BS EN 15877-1:2012

BSI Standards Publication

Railway applications — Marking on railway vehicles —

Part 1: Freight wagons

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National foreword

This British Standard is the UK implementation of EN 15877-1:2012.

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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Foreword

This document (EN 15877-1:2012) 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of an identical text or by endorsement, at the latest by December 2012, and conflicting national standards shall be withdrawn at the latest by December 2012.

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(s).

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 organisations of the following countries are bound to implement this European Standard: Austria, Belgium, Bulgaria, Croatia, 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, Turkey and the United Kingdom.

Introduction

This European standard describes standardised markings for use on railway vehicles. These markings are used to provide various items of information relating to the characteristics and intended use of vehicles in a clear and concise manner. Among those markings are safety signs used to alert equipment operators to hazards that may be encountered in the use or maintenance of the vehicles.

The standard consists of two parts:

— *Part 1: Freight wagons;*

— *Part 2: External Markings on Coaches, Motive Power Units, Locomotives and On Track Machines.*

The provisions of this Part 1 of the standard cover:

— the markings required by the Conventional Rail Rolling Stock Freight Wagon TSI which mandates the minimum set of markings relevant to its design and operation to be carried by any wagon which is certified as TSI and/or UTP compliant;

— the markings, in addition to those which are TSI/UTP mandatory, which are relevant to its design and operation as required by industry.

In addition to the markings shown in this standard, there might be other industrial markings and text applied to a freight wagon, e.g. instructions and warnings concerning the use of equipment. Such additional markings are not in contravention of this standard provided they do not interfere with or affect the markings in the standard.

The standard is applicable to all railway freight wagons 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:

— the Technical Specification for Interoperability Subsystem: Rolling Stock Scope: Freight Wagons as published in the EU official journal L344 dated 8th December 2006, as amended by Commission Decision (2009/107/EC),

— The Technical Specification for Interoperability Subsystem : Operation and Traffic Management

— the Convention Concerning International Carriage by Rail (COTIF) as amended by the Vilnius Protocol in force from 1.7.2006, applicable from 01.01.2011

It therefore supports the essential requirements of:

— Directive 2008/57/EC on the interoperability of the rail system within the Community;

— COTIF UTP GEN-A: General provisions – Essential requirements (A 94-01A/1.2009) in force since 1st August 2009.

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

1 Scope

This European Standard identifies the information required to be marked on freight wagons, or parts of freight wagons, relating to their technical, operational and maintenance 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 a note(s) where appropriate.

Tank barrel manufacturers' design criteria, test and product specification plates have not been considered in this European Standard as they are specified in EN 12561-1:2011, Railway applications — Tank wagons — Part 1: Identification plates for tank wagons for the carriage of dangerous goods.

Dangerous Goods markings have not been considered in this European Standard where fully specified in RID (dimensions, colour, location and form). Where markings are not fully specified in RID they are included in this standard

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 12561-1, *Railway applications — Tank wagons — Part 1: Identification plates for tank wagons for the carriage of dangerous goods*

EN 15528, *Railway applications — Line categories for managing the interface between load limits of vehicles and infrastructure*

prEN 15877-2, *Railway applications — Marking on railway vehicles — Part 2: External markings on coaches, motives power units, locomotives and on track machines*

ISO 3864-1, *Graphical symbols — Safety colours and safety signs — Part 1: Design principles for safety signs and safety markings*

CIE 015-2004, *Colorimetry* — 3rd edition

CIE 054.2-2001, *Retroreflection: Definition and Measurement*

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
buffer stroke
measured distance difference between an uncompressed and a fully compressed buffer

3.1.2
decal
a picture or design printed on specially prepared plastic sheeting for the purpose of adherence to a freight wagon

3.1.3
luminance contrast, k
luminance of colour L_1 divided by the luminance of colour L_2 where L_1 is greater than L_2

$$k = \frac{L_1}{L_2}$$

[SOURCE: IEC 60050-845:1987, 845-04-69]"

3.1.4
luminance factor, β
ratio of the luminance of the surface element in a given direction to that of a perfect reflecting or transmitting diffuser identically illuminated

3.1.5
marking
lettering or symbols applied to a freight wagon by means of decals, hand painting or by another agreed method, with the purpose of providing information concerning the wagon

3.1.6
paint
liquid mixture, usually of a solid pigment in a liquid medium such as oil or water

3.1.7
railway vehicle
vehicle suitable for circulation on its own wheels on railway lines with or without traction

3.1.8
stencil
template for the required lettering

3.1.9
tare
weight of a railway vehicle without fuel or load

Note 1 to entry: To follow common practice, “weight” is used throughout this standard as kilogramme or tonne.

3.1.10
vehicle
vehicle is the smallest part in a train (a single vehicle)

Note 1 to entry: It features an individual body shell lying on its own sets of bogies or wheels or sharing them with adjacent vehicles

3.1.11
wagon
railway vehicle without traction designed to carry freight or goods

3.2 Abbreviations

Term	Definition
AC	Alternate current
ATP	Automatic Train Protection
CER	Community of European Railways and Infrastructures Companies.
CIE	International Commission on Illumination, Vienna, Austria. http://www.cie.co.at/cie/
COTIF	Convention concerning International Carriage by Rail (COTIF) of 9 May 1980 in the version of the Protocol of Modification of 3 June 1999
CR	Conventional Rail System
DC	Direct current
EFTA	European Free Trade Association
ERA	European Railway Agency
EU	European Union
EVN	European Vehicle Number - Article 32 of the 2008/57/EC
OSJD	Warsaw based Organisation for Collaboration between Railways
OTIF	Intergovernmental Organisation for International Carriage by Rail
PPV/PPW	OSJD Rules for International Operation of Wagons and Coaches of 01/01/1956 updated 01/01/1997
RAL	Colour standardisation system of the German Institute for Quality Assurance and Certification
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 2008/68/EC)
RIV	"RIV" means the agreements between Railway Undertakings governing the exchange and use of wagons between railway undertakings (version 2000)
RST	Rolling stock
RU	Railway Undertaking
TSI	Technical Specifications 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
UIP	International Union of Private Wagon Owners.
UIRR	International Union of Combined Road-Rail Transport Companies.
UNIFE	Union of the European Railway Industries.
UITP	International Association of Public Transport.
UTP	Uniform Technical Prescriptions according to Appendix F (APTU) of COTIF1999
VKM	Vehicle Keeper Marking
WAG TSI	Freight Wagons TSI

4 Markings

4.1 General principles

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

4.1.2 A marking shall be located on the wagon at a position easily visible by staff standing at ground level 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 sign for live catenary, shall be located in such a position that they can be seen before the hazard zone is actually reached.

The location of a marking shall be such that correctly positioned tarpaulins, which may be used to sheet the wagon, do not obscure the marking.

4.1.3 Advertising, designs or other text or pictures not relating to the markings applied to a wagon shall not affect the visibility and the clear and unambiguous understanding of the marking. Such items may only be placed on the side walls or on the tank shell. In this case, a border of minimum 100 mm shall be placed around each marking or composition of markings; these borders shall have a “neutral” colour or be the same colour which accentuates the marking. The requirement for a 100 mm minimum width shall also apply if the colour of the material on which the marking is placed does not provide enough contrast to the marking; for example, the markings in 4.5.13 which have a yellow outer part will need a border if they are placed on a wagon that is painted yellow.

4.1.4 Graffiti which affects the visibility or understanding of the markings shall be removed.

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

4.1.6 A marking shall ensure durable, non-degraded marking for a period of at least 6 years under a temperature range of -40 to +90 °C. If a marking is defective or illegible, it shall be restored. It shall be weather-resistant and resistant to cleaning agents, high pressure water or air cleaning and cleaning machines with brushes. If a marking has faded e.g. due to sunlight, it shall be restored.

4.1.7 Alphanumeric characters used on 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.

4.1.8 The dimensions indicated in this document may have a tolerance of plus or minus 10 % when hand produced. For better readability, it is recommended to use industrial foils or stencils for hand produced markings.

4.1.9 When employing the use of moveable panels it shall be ensured that the required panel is suitably secured so as not to be inadvertently changed or get lost.

4.1.10 The inscription panel may be replaced by applying the requisite markings directly to the sidewall or tank.

1) For the assessment of the location criteria, the ground level should not to be lower than 200 mm below the rail surface; in accordance with anthropometric data, the eye level of the reading person should not to be less than 1500 mm above ground; and the reading distance should be minimum 700 mm from the side of the wagon. 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 2000 mm.

4.2 Colour

4.2.1 Colours used shall conform to the colour areas indicated in the chromaticity diagram (Figure 1). Table 1 shows the coordinates in the chromaticity diagram of the four corners which, connected by straight lines, indicates the boundaries for the allowed variation of the colour. Colours that do not meet these chromaticity coordinates shall not be used. The colours indicated in the diagrams are defined according to ISO 3864-1.

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 5.

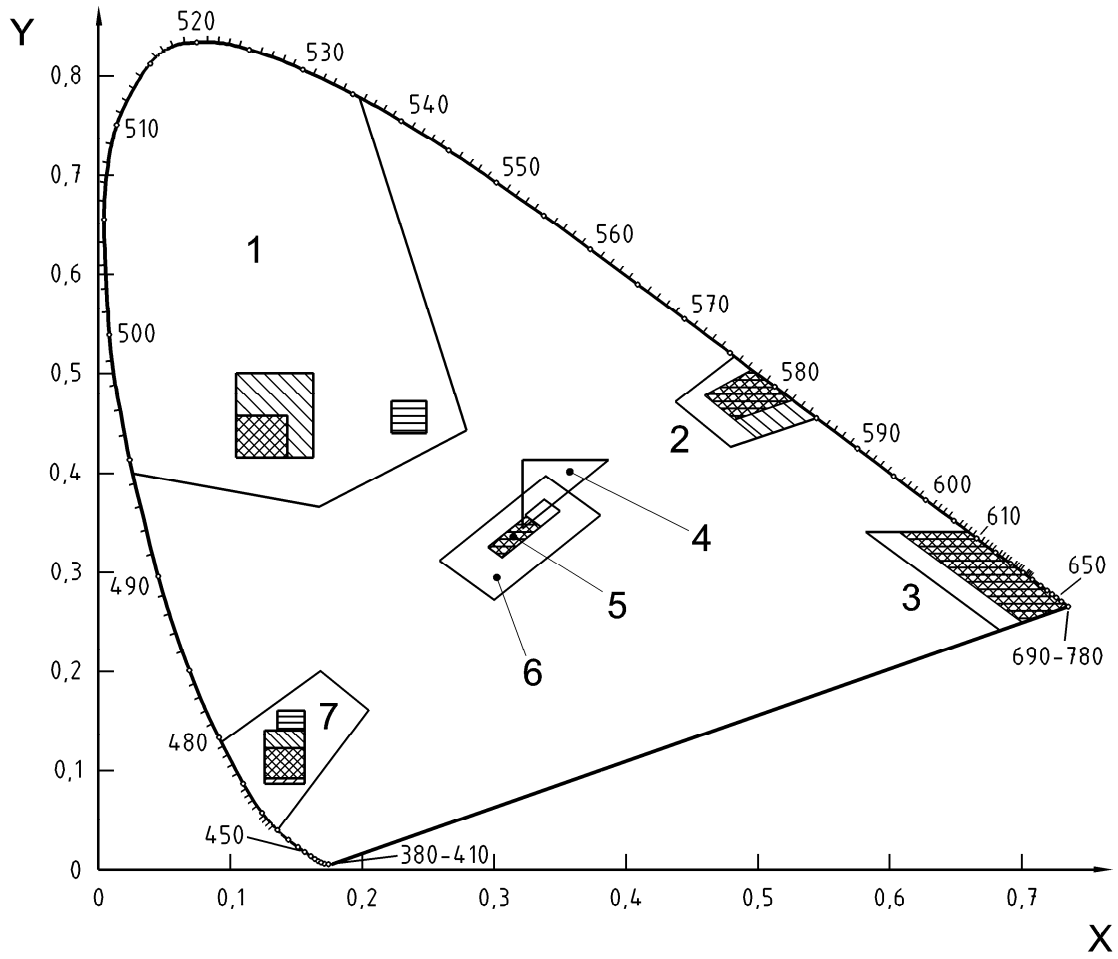
4.2.4 If there is no colour specification indicated with the specification of a marking, the colour of the informative part (the symbol, letters/numbers, borders and lines) shall be black on a light background or white on a dark background. The background for decals, stencils and painted markings may be transparent and thereby represented by the colour of the material on which the marking is placed, e.g. the wall of the wagon. In any case, when a part of the marking is indicated to be the wagon colour background, the requirement to the luminance contrast shall be met.

Table 1

	Chromaticity coordinates of corner point					Luminance factor ß		
Colour		1	2	3	4	ordinary material	retro reflecting	RAL®
Red	*x*	0,735	0,681	0,579	0,655	≥ 0,07	≥ 0,05	3020
	y	0,265	0,239	0,341	0,345			
Blue	*x*	0,094	0,172	0,210	0,137	≥ 0,05	≥ 0,01	5015
	y	0,125	0,198	0,160	0,038			
Yellow	*x*	0,545	0,494	0,444	0,481	≥ 0,45	—	1023
	y	0,454	0,426	0,476	0,518			
Yellow retro reflecting	*x*	0,494	0,470	0,493	0,522	—	≥ 0,27	
	y	0,505	0,480	0,457	0,477			
Green	*x*	0,201	0,285	0,170	0,026	≥ 0,12	≥ 0,04	6018
	y	0,776	0,441	0,364	0,399			
White	*x*	0,350	0,305	0,295	0,340	≥ 0,75	≥ 0,35	9016
	y	0,360	0,315	0,325	0,370			
Black	*x*	0,385	0,300	0,260	0,345	≤ 0,03	—	9011
	y	0,355	0,270	0,310	0,395			
Orange*	*x*	0,520	0,520	0,578	0,618	≥ 0,22	≥ 0,12	2003
	y	0,380	0,400	0,422	0,380			

* This colour is not specified in ISO 3864 but is specified in RID.

The column RAL® is not normative for colour matching, but an example from an industry colour order system to indicate what the respective colours look like.



Key

1 green
2 yellow
3 red
4 yellowish phosphorescent white
5 white
6 black
7 blue

Figure 1 — Chromaticity diagram

4.2.5 Conditions

The physical requirements that safety signs have to meet are primarily related to daytime colour.

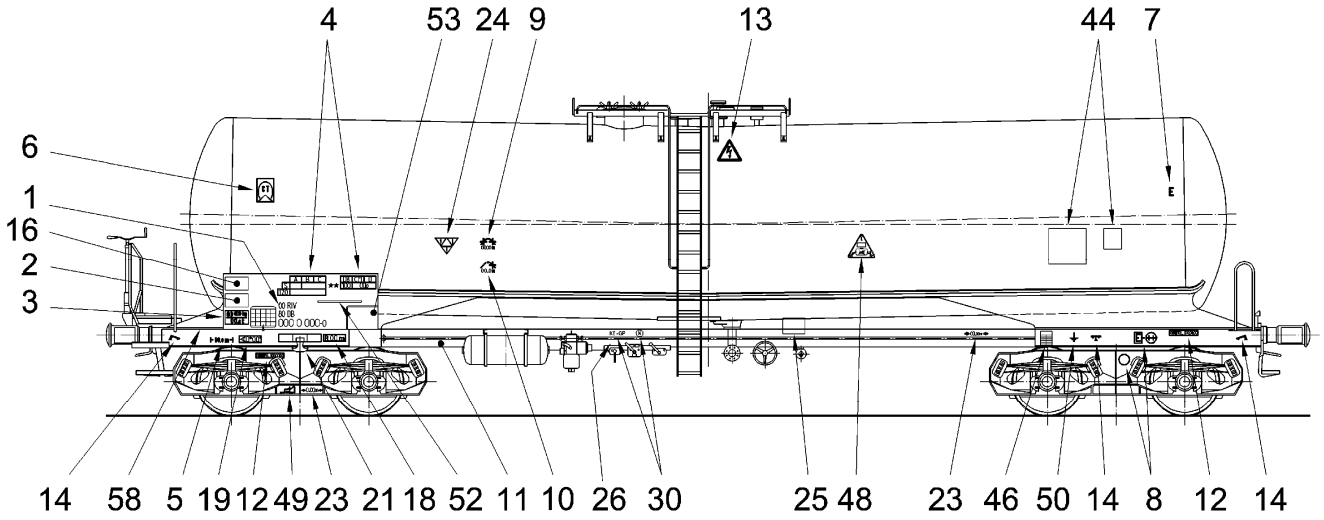
Measurements of chromaticity coordinates and luminance factor ß shall be made as specified in CIE 015-2004.

For the measurement of chromaticity coordinates and luminance factor ß of ordinary, luminescent and retro reflecting markings, the material is considered to be illuminated by daylight as represented by the standard illuminant D65 at an angle of 45° with the normal to the surface and the observation made in the direction of the normal (45/0 geometry).

The coefficient of retro reflection shall be measured in accordance with CIE 054.2–2001, using standard illuminant A with the condition that the entrance and observation angles are in the same plane.

4.3 Positioning

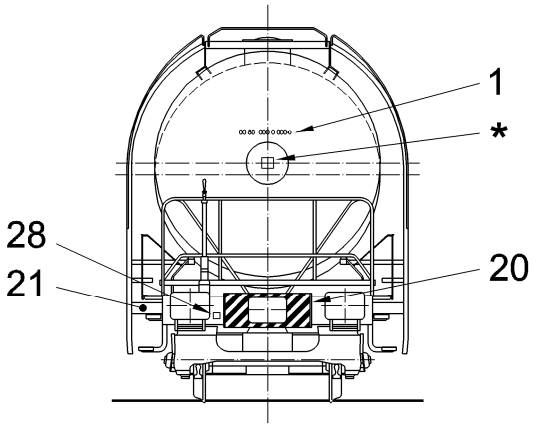
Where applicable, markings shall be positioned generally according to Figures 2.a, 2.b and 3. The list of markings is contained in the table under 4.4 and their position and meaning described in 4.5. Not all markings can be accommodated in the diagrams.



Key

See 4.4

Figure 2a



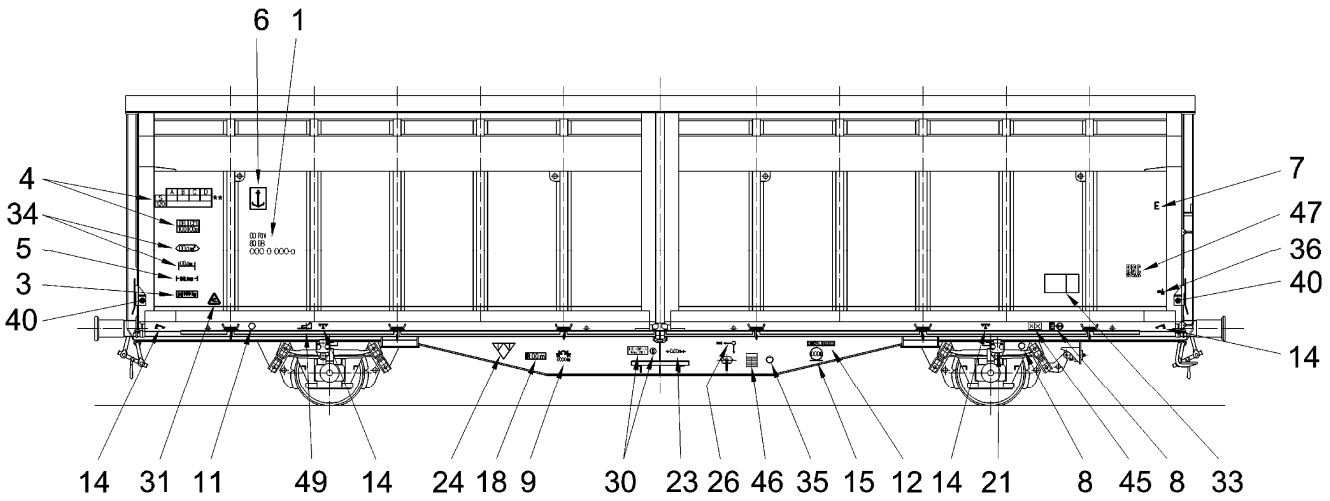
Key

See 4.4

NOTE Where movable panels are used, the name of the substance transported position No. 52 and the maximum permissible load weight for that substance should be written on the same panel but shall not exceed the maximum permissible loads as indicated on the tank identification plate* or the maximum of the load table Position No.4

***** Details of the Tank Identification Plate are specified in EN 12561-1 “Railway applications — Tank wagons — Part 1: Identification plates for tank wagons for the carriage of dangerous goods”.

Figure 2b



Key

See 4.4

Figure 3

4.4 List of markings

Position No.	Description	Subclause
1	Vehicle unique number (EVN)	4.5.1
2	Gauge marking	4.5.2
3	Wagon tare weight and hand braked weight	4.5.3
4	Wagon load table	4.5.4
5	Length over buffers	4.5.5
6	Traffic to and from Great Britain	4.5.6
7	Wagons built for running between networks with different track gauges	4.5.7
8	Wagons with gauge changing wheelsets	4.5.8
9	Shunting prohibited on humps with a small curve radius	4.5.9
10	Bogie wagons with a distance between inner axles in excess of 14,0 m and which are accepted for hump shunting	4.5.10
11	Wagons prohibited from passing through retarders or other stopping devices in service mode	4.5.11
12	Table of maintenance dates	4.5.12
13	High voltage warning notice (lightning flash)	4.5.13
14	Lifting and jacking points	4.5.14
15	Carrying capacities	4.5.15
16	Volumetric capacities	4.5.16
17	Height of the loading plane for container wagons in tare condition	4.5.17
18	Minimum curve radius	4.5.18
19	Maximum ferry ramp angle	4.5.19
20	Impact protection	4.5.20
21	Wagons fitted with projecting tow hooks	4.5.21
22	Concentrated payloads	4.5.22
23	Distance between end axles or bogie centres	4.5.23
24	Wagons which need special care when being shunted	4.5.24
25	Manually applied parking brake	4.5.25
26	Isolating brake handle	4.5.26
27	Instructions and safety advices for special equipment	4.5.27
28	Buffer stroke	4.5.28
29	Numbering of wheelsets	4.5.29
30	Brake system markings	4.5.30
31	Wagons fitted with the automatic coupler (conforming to the OSJD standard)	4.5.31
32	Customs authorisation plate for wagons operating on 1520 mm gauge railways	4.5.32
33	Derogation Plate	4.5.33
34	Length for load and floor space	4.5.34

Position No.	Description	Subclause
35	Spark arrestor plates	4.5.35
36	Removable wagon accessories	4.5.36
37	Marking for the inside of wagons: “Do not use nails/wire staples”	4.5.37
38	Combined transport wagons	4.5.38
39	Permanently coupled wagon units	4.5.39
40	Wagons fitted with a train line	4.5.40
41	Wheels able to withstand high thermal stresses	4.5.41
42	Tyred wheels	4.5.42
43	Ventilation pipes	4.5.43
44	Tank code , special provision code(s) and next inspection due	4.5.44
45	Replacement of springs	4.5.45
46	Wheel tyre inspection	4.5.46
47	Inspection periods for temperature controlled units	4.5.47
48	Protection of the inner lining of wagons	4.5.48
49	Permissible diameter of the wheel	4.5.49
50	Earthing protection	4.5.50
51	Prohibition to run with open sliding doors, curtains or hood	4.5.51
52	Transported goods	4.5.52
53	Orange Plate for dangerous goods (RID subclause 5.3.2)	4.5.53
54	Wheel point loading	4.5.54
55	Elevated temperature	4.5.55
56	Vacuum insulated tanks	4.5.56
57	Smoking and naked flames forbidden	4.5.57
58	High strength coupling	4.5.58
59	Derailment Detector	4.5.59

4.5 Details of vehicle markings

4.5.1 Vehicle unique number (EVN)

The vehicle number lettering shall be at least 80 mm.

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

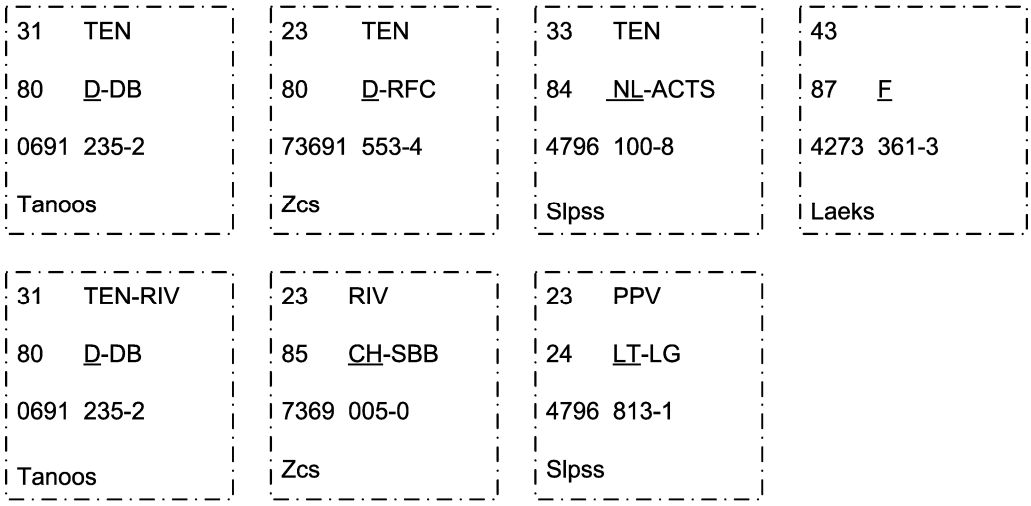
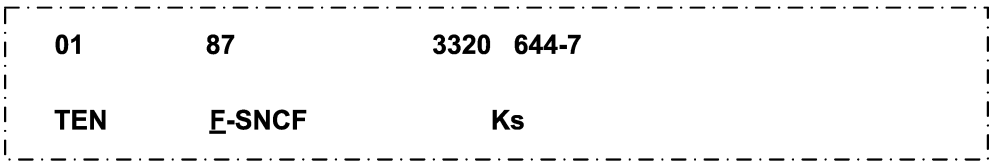


Figure 4

When the wagon body does not provide sufficient surface area for this layout (flat wagons in particular) the markings shall be applied as follows:



NOTE The dotted frame around the markings in Figures 4 and 5 is not part of the marking.

Position: On the left of each side wall, or the left of each solebar in the case of low-sided open wagons or on inscription panels in the case of wagons without side walls (e.g. tank wagons). The marking is to be located not higher than 2 metres above rail level.

Meaning: (based on the examples in Figure 4 above).

31: Fitness for interoperability (2 digits).

80: Country in which the wagon is registered (2 digits) in accordance with TSI OPE P.4.

0691: Principal technical characteristics (4 digits).

235: Generic number of the wagon in its registration series.

-2 : Check digit.

PPV/PPW: OSJD Rules for International Operation of Wagons and Coaches of 01/01/1956 updated 01/01/1997.

RIV: The RIV marking on a wagon means that the wagon, in addition to having been approved against the rules in force, also meets the regulations of railway Technical Unity (TU) and the provisions of leaflets in the UIC Code.

TEN: The TEN marking according to Annex P.5 of the EU regulations as set out in 2006/920/EC and as amended by 2009/107/EC and corresponding COTIF regulations.

D: Country in which the wagon is registered, in this example Germany.

DB: Vehicle Keeper Marking (VKM); this information is compulsory if the full name of the company, complete with full address, is not given.

F: Example without VKM.

When the full name and address information is inscribed on the vehicle, a VKM is not required for Vehicles of Keepers with such a limited vehicle fleet that this does not warrant the use of a VKM,

or

specialised vehicles for infrastructure maintenance.

Figure 5

4.5.2 Gauge marking

Dimensions in millimetres

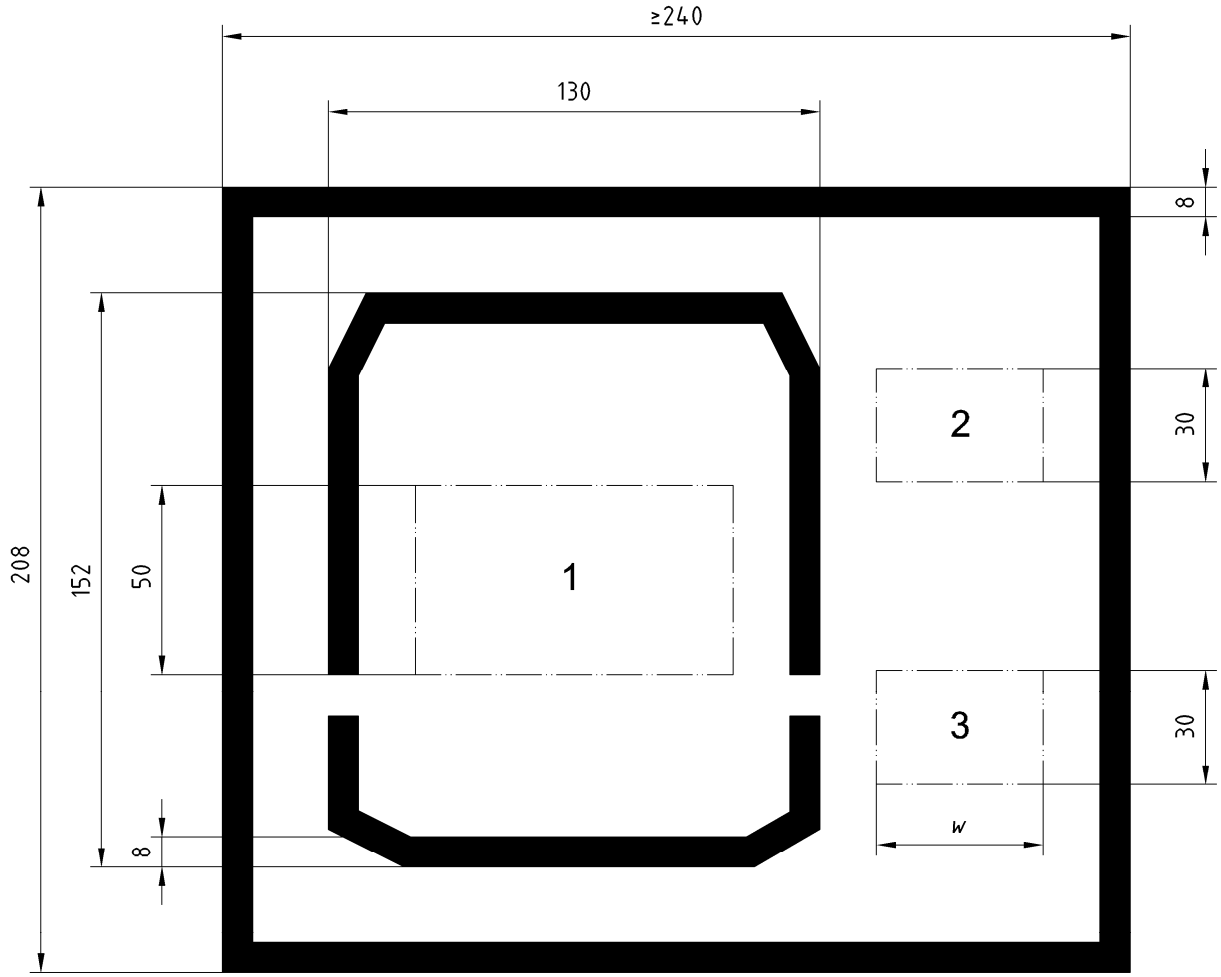
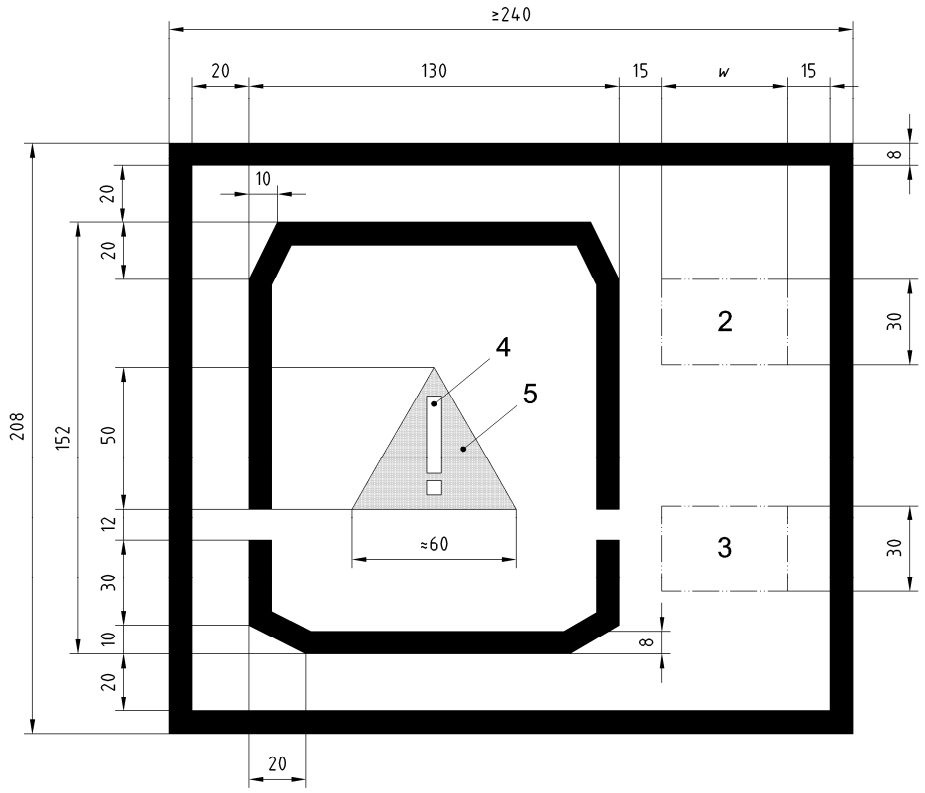


Figure 6a

Dimensions in millimetres



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: On the left of each side wall, or the left of each solebar, or on inscription panels, near to the vehicle number.

Meaning: Key 1: G1 or GA or GB or GC indicates the Kinematic reference contour of the wagon as requested in the WAG TSI and OTIF regulations.

Figure 6b is used when the gauge is different from G1 or GA or GB or GC.

Key 2: indicates the kinematic reference contour for the superstructure of the wagon.

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

For example G1 or G2 or GB1 or GB2, etc.,

Key 3: indicates the kinematic reference contour for the infrastructure of the wagon

For example GI1 or GI2 or GI3, etc.

NOTE This gauge marking does not indicate the loading gauge of the wagon. For instance it is possible to load GI1 flat wagon in respect of the GC loading gauge and in accordance with operational rules.

Figure 6b

4.5.3 Wagon tare weight and hand braked weight

Dimensions in millimetres

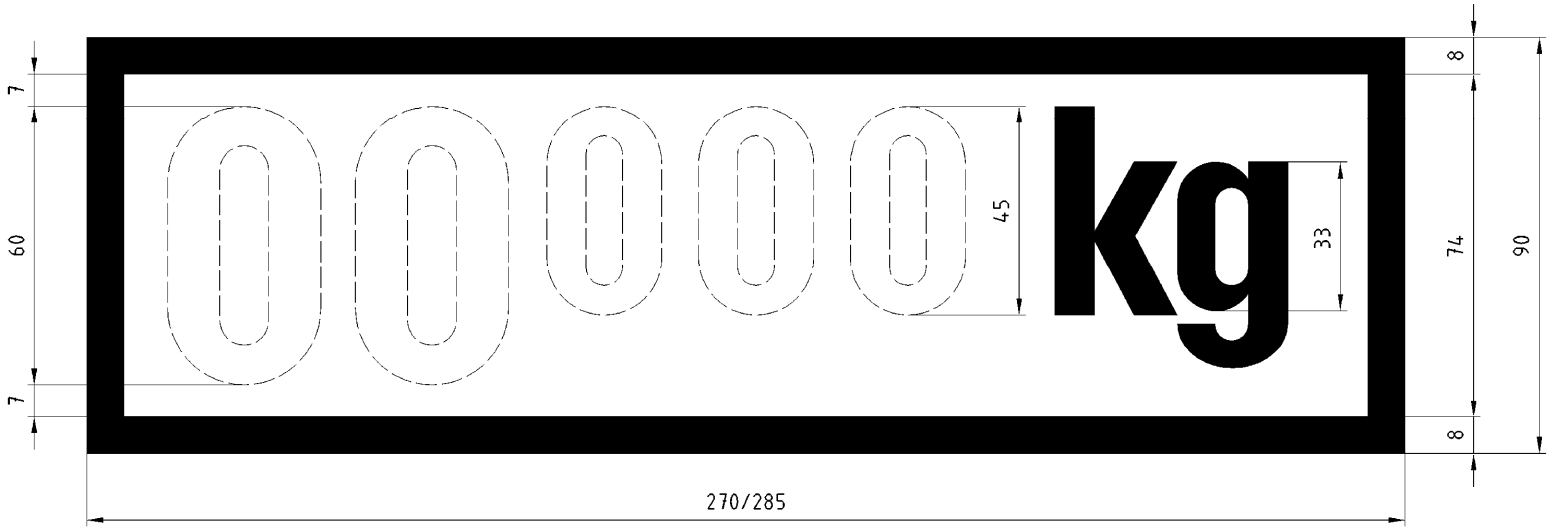


Figure 7 — Tare

Dimensions in millimetres

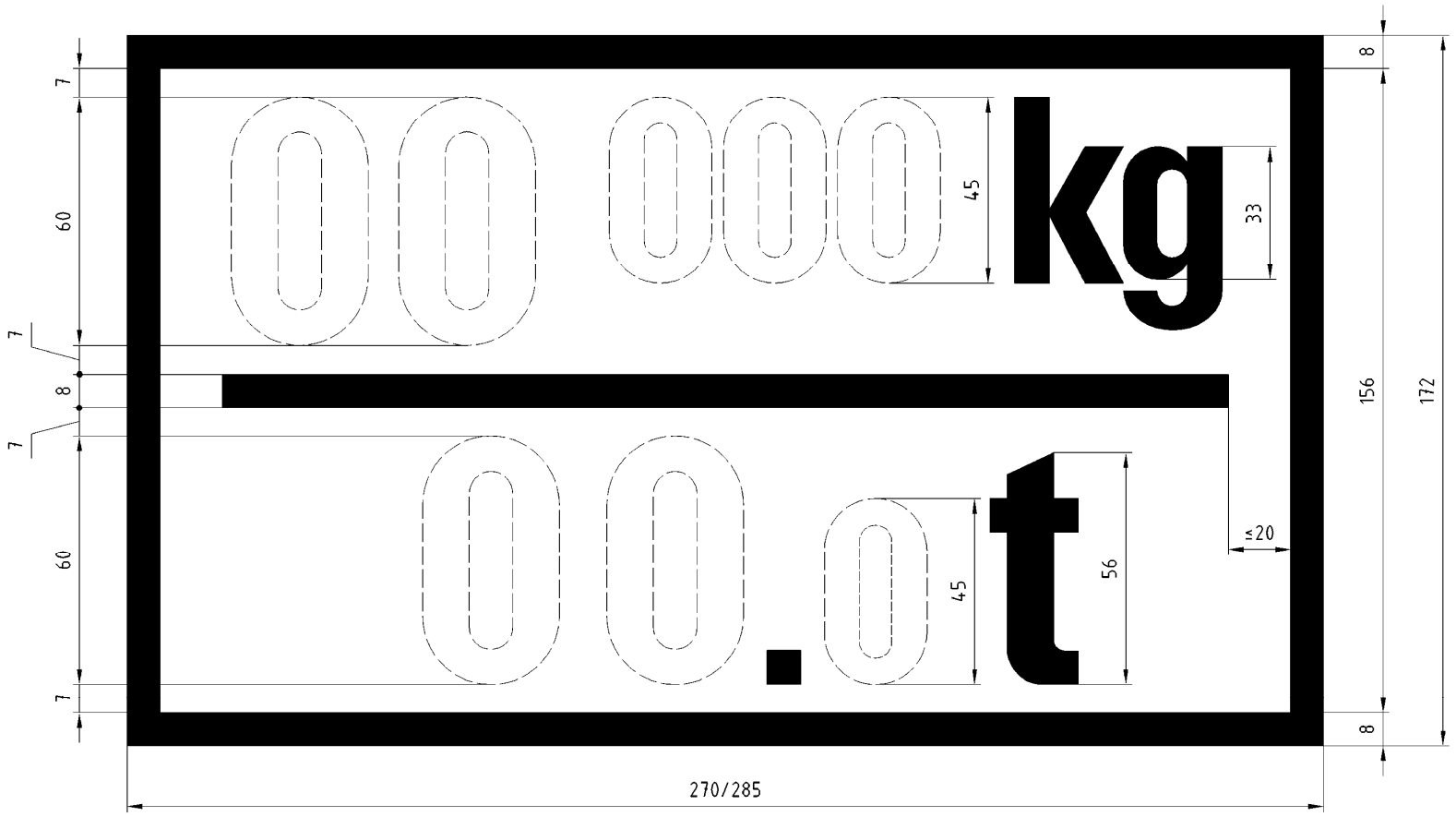
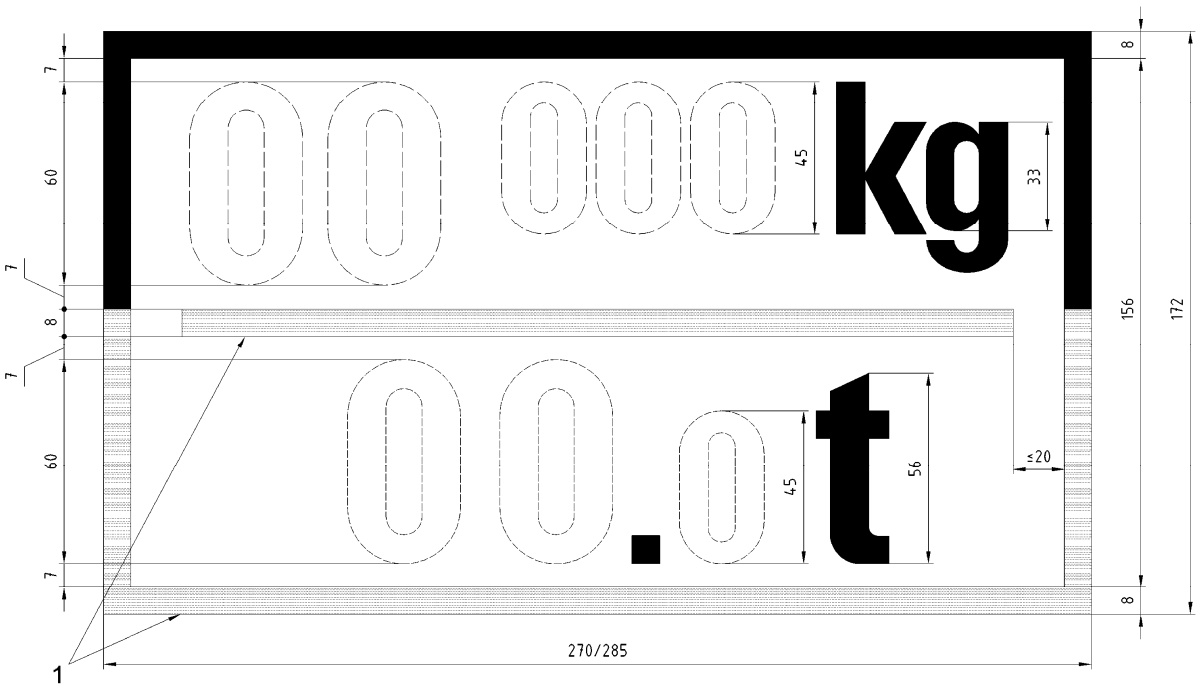


Figure 8 — Wagon tare and braked weight of the platform-operated hand brake

Dimensions in millimetres



Key: 1 red

Position: On the left of each side of the wagon.

Meaning: Indicates the wagon tare (upper figure) and hand braked weight (lower figure).

The marking shown in Figures 8 or 9 is marked on the wagon when the hand braked weight is less than the total weight of the vehicle (tare + load corresponding to the maximum weight).

The braked weight as shown in Figure 9 shall be marked in a red box when it refers to a ground-operated hand brake.

When a wagon is fitted with more than one independently-acting hand brake, the corresponding number of brakes shall be indicated in front of the braked weight (for example: 2 × 00,0 t).

