

# UIC CODE

# 571-3

6th edition, November 2004

*Translation*

# OR

## **Standard wagons - Special-purpose wagons - Characteristics**

*Wagons unifiés - Wagons adaptés à certains trafics - Caractéristiques  
Einheitsgüterwagen - Güterwagen der Sonderbauart - Merkmale*



UNION INTERNATIONALE DES CHEMINS DE FER  
INTERNATIONALER EISENBAHNVERBAND  
INTERNATIONAL UNION OF RAILWAYS

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## Leaflet to be classified in Volumes:

IV - Operating

V - Rolling Stock

## Application:

With effect from 1 April 2002

All members of the International Union of Railways

## Record of updates

<b>1st edition, January 1963</b>	First issue published under the title "Standard wagons accepted for running on international services - Wagons adapted for a certain type of traffic - Characteristics".
<b>3rd edition, January 1968</b>	and 6 Amendments.
<b>4th edition, January 1974</b>	and 2 Amendments.
<b>5th edition, January 1979</b>	Published under the title: "Standard wagons - Special-purpose wagons - Characteristics" - Reprint dated 1.1.96 including 13 Amendments.
<b>6th edition, November 2004</b>	Supplementary characteristics concerning type 3A and 3B wagons. Adaptation to editorial guide M1.  Important: the articles (points) in this leaflet have been renumbered in the new edition. Digit 0 becomes 1 (digit 1 becomes 2, and so on). Please take account of this when using cross-references from other leaflets.

*The person responsible for this leaflet is named in the UIC Code*

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## Summary

In order to speed up operations and simplify wagon utilisation by customers, UIC Member Railways shall undertake in their wagon-building programmes to abide by the standardisation rules contained in this leaflet, except in the case of very specific requirements.

# 1 - General

- 1.1 - In order to speed up operations and simplify wagon utilisation by customers, UIC Member Railways shall undertake in their wagon-building programmes to abide by the standardisation rules contained in this Leaflet, except in the case of very specific requirements.

When a Railway faced with such requirements does not comply with the type 2 specifications in point 4 - page 18 of this leaflet for the construction of certain two-tier car-carrying wagons, the overall length of standard wagons must under no circumstances exceed that of wagons covered by point 4, i.e. 27,0 metres.

- R 1.2 - It is recommended that:

- wagons to be built should be of types which:
  - are described in this leaflet as "standard" in accordance with the set of standard drawings managed by ERRI;
  - are described in this leaflet as "partially standardised" in accordance with the requirements stated in the ERRI reports concerning partial standardisation and the set of standard drawings managed by ERRI;
- to improve aerodynamic efficiency, the solutions presented in *ERRI Report B 12/RP 54* (see [Bibliography - page 83](#)) be used, where these are cost-effective.

Standardised or partially-standardised vehicles and their normalised components are listed in document *ERRI DG4* (see [Bibliography - page 83](#)).

- 1.3 - The interchangeable parts listed in *UIC Leaflet 570* (see [Bibliography - page 83](#)) shall be used for building the wagons.
- 1.4 - The wagons must comply with the following running conditions:

**N.B. :** some wagons are subject to additional provisions laid down in the relevant points of this leaflet.

## 1.4.1 - Wagons with 20 t axle-load:

- the strength of these wagons and their running quality must allow them to be worked at 100 km/h with the permissible maximum load on lines designed for 20 t axle-loads (lines in category C), this weight normally being distributed along the entire wagon length;
- the brake gear of wagons must allow these wagons to be worked under S conditions with a 20 t axle-load.

The following wagons, covered by the provisions of this leaflet, are suitable for 20 t axle-loads:

- controlled-temperature wagons (point 2 - page 6),
- wagons with opening roof (point 3 - page 15),

- two-tier car-carrying wagons (point 4 - page 18) subject to exemptions set out in points 4.2.1 - page 20 and 4.3.1 - page 21,
- 2-axle wagons with bilateral controlled unloading by gravity at the top (point 5 - page 23),
- covered bogie wagons with opening roof (point 6 - page 25),
- bogie wagons for the conveyance of coiled metal, equipped with movable hoods, fixed end-walls and loading cradles (point 7 - page 32):
  - type 1A: wagons with telescopic hoods and two 2-axle bogies, when the wagon is not fitted with running gear and brakes providing for 22,5 t axle-loads,
  - type 1B: wagons with synthetic sheets and two 2-axle bogies, when the wagon is not fitted with running gear and brakes providing for 22,5 t axle-loads,
  - type 2: wagons with telescopic hoods and two 3-axle bogies,
- bogie wagons with bilateral bulk unloading by gravity (point 8 - page 37) when these wagons are not fitted with running gear and brakes providing for 22,5 t axle-loads:

#### 1.4.2 - Wagons with 22,5 t axle-loads:

- the strength of these wagons and their running stability must allow them to be worked at 100 km/h with the permissible maximum load on lines designed for 22,5 t axle-loads (lines in category D), and at 120 km/h with the load corresponding to a 20 t axle-load, this weight normally being distributed along the entire wagon length;
- the brake-gear of wagons must allow their use in S traffic with 22,5 t axle-loads.

The following wagons, covered by the provisions of this leaflet, are suitable for 22,5 t axle-loads:

- bogie wagons for the conveyance of coiled metal, equipped with movable hoods, fixed side walls and loading cradles (point 7):
  - type 1A: wagons with two 2-axle and telescopic hoods, when these wagons are fitted with running gear and brakes providing for 22,5 t axle-loads,
  - type 1B: wagons with two 2-axle bogies and synthetic sheets, when these wagons are not fitted with running gear and brakes providing for 22,5 t axle-loads,
- bogie wagons with bilateral bulk unloading by gravity (point 8) when these wagons are fitted with running gear and brakes providing for 22,5 t axle-loads,
- 2-axle covered wagons with sliding walls (point 9 - page 40).



○ **1.5 - Wagons shall be built:**

- with or without a crossover system,
- with or without screw brakes,

in accordance with the provisions of *UIC Leaflet 535-3* (see Bibliography - page 83).

Addition of a crossover system on wagons is not allowed in the following cases:

- wagons designed to incorporate at least one platform in accordance with the provisions of *UIC Leaflet 535-2* (see Bibliography - page 83),
- wagons without superstructure or with end-loading possibilities,
- bogie wagons which, if designed with an intercommunicating gangway, would infringe maximum conditions for fitting with the automatic coupler as per *UIC Leaflet 530-2* (see Bibliography - page 83).

○ **1.6 - The maximum tare of wagons covered by this leaflet shall be that of wagons fitted with compressed air brakes and:**

- for wagons with superstructure, comprising at least one platform complying with the provisions of *UIC Leaflet 535-2*: one screw brake operable from this platform,
- for other wagons with superstructure: an intercommunicating gangway complying with the provisions of *UIC Leaflet 535-2* and a screw brake operable from the gangway,
- for wagons without superstructure: crossing steps complying with the provisions of *UIC Leaflet 535-2*, and a screw brake operable from the ground,
- for two-tier car-carrying wagons: a screw brake operable from the ground,
- for wagons with superstructure and without platforms which, due to their length (see point 1.5), cannot be fitted with intercommunicating gangways: a screw brake operable from the ground,
- without a main electric wiring system.

Where refrigerator and insulated wagons built to the British gauge are concerned, the tare shall also include the hand-brake in accordance with the provisions of *UIC Leaflet 549* (see Bibliography - page 83).

The minimum tare (not specified in this leaflet) results from application of the conditions of *UIC Leaflet 530-2*, whether the wagon is fitted with a gangway and screw brake or not.

○ **1.7 - The length of the underframe (between the buffer fixing planes) as laid down in this leaflet, refers to wagons without a crossover gangway.**

In all cases, the length of the underframe must have a positive tolerance (complying with the relevant national standard) after manufacture.

- **1.8** - Permanent additional gear may only be fitted to the wagons with the approval of UIC, which shall decide whether or not the presence of such gear alters the standard characteristics of the wagon. The request to UIC shall be accompanied by:
  - a detailed description,
  - the submission of a prototype.
- **1.9** - It must be possible to lift the wagons, when loaded, by either one of the two ends, by inserting the lifting arms under the headstock:
  - level with the side buffers for bogie wagons,
  - in extension of the sole-bars for 2-axle wagons.
- **1.10** - When the sliding walls of 2-axle covered wagons and of bogie wagons are in the open position, they foul the gauge defined in *UIC Leaflet 505-3* (see [Bibliography - page 83](#)).

These wagons must be fitted, on each side, with a pictogram (see Fig. [26 - page 75](#)), to indicate that they cannot be moved unless the sliding walls are in closed and locked position.

## 2 - Wagons under controlled-temperature conditions

Refrigerator, insulated and mechanically-refrigerated wagons are of one of the three following types:

*Types 1 and 3:*

able to run only on continental-gauge lines.

*Type 2:*

able to run also on the British-gauge lines.

They are 2-axle wagons or bogie wagons with two 2-axle bogies.

### 2.1 - Common provisions

- **2.1.1** - These wagons must allow for the fitting of a 3 000 V electric cable to power supply vehicles in the cases covered by the *RIC* (see [List of abbreviations - page 82](#)). See *UIC Leaflet 552* (see [Bibliography - page 83](#)).

- **2.1.2** - 2-axle wagons must have two doors, each one being positioned centrally in each side wall.

Bogie wagons must have four doors, i. e. two in each side wall, facing each other.

Each door must leave an unobstructed minimum opening measuring 2,700 m in width and 1,900 m in height with, where necessary, rounded-up corners with an appropriate radius.

- **2.1.3** - Irrespective of the load condition of these wagons, it must be possible to open the doors level with a platform 1,150 m in height above rail level, still retaining a 20 mm margin to accommodate any inclination of the wagon.

**NB :** it is recommended that wedges of suitable thickness be used to maintain the height of the buffers of existing empty insulated and refrigerator wagons, when in service, as close as possible to 1,065 m, and in all cases higher than 1,030 m.

In addition it is recommended that, where possible, and when the modifications involved are only slight, the door fittings of existing stock should be altered to allow for door opening level with platforms 1,150 m high.

- **2.1.4** - The inner lining of the walls and roof must be unaffected by chemical products routinely used for cleaning, disinfection and deodorisation purposes. As regards cleaning, see *UIC Leaflet 422* (see [Bibliography - page 83](#)). This lining must be smooth, easy to clean and disinfect; in particular any not easily accessible part should be avoided.

The inner lining and any other parts which may come into contact with foodstuffs, must be made of an anti-corrosive material and so designed that they can neither abnormally alter the composition of foodstuffs nor transfer noxious substances to them.

The walls must be constructed in such a way that the area liable to come into contact with the load is as small as possible and that the air flow between the walls and the load is impeded as little as possible in the vertical direction.

**O 2.1.5** - The top surface of the floor must be absolutely waterproof. Whether of metal or not, it should have the same properties as the parts referred to in point **2.1.4** - page 6; in addition, its design characteristics must ensure that the risk of staff losing their foothold on it is reduced to a minimum.

**O 2.1.6** - Wagons under controlled-temperature conditions shall comply with one of the following wagon-body heat-insulation categories as defined in *UIC Leaflet 574* (see *Bibliography* - page 83):

-  $I_N$  for which the overall coefficient of thermic transmission of the body is:

$$K \leq 0,7 \text{ W/m}^2 \text{ } ^\circ\text{C} (0,60 \text{ kcal/m}^2\text{h}^\circ\text{C})$$

-  $I_R$  for which the overall coefficient of thermic transmission of the body is:

$$K \leq 0,4 \text{ W/m}^2 \text{ } ^\circ\text{C} (0,35 \text{ kcal/m}^2\text{h}^\circ\text{C})$$

when the wagons are in a normal state of repair.

**NB** : To allow for any wear that the wagon may be subjected to when in service, a 15 to 20% margin shall be designed into the wagon in new condition, depending on the building method adopted and of the type of insulation used.

New wagons must belong to Category  $I_R$ .

**R 2.1.7** - It is recommended that non-hygroscopic insulating materials be used and that a construction method be employed which ensures maximum body watertightness, especially on the warm side, in order to maintain the value of Coefficient K as near to constant as possible.

**O 2.1.8** - To facilitate air circulation and to avoid the risk of damage by dampness, the goods shall rest on gratings which must be unaffected by the commodity conveyed and by the chemical products normally used for cleaning, disinfection and deodorisation purposes. For cleaning, see *UIC Leaflet 422*.

The upper surface of the gratings must be such that the risk of staff losing their foothold on them is reduced to a minimum.

If the gratings are not a constituent part of the floor, they shall be hinged to the walls or, if required, to the floor, and devices shall be provided whereby they can be held vertically against these walls.

**R 2.1.9** - However, the use of gratings shall not be obligatory if the floor is specially designed to allow proper air circulation underneath the freight along the whole wagon length. In this case, all relevant measures must be taken to allow for easy and complete evacuation of wash water.

- O 2.1.10** - If the wagon must be suitable for freight forklifting, the floor must be designed to withstand the maximum load per wheel as stipulated for wagons in *UIC Leaflet 577* (see [Bibliography - page 83](#)). The same provision shall apply to gratings when they form an integral part of the floor. Gratings hinged to the walls - or possibly to the floor when they rest on it - must be sufficiently strong to withstand a maximum load of 1 200 kg per wheel, without any subsidence occurring.

Wagons complying with this provision shall bear the special mark, the characteristics and positioning of which are given in [Appendix B, Fig. 7 - page 58](#) of this leaflet.

- O 2.1.11** - Wagons used for the conveyance of fresh meat shall be fitted with meat-hanging devices (including bars and hooks) made of anti-corrosive material, and positioned to avoid the meat coming into contact with the floor. The distance between meat hooks and the upper level of gratings must be at least 1 780 mm.

They must be at least 250 hooks for 2-axle wagons and 400 for bogie wagons.

- R 2.1.12** - It is recommended that the bodies of controlled-temperature wagons be built with sufficient airtightness to ensure that the per-hour air exchange with the outside for empty wagons is less than one time the inside volume of vehicles operated under normal conditions.

- O 2.1.13** - As a general rule, wagons suitable for traffic under controlled-temperature conditions must comply with the *ATP regulations* (see [List of abbreviations - page 82](#)) drawn up by the United Nations Economic Commission for Europe, insofar as the rolling stock concerned is designed for the products covered by this Agreement.

The wagons must bear the identification marks stipulated in the *ATP, Appendix 1, Annex 4*. These marks shall be affixed below the "UIC" or "UIC St" signs. An example of this marking is given in [Appendix B, Fig. 7 - page 58](#).

- R 2.1.14** - The wagons may be able to run under SS conditions.

- O 2.1.15** - Bogie wagons, irrespective of their load condition, must be capable of running singly on transition track with minimum curve radii of 60 m.

## o 2.2 - Refrigerator and insulated wagons (lbbs, lbfs, las)

**NB :** The provisions contained in this point apply specifically to refrigerator wagons. Insulated wagons must comply with the same conditions, except as regards (a) the recipient housing the refrigerant (ice bunkers) and the appliances for loading it (loading hatches) and (b), the gratings which are only recommended for this type of wagon.

### o 2.2.1 - Main dimensions

#### 2.2.1.1 - Type 1 - 2-axle wagon (lbbs)

Length over buffers	14,020 m
Length of underframe	12,780 m
Minimum usable floor length	10,500 m <sup>(a)</sup>
Minimum usable floor width	2,550 m
Minimum usable floor area	27,000 m <sup>2</sup> <sup>(a)</sup>
Wheelbase	8,000 m

a. These specifications apply to refrigerator wagons. For insulated wagons, additional characteristics must be introduced to offset the absence of any source of refrigeration.

#### 2.2.1.2 - Type 2 - 2-axle wagon (lbfs)

Length over buffers	14,020 m
Length of underframe	12,780 m
Minimum usable floor length	10,500 m <sup>(a)</sup>
Minimum usable floor width	2,150 m
Minimum usable floor area	23,000 m <sup>2</sup> <sup>(a)</sup>
Wheelbase	8,000 m

#### 2.2.1.3 - Type 3 - Bogie wagon (las)

##### *Variant 1*

Length over buffers	21,040 m
Length of underframe	19,800 m
Minimum usable floor length	16,400 m <sup>(a)</sup>
Minimum usable floor width	2,550 m
Minimum usable floor area	41,800 m <sup>2</sup> <sup>(a)</sup>
Distance between bogie pivots	15,800 m
Bogie wheelbase	1,800 m <sup>(a)</sup>

## Variant 2

Length over buffers	22,240 m
Length of underframe	21,000 m
Minimum usable floor length	17,800 m <sup>(a)</sup>
Minimum usable floor width	2,550 m
Minimum usable floor area	45,000 m <sup>2</sup> <sup>(a)</sup>
Distance between bogie pivots	16,800 m
Bogie wheelbase	1,800 m <sup>(b)</sup>

a. These specifications apply to refrigerator wagons. For insulated wagons, additional characteristics must be introduced to offset the absence of any source of refrigeration.

b. 2 m in the case of wagons suitable for traffic with the Iberian Peninsula.

### O 2.2.2 - Load characteristics

**Maximum tare** (excluding the weight of the cold-producing substance)

– Type 1 wagons:	15,5 t
– Type 2 wagons:	15,5 t
– Type 3 wagons:	Variant 1: 31 t
	Variant 2: 32 t

### 2.2.3 - Equipment

R 2.2.3.1 - It is recommended that the wagons be fitted with forced ventilation, e.g. air-driven roof-mounted ventilators.

O 2.2.3.2 - If these devices are to be used for pre-cooling when the wagon is stationary, they must be capable of being connected to a 220 V local mains system, by means of 220 V, 16 A current socket. The connecting circuit must comply with the regulations of *UIC Leaflet 554-1* (see [Bibliography - page 83](#)).

**N.B :** For wagons built before 1.1.1972, the supply cable, in the form of a suitable connecting circuit (see [Appendix A, Fig. 2 and 3 - page 56](#)) may terminate in a socket corresponding to the diagram shown in [Appendix A, Fig. 1 - page 55](#).

The wagon electrical equipment must include only one junction-box, easily accessible, situated on one of the end walls.

If operated electrically when the wagons are stationary, the ventilators must have a minimum total output of 6 000 m<sup>3</sup>/h in the case of 2-axle wagons and of 11 000 m<sup>3</sup>/h in the case of bogie wagons under the static pressure existing in service, under the conditions laid down for the air circulation, also for the reserve of ice and the load itself.

**R 2.2.3.3** - In order to comply with the provision of the previous paragraph without creating excessive ventilator power, also with the requirement of reducing temperature differences inside the load to the minimum, it is recommended, specially in the case of bogie wagons, that the ventilation circuit installed should be powerful enough to reduce load losses to the minimum and that a device for air distribution be designed to ensure the desired uniformity of temperature.

**O 2.2.3.4** - The source of refrigeration for refrigerator wagons shall normally be water ice contained in two ice bunkers, one at each end of the wagon.

**NB :** In fact, other sources of refrigeration may be provided in refrigerator wagons and they shall be adapted to each particular case: dry ice, liquid nitrogen, liquid carbon dioxide, etc.

Devices accessible from the outside must be provided to allow the speedy drainage of melted ice.

The holes provided for the drainage of melted ice, which may also be used for the drainage of wash water, must be fitted with devices preventing air intake.

On 2-axle wagons, each ice bunker must have a minimum volume of 2,5 m<sup>3</sup> in order to be able to hold at least 1 250 kg of water ice and, on bogie wagons, a minimum volume of 6,0 m<sup>3</sup> to be able to hold at least 3 000 kg of water ice.

**R 2.2.3.5** - It is furthermore recommended that the ice bunkers be so designed that the heat transfer between them and the surrounding air be made by convection and with a maximum efficiency.

**O 2.2.3.6** - The loading of the cold-generating product shall take place from outside the wagon through two hatches - each one in the centre of the upper part of each end wall - suitable for mechanical loading in a vertical direction and for manual loading. The wagons shall be provided with a platform accessible from each side of the wagon situated at a maximum height of 1,5 m above the centre-line of the automatic coupler (see *UIC Leaflet 535-2, point 2.6 and Appendix 14 and 15*).

The partitions separating the ice bunkers from the load area must allow for the loading and unloading of ice from inside the wagon.

**R 2.2.3.7** - In order to be able to use the volume taken up by the ice bunkers to increase the load capacity of the wagon, it is recommended that their partitions be designed to fold back against the end walls.

**O 2.2.3.8** - If receptacles for dry ice are provided, they must be placed in the relevant space under the roof.



## ○ 2.3 - Mechanically-refrigerated wagons (lbbgs, lbfgs, lags)

### ○ 2.3.1 - Main dimensions

#### 2.3.1.1 - Type 1 - 2-axle wagon (lbbgs)

Length over buffers	14,020 m
Length of underframe	12,780 m
Minimum usable floor length	11,000 m
Minimum usable floor width	2,550 m
Minimum usable floor area	28,000 m <sup>2</sup>
Wheelbase	8,000 m

#### 2.3.1.2 - Type 2 - 2-axle wagon (lbfgs)

Length over buffers	14,020 m
Length of underframe	12,780 m
Minimum usable floor length	11,000 m
Minimum usable floor width	2,150 m
Minimum usable floor area	23,500 m <sup>2</sup>
Wheelbase	8,000 m

#### 2.3.1.3 - Type 3 - Bogie wagon (lags)

##### *Variant 1*

Length over buffers	21,040 m
Length of underframe	19,800 m
Minimum usable floor length	16,800 m <sup>(a)</sup>
Minimum usable floor width	2,550 m
Minimum usable floor area	43,000 m <sup>2</sup> <sup>(b)</sup>
Distance between bogie pivots	15,800 m
Bogie wheelbase	1,800 m <sup>(c)</sup>

a. In the case of a wagon with 2 refrigeration units, the minimum usable floor length is 15,800 m.

b. In the case of a wagon with 2 refrigeration units, the minimum floor area is 40,5 m<sup>2</sup>.

c. 2 m as regards wagons suitable for traffic with the Iberian Peninsula.



