gear

Dimensions in millimetres



Position: At the designated points.

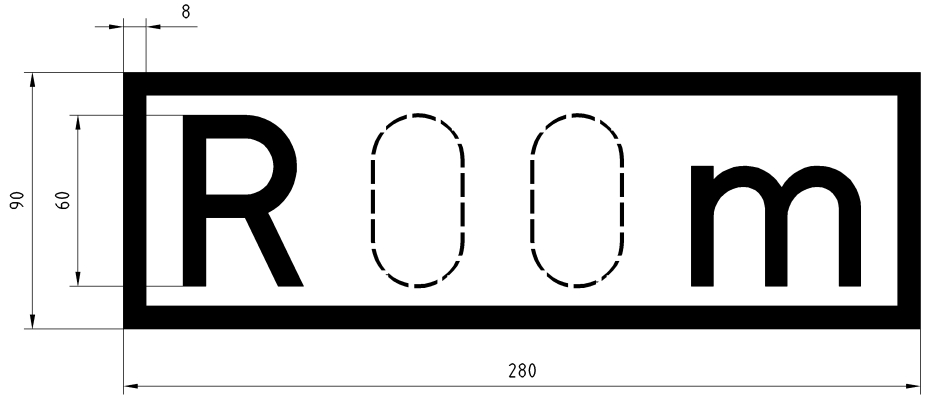
Meaning: Marking indicating where to place jacks, lifting devices, etc., in order to lift the whole of the vehicle body by one end, or close to the end, without the running gear.

Figure 56

4.5.20 Radius curve restrictions

4.5.20.1 Minimum radius horizontal curve

Dimensions in millimetres



Position: On each side of the vehicle.

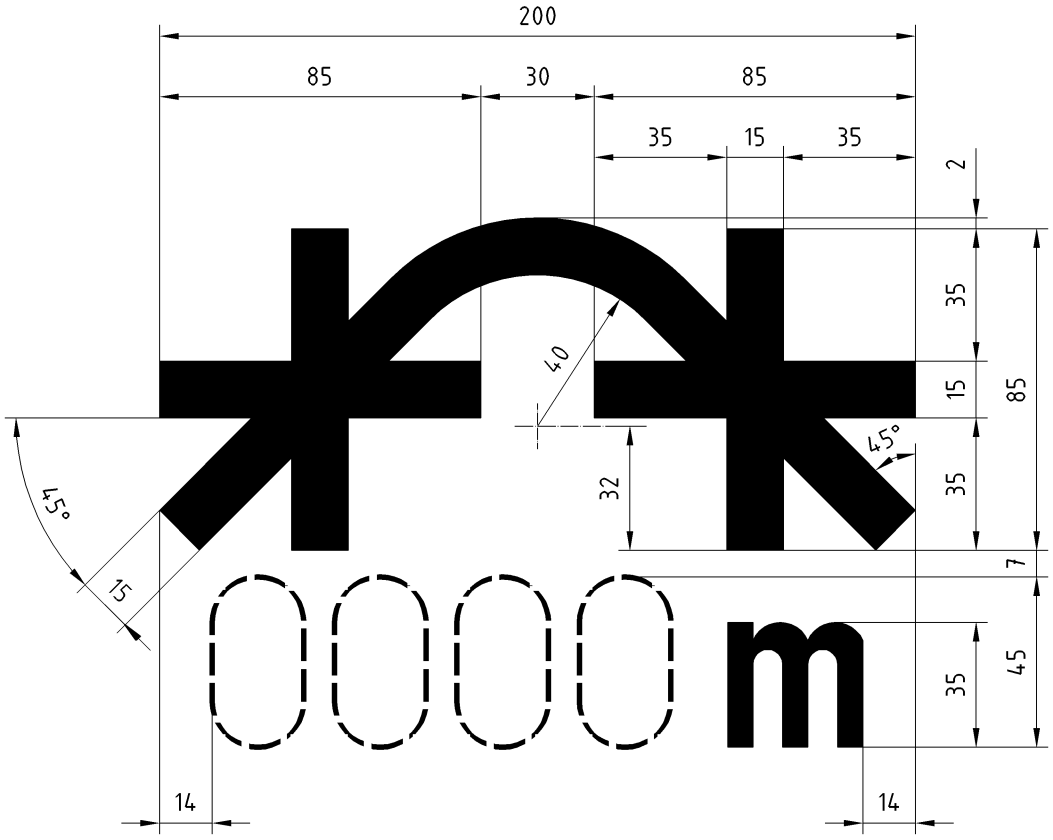
Meaning: Indicates the minimum radius curve which the vehicle can negotiate. This marking is mandatory if the value is above the normal minimum standard

Remark: If the radius is more than two digits then the box should be adjusted to accommodate.

Figure 57

4.5.20.2 Shunting prohibited on humps with a small vertical curve radius or not to be hump shunted

Dimensions in millimetres



Position: On each side of the vehicle adjacent to the other markings for operating restrictions.