NOTE The marking shown in Figure 7 should not be affixed to a wagon that is to carry the marking in Figures 8 or 9

Figure 9 — Wagon tare and braked weight of the ground-operated hand brake (the latter to be shown in a red box)

4.5.4 Wagon load table

Load limits – Figure 10 to Figure 18 are example formats.

Dimensions in millimetres

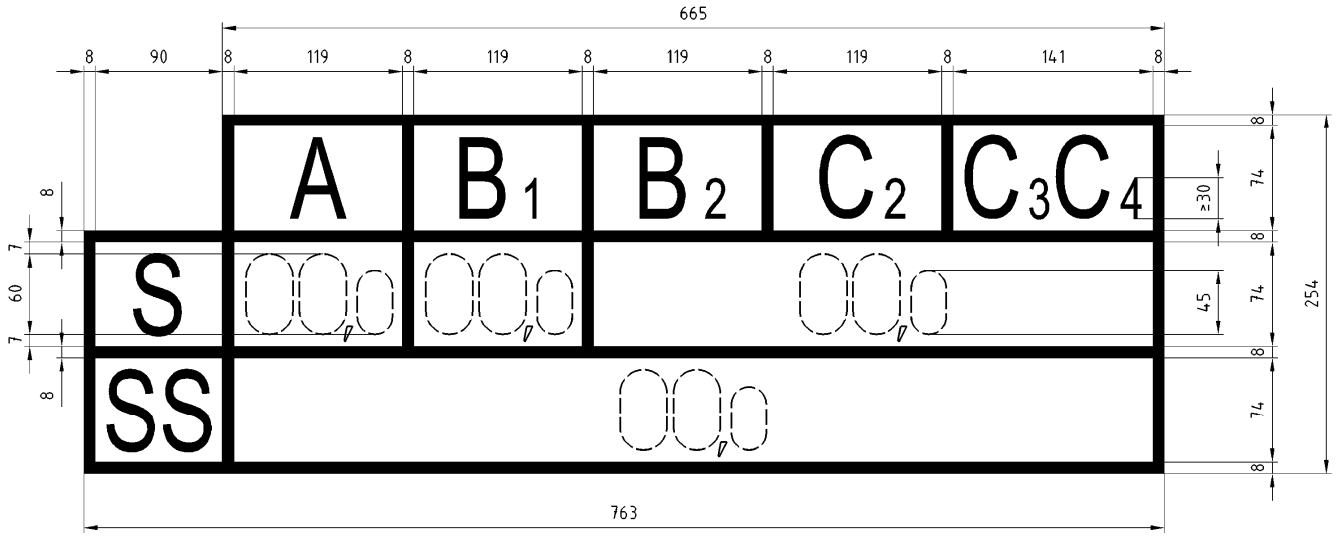


Figure 10

Dimensions in millimetres

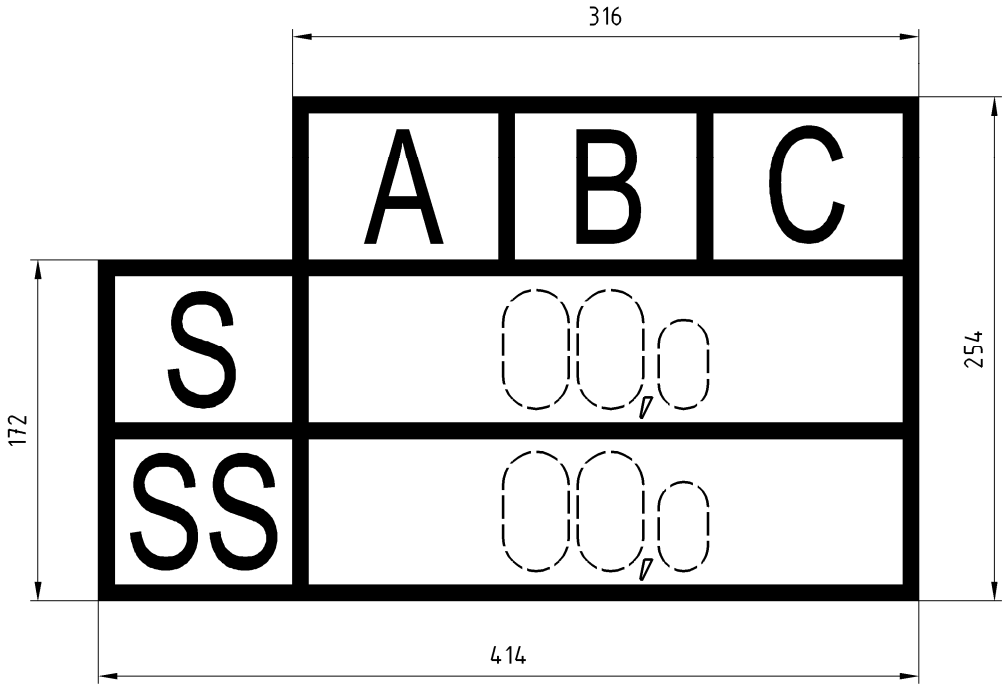


Figure 11

Dimensions in millimetres

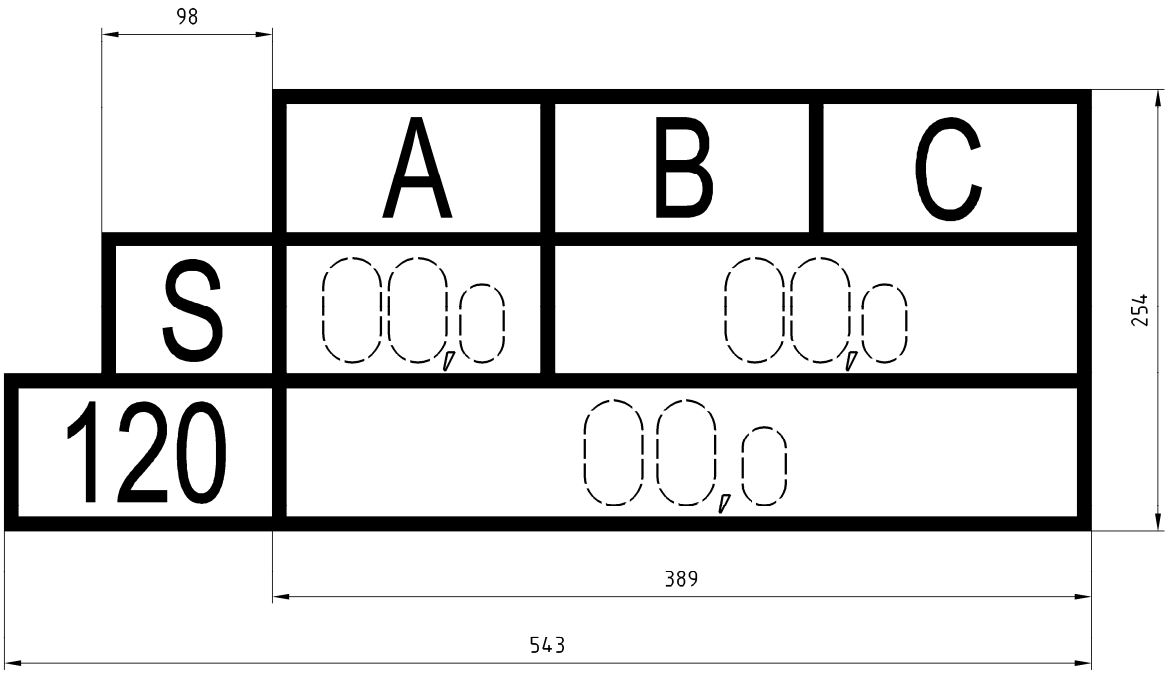


Figure 12

Dimensions in millimetres

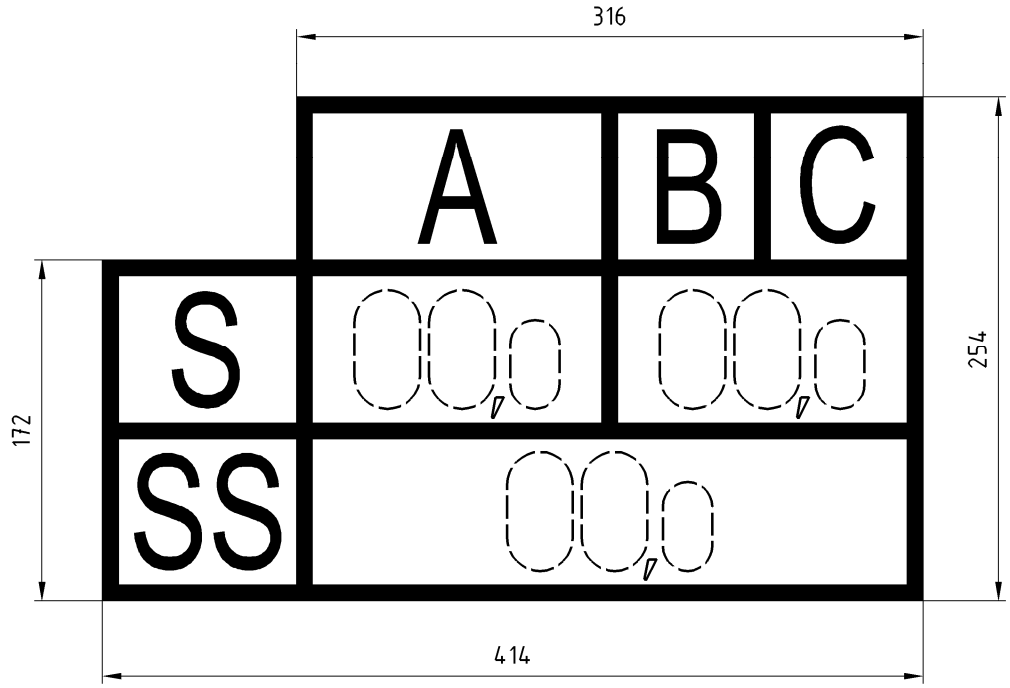


Figure 13

Dimensions in millimetres

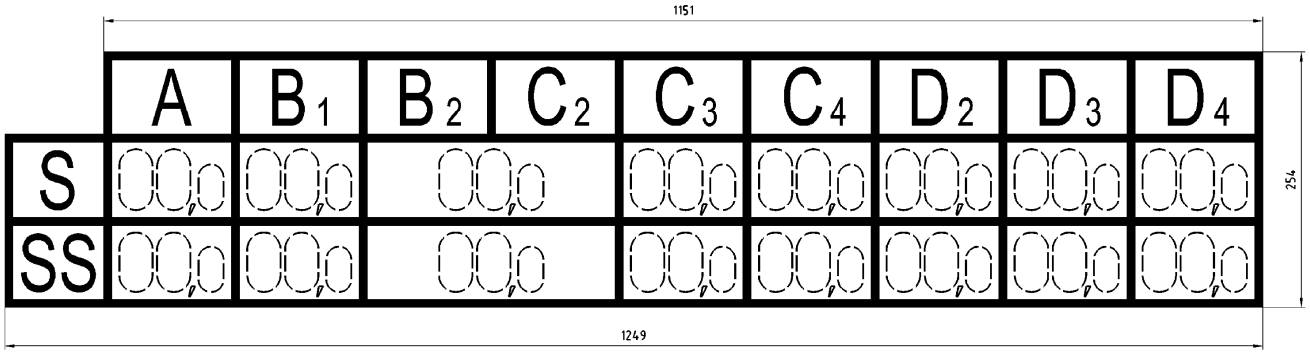


Figure 14

Dimensions in millimetres

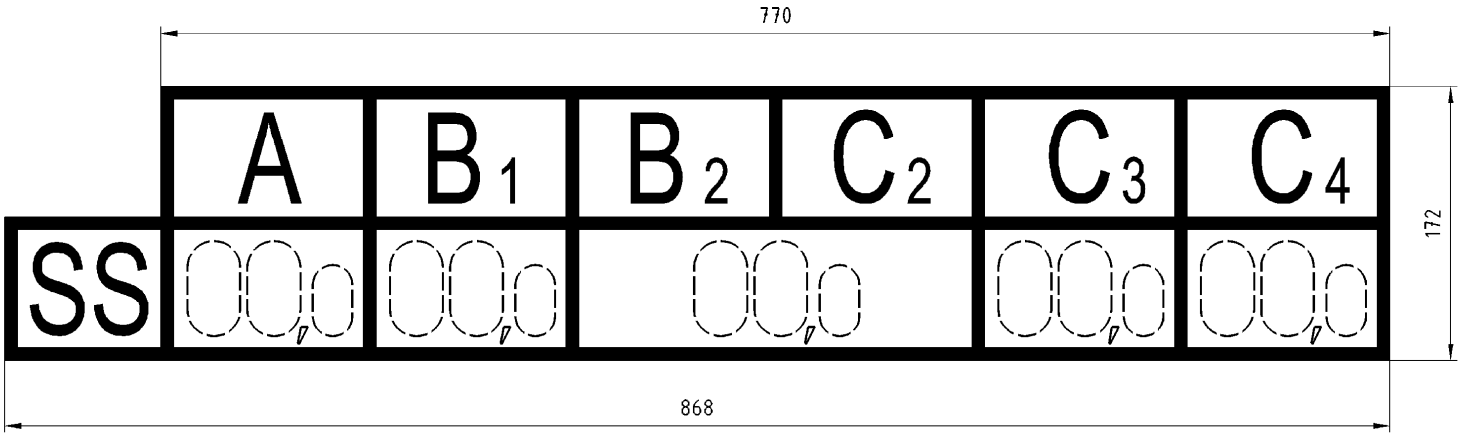
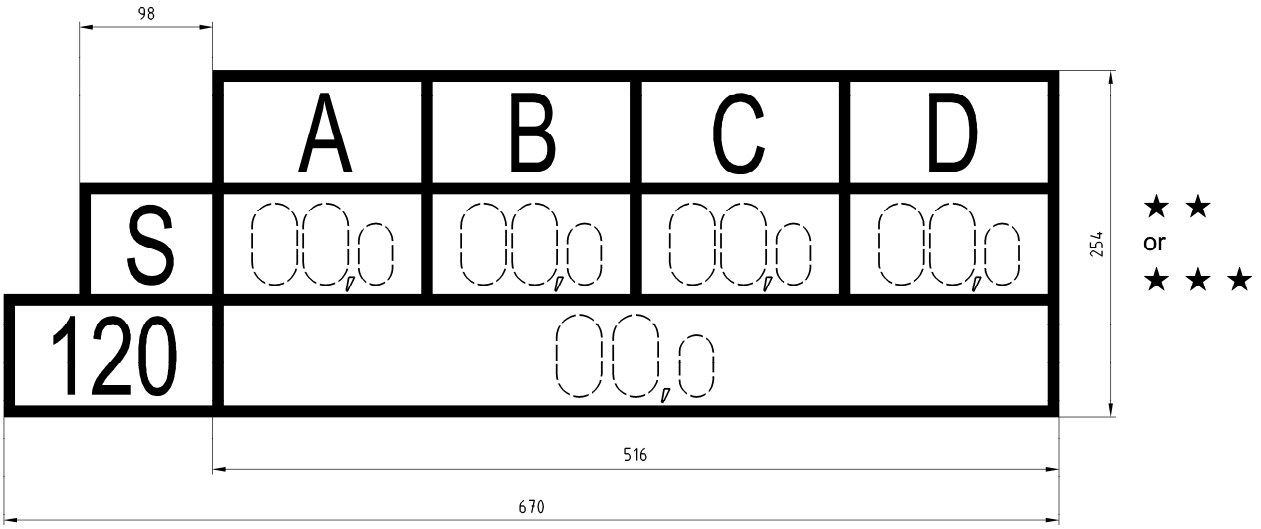


Figure 15

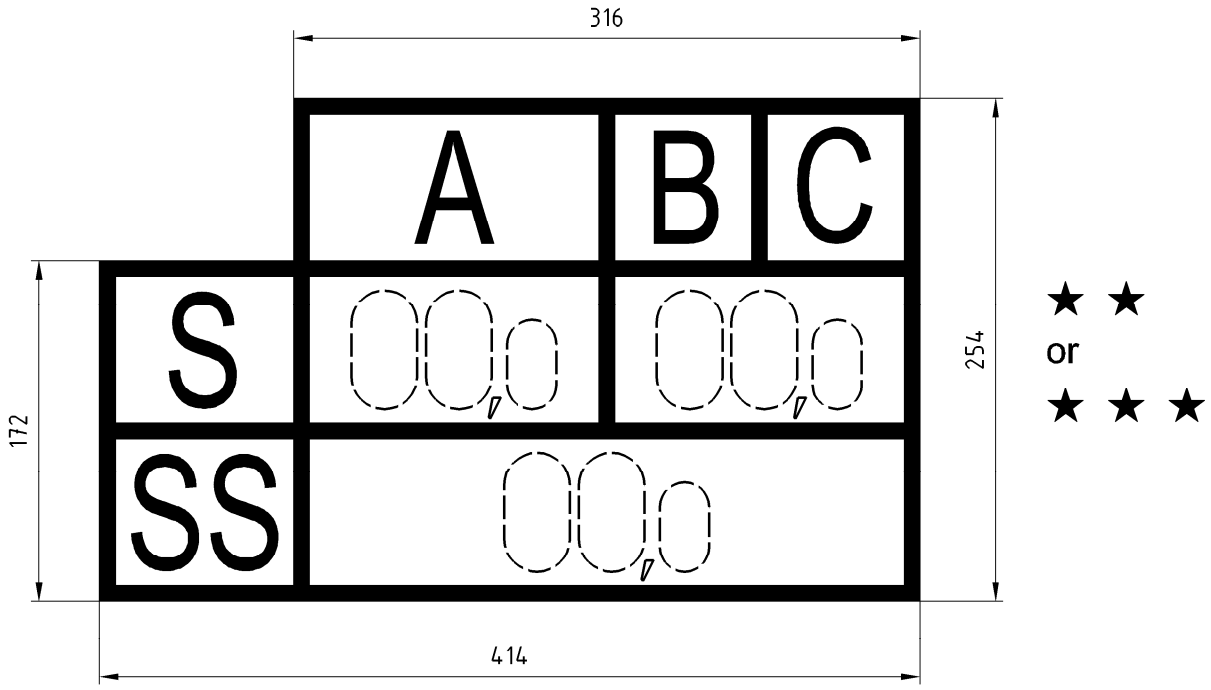
Dimensions in millimetres



NOTE As an exception to this rule, the stars may also be positioned to the left of the load limit panel.

Figure 16

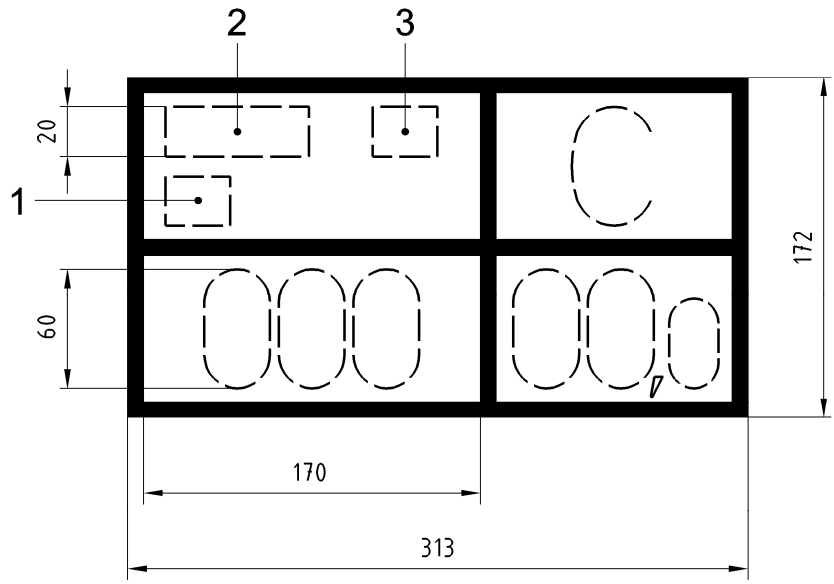
Dimensions in millimetres



NOTE As an exception to this rule, the stars may also be positioned to the left of the load limit panel.

Figure 17

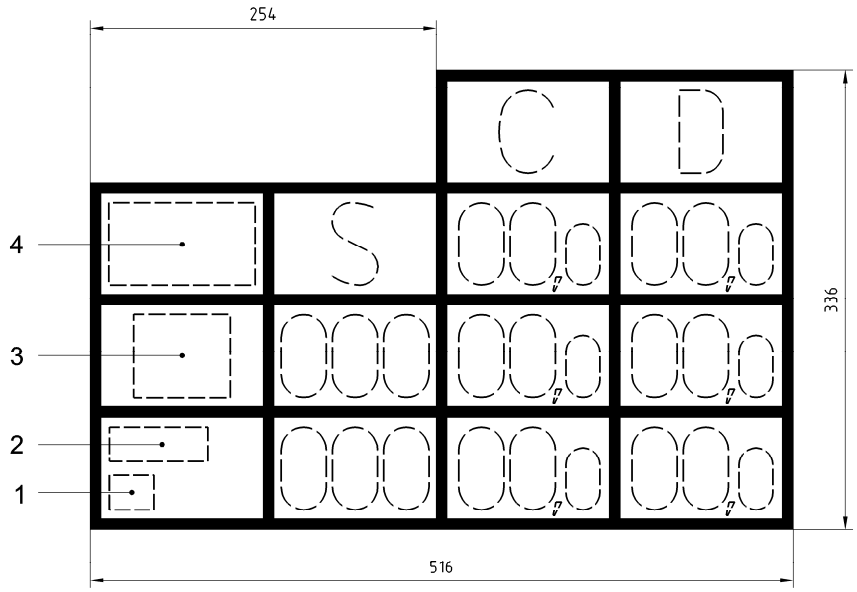
Dimensions in millimetres



Key: 1, 2, 3 are the mark(s) of the corresponding network(s).

Figure 18

Dimensions in millimetres



Key: 1, 2, 3, 4 are the mark(s) of the corresponding network(s).

Position: On the left of each side of the wagon.

Meaning for Figures 10 to 19

A, B, C, D and E etc.,	Line categories as defined in EN 15528.
S	Maximum payload in t (tonnes) for wagons running in trains operated under S conditions (maximum speed 100 km/h) with no particular operating restrictions.
SS	Maximum payload in t for wagons running in trains operated under SS conditions (maximum speed 120 km/h) with no particular operating restrictions.
120/00,0	Wagons authorised to run in trains up to 120 km/h when unloaded (Figures 12 and 16).
Fig.18-19	Between Contracting parties and exceeding the normal load limits. Figure 18 and Figure 19 are examples for **interoperable wagons and with the payloads indicated** for the networks indicated.
★★	Wagons built before entry into force of CR TSI RST Freight Wagon (31.01.2007). Maximum load in t for wagons authorised to run in trains up to 120 km/h with a brake that does not meet all the requirements for SS conditions.
★★★	Wagons built since entry into force of CR TSI RST Freight Wagon (31.01.2007) and fitted with a variable load valve. Maximum load in t for wagons authorised to run in trains up to 120 km/h with a brake that does not meet all the requirements for SS conditions.

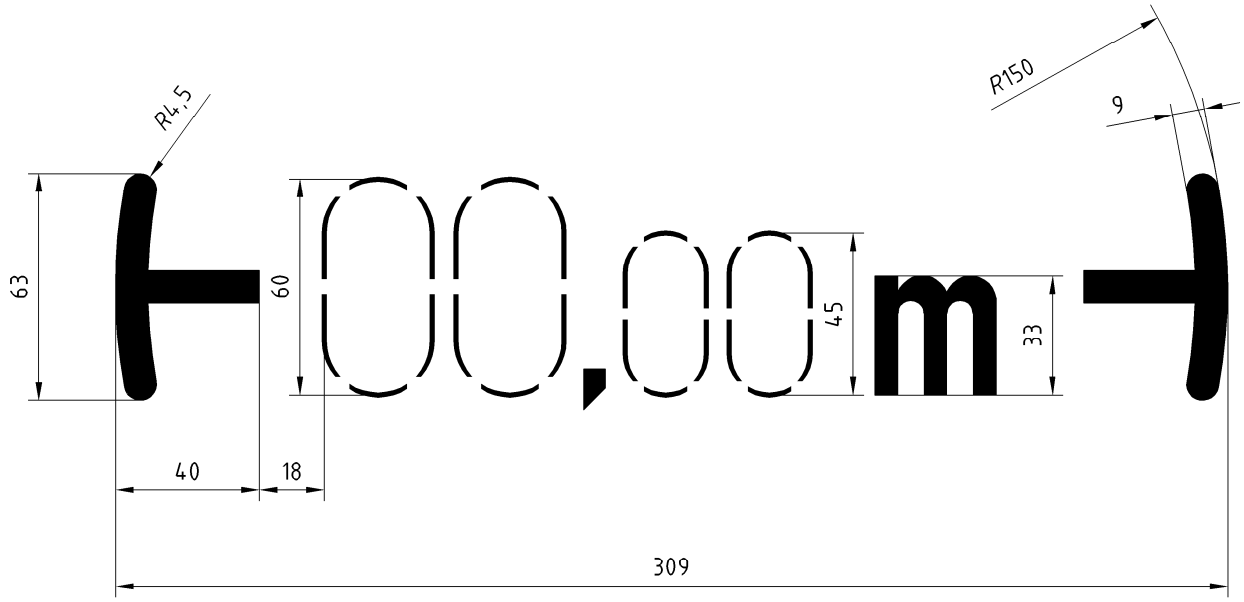
NOTE 1 The load table should record the maximum payload calculated in accordance with EN 15528 for each line category.

NOTE 2 For wagons carrying the ★★ or ★★★ marking, RUs should define the necessary rules for the correct formation of the train (achieving the correct brake percentage, timetable changes where appropriate, etc.).

Figure 19

4.5.5 Length over buffers

Dimensions in millimetres



Position: On the left hand side of the wagon.

Meaning: Indicates the wagon's length over uncompressed buffers in metres.

On wagons made up of separate units joined together by a permanent coupling (multiple wagon units) the total length of the wagon shall be indicated.

Figure 20

4.5.6 Traffic to and from Great Britain

Dimensions in millimetres

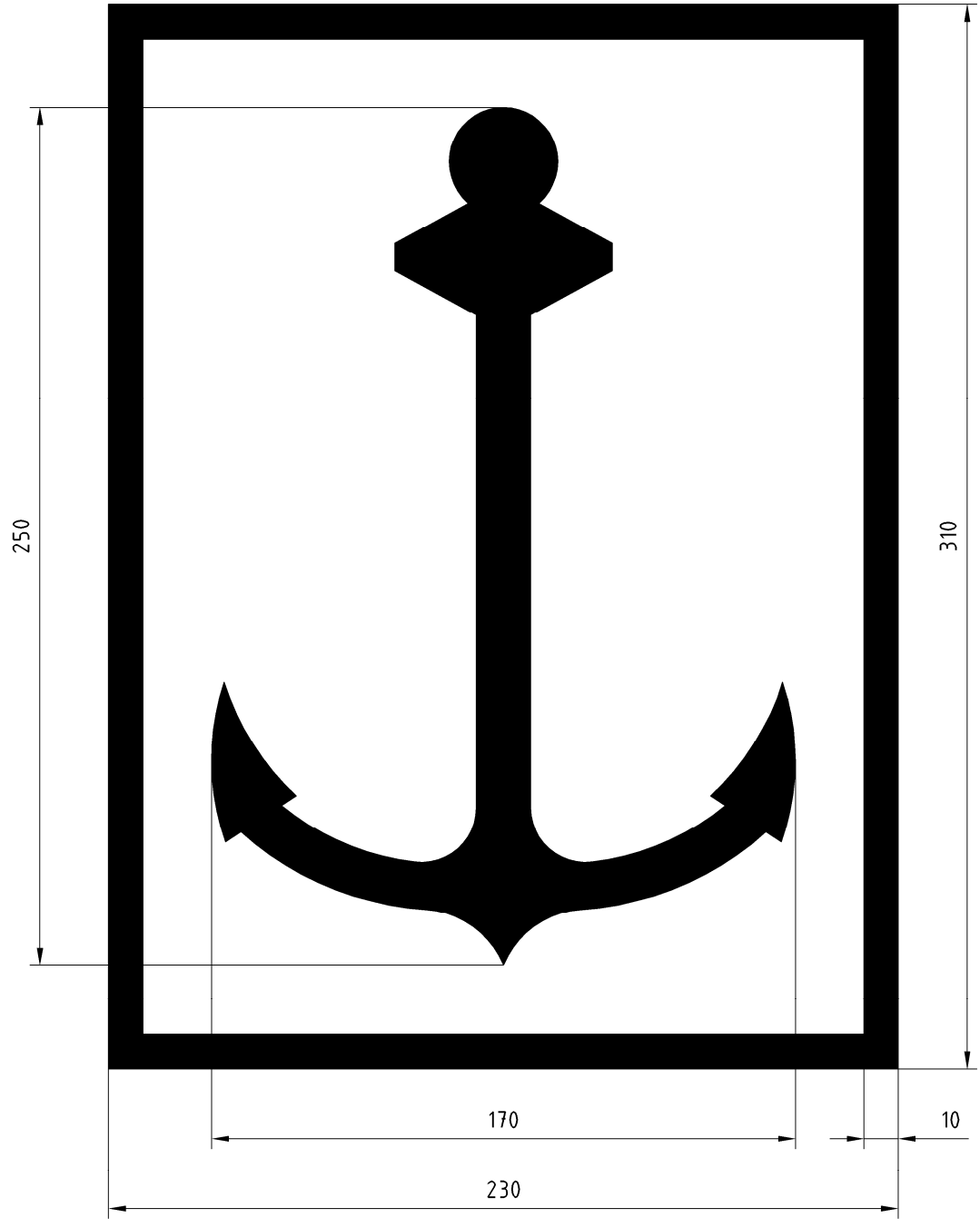
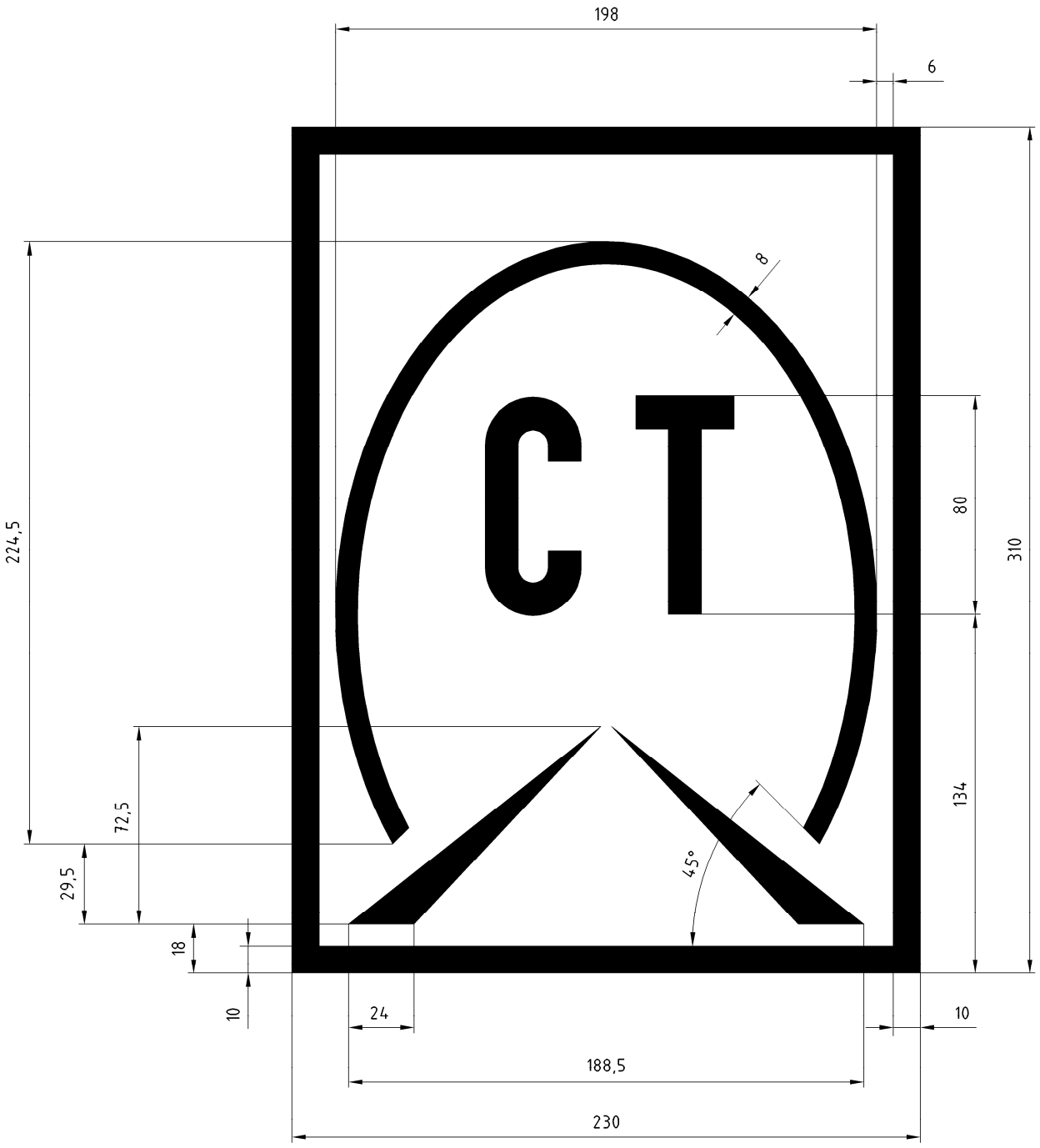


Figure 21 — For wagons accepted on train-ferries

Dimensions in millimetres



Position: On the left of each side wall.

Meaning: These markings are only for wagons, permitted to be used for traffic to and from Great Britain according to Figure 21 or Figure 22 or combination of Figures 21 and 22 (horizontally or vertically)

Figure 22 — For wagons accepted through the Channel Tunnel

4.5.7 Wagons built for running between networks with different track gauges

Dimensions in millimetres

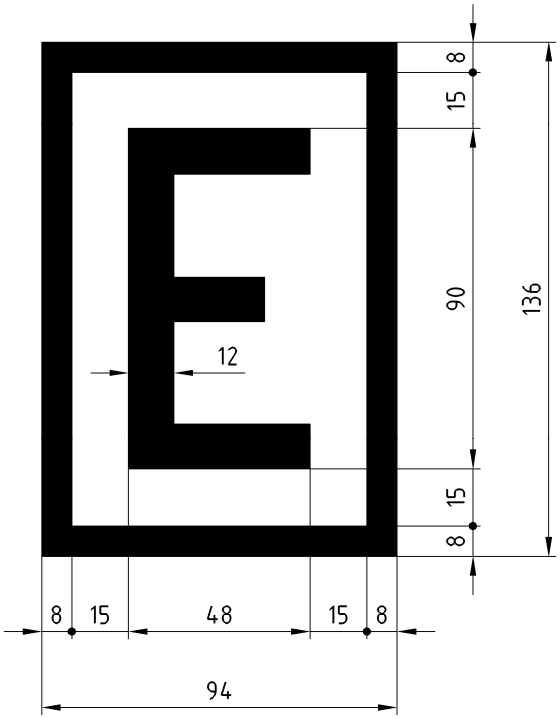


Figure 23a — Networks with 1520 mm track gauge

Dimensions in millimetres

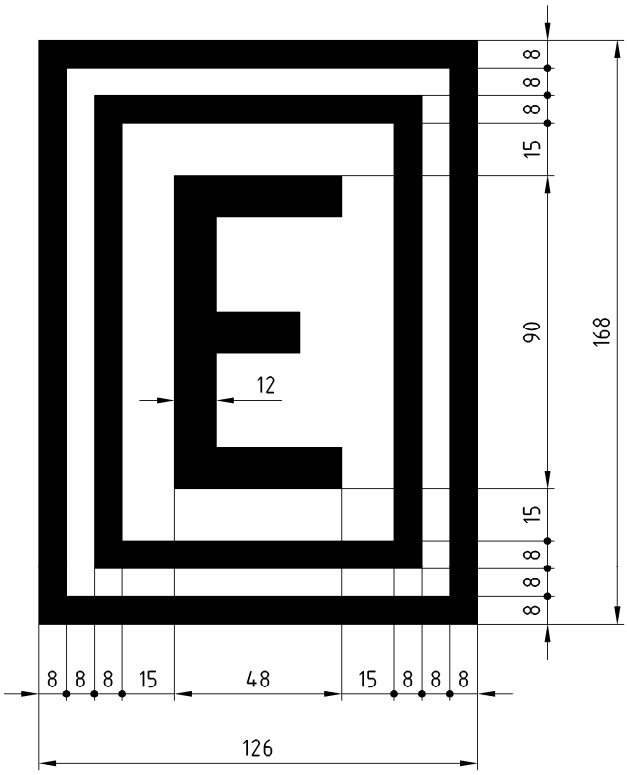


Figure 23b — Finland - 1524 mm track gauge

Dimensions in millimetres

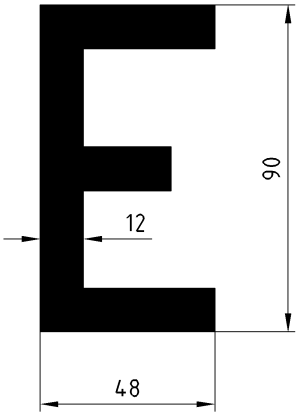


Figure 23c — Spain, Portugal - 1668 mm track gauge

Position: On the right side on each sidewall or solebar

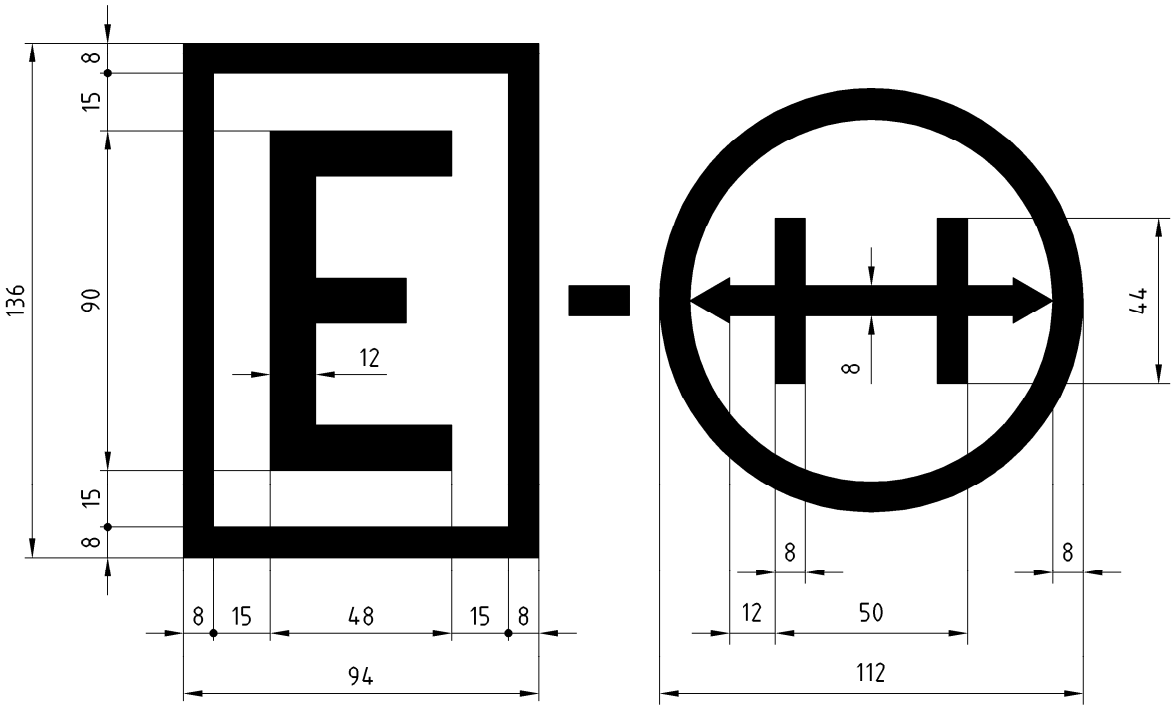
Meaning: Markings for wagons built for running between networks with different track gauges

Figure 23

4.5.8 Wagons with gauge changing wheelsets

4.5.8.1 Markings on the wagon body

Dimensions in millimetres



Position: On the right of each side wall or solebar.

Meaning: For wagons which are suitable for running between networks with different track gauges and fitted with automatic gauge changeover facilities. Wagons fitted with this type of running gear shall carry the appropriate combination of the markings shown in 4.5.7 and 4.5.8

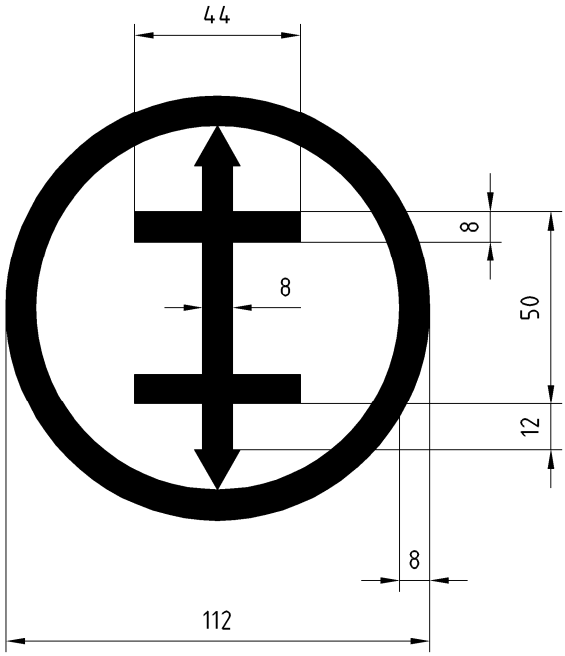
NOTE When changing axles of this type, the date (month and year) of the last axlebox overhaul should be marked, along with the VKM of the wagon keeper on the outside of each axle-box in white paint and clearly visible. Exchangeable bogies are to be fitted with a special overhaul plate.

Figure 24 — Example of combination

4.5.8.2 Markings on the running gear

4.5.8.2.1 Running gear with automatic gauge changeover capability between 1435 mm and 1668 mm track gauges

Dimensions in millimetres



Position: On the corresponding bogie frames or axle guard on 2 axle wagons

Meaning: This marking is carried by wagons that have running gear fitted with gauge adjustable axles with a nominal gauge of 1435 mm or 1668 mm.

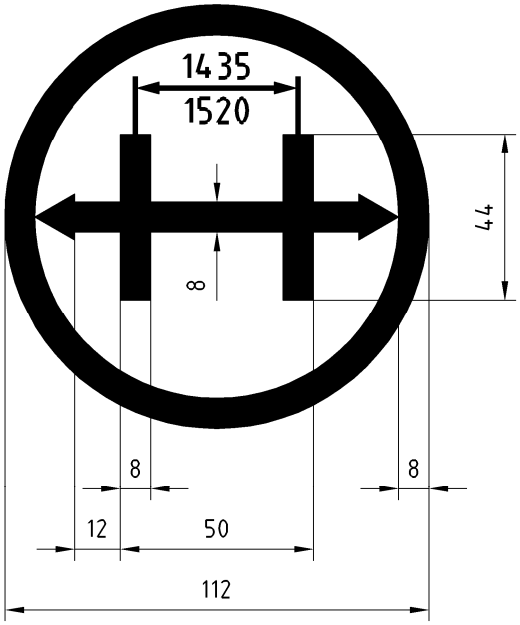
The provisions of 4.5.8.1 apply in principle.