○ **2.3.3.4** - When the refrigeration units are equipped with an electric motor under the conditions stipulated in point **2.3.3.1**, it must be possible for them to be connected to a local mains system:

- by means of a 380 V/32 A socket when there is one refrigeration unit per wagon,
- by means of a 380 V/63 A socket when there are two refrigeration units per wagon,

with the proviso that it must also be possible to operate the motors of the forced ventilation system. The connecting circuit must comply with the provisions of *UIC Leaflet 554-1*.

○ **2.3.3.5** - The refrigeration unit shall be mounted at one end of the body, and must be easily accessible by means of a platform complying with the conditions of *UIC Leaflet 535-2*.

**NB** : In the case of bogie wagons, however, there may be 2 refrigeration units, one at each end.

The control panel (start, stop, temperature control, pilot lamps) must be accessible from the loading ramps and from the ground.

Two thermometers must be placed in the wagon, one on each side.

The probes of the thermostat and thermometers shall be located in the same place in the wagon.

### 3 - Wagon with opening roof (Taems)

This is a 2-bogie wagon, each bogie being 2-axled.

This type of wagon is standardised and two variants of roll-back opening roof have been adopted:

- Variant S: roof made of a sheet of synthetic material, reinforced by steel plates.
- Variant M: roof made of articulated light-alloy metal plates.

The wagon may be fitted with protective devices for the end walls.

The wagon has been standardised.

#### o 3.1 - Main dimensions

Length over buffers	mini	14 040 mm
	maxi	14 290 mm
Length of underframe	mini	12 800 mm
	maxi	13 050 mm
Minimum useful floor length	without protective devices	12 750 mm
	with protective devices	12 400 mm
Minimum useful floor width		2 640 mm
Minimum useful width at the level of the upper edges		2 550 mm
Useful loading height		2 250 mm <sup>(a)</sup>
Minimum useful floor area	without protective devices	33 m <sup>2</sup>
	with protective devices	32 m <sup>2</sup>
Minimum capacity	without protective devices	75 m <sup>3</sup>
	with protective devices	73 m <sup>3</sup>
Height of doorway		2 100 mm
Width of doorway		4 000 mm
Distance between bogie pivots		9 000 mm
Bogie wheelbase		1 800 mm

a. It is recommended that the height limit corresponding to the capacity be marked by painting a yellow line around the inside part of the body.

## o 3.2 - Load characteristics

**3.2.1 - Maximum tare:** 23,5 t.

**3.2.2** - The wagons must be able to withstand the following evenly-distributed loads and loads resting on two supports:

Loading length or distance between (m)	2	3	5	9
Evenly-distributed loads (t)	30	34	39	50
Loads resting on 2 supports (t)	35	42	48	80 - tare

**3.2.3** - The evenly-distributed loads stipulated in point **3.2.2** must be placed symmetrically in relation to the longitudinal and transversal centre lines of the wagon and take up at least 1,2 m of the floor width.

The loads resting on two supports must be placed symmetrically in relation to the longitudinal and transversal centre-lines of the wagon and the supports must at least take up 1,2 m of the floor width and 0,200 m of the floor length.

## 3.3 - Equipment

o **3.3.1** - The wagon shall be provided with a roll-back roof. The opening and closing of this roof shall be carried out with a wheel.

o **3.3.2** - When the roof is in the open position, no part of the side walls of the wagon must be more than 3,600 m above rail level.

o **3.3.3** - The opening roof shall completely disengage from the surround formed by the upper edges of the side and end walls.

o **3.3.4** - It should be possible to gain access to the wagon through the side doors when the roof is opened and when it is closed.

### **3.3.5 - Opening and closing of the roof**

o **3.3.5.1** - The opening and closing of the roof must be straightforward and easy to carry out, regardless of the atmospheric conditions. A locking device must be provided to prevent any untimely movement of the roof when closed and also when fully opened.

R **3.3.5.2** - This device may be manually-operated or automatic.

o **3.3.5.3** - It must be possible to open and close the roof without any difficulty from ground level and from a loading quay.

o **3.3.5.4** - It must be possible to check easily visually that all the closing and locking devices of the roof are in the proper position.

- **3.3.5.5** - An inscription plate, giving instructions for moving and securing the roof, worded in three languages (French, German and Italian), must be placed on each side wall or on each end wall, as near as possible to the closing and locking devices.

Furthermore, a pictogram must indicate very clearly the position in which the roof must be placed during running.

- **3.3.6** - The floor shall be of wood; a metal or composite floor may be authorised however, provided that it is suitable for the nailing of chocks and constitutes no danger of slipping to handling staff.
- **3.3.7** - The wagon shall include an opening measuring 2 100 x 4 000 mm on each side, without intermediate upright. This opening shall be closed by a two-leaf sliding door with lower runners.
- **3.3.8** - The walls and doors of the wagon shall be of metal.

The walls may consist of corrugated plates, but there must be no unevenness likely to harm the goods transported.

### **3.3.9 - Securing devices**

- R **3.3.9.1** - The wagon floor may be equipped with 12 securing devices.
- **3.3.9.2** - If such securing devices exist, they must comply with the following conditions:
  - they must be evenly-distributed on each side of the wagon, along the side walls;
  - it must be possible to place in position, on the said devices, any cable suitable for securing the load, without having recourse to other means;
  - they must be capable of withstanding a tractive force of 170 kN exerted towards a direction forming an angle of approximately 45° with the floor area and an angle of approximately 30° with the vertical plane of the wagon longitudinal centre-line;
  - finally, they must not protrude above the floor when they are not in use.

## **3.4 - Operating conditions**

- R **3.4.1** - The wagon must be suitable for running empty at 120 km/h under SS conditions.
- **3.4.2** - It must be possible for the wagon to run, singly, on transition curves with a minimum curve radius of 35 m, irrespective of its load condition.

## 4 - Two-tier wagons for the conveyance of motor cars

Two-tier wagons are of either one of the following two types:

*Type 1 (Laaeks):*

4-axle wagons, with two twin-parts.

*Type 2 (Laeks):*

3-axle wagons, with two articulated parts.

### 4.1 - Common provisions

#### ○ 4.1.1 - Operating conditions

The wagons must be capable of running at 120 km/h when empty.

They must have technical characteristics enabling them to be classified in Category SS merely by adapting the brake.

The wagons, irrespective of their load condition, must be capable of running, singly, on transition curves with a curve radius of 75 m.

The coupling or articulation systems of the parts must enable them to negotiate marshalling yard humps corresponding to the profile given in *UIC Leaflet 522* (see Bibliography - page 83).

#### 4.1.2 - Equipment

##### ○ 4.1.2.1 - Gangways must ensure continuity of the platforms between the two parts of the wagon.

For transshipment and the running of motor cars from one wagon to another, the ends of each loading deck must be provided with lifting or movable articulated gangways.

The lifting gangways at the end of the upper loading deck must comply with the provisions shown in Appendix C, Fig 8 and 9 - page 59.

##### ○ 4.1.2.2 - The gangways, as well as the wagon floor, must be able to withstand a minimum load of:

- 7 kN per wheel, on the lower deck,
- 5 kN per wheel, on the upper deck.

##### ○ 4.1.2.3 - The loading of motor-cars shall, usually, be carried out in a single file. However, the loading of small motor cars in two files must not be excluded, at least on the lower loading deck.

- **4.1.2.4** - The scotching of motor cars on the wagon must be straightforward and reliable; it must also impede any inadmissible transversal movement of the motor-cars.

Each motor car must be secured lengthwise, in both directions, by means of scotching devices fitted at least on 2 wheels, designed to impede any untimely release and to constitute no danger during transshipment operations.

- **4.1.2.5** - Both upper half-platforms must be equipped at each end of the wagon with an articulated movable part making it possible:

- in the low position (see Appendix C, Fig. 12 - page 62, position III), to tranship motor cars from an end-on loading platform, approximately 1 200 mm above rail level, by means of removable guiding channels or a light ramp at a height of 800 mm. The angle formed by the movable part of the upper platform with the fixed part must not exceed 8°;
- in the high position (position I), to leave enough space for the running of motor cars during loading and unloading operations involving the lower loading level;
- in the intermediate position (position II - conveyance position), to leave, at the wagon ends, a suitable free height for the motor cars loaded on the lower loading level.

- R **4.1.2.6** - Each upper half-platform may be entirely inclinable so that, in the inclined position, it is directly accessible to motor cars from an end-on platform approximately 1 200 mm above rail level.

In this case, it is accepted furthermore that the upper half-platforms may be lowered horizontally over their whole length.

- **4.1.2.7** - The two halves of the lower loading deck must be so designed that loading can be carried out from an end-on platform with a height of approximately 1 200 mm above rail level.

- **4.1.2.8** - The lifting and lowering devices of the movable parts of the upper platform, as well as the scotching devices for motor cars, shall form an integral part of the wagon equipment.

The operating devices of the movable parts of the upper platform shall be of a manual type.

At least in the case mentioned in point 4.1.2.6, it must be possible to operate these devices, with the help of driving mechanisms working at 150 revolutions/minute, by means of a square tip conforming to Appendix C, Fig. 10 - page 60. The control mechanism must be free from any overload.

- **4.1.2.9** - It must be possible to lock the movable articulated parts of the upper platform in each one of the 3 positions referred to in point 4.1.2.5; the locking system must be independent from the lifting device.

- **4.1.2.10** - To ensure the safety of operators :

- the design of the loading decks and of their access devices must leave the space, required for carrying out the scotching operations of the motorcars, unobstructed,
- a hand-rail must be provided on each side of the upper platform,



- the operating devices of the movable parts of the upper platform must impede any untimely lowering of the latter,
  - it must be possible to check the position of the locking devices of the upper platform from outside the wagon,
  - operating instructions must be affixed to the wagon, in three languages or in the form of pictograms.
- O** 4.1.2.11 - The floors must have edges high enough to prevent the scotches from falling off during running.
- O** 4.1.2.12 - The floor of the upper and lower platforms shall be made of timber, sheet plate or metal gratings.
- R** 4.1.2.13 - When the floor of the upper platform is made of metal gratings, a protective device may be provided beneath this platform to prevent the motor cars placed on the lower platform from being soiled.
- O** 4.1.2.14 - The minimum clearance to be left for the motor cars is defined in Appendix C, Fig. 11 - page 61.

## 4.2 - Type 1 wagon (Laaeks)

4.2.1 - On account of its special design, this wagon does not conform to all the regulations laid down in point 1 - page 2. Derogations are admitted in respect of the following points of this leaflet:

- Point 1.2 - page 2: *UIC Leaflet 517 (see Bibliography - page 83)* relative to the height of suspension springs;
  - Point 1.3 - page 2: the maximum axle weight on rails is less than 20 t.
- O** 4.2.2 - The underframe shall consist of two components which are mutually complementary and cannot be separated in service.

Each upper half-platform rests on uprights situated exclusively near the ends of each half-underframe.

### 4.2.3 - Main dimensions

The wagon has the following dimensional characteristics:

Length over buffers	27,000 m
Length of underframe	25,760 m
Minimum usable length of upper platform with end gangways in the raised position	26,500 m <sup>(a)</sup>
Minimum usable length of lower platform with end gangways in the raised position	26,100 m
Wheelbase of each half-underframe	9,000 m
Maximum distance between axles	22,500 m
Height of the central axis of the automatic coupler above rail level, when the wagon is empty (maximum value)	1,020 m
Wheel diameter	0,840 m

a. The distance between the middle axle and each of the end axles must be such that the position of the axles on the track is not more unfavourable than for a 2-axle wagon with a wheelbase of 9,000 m. The wagon design is such that the reduction calculations in the gauge are made taking 9,000 m for the wheelbase measurement.

### 4.2.4 - Load characteristics

Maximum tare	30 t
Wagon load limit (minimum value)	22 t
Load limit on upper platform (minimum value)	11 t <sup>(a)</sup>
Load limit on lower platform (minimum value)	11 t

a. 8 t for wagons as per point 4.1.2.6, paragraph 2.

## 4.3 - Type 2 wagon (Laek (k) s)

4.3.1 - On account of its special design, this wagon does not conform to all the regulations laid down in point 1 - page 2. Derogations are admitted in respect of the following points of this leaflet:

- Point 1.2 - page 2: Departure from the provisions of *UIC Leaflet 517* is accepted as regards the suspension springs, the axle guards, the plays between axle-boxes and axle guards.
- Point 1.3 - page 2: the maximum axle weight on rails is less than 20 t.
- Point 1.8 - page 5: this point does not apply to 3-axle articulated wagons.

4.3.2 - The underframe is made of two articulated parts, the articulation being situated level with the centre axle.

Each upper half-platform rests on uprights situated exclusively near the ends of each half-underframe.

### O 4.3.3 - Main dimensions

The wagon has the following dimensional characteristics:

Length over buffers	27,000 m
Length of underframe	25,760 m
Minimum usable length of upper platform with end gangways in the raised position	26,500 m <sup>(a)</sup>
Minimum usable length of lower platform with end gangways in the raised position	26,100 m
Minimum distance between the middle axle and each of the end axles	10,400 m <sup>(a)</sup>
Minimum distance between end axles	21,000 m
Height of the central axis of the automatic coupler above rail level, when the wagon is empty (maximum value)	1,020 m
Wheel diameter	0,840 m

a. The distance between the middle axle and each of the end axles must be such that the position of the axles on the track is not more unfavourable than for a 2-axle wagon with a wheelbase of 9,000 m. The wagon design is such that the reduction calculations in the gauge are made taking 9,000 m for the wheelbase measurement.

### O 4.3.4 - Load characteristics

Maximum tare	27 t
Minimum weight, on rails, of the intermediate axle	10,2 t
Wagon load limit (minimum value)	19 t
Load limit on upper platform (minimum value)	11 t <sup>(a)</sup>
Load limit on lower platform (minimum value)	11 t

a. 8 t for wagons as per point 4.1.2.6, paragraph 2.

### R 4.3.5 - Equipment

It is recommended that the wagon design be such that the transverse forces exerted by the axles on the track be as small as possible.

## 5 - 2-axle wagon with bilateral controlled top unloading by gravity

The wagons are of one of the following two types:

*Type 1 - Wagon without roof (Fcs):*

this wagon is specially intended for the conveyance of goods which are not vulnerable to dampness.

*Type 2 - Wagon with opening roof (Tds):*

this wagon is specially intended for the conveyance of goods which are vulnerable to dampness.

### o 5.1 - Main dimensions

The wagon has the following dimensional characteristics:

Length over buffers	9,640 m
Length of underframe	8,400 m
Wheelbase	6,00 m
Capacity (wagon without roof)	40,000 m <sup>3</sup>
Capacity (wagon with roof)	38,000 m <sup>3</sup>
Minimum width of loading aperture (wagon without roof)	1,900 m
Minimum width of loading aperture (wagon with roof)	1,200 m
Minimum length of loading aperture (wagon without roof)	8,000 m
Minimum length of loading aperture (wagon with roof)	7,900 m
Maximum height of wagon body above rail level (wagon without roof)	4,000 m
Maximum height of wagon body above rail level (wagon with roof, in the open position)	4,140 m

Two unloading apertures, fitted with chutes whose dimensions are given below, are placed on each side of the wagon:

Unloading free openings:			
length	1,300 m	to	1,500 m
width	0,400 m	to	0,500 m
Chute width:			
fixed	0,500 m	to	0,600 m
movable	0,600 m	to	0,830 m
Distance between centre-lines of the chutes in the longitudinal direction of the wagon			
fixed	3,100 m	to	3,400 m
movable	3,000 m	to	3,150 m
Height of lower edge of the chutes in relation to the rail			
fixed	0,700 m	to	0,720 m
movable	0,380 m	to	0,400 m

## o 5.2 - Load characteristics

### Maximum tare

- Type 1 wagons: 13,0 t
- Type 2 Wagons: 13,5 t

## 5.3 - Equipment

### o 5.3.1 - The metal wagon body includes two hoppers. The slope of the hopper walls must be:

- side walls: 43°,
- end walls: 48°.

### o 5.3.2 - A fixed chute and a movable chute must be placed under each unloading aperture.

#### 5.3.3 - Unloading

### o 5.3.3.1 - It must be possible to grade the unloading, which must take place sideways by straightforward gravity.

It must be possible for the hoppers to be emptied completely from one side of the wagon.

### o 5.3.3.2 - It must be possible to empty completely the wagon simultaneously on both sides or, optionally, only on one side.

### R 5.3.3.3 - An additional device for unloading in the centre of the track is permitted.

### o 5.3.3.4 - Opening of the unloading traps and, as the case may be, operation of the opening roof, must be effected by mechanical devices activated from an end platform accessible from both sides of the wagon.

## 6 - Covered bogie wagons with sliding walls

These wagons identify with the following types:

*Type 1 (Habiss):*

*Type 2A (Habbins):*

wagon with securing device in the floor and end walls.

*Type 2B (Habbills):*

wagon with load protecting device.

These bogie wagons, incorporating two 2-axle bogies, are designed more specifically for conveying palletised loads.

Type-1 wagon is standardised.

### 6.1 - Type 1 wagon (Habiss)

#### ○ 6.1.1 - Main dimensions

Length over buffers	21,700 m
Length of underframe	20,460 m
Distance between bogie pivots	16,660 m
Bogie wheelbase	1,800 m
Total inside length of each one of the 2 loading compartments	9,670 m
Usable width of the body	2,600 m
Unobstructed length of the opening of the side-walls for each of the 2 loading compartments	9,670 m
Minimum unobstructed height of the opening of the side-walls	2,200 m
Total usable floor area	50 m <sup>2</sup>
Total body capacity	131 m <sup>3</sup>
Usable height of body over a width of 1 m on either side of its longitudinal median plane	2,250 m
Height of loading plane in relation to rail level (empty wagon, in new condition)	1,195 m

**O 6.1.2 - Load characteristics**

**Maximum tare** (including the devices stipulated in points 6.1.3.7 and 6.1.3.8 - page 27): 29 t.

The wagon must be capable of accommodating the following evenly-distributed loads, placed symmetrically in relation to the longitudinal and transversal centre-lines and taking up at least 1,2 m of the floor width:

Loading length (m)	Load (t)
4,00	22
7,00	25
10,00	28
13,00	33
17,00	41
total usable length	80 - tare

**6.1.3 - Equipment**

- O 6.1.3.1** - Each wagon shall be fitted with side walls, each with 4 sliding panels which can move along the whole length of the wagon.
- R 6.1.3.2** - Goods loading and unloading operations may take place over the complete inside length of the body but, for any combination of the walls, the free opening shall be at least equivalent to half this length.
- O 6.1.3.3** - The end walls, the components of the median partition, the sliding panels and the intermediate movable half-partitions must not include any protruding part likely to damage the goods.
- O 6.1.3.4** - The wagon shall be provided with internal fittings for the purpose of splitting up the load and restricting or preventing its movement.
- O 6.1.3.5** - The individually- and independently-controlled sliding panels shall be fitted with bottom rollers and an upper guide.

They must be provided with automatic safety devices to avoid any wrong movement in the course of opening and closing operations.

Irrespective of its position along the side and for the various opening combinations of the latter, each panel must be easy to immobilise by means of a stop pedal, easily accessible from outside the wagon.

During opening operations, each panel must move transversely away from the load before any longitudinal movement takes place, while remaining more or less in a vertical position.

When in the fully closed position, a device shall permit the simultaneous locking of the two side panels of each compartment; this lock may be padlocked or sealed to comply with customs regulations.

- **6.1.3.6** - The wagons must be fitted with a transverse partition dividing the body into two equal compartments; this partition shall consist of two independent movable panels.

In each compartment, 2 upper longitudinal runners shall permit the displacement of the panels towards the corresponding end wall, thus leaving an unobstructed space in the centre of the wagon for the purpose of loading long items.

It must be possible to secure each panel to the median uprights by means of a lock, and to the corresponding end wall by means of a retaining device.

- **6.1.3.7** - The internal fittings specified in point **6.1.3.4 - page 26** include, at the most, for the whole of the wagon:

- 36 intermediate movable half-partitions;
- 4 devices constituting a loading key.

These fittings are suspended and move, by means of rollers, on the runners stipulated in point **6.1.3.6**, paragraph 2.

When the fittings are not in use, it must be possible for them to be secured on the end walls by means of a retaining device.

- **6.1.3.8** - It is recommended that the wagon floor be fitted with 16 securing devices.

Should these securing devices exist, they must comply with the following conditions:

- their positioning must conform to that shown in Appendix **F - page 74**;
- it must be possible to place, on those devices, any cable suitable for securing the load, without having recourse to other means;
- the devices must be capable of withstanding a tractive force of 85 kN exerted towards a direction forming an angle of approximately 45° with the floor area and an angle of approximately 30° with the vertical plane of the wagon longitudinal centre-line;
- finally, they must not protrude above the floor when they are not in use.

- **6.1.4 - Operating conditions**

**6.1.4.1** - The wagon must be suitable for running under SS conditions.

It may be classified in the S category but, in this case, its characteristics must be such that, by merely adapting the brake, the wagon can be classified in the SS category.

**6.1.4.2** - Irrespective of its load condition, it must be able to run singly over transition track with a minimum 60 m curve radius.