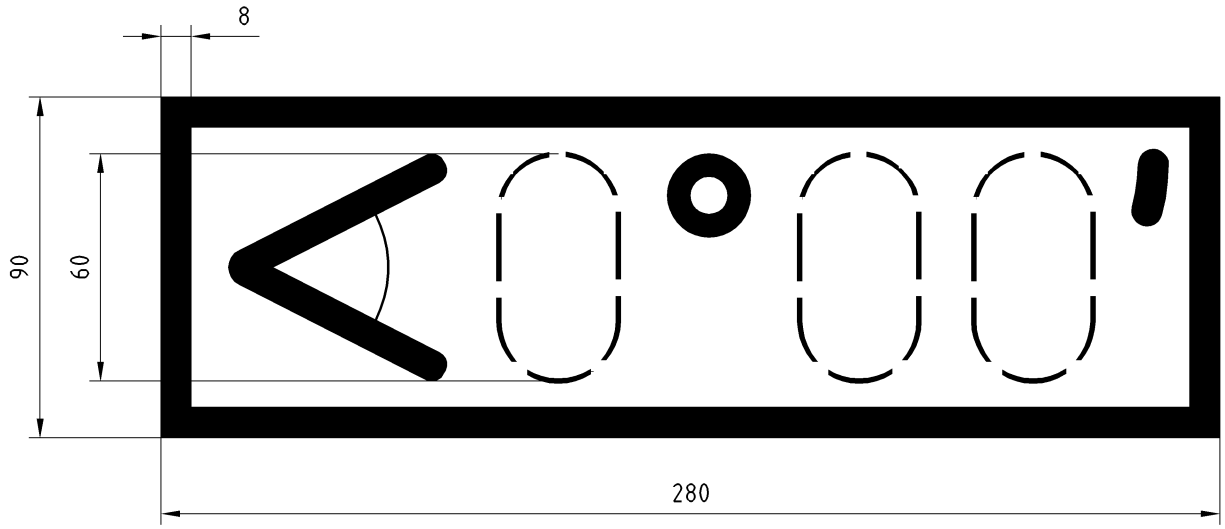
Meaning: This marking is compulsory for vehicles which by reason of their design are liable to sustain damage when crossing shunting humps with a vertical radius of ≤ 250 m. The value marked indicates the smallest curve radius that the vehicle can negotiate.

Remark: When the sign is shown without any dimension value at all then the vehicle shall not be hump shunted in any event.

Figure 58

4.5.20.3 Maximum ferry ramp angle

Dimensions in millimetres



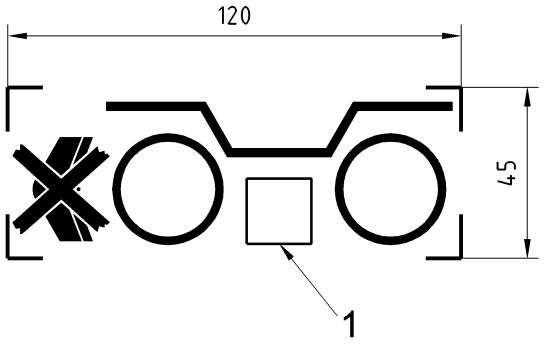
Position: On each side of the vehicle adjacent to the other markings for operating restrictions.

Meaning: Indicates vehicles that can only negotiate a ramp angle of less than 2°30‘ when running onto/off ferries.
The marking shall specify the maximum ramp angle which the vehicle can negotiate.

Figure 59

4.5.21 Isolation of bogie brake

Dimensions in millimetres



Key

1 Digit or letter for the bogie identification

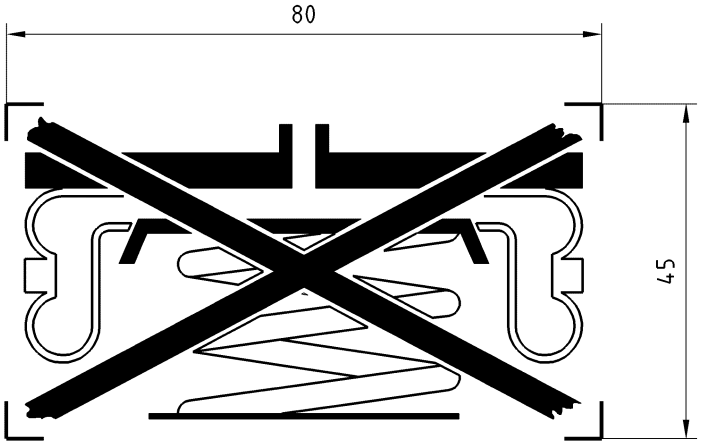
Position: Adjacent to bogie brake isolating cock