Figure 25

4.5.8.2.2 Running gear with automatic gauge changeover capability between 1435 mm and 1520 mm track gauges

4.5.8.2.2.1 Running gear with nominal gauge 1435 mm

Dimensions in millimetres



Position: On the corresponding bogie frames or axle guard on 2 axle wagons

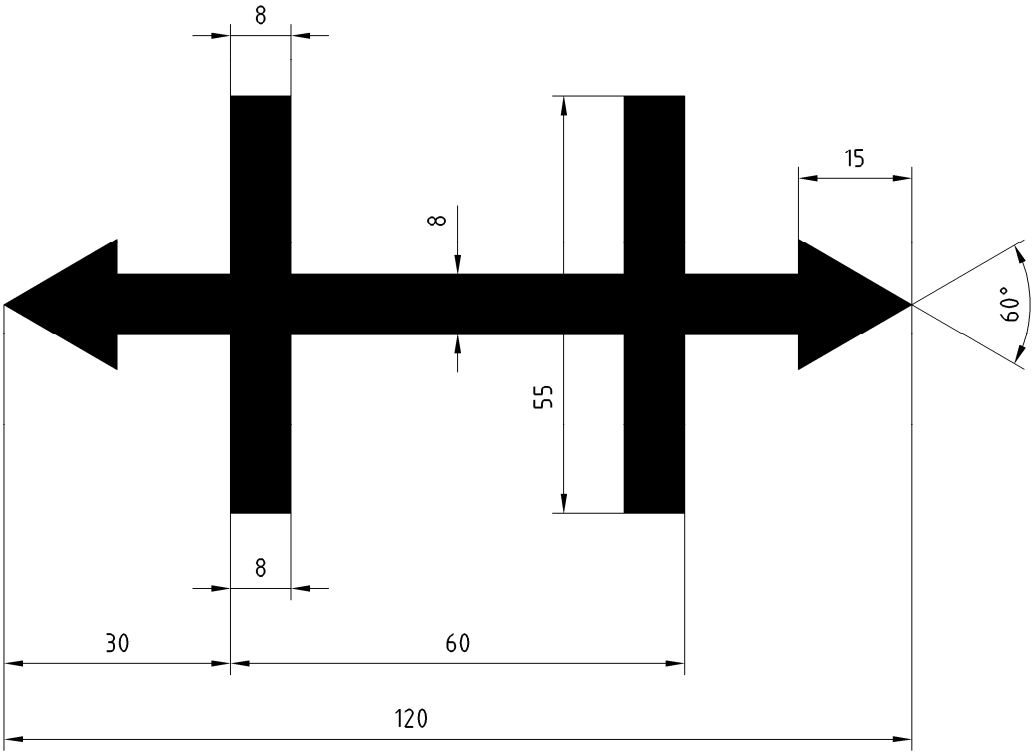
Meaning: This marking is carried by wagons that have running gear fitted with gauge-adjustable axles with a nominal gauge of 1435 mm.

The provisions of 4.5.8.1 apply in principle.

Figure 26

4.5.8.2.2.2 Running gear with nominal gauge 1520 mm

Dimensions in millimetres



Position: On the corresponding bogie frames or axle guard on 2 axle wagons

Meaning: This marking is used by RUs that are signatories to the PPV/PPW.

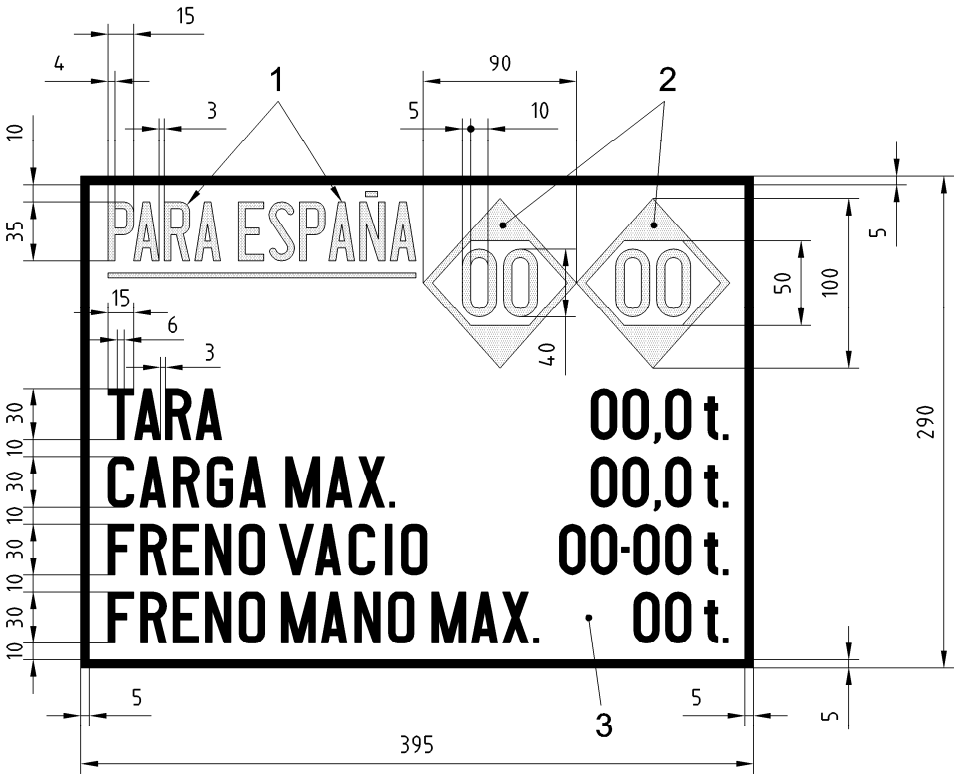
This marking is carried by wagons that have running gear fitted with gauge-adjustable axles with a nominal gauge of 1520 mm.

The provisions of 4.5.8.1 apply in principle.

Figure 27

4.5.8.3 Additional markings for wagons accepted for running in Spain and Portugal

Dimensions in millimetres



Key:

1 red
2 yellow
3 blue background
frame and inscriptions, other than Key 1 and Key 2, to be
- black on white painted wagons
- in white on a blue background on other wagons.

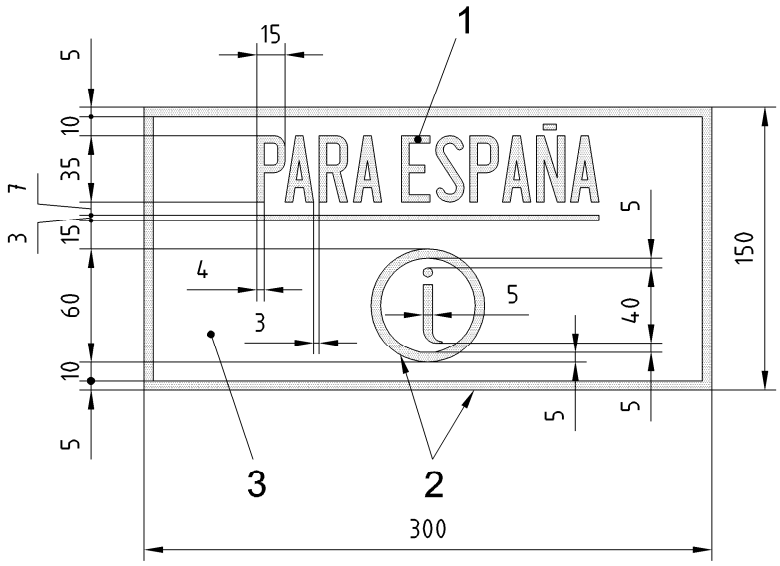
Position: On the right of each side wall.

Meaning:

Left-hand diamond	Maximum speed at maximum load
Right-hand diamond	Maximum speed when empty. When the maximum empty speed and maximum speed loaded are the same, a single diamond marking will suffice.
TARA	Vehicle tare
CARGA MAX	Maximum load limit
FRENO VACIO	Vacuum brake Left-hand figure = braked weight in “empty” position Right-hand figure = braked weight in “loaded” position
FRENO MANO MAX	Maximum braked weight of the screw brake

Figure 28 — For wagons fitted with a vacuum brake

Dimensions in millimetres



Key:
1 red
2 white
3 blue background

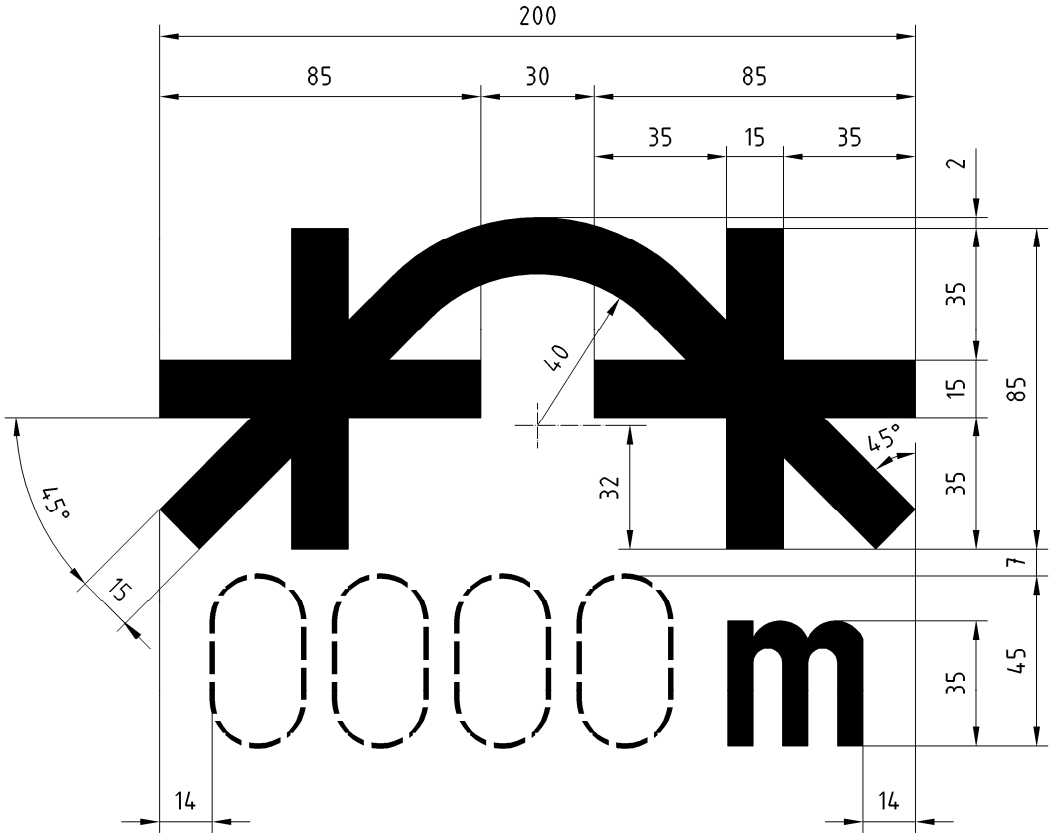
Position: On the right of each side wall.

Meaning: Wagon with its brake isolated can be included in a train.

Figure 29 — For wagons with only one brake pipe for vacuum brake

4.5.9 Shunting prohibited on humps with a small curve radius

Dimensions in millimetres



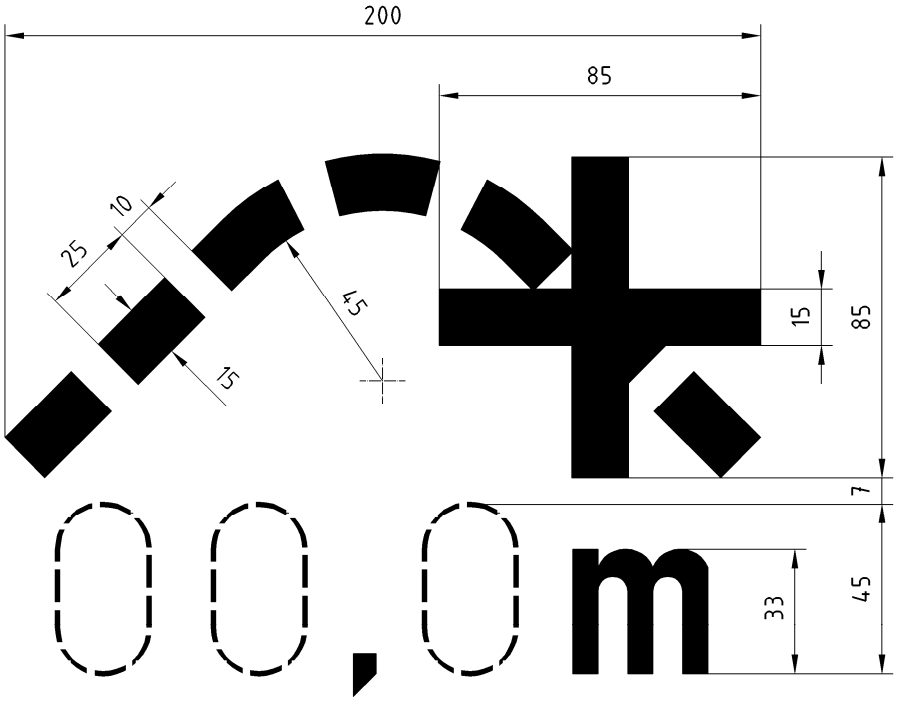
Position: On the left of each solebar or on parts covering the solebar or on a special panel fitted at the same height as the solebars.

Meaning: This marking is compulsory for wagons 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 wagon can negotiate.

Figure 30 — Wagons not authorised to negotiate all shunting humps

4.5.10 Bogie wagons with a distance between inner axles in excess of 14,0 m and which are accepted for hump shunting

Dimensions in millimetres



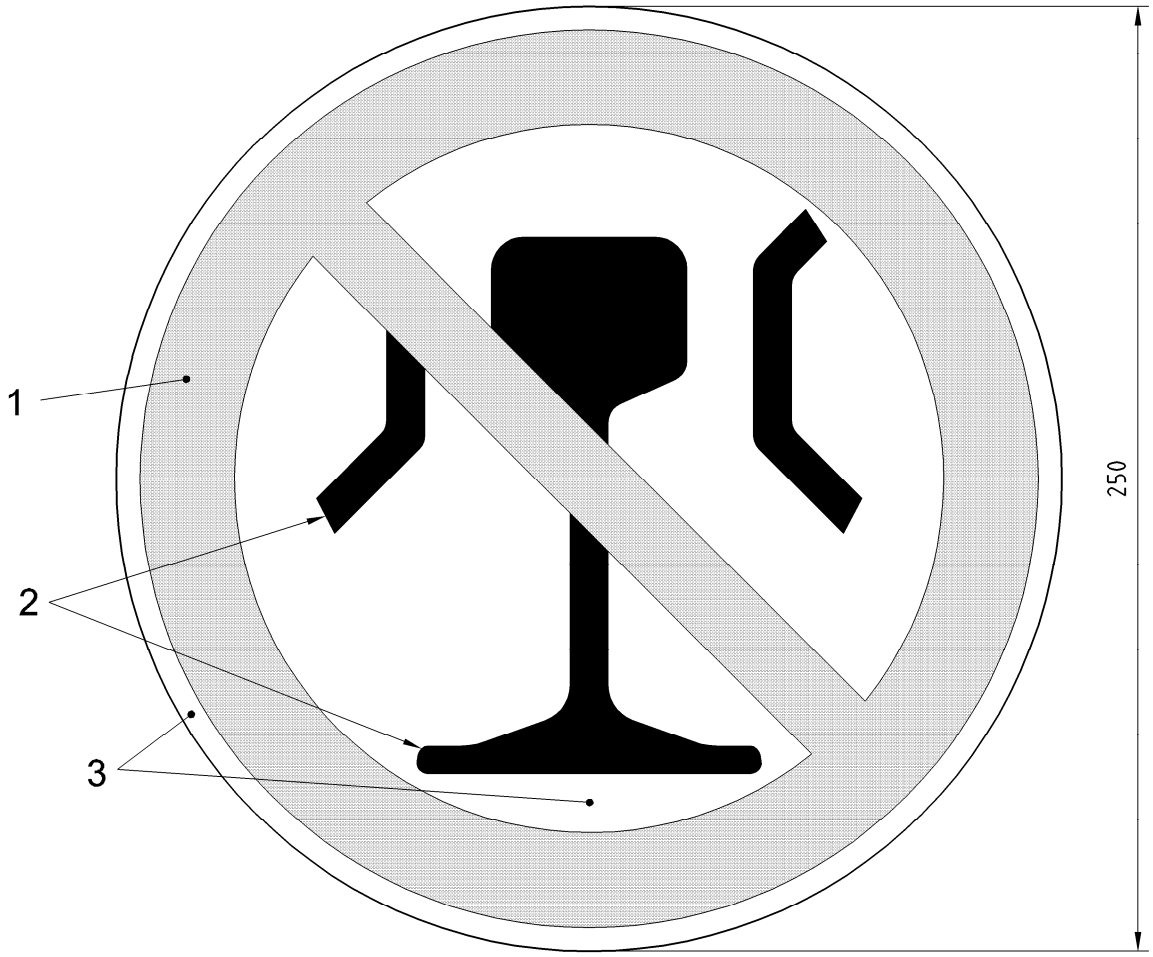
Position: On the left of each solebar or on parts covering the solebar or on special panels fitted at the same height as the solebars.

Meaning: This marking is compulsory on bogie wagons that are suitable for crossing shunting humps but which have a distance of more than 14,0 m between consecutive inner axles. The value indicated is the largest distance between two consecutive axles.

Figure 31

4.5.11 Wagons prohibited from passing through retarders or other stopping devices in service mode

Dimensions in millimetres



Key:
1 red
2 black
3 white

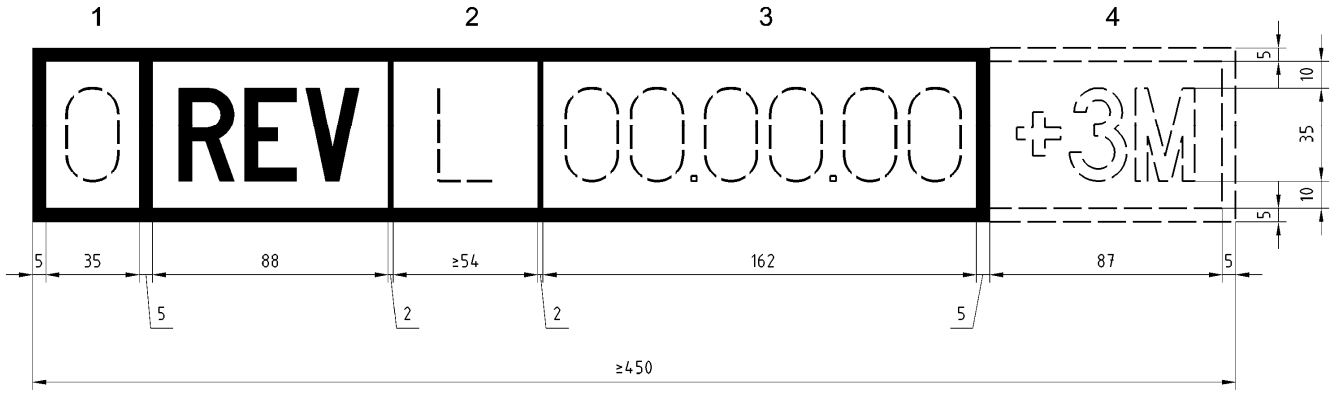
Position: On the left of each solebar or on parts covering the solebar or on special panels fitted at the same height as the solebars.

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

Figure 32

4.5.12 Table of maintenance dates

Dimensions in millimetres

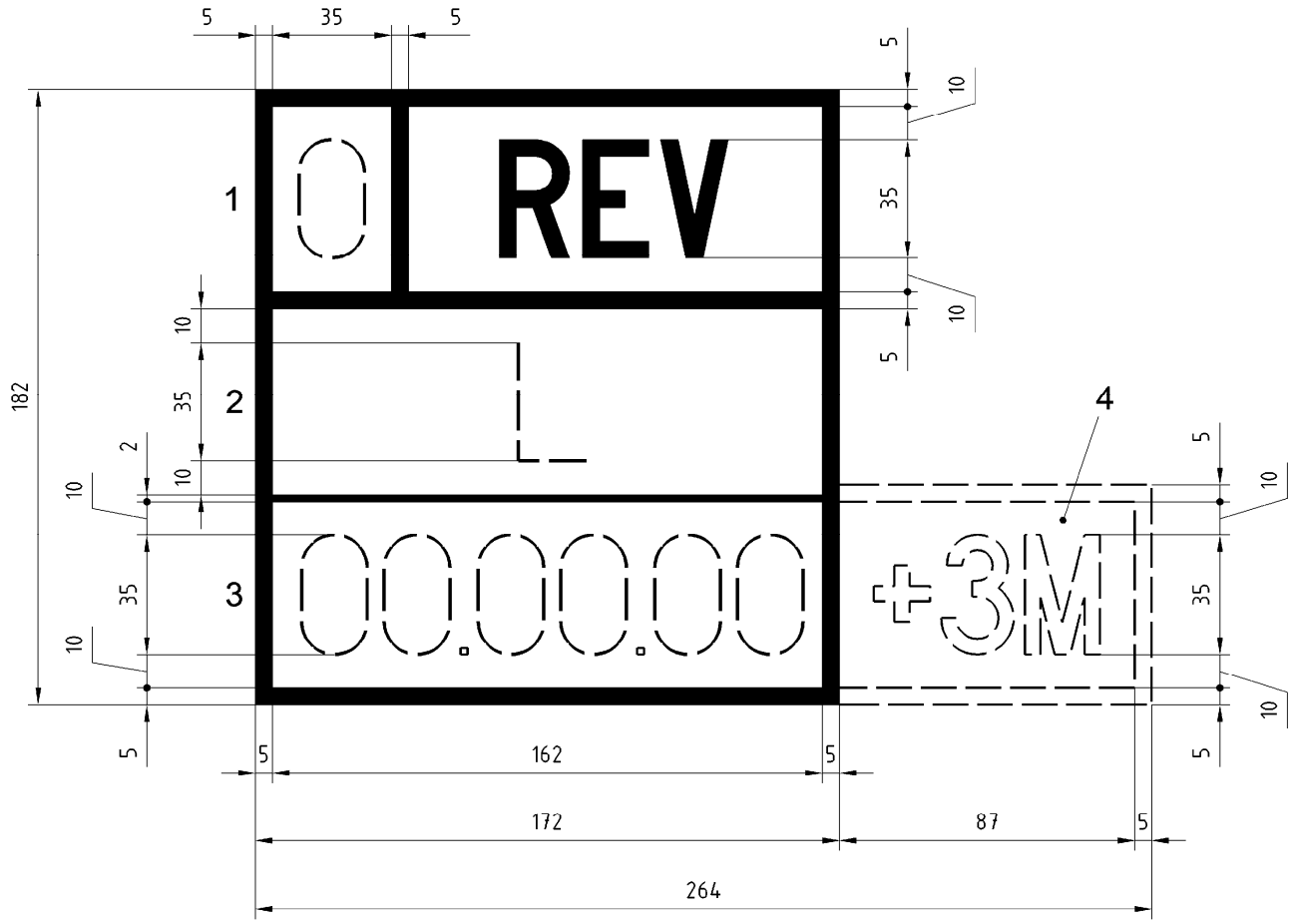


Key

1 maintenance validity period in years
2 identification mark of the workshop that carried out the maintenance work
3 date of last revision (day, month, year)
4 additional marking to be applied only on the instructions of the keeper

Figure 33

Dimensions in millimetres



Key:
1 maintenance validity period in years
2 identification mark of the workshop that carried out the maintenance work
3 date of last revision (day, month, year)
4 additional marking to be applied only on the instructions of the keeper

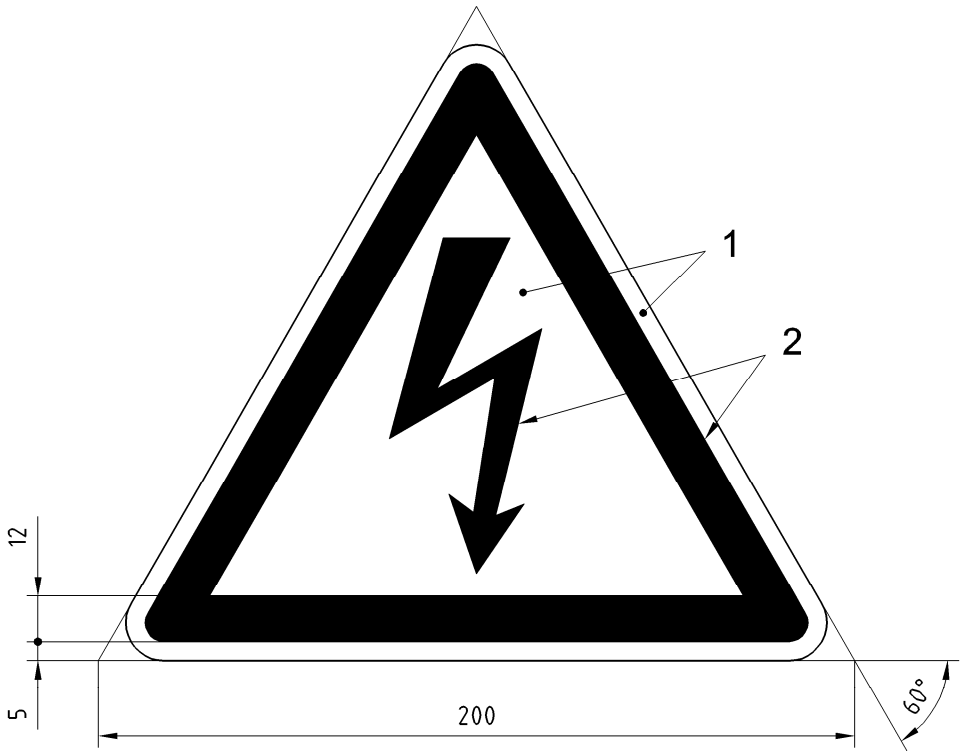
Position: At the right of each solebar or on the parts covering the solebar or on special panels fixed at the same height and on bogie frames where applicable.

Meaning: From this date, Position 3, + maintenance validity period + extended validity period of 3 months, Position 4, (if indicated), the wagon loses its authorisation to run in normal service.

Figure 34

4.5.13 High voltage warning notice (lightning flash)

Dimensions in millimetres



Key:
1 yellow
2 black

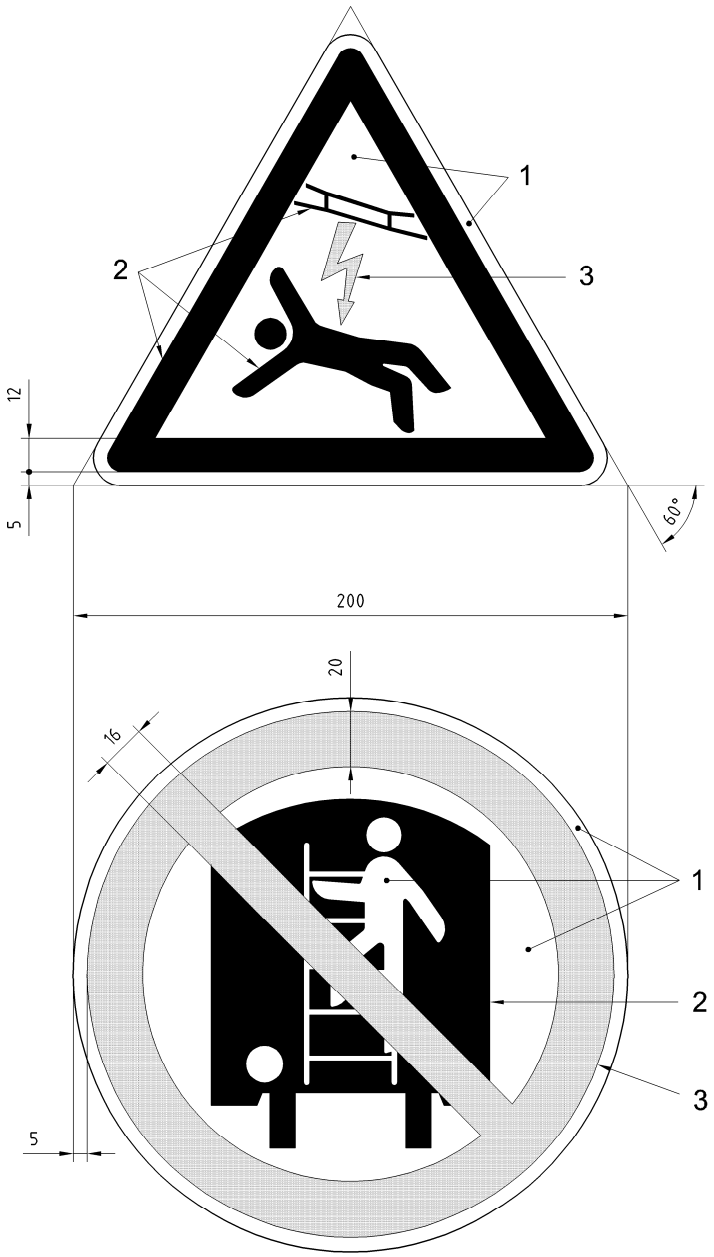
Position: On wagons fitted with steps or ladders, in the immediate vicinity of these fittings, and at a height such that the warning notice is visible before the danger zone is reached. For use on wagons where the top step or upper part of the ladder is more than 2,0 m above rail level.

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.

This warning notice is also to be used wherever high voltage equipment is installed on a wagon.

Figure 35 - High voltage warning notice (lightning flash)

Dimensions in millimetres



Key:
1 yellow
2 black
3 red

Position: On wagons fitted with steps or ladders, in the immediate vicinity of these fittings and at the eye-level height. For use on wagons where the top step or upper part of the ladder is more than 2 m above rail level or wagons where the structure enables climbing onto the wagon.

This figure 36 may be contained in a blue rectangle background 400 mm by 220 mm.

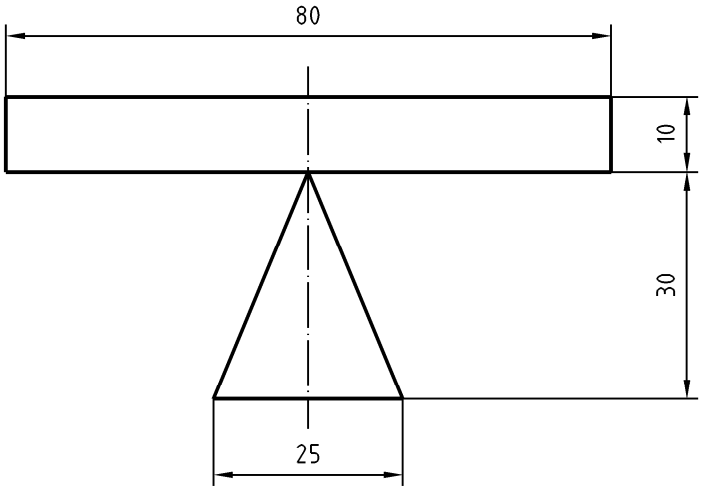
Meaning: Warning against high voltage catenary. Stop! You are entering a particularly dangerous area.

Only duly authorised personnel may work in this area having first taken the necessary precautions

Figure 36 — Additional high voltage warning marking to be used if required

4.5.14 Lifting and jacking points

Dimensions in millimetres

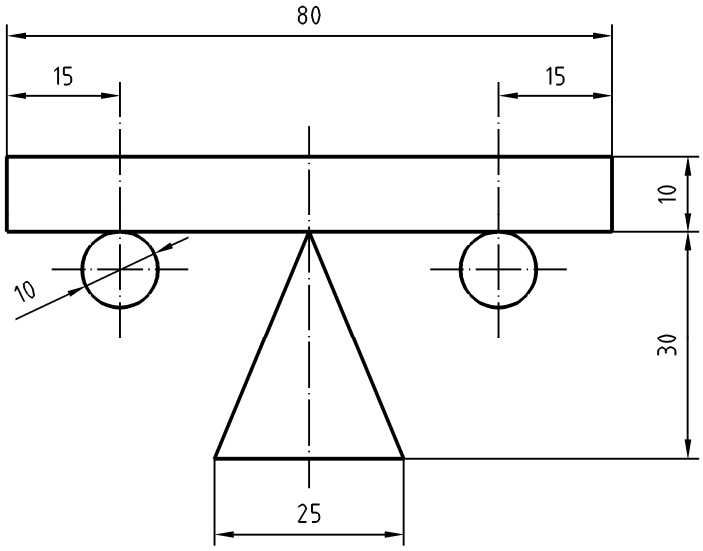


Position: At the designated points on the solebars.

Meaning: Marking indicating where to place jacks, lifting devices, etc., in order to lift the whole of the wagon body without running gear.

Figure 37 — Lifting and jacking point without running gear

Dimensions in millimetres

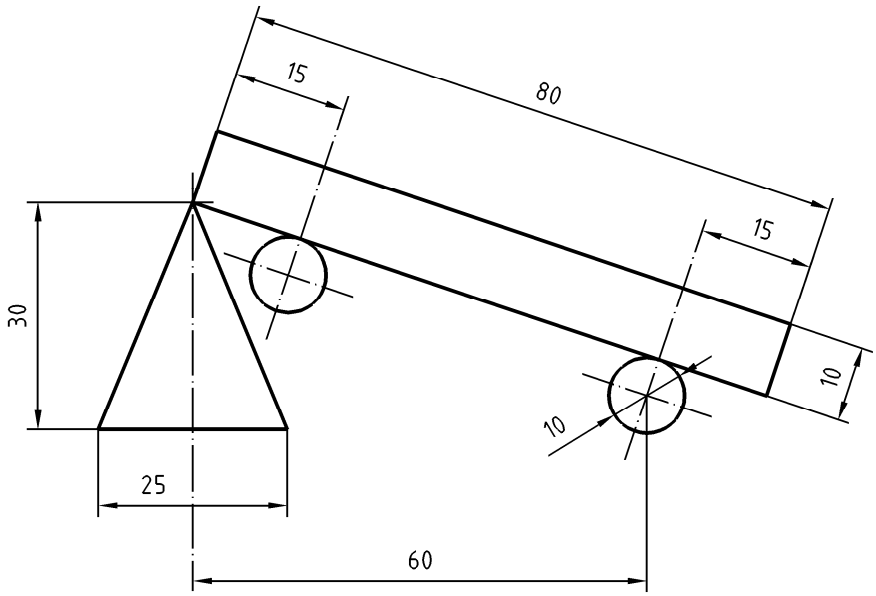


Position: At the designated points on the solebars.

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

Figure 38 — Lifting and jacking at 4 points with or without running gear

Dimensions in millimetres



Position: At the designated points on the wagon headstocks or nearby.

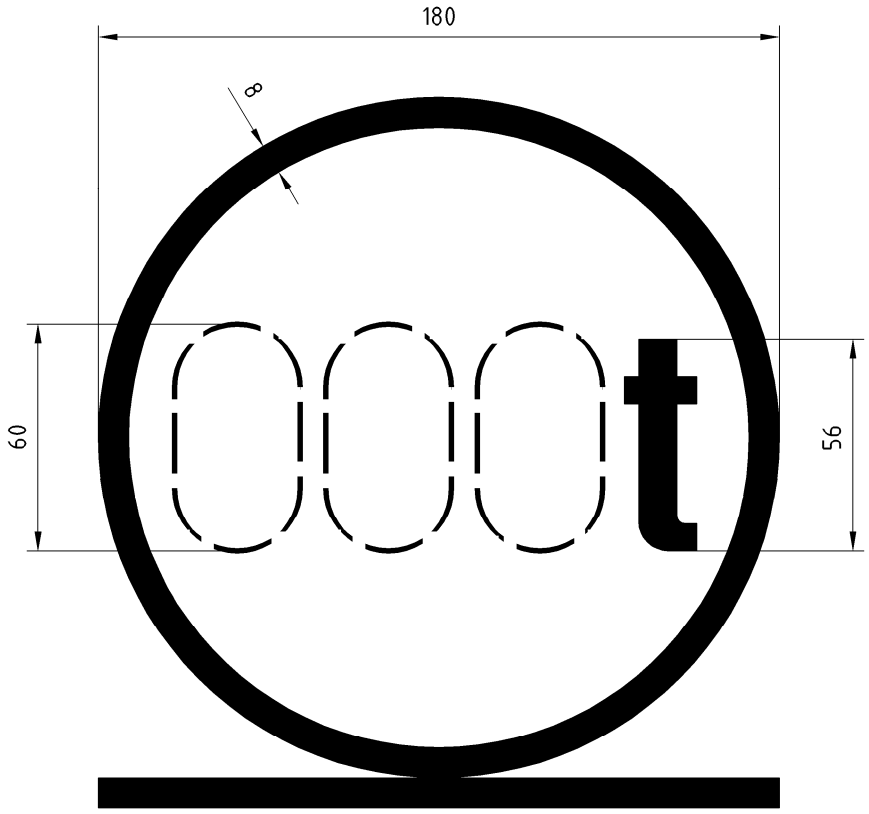
Meaning: Marking indicating where to place jacks, lifting devices, etc., in order to lift the whole of the wagon body by one end, or close to the end, including the running gear where appropriate.

Figure 39 — Lifting and jacking or re-railing with or without running gear at one end only or close to the end

4.5.15 Carrying capacities

4.5.15.1 Carrying capacity en route

Dimensions in millimetres



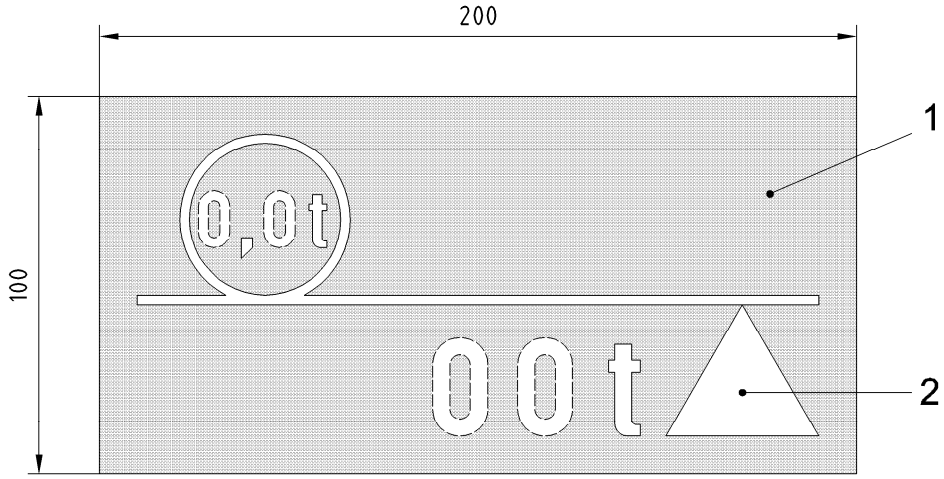
Position: On the right of each solebar or on parts covering the solebar or on special panels fitted at the same height as the solebars.

Meaning: Marking for wagons having a carrying capacity that is greater than the maximum load marked on the load table and for special wagons with no maximum load marking. It indicates in tonnes the maximum authorised load for the wagon concerned.

Figure 40a

4.5.15.2 Maximum load at wagon end during loading and off-loading

Dimensions in millimetres



Key: 1 red background
2 white including all inscriptions

Position: On the right of each solebar or on parts covering the solebar or on special panels fitted at the same height as the solebars.

Meaning: Wheel load (van/lorry), if exceeded, then additional supports for the distribution of the load over the wagon floor are required.

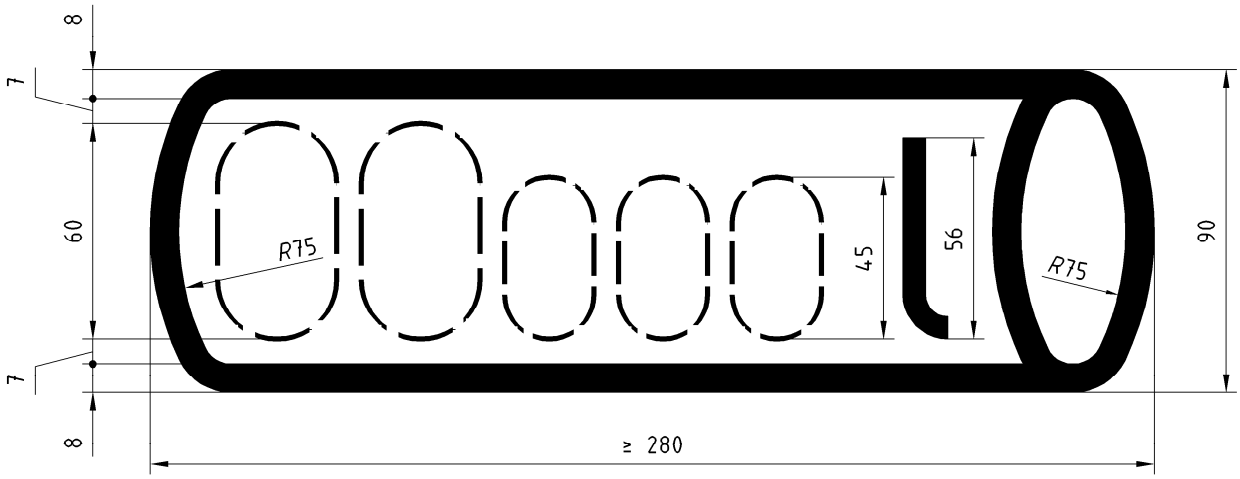
Wheelset load (van/lorry), if exceeded, then the end of the freight wagon should be supported when loading and unloading over the head ramp.

NOTE A van is a covered goods motor vehicle typically without side windows, and a lorry is a large, heavy motor goods vehicle, usually open.

Figure 40b

4.5.16 Volumetric capacities

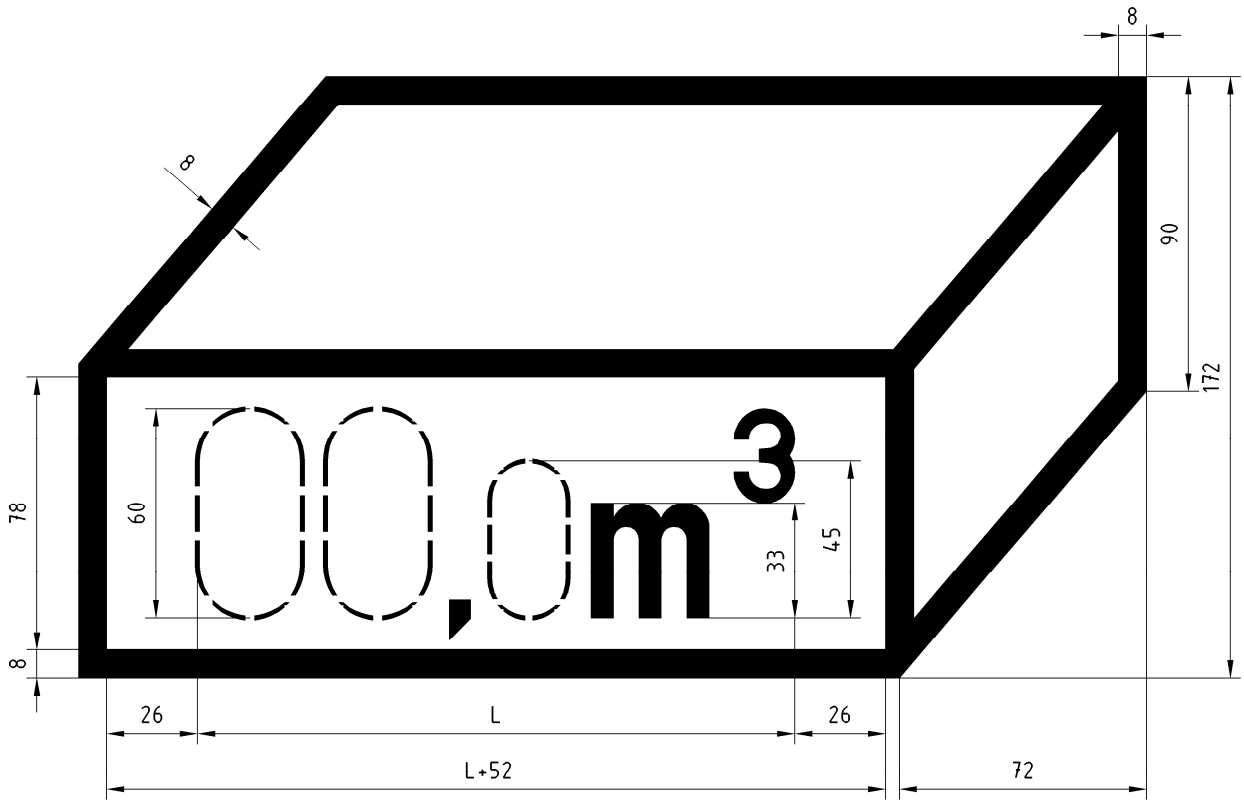
Dimensions in millimetres



NOTE If exceeding 99,999 litres add an extra leading digit.