## 6.2 - Type 2A (Habbins) and 2B (Habbills) wagons

### 6.2.1 - Main dimensions

Length over buffers		24,130 m
Length of underframe		22,890 m
Distance between bogie pivots		18,590 m
Minimum usable floor length, including thickness of any lockable partitions		22,860 m
Maximum total thickness of any lockable partitions (type 2B wagon)		0,900 m
Minimum usable floor width		2,740 m
Minimum lengthwise clearance of side walls for each sliding panel		11,290 m
Minimum heightwise clearance of side walls		2,800 m
Maximum height of loading plane above rail level (empty wagon-new condition)		1,200 m
Minimum heightwise clearance inside body (between side panels in closed position)	over a 2 m width	2,500 m
	over a 2,6 m width	2,200 m
Minimum width covered by roof		1,000 m
Minimum usable floor area including any area taken up by lockable partitions		62,50 m <sup>2</sup>
Area taken up, where relevant, by lockable partitions (type 2B wagon)		approx. 2,30 m <sup>2</sup>
Minimum usable volume, restricted heightwise to side clearances, including any volume taken up by lockable partitions		164 m <sup>3</sup>
Volume reduction, due to lockable partitions, if any (type 2B wagon)		approx. 8 m <sup>3</sup>

### 6.2.2 - Load characteristics

**Maximum tare** (wagon without intercommunicating gangway and with ground-operated screw brake):

- Type 2A wagons: 30 t
- Type 2B wagons: 32 t, including a minimum of 8 lockable partitions.

The wagon must be capable of carrying the following loads, distributed evenly and positioned symmetrically in relation to its longitudinal and transverse centre-lines, and taking up at least 1,20 m of the floor width:

Loading length (m)	Load (t)
4,00	22,0
7,00	25,0
10,00	28,0
13,00	36,0
17,00	42,0
total loading length	90 - tare

## O 6.2.3 - Standard arrangements

### 6.2.3.1 - General

End walls, intermediate uprights, sliding side walls and where appropriate, lockable partitions, must not cause any protrusion inside the wagon that is liable to obstruct the positioning of palletised loads or to damage consignments.

### 6.2.3.2 - Sliding walls

The wagon shall have an intermediate upright and two sliding panels on each side. When closed, panels must be flush with each other and make for a smooth surface inside the wagon.

Sliding panels must be able to move along the full length of the wagon so as to allow access to both halves of the load. The opening clearance must comply with the provisions of point [6.2.1 - page 28](#).

To open or close a new wagon, the force needed for moving the sliding partitions widthwise must not exceed 300 N, and 200 N in the lengthwise direction. Built-in safety mechanisms must be provided to prevent unintended opening/closing.

When panels are opened it must be possible to move them away from the load widthwise before they are moved lengthwise.

An automatic locking mechanism, the correct operation of which can be checked from outside the wagon, must be provided to secure each panel in the open and closed positions.

Panel closing mechanisms must allow for the use of padlocks for customs purposes.

## **6.2.4 - Provisions specific to type 2A wagons - Load securing**

- O 6.2.4.1** - The wagon must be provided with 16 load-securing fittings in the floor. These must comply with the following conditions:

- they must be positioned at uniform intervals along each side wall;
- it must be possible to attach standard load-securing devices to these fittings without other means being required;
- each fitting must be able to withstand a tensile force of 85 kN exerted in the direction forming an angle of about 45° with the floor surface and an angle of about 30° with the vertical plane of the wagons' longitudinal centre-line;
- fittings must not protrude above floor when not in use.

- O 6.2.4.2** - Each end wall of the wagon must be provided with 4 securing fittings, arranged in sets of two near each corner upright inside the wagon, at heights of about 0,750 m and 1,500 m above the floor.

Each fitting must be able to withstand a tensile force of 30 kN in all directions when this force is exerted simultaneously on two fittings at the same height.

These fittings must not protrude from the wall when not in use.

- R 6.2.4.3** - It is recommended that a line be painted on the floor and end walls to indicate the vertical plane of the wagon's longitudinal centre-line and so facilitate the positioning of pallets.

- R 6.2.4.4** - Wagons may be fitted with tracks and punched longitudinal girders with a view to subsequent fitting of mobile lockable partitions (see point [6.2.5](#)).

- O 6.2.5 - Provisions specific to type 2B wagon - Protection of consignments**

- The wagon must be fitted with 8 mobile and lockable transverse partitions to divide-up and steady the load.

These partitions, approximately rectangular in shape, shall be suspended, and shall be movable along two lengthwise upper runner tracks over the whole length of the wagon.

They must be at least 2,500 mm wide.

When locked, each partition shall be secured by two lower and two upper locks which fit into the punch holes in the longitudinal girders located on each side on the floor and roof over the full length of the wagon.

- The partition operating system must comply with the following conditions:
  - a single employee, in the wagon, must be able to unlock a partition, move it and relock it,
  - two employees outside and on each side of the wagon must also be able to unlock a partition, move it and relock it,

- locking must be automatic as soon as the unlocking mechanism has been released,
  - it should be possible to lock two adjacent partitions with minimum spacing,
  - it must be impossible for partitions to shift upwards, come off their tracks or unlock accidentally.
- Each partition must be fitted with side handles that do not protrude, and that enable an employee inside the wagon to cross safely from one side of the partition to the other without having to leave the wagon.

#### **O 6.2.6 - Operating conditions**

It must be possible for these wagons, irrespective of their load status, to be worked individually on siding tracks with a minimum curve radius of 60 m.

## 7 - Bogie wagons for the conveyance of coiled metal

### Bogie wagons for the conveyance of coiled metal with movable covers, fixed end walls and loading cradles

They shall be of one of the following types:

*Type 1A (Shimms/Shimmns):*

wagons with telescopic hoods and two 2-axle bogies.

*Type 1B (Shimms/Shimmns):*

wagons with synthetic sliding sheeting and two 2-axle bogies.

*Type 2 (Sahimms):*

wagons with telescopic hoods and two 3-axle bogies.

These wagons are specially intended for the conveyance of coiled metal vulnerable to bad weather.

Type 1A, type 1B and type 2 wagons are standardised.

### 7.1 - Common provisions

- 7.1.1 - The wagons must be capable of running at 120 km/h when empty.
- 7.1.2 - The wagon shall have 5 fixed loading cradles.
- 7.1.3 - When the hoods are closed, there must be adequate sealing:
  - between the hoods on the one hand,
  - as well as between the hoods or the synthetic sheeting:
    - and the end walls,
    - and the floor,

so as to prevent rain and snow from penetrating inside the wagon.

The same provisions apply to the sealing of the floor.

- 7.1.4 - Type 1A and 2 wagons must be provided with devices automatically locking the hoods in the closed position, these devices being immobilised in this position to prevent untimely release during transit.

Type 1B wagons must be fitted with devices :

- allowing the synthetic sheet to be opened or closed from one side of the wagon,
- automatically locking the sheet in the closed position,
- preventing untimely release during transit.

**O 7.1.5** - The opening or closing of the hoods or the synthetic sheet must be easy to carry out.

**O 7.1.6** - The wagons must be provided with at least one device, on each side, giving access to the cradles when the hoods or the sheet are open.

**O 7.1.7 - Inscriptions**

**7.1.7.1** - The wagons must bear an inscription giving a loading diagram specifying, for each cradle, the maximum and minimum diameters and the maximum permissible weight of coiled metal.

**7.1.7.2** - The wagons must bear inscriptions in one or more languages and a pictogram in accordance with Appendix D, Fig. 20 - page 70, indicating that while running, the wagons' hoods and sheeting must be closed and locked.

**7.1.7.3** - In accordance with Appendix D, Fig. 21 and 22 - page 71, wagons must be provided with a pictogram indicating:

- how to operate the devices designed to prevent unacceptable lateral movement of the coiled metal,
- that the devices must, while in service, be in the operative position.

**O 7.1.8 - Sides of the cradles**

**O 7.1.8.1** - The sides of the cradles shall be made of steel.

**R 7.1.8.2** - These sides may be lined with timber or other protective lining.

**O 7.1.9** - The wagons shall be equipped with devices preventing unacceptable lateral movement of the coiled metal during transit. These devices must not however prevent the upward movement of the coiled metal on buffing impacts.

## 7.2 - Type 1A and 1B wagons (Shimmns)

### 7.2.1 - Main dimensions

Length over buffers	12,040 m
Length of underframe	10,800 m
Usable length between end walls	10,800 m
Usable length between cradles	2,400 m
Distance between bogie pivots	7,000 m
Distance between bogie axles	1,800 m

### 7.2.2 - Load characteristics

#### 7.2.2.1 - Maximum tare

- Type 1A wagons: 23 t *Where applicable, this tare may be increased by the weight of the timber-cradle lining.*
- Type 1B wagons: 22 t

**7.2.2.2** - The wagons must be capable of containing, in the cradles, coiled sheet metal of the following external diameters and unit weights:

Cradle No. <sup>a</sup>	Diameter of coiled sheet metal	Unit weight of coiled sheet with an axle-load of	
		20 t (Shimms)	22,5 t (Shimms)
No. 1	1 000 mm to 2 250 mm	up to 29 t	up to 33 t
No. 2	800 mm to 1 700 mm	up to 15 t	up to 17 t
No. 3	1 000 mm to 2 700 mm	up to 45 t	up to 45 t
No. 4	800 mm to 1 700 mm	up to 15 t	up to 17 t
No. 5	1 000 mm to 2 250 mm	up to 29 t	up to 33 t

a. The cradles shall be numbered 1 to 5 starting from one end of the wagon.

### 7.2.3 - Equipment

**7.2.3.1** - The underframe and cradles must be so designed that the load limit corresponding to the weight of 22,5 t per axle may be used.

**7.2.3.2** - The arrangement of the cradles is defined in Appendix D, Fig. 13 - page 63 and their shape in Appendix D, Fig. 14 - page 64.

**7.2.3.3** - Wagon type 1A shall be fitted with three hoods all of broadly the same length which can be moved longitudinally in the wagon to overlap each other. Wagon type 1B is fitted with a synthetic sheeting which can also be moved longitudinally.

To allow each of the cradles to be loaded and unloaded without any difficulty, approximately:

- 2/3rd - type 1A and
- 3/5th - type 1B

of the load opening shall be left clear in the open position.

#### 7.2.3.4 - The clearance to be left beneath

- the lowest hood is defined in Appendix D, Fig. 15 - page 65,
- the tarpaulin is defined in Appendix D, Fig. 16 - page 66.

#### 7.2.4 - Operating conditions

Irrespective of its load condition, the wagon must be able to run individually in sidings with a minimum curve radius of 35 m.

### o 7.3 - Type 2 wagons (Sahimms)

#### 7.3.1 - Main dimensions

Length over buffers		15,000 m
Length of underframe		13,760 m
Usable length between the end walls		13,760 m
Usable width in the cradles:	minimum	2,300 m
	recommended	2,400 m
Distance between bogie pivots		8,000 m
Bogie wheelbase		1,700 m

#### 7.3.2 - Load characteristics

##### 7.3.2.1 - Maximum tare : 34 t

*Where applicable, this tare may be increased by the weight of the timber-cradle lining.*



**7.3.2.2** - The wagon must be capable of taking, in its cradles, coiled with the following external diameters and unit weights:

<b>Cradle No. <sup>a</sup></b>	<b>Diameter of the coiled metal</b>	<b>Unit weight of the coiled metal</b>
No. 1	1 200 mm to 2 250 mm	up to 25 t
No. 2	1 200 mm to 2 700 mm	up to 45 t
No. 3	1 200 mm to 2 700 mm	up to 45 t
No. 4	1 200 mm to 2 700 mm	up to 45 t
No. 5	1 200 mm to 2 250 mm	up to 25 t

a. The cradles shall be numbered 1 to 5 starting from one end of the wagon.

### **7.3.3 - Equipment**

**7.3.3.1** - The arrangement of the cradles is laid down in Appendix D, Fig. 17 - page 67 and their shape and dimensions in Appendix D, Fig. 18 - page 68.

**7.3.3.2** - The wagon shall be fitted with 4 hoods which can be moved lengthwise inside the wagon, so that 2 hoods can overlap each other.

In deciding the lengths of the hoods, allowance must be made for a rolling distance of the coils of about 250 mm, so that any upward movement of the largest coils permitted in cradles 2 and 4 should not cause them to rub against the edge of the end hoods.

Moreover, a safety margin of at least 200 mm must be allowed between the open hoods and the coils permitted in cradles 2 and 4, to facilitate loading and unloading.

**7.3.3.3** - The clearance to be allowed beneath the lowest hood is defined in Appendix D, Fig. 19 - page 69.

**7.3.3.4** - The wagon shall be fitted with Type C buffers as specified in *UIC Leaflet 526-1, point 0.2* (see Bibliography - page 83).

### **7.3.4 - Operating conditions**

**7.3.4.1** - Irrespective of its load condition, the wagon must be capable of running singly on branch lines with a minimum curve radius of 75 m.

**7.3.4.2** - For loading on train-ferries, the largest broken angle to be taken into account is only 2°30'.

## 8 - Bogie wagons with bilateral bulk unloading by gravity

These wagons shall be equipped with two 2-axle bogies.

They shall be of one of the following two types:

*Type 1 - Wagon without roof (Falns):*

this wagon is specially intended for the conveyance of goods which are not vulnerable to bad weather.

*Type 2 - Wagon with opening roof (Talns):*

this wagon is specially intended for the conveyance of goods vulnerable to dampness.

Type 1 wagon is standardised.

### 8.1 - Common provisions

- **8.1.1** - The underframe and hoppers must be designed to withstand loads corresponding to 22,5 t axle-load.
- **8.1.2** - The wagons shall be provided on each side with 2 unloading traps. These traps shall be suspended from horizontal hinges fixed to the upper cantrails of the side walls.
- **8.1.3** - The width of the opening of the unloading traps must be at least 0,600 m.
- **8.1.4** - The sealing of the unloading traps must be such that dry products with a grain size of 2 mm and above can be transported without loss without using a non-metallic sealing joint. The construction of the traps must permit carriage of products with a grain size smaller than 2 mm through the subsequent fitting of a non-metal sealing joint.
- **8.1.5** - The height of the edge of each of the lower slopes of the high-crowned floor above rail level must be at least 0,780 m.
- **8.1.6** - The width between the two lower edges of the slopes of the crown of a compartment must not be more than 2,710 m.
- **8.1.7** - The incline of the slopes of the crown in relation to the horizontal must be 49°.

#### 8.1.8 - Device for operating the unloading traps

- **8.1.8.1** - Manual opening and closing must be possible from both sides of the wagon at ground level.
- **8.1.8.2** - A clearance must be left for any additional control(s) performed:
  - from the centre of one or both end platforms of the wagons,
  - and/or from a pit, along the axis and at the ends of the wagon.
- **8.1.8.3** - It must be possible to open both traps of the same compartment in one operation. For this purpose, two square tips are situated on each side of the wagon at both ends (Appendix E, Fig. 23 - page 72). The user then makes use of a detachable key, the length of which is adapted to these unloading installations.

- **8.1.8.4** - A space must be left round the tips in accordance with Appendix E, Fig. 23 - page 72
- R **8.1.8.5** - When the opening of the unloading traps is carried out from the centre of the platform, this operation can be effected by means of a wheel or a lever sleeve in accordance with Appendix E, Fig. 23 - page 72.
- **8.1.8.6** - To allow for subsequent automation of the trap control, the clearances defined in Appendix E, Fig. 24 - page 73 shall be left.
- **8.1.8.7** - It must be easy to check the locking of the traps in the closed position.

## ○ **8.2 - Main dimensions**

### **8.2.1 - Type 1 wagon (Falns)**

Length over buffers		12,540 m
Length of underframe		11,300 m <sup>(a)</sup>
Distance between bogie pivots		7,500 m
Bogie wheelbase		1,800 m
Length of loading aperture		10,960 m
Width of loading aperture		1,950 m
Maximum height of wagon body above rail level		4,000 m
Dimensions of the opening of a trap	maximum length	5,000 m
	minimum height	1,500 m
Maximum width of wagon with the traps open		4,300 m
Body capacity		75 m <sup>3</sup>

a. The length of the underframe makes it possible to have two small end platforms, complying with the provisions of UIC leaflet 535-2, point 2.5, which may be necessary for opening/closing of the traps.

## 8.2.2 - Type 2 wagon (Tains)

Length over buffers	12,540 m	
Length of underframe	11,300 m <sup>(a)</sup>	
Distance between bogie pivots	7,500 m	
Bogie wheelbase	1,800 m	
Minimum length of loading aperture	10,750 m	
Width of loading aperture	1,200 m	
maximum height of the wagon above rail level, with the roof open	4,140 m	
Dimensions of the opening of a trap	maximum length	5,000 m
	minimum height	1,500 m
Maximum width of wagon with the traps open	4,300 m	
Body capacity	71,5 m <sup>3</sup>	

a. The length of the underframe makes it possible to have two small end-platforms, complying with the provisions of UIC leaflet 535-2 point 2.5. For opening/closing of the roof and the traps, the wagon must at least be fitted with one, or possibly two, end platforms.

## o 8.3 - Load characteristics

### Maximum tare

- Type 1 wagons: 25 t *The tare may be increased by the weight of the necessary devices for the automatic opening/closing of the traps.*
- Type 2 wagons: 25,5 t

## o 8.4 - Equipment

### 8.4.1 - In the open position, the roof must:

- come within the TU gauge for wagons,
- completely clear the loading aperture.

### 8.4.2 - The operation of the roof must be carried out from an end platform.

### 8.4.3 - It must be possible to lock the roof both in the closed and in the open positions.

It must be easy and straightforward to check the locking of the roof.

## o 8.5 - Operating conditions

Irrespective of their load condition, the wagons must be capable of running, singly, in sidings with a minimum 75 m curve radius.

## 9 - 2-axle covered wagons with sliding walls

These wagons are of the following types:

*Type 1A (Hbins):*

medium-capacity wagon with securing fitments in the floor and end walls.

*Type 1B (Hbillns):*

medium-capacity wagon with load-protection fittings in the form of mobile lockable partitions.

*Type 2A (Hbbins):*

large-capacity wagon with securing fitments in the floor and end walls.

*Type 2B (Hbbillns):*

large-capacity wagon with load-protection fittings in the form of mobile lockable partitions.

*Type 3A (Hbbis):*

extra high-capacity wagon with securing fitments in the floor and end walls.

*Type 3B (Hbbills):*

extra high-capacity wagon with securing fitments in the floor and end walls, plus load-protection fittings in the form of mobile lockable partitions.

These wagons are mainly used for the carriage of palletised loads.

They can also be used for loads normally conveyed in covered wagons, but the load must not come into contact with the sliding side walls.

Type 2A and 2B wagons are partially standardised. Conditions additional to those defined in the present chapter for these two wagon types, as well as ERRI (ex-ORE) standard drawings for certain components or groups thereof, are given in interim standardisation report *B 12/RP 48* (see [Bibliography - page 83](#)).

## o 9.1 - Main dimensions

### 9.1.1 - Type 1A and 1B wagons

Length over buffers	approx. 14,200 m
Length of underframe	approx. 13,000 m
Distance between axles	9,000 m
Usable floor length, if relevant including thickness of lockable partitions	12,800 ± 0,040 m
Maximum total thickness of any lockable partitions (type 1B wagon)	0,550 m
Maximum usable floor width	2,670 m
Minimum clear opening length of sides each sliding panel	6,200 m
Minimum clear opening height of sides	2,300 m
Maximum height of loading plane above rail level (empty wagon, new condition)	1,200 m
Minimum clear height within body below roof	2,350 m
Minimum width covered by roof	2,500 m
Minimum usable floor surface, if relevant including surface taken up by lockable partitions	34 m <sup>2</sup>
Surface taken up by lockable partitions (if relevant) (type 1B wagon)	approx. 1,5 m <sup>2</sup>
Minimum usable volume limited heightwise by the opening clearance of sides including, if relevant, surface taken up by lockable partitions	78 m <sup>3</sup>
If relevant, reduction in volume due to lockable partitions (type 1B wagon)	approx. 3,5 m <sup>3</sup>

### 9.1.2 - Type 2A and 2B wagons

Length over buffers		15,500 m
Length of underframe		14,260 m
Distance between axles		9,000 m
Usable floor length or if relevant including thickness of lockable partitions		14,200 ± 0,040 m
Maximum total thickness of any lockable partitions (type 2B wagon)		0,550 m
Minimum usable length of floor		2,890 m
Minimum clear opening length of sides for each sliding panel		7,000 m
Minimum clear opening height of sides		2,600 m
Maximum height of loading plane above rail level (empty wagon, new condition)		1,200 m
Minimum clear height inside body (between side panels when closed):	over 2 m width	2,600 m
	over 2,6 m width	2,400 m
Minimum width covered by roof		1,900 m
Minimum usable floor surface, if relevant including surface taken up by lockable partitions		41 m <sup>2</sup>
Surface taken up by lockable partitions (if relevant) (type 2B wagon)		approx. 1,6 m <sup>2</sup>
Minimum usable volume, limited heightwise by the opening clearance of sides including, if relevant, surface taken up by lockable partitions		103 m <sup>3</sup>
If relevant, reduction in volume due to lockable partitions (type 2B wagon)		approx. 4 m <sup>3</sup>

### 9.1.3 - Type 3A and 3B wagons

Length over buffers		17,250 m
Length of underframe		16,000 m
Wheelbase		10,000 m
Loading length		15,970 m
Loading width		2,900 m
Loading plane		46,3 m <sup>3</sup>
Loading volume		approx. 130,0 m <sup>3</sup>
Lateral loading height		2,850 m
Maximum height of loading plane above rail level (empty wagon - new condition)		1,200 m

## o 9.2 - Load characteristics

### 9.2.1 - Type 1A and 1B wagons

**Maximum tare** (wagon with intercommunicating gangway and screw brake operable from gangway)

- Type 1A wagons: 15 t
- Type 1B wagons: 16,5 t, including the 6 lockable partitions

The wagon must be capable of carrying the following loads, distributed evenly and positioned symmetrically in relation to its longitudinal and transverse centre-lines, and taking up at least 1,2 m of the floor width:

Length of load (m)	Load (t)
3	12
6	16
12	45 - tare

### 9.2.2 - Type 2A and 2B wagons

**Maximum tare** (wagon without intercommunicating gangway and with a screw brake operable from the ground)

- Type 2A wagons: 15,5 t
- Type 2B wagons: 17 t, including the 6 lockable partitions

The wagon must be capable of carrying the following loads, distributed evenly and positioned symmetrically in relation to its longitudinal and transverse centre-lines and taking up at least 1,2 m of the floor width:

Length of load (m)	Load (t)
3	12
6	16
14	45 - tare

### 9.2.3 - Type 3A and 3B wagons

**Maximum tare**

- Type 3A wagons: 16,5 t
- Type 3B wagons: 18 t, including the 6 lockable partitions



## 9.3 - Equipment and fittings

### ○ 9.3.1 - Sliding walls

**9.3.1.1** - The wagon shall have an intermediate upright and two sliding panels on each side. When closed, panels must be flush with each other and make for a smooth surface inside the wagon.