Meaning: Bogie Brake isolation cock

Figure 60

4.5.22 Isolation of pneumatic suspension

Dimensions in millimetres



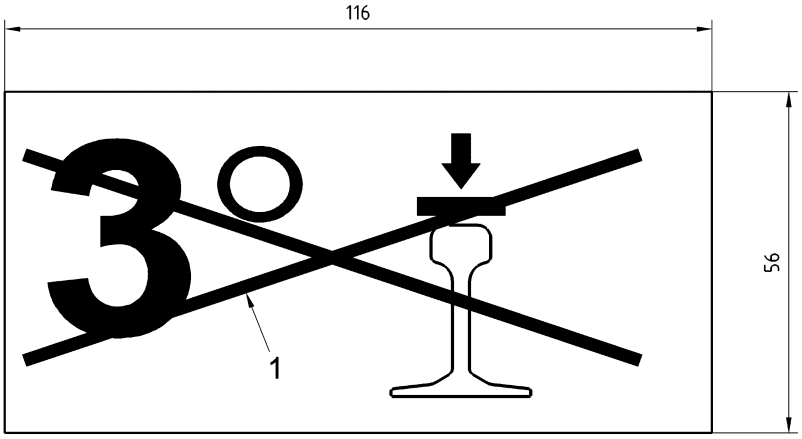
Position: Adjacent to pneumatic suspension isolating cock

Meaning: Pneumatic suspension isolation cock

Figure 61

4.5.23 Isolation of third-rail shoegear

Dimensions in millimetres



Key

1 Red

Position: Adjacent to third-rail shoegear isolating device

Meaning: Location of the device to isolate third-rail shoegear

Figure 62

4.5.24 Control of nose doors or coupling shield

Dimensions in millimetres

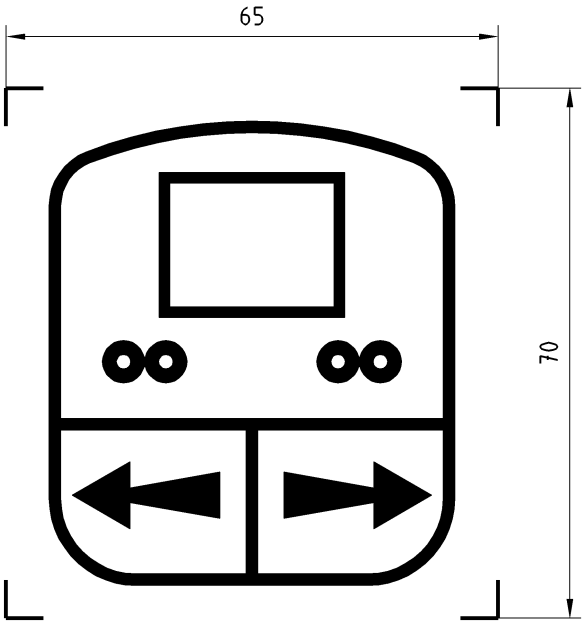
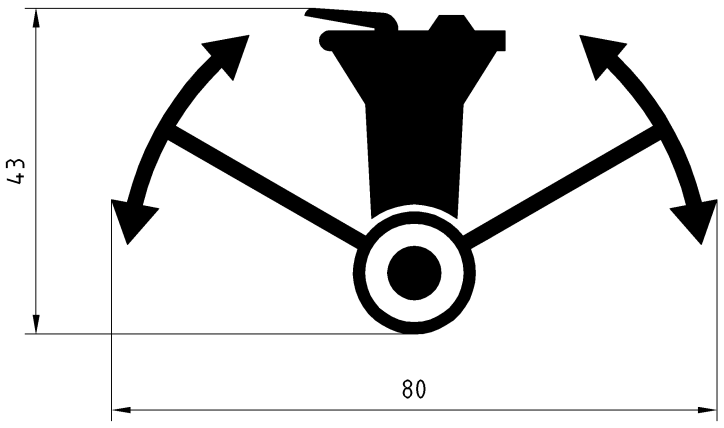


Figure 63

Alternative

Dimensions in millimetres



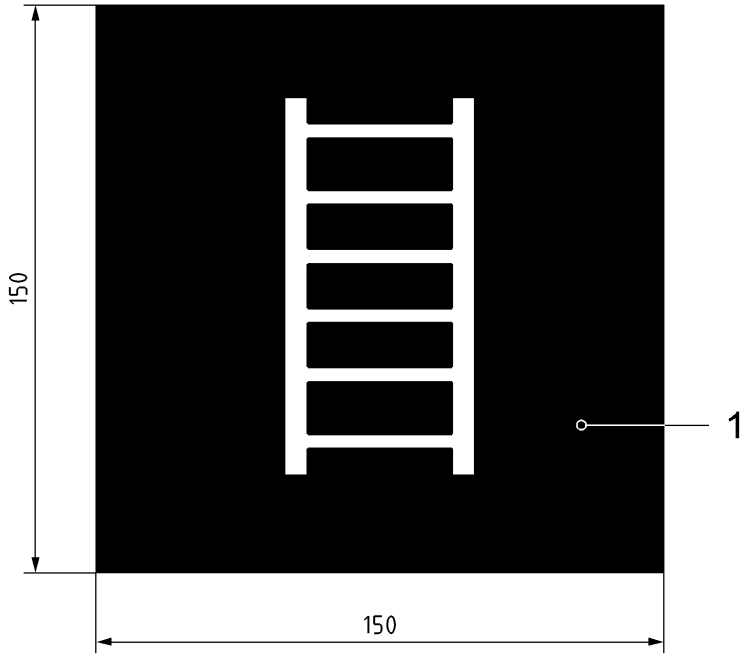
Position: Adjacent to nose door/coupling shield operating device