Figure 41a — Tank and cask wagons

Dimensions in millimetres



Position: On the left of each side of the wagon, wall or the tank itself or on special panels.

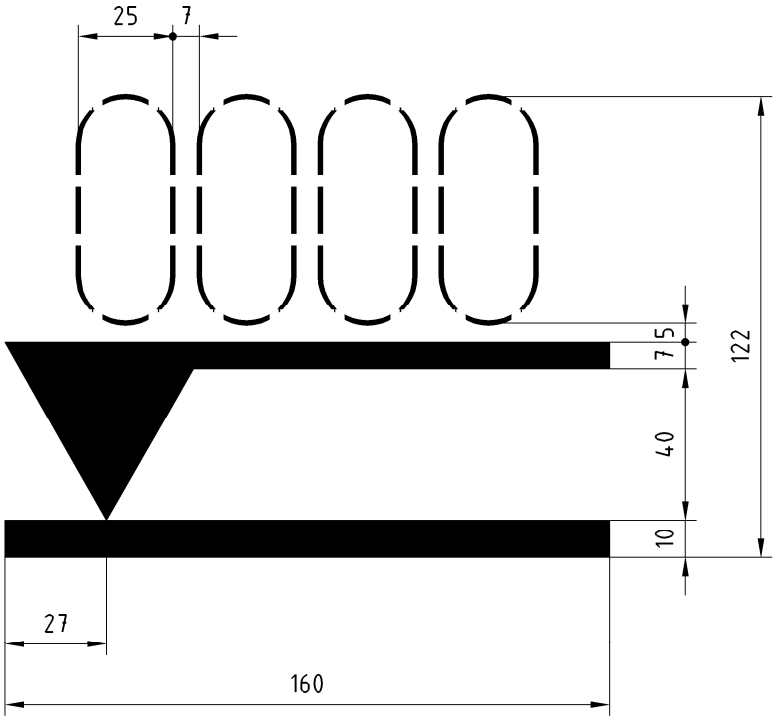
Meaning: Capacity in m^3 or litres according to the type of wagon.

NOTE If exceeding 99.9m^3 or 99,999 litres add an extra leading digit.

Figure 41b — Hopper and box wagons

4.5.17 Height of the loading plane for container wagons in tare condition

Dimensions in millimetres



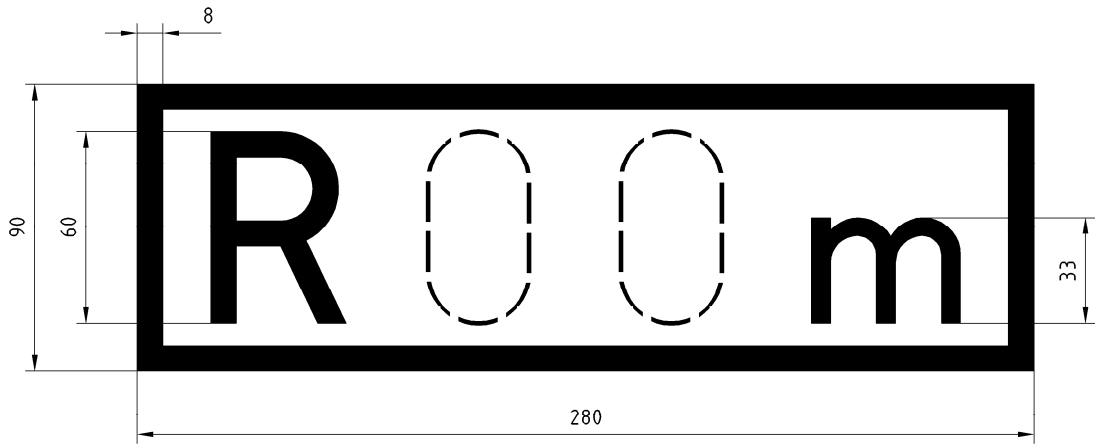
Position: On the right of each solebar.

Meaning: This marking is carried by container wagons that are suitable for transporting large containers and/or swap bodies. It indicates the height in millimetres of the loading plane when the wagon is in tare condition.

Figure 42

4.5.18 Minimum curve radius

Dimensions in millimetres



Position: On the left of each solebar or on parts covering the solebar or on special panels fitted at the same height as the solebars.

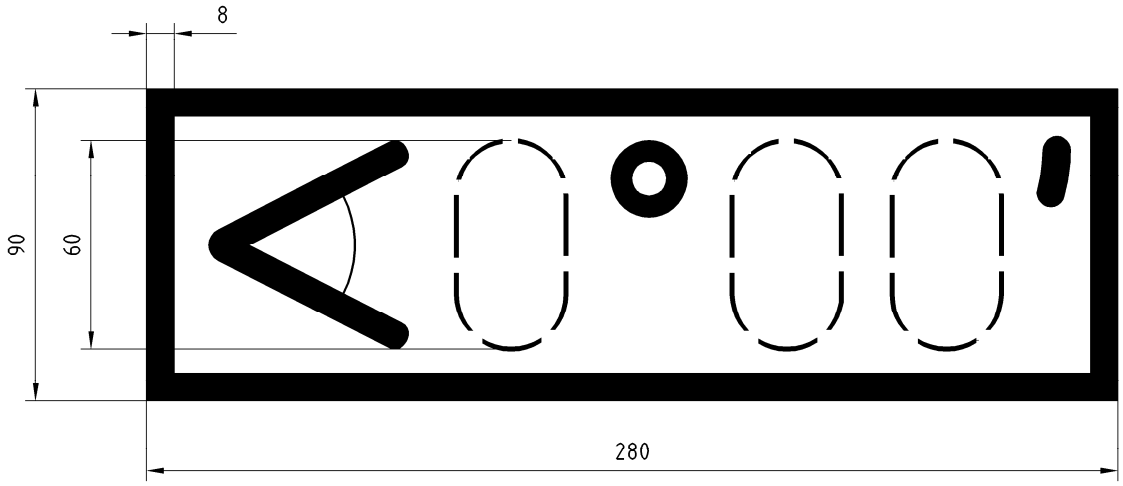
Meaning: This marking is for freight wagons which are only able to negotiate curves over 35 m in radius, indicating the minimum authorised curve radius.

NOTE On wagons with special fittings, for example low-loader wagons, this indication refers to the radius that the wagon can negotiate with the central position of the lateral sliding device and/or the maximum distance between bogie centres.

Figure 43

4.5.19 Maximum ferry ramp angle

Dimensions in millimetres



Position: On the left of each solebar or on parts covering the solebar or on special panels fitted at the same height as the solebars.

Meaning: Indicates wagons that can only negotiate a ramp angle of less than 2°30‘ when running onto/off ferries.

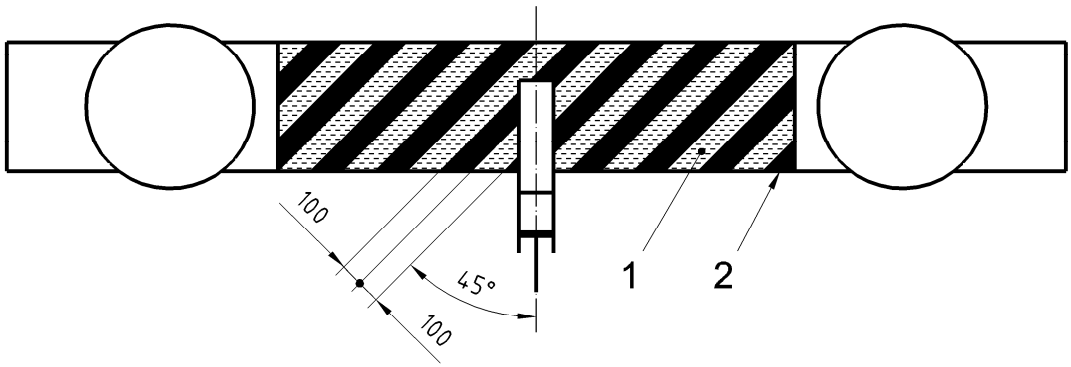
The marking shall specify the maximum ramp angle which the wagon can negotiate.

Figure 44

4.5.20 Impact protection

4.5.20.1 Wagons fitted with anti-crash-components

Dimensions in millimetres



Key: 1 yellow
2 black

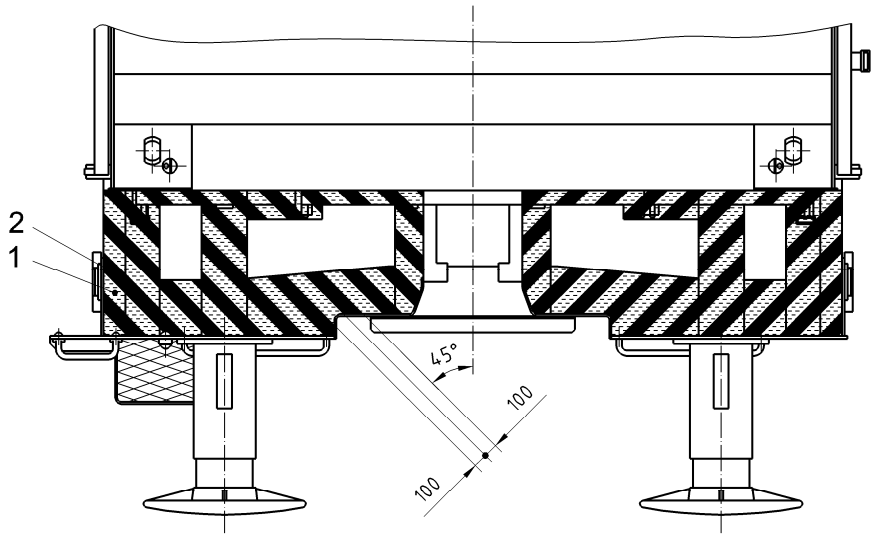
Position: On the headstocks between the buffers.

Meaning: Wagon fitted with anti-crash components whereby the Berne rectangle might be encroached.

Figure 45

4.5.20.2 Wagons fitted with a telescopic end frame and long-stroke shock absorbers

Dimensions in millimetres



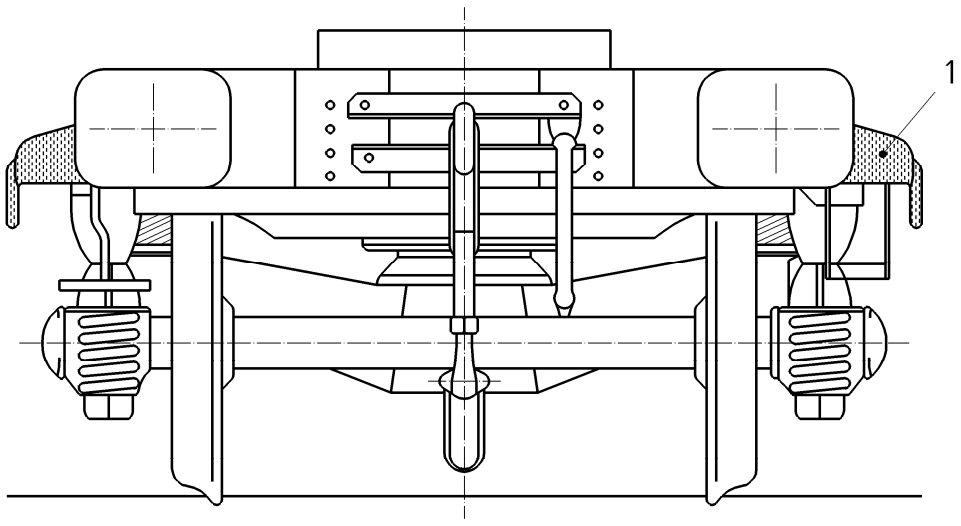
Key: 1 yellow
2 black

Position: Covering the danger areas for wagons fitted with such shock absorbers.

Meaning: In the event of impact, the wagon ends become displaced in relation to the underframe. Distances and clearances are reduced as a result.

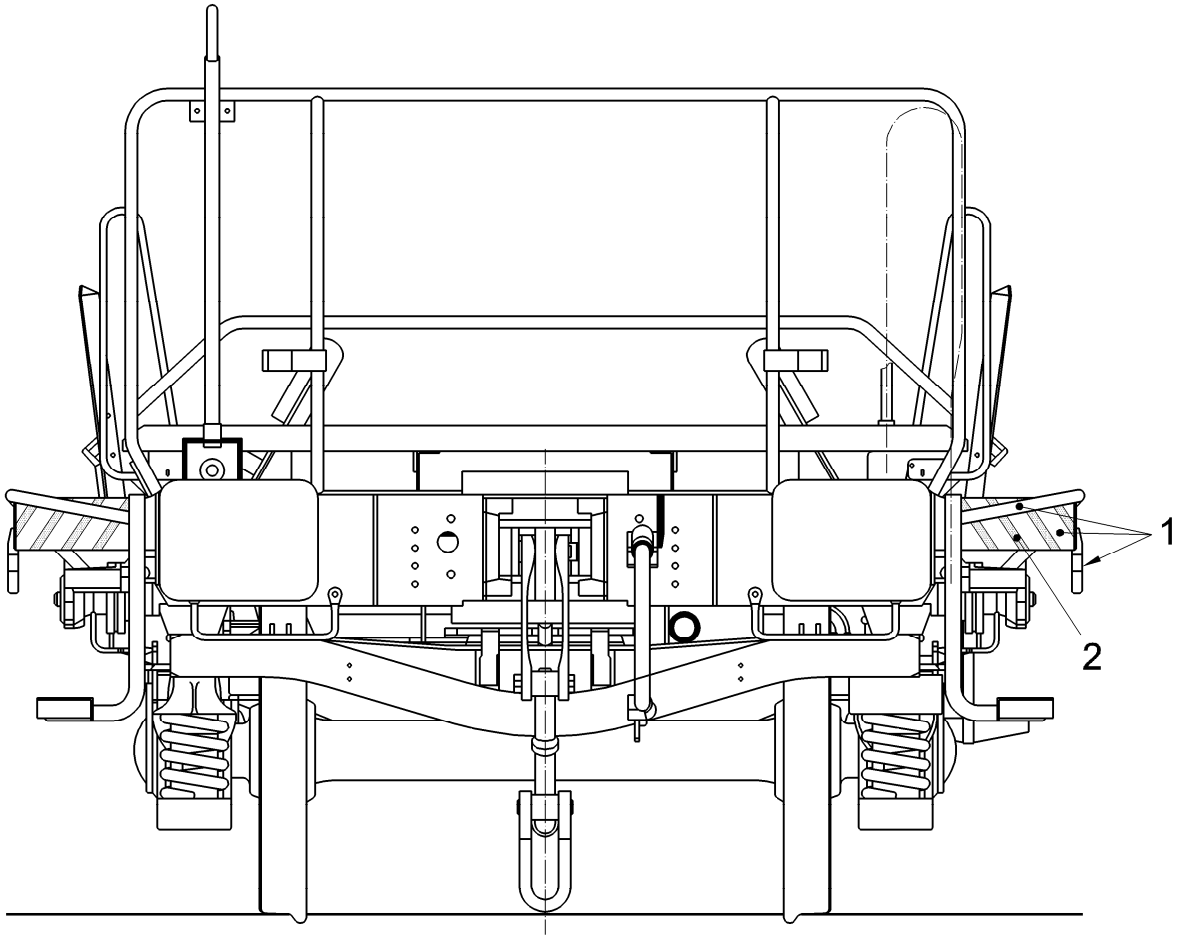
Figure 46

4.5.21 Wagons fitted with projecting tow hooks



Key: 1 yellow

Figure 47



Key: 1 projecting tow hooks and sheet metal edges with yellow painted markings
2 tow hook support: black diagonal stripes on yellow background

Position: Tow hooks and their fenders projecting more than 150 mm in relation to the body structure and any supports and brackets shall be colour-marked as follows:

Tow hooks and fenders: in yellow

Colour-marking of tow hook supports and brackets:

— Projecting up to 250 mm: in yellow (Figure 47)

— Projecting more than 250 mm: black and yellow diagonal stripes of 50 mm width (Figure 48)

Meaning: Marking serving as a warning against the risk of injury.

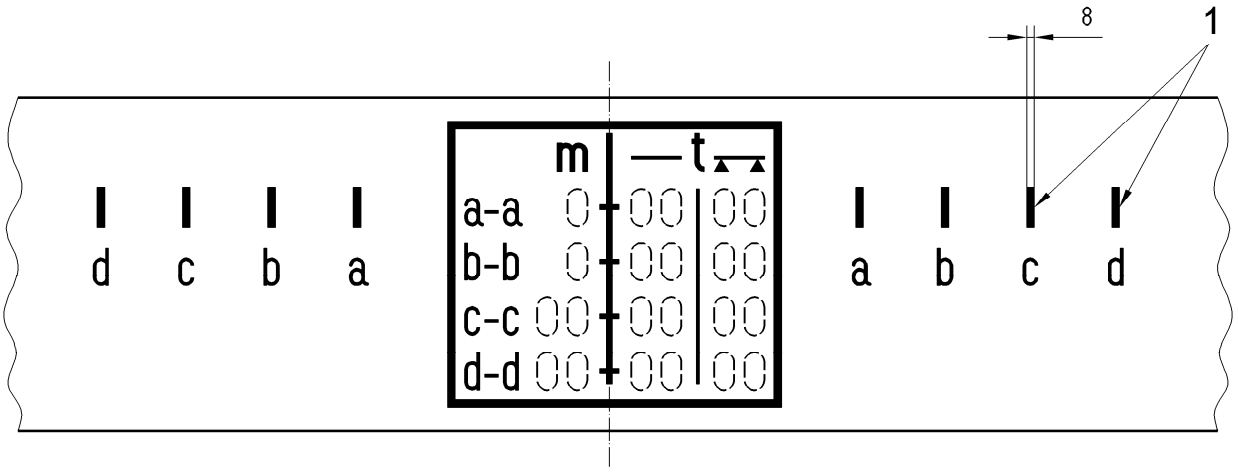
Figure 48

4.5.22 Concentrated payloads

4.5.22.1 Example of concentrated loads spread over supporting surfaces of different lengths and loads resting on two separate points

4.5.22.1.1 Width of bearing surface ≥ 2 m

Dimensions in millimetres



Key: 1 markers on solebars

Legend

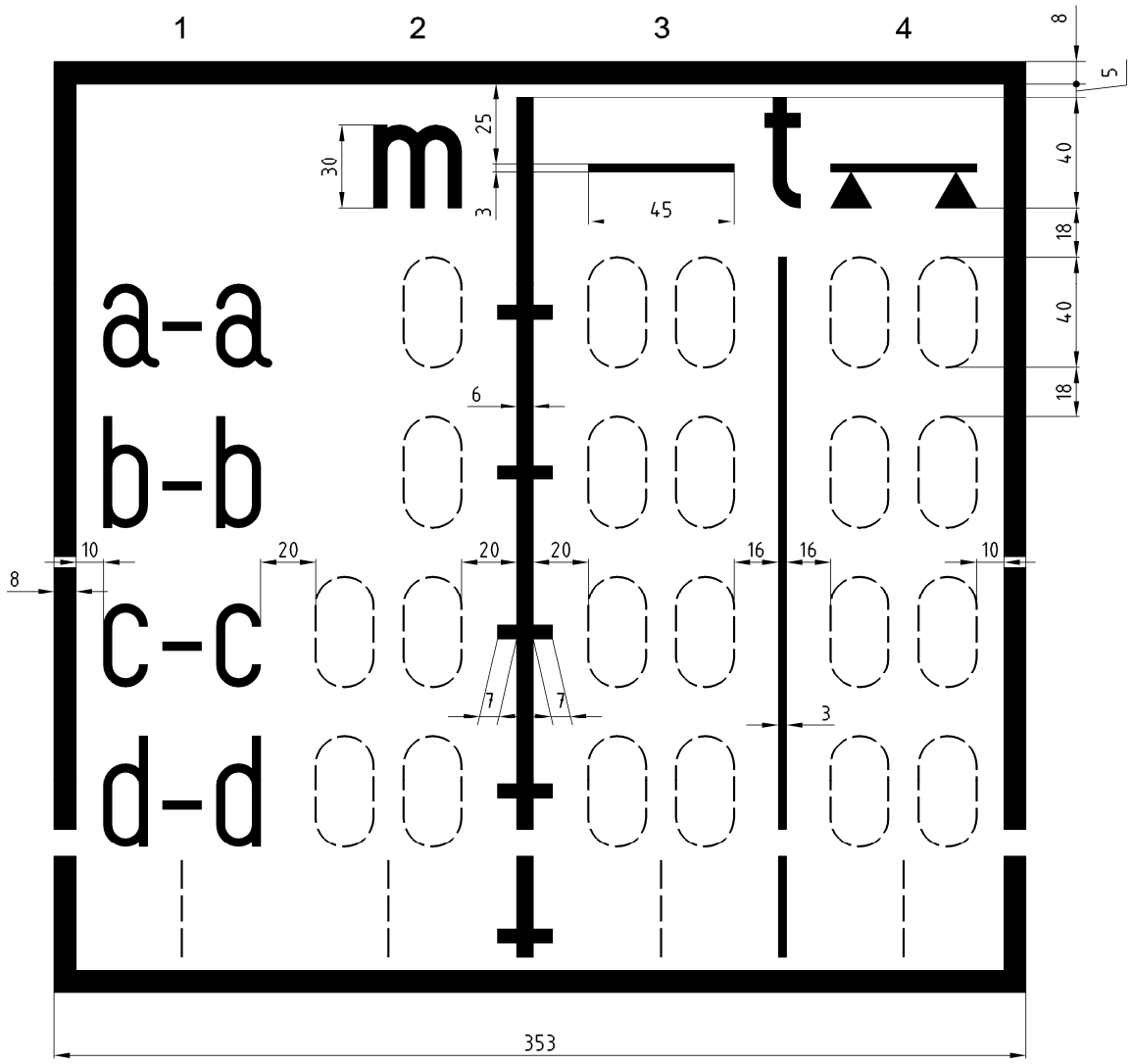
Maximum value for different lengths:

— of concentrated loads spread over the lengths of the supporting surface

— of loads resting on two supporting points

Figure 49a

Dimensions in millimetres



Key:

1 indication of the length of the supporting surfaces of the concentrated loads or distance between supporting points
2 distance, in metres, between the length markers
3 maximum value in tonnes, of the concentrated loads
4 maximum value in tonnes, of loads resting on two supporting points

Legend

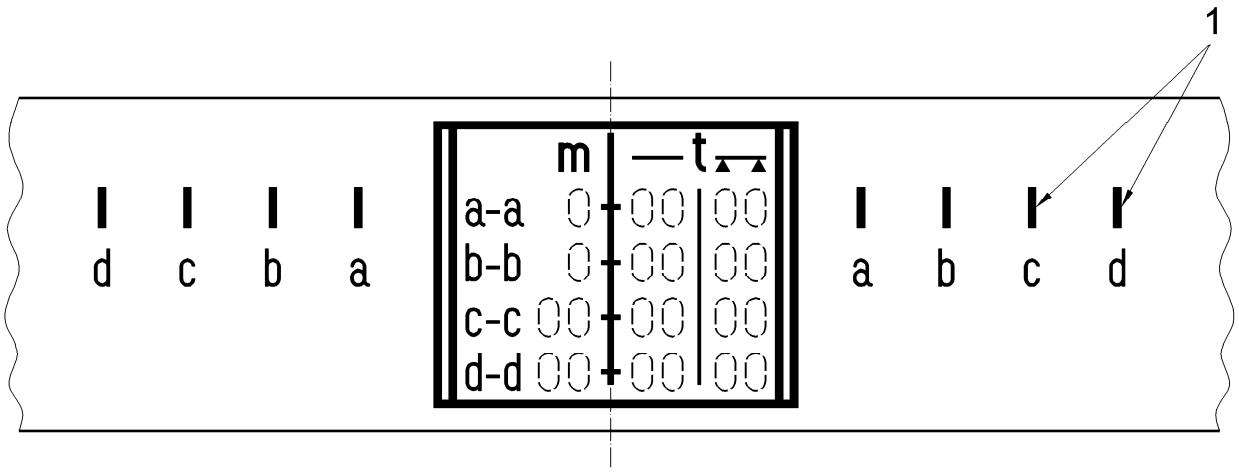
Maximum value for different lengths:

— of concentrated loads spread over the lengths of the supporting surface

— of loads resting on two supporting points

Figure 49b

4.5.22.1.2 Width of bearing surface ≥ 1,20 m



Key: 1 markers on solebars

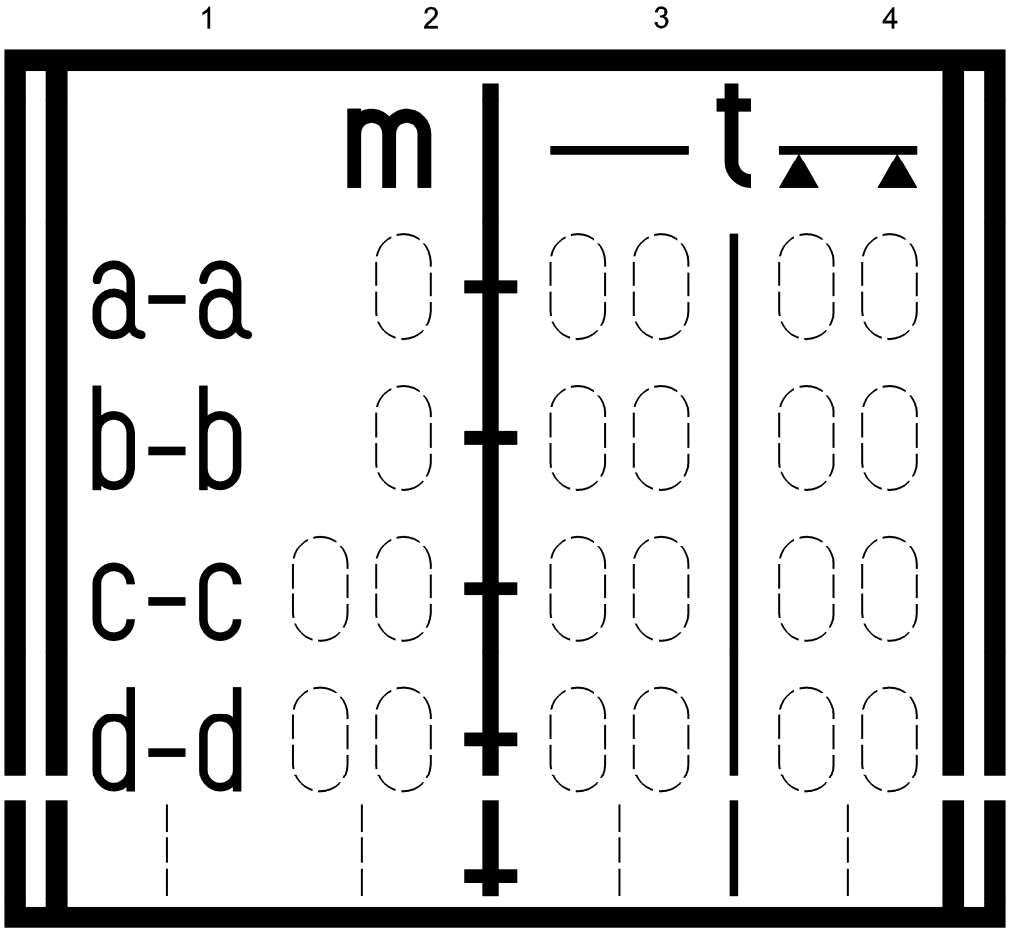
Legend

maximum value for different lengths:

— of concentrated loads spread over the lengths of the supporting surface

— of loads resting on two supporting points

Figure 50a



Key:

1 indication of the length of the supporting surfaces of the concentrated loads or distance between supporting points;

2 distance, in metres, between the length markers;

3 maximum value, in tonnes, of the concentrated loads;

4 maximum value in tonnes, of loads resting on two-supporting points

Legend

maximum value for different lengths:

— of concentrated loads spread over the lengths of the supporting surface

— of loads resting on two supporting points

Position: At centre of each solebar or on parts covering the solebar or on special panels fitted at the same height as the solebars.

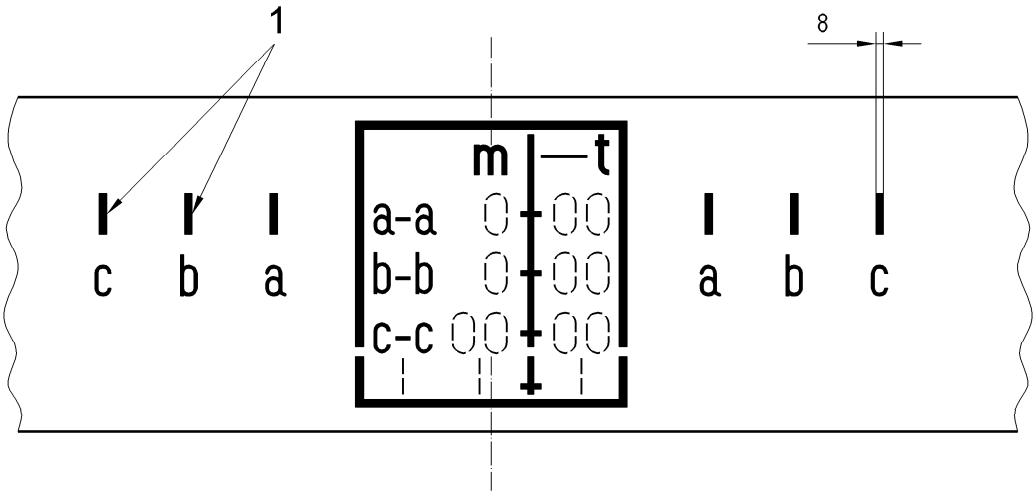
Meaning: On flat wagons, this marking indicates the maximum values for concentrated loads and loads resting on two supporting points. This is optional for other wagons which may, if required, carry this specified marking.

Figure 50b

4.5.22.2 Example of concentrated loads distributed over supporting surfaces of different length

4.5.22.2.1 Width of bearing surface ≥ 2 m

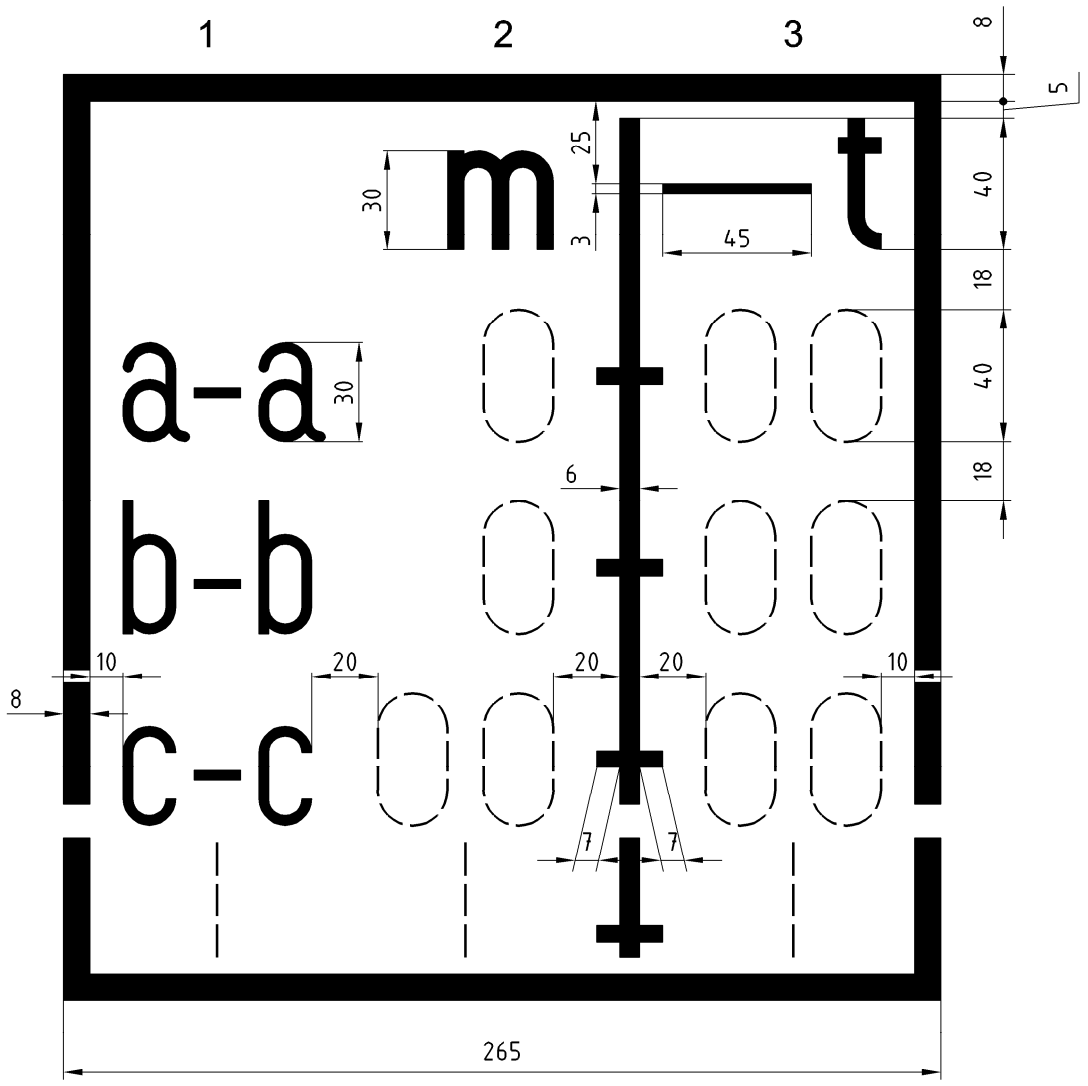
Dimensions in millimetres



Key: 1 markers on solebars

Figure 51a

Dimensions in millimetres



Key:

1 indication of the length of the supporting surfaces of the concentrated loads or distance between supporting points

2 distance, in metres, between the length markers

3 maximum value, in tonnes, of the concentrated loads. Maximum value for different lengths of concentrated loads:

Legend

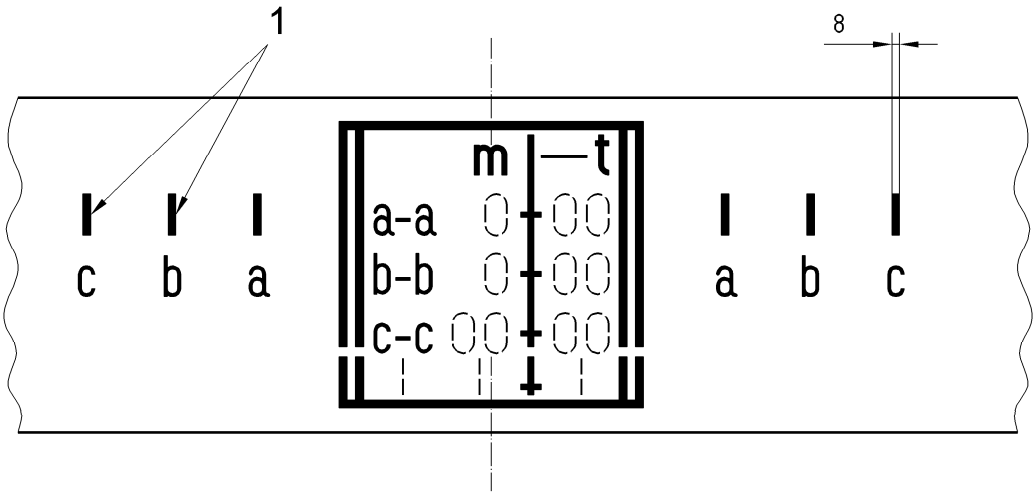
maximum value for different lengths:

— spread over the lengths of the supporting surface

Figure 51b

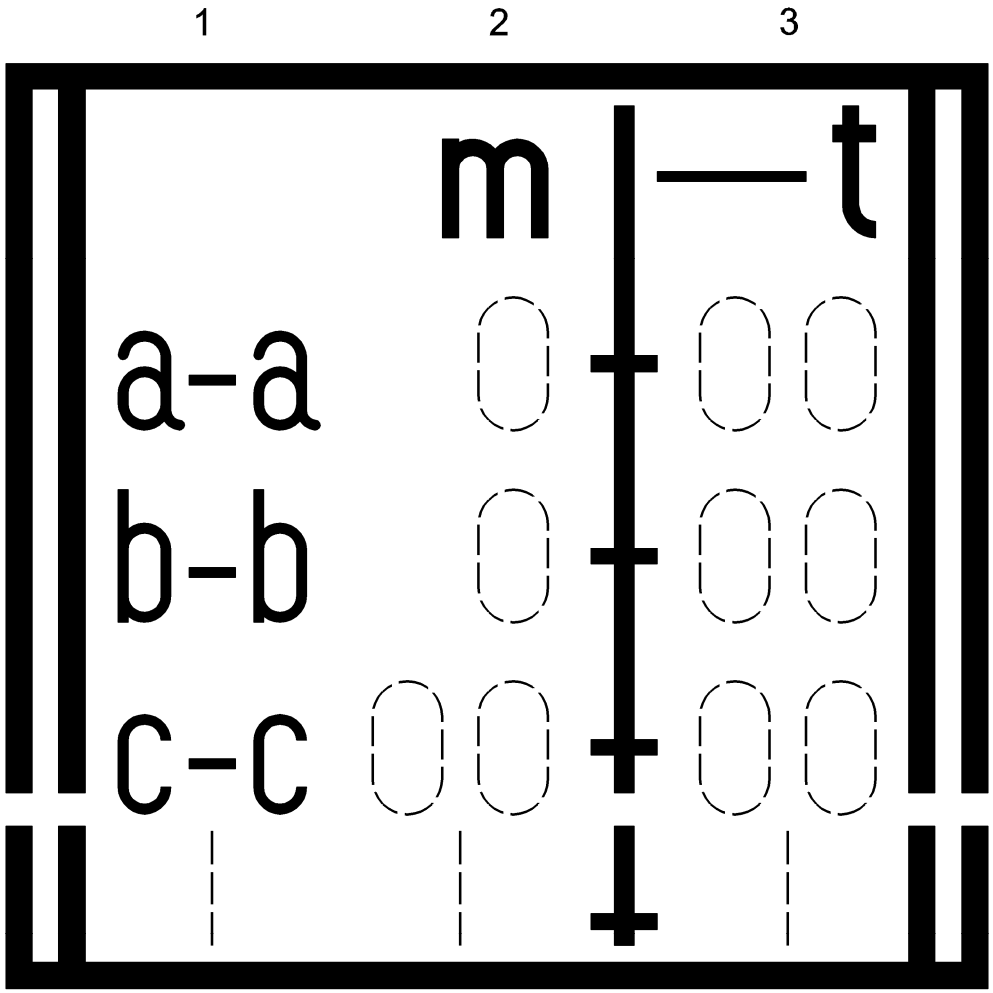
4.5.22.2.2 Width of bearing surface ≥ 1,20 m

Dimensions in millimetres



Key: 1 markers on solebars

Figure 52a



Key:

1 indication of the length of the supporting surfaces of the concentrated loads or distance between supporting points

2 distance, in metres, between the length markers

3 maximum value, in tonnes, of the concentrated loads.

Legend

maximum value for different lengths of concentrated loads:

— — spread over the lengths of the supporting surface

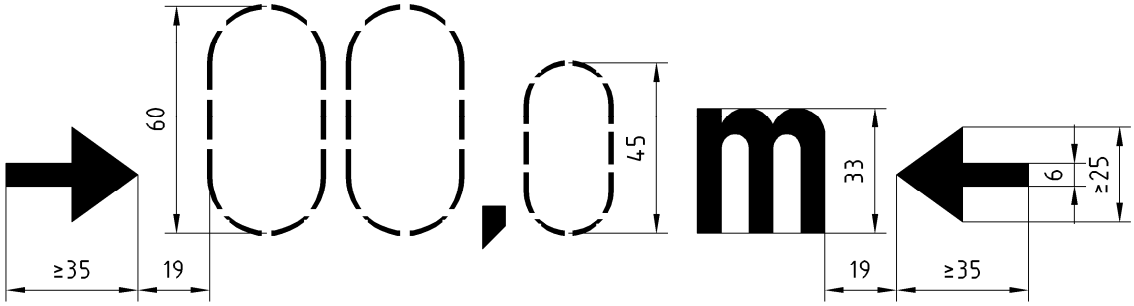
Position: At centre of each solebar, or on parts covering the solebar or on special panels fitted at the same height as the solebars.

Meaning: On flat wagons, this marking indicates the maximum values for concentrated loads. This is optional for other wagons which may, if required, carry this specified marking.

Figure 52b

4.5.23 Distance between end axles or bogie centres

Dimensions in millimetres



Position: On the right of each solebar or on the bogie frame (it is sufficient for the marking to feature on the left-hand side of the bogie, on each side of the wagon) or on parts covering the solebar or on special boards fitted at the same height as the solebars.

NOTE On articulated wagons, the marking needs to be on each solebar.

Meaning: Indicates the distance between

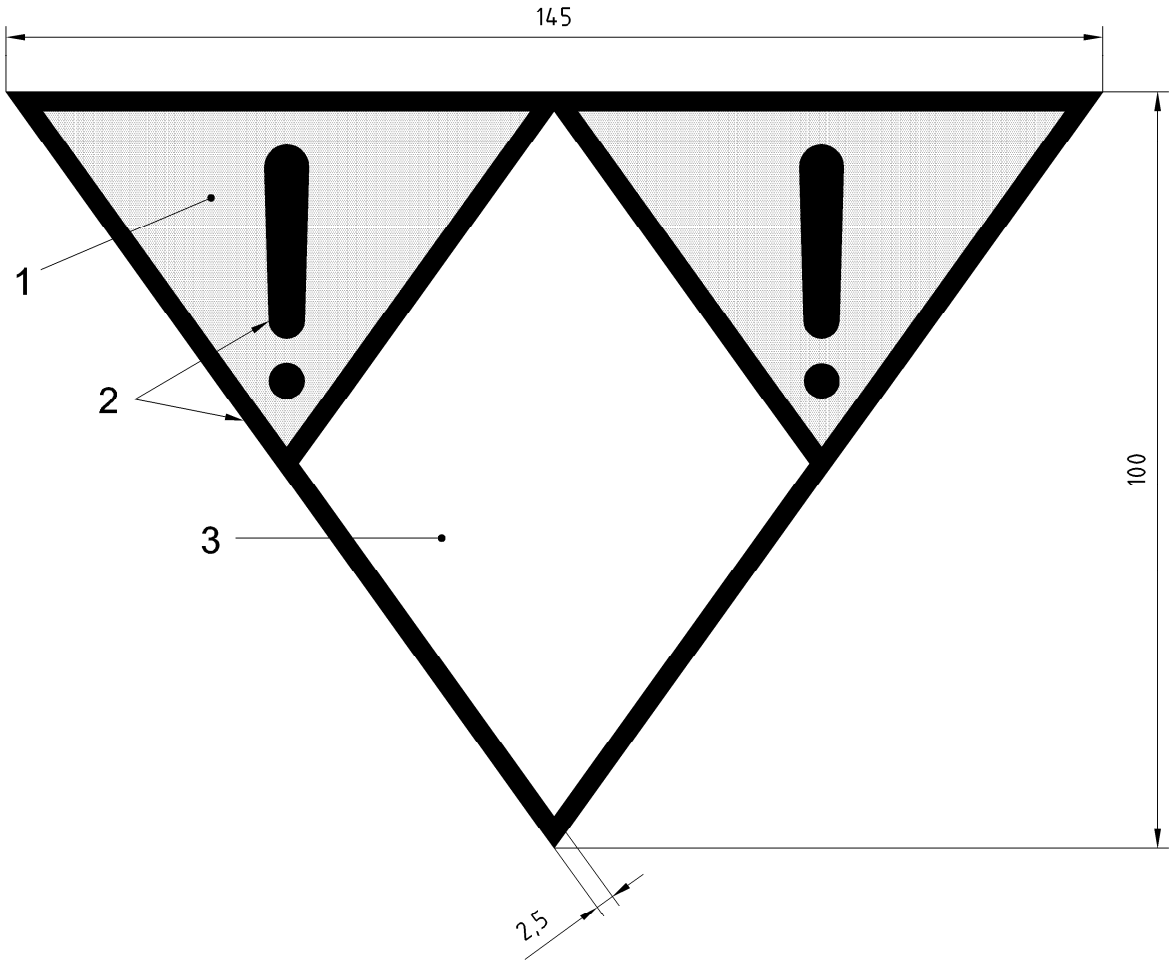
- the end axles of wagons without bogies,
- bogie pivots,
- outer axles of each bogie,
- the bogie centres per each unit of articulated wagons.