**9.3.1.2** - Sliding panels must be able to move along the full length of the wagon so as to allow access to both halves of the load. The opening clearance must comply with the provisions of point **9.1 - page 41** above.

**9.3.1.3** - Panels must be easy to open and close, and safety devices to prevent unintended opening or closing must be fitted.

When panels are opened it must be possible to move them away from the load widthwise before they are moved lengthwise.

An automatic locking mechanism the correct operation of which can be checked from outside the wagon must be provided to secure each panel in the open and closed positions.

**9.3.1.4** - For each sliding wall, an operating mechanism must be mounted on the end walls (see Appendix **G**, Fig. **26 - page 75**). It must be possible for the walls to be closed by means of padlocks or seals for customs purposes. A clearance as defined in Appendix **G**, Fig. **27 - page 76** must be left next to the access opening.

**9.3.1.5** - When opening or closing the sliding walls of a new wagon, the pressure needed to move the sliding wall sideways must not exceed 300 N. The pressure needed for lengthwise movement must not exceed 200 N.

### 9.3.2 - Provisions specific to type 1A, 2A, 3A and 3B wagons - Load securing

#### ○ 9.3.2.1 - The wagon must be provided with 12 (13 for type 3A) load securing fittings in the floor. These must comply with the following conditions:

- they must be positioned at uniform intervals along each side;
- it must be possible to attach any sort of load securing device to these fittings without other means being required;
- each fitting must be able to withstand a tensile force of 85 kN exerted in the direction forming an angle of approx. 45° with the floor surface and an angle of approx. 30° with the vertical plane of the wagon's longitudinal centre-line;
- fittings must not protrude above the floor when not in use.

#### ○ 9.3.2.2 - Each end wall of the wagon must be provided with 4 securing fittings, arranged in sets of two near each corner upright inside the wagon at heights of approx. 0,750 m and 1,500 m above floor level.

Each fitting must be able to withstand a tensile force of 30 kN in all directions when this force is exerted simultaneously on two fittings at the same height.

These fittings must not protrude from the wall when not in use.

**R 9.3.2.3** - It is recommended that a line be painted on the floor and end walls to indicate the vertical plane of the wagon's longitudinal centre-line and so facilitate the positioning of pallets.

**R 9.3.2.4** - Wagons may be fitted with tracks and punched uprights with a view to subsequent fitting of mobile lockable partitions (see point **9.3.3.1**).

### **9.3.3 - Provisions specific to type 1B, 2B and 3B wagons - Protection of consignments**

**O 9.3.3.1** - Wagons must be fitted with six transverse partitions, mobile and lockable, to divide up and steady the load.

These partitions, approximately rectangular in shape, shall be suspended, and shall be movable along two lengthwise upper runner tracks over the whole length of the wagon.

For type 1B wagons, they must be at least 2,500 mm wide.

The partitions (2,700 mm wide) for type 2B and 3B wagons, as well as the upper rail mounted on the roof for guiding and locking, shall be of standard type. The main dimensions of the punched rails, the size of hole, as well as the distances between rail holes and guide-rail holes punched in wagon floors to allow locking of the partitions, are given in Appendix G, Fig. 29 - page 78. The mandatory connection dimensions are given in Appendix G, Fig. 30 - page 79.

When locked, each partition shall be secured by two lower and two upper locks with fit into the punch holes in the uprights located on each side of the floor and roof over the full length of the wagon.

**O 9.3.3.2** - The partition operating system must comply with the following conditions:

- a single employee, inside the wagon, must be able to unlock a partition, move it and relock it;
- two employees outside and on each side of the wagon must also be able to unlock a partition, move it and relock it;
- locking must be automatic as soon as the unlocking mechanism has been released;
- it should be possible to lock two adjacent partitions with minimum spacing;
- it must be impossible for partitions to shift upwards, come off their tracks or unlock accidentally.

**O 9.3.3.3** - Each partition must be fitted with non-protruding side handles that enable an employee inside the wagon to cross safely from one side of the partition to the other without having to leave the wagon.

**R 9.3.3.4** - The wagons can be mounted with securing systems defined in points **9.3.2.1** and **9.3.2.2** - page 44.

### **9.3.4 - Common provisions**

**O 9.3.4.1** - The end walls, intermediate uprights, sliding side walls and, where appropriate, lockable partitions must not give rise to any protrusions inside the wagon likely to obstruct the positioning of palletised loads or to damage consignments.

### **R 9.3.4.2 - Ventilation**

Wagons may be equipped with a ventilation system.

**O 9.3.4.2.1** - If such systems are fitted, they must be of one of the two types defined below.

#### **O 9.3.4.2.2 - Ventilation apertures in sliding walls**

The 4 apertures (2 on each side) must be at least 1,450 m above the floor, and their total surface area through which air can pass must be at least 1 m<sup>2</sup>.

**NB** : FS may provide extra ventilation apertures in wagons to meet the needs of climatic conditions resulting from their geographical situation.

These apertures must be closable by means of full shutters which can be moved from the outside by sliding vertically, and which can be sealed from the outside.

These apertures must be provided with fixed slotted shutters, built into the wall in such a way as to ensure that there are no sharp edges or protrusions and that the inside wall is completely smooth.

The apertures must be positioned as follows: to give evenly-distributed ventilation when the wagon is viewed from outside, from left to right there must be an aperture in the first third of each sliding wall.

#### **O 9.3.4.2.3 - Ventilation apertures in end walls**

Two ventilation apertures must be provided, one in each end wall, at roof level. They must be designed and positioned in accordance with Appendix G, Fig. 31 - page 80.

The lower edge of the ventilation aperture must be at least:

- 2,3 m above the floor in the case of type 1A and 1B wagons,
- 2,6 m above the floor in the case of type 2A and 2B wagons.

The total surface area of apertures through which air can pass must be at least 0,4 m<sup>2</sup>.

The apertures must be closeable by means of full shutters which can be moved from each side of the wagon and sealed from the outside.

Apertures must:

- be designed to make it impossible for water or snow to penetrate inside the wagon,
- have fixed grids to prevent minor pilfering when the shutters are open.

## 10 - Bogie flat wagons fitted with a mechanical sheeting system

These wagons fall into the following categories:

*Type A (Rils):*

resulting from transformation of existing type 1 flat wagons.

*Type B (Rilns):*

resulting from a new design.

These are wagons fitted with 2-axle bogies designed more specifically for the transport of palletised loads. However they can load any freight commodity requiring the use of flat wagons.

### o 10.1 - Main dimensions

#### 10.1.1 - Type A wagon- Rils

Length over buffers		19,900 m
Length of underframe		18,660 m
Minimum useful floor length		18,410 m
Minimum usable floor width	with scotching edge	2,670 m
	without scotching edge	2,730 m
Usable area	with scotching edge	min. 49,1 m <sup>2</sup>
	without scotching edge	min. 50,2 m <sup>2</sup>
Height of loading plane above rail level		1,235 m
Distance between bogie pivots		14,860 m
Bogie wheelbase		1,800 m

### 10.1.2 - Type B wagon - Rilns

Length over buffers		max. 20,090 m
Length of underframe		max. 18,850 m
Minimum useful floor length		18,500 m
Minimum usable width of floor	with scotching edge	2,670 m
	without scotching edge	2,730 m
Usable area	with scotching edge	min. 49,4 m <sup>2</sup>
	without scotching edge	min. 50,5 m <sup>2</sup>
Height of loading plane above rail level		1,235 m
Distance between bogie pivots		max. 15,050 m
Bogie wheelbase		1,800 m

## o 10.2 - Load characteristics

### 10.2.1 - Type A wagon

**Maximum tare: 25 t**

The wagons must be able to receive uniformly-distributed loads and/or the following loads resting on two props:

Loading length or distance between props (m)	2	5	9	15	18
Evenly-distributed loads (t)	32	35	36	44	80 - tare
Loads resting on two props (t)	33	38	44	80 - tare	24

### 10.2.2 - Type B wagon

**Tare maximale : 25 t**

The wagons must be able, at the minimum, to receive uniformly-distributed loads and/or the following loads resting on two props:

Loading length or distance between props (m)	2	5	9	15	18
Evenly-distributed loads (t)	26	29	35	49	90 - tare
Loads resting on two props (t)	28	32	38	90 - tare	28

**10.2.3** - The uniformly-distributed loads as specified in points **10.2.1** and **10.2.2** - page 48 must be positioned symmetrically by reference to the longitudinal and transverse axes of the wagon, and they must occupy at least 1,2 m of the floor width.

Loads resting on two props must be positioned symmetrically by reference to the longitudinal and transverse axes of the wagon, and the props must occupy at least 1,2 m of the floor width and at least 0,200 m of the floor length.

## **10.3 - Equipment**

### **O 10.3.1 - Mandatory fittings**

The wagons must be fitted with a timber floor.

The wagon cover shall be a tarpaulin in woven fabric PVC-coated on both sides and resting on 18 tubular hoops. At each extremity the two hoops shall be linked together to allow for easy opening by only one employee. The effort produced by this employee must not exceed 30 daN.

In the open position, the cover must clear at least 2/3 rds of the useful floor length.

The longitudinal axis of the wagon shall be marked-out by a paint strip on the floor.

On the end walls, the vertical centre-line shall be marked-out by a paint strip.

Fifteen locating points evenly distributed along each side of the wagon and capable of withstanding a tensile load of 30 kN.

### **R 10.3.2 - Recommended equipment**

Locking of the cover on the end wall using a centralised locking mechanism with bilateral control, at a minimum of 3 points (2 lateral and 1 upper central).

Wooden floorboard with 20 mm lateral edges built into the floor to avoid transverse play of palletised loads.

Anchoring points can be formed of 15 cable (rope) spins evenly distributed alternately on the sides with, for each, a securing hook located exactly opposite one another.

Ten retractable securing rings which must:

- be evenly distributed along the lengthwise edges;
- allow for the use of any securing system fit for keeping the load firmly in position without the need to resort to other means;
- make it possible to withstand a minimum tensile load of 170 kN applied in a direction at an angle of 45° with the floor surface and an angle of some 30° with the vertical plane of the wagon's longitudinal axis;
- not show any protrusion at floor level when not in use.

Four securing rings on the inner surfaces of the end walls.

The sheeting hoops may be fitted with a sheeting cast-off mechanism to provide more inner space (see Appendix H - page 81). In this case, the maximum loading height must be clearly indicated on the end wall by means of a paint strip.

To make it easier for staff to access the wagons, the latter must be fitted with a side-access stirrup-shaped footboard and with handles mounted on the edge of the end walls.

#### o **10.4 - Operating conditions**

It must be possible for wagons, regardless of their loading condition, to be worked separately on transition track with a minimum curve radius of 50 m.

The wagons must be suitable for 120 km/h working.

## 11 - Bogie flat wagons with high stanchions

*Type Snps:*

these are two 2-axle bogie wagons designed for carrying pipes, timber and sawwood.

### 11.1 - Main dimensions

Length over buffers	20,840 m
Length of underframe	19,600 m
Distance between bogie centres	15,800 m
Bogie pitch	1,800 m
Usable length	19,600 m
Usable width	2,723 m
Usable area	min. 53,3 m <sup>2</sup>
Height of stanchions above loading plane	2,000 m
Height of floor above rail level	1,280 m

### 11.2 - Load characteristics

**Maximum tare:** 25 t

The wagon(s) must be suitable for receiving evenly distributed loads and/or the following loads resting on two props:

Loading length or distance between props (m)	2,2	6,7	11,2	15,8	17,6
Evenly-distributed loads (t)	33	39	39	52	90 - tare
Loads resting on two props (t)	33	33	33	90 - tare	33

### 11.3 - Equipment

On either side of the wagon: 8 fixed stanchions evenly distributed and integral with the underframe.

The inner surface of the stanchions must be lined with a protective material.

It must be possible for opposite stanchions to be linked together by means of strap adjustable heightwise. These straps shall be covered with a flexible material ensuring load protection.



Between opposite stanchions, and at a distance of 1 m from the end walls, the wagon shall be fitted with wooden beams 80 mm in height destined to receive the load. In-between these beams, auxiliary beams of lesser height shall be positioned to prevent load subsidence.

The wagon floor must allow for free movement on foot.

#### **11.4 - Operating conditions**

Irrespective of their load status, wagons must be capable of running individually on siding tracks with a minimum curve radius of 35 m.

Where the access to train-ferries is concerned, allowance must be made for a minimum angle breakage of 2°30'.

Wagons must be suitable for running at 120 km/h when empty.

## 12 - Flat wagons with two 3-axle bogies

### Type Sammns:

the wagons must be fitted with stanchions, drop ends and retractable cross-pieces.

These wagons are designed to carry heavy rolled sections (with raised cross-pieces) and other heavy high-cube loads. With the cross-pieces folded-down (in other words with plane loading surface), they are suitable for carrying heavy-duty tracklaying vehicles.

### 12.1 - Main dimensions

Length over buffers		16,400 m
Length of underframe		15,160 m
Loading length		15,000 m
Loading width between stanchions		2,585 m
Loading width without stanchions	over a length of 12,450 m	3,090 m
	at wagon extremities	2,950 m
Loading surface		46,0 m <sup>2</sup>
Height of floor above rail level		1,300 m
Distance between bogie pivots		9,150 m
Bogie wheelbase		1,700 m

### 12.2 - Load characteristics

**Maximum tare:** 31,0 t

Wagons must be able to receive evenly-distributed loads and the following loads:

Loading length or distance between props (m)	3	5	7	9
Evenly-distributed loads (t)	63	74	89	135 - tare
Loads resting on two props (t)	66	93	135 - tare	135 - tare

## 12.3 - Equipment

The underframe must be designed for a load limit corresponding to a 22,5 t axle load.

The wagons must be fitted with a wooden floor.

Four securing devices must be fixed to the wagon floor for load securing purposes. These devices shall be positioned symmetrically to the longitudinal and transversal axis of the wagon, at a distance 8 400 x 1 750 m.

The wagon floor shall comprise 6 retractable cross-pieces or similar devices, enabling the conveyance of both heavy rolled sections or heavy-duty vehicles.

The wagons shall be fitted, on each side, with 6 removable steel stanchions. When these stanchions are not used, they shall be housed in the areas provided along the underframe solebars.

Each wagon extremity shall comprise an externally-retractable drop-end held into position by two retractable sliding stanchions. The retracted sliding stanchions must not foul the clearance gauge, so that the wagon can be operated with retracted sliding stanchions and articulated drop-ends.

The wagons shall incorporate securing devices with the following specific characteristics:

- 26 round steel rings (minimum diameter: 16 mm) shall be fixed to the solebars,
- 12 securing rings shall be fixed to the floor and they must:
  - be distributed evenly along each wagon side,
  - allow fitting of all systems for securing loads without auxiliary equipment being required.

These devices must be able to withstand a minimum tensile load of 170 kN applied at an angle of some 45° in relation to the floor surface and of some 30° in relation to the vertical plane of the wagon's longitudinal axis.

These devices must not present any protrusion at floor level when not in use.

## 12.4 - Operating conditions

The wagons must be suitable for 120 km/h working when empty.

The wagons must be able to operate individually, irrespective of their load status, on siding tracks with a minimum curve radius of 75 m.

For loading on train-ferries, a minimum breakage angle of 2°30' must be allowed.

## Appendix A - Refrigerator wagons

For wagons built before 1.1.1972

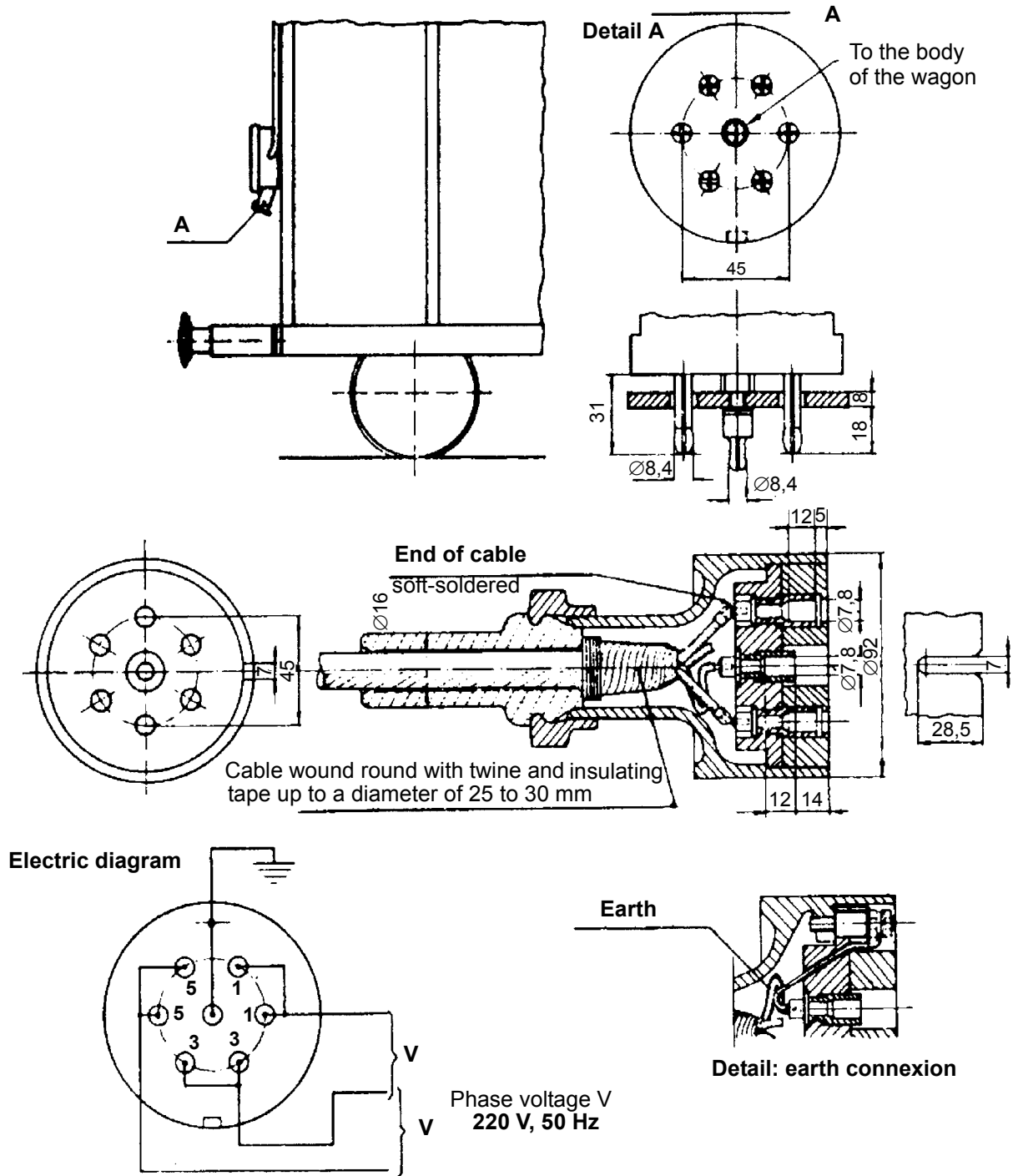
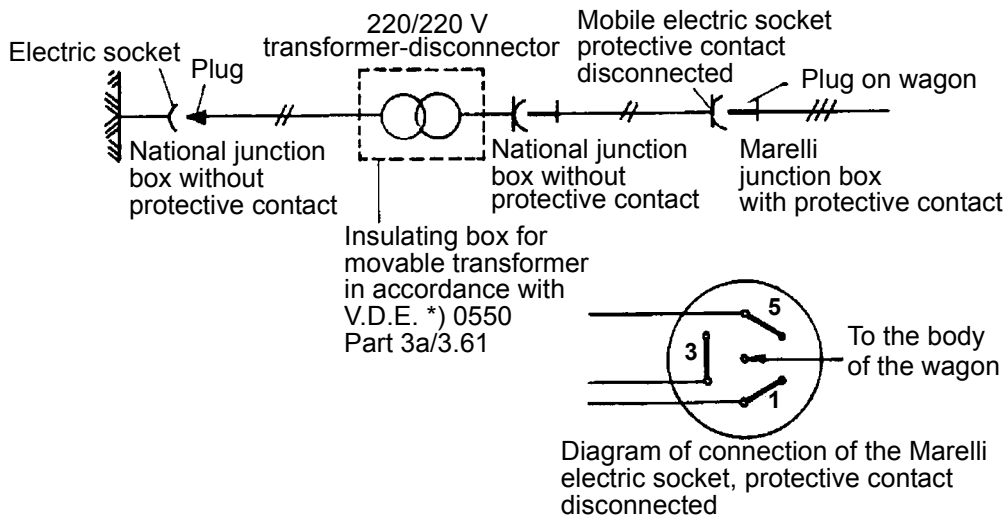