Meaning: Location of the device to open/close nose doors/coupling shield

Figure 64

4.5.25 Emergency ladder

Dimensions in millimetres



Key

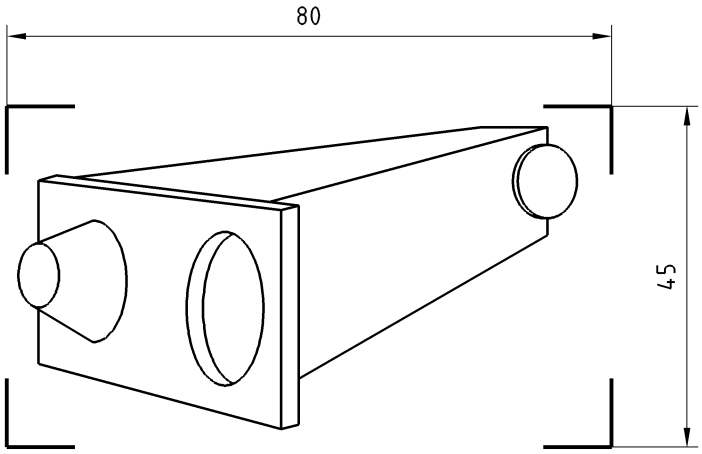
1 green

Position:	Adjacent to emergency ladder location
Meaning:	Location of the Emergency Ladder

Figure 65

4.5.26 Emergency coupler

Dimensions in millimetres

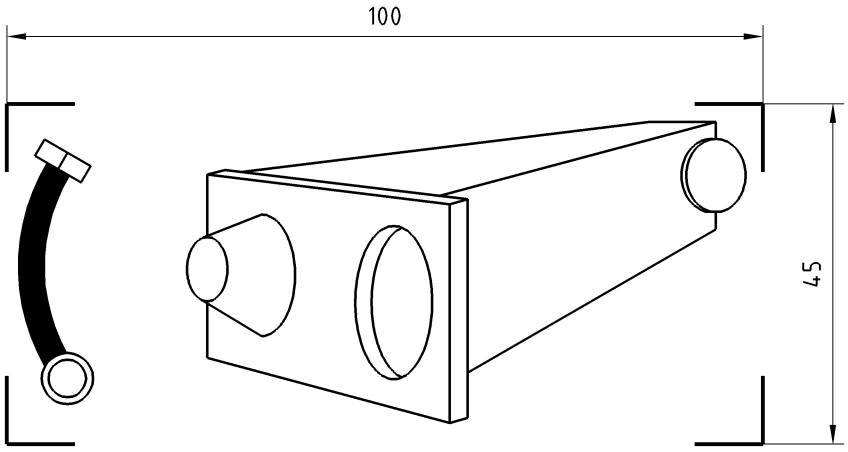


Colour:	In accordance with section 4.2.4.
Position:	Adjacent to emergency coupler location
Meaning:	Emergency coupler located here

Figure 66

4.5.27 Emergency coupler equipment

Dimensions in millimetres

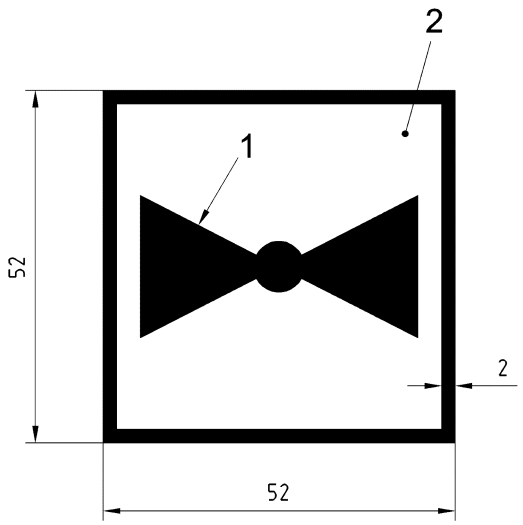


Position:	Adjacent to emergency coupler equipment location
Meaning:	Emergency coupler equipment located here