Figure 53

4.5.24 Wagons which need special care when being shunted

4.5.24.1 Wagons not to be loose-shunted

Dimensions in millimetres



Key: 1 red
2 black
3 white

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

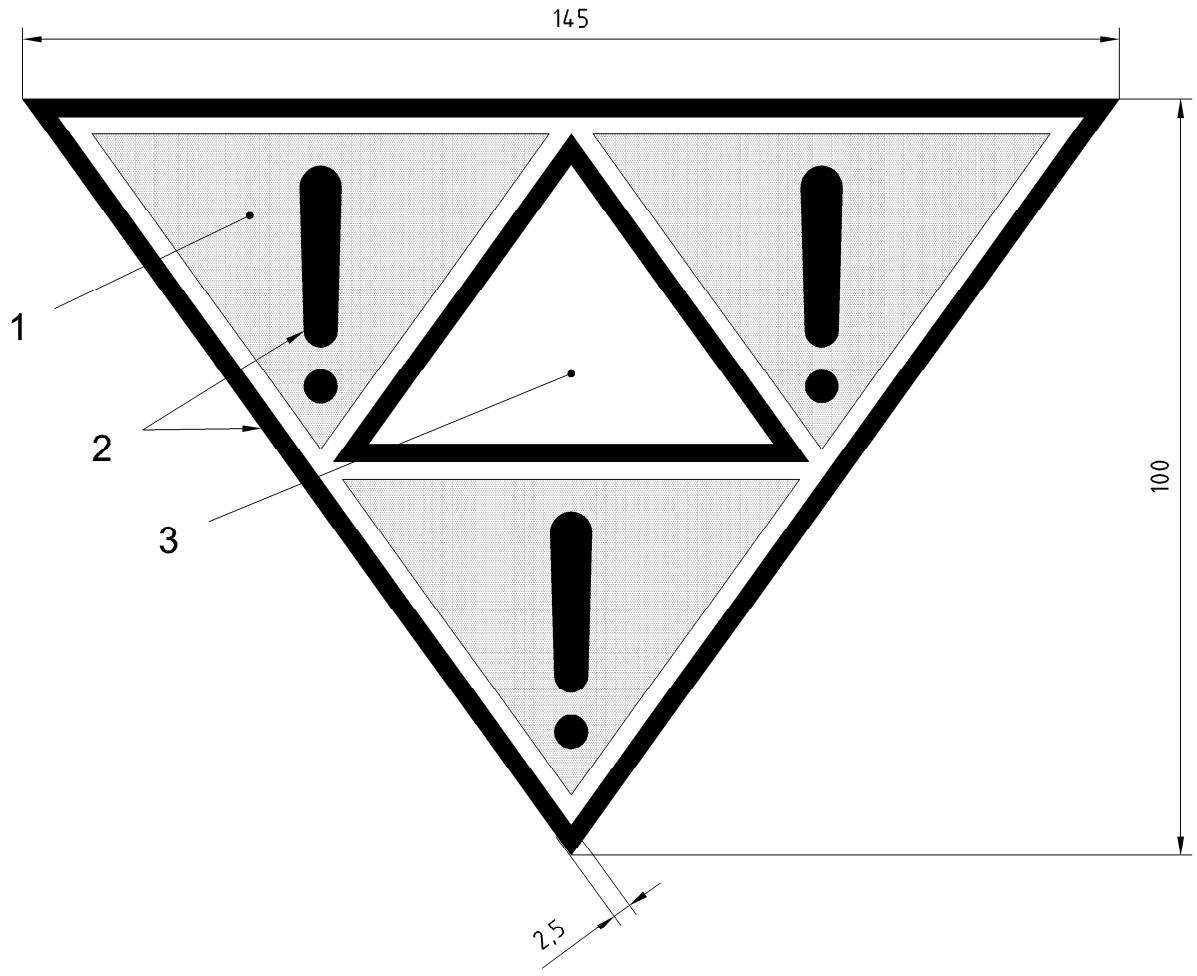
Meaning: Special care should be taken when marshalling trains to avoid damaging the wagon. Wagon shall not be loose-shunted (shall not impact or be impacted) with other rolling stock without taking special precautions.

NOTE This marking is compulsory on wagons with special fittings (electronic equipment, refrigerator units, etc.) for which normal buffing impacts are not authorised as they are liable to damage the equipment. These wagons may not carry the TEN / RIV marking but can be covered by bilateral agreements.

Figure 54a

4.5.24.2 Wagons that shall not be fly- or gravity-shunted

Dimensions in millimetres



Key:
1 red
2 black
3 white

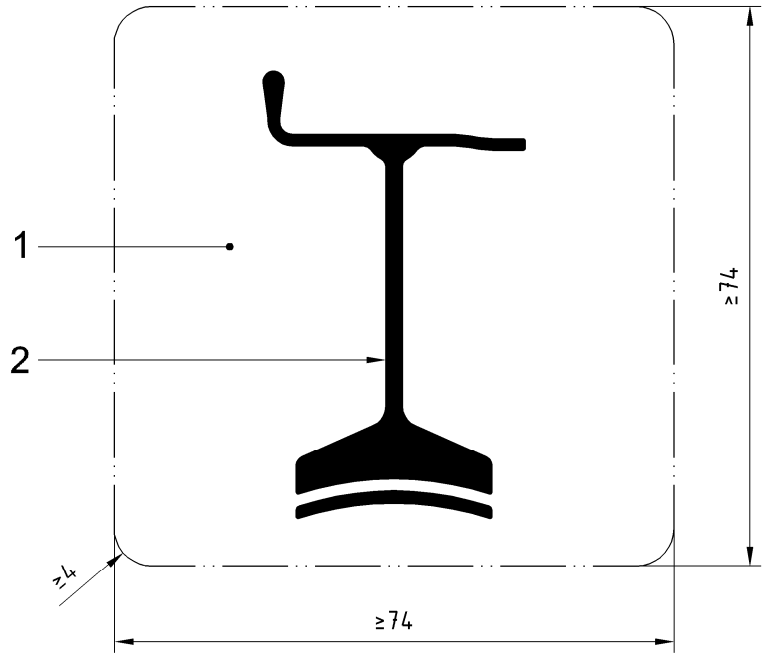
Position: On the left of each solebar or on parts covering the solebar or on special boards fitted at the same height as the solebars.

Meaning:
— Wagon shall not be fly- or gravity-shunted,
— Wagon shall be marshalled by a motive power unit,
— Wagon shall not be loose-shunted.

Figure 54b

4.5.25 Manually applied parking brake

Dimensions in millimetres



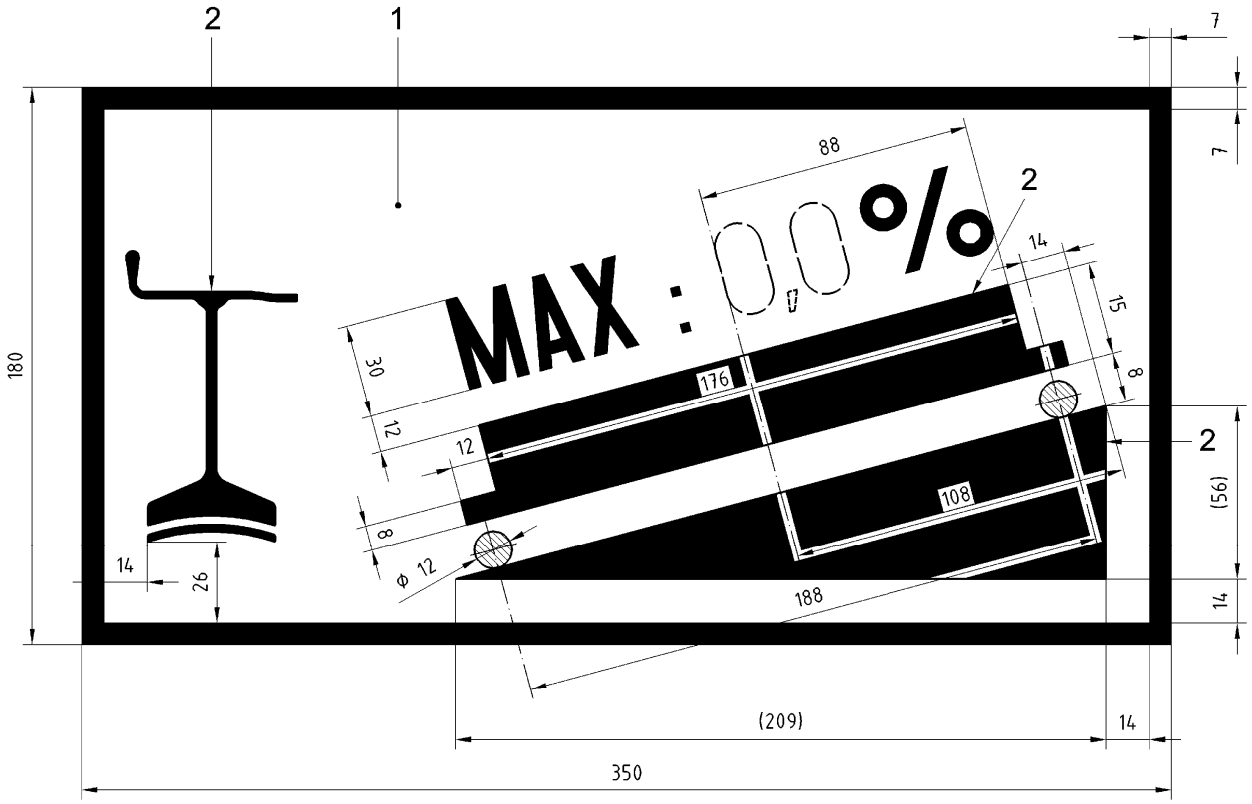
Key: 1 white or yellow
2 black

Position: On the solebar on both sides of the wagon near to the access point for the hand brake.

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

Figure 55a

Dimensions in millimetres



Key: 1 white or yellow
2 black

Position:
— If Handbrake operated from ground level: On the operating shaft, close to each handbrake wheel
— If Handbrake operated from the platform: Next to the marking shown in Figure 8

Meaning: The marking is needed for wagons fitted with composite brake blocks and hand brake which are not capable of meeting a 4 % gradient. The figure shown indicates the maximum gradient at which the handbrake may be used with no risk of the wagon rolling away.

Figure 55b – Additional marking for the manually applied parking brake for wagons with composite brake blocks

4.5.26 Isolating brake handle

Dimensions in millimetres

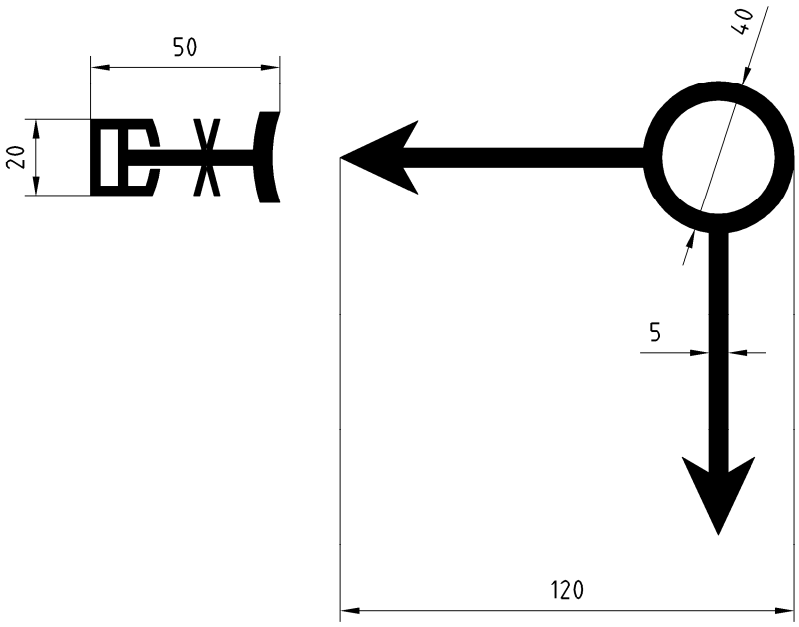


Figure 56a — Marking for one side of the wagon

Dimensions in millimetres

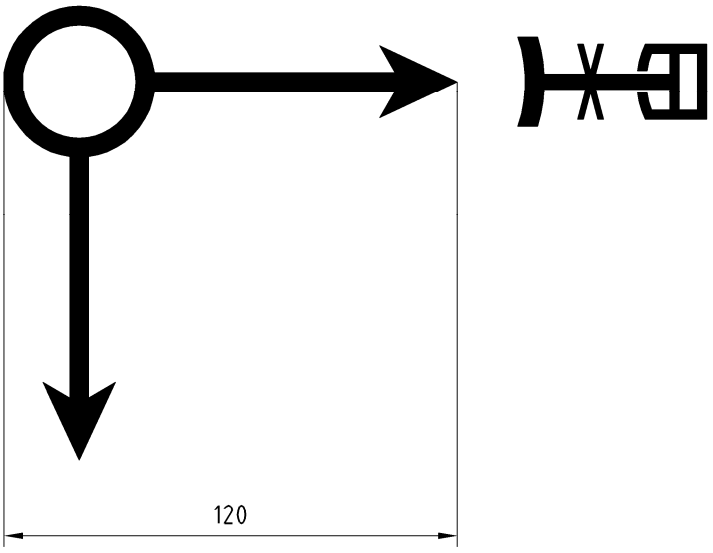


Figure 56b — Marking for the other side of the wagon

Figure 56c - Alternative markings **Figure 56d - Alternative markings**

Position: On both sides of the wagon near to each distributor isolating handle with corresponding left or right marking.

Alternative markings 56c and 56d may be used to complete Figures 56a and 56b or as stand alone items at lever end positions.

Meaning: The pneumatic brake is isolated when the handle is in the horizontal position.

Figure 56

4.5.27 Instructions and safety advices for special equipment

Examples of Markings for wagons with special fittings (wagons with automatic discharge facility, opening roof, etc.).

Wandarretierung lösen durch Schließen und Öffnen mit Bedienhebel.

Débloquer l'arrêt mural en l'ouvrant et le fermant avec le levier de commande.

Release wall locking device by closing and opening with control lever.

Allentare il blocco della parete mediante chiusura e apertura con la leva di servizio.

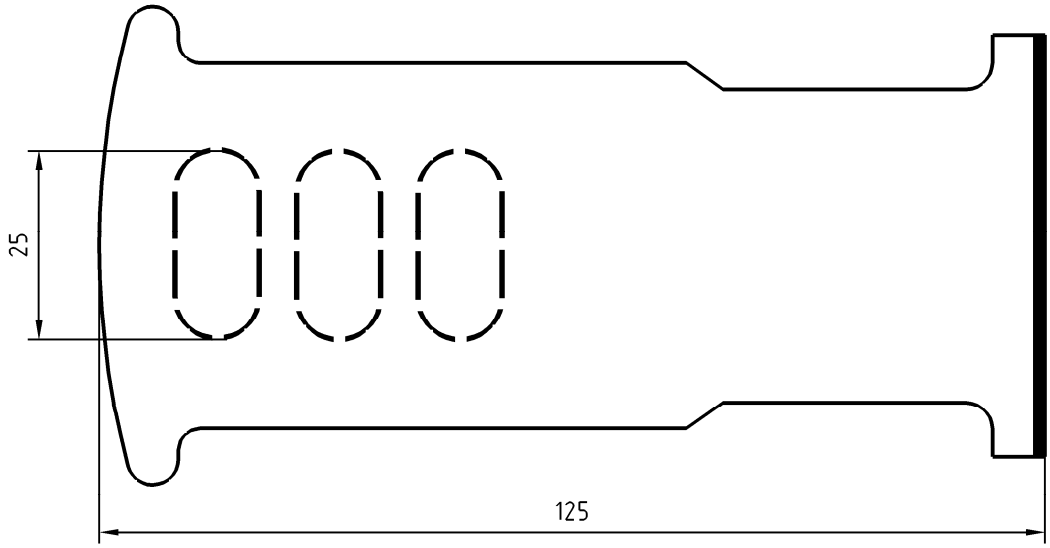
Position: At suitable places on both sides of the wagon.

Meaning: Instructions on how to operate these fittings and the safety measures to be taken, if possible in several languages in addition to the four shown.

Suitable pictograms can be added to these instructions.

4.5.28 Buffer stroke

Dimensions in millimetres



Position: On the headstocks between the buffers near the left buffer

Meaning: This marking indicates the buffer stroke. It is needed if the buffer stroke is greater than 105 mm.

Figure 57

4.5.29 Numbering of wheelsets

On the solebar, on both sides of the wagon, a numerical reference of the wheelset above each axle-box, corresponding to the position of the wheelset in increasing order from a selected wagon extremity shall be indicated.

For the order of wagon extremities EN13775 may be used for reference. Minimum height of the characters to be 40 mm.

4.5.30 Brake system markings

4.5.30.1 Examples of abbreviated references for compressed air brakes

1. Inscriptions denoting the manufacturer's brake type

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 und Metcalfe, Distributor DMD 3	DM
MZT HEPOS	MH
SAB-WABCO, type SW 4/SW 4C/SW 4/3	SW
Distributor KE-483	KE 483
Bumar-Fablok, type MBF-01A, MBF-01B,MBF-02	FL
Matrosow	M

2. Inscriptions denoting the system type of air brake

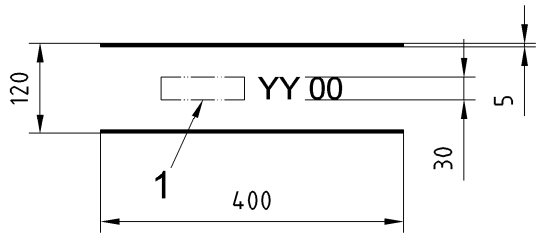
Freight train brake	G
Passenger train brake	P
High power brake	R
G-P changeover device	GP
P-R changeover device	PR
G-P-R changeover device	GPR
Automatic load-proportional braking system	A

Position: In the middle of each solebar or on parts covering the solebar or on special boards fitted at the height of the solebars, near the changeover devices for the brake with the other brake markings

4.5.30.2 Changeover device for air brakes. Marking of the braked weight on wagons. Brake type abbreviations

4.5.30.2.1 Braked weight of wagons without empty/loaded changeover device

Dimensions in millimetres



Key: 1 This marking may be preceded by the word “Brake”.

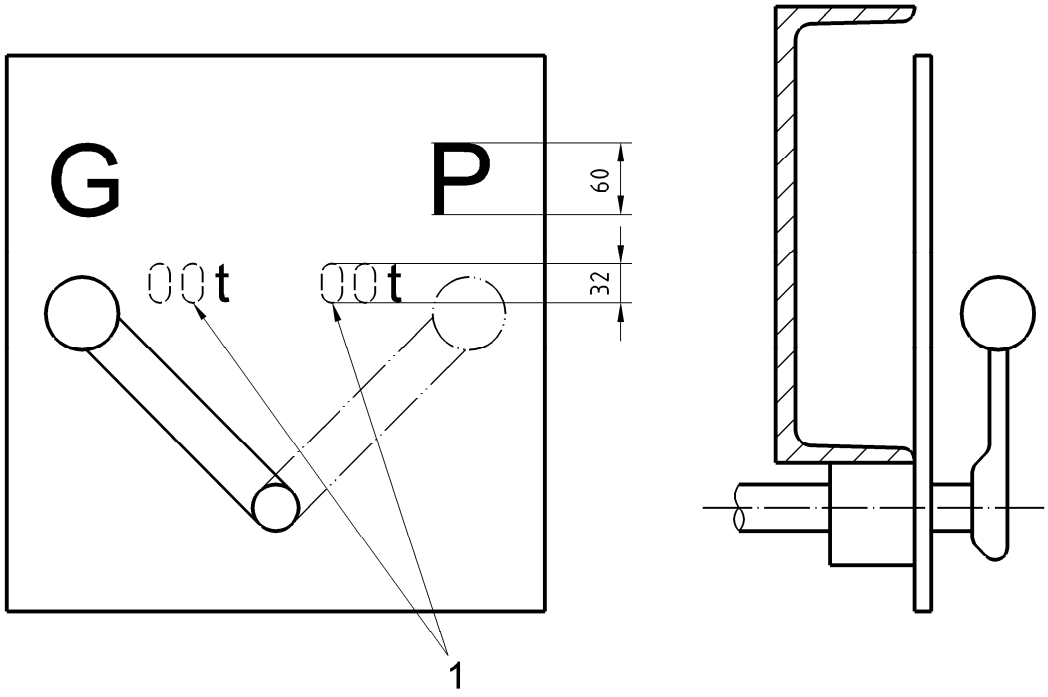
Position: On each solebar, close to the indication of the brake system

Meaning: Marking indicating the brake type (YY) as shown in point 4.5.30.1 and indication of the braked weight in tonnes.).

Figure 58a

4.5.30.2.2 “Freight / Passenger” (G/P) changeover device

Dimensions in millimetres



Key:
- G goods
- P passenger
- 1 This braked weight is not used for new wagons

Position: On the plate behind the changeover lever, alongside the corresponding lever position, if the braked weights (t) in the Freight (G) and Passenger (P) positions are different.

Meaning: On wagons that are fitted with a Freight / Passenger (G/P) changeover device, the changeover from one regime to another is made using a lever fitted with an end knob.

In the Freight braking mode, the lever slants upwards and to the left.

In the Passenger braking mode, the lever slants upwards and to the right.

Figure 58b

4.5.30.2.3 "Empty/Loaded" changeover device

Wagons fitted with a single "empty/loaded" changeover devices 59a 59b 59c and 60

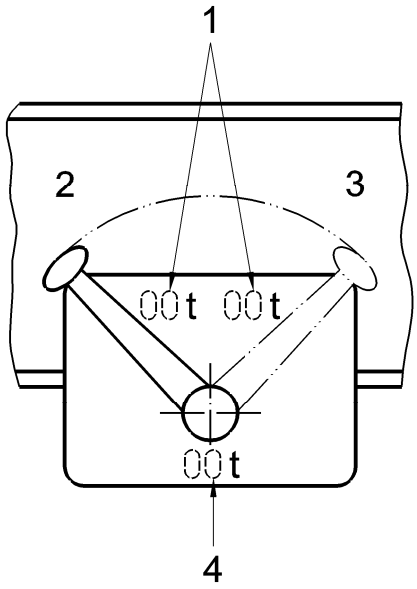


Figure 1a — "Empty" braking position plus one "loaded" braking position

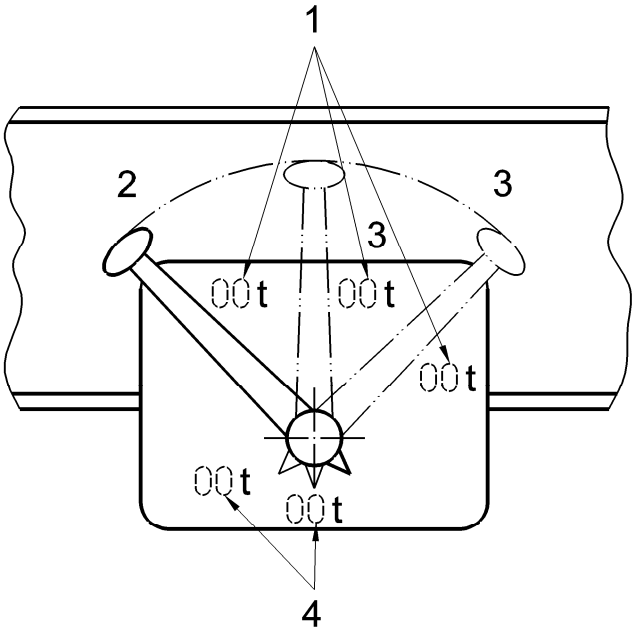
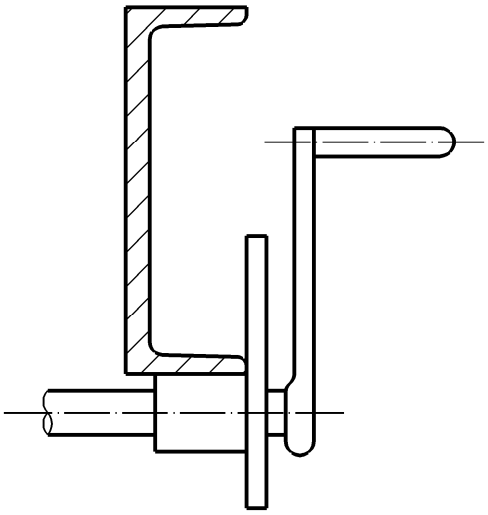


Figure 59b — "Empty braking position plus several (for example two) "loaded" braking positions



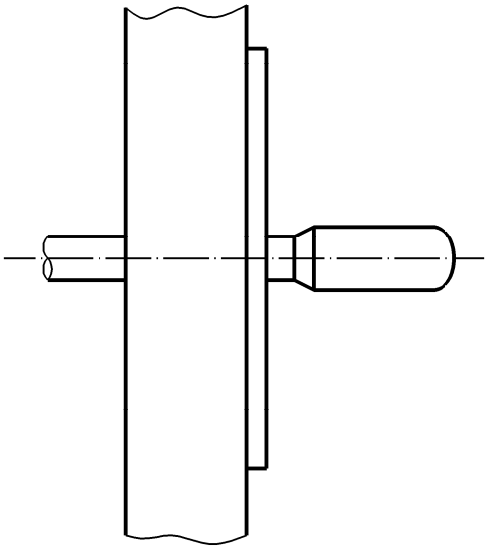


Figure 59c

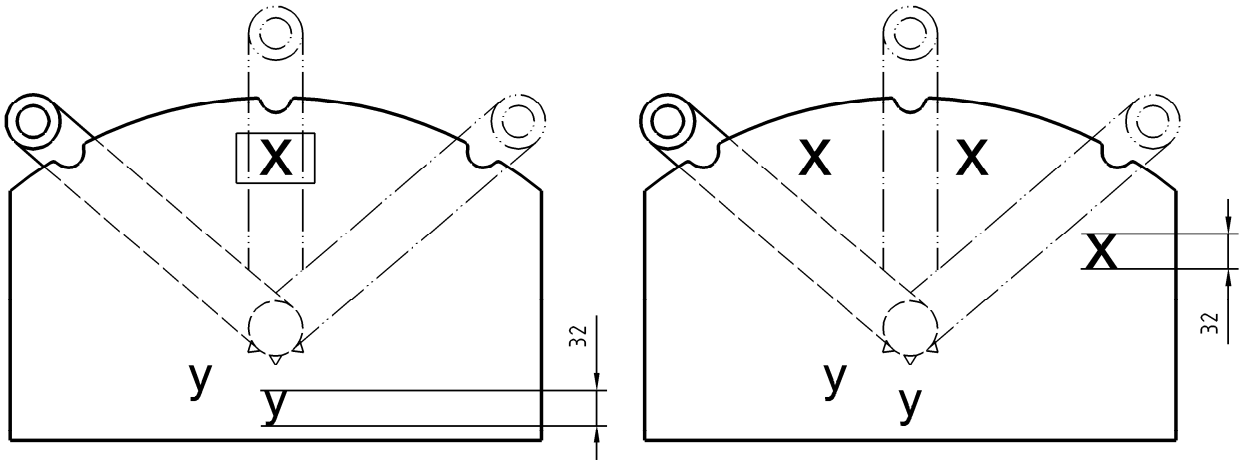
Key: Figures 59 a and 59 b

1 braked weight
2 empty
3 loaded
4 changeover weight

Figure 59

Alternative

Dimensions in millimetres



Key:

X = braked weight
Y= changeover weight

Figure 60

Wagons fitted with 2 or more “empty/load” changeover devices (Figure 61a, Figure 61b, Figure 61c)

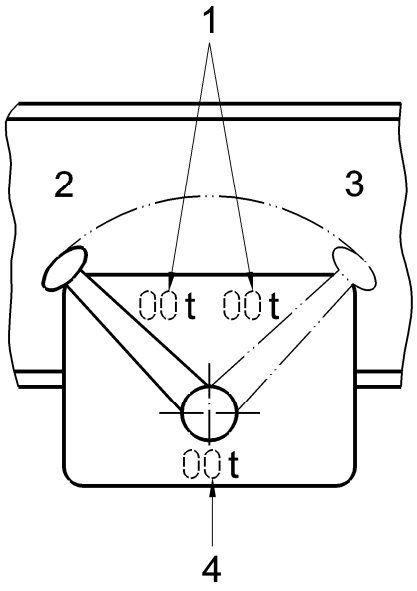


Figure 2a — “Empty” braking position plus one “loaded” braking position

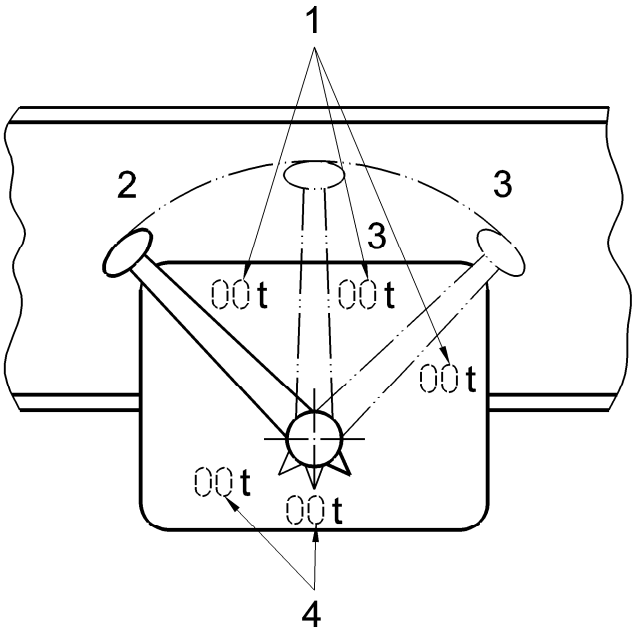


Figure 61b — “Empty braking position plus several (for example two) “loaded” braking positions

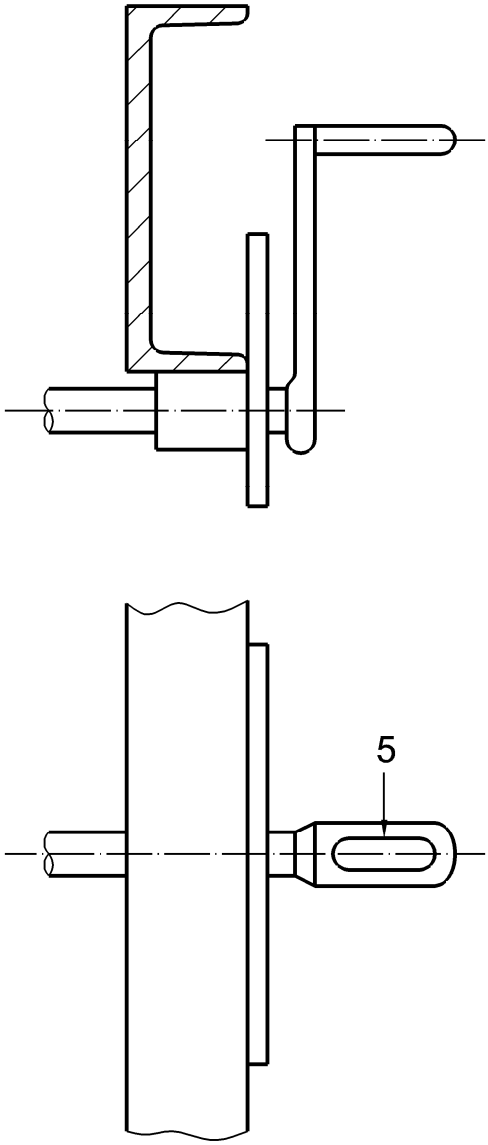


Figure 61c

Key: Figures 61a, 61b, 61c
1 braked weight
2 empty
3 loaded
4 changeover weight
5 oblong hole

NOTE If there is the «empty-loaded» changeover device alone with several positions of the lever (the “empty” braking system and several “loaded” braking systems) the braked weight corresponding to each position of the lever is

inscribed in a window, fitted at the top, in the middle of the plate behind which the lever moves (see Figure 60).

If there is the “empty/loaded” position and several positions of the lever for loaded braking weight, the braked weight corresponding to each position of the lever is inscribed on a plate which rotates with the lever, thereby showing the braked weight in a window in the fixed plate.

Position: On each solebar, approximately in the middle of the wagon, on the plate behind the changeover lever. The braked weights (t) are marked next to the corresponding position of the lever. The changeover weights are indicated on the same plate, near the point of rotation of the lever.

Meaning: On wagons having an "empty" braking mode and one or more "loaded" braking modes, the changeover from one mode to another is affected using a crank handle as shown in the above Figure 59a, Figure 59b, Figure 60, Figure 61a, Figure 61b.

When the wagon has only a single "empty / loaded" device, it shall be fitted with a lever of the kind shown in Figures 59c.

When the wagon has two or more separate "empty / loaded" devices, the levers are fitted with a handle with an oblong hole as shown in Figure 61c.

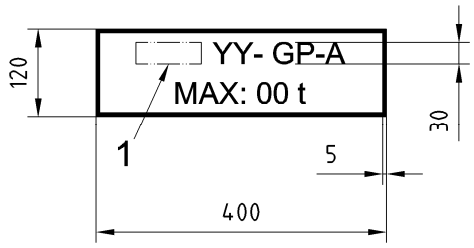
In the "empty" braking mode, the lever slants upwards and to the left.

Figure 61

4.5.30.2.4 Wagons fitted with an automatic load-proportional braking system

4.5.30.2.4.1 Type of brake

Dimensions in millimetres



Key: 1 This marking may be preceded by the word “brake”.

Position: In a box painted on each solebar.

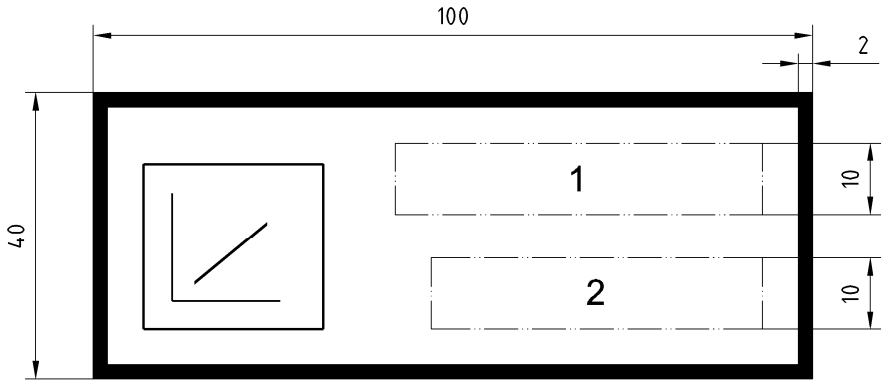
Meaning: Indication of the type of brake (YY) in accordance with 4.5.30.1

Additional information also shown in 4.5.30.1 (GP, A) and indication of the maximum braked weight up to this maximum value, the braked weight is equal to the sum of the wagon tare and the load.

Figure 62a

4.5.30.2.4.2 Load-weigh valve

Dimensions in millimetres



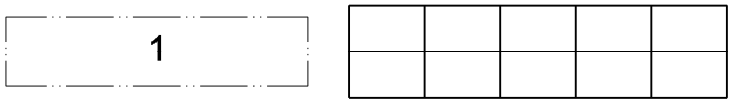
Key: 1 load-weigh valve (lettering is voluntary)
2 type number and specifications of the load-weigh valve (e. g. TYPE 1: 0, 8 bar / 10 kN)

Position: On a plate close to each load-weigh valve and additionally near the relevant pneumatic relay

Meaning: Key 2 indicates the type number of the load-weigh valve followed by the control pressure T in bars which depends on the load on the valve in kN.

Figure 62b

4.5.30.2.4.3 Brake system marking



Key: 1 corresponding language word for Brake

Position: On each solebar, after the brake system marking.

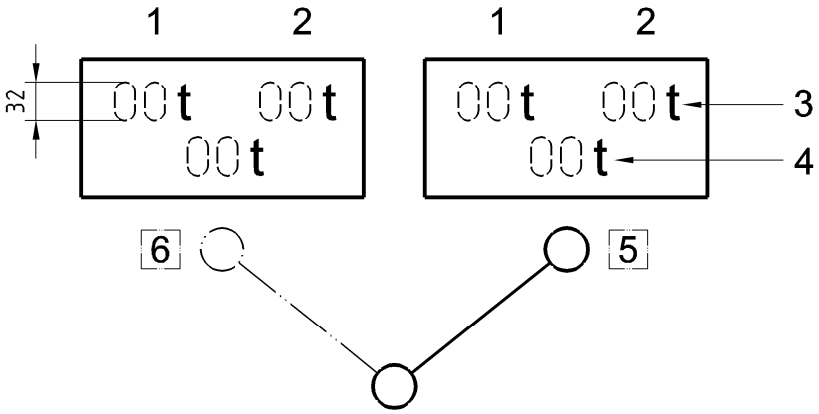
Meaning: On some older wagons, the braked weights for each load state (maximum of five) are shown as tables. Each column in the table contains two figures:

— above: the braked weight value in tonnes;

— below: minimum weight on rail (in tonnes) giving a braked weight (in tonnes) at least equal to this value.

Figure 63

4.5.30.2.5 Wagons fitted with an automatic “empty / loaded” changeover device

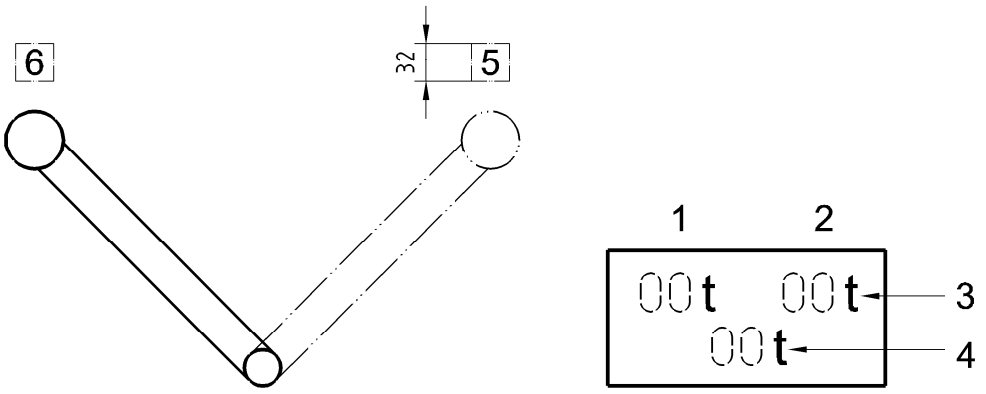


Key:

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

Figure 64 — Wagons featuring several braked weight values in the Freight and Passenger positions

Dimensions in millimetres

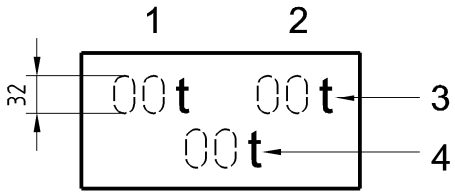


Key:

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

Figure 65 — Wagons featuring a single braked weight value in the Freight and Passenger positions

Dimensions in millimetres



Key:

1 empty
2 loaded
3 braked weight
4 changeover weight

Position:
For figures 64, 65 and 66

On each solebar near to the brake system marking.

Meaning:

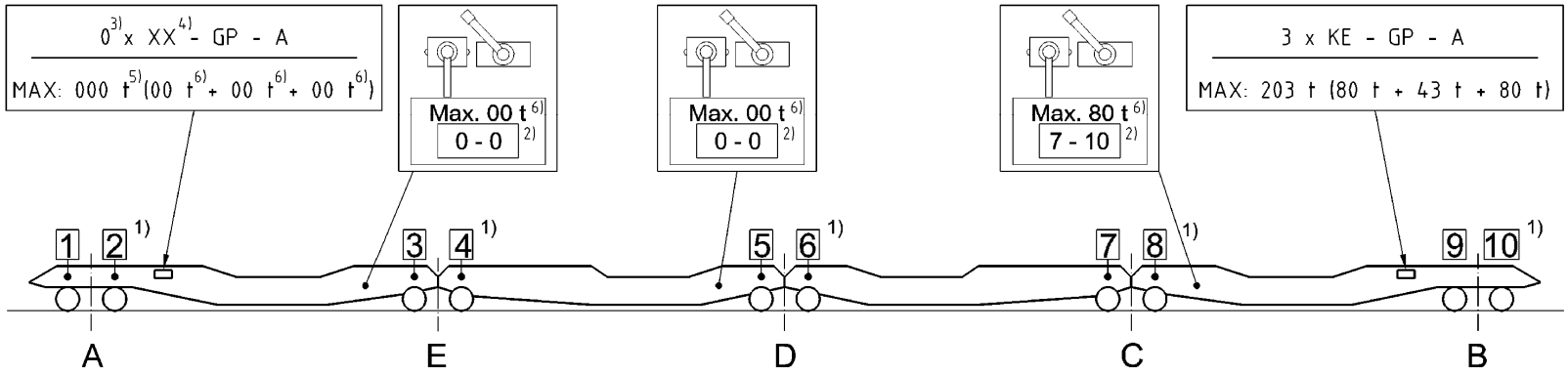
On these wagons, the “empty / loaded” changeover takes place automatically when the gross weight (wagon tare + load tonnes) is greater than the changeover weight marked in tonnes.

Figure 66 — Wagons featuring a Freight brake or Passenger brake only

4.5.30.2.6 Marking of the wheelsets of wagons with a single distributor

On wagons fitted with a single brake distributor, an identification marking (Type serial number in 40 mm height, at minimum) can be applied to the solebar above each axle-box (optional).

4.5.30.2.7 Wagons with more than one distributor



Key: A to E Individual bogie indicators

1 marking of the wheelset number above the axle on the solebar on either side of the wagon

2 marking of the wheelset assigned to this braking system immediately below the braked weight inscription of this system

3 number of distributors of the entire multiple unit

4 type of brake

5 maximum obtainable braked weight (sum of all braked weights)

6 braked weight of a braking system

a) Wagons with more than one distributor and separate “empty / loaded” changeover systems

The braked weight [t] of the associated distributor and the changeover weight [t] for the wagon shall be marked on the identification plates for each “empty/loaded” changeover device (As per 4.5.30.2.4).

b) Example of wagons with several distributors and automatic load-proportional brakes

Figure 67

Dimensions in millimetres

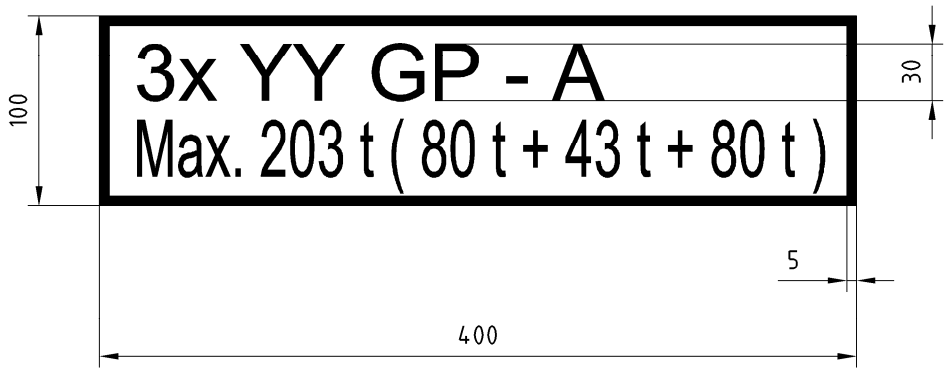
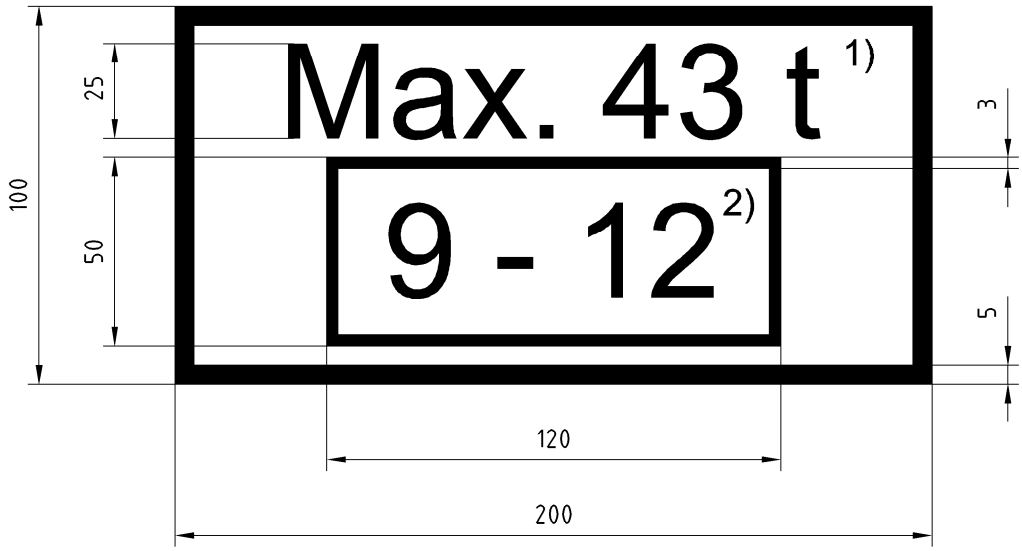


Figure 68

Dimensions in millimetres



Position: Figure 68 and Figure 69: On each solebar near the brake isolating levers.