Fig. 1 - End of supply cable for the electrical ventilation equipment (220 V/50 Hz alternating current)

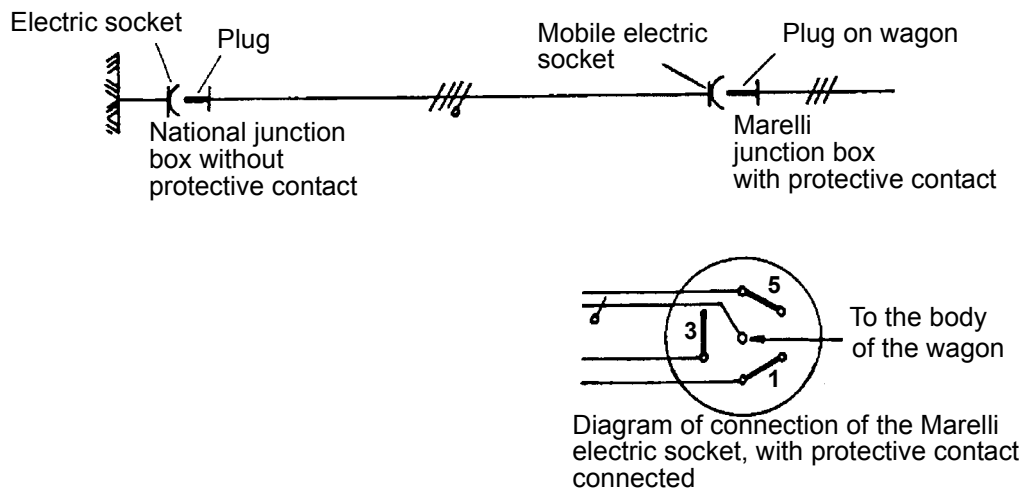
**Diagram showing the methods of connection to the mains (lineside connection) (to serve as a guide)**

**For wagons built before 1.1.1972**



\*) V.D.E. = Verband Deutscher Elektrotechniker

*Fig. 2 - With transformer - disconnector*



*Fig. 3 - With protective conductor*

## Appendix B - Refrigerator, insulated and mechanically-refrigerated wagons

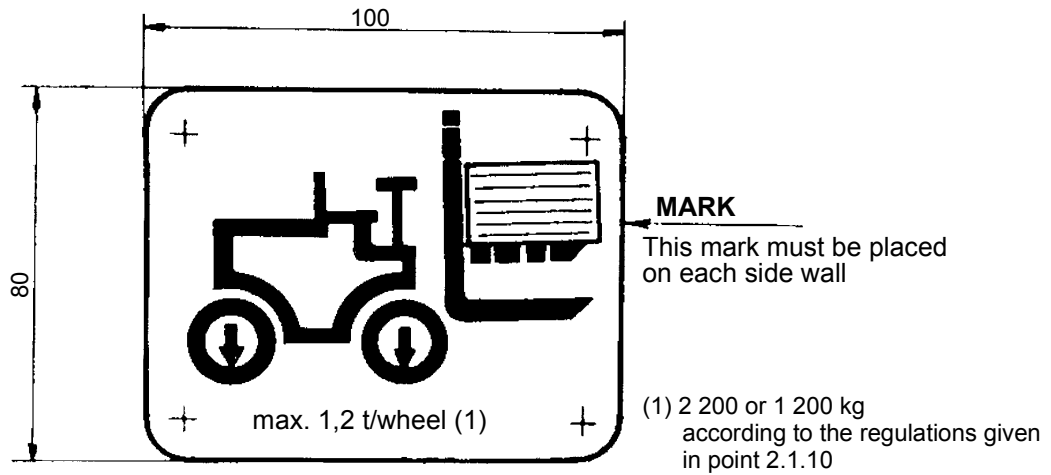


Fig. 4 - Marking of wagons suitable for the handling of goods by means of fork-lift trucks

### Position of the mark

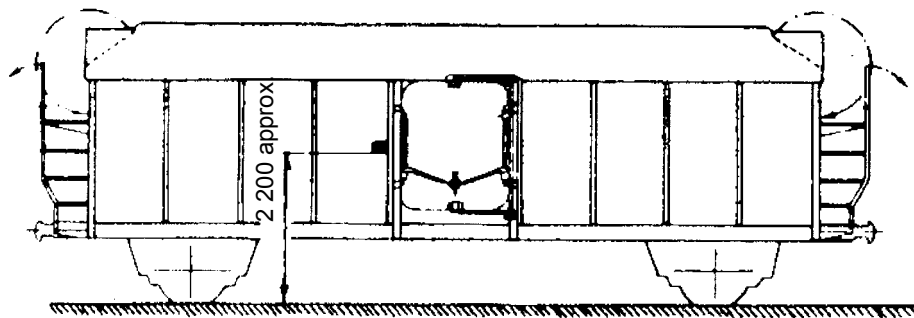


Fig. 5 - Wagons fitted with one-leaf doors

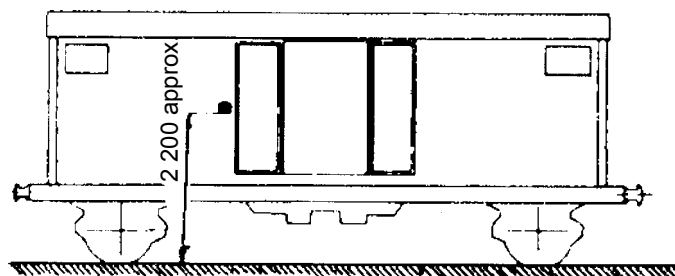


Fig. 6 - Wagons fitted with double-leaf doors

see point 2.1.13 - page 8

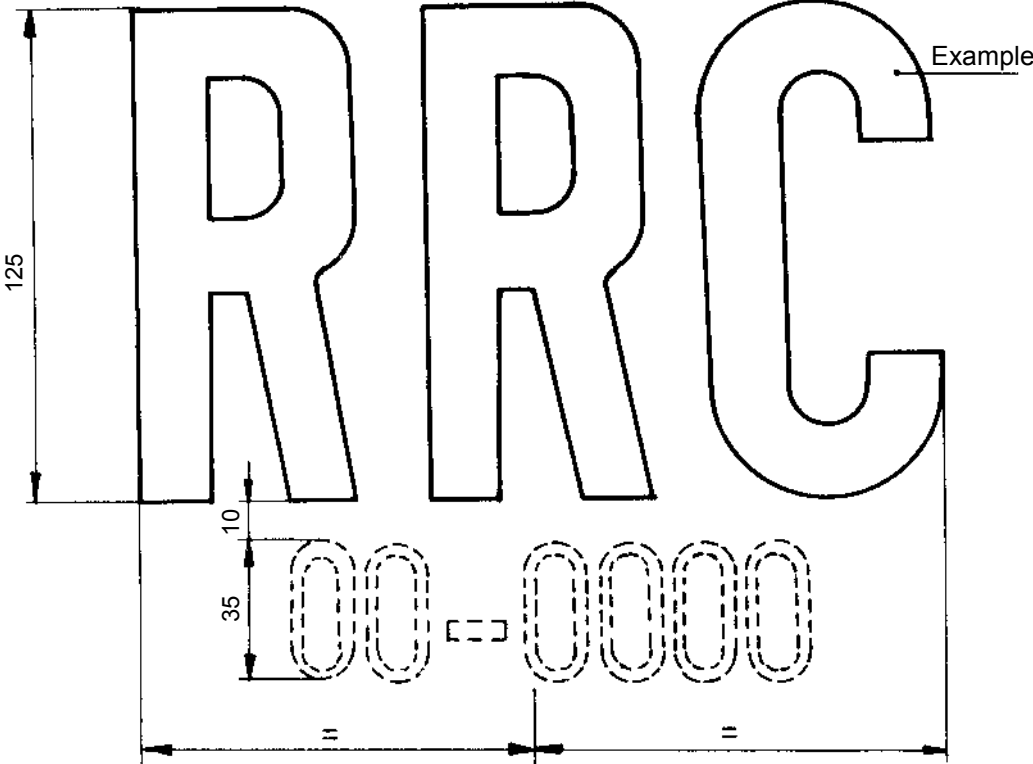


Fig. 7 - Marking standardisation in accordance with the marks stipulated in the ATP

## Appendix C - Two-tier wagons for the conveyance of motor cars

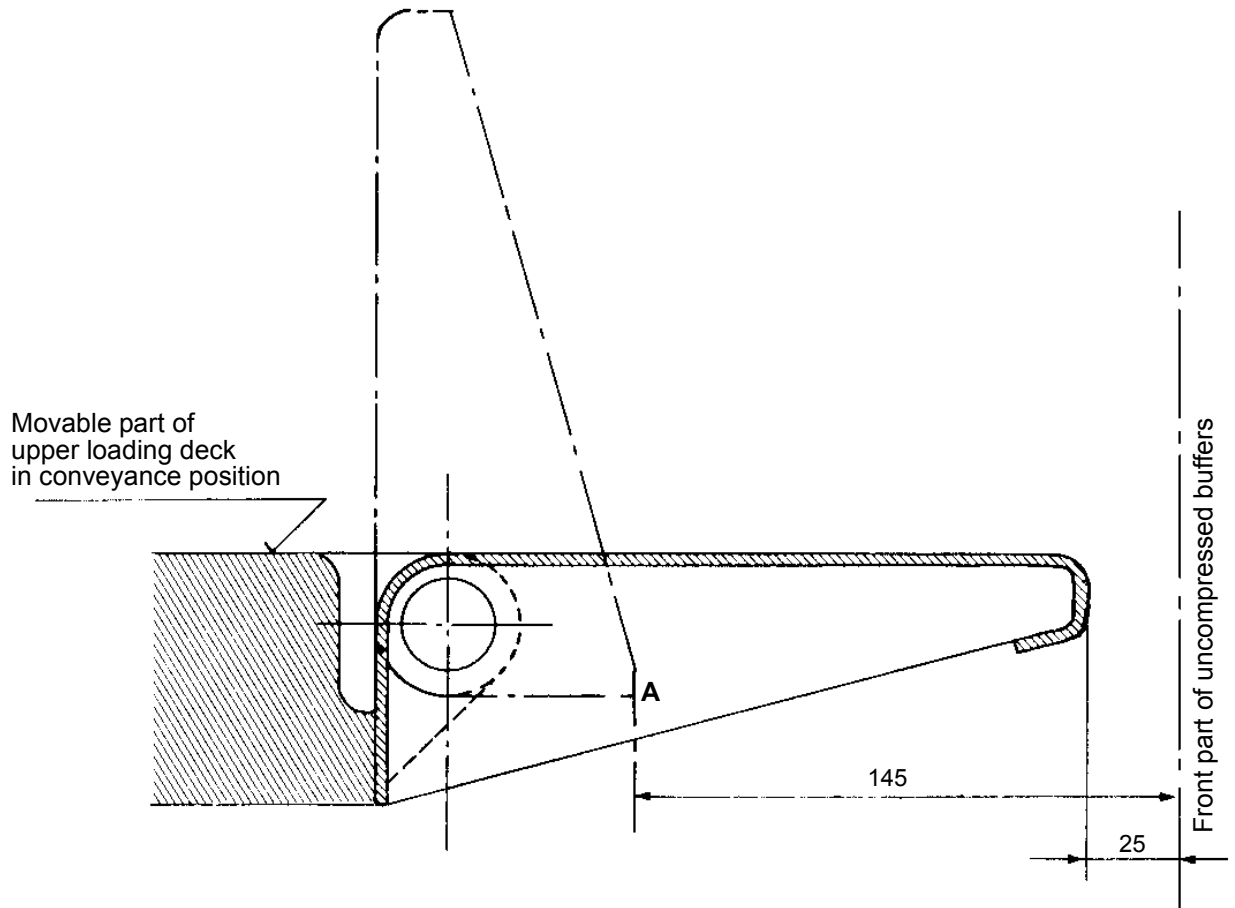


Fig. 8 - End lifting gangway on upper loading deck

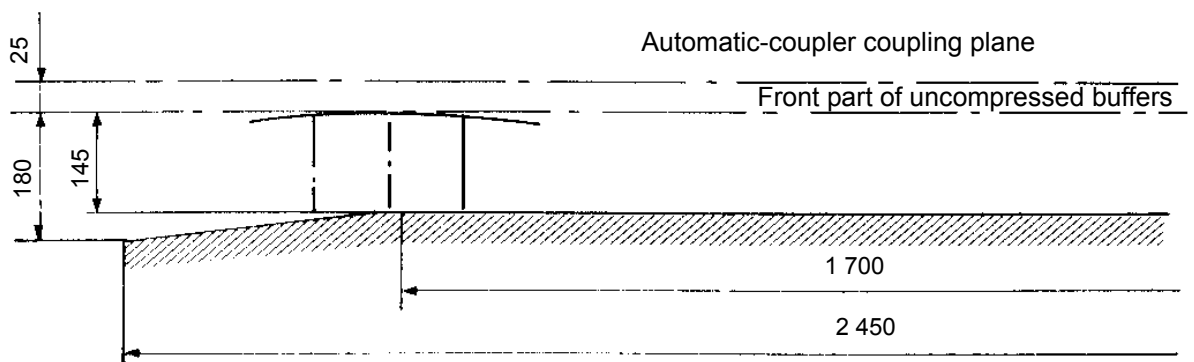


Fig. 9 - Range of measurements at the level of point A (gangway in raised position)



see point 4.1.2.8 - page 19

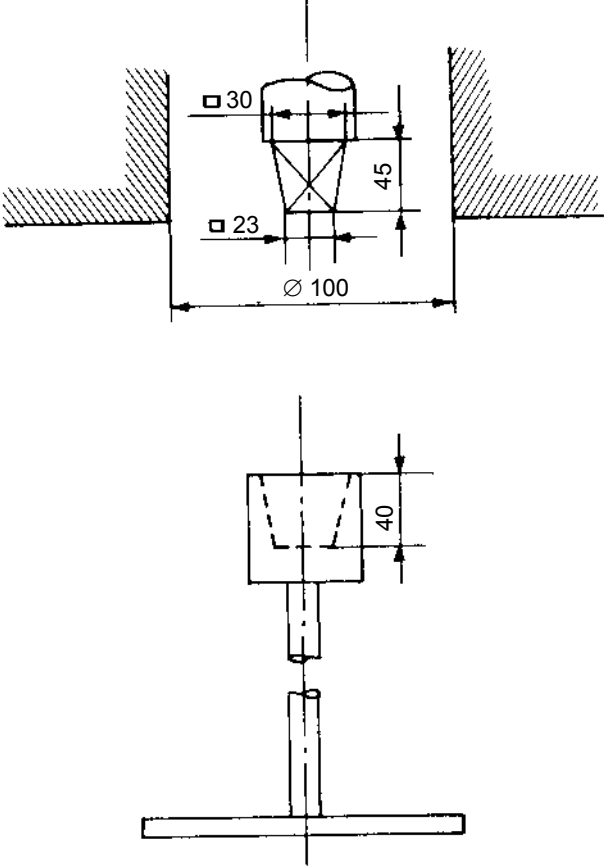


Fig. 10 - Control device of the movable parts of the upper tier (square tip)

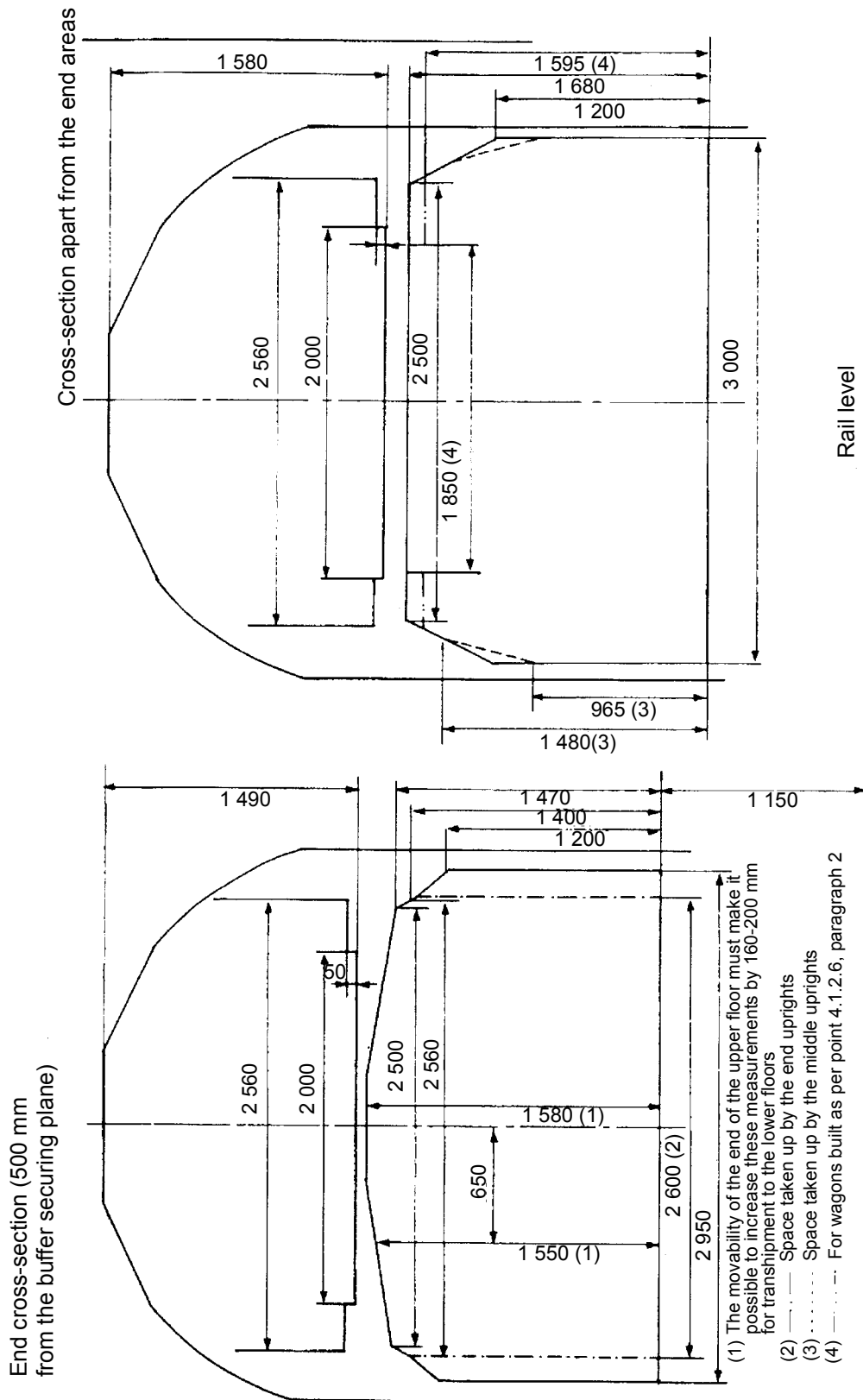


Fig. 11 - Minimum clearance to be left for motor cars

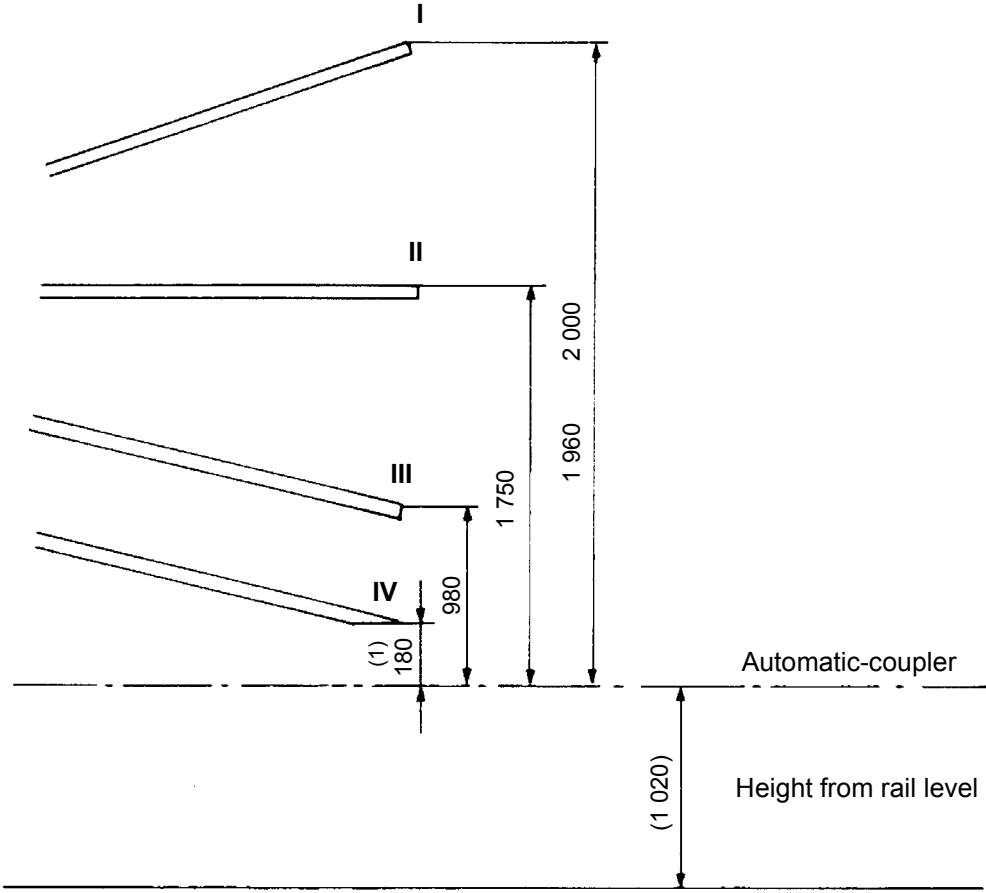


Fig. 12 - Position of the end of the upper deck

(1) Valid when the position specified in point 4.1.2.6 - page 19 is applied

## Appendix D - Bogie wagons for the conveyance of coiled metal equipped with movable cover, fixed end walls and loading cradles