Figure 67

4.5.28 Non-visible stop cocks

Dimensions in millimetres



Key

1 black

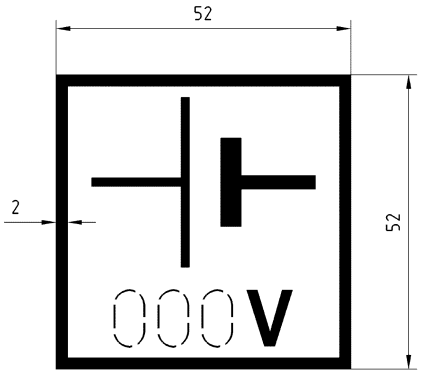
2 white

Position:	Adjacent to location of non-visible stop cocks
Meaning:	Stop cock located here

Figure 68

4.5.29 Location of batteries

Dimensions in millimetres

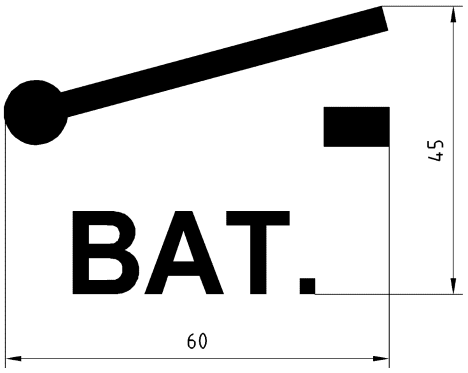


Position:	Adjacent to location of batteries
Meaning:	Location of batteries and voltage

Figure 69

4.5.30 Battery isolation switch

Dimensions in millimetres



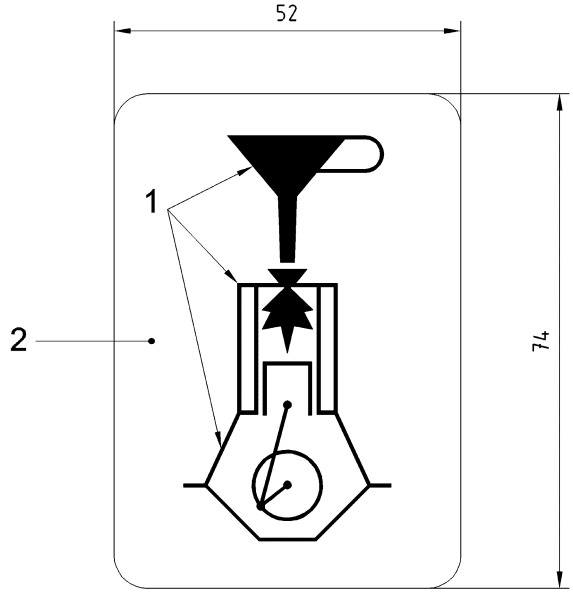
Position: Adjacent to the battery isolation switch

Meaning: Battery isolation switch

Figure 70

4.5.31 Engine fuel filling point

Dimensions in millimetres



Key

1 black

2 orange brown

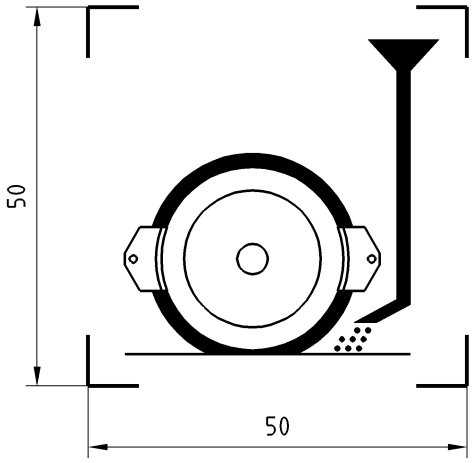
Position: Adjacent to the fuel filling point