Meaning: Examples of markings for multiple wagons with three distributors (3x), letter code for brake type in accordance with 4.5.30.1 (YY); additional letters in accordance with 4.5.30.1 (GP, A). The braked weights of the corresponding distributor should be marked on the plates for each “empty-loaded” changeover device together with the changeover weight for the wagon as a whole.

The following shall also be indicated:

Figure 68

— the number of brake systems,

— the total braked weight and in brackets the braked weight obtained from each distributor.

Figure 69

1) Braked weight delivered by the system controlled by the distributor in question.

2) Indication of the end numbers of the wheelsets on which this braking system acts.

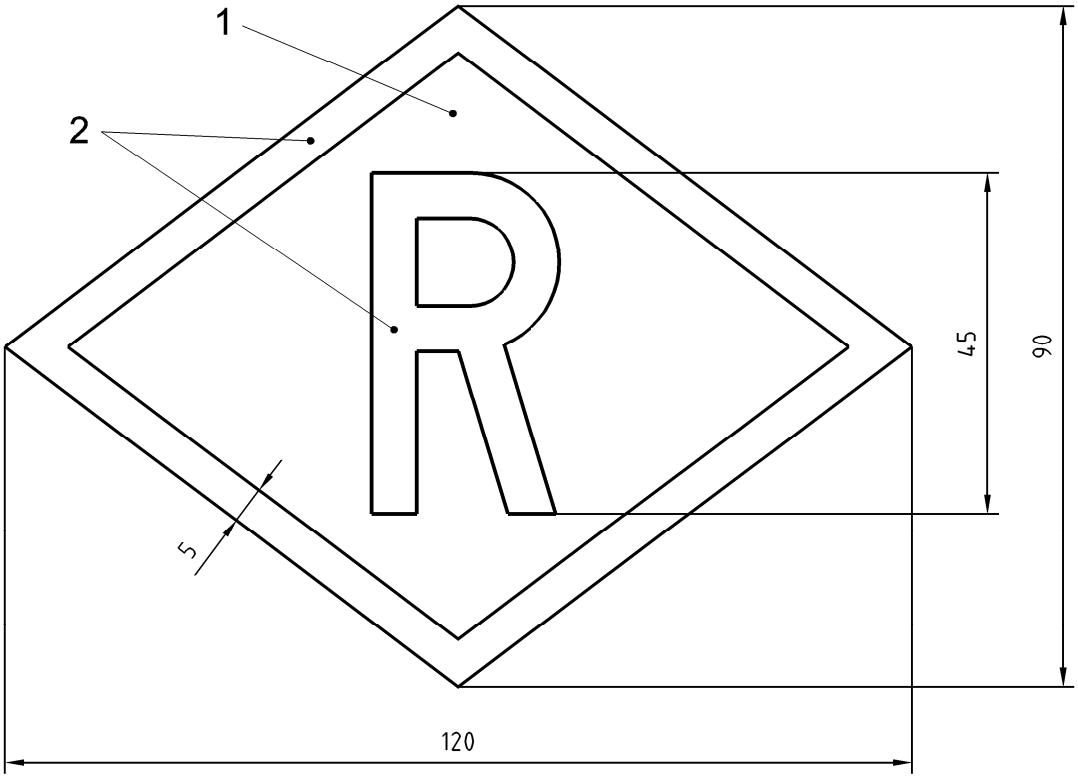
Figure 69

4.5.30.2.8 Marking of the wheelsets of wagons fitted with several distributors and an automatic load proportional braking system

On multiple wagons with permanent couplings fitted with several distributors and an automatic load-proportional braking system, an identification number should be marked on each solebar to indicate the corresponding position of the wheelset in ascending order from one end of the wagon to another.

4.5.30.2.9 High power R brake system with brake mode “R” (in a rhombus)

Dimensions in millimetres



Key: 1 wagon colour background
2 yellow

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

Meaning: Wagons that carry this marking are fitted with a high power R brake system with brake mode “R”. These wagons achieve a defined higher braking power level.

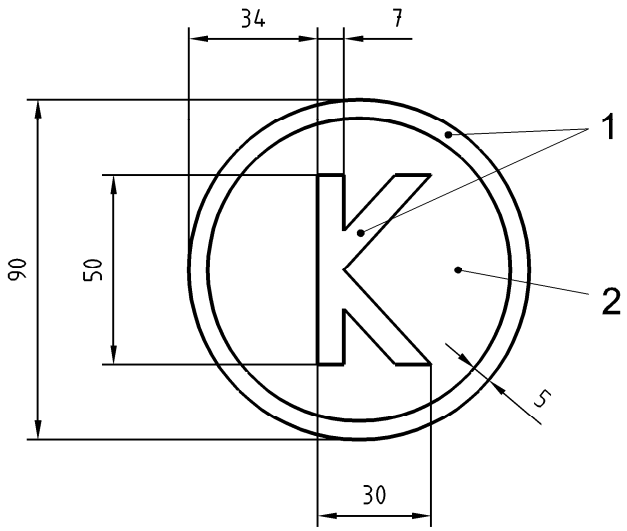
NOTE The braked weight inscriptions for the system should show the braked weight without the use of the train pipe brake pipe accelerator. The braked weight in the latter case should be shown in red.

The braked weights shall also be written in the same manner even if the wagon is only fitted with a train emptying accelerator without a high power R brake system.

Figure 70

4.5.30.2.10 Wagons fitted with composite brake blocks

Dimensions in millimetres

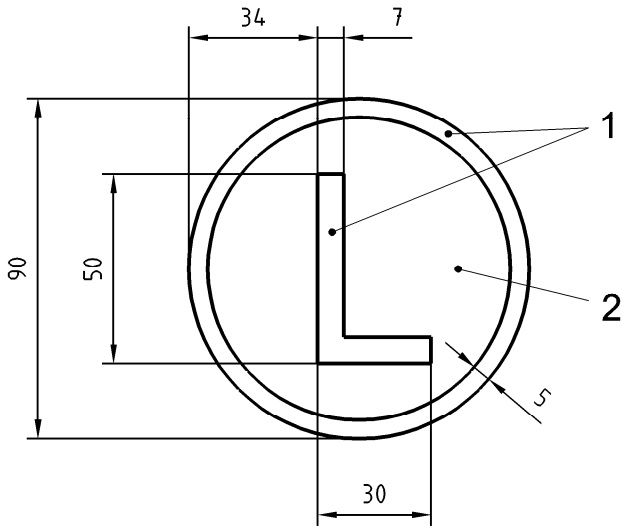


Key:

1 yellow
2 wagon colour background

Figure 71

Dimensions in millimetres

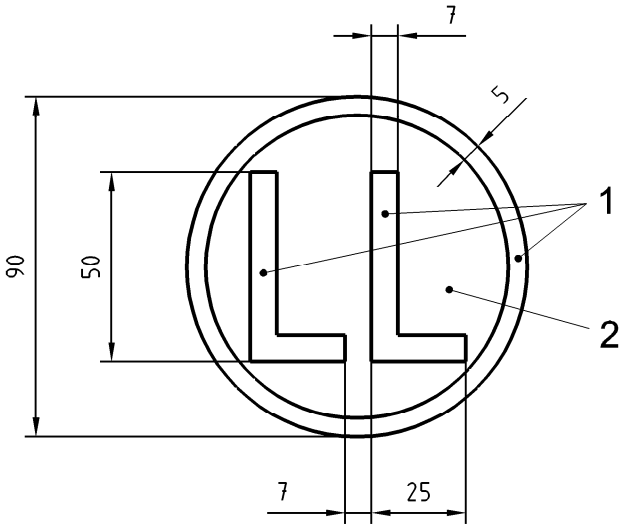


Key:

1 yellow
2 wagon colour background

Figure 72

Dimensions in millimetres



Key: 1 yellow
2 wagon colour background

Position: In the middle of each solebar or on parts covering the solebar or on special boards fitted at the same height as the solebars, on the right hand side of the marking indicating the brake type.

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

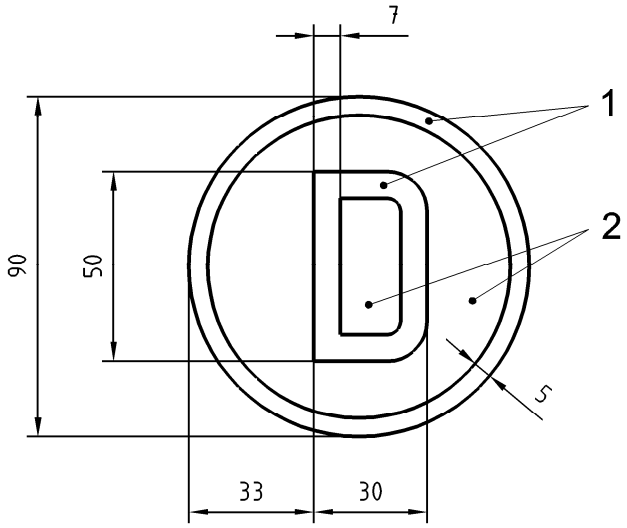
- a high friction value (K)
- a medium friction value (L)
- a low friction value (LL)

NOTE This marking does not imply interchangeability of different types of brake blocks.

Figure 73

4.5.30.2.11 Wagons fitted with disc brakes

Dimensions in millimetres



Key: 1 yellow
2 wagon colour background

Position: In the middle of each solebar or on parts covering the solebar or on special boards fitted at the same height as the solebars, on the right hand side of the marking indicating the brake type.

Meaning: Wagons that carry this marking are fitted with disc brakes.

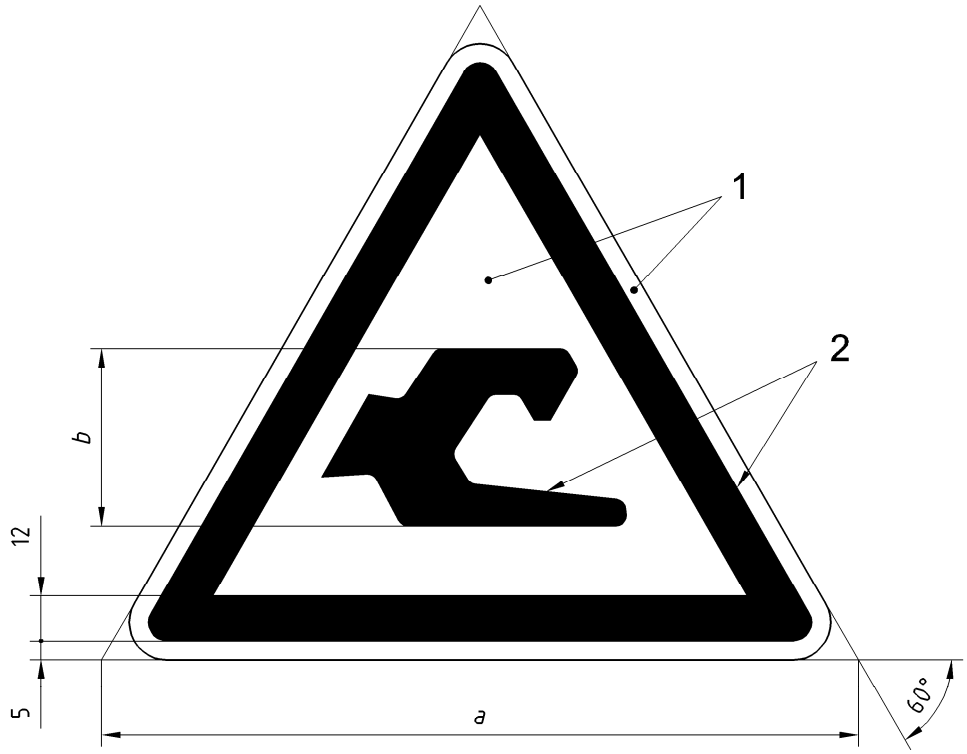
Figure 74

4.5.30.2.12 Electropneumatic brake

This marking is defined in the part 2 of this standard. See prEN 15877-2.

4.5.31 Wagons fitted with the automatic coupler (conforming to the OSJD standard)

Dimensions in millimetres



Template	Dimension	
	a	***b***
1	400	100
2	200	50

Key:
1 reflective yellow
2 black

Position: At each alternate left end of the wagon sides or solebar.

Template 1 in the table above shall be affixed on both sides of the wagon as well as on the front walls of the wagons ends. Template 2 may be used in the case of restricted available space.

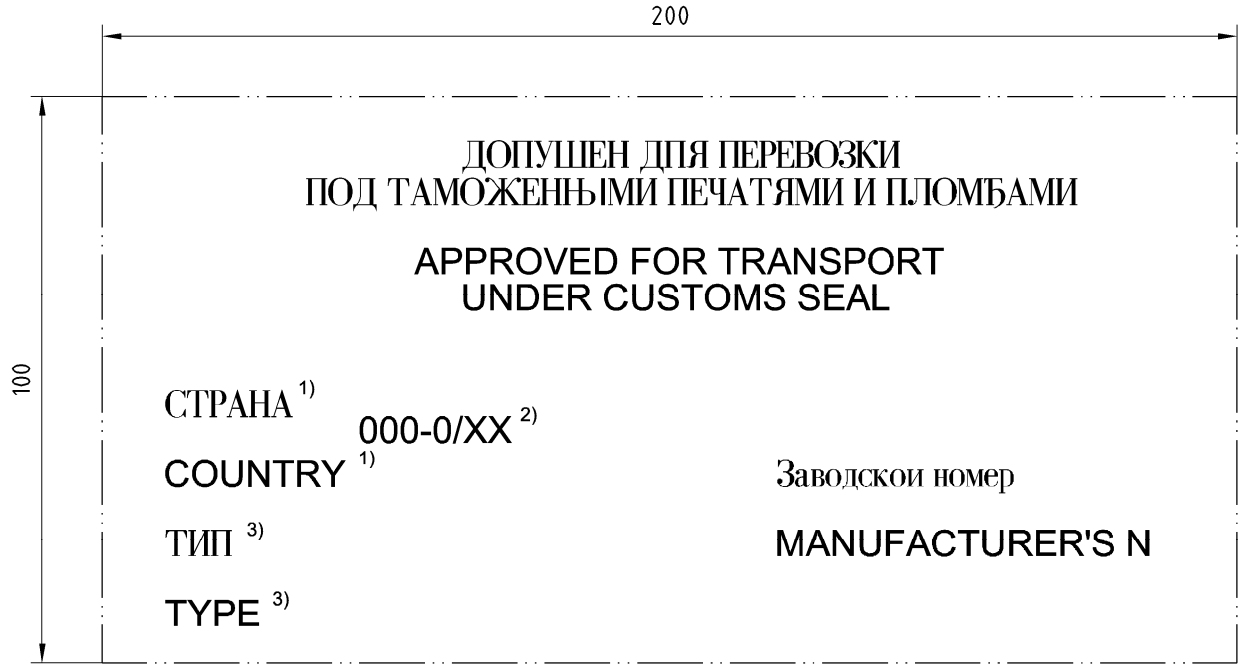
Meaning: Wagon fitted with automatic couplers.

NOTE On wagons fitted with the automatic coupler, the Berne rectangle clearances may be partially encroached.

Figure 75

4.5.32 Customs authorisation plate for wagons operating on 1520 mm gauge railways

Dimensions in millimetres



Key:

1) name of the country that granted customs authorisation

2) 000-0/XX: Authorisation certificate number:

— first three digits: code of the customs bureau that issued the authorisation certificate

— next digit: authorisation certificate record number

— XX: year of authorisation

3) for design approval only

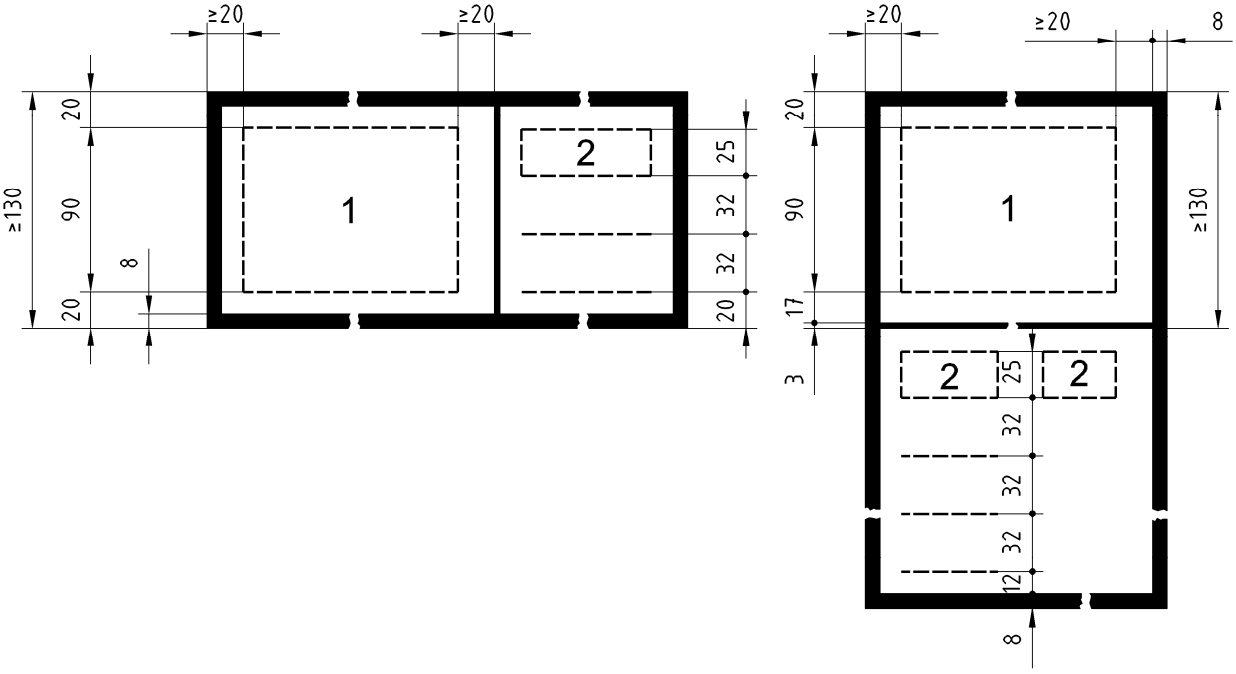
Position: At each end of the wagon sides or solebar in a clearly visible position.

Meaning: The plate shows that the wagon has been approved to run on 1520 mm gauge lines. A metal plate measuring 200 mm × 100 mm should be used for this purpose. The following inscriptions should be clearly and durably engraved or embossed in Russian and English or applied by some other means.

Figure 76

4.5.33 Authorisation plate

Dimensions in millimetres



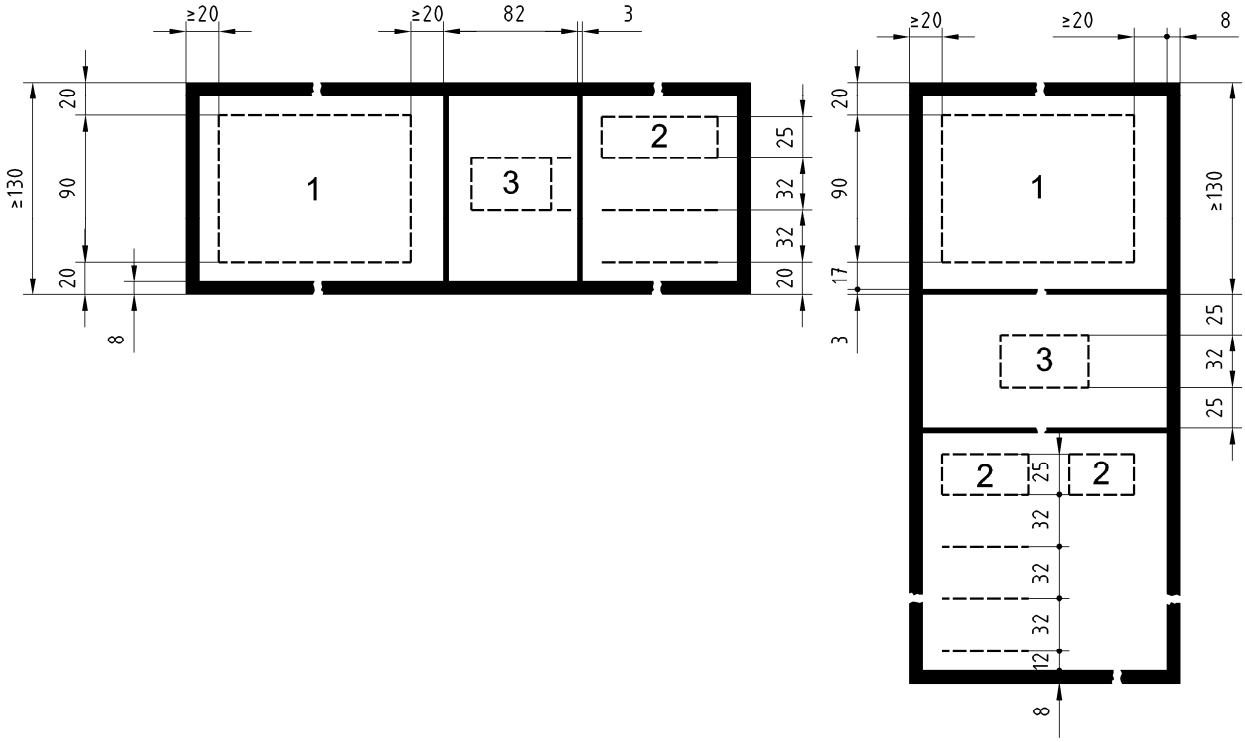
Key:
1 code of initial acceptance country
2 codes of countries giving subsequent agreement

Position: On the right of each side wall.

Meaning: Because the use of these wagons is subject to authorisation of authorising entity(ies) of the Member States, the country codes defined in the CR TSI Operation and Traffic Management, where the wagons are cleared to run, are entered in these boxes and these wagons may only be used on the networks in these Member States.

Figure 77

Dimensions in millimetres



Key:

1 code of initial acceptance country

2 codes of Countries giving subsequent agreement

3 rectangle for gauge code

Position: On the right of each side wall.

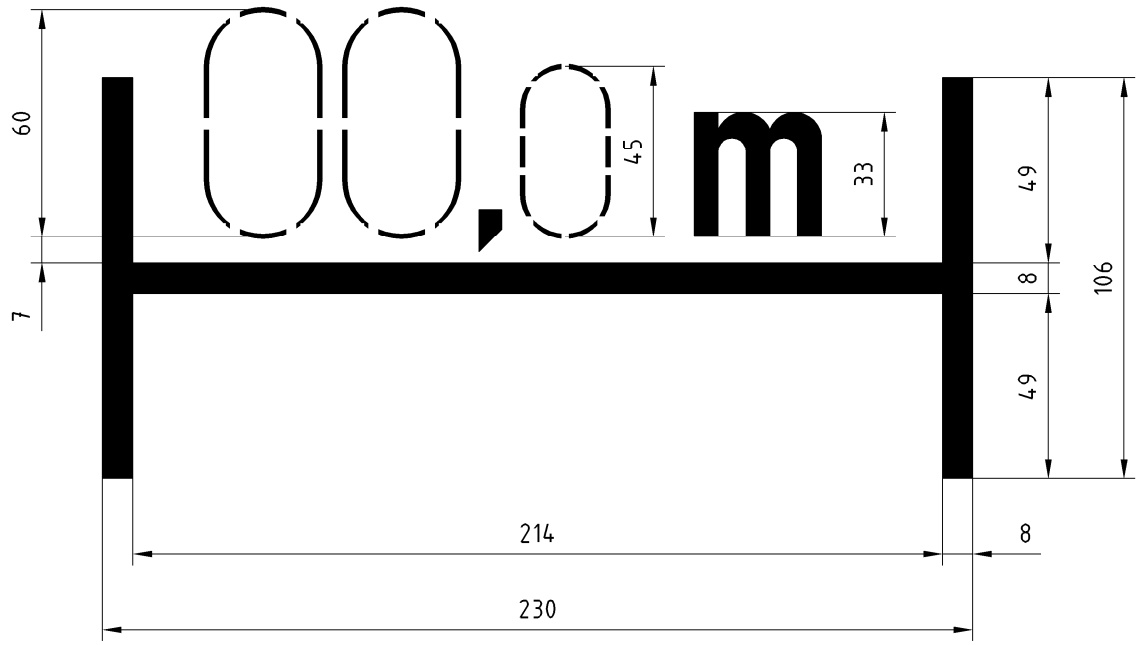
Meaning: Because they are not built to the international gauge defined in the CR TSI RST Freight Wagon, the use of these wagons is therefore subject to bi-or multilateral agreements between Member States. The alphabetical country codes defined in Annex P.4 of the CR TSI Operation and Traffic Management of the parties to these agreements are entered in these boxes and these wagons may only be used on the networks in these Member States.

The letters as defined in the CR TSI RST Freight Wagon indicate the gauge to which the wagons were built.

Figure 78

4.5.34 Length for load and floor space

Dimensions in millimetres

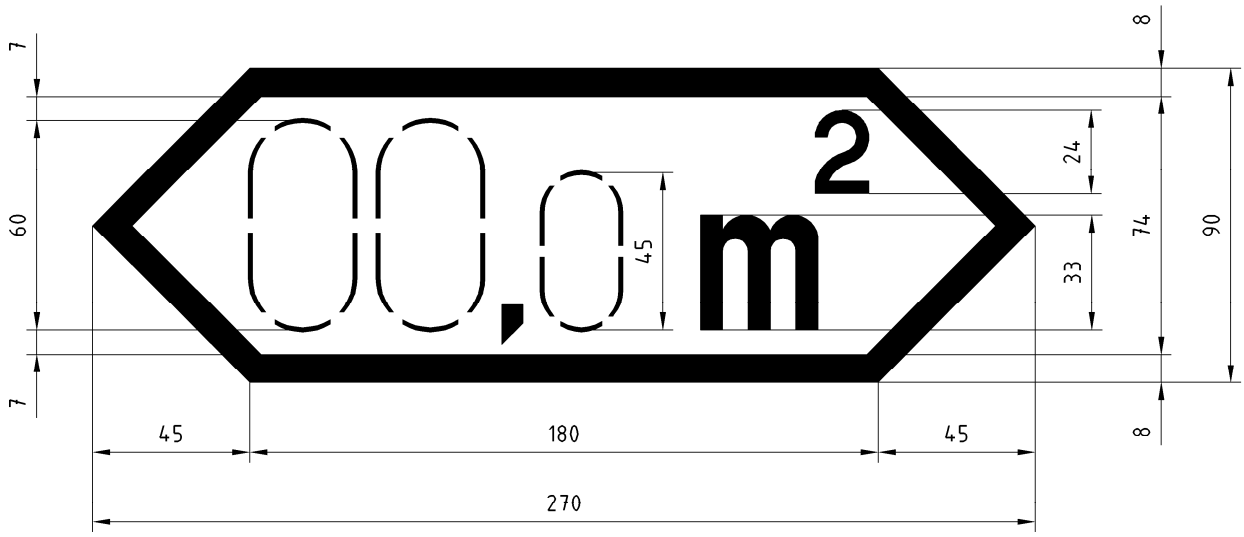


Position: On the left of each side wall.

Meaning: Loading length in metres for flat wagons and covered wagons with a flat floor, minus the thickness of any intermediate partitions (useful length).

Figure 79 — Length of load

Dimensions in millimetres



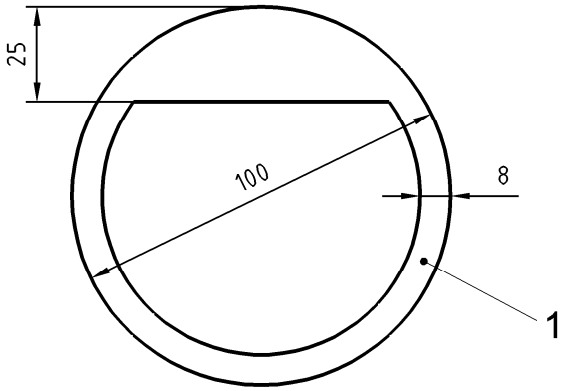
Position: On the left of each side wall.

Meaning: Surface area in square metres of the floor of covered wagons and wagons with an opening roof and flat floor.

Figure 80 — Floor space

4.5.35 Spark arrestor plates

Dimensions in millimetres



Key: 1 White and the background shall be dark and observe the provisions concerning contrast according to 4.2.

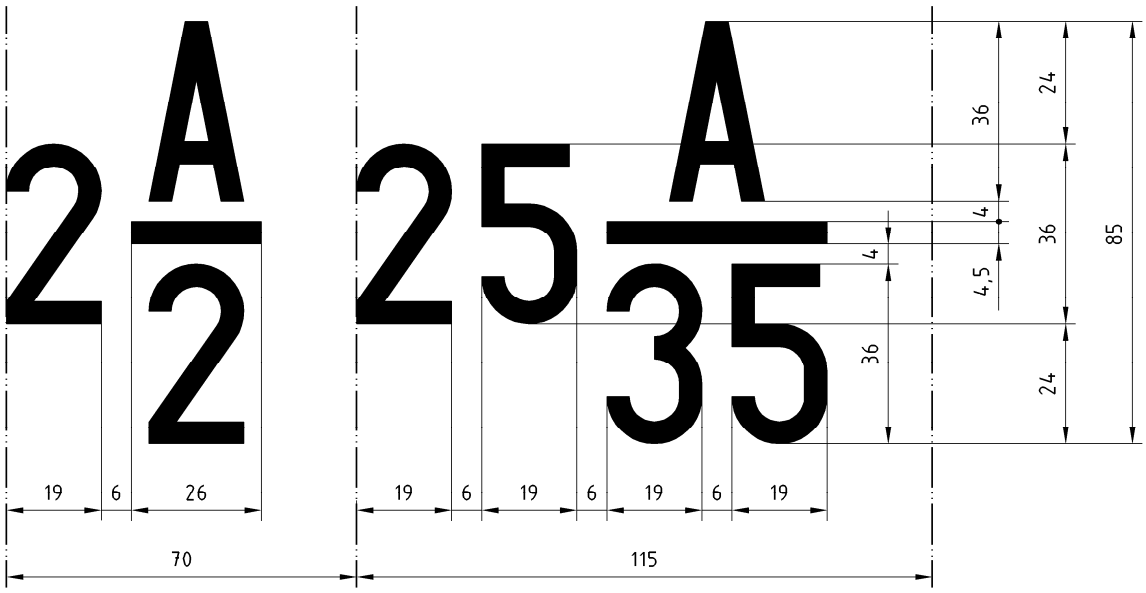
Position: In the middle of each solebar or on parts covering the solebar or on special boards fitted at the same height as the solebars. This marking may also be affixed on the right of each side wall.

Meaning: Wagon fitted with spark arrestor plates. These plates are required for wagons carrying class 1 dangerous goods commodities, sub-classes 1.1, 1.2, 1.3, 1.5 and 1.6, as well as certain commodities in classes 4.1 and 5.1 (RID, part 7, points 7.2.4 W2 and W8).

Figure 81

4.5.36 Removable wagon accessories

Dimensions in millimetres



Position: On the right of each side wall.

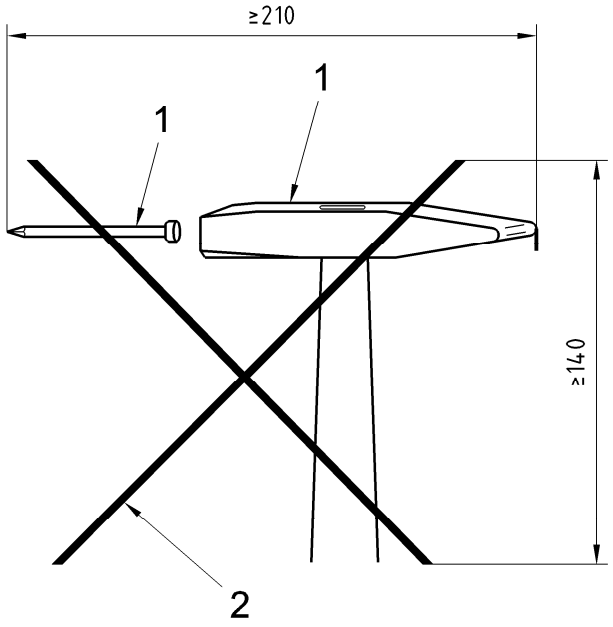
Meaning: The number and type of removable accessories are to be indicated. In the case of carboy wagons and wagons with removable receptacles, the number of such receptacles should be indicated. The figure placed before the fraction indicates the number of removable accessories belonging to the wagon. The letter “A” indicates that the accessories are removable and the denominator of the fraction gives the serial number assigned to the removable accessory in the list below. The names of the accessories may also be added in letters alongside these markings.

Serial number	Description of the removable accessory
1	Removable stanchion
2	Removable side board for flat wagon
3	Removable end board for flat wagon
4	Removable side panel
5	Removable centre post for securing load
6	Stanchion chain
7	Crank handle for car-carrying wagons
8	— reserved —
9	Swivelling bolster with stanchions
10	Removable bolster
11 — 12	— reserved —
13	— reserved —
14	— reserved —
15 — 16	— reserved —
17	— reserved —
18	— reserved —
19	— reserved —
20	— reserved —
21	— reserved —
22	— reserved —
23	— reserved — (the folding seat for horse boxes is removed from the list)
24	Coupling rod (rigid coupling
25	— reserved —
26	Ice tank or bunker
27	Ice tank screen
28	Ice tank frame
29	Trestle or bar with meat hooks
30	Removable cross-piece for low-loader wagons
31	Removable support bracket (for wagons used for special loads)
32	Securing crossbar (for wagons used for special loads)
33	Removable floor panel (for wagons used for special loads)
34	— reserved —
35	Wedging block
36	Skid, with or without shoe, for flat wagons used for carrying cars
37	Securing belts for flat wagons used for carrying cars
38	Girder for removable ramps for flat wagons used for carrying cars
39	— reserved —
40	Spare heating coupling
41	Fire extinguishers
42	Wheel scotches for car-carrying vehicles
43	Loading ramp, gangway
44	— reserved —
45	— reserved —
46	— reserved —
47	Metal cradles for rolls of sheeting
48	Panel for covering markings
49	Loading frame for special types of goods

Figure 82 — Removable wagon accessories

4.5.37 Marking for the inside of wagons: “Do not use nails/wire staples”

Dimensions in millimetres



Key:
1 outline in black
2 black or red

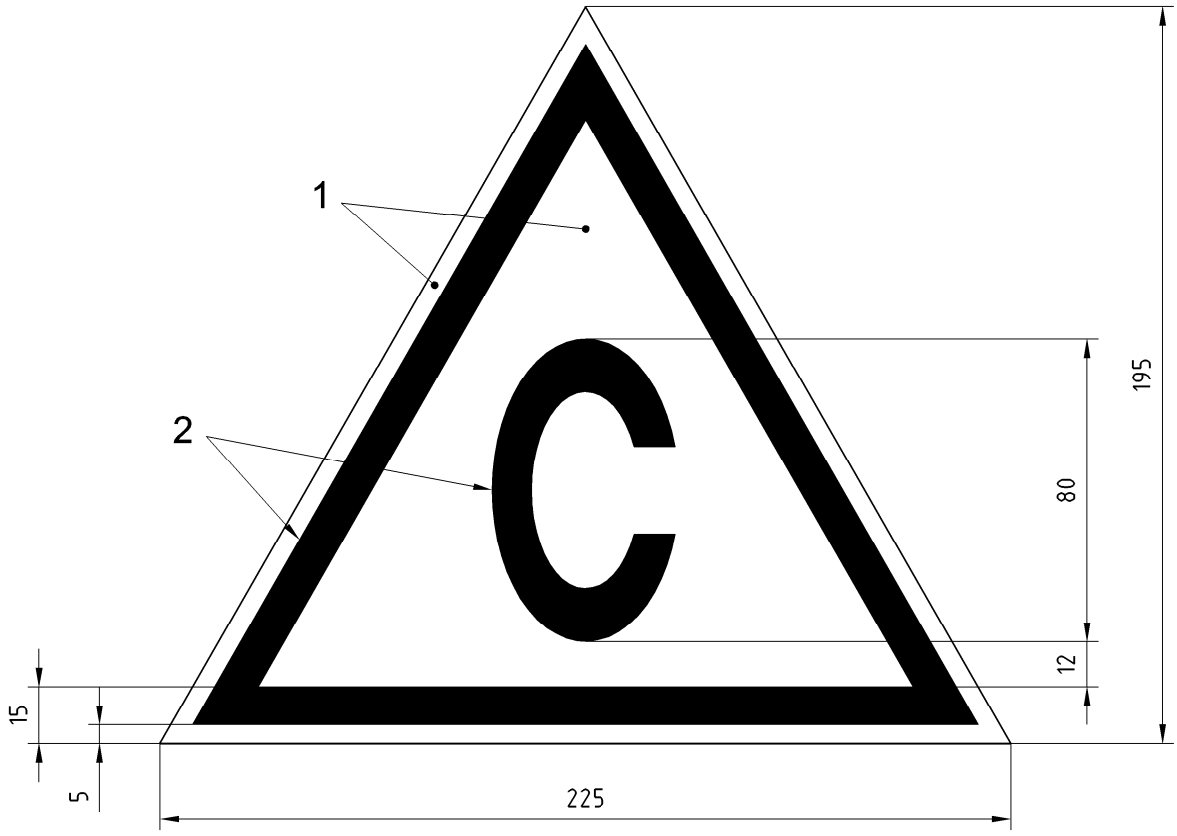
Position: Inside the wagon in a clearly visible location, if possible at eye level when standing on the loading floor.

Meaning: Nails or staples should not be used on the walls or floor of this wagon.

Figure 83

4.5.38 Combined transport wagons

Dimensions in millimetres



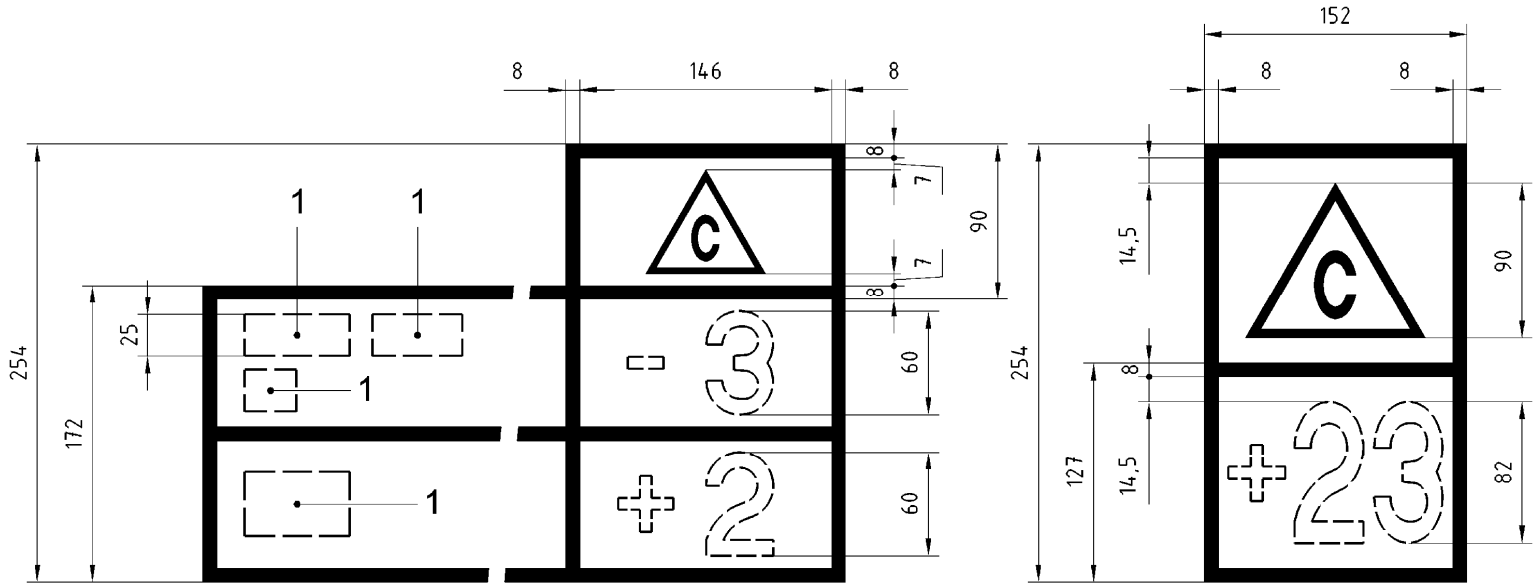
Key: 1 yellow
2 black

Position: On the left on each side wall

Meaning: Characteristics for the coding of load units of swap-body carrier wagons and carrier wagons with independent wheelsets.

Figure 84

Dimensions in millimetres



Key: 1 Corresponding networks for the countries where the wagon has been authorised with the provisions of the box to the right of the country code.

Examples:

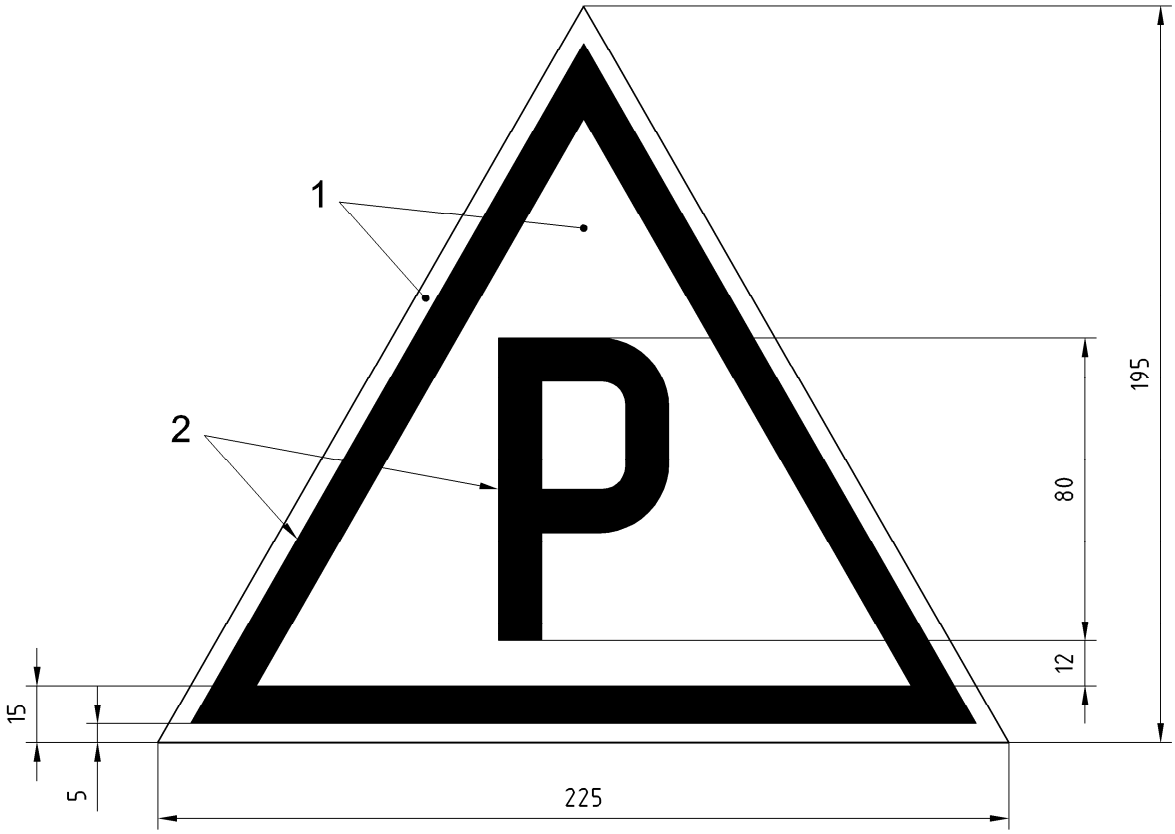
-3 The wagon can only be loaded with swap bodies that have a profile number that is lower (in this example by at least 3 points) than the profile number assigned to the RU or RUs concerned.