Type 1A and 1B wagons

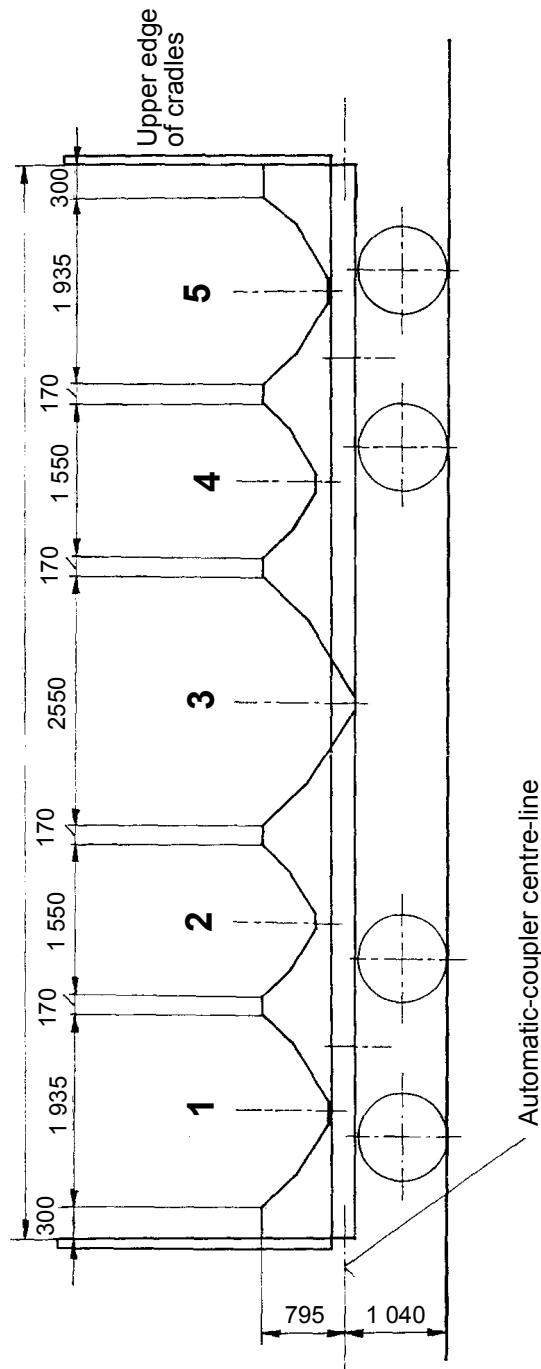
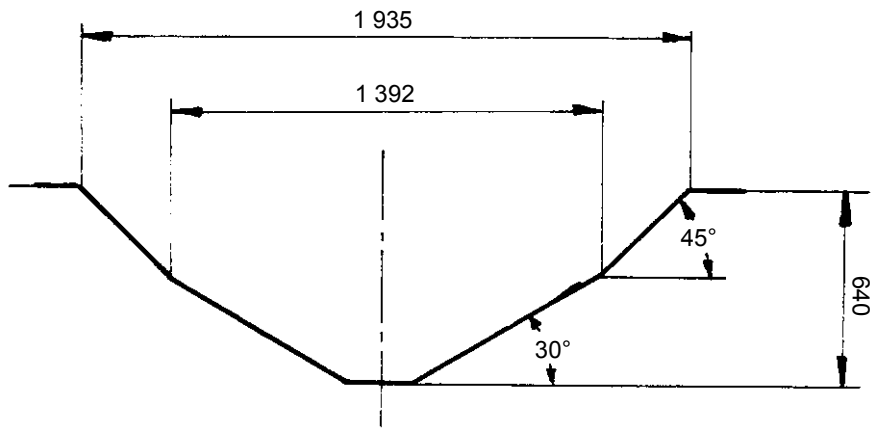


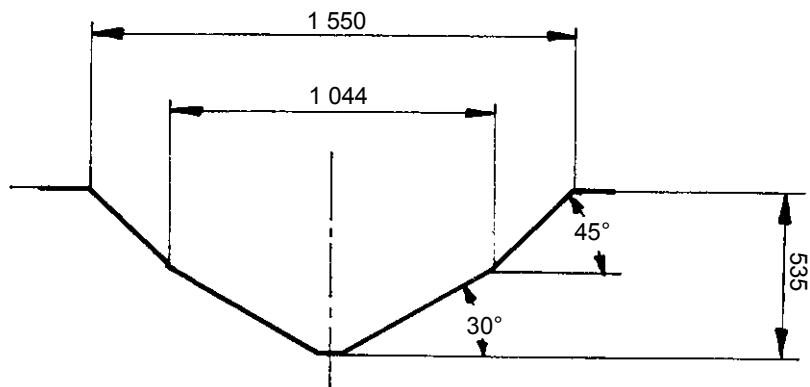
Fig. 13 - Layout of cradles

Type 1A and 1B wagons

Cradles 1 and 5



Cradles 2 and 4



Cradle 3

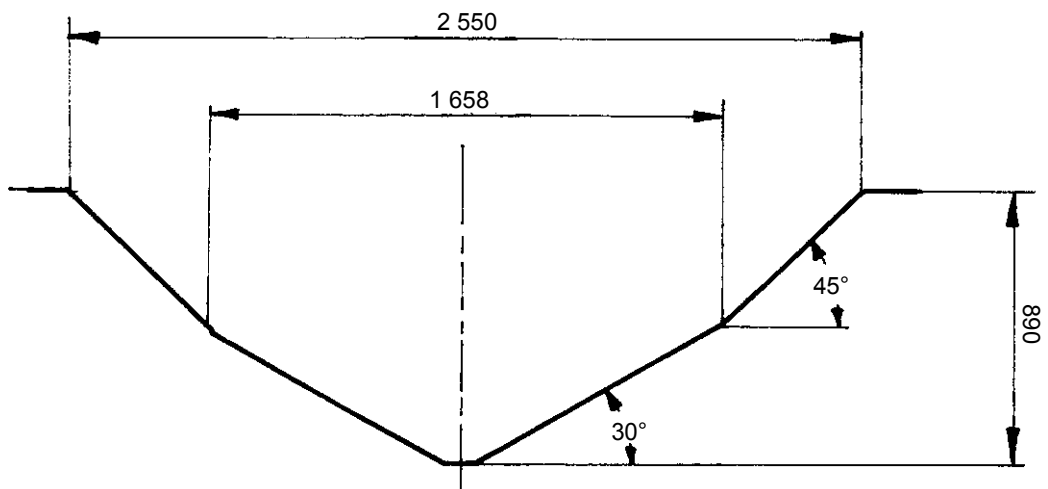


Fig. 14 - Shape of cradles

Type 1A wagons

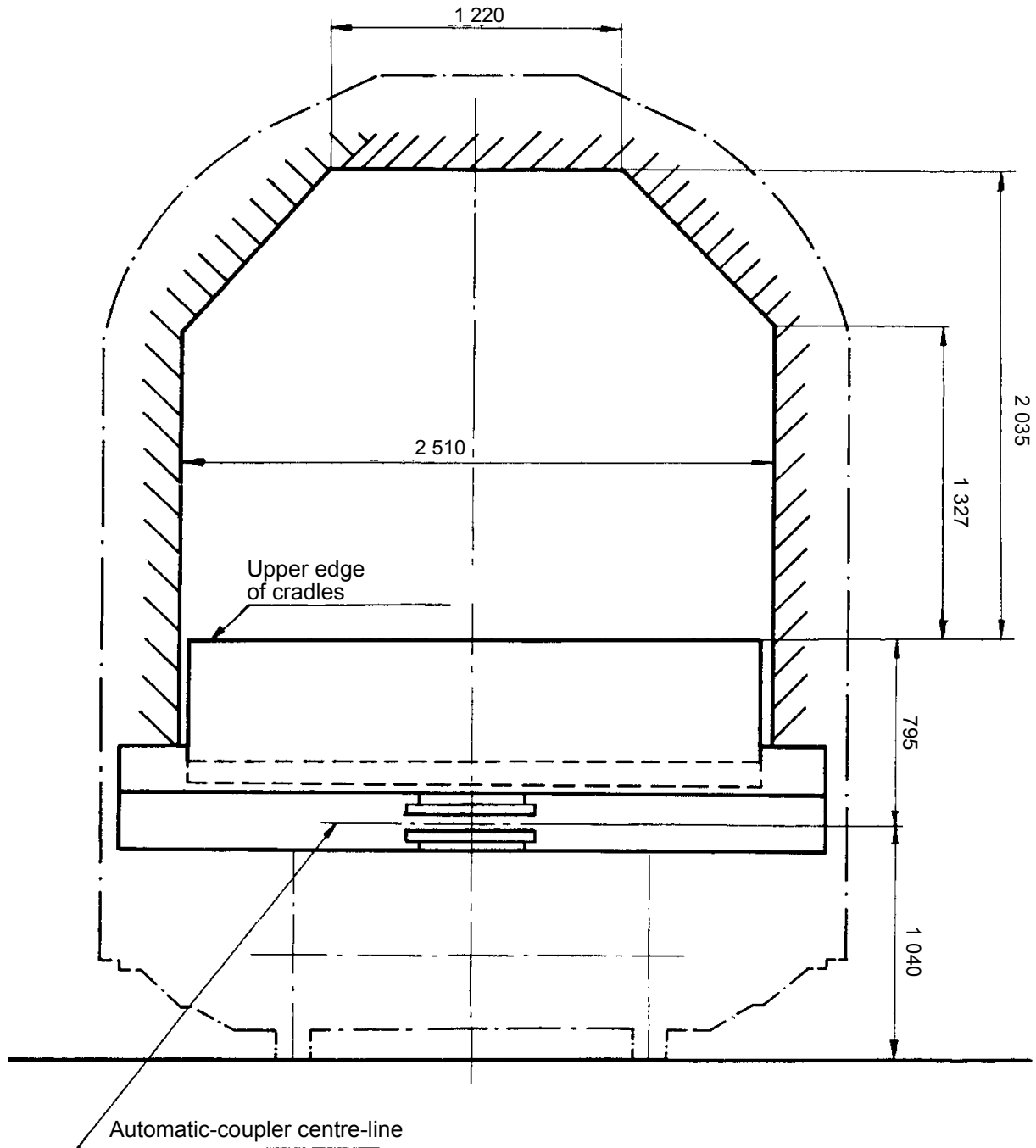


Fig. 15 - Space to be left beneath the lowest hood or the synthetic sheet folded at one end of the wagon

Type 1B wagons

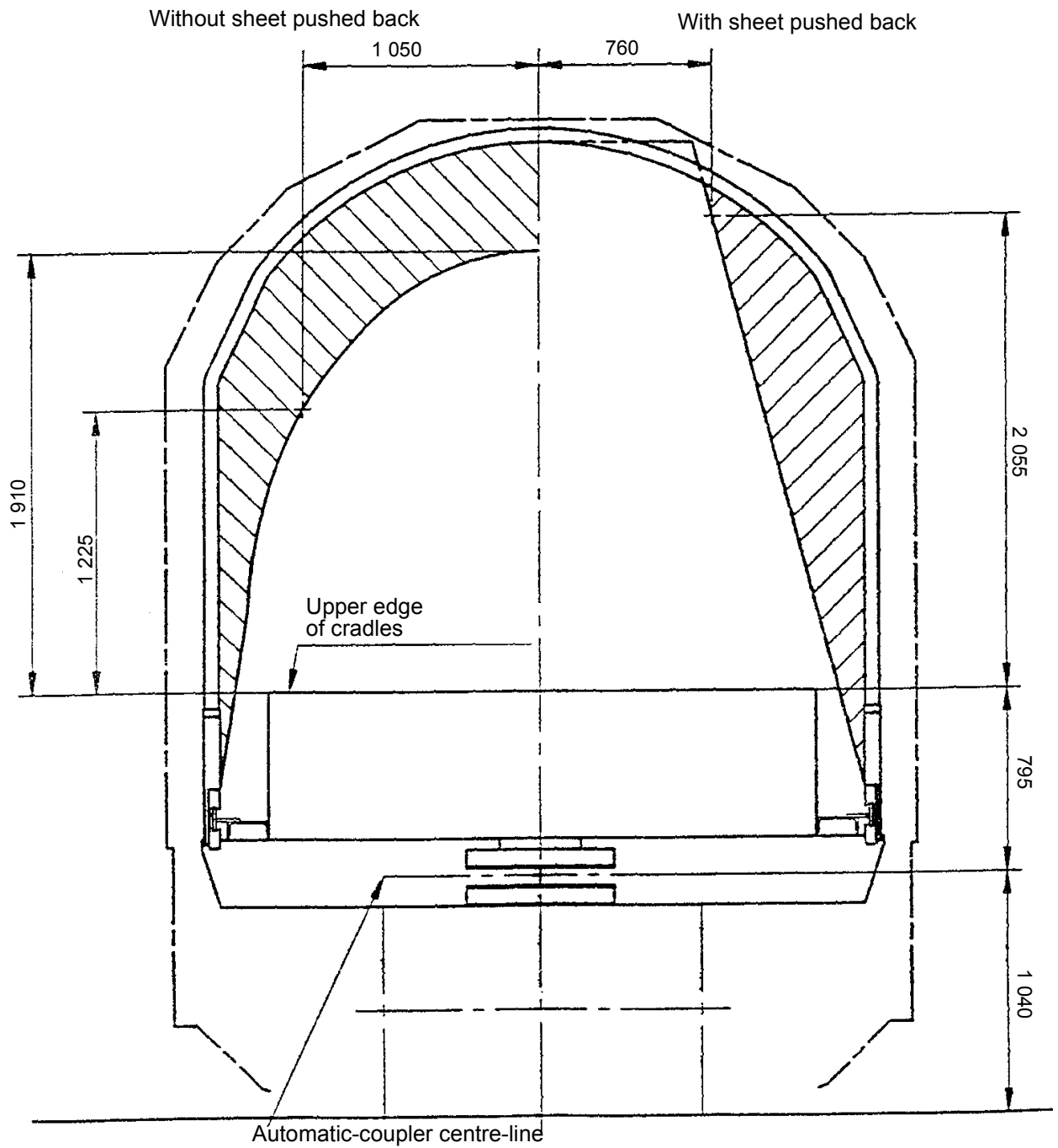


Fig. 16 - Space to be left beneath the sheet completely folded at one end of the wagon

Type 2 wagons

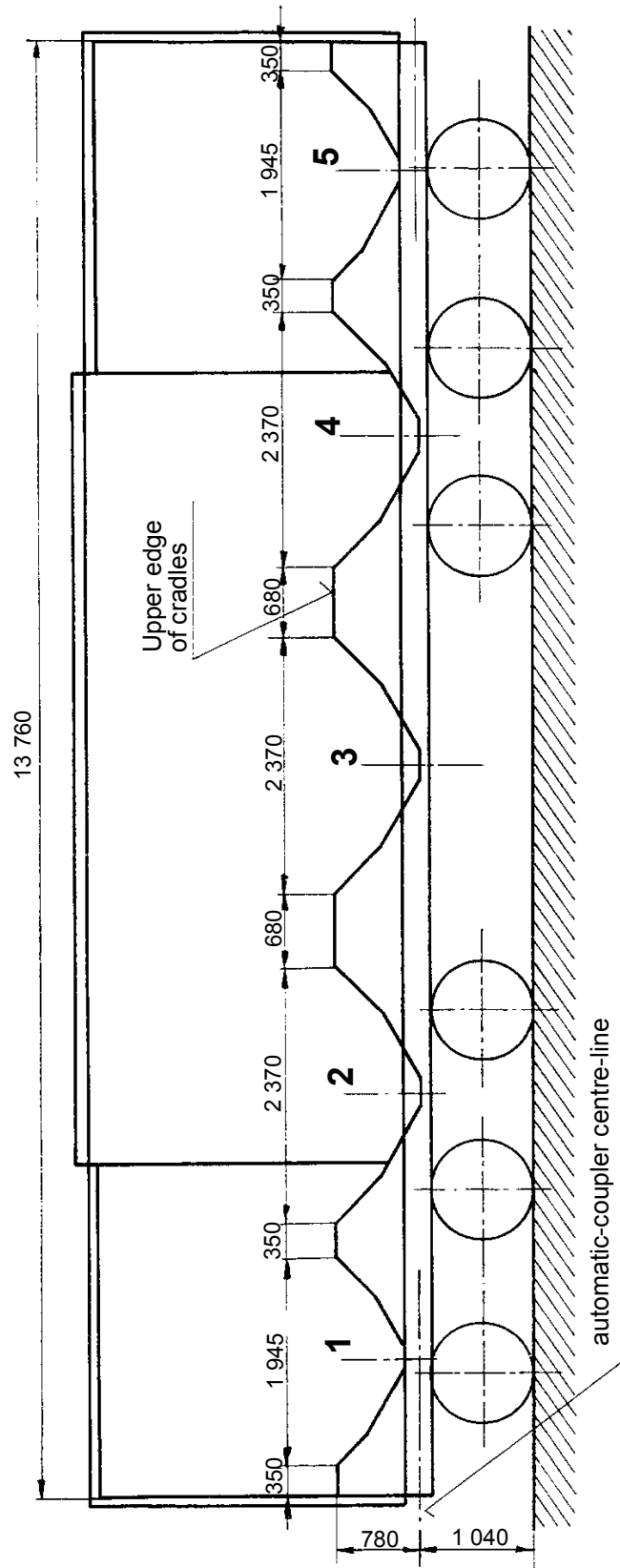
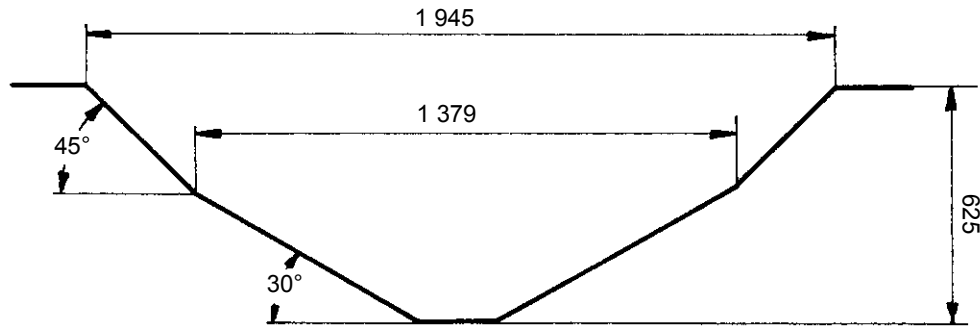