Meaning: Symbol denoting filling connection for fuel for the engine

Figure 71

4.5.32 Filling point for sandbox

Dimensions in millimetres

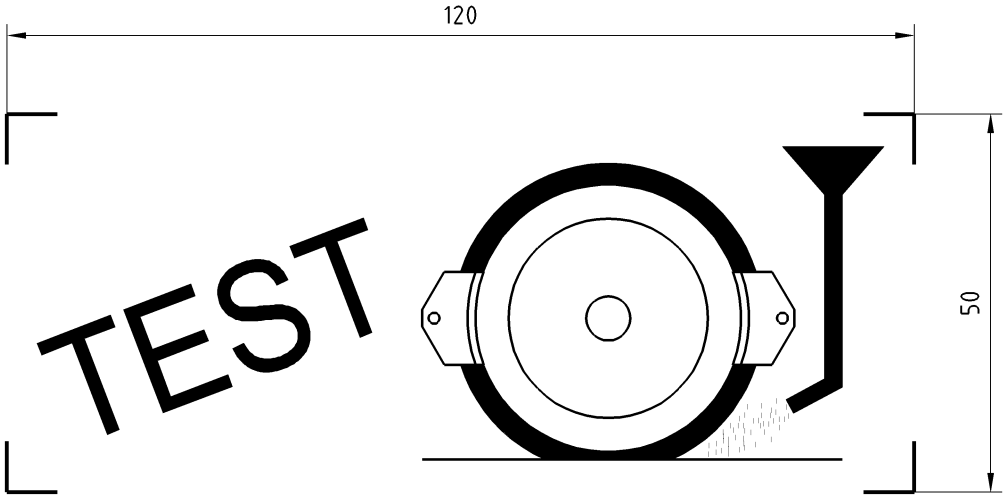


Position:	adjacent to the sand nozzle
Meaning:	symbol for sandbox filling point

Figure 72

4.5.33 Sanding test

Dimensions in millimetres

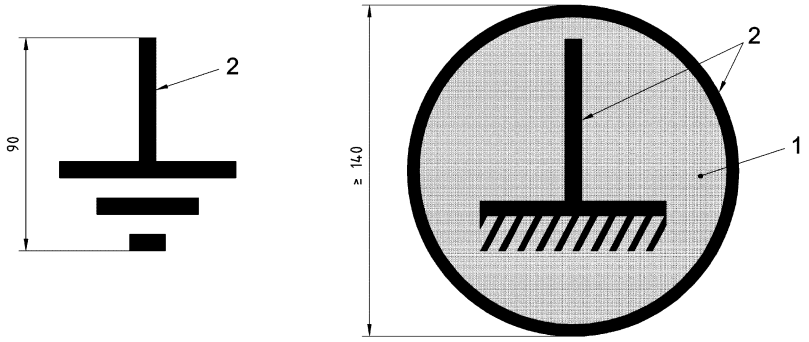


Position:	Adjacent to sanding test button
Meaning:	Press button to test sanding equipment

Figure 73

4.5.34 Earthing protection

Dimensions in millimetres



Key

1 yellow

2 black

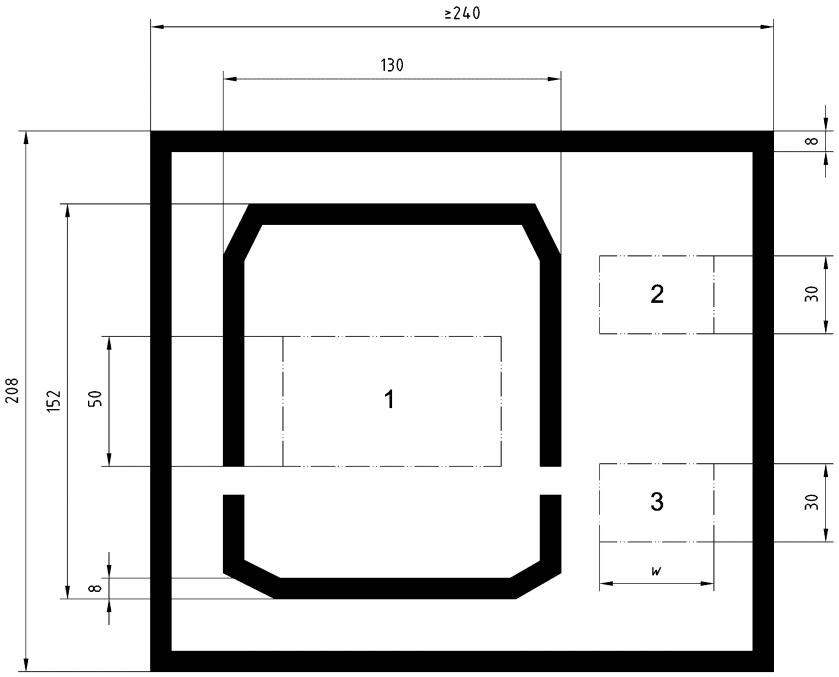
Position: Either of the above markings may be used alongside the earthing protection point

Meaning: Location of earthing point

Figure 74

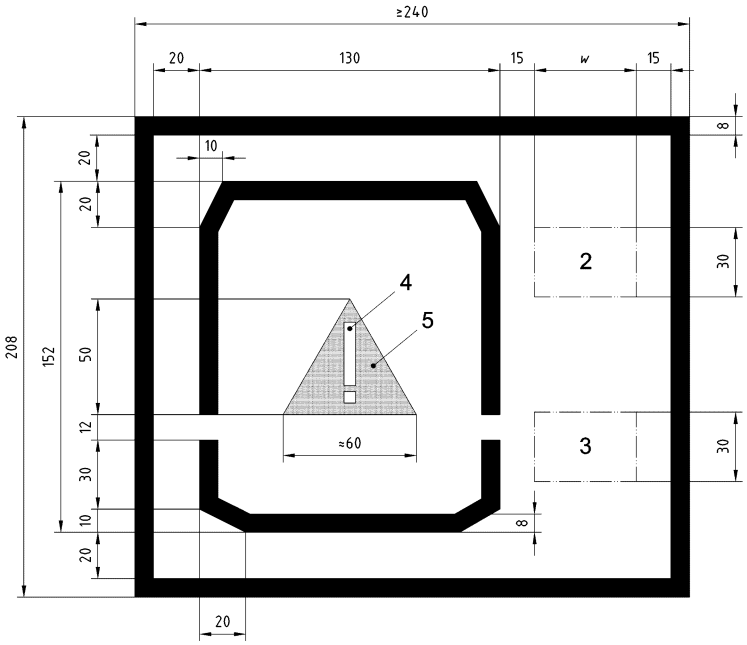
4.5.35 Gauge marking

Dimensions in millimetres



a)