+2 The wagon can be loaded with swap bodies that have a profile number that is greater (in this example by up to 2 points) than the profile number assigned to the RU or RUs concerned.

+23 The wagon can be loaded with swap bodies that have a profile number that is greater (in this example by up to 23 points) than the profile number assigned to the RU or RUs concerned.

Figure 85 — Examples

Dimensions in millimetres



Key: 1 yellow
2 black

Position: On the left on each side wall

Meaning: Characteristics of recess wagons and variants for carrying semi-trailers that exceed specified capacity

Figure 86

Dimensions in millimetres

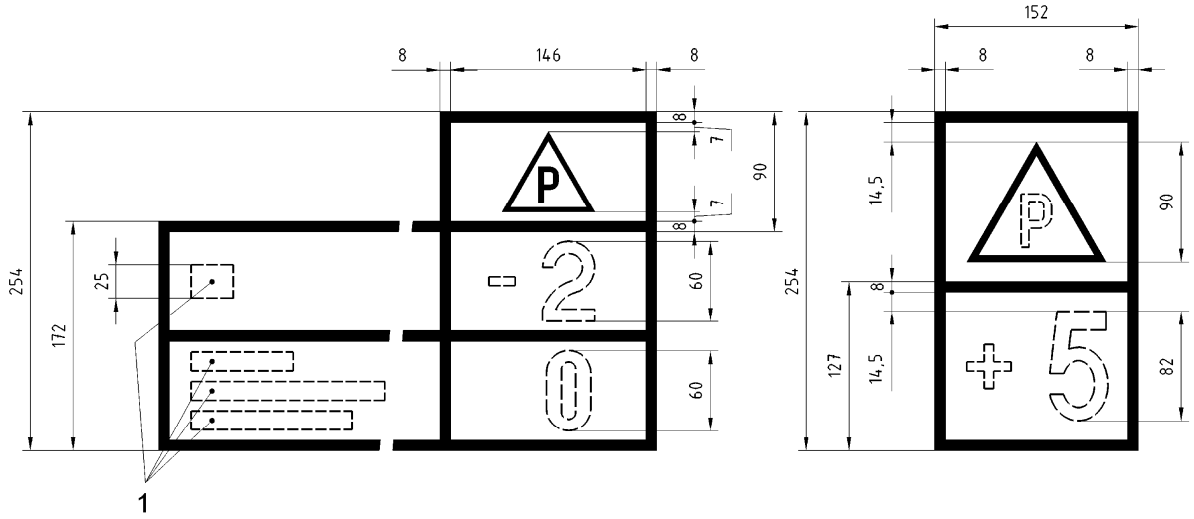
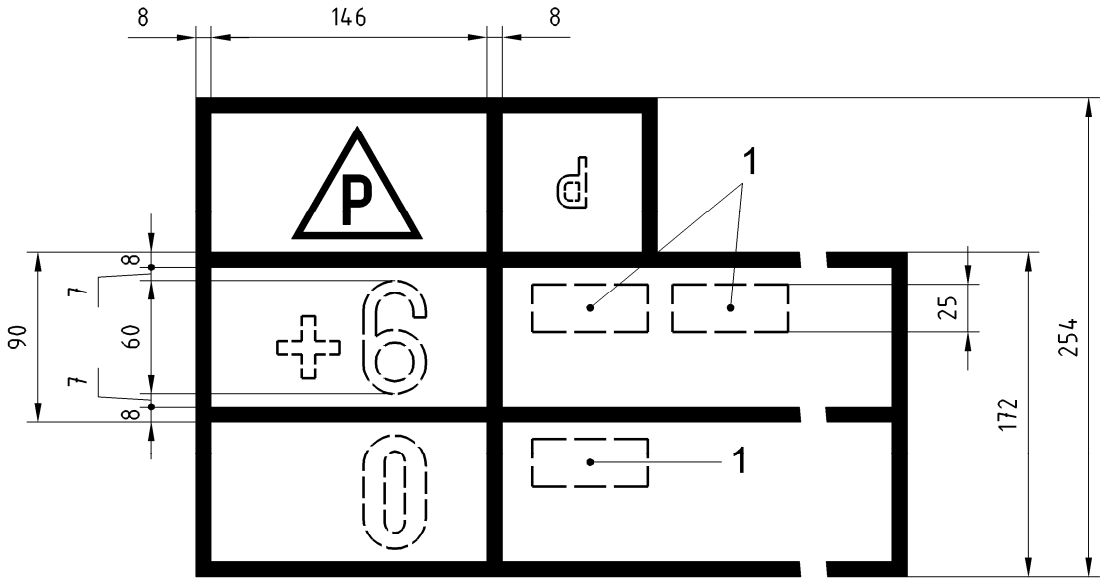


Figure 87a — Examples

Dimensions in millimetres



Key: 1 corresponding networks

Examples:

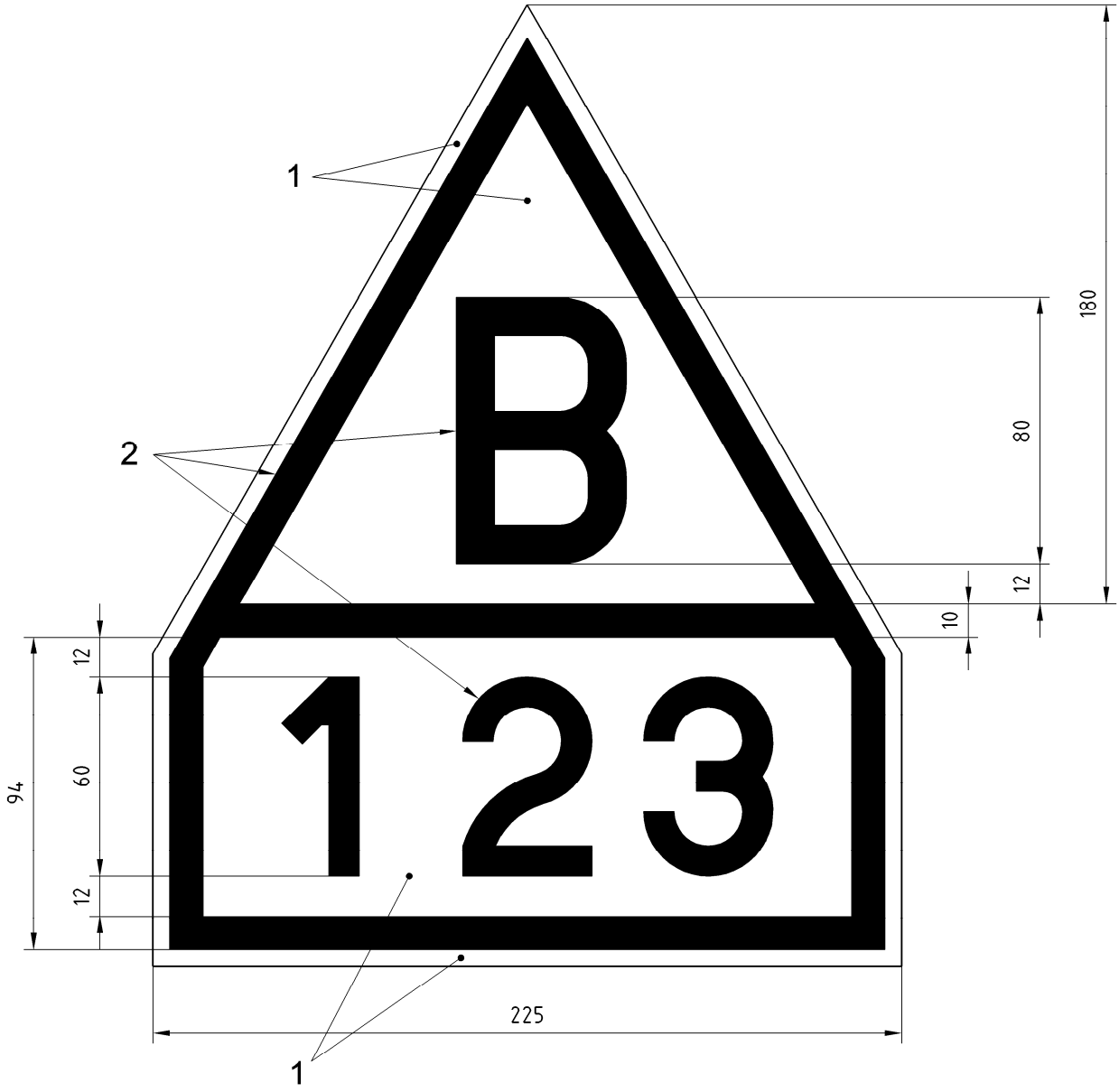
-2 The wagon may only be loaded with semi-trailers that have a profile number that is lower (in this example by at least 2 points) than the profile number assigned to the RU or RUs concerned.

0 The wagon may only be loaded with semi-trailers that have a profile number that is no higher than the profile number assigned to the RU or RUs concerned.

+5 The wagon can be loaded with semi-trailers that have a profile number that is greater (in this example by up to 5 points) than the profile number assigned to the RU or RUs concerned.

Figure 87b – Example

Dimensions in millimetres



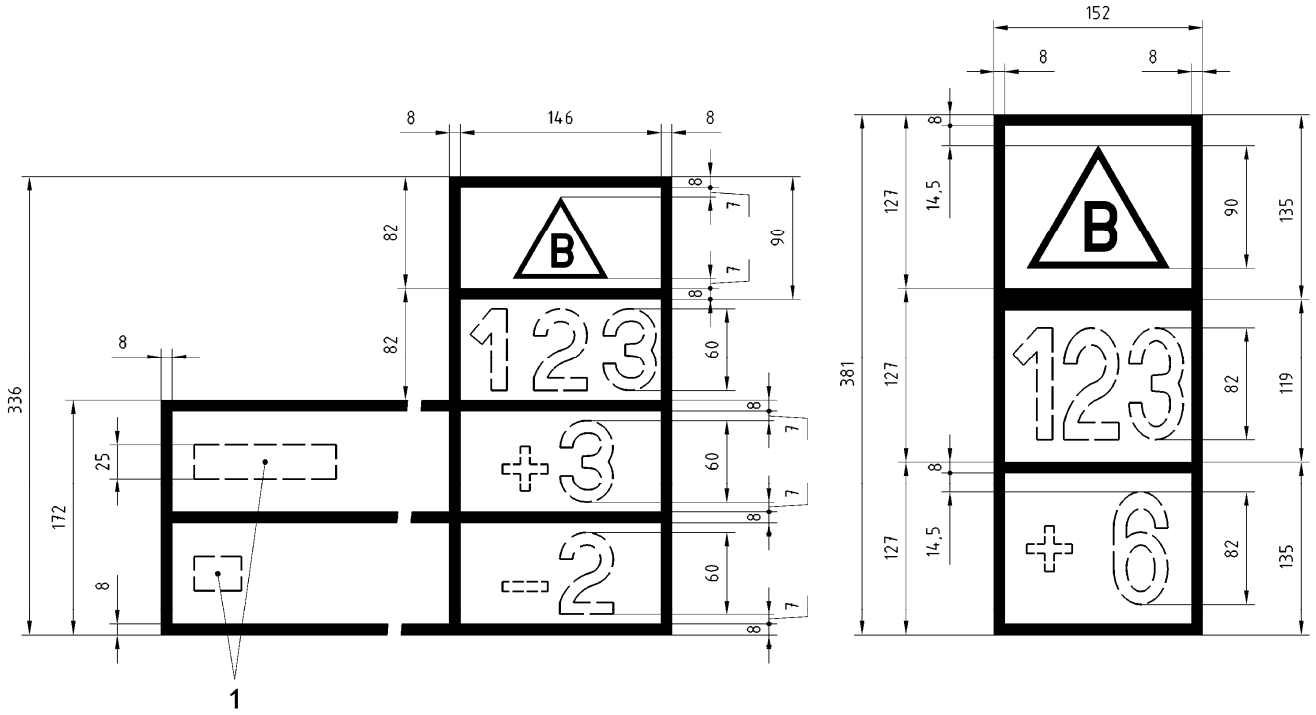
Key: 1 yellow
2 black

Position: On the left on each side wall

Meaning: Characteristics of roller-unit carrier wagons

Figure 88

Dimensions in millimetres



Key: 1 corresponding networks

Examples:

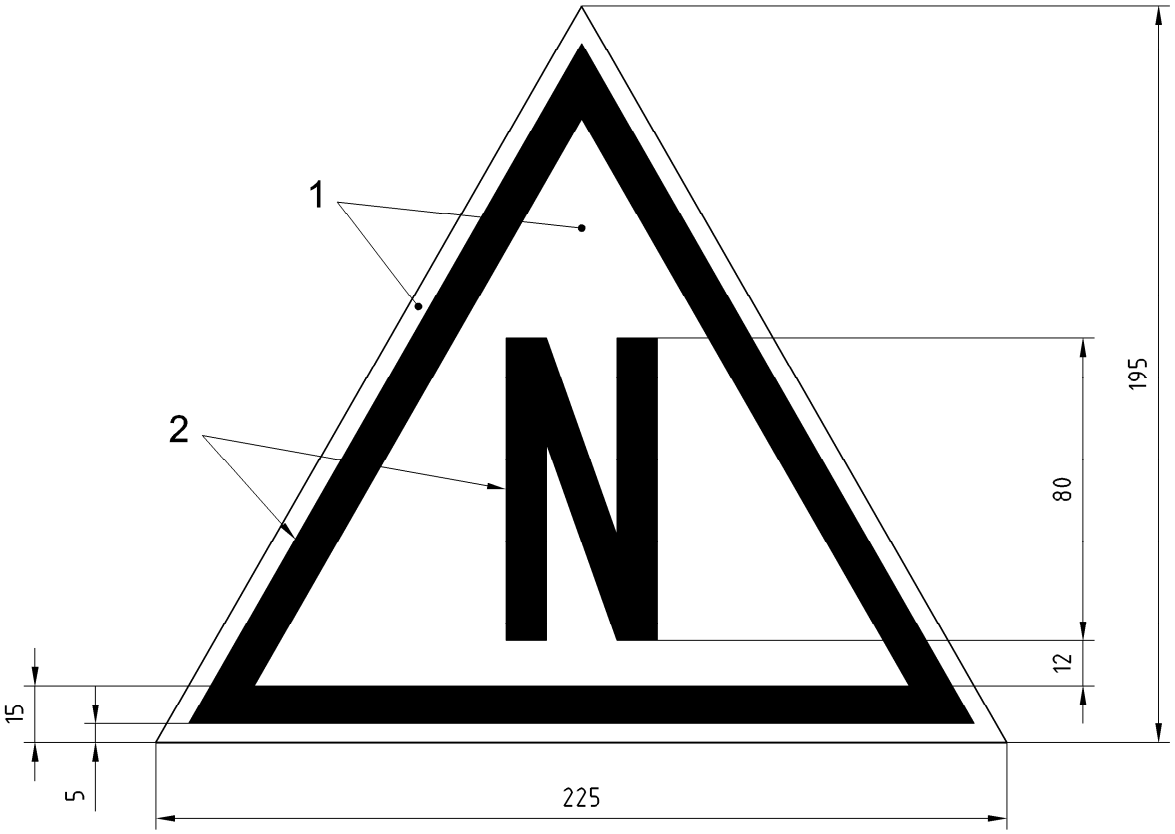
+3 The wagon may be loaded with roller units that have a profile number that is greater (in this case by up to 3 points) than the profile number assigned to the RU (or RUs) concerned.

-2 The wagon may only be loaded with roller units that have a profile number that is lower (in this example by at least 2 points) than the profile number assigned to the RU (or RUs) concerned.

+6 The wagon may be loaded with roller units that have a profile number that is greater (in this example by up to 6 points) than the profile number assigned to the RU (or RUs) concerned.

Figure 89 — Examples

Dimensions in millimetres



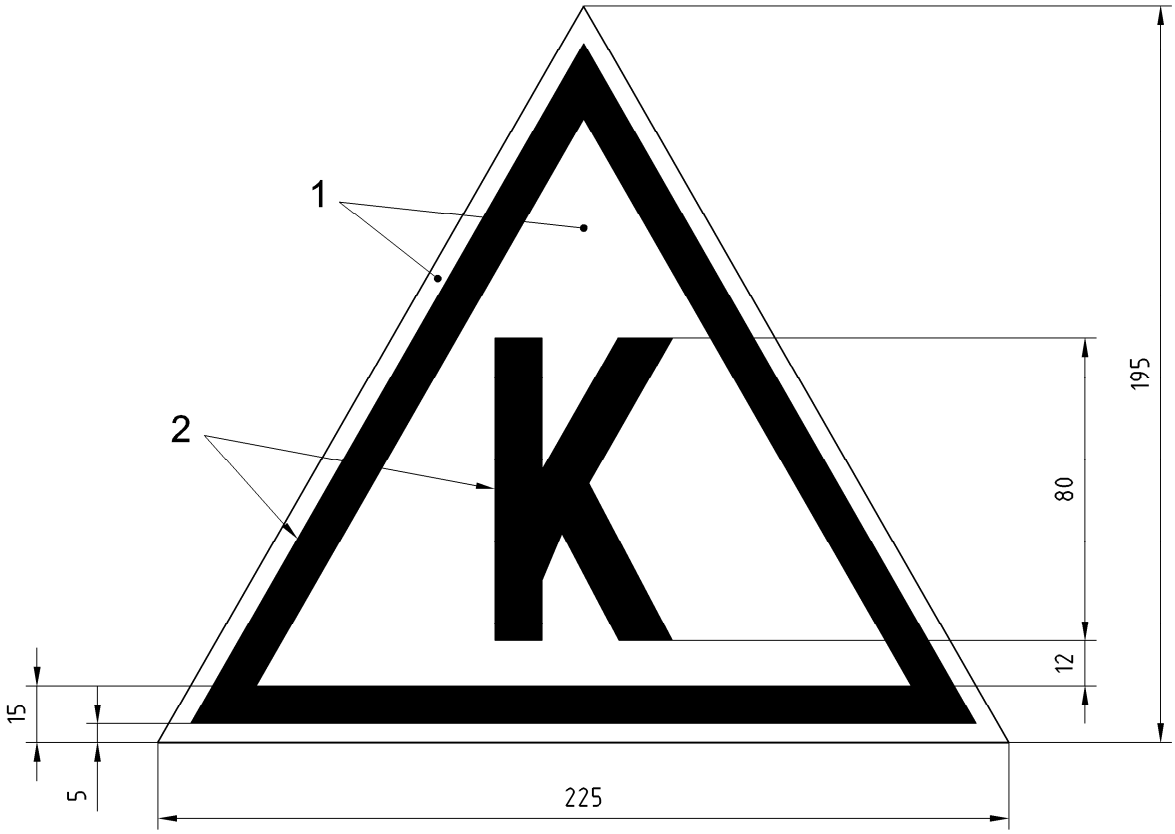
Key: 1 yellow
2 black

Position: On the left on each side wall

Meaning: Marking for recess wagons for semi-trailers

Figure 90

Dimensions in millimetres



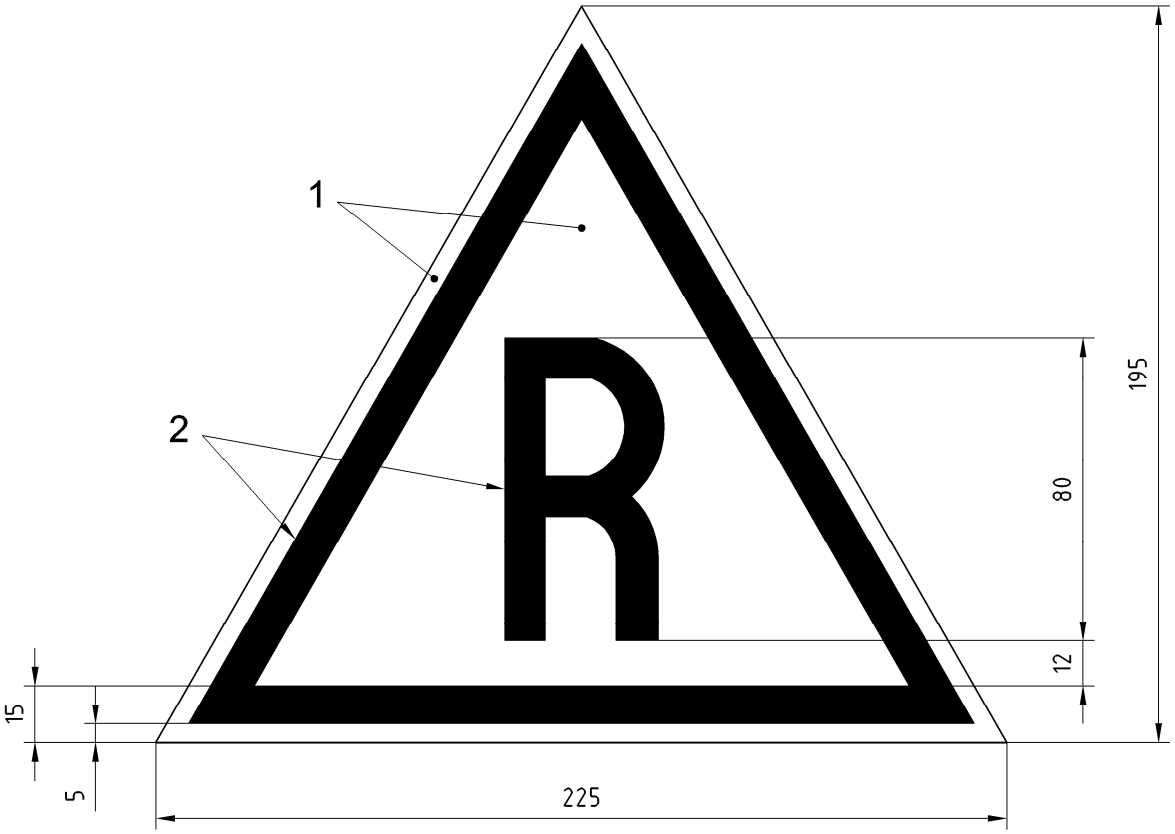
Key: 1 yellow
2 black

Position: On the left on each side wall

Meaning: Marking for Kombirail system wagons

Figure 91

Dimensions in millimetres



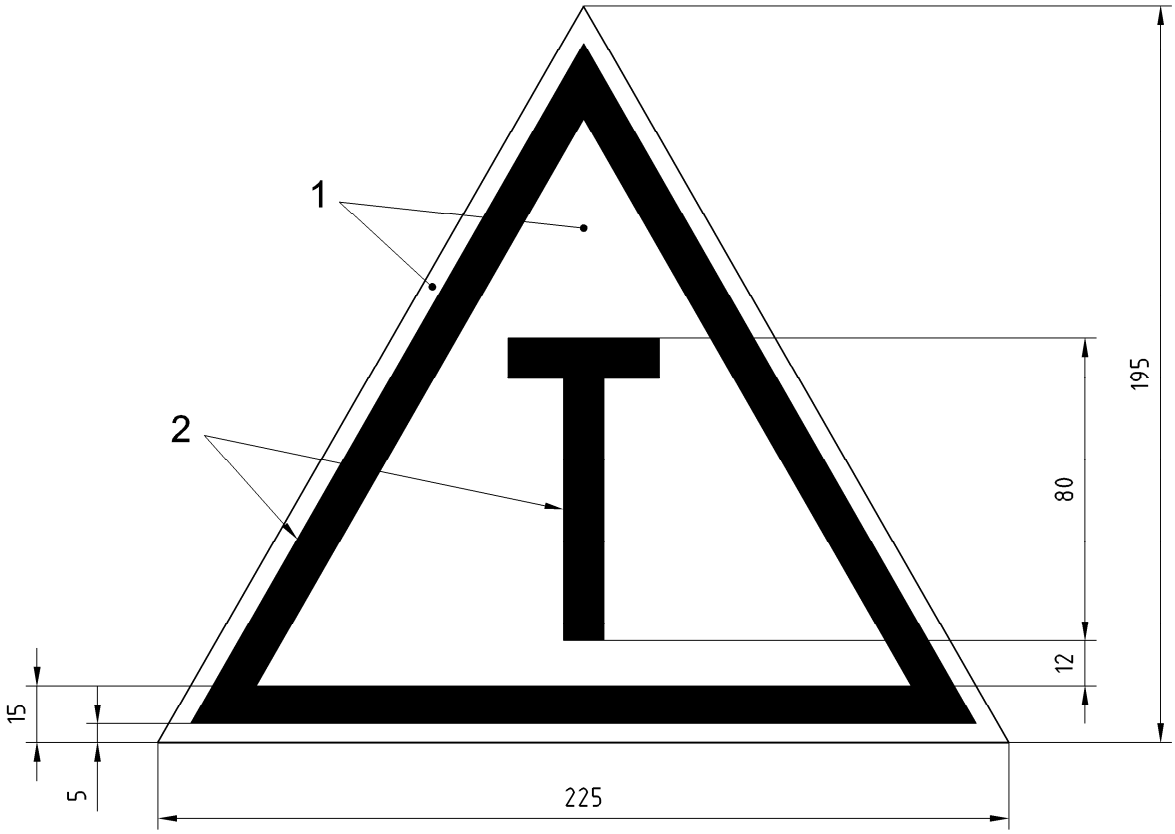
Key: 1 yellow
2 black

Position: On the left on each side wall

Meaning: Marking for Roadrailer system wagons

Figure 92

Dimensions in millimetres



Key: 1 yellow
2 black

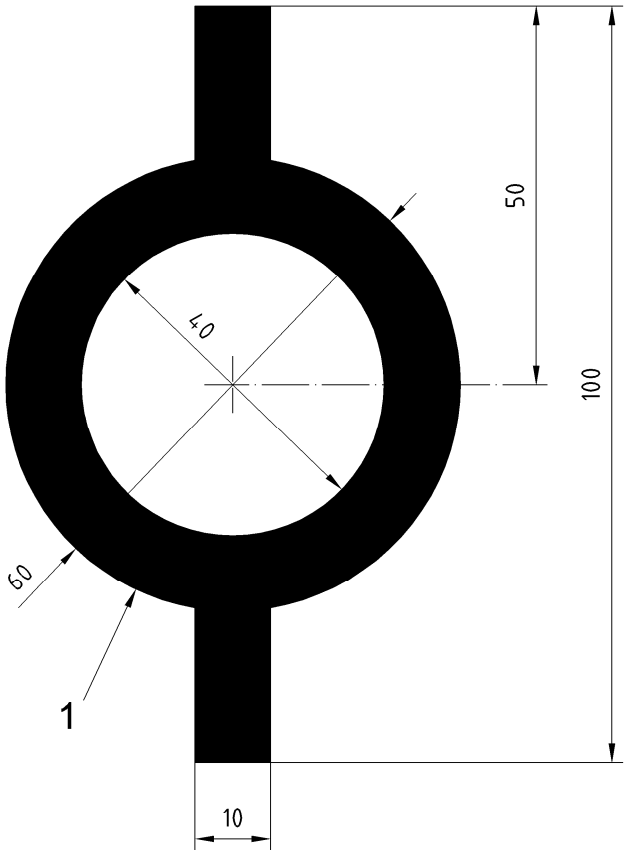
Position: On the left on each side wall

Meaning: Marking for Trans-railer system wagons

Figure 93

4.5.39 Permanently coupled wagon units

Dimensions in millimetres



Key: 1 colour contrasting with that of the wagon

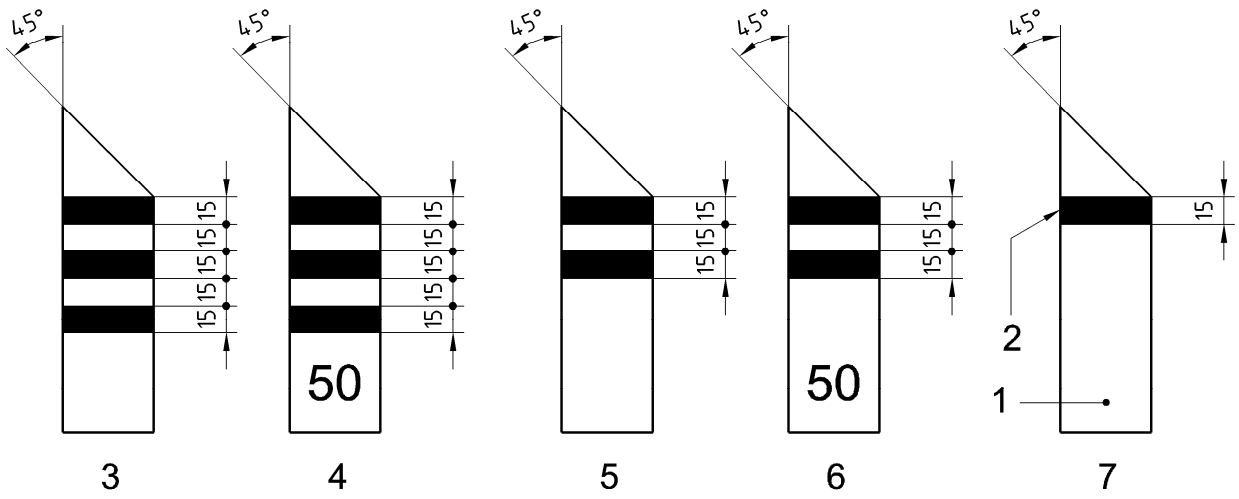
Position: On each inner headstock, next to the right-hand buffer.

Meaning: Not to be uncoupled in service. This marking is only used on wagons made up of several units that are permanently coupled together.

Figure 94

4.5.40 Wagons fitted with a train line

Dimensions in millimetres



Key:

1 Yellow
2 Black
3 For 3000 V
4 For 3000 V and 50 Hz
5 For 1500 V
6 For 1500 V and 50 Hz
7 For 1000 V

Position: On the lower part of the corner posts, on both outward-facing surfaces. For wagons without corner posts, it is recommended that the required markings be affixed to metal panels.

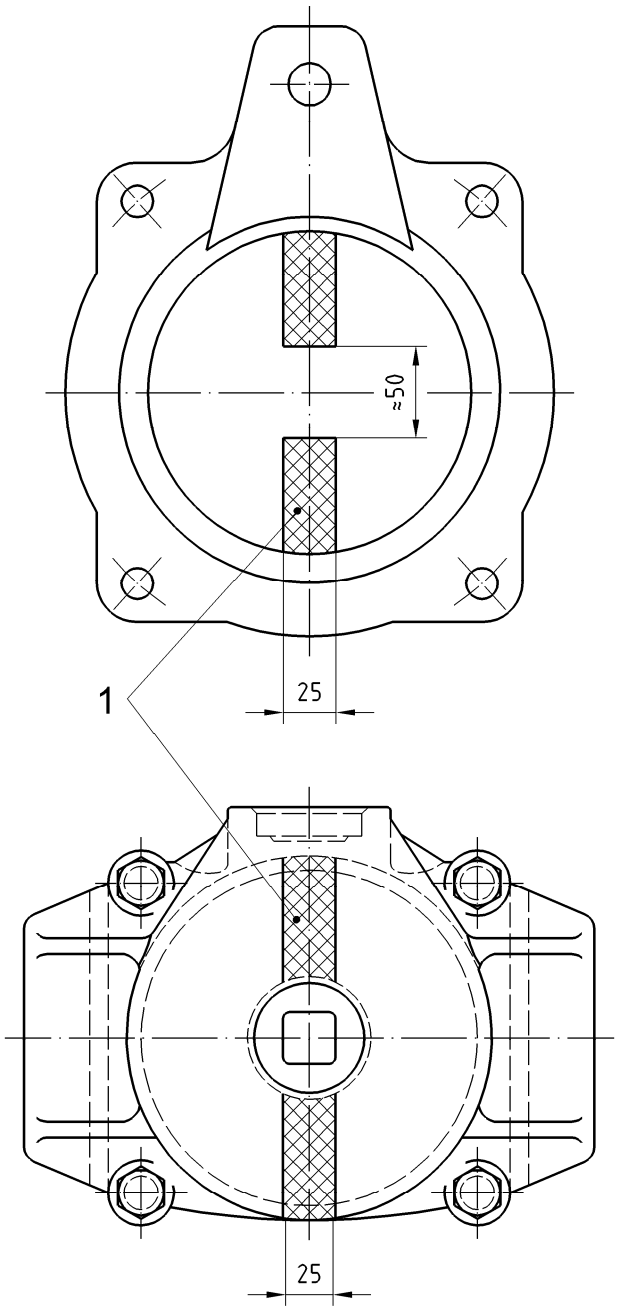
Light yellow rectangle approx. 200 mm high, the same width as the corner post and with the top corner cut off at an angle of approx. 45° inclined downwards towards the centre of the wagon. Black horizontal stripes approx. 15 mm high are painted on the yellow rectangle at intervals of 15 mm.

Meaning: Wagon is fitted with a train line. One black stripe indicates a 1000V DC cable, two stripes for a 1500 cable and three stripes for a 3000 V cable. Approval for running on 50 Hz AC electrified networks is indicated by the number “50”.

Figure 95

4.5.41 Wheels able to withstand high thermal stresses

Dimensions in millimetres



Key: 1 white discontinuous vertical stripe

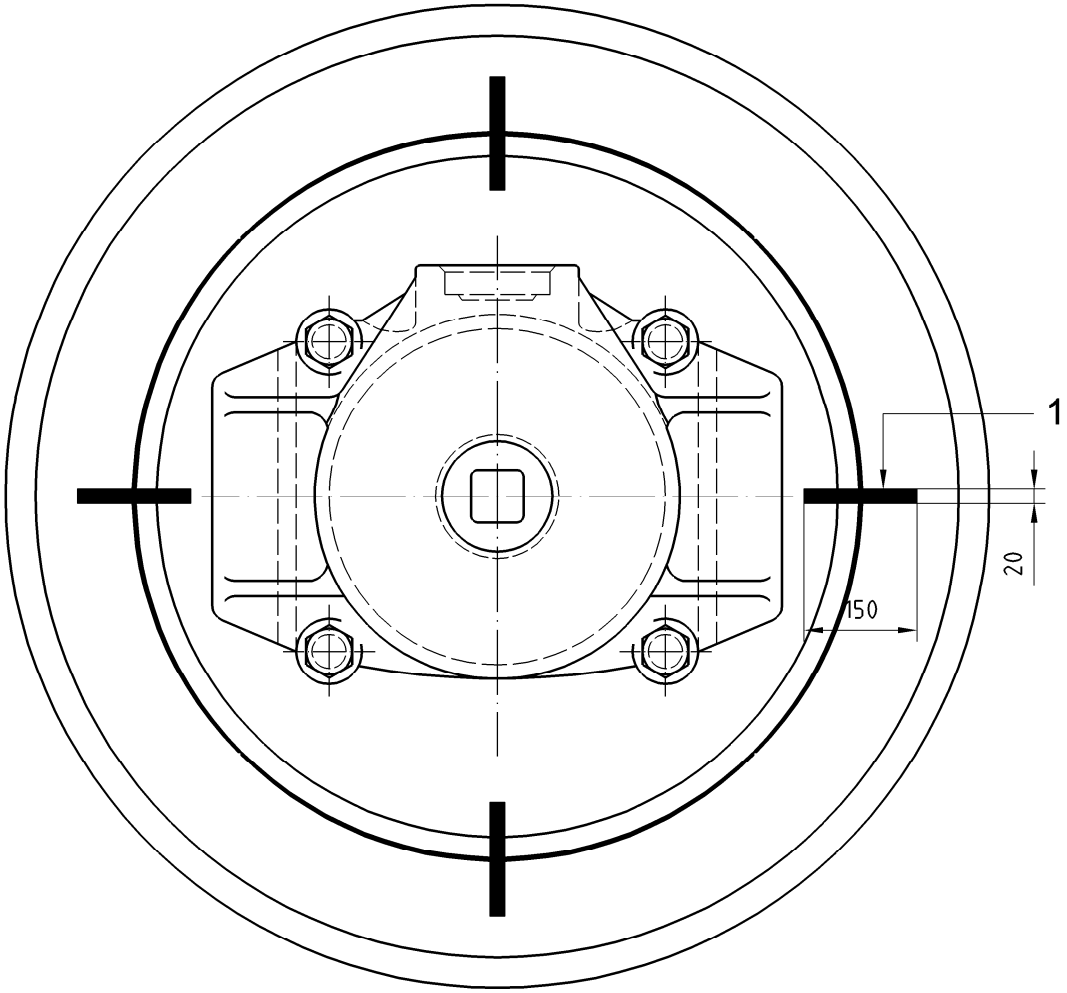
Position: On the axlebox cover.

Meaning: The wheelsets in question have wheels that are able to withstand high thermal loading.

Figure 96

4.5.42 Marking of tyred wheels

Dimensions in millimetres



Key: 1 white

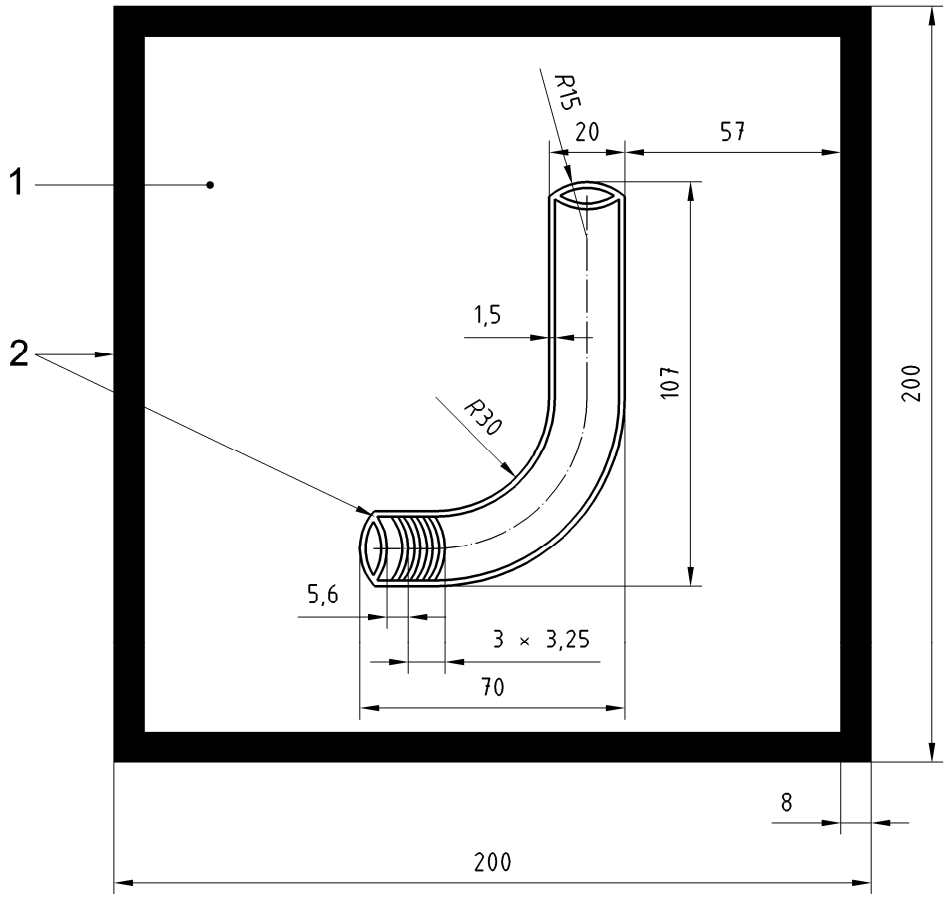
Position: Control marks (four individual white coloured stripes at 90° intervals) on the outer surface of the wheel tyre and rim.

Meaning: Control mark to check the position of the tyre in relation to the wheel rim.

Figure 97

4.5.43 Ventilation pipes

Dimensions in millimetres



Key: 1 yellow
2 black

Position: On tanks next to the pipes in question.

Meaning: Ventilation pipes marked with this symbol shall not be sealed off.

Figure 98

4.5.44 Tank code, special provision code(s) and next inspection due

Dimensions in millimetres

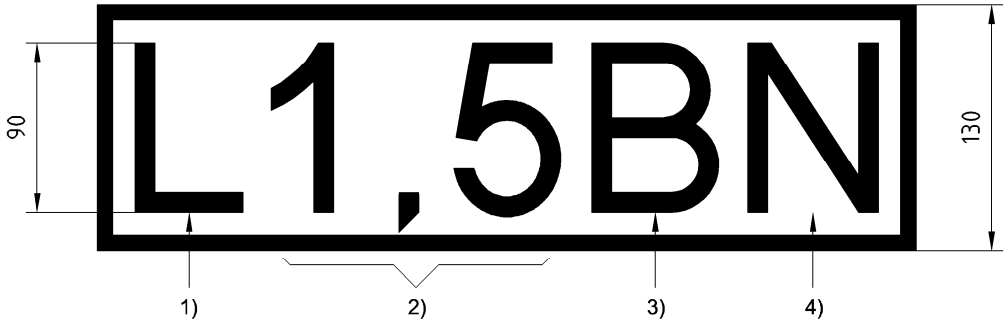


Figure 99a

Figure 99b

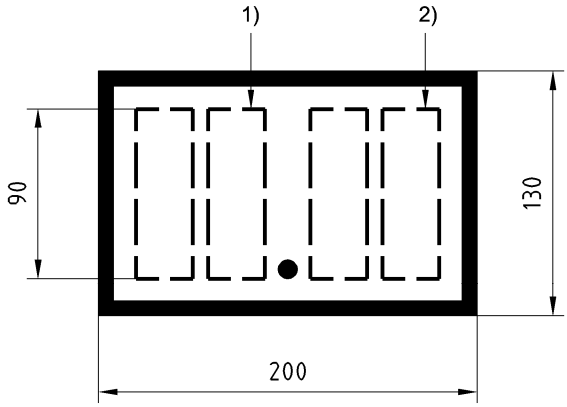


Figure 99c

Position: Grouped, at each far right end of the side of the tank. Preferably placed above each other in the order from the top: fig 99a, 99b, 99c

Meaning: Figure 99a: A four element alphanumeric code indicating 1) the type of tank, 2) its calculation pressure, 3) its openings, 4) its safety valves and devices. The tank codes and their hierarchy are defined in RID subclauses 4 3.4.1

Figure 99b: This is an example according to RID.