Fig. 17 - Layout of cradles

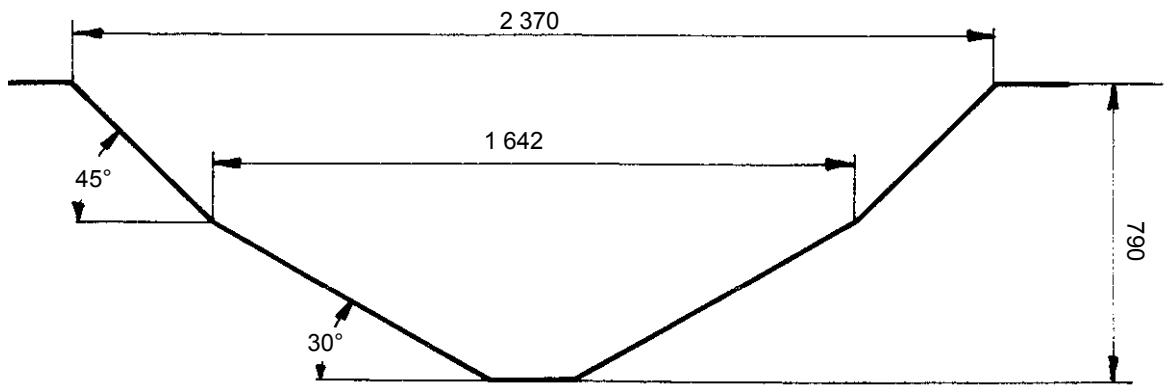


**Type 2 wagons**

Cradles 1 and 5



Cradles 2, 3 and 4



*Fig. 18 - Shape of cradles*

Type 2 wagons

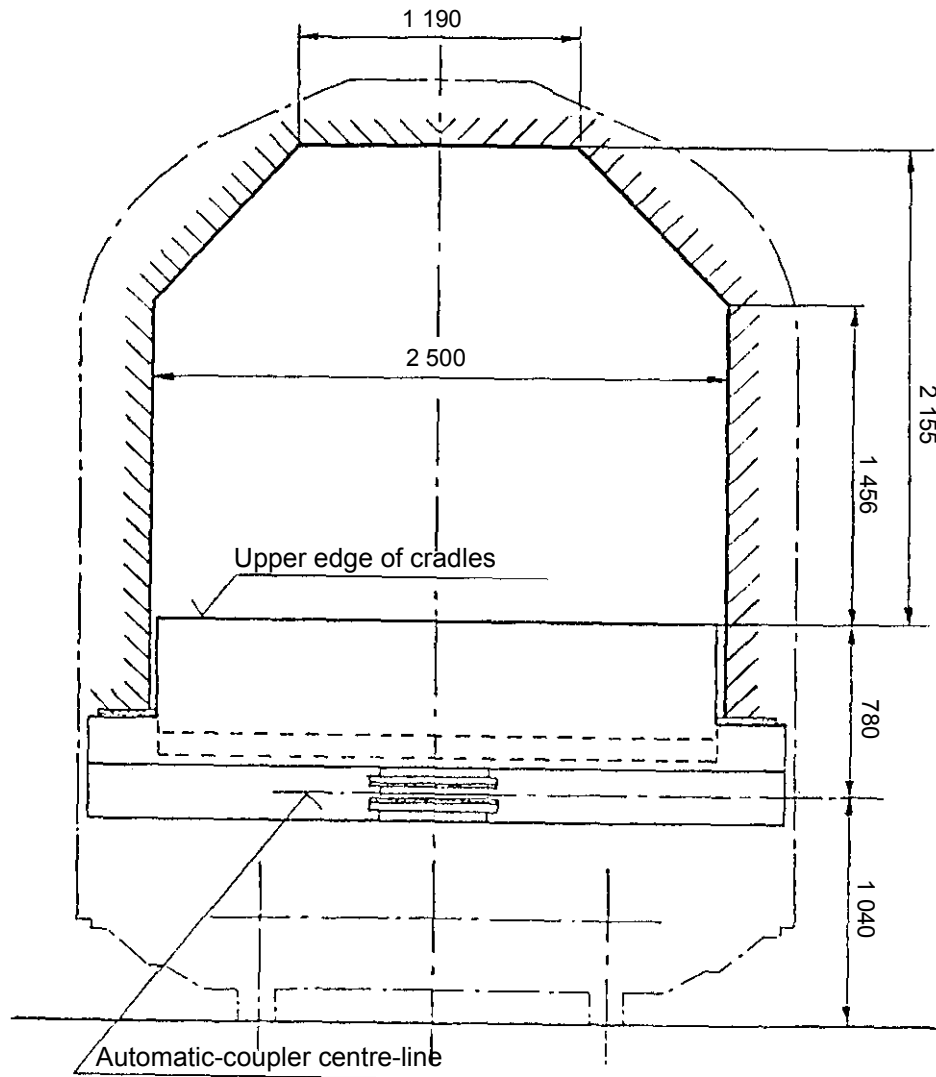


Fig. 19 - Space to be left beneath the lowest hood

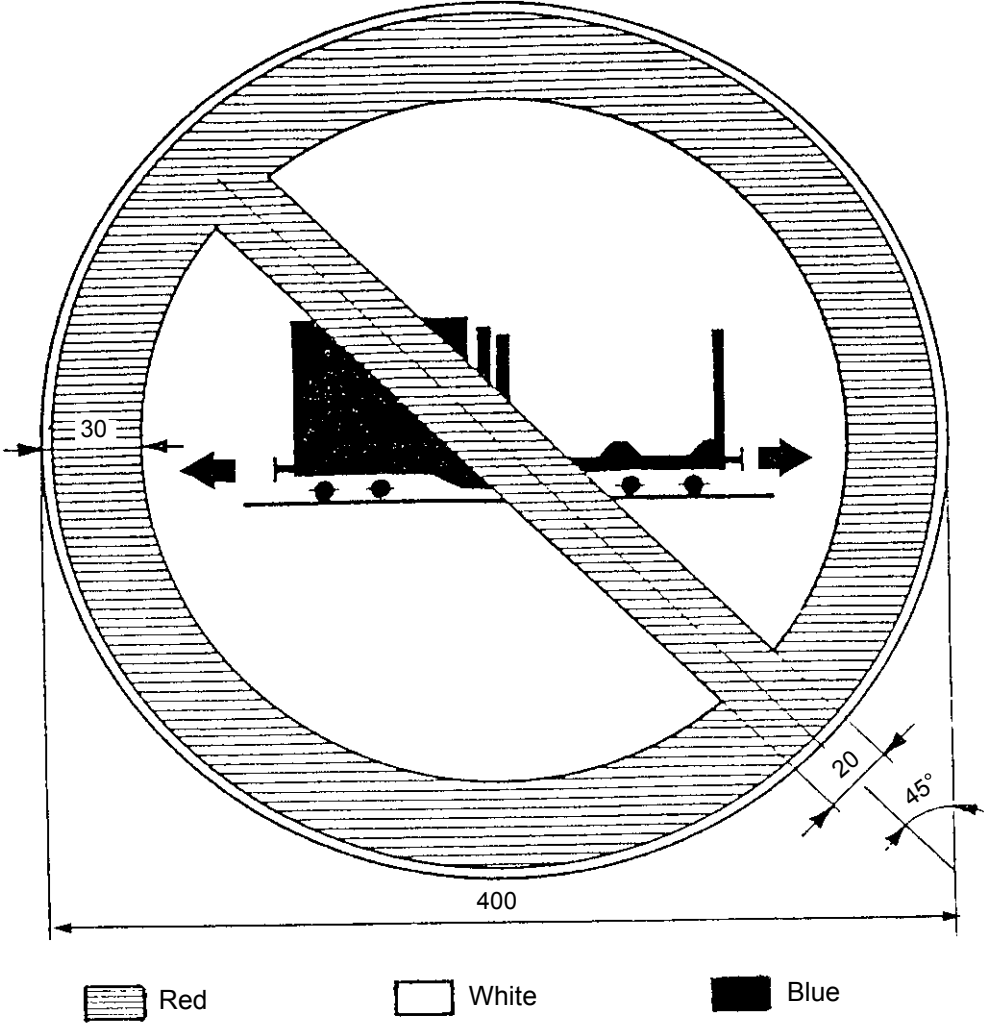


Fig. 20 - Pictogram showing prohibition to run with the hood open

Positioning of immobilisation arms

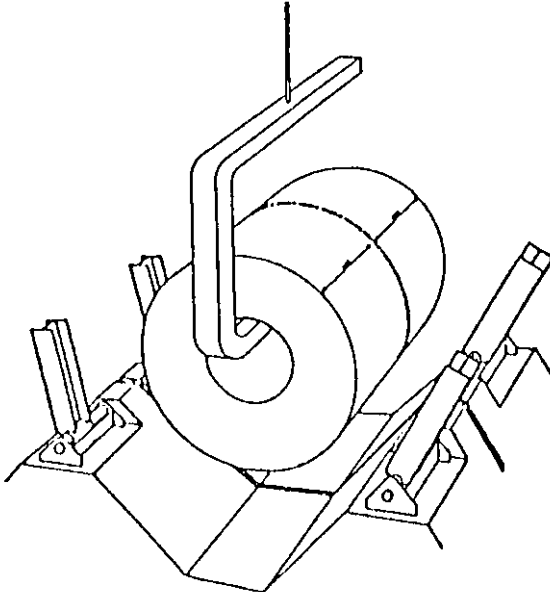


Fig. 21 - Loading

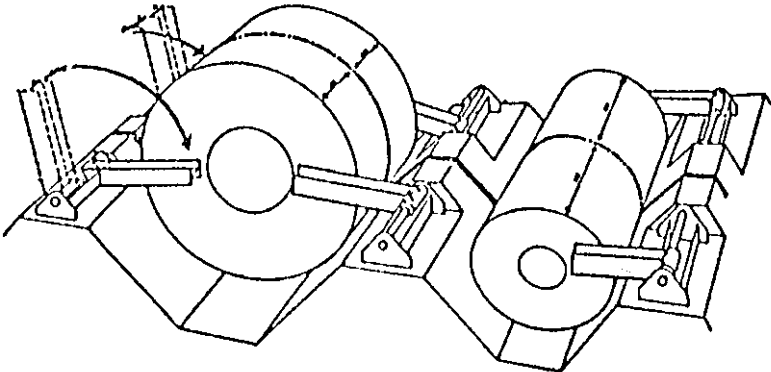


Fig. 22 - Conveyance

## Appendix E - Bogie wagons with bilateral bulk unloading by gravity

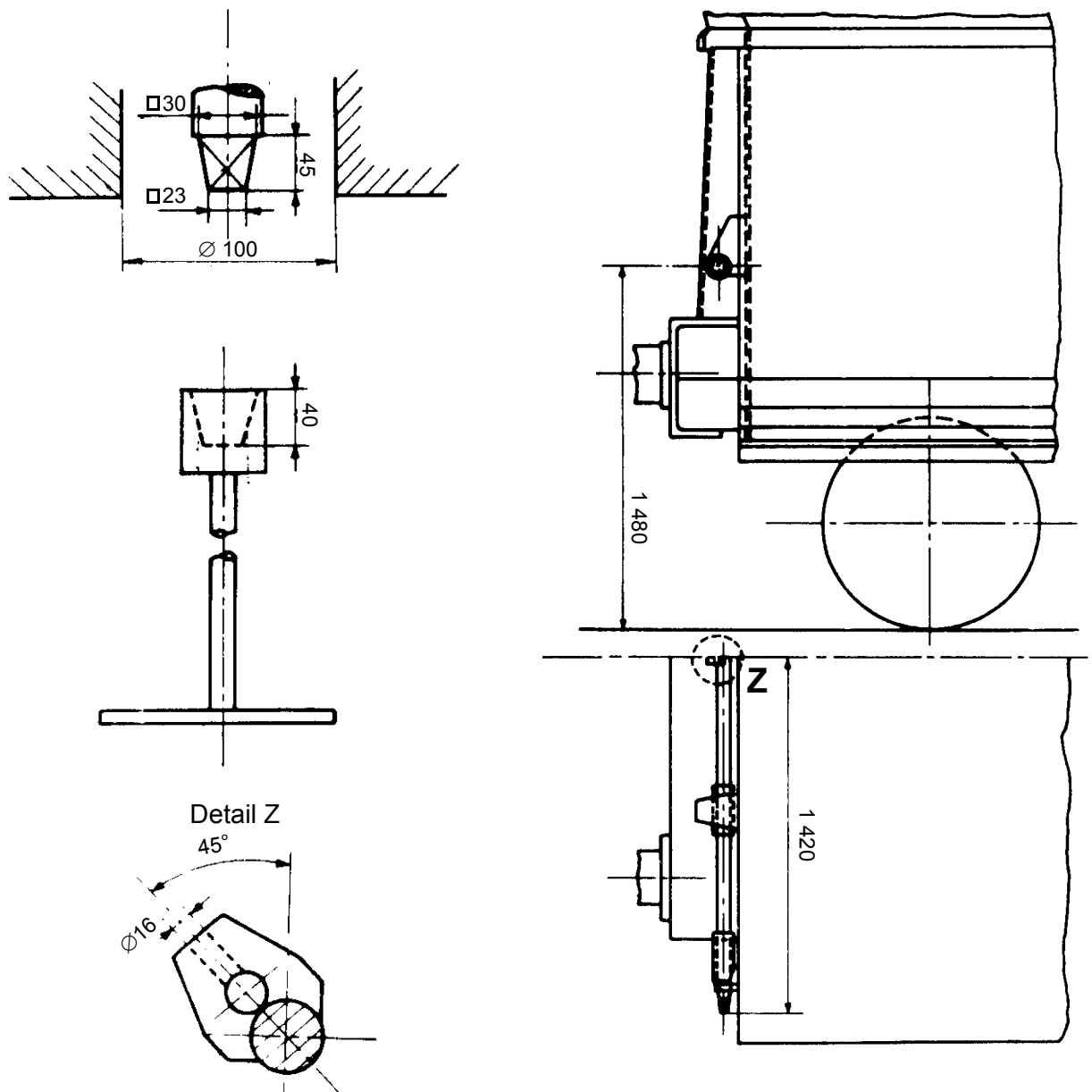
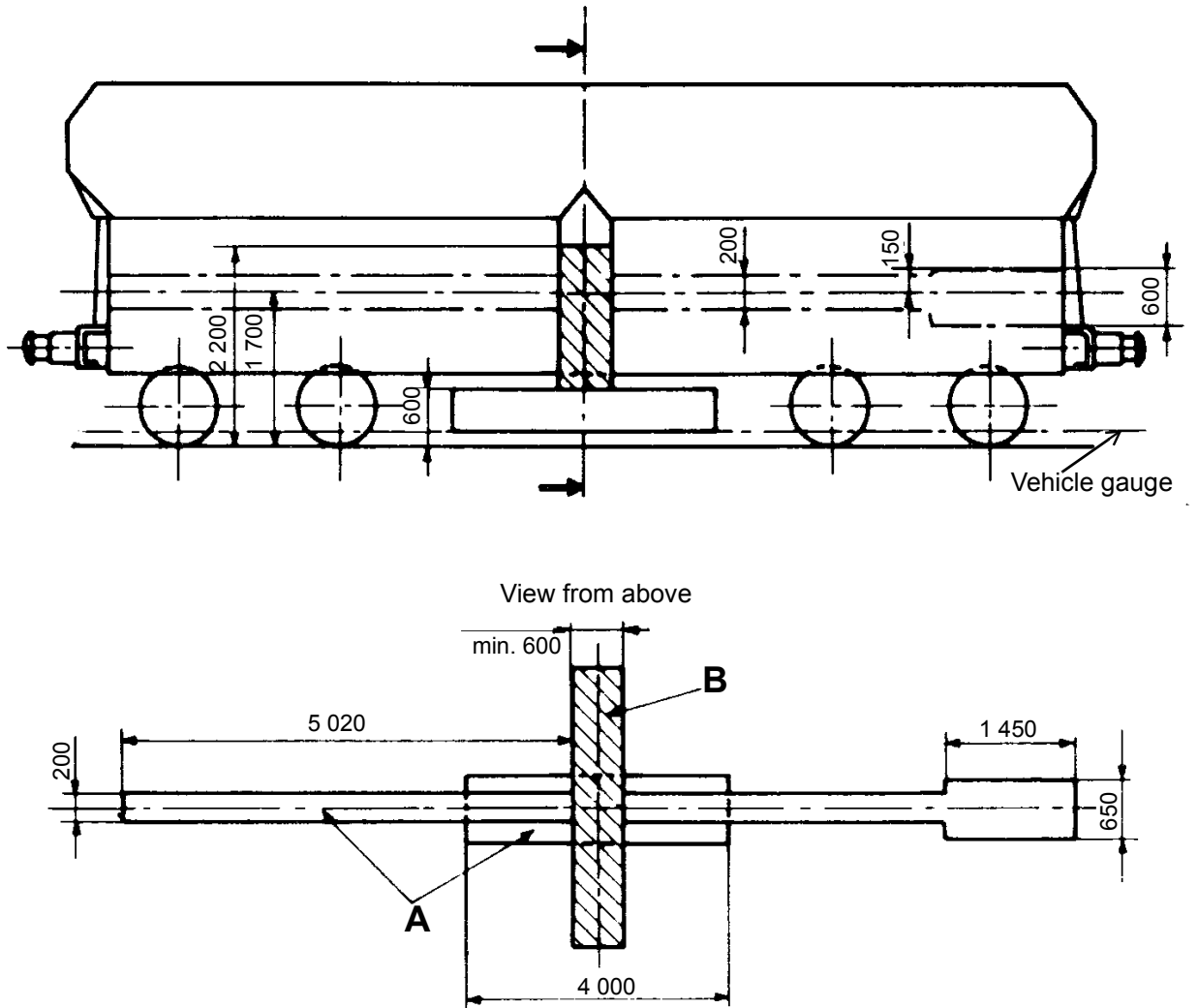


Fig. 23 - Square tips for opening unloading traps



A, B = Clearances to be left for the automatic control device of traps (clearance B may also be used for the brake control device).