Dimensions in millimetres



b)

Figure 75 *(continued)*

Key

1, 2 and 3 classification of kinematic gauges in accordance with EN 15273-2

4 white

5 red

W width depending on the font chosen

Position: At each corner on the vehicle ends.

Meaning: Key 1: G1 or GA or GB or GC indicates the kinematic gauge of the vehicle as requested in the Rolling Stock TSIs and OTIF regulations.

Figure 75b is used when the gauge is different from G1 or GA or GB or GC.

Key 2: indicates the kinematic gauge for the superstructure (upper part) of the vehicle.

The contour of the kinematic gauge shall be smaller or equal to the kinematic gauge according to Key 1.

For example G1 or G2 or GB1 or GB2 or 3.3 or GB-M6 or W6, etc.,

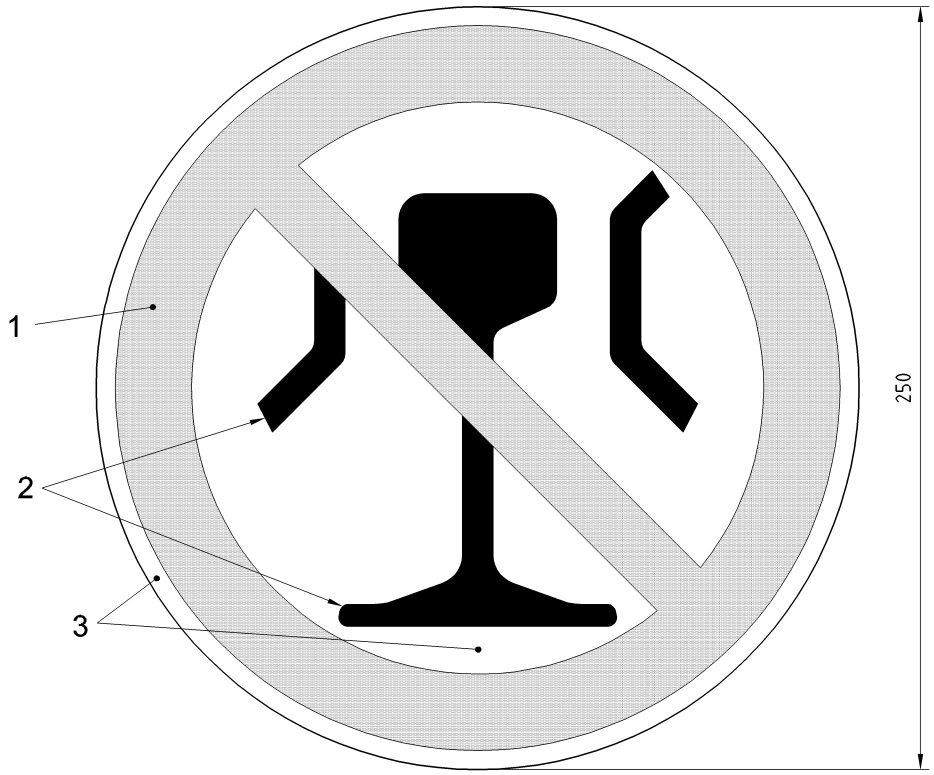
Key 3: indicates the kinematic gauge for the infrastructure (lower part) of the vehicle.

For example GI1 or GI2 or GI3, etc.

Figure 75

4.5.36 Vehicles prohibited from passing through retarders or other stopping devices in service mode

Dimensions in millimetres



Key

1 red

2 black

3 white

Position: On each side of the vehicle adjacent to the other markings for operating restrictions.

Meaning: Because of design considerations these vehicles shall not pass through retarders or other fixed installation types of shunting and stopping devices when these devices are in operation mode.

Figure 76

Annex ZA
(informative)

Relationship between this European Standard and the Essential Requirements of EU Directive 2008/57/EC

This European Standard has been prepared under mandates given to CEN/CENELEC/ETSI by the European Commission and the European Free Trade Association to provide a means of conforming to Essential Requirements of the Directive 2008/57/EC[2)].

Once this standard is cited in the Official Journal of the European Union under that Directive and has been implemented as a national standard in at least one Member State, compliance with the clauses of this standard given in Table ZA.1 for Locomotives and Passenger Rolling Stock and ZA.2, ZA.3 for Operations and Traffic Management confers, within the limits of the scope of this standard, a presumption of conformity with the corresponding Essential Requirements of that Directive and associated EFTA regulations.