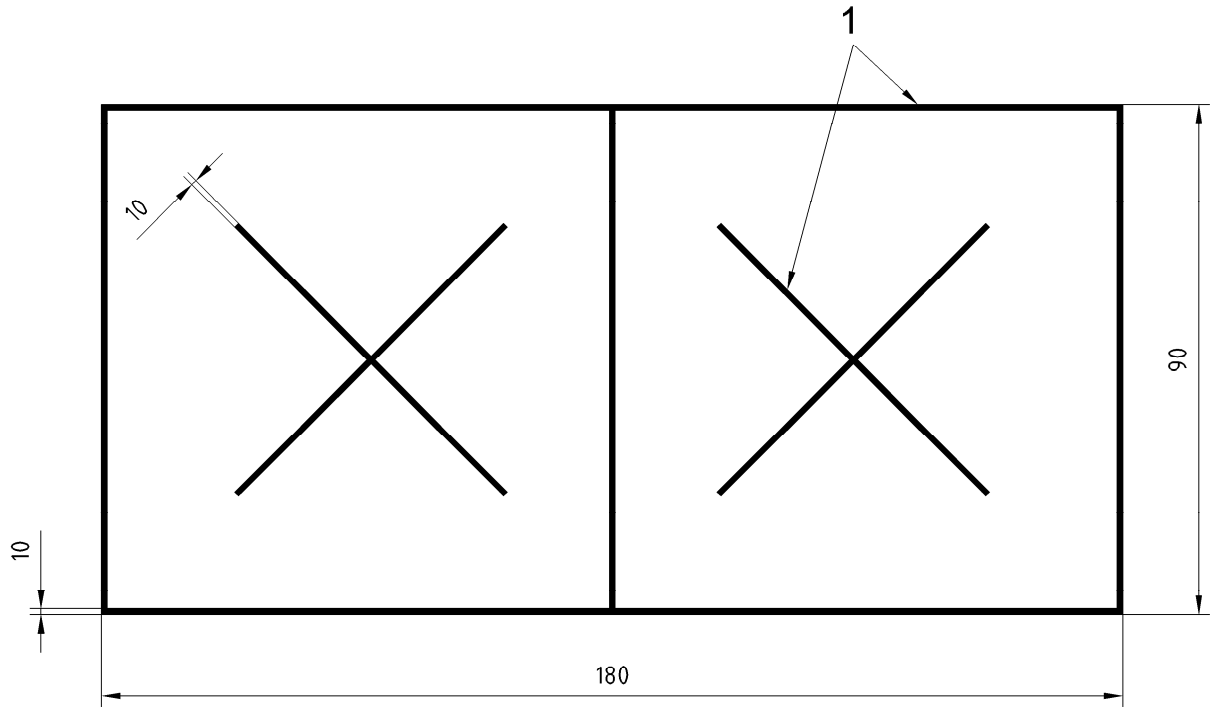
Figure 99c: Indication, according to RID subclause 6.8.2.5.2, of the deadline for next tank inspection and test (end of month). The marking specifies the month 1) and year 2) of the next inspection. If the date indicates the next intermediate inspection, the letter “L“ is added after the deadline (also inside the frame).

NOTE Figs. 99a, 99b and 99c are examples; the frames are optional.

Figure 99

4.5.45 Replacement of springs

Dimensions in millimetres



Key: 1 colour contrasting with that of the vehicle

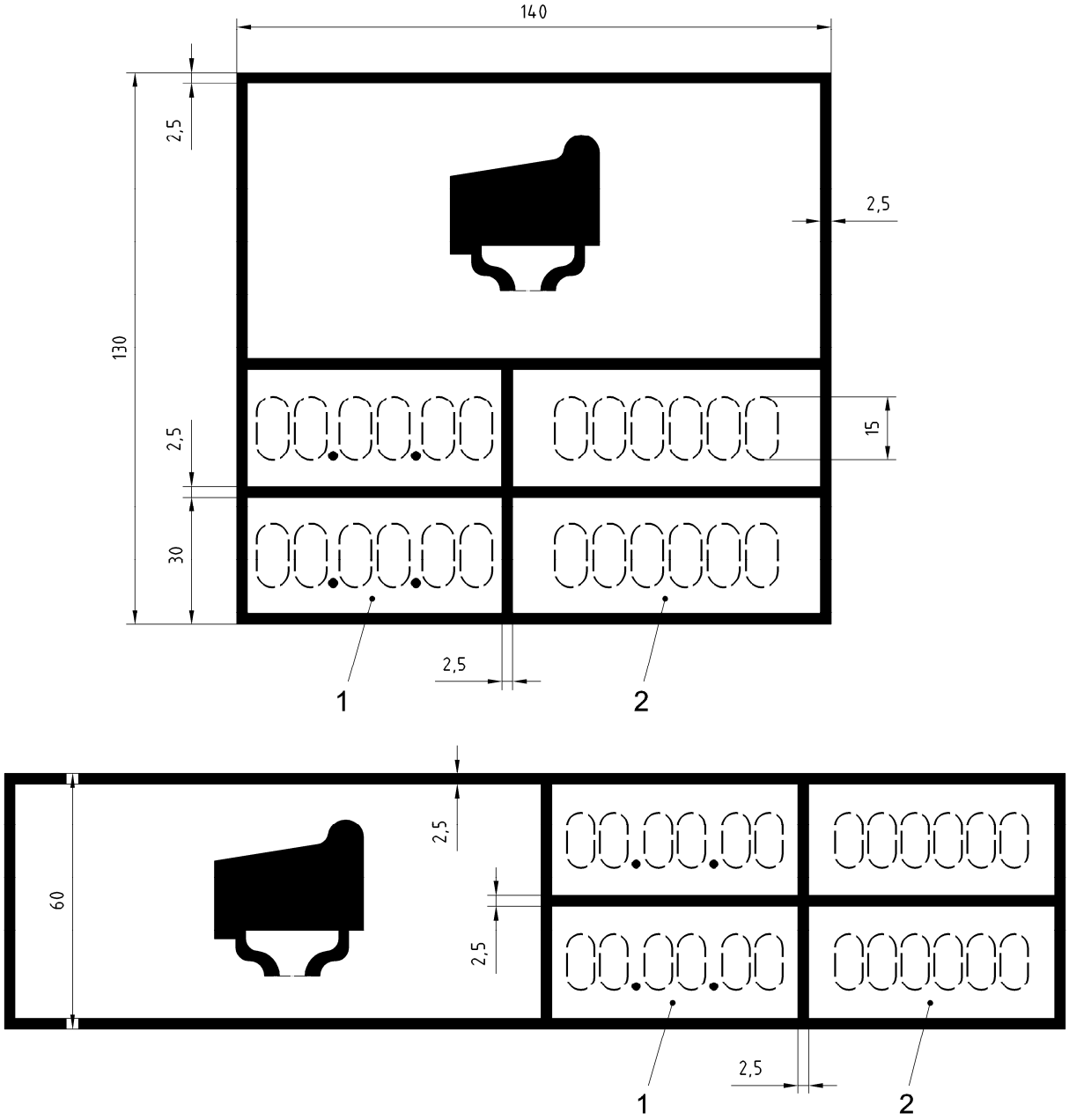
Position: On the right of each solebar, or on parts covering the solebar or on special boards fitted at the same height as the solebars.

Meaning: On wagons with a rigid underframe (tank wagons, hopper wagons, etc.), this marking indicates that if one spring is damaged, both springs shall be replaced. This does not apply to suspension springs with progressive stiffness (e.g. parabolic springs).

Figure 100

4.5.46 Wheel tyre inspection

Dimensions in millimetres



Key: 1 day, month and year of the two last checks
2 code number of the workshop

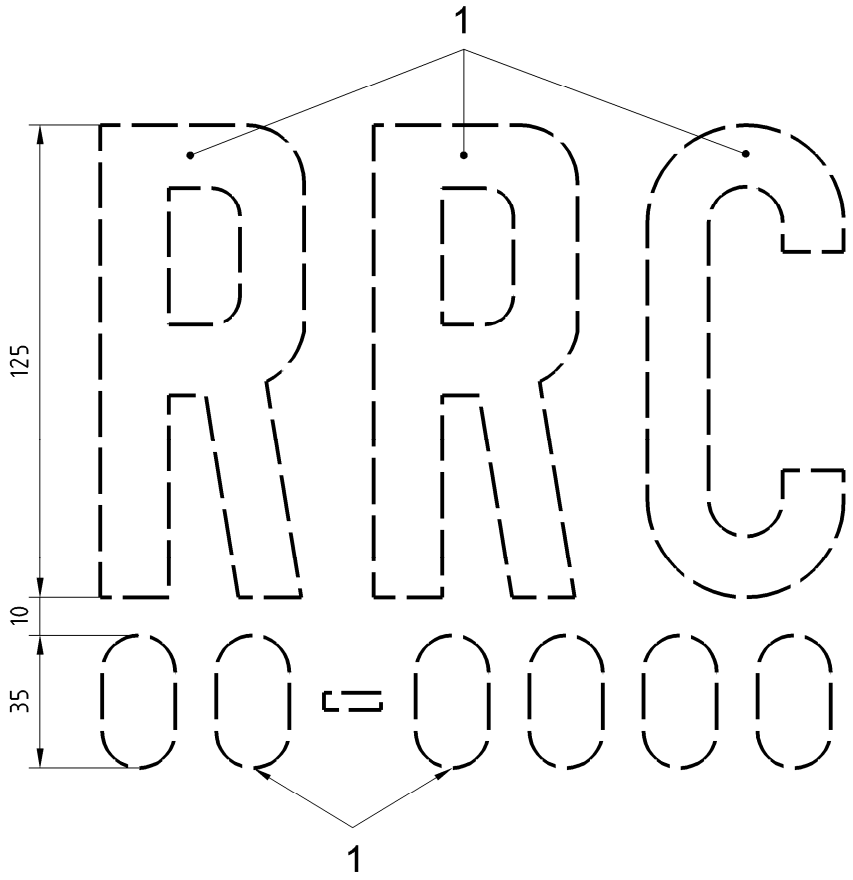
Position: On the right of each solebar, or on parts covering the solebar or on special boards fitted at the same height as the solebars.

Meaning: This plate indicates the date (day, month and year) (1) of the last two checks to ensure the tyre is firmly in place on the wheel body. In addition to the date, the code number of the workshop is also specified (2).

Figure 101

4.5.47 Inspection periods for temperature controlled units

Dimensions in millimetres



Key: 1 blue characters and a white background

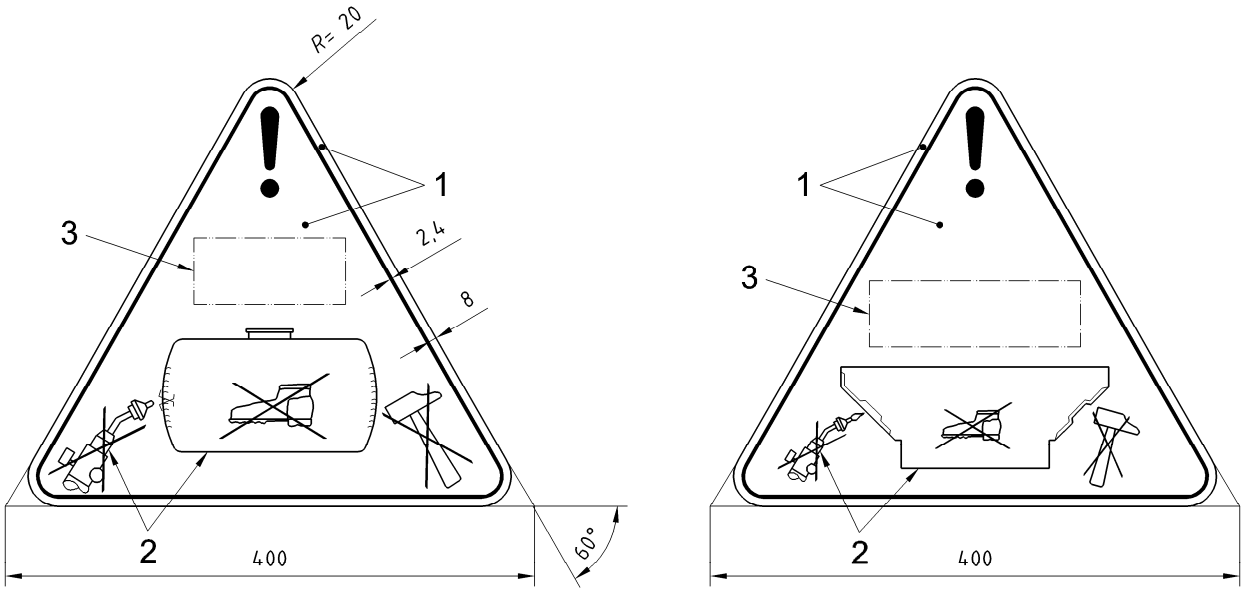
Position: On the right of each side wall.

Meaning: On wagons used to carry perishable foodstuffs, this marking shows the distinguishing mark for the temperature control system under the ATP agreement and indicates the expiry date (month and year) of the certificate held by the wagon.

Figure 102

4.5.48 Protection of the inner lining of wagons

Dimensions in millimetres



Key:
1 yellow
2 black
3 rectangles for markings such as: REVÊTEMENT INTÉRIEUR, INNENAUSKLEIDUNG, INVESTIMENTO INTERNO

Position: On both sides of the tank or hopper at clearly visible points.

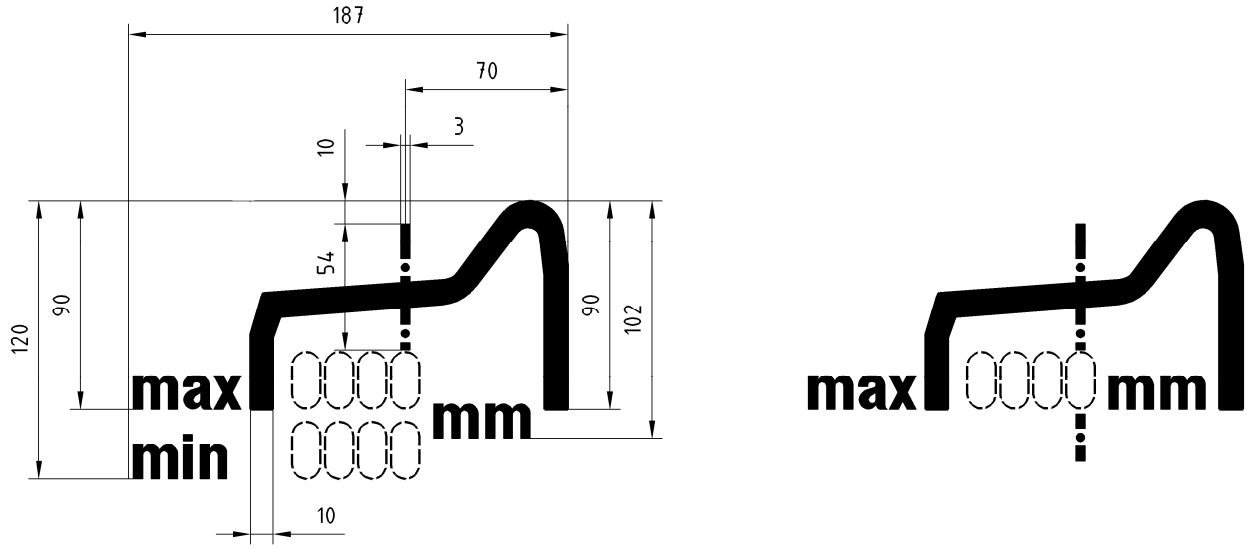
Meaning: Precautions designed to protect the inner lining (enamel, coat of paint…).

NOTE The words “inner lining” may be added to this pictogram in one or more languages.

Figure 103

4.5.49 Permissible diameter of the wheel

Dimensions in millimetres



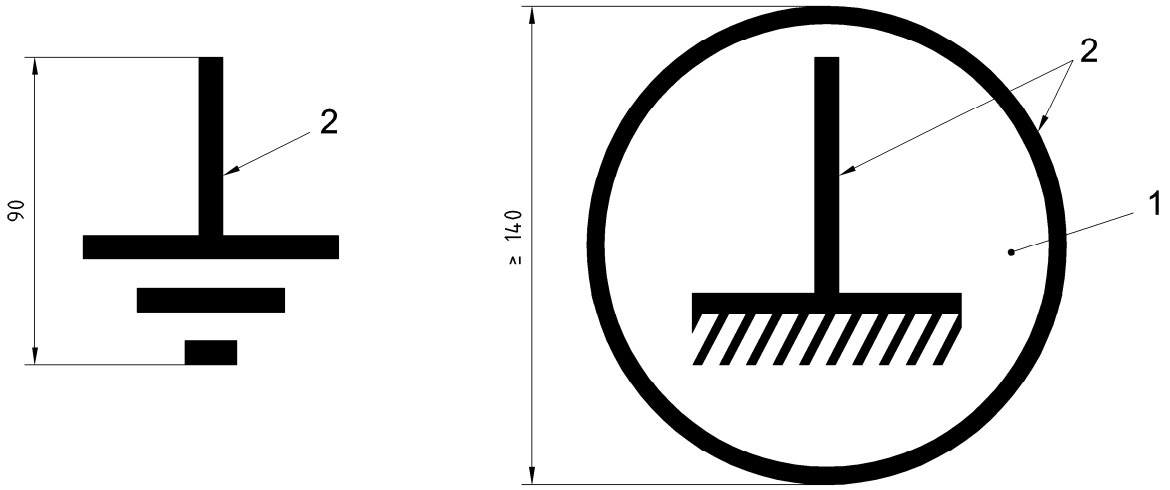
Position: On both sides of the wagon on the solebar above the right wheelset or the bogie frame. It is to be marked on the right hand side of the bogie, on both sides of the wagon or on special boards fitted at the same height as the solebars.

Meaning: On certain wagons the max/min diameter of the wheels is to be given to enable compliance with dimension limits, for example buffer height.

Figure 104

4.5.50 Earthing protection

Dimensions in millimetres



Key: 1 yellow
2 black

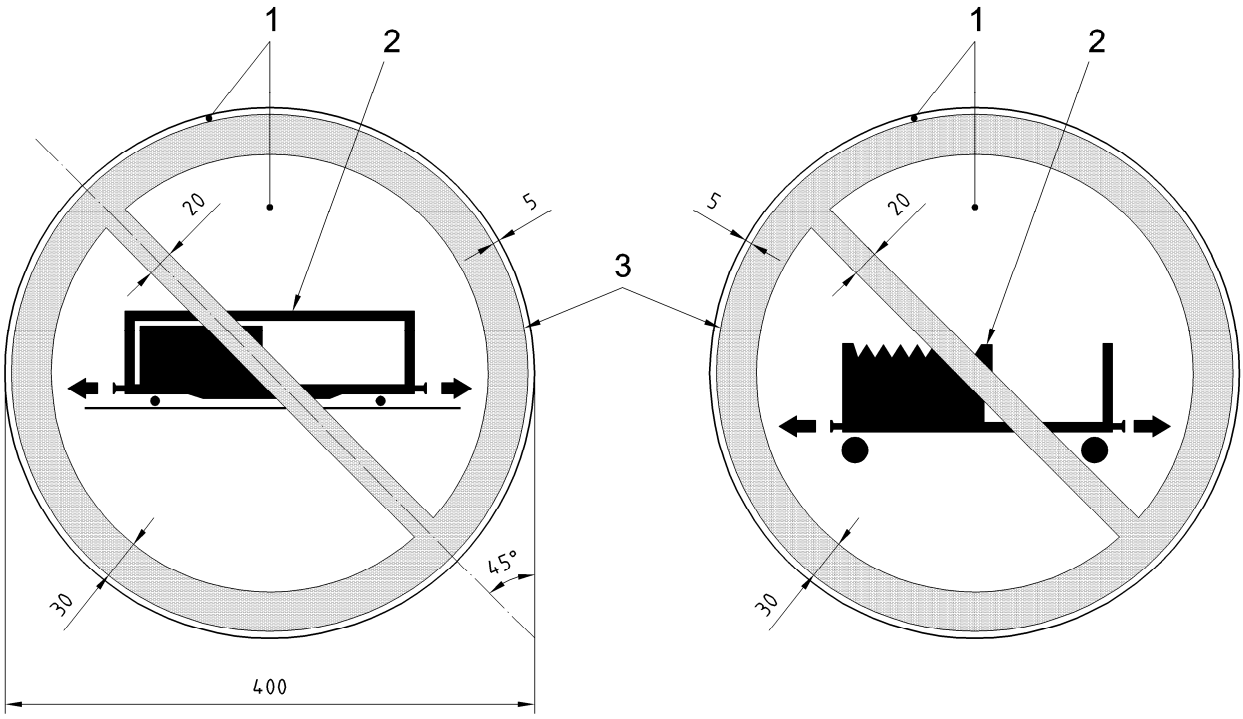
Position: Next to the earthing point.

Meaning: Identifies the places, where earthing protection is needed.

Figure 105

4.5.51 Prohibition to run with open sliding doors, curtains or hood

Dimensions in millimetres



Key:
1 white
2 black
3 red

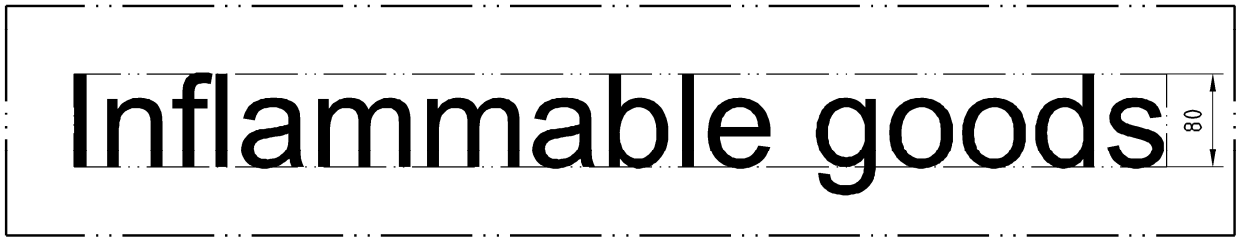
Position: On each side of the wagon.

Meaning: It is not allowed for wagons to run with sliding doors, curtains or hoods etc., in the open position.

Figure 106

4.5.52 Transported goods

Dimensions in millimetres



Position: On the wagon inscription panel on left hand end of each body side.

Meaning: Names the products for which the tank is designed.

Figure 107 — Example

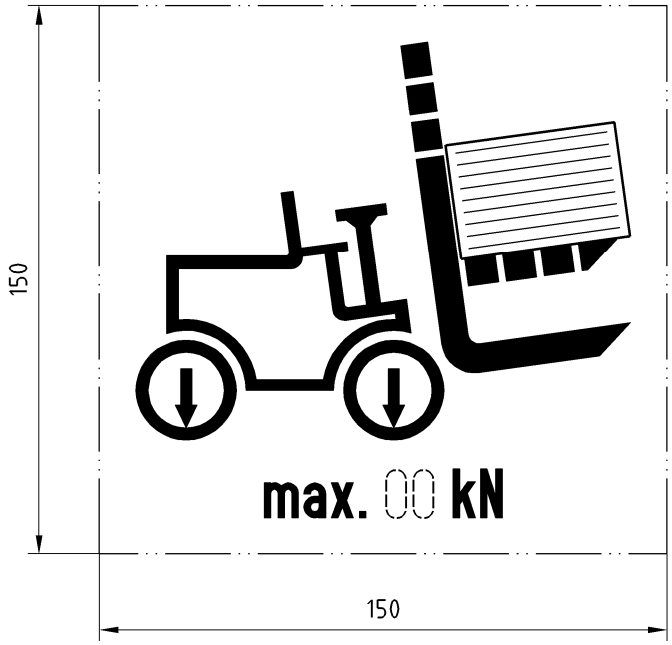
4.5.53 Orange plate for dangerous goods

Position: On each side of the wagon on the inscription panels. If the tank is separated into individual compartments, an orange plate with the appropriate indications shall instead be placed on each side of the wagon at the position of each compartment.

Meaning: As per RID subclause 5.3.2.

4.5.54 Wheel point loading

Dimensions in millimetres



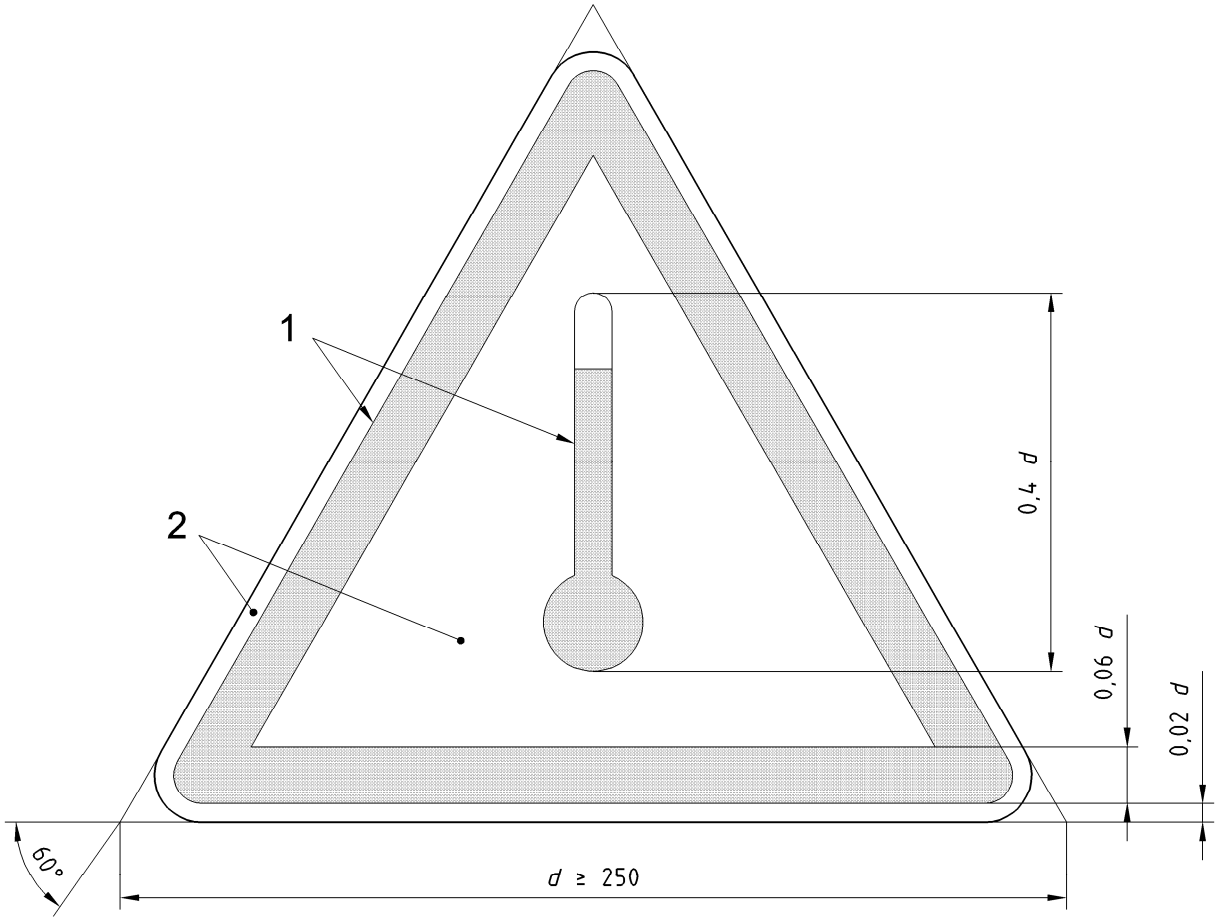
Position: Inside the wagon in a clearly visible location, if possible at eye level.

Meaning: Indication of wagon floor permitted wheel force loading less or equal to the maximum indicated.

Figure 108

4.5.55 Elevated temperature

Dimensions in millimetres



Key: 1 red
2 white

Position: On both sides of the wagon at clearly visible points.

On large containers, tank-containers and portable tanks additionally at both ends.

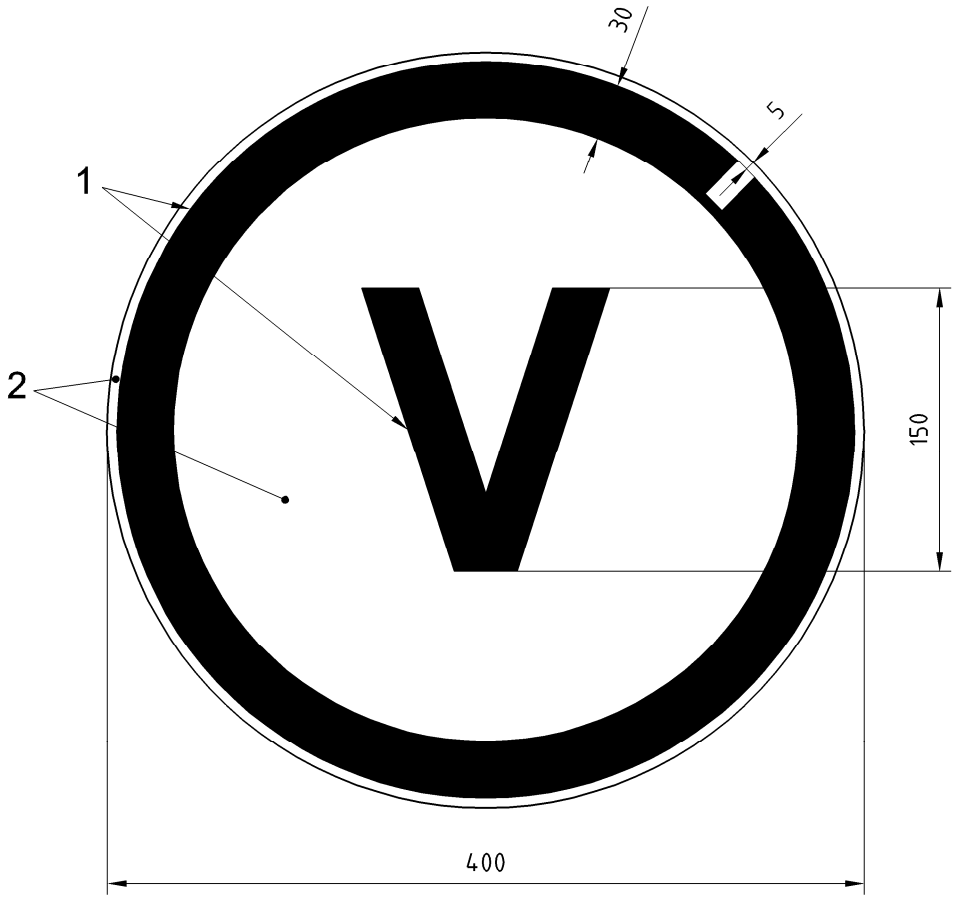
Meaning: Caution - May be carrying elevated temperature substances.

Reference: RID subclause 5.3.3.

Figure 109

4.5.56 Vacuum insulated tanks

Dimensions in millimetres



Key: 1 yellow
2 black

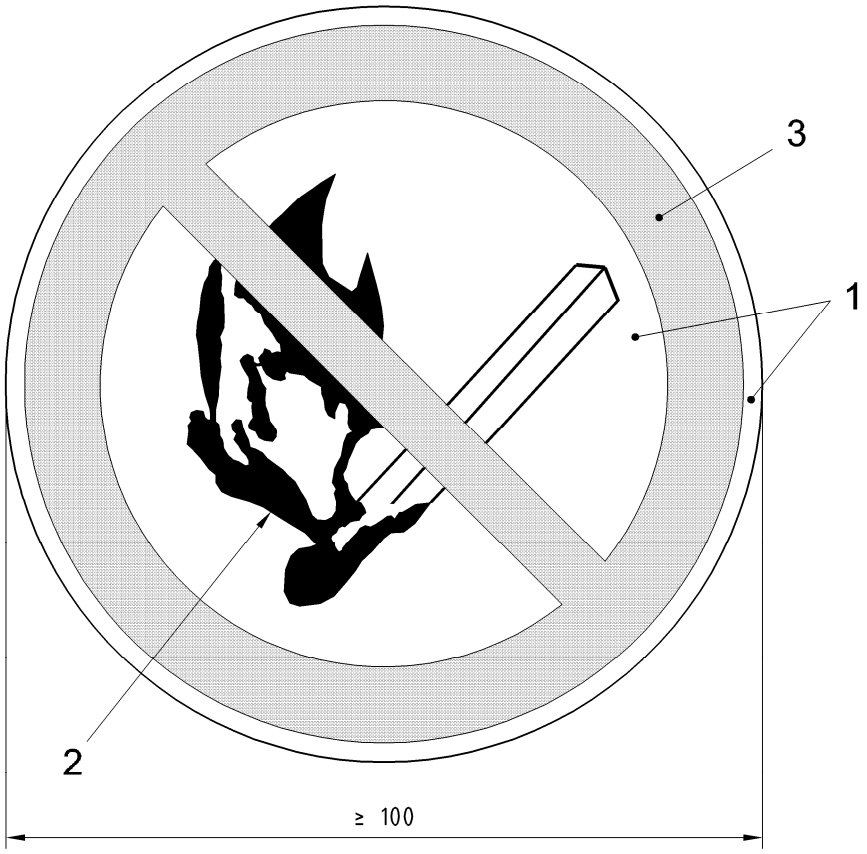
Position: On both sides of the tank at clearly visible points.

Meaning: Thermally insulated by vacuum (RID 6.8.3.2.15 and 6.8.3.5.5)

Figure 110

4.5.57 Smoking and naked flames forbidden

Dimensions in millimetres



Key:
1 white
2 black
3 red

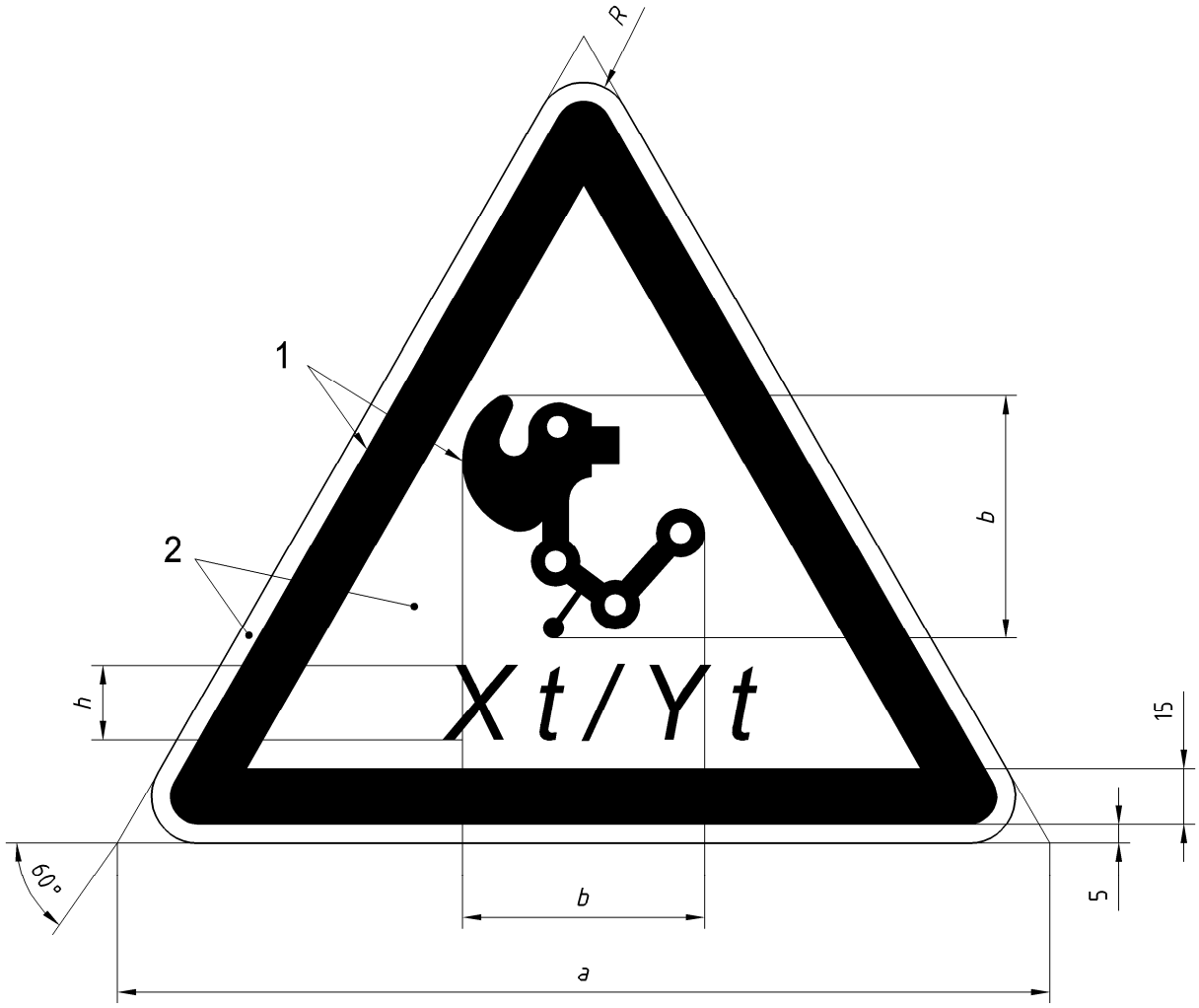
Position: Close to bottles containing compressed liquefied gas.

Meaning: Marking prohibiting naked flames or smoking in the vicinity of bottles containing compressed liquefied gas used for wagons equipped with machines operated independently or from an external source of energy.

Figure 111

4.5.58 High strength coupling

Dimensions in millimetres



Template	Dimensions			
	a	b	h	R
1	400	130	30	22
2	200	65	20	11

Key: 1 black
2 yellow
R radius

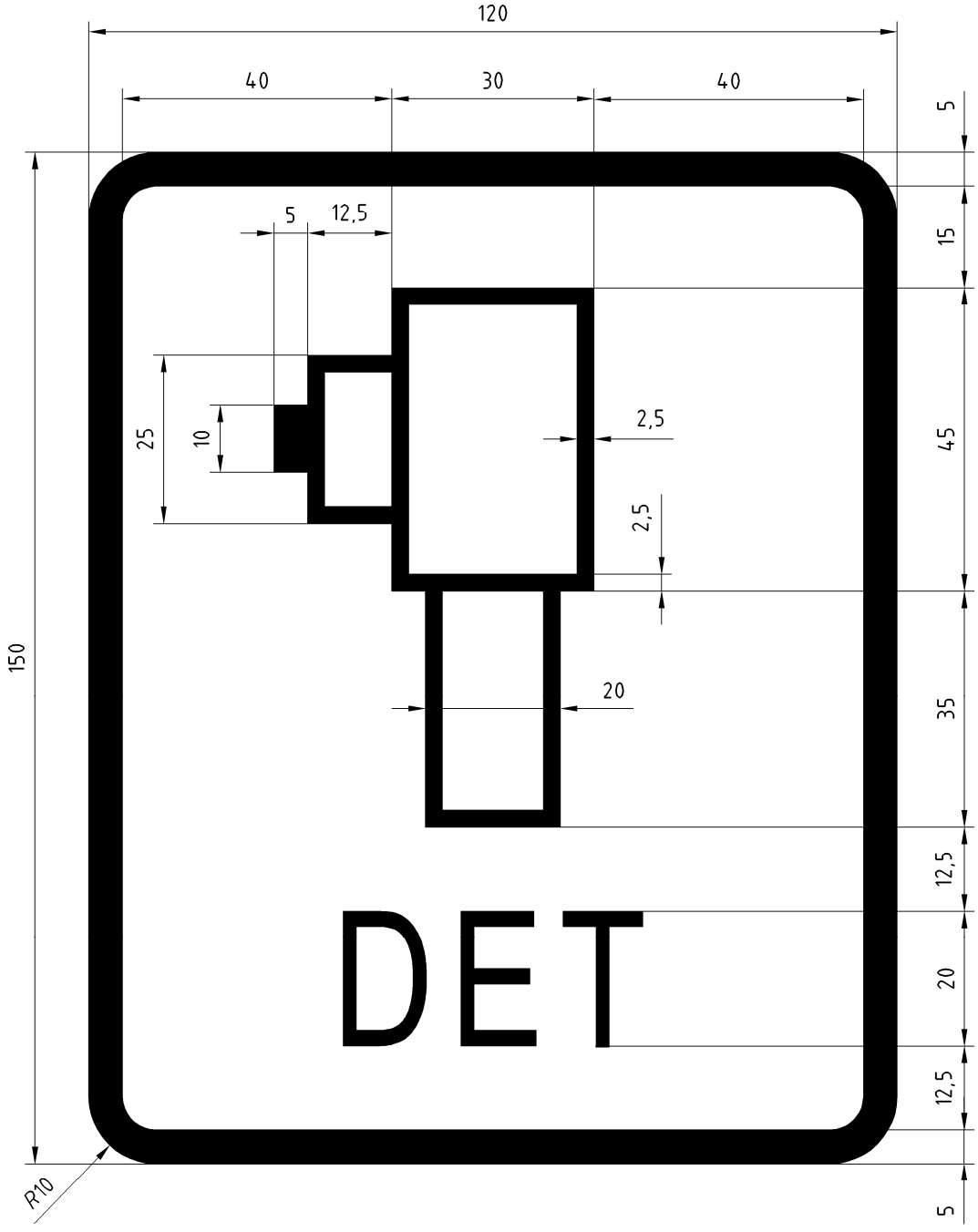
Position: At each alternate end of the wagon sides or solebar. The template of the marking shall be chosen to fit into the space earmarked for this purpose.

Meaning: Wagon fitted with high strength coupling – X t relates to the strength of the coupling, Y t to the coupling hook. A high strength coupling is as defined in EN 15566:2009 paragraph 4.1 Table 1, where the system designation of strength is higher than 1 MN.

Figure 112

4.5.59 Derailment detector

Dimensions in millimetres



Position: On alternate left hand sides of the wagon on the solebar in a conspicuous position close to the detector itself.

Meaning: Derailment detectors for freight wagons are devices which respond to unusually high vertical accelerations of the vehicle indicating the possibility of derailment.

Figure 113

Annex ZA
(informative)

Relationship between this European Standard and the Essential Requirements of EU Directive 2008/57/EC of the European Parliament and of the Council of 17 June 2008 on the interoperability of the rail system within the Community (Recast)

This European Standard has been prepared under a mandate 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 CR Freight Wagons and Table ZA.2 for CR Traffic Operations and 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.

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.1 — Correspondence between this European Standard, the CR TSI RST Freight Wagons dated July 2006, published in the OJEU on 8 December 2006 and its intermediate revision published in the OJEU on 14 February 2009 and Directive 2008/57/EC *(1 of 2)*

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 subsystem 4.2 Functional and technical specifications of the subsystem, §4.2.2.5 Structures and mechanical parts, Marking of freight wagons 5 Interoperability constituents 5.3 List of constituents §5.3.1.3 Structures and mechanical parts, Decals for markings 5.4 Constituents performances and specifications §5.4.1.3 Structures and mechanical parts, Decals for markings 6 Assessment of conformity and/or suitability for use of the constituents and verification of the subsystem 6.1 Interoperability constituents §6.1.3.1.3 Specification for assessment of ICs, Structures and mechanical parts, Marking of freight wagons Annex B Structures and mechanical parts, Marking of freight wagons Annex Q Assessment procedures, Interoperability constituents Annex AA Assessment procedures, verification of subsystems Intermediate Revision, Annex I:	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 2.4.1 Safety §4 2.6 Requirements specific to operation and traffic management subsystem 2.6.1 Safety	Decals for wagon marking are categorised as an Interoperability Constituent in the TSI.

"to be continued"

Table ZA.1 *(2 of 2)*

Clause/ subclauses of this European Standard	Chapter/§/annexes of the TSI	Corresponding text, articles/§/annexes of the Directive 2008/57/EC	Comments
	Annex B Structures and mechanical parts, Marking of freight wagons (as amended)		

Table ZA.2 — Correspondence between this European Standard, the CR TSI Operations and Traffic Management dated August 2006, published in the OJEU on 18 December 2006 and its intermediate revision published in the OJEU on 14 February 2009 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 subsystem 4.2 Functional and technical specifications of the subsystem, §4.2.2.3 Specifications relating to trains, Vehicle identification Annex P Vehicle identification Intermediate Revision, Annex II: Annex P.5 Alphabetical marking of the interoperability capability (as amended)	Annex III, Essential requirements 2 Requirements specific to each subsystem 2.6 Requirements specific to operation and traffic management subsystem 2.6.1 Safety 2.6.3 Technical compatibility	

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

Bibliography

[1] EN 13775 (all parts), *Railway applications - Measuring of new and modified freight wagons*

[2] EN 15273-2, *Railway applications - Gauges - Part 2: Rolling stock gauge*

[3] EN 15566, *Railway applications - Railway rolling stock - Draw gear and screw coupling*

[4] COTIF 1999, *Convention Concerning International Carriage by Rail (COTIF) as amended by the Vilnius Protocol in force from 1.7.2006, applicable from 01.01.2011*

[5] *List of Vehicle Keeper Markings, Rules for Registration of a vehicle Keeper marking Code dated 9th July 2007 in accordance with ERA/OTIF.*

[6] RID 2011

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