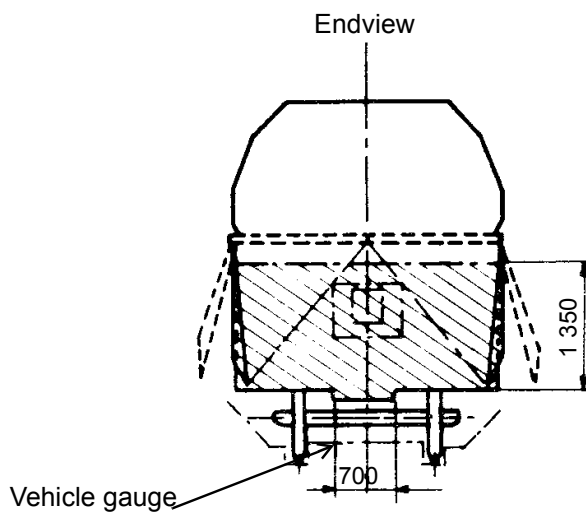


Fig. 24 - Clearances to be left in wagon

# Appendix F - Covered bogie wagons with sliding walls

Type 1 wagons

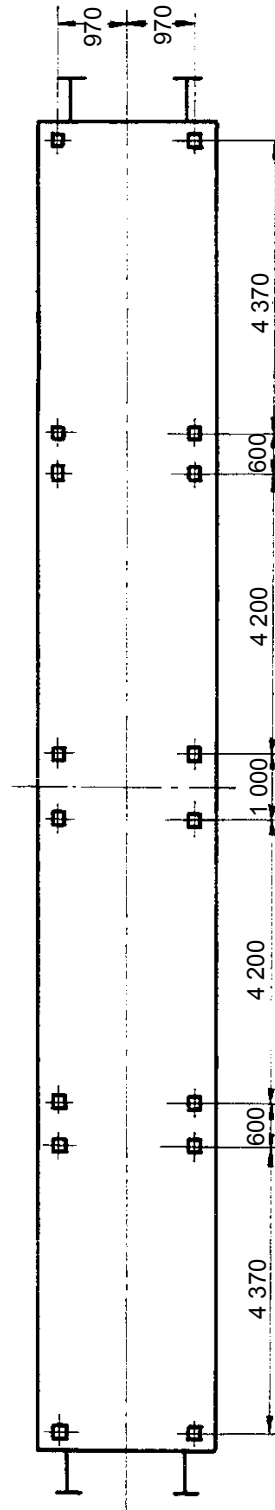


Fig. 25 - Layout of securing equipment

## Appendix G - Two-axle covered wagons and bogie wagons with sliding walls

Types 1A, 1B, 2A, 2B, 3A, 3B wagons

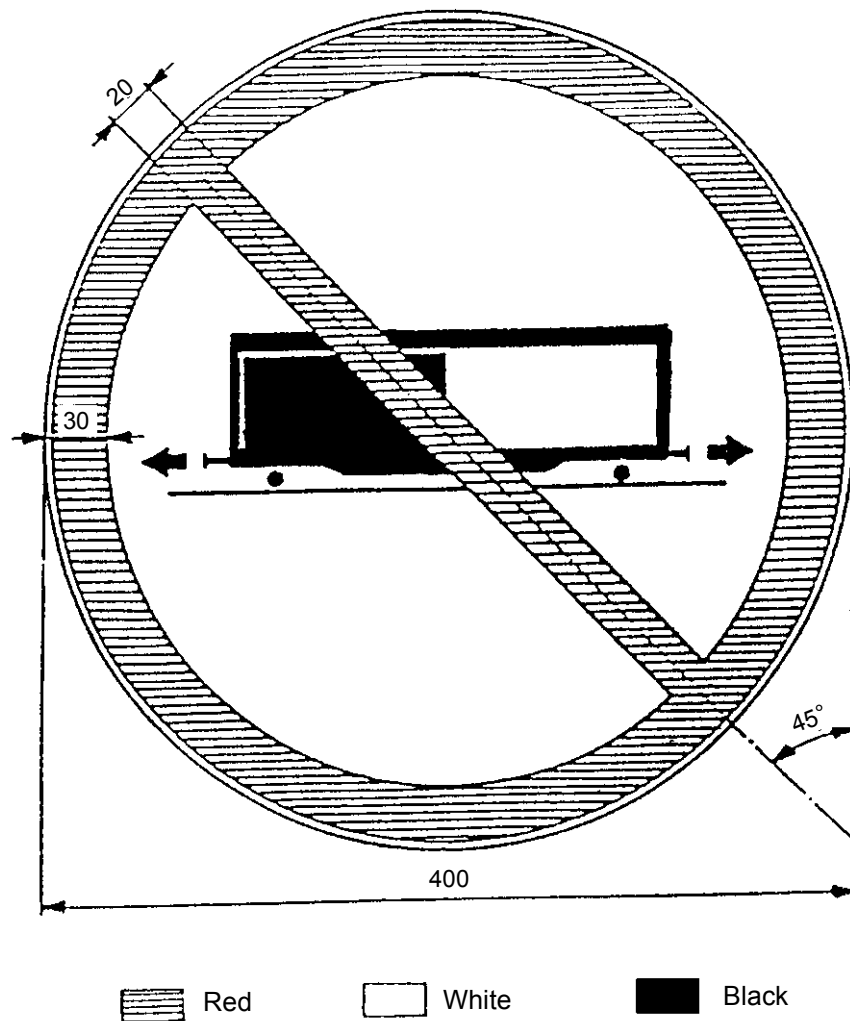


Fig. 26 - Pictogram showing prohibition to run with sliding walls open



Type 2A and 2B wagons

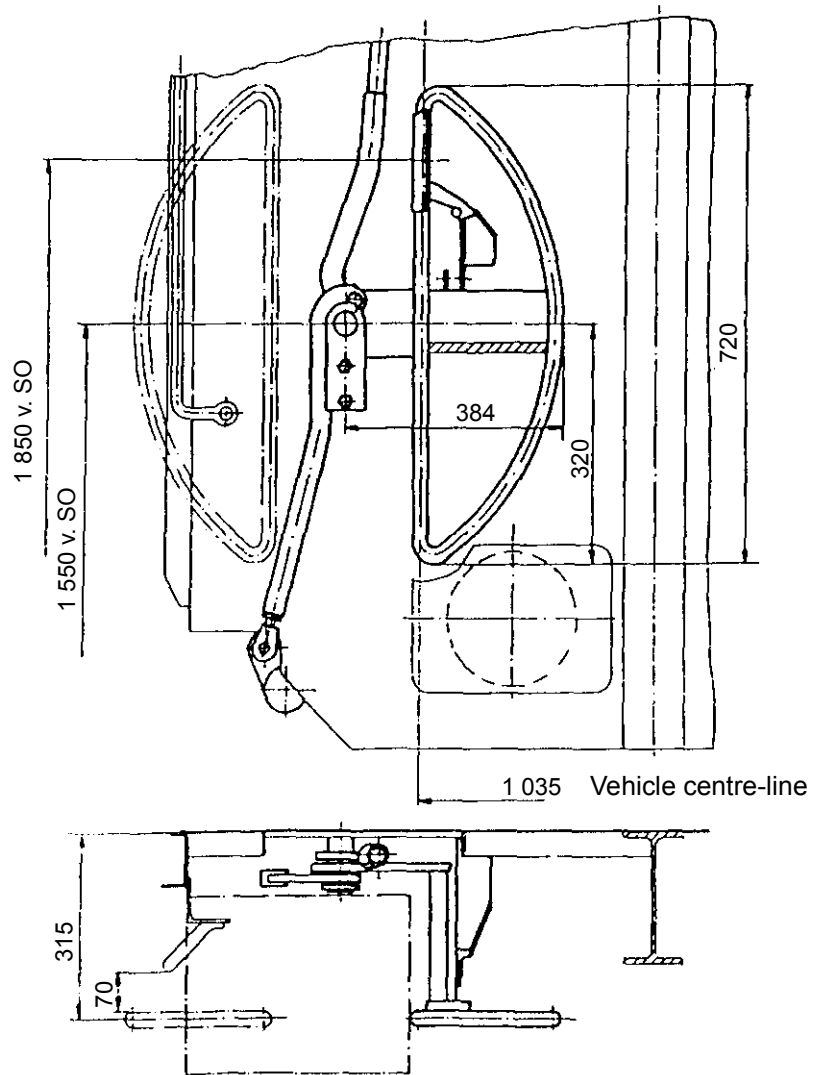


Fig. 27 - Control device

Type 1A, 1B, 2A, 2B, 3A, 3B wagons

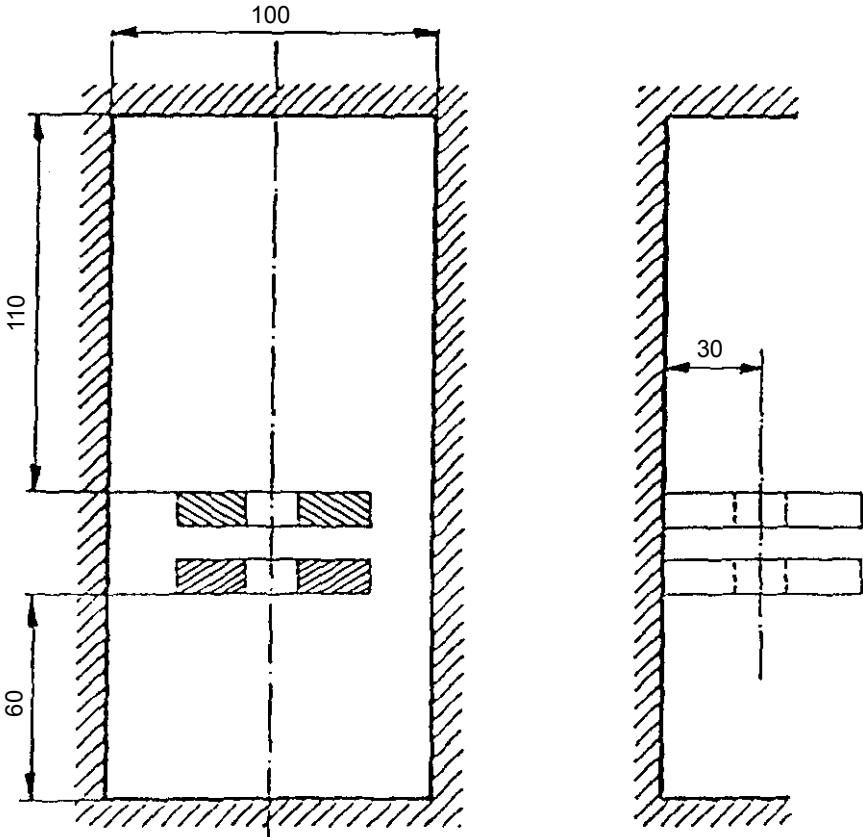


Fig. 28 - Clearance to be provided at right angles to the customs sealing staple

Type 2A and 2B wagons

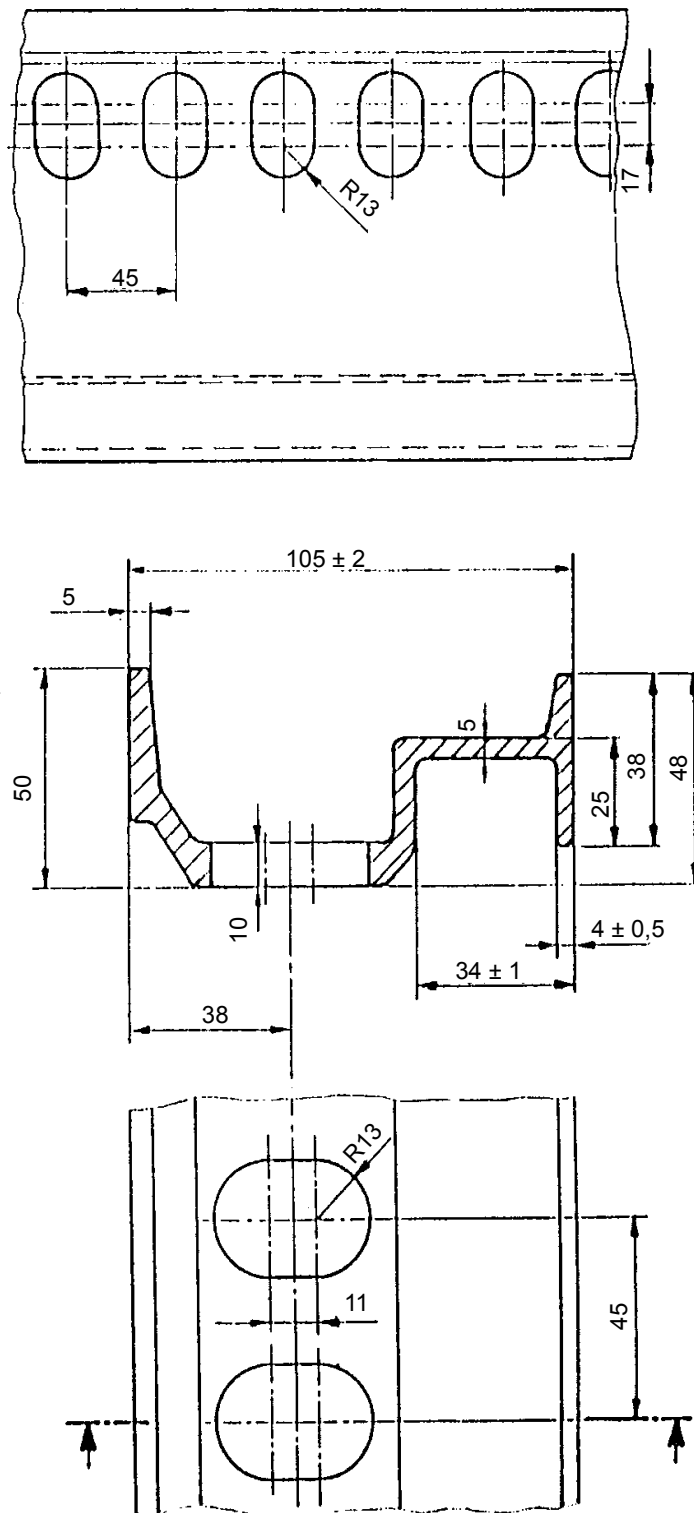


Fig. 29 - Punched slide rail and guide rail/punched rail combination  
(size of holes, distance between them)

Type 2A and 2B wagons

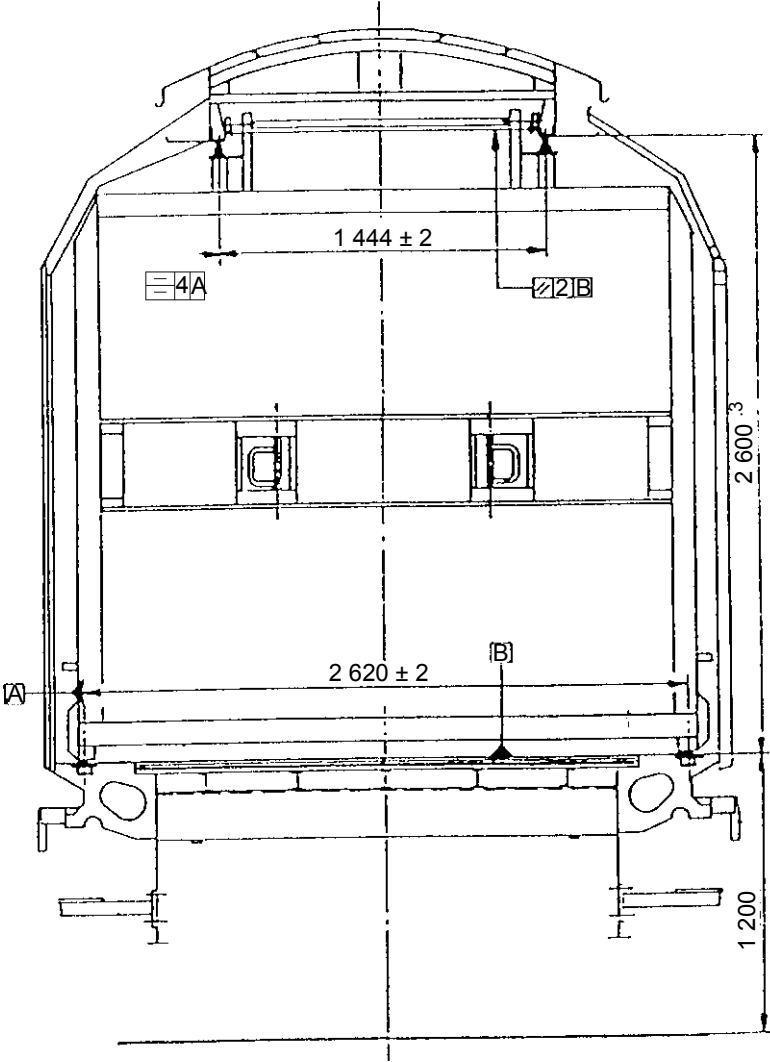


Fig. 30 - Layout of guide and punched rails

Type 1A, 1B, 2A, 2B, 3A, 3B wagons

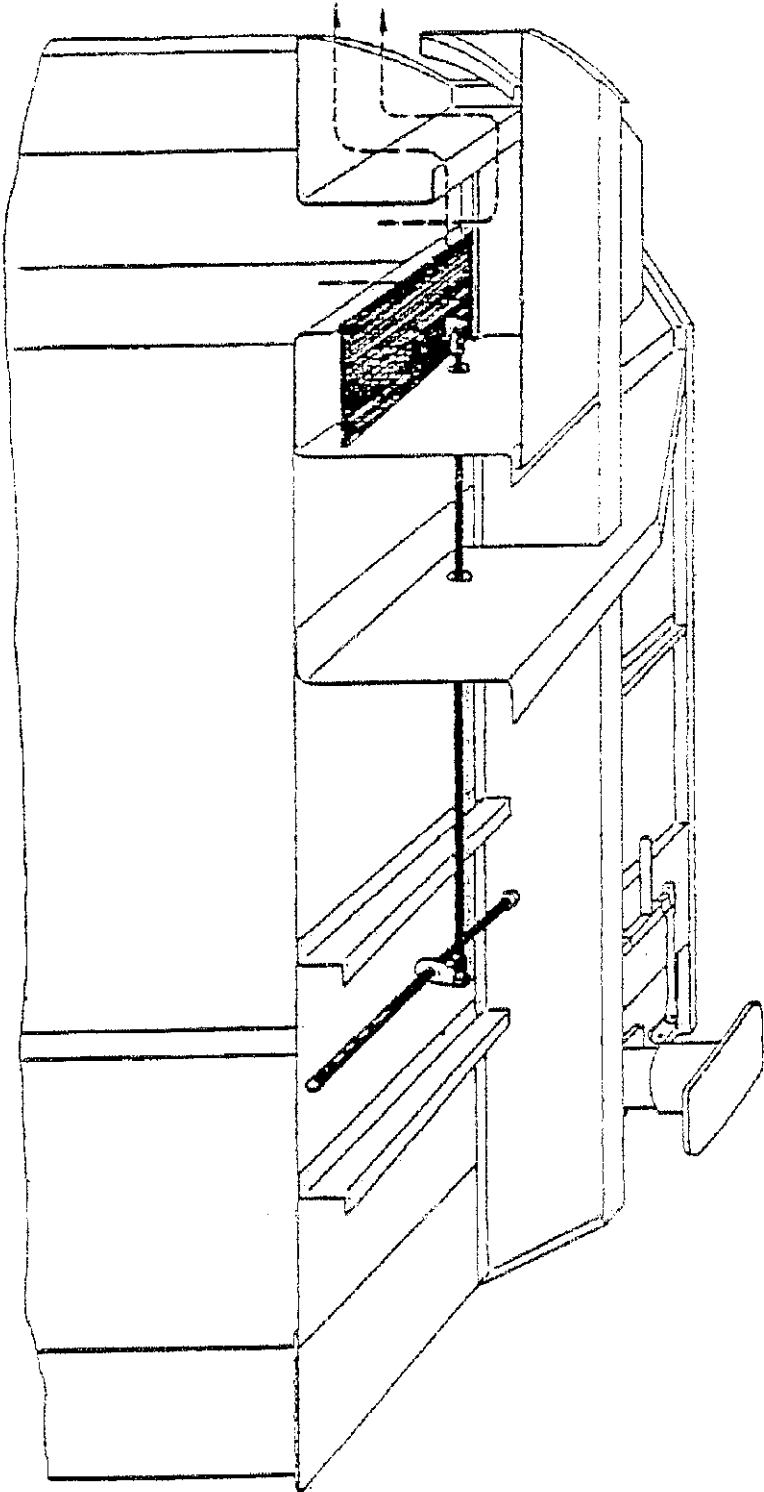


Fig. 31 - Ventilation mechanism

## Appendix H - Bogie flat wagons (Ril(n)s) fitted with mechanical sheeting

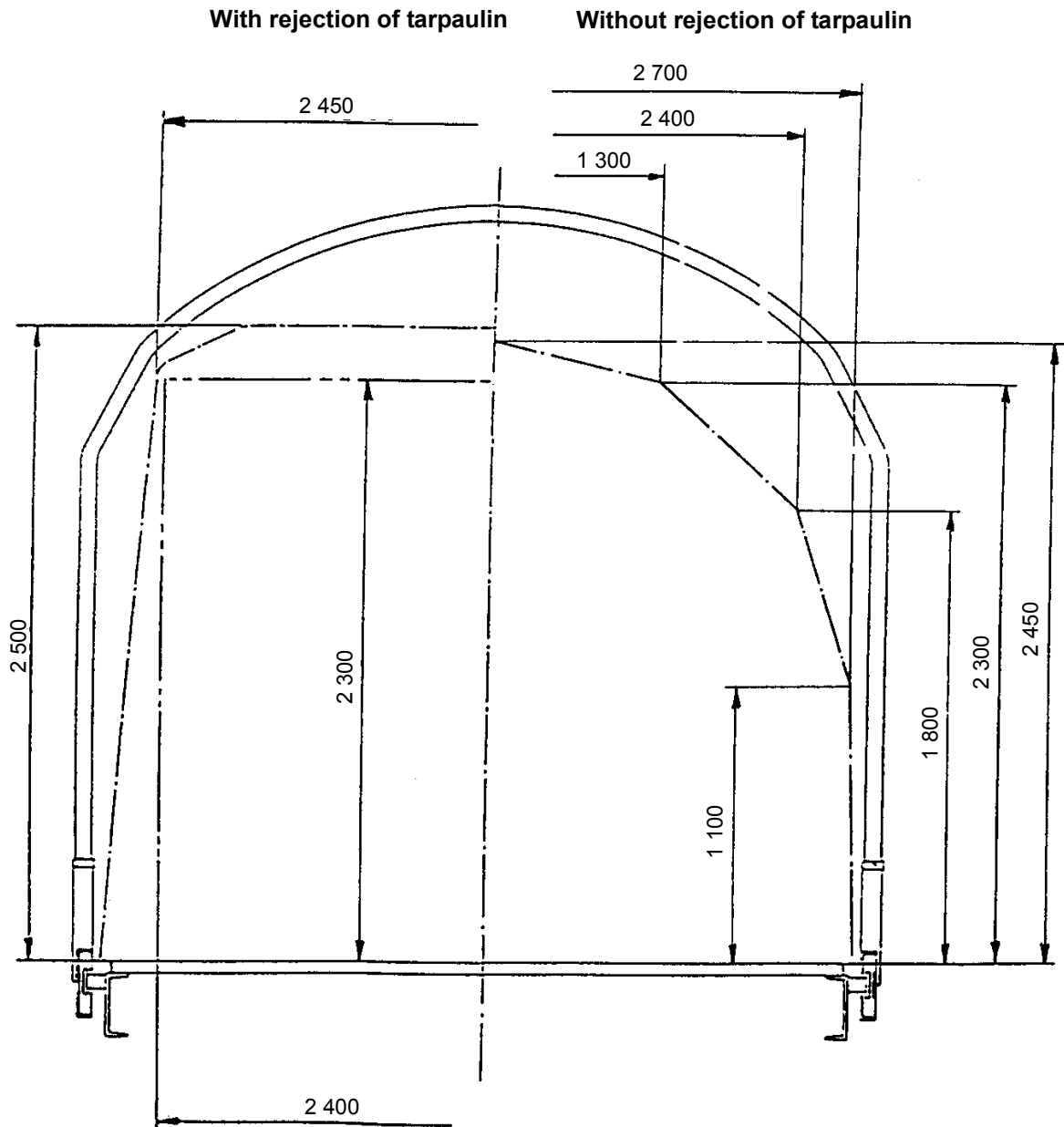


Fig. 32 - Space to be left beneath mechanical sheeting

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## List of abbreviations

**ATP**

Agreement concerning the international conveyance of perishable foodstuffs and the appliances to be used for this traffic

**RIC**

Regulations governing the reciprocal use of carriages and brake vans in international traffic

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- UIC Leaflet 530-2: Wagons - Running safety, 4th edition of 1.7.85 - Reprint dated 1.7.97. NB: The set of diagrams (Appendices 1, 2 and 3) with 4 Amendments may be viewed in full by UIC Members only*
- UIC Leaflet 530-4: Permissible state of equipment on wagons in international traffic during the period of introduction of automatic couplers, 2nd edition of 1.7.82*
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- UIC Leaflet 554-1: Power supply to electrical equipment on stationary railway vehicles from a local mains system or another source of energy at 220 V or 380 V, 50 Hz, 3rd edition of 1.1.79*
- UIC Leaflet 554-2: Power supply to mechanically-refrigerated wagons running in rafts - Safety measures and electric installations, 1st edition of 1.1.78*
- UIC Leaflet 570: Wagons - Interchangeable parts, 6th edition of 1.1.81 - Reprint dated 1.1.95*
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## 2. Minutes of meetings

### **International Union of Railways (UIC)**

*Traction & Rolling Stock Committee (Question 45/B/FIC - Revisions of leaflets. Approval of additions and amendments to Leaflet 571-3), June 1985*

*Joint Sub-Committee for Wagons (Question 45/B/FIC - Development of Leaflet 571-3 following the decisions reached by the Traction & Rolling Stock Committee concerning revision of UIC Leaflet 530-2), September 1985*

*Joint Sub-Committee for Wagons (Question 45/B/FIC - Development of chapters 6 and 7 of UIC Leaflet 571-3), January 1986*

*Traction & Rolling Stock Committee (Question 45/B/30 - Standardisation of wagons. a) Normalisation of two-axle covered wagons with sliding walls Hb (b) i (kk) s and 22,5 t axle-loads), June 1986*

*Traction & Rolling Stock Committee (Question 45/B/30 - Standardisation of new covered wagons with sliding walls (Habbills)), June 1990*

*Joint Sub-Committee for Wagons" (Question 45/B/30 - Additions to UIC Leaflet 571-3 on the basis of proposals from ORE Committee B 12), January 1991*

*Traction & Rolling Stock Committee (Question 45/B/41 - Point 12.3 - Efficient aerodynamic design for trains), November 1992*

*Joint Sub-Committee for Wagons (Question 45/B/FIC - Approval of additions to UIC Leaflet 571-3 proposed by ERRI Committee of Experts B 12), January 1993*

*Joint Sub-Committee for Wagons (Question 45/B/FIC - Approval of modifications proposed by SC ERRI B 12. Harmonisation of Leaflet 571-3), January 1995*

*Rolling Stock Committee (Question 45/B/30 - Point 10.3 - Unification of wagons Rils, Rilns, Snps and Sammns. Modification to Leaflet 571-3), May 1995*

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*ERRI B 12/RP 48: Wagons - Partial standardisation of certain features of the sliding wall wagons for 22,5 t axle-load Hbi(II)ns (Type 1A and 1B of UIC Leaflet 571-3) and Hbbi(II)ns (Type 2A and 2B of UIC Leaflet 571-3), 1 April 1989*

*ERRI B 12/RP 54: Wagons - Reduction in the aerodynamic drag of wagons, 1 October 1992*

*ERRI DG4: Drawings of standardized rolling stock with conditions governing their acquisition and use, 7th edition of July 1996*

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© International Union of Railways (UIC) - Paris, 2004

Printed by the International Union of Railways (UIC)  
16, rue Jean Rey 75015 Paris - France, November 2004  
Dépôt Légal November 2004

ISBN 2-7461-0706-6 (French version)  
ISBN 2-7461-0707-4 (German version)  
ISBN 2-7461-0708-2 (English version)