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Inland Transport Committee

Working Party on the Transport of Dangerous Goods

**Joint Meeting of the RID Committee of Experts and the
Working Party on the Transport of Dangerous Goods**

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**Proposals for amendments to RID/ADR/ADN:
new proposals**

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OR

Intermodal Transport Units (other than semi-trailers) for vertical transshipment and suitable for carriage on wagons - Minimum requirements

Unités de