Table ZA.1 — Correspondence between this European Standard, the CR TSI Locomotive and Passenger Rolling Stock published in the Official Journal on 26 May 2011, and Directive 2008/57/EC

Clause/ subclauses of this European Standard	Chapter/§/annexes of the TSI	Corresponding text, articles/§/annexes of the Directive 2008/57/EC	Comments
The whole standard is applicable.	4.Characterisation of the Rolling Stock subsystem 4.2. Functional and technical specification of the subsystem 4.2.2 Structures and mechanical parts §4.2.2.6 Lifting and jacking Annex B Lifting and jacking points B.6 Marking of rescue jacking (resp lifting) points	Annex III, Essential requirements 1 General requirements 1.1 Safety Clause 1.1.1 1.2 Reliability and availability 2 Requirements specific to each subsystem 2.4 Rolling stock Clause 2.4.1 Safety §4 Clause 2.4.3 Technical compatibility §3 2.5 Maintenance Clause 2.5.3 Technical compatibility	When the revised TSI comes into effect, this table will be superseded by a revised table.

2) This Directive 2008/57/EC adopted on 17th June 2008 is a recast of the previous Directives 96/48/EC 'Interoperability of the trans-European high-speed rail system' and 2001/16/EC 'Interoperability of the trans-European conventional rail system' and revisions thereof by 2004/50/EC 'Corrigendum to Directive 2004/50/EC of the European Parliament and of the Council of 29 April 2004 amending Council Directive 96/48/EC on the interoperability of the trans-European high-speed rail system and Directive 2001/16/EC of the European Parliament and of the Council on the interoperability of the trans-European conventional rail system'.

Table ZA.2 — Correspondence between this European Standard, the Technical Specification for Interoperability Subsystem Operation and Traffic Management (TSI OPE) dated May 2011 (published in the Official Journal L 144, 31 May 2011), and Directive 2008/57/EC

Clause/ subclauses of this European Standard	Chapter/§/annexes of the TSI	Corresponding text, articles/§/annexes of the Directive 2008/57/EC	Comments
The whole standard is applicable.	4. Characteristics of the subsystem 4.2. Functional and technical specification of the subsystem 4.2.2 Specifications relating to trains §4.2.2.3 Vehicle identification Appendix P	Annex III, Essential requirements 1 General requirements 1.1 Safety Clause 1.1.1 1.2 Reliability and availability 2 Requirements specific to each subsystem 2.6 Operation and traffic management Clause 2.6.1 Safety §1 Clause 2.6.3 Technical compatibility	This table is applicable until 1 January 2014

Table ZA.3 — Correspondence between this European Standard, the Technical Specification for Interoperability Subsystem Operation and Traffic Management (TSI OPE) dated November 2012 (published in the Official Journal L 345, 15 December 2012), and Directive 2008/57/EC

Clause/ subclauses of this European Standard	Chapter/§/annexes of the TSI	Corresponding text, articles/§/annexes of the Directive 2008/57/EC	Comments
The whole standard is applicable.	4. Characteristics of the subsystem 4.2. Functional and technical specification of the subsystem 4.2.2 Specifications relating to trains §4.2.2.3 Vehicle identification Appendix P European Vehicle Number and linked alphabetical marking on the bodywork	Annex III, Essential requirements 1 General requirements 1.1 Safety Clause 1.1.1 1.2 Reliability and availability 2 Requirements specific to each subsystem 2.6 Operation and traffic management Clause 2.6.1 Safety §1 Clause 2.6.3 Technical compatibility	This table is applicable from 1 January 2014.

WARNING — Other requirements and other EU Directives may be applicable to the product(s) falling within the scope of this standard.

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[2] ISO 3864-1, *Graphical symbols — Safety Colours and Safety Markings — Part 1: Design Principles for Safety Markings in Work Places and Public Areas*

[3] Directive 2008/57/EC on the interoperability of the trans-European rail system.

[4] RID, Regulations concerning the International carriage of Dangerous goods (Appendix C to COTIF 1999) (RID is also annex to EU Council Directive 96/49/EC).

[5] UIC-544-2, *Conditions to be observed by the dynamic brake of locomotives and motor coaches so that the extra braking effort produced can be taken into account for the calculation of the brake-weight*

[6] RIC 2001 (Regolamento Internationale delle Carrozze), *Agreement governing the exchange and use of coaches in international traffic — Source UIC*

[7] UIC 541-5, *Brakes — Electropneumatic brake (ep brake) — Electropneumatic emergency brake override (EBO)UIC*

[8] UIC 541-6, *Brakes — Electropneumatic brake (ep brake) and Passenger alarm signal (PAS) for vehicles used in hauled consists*

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[13] List of Vehicle Keeper Markings, Rules for Registration of a vehicle keeper marking code dated 9th July 2007 in accordance with ERA/OTIF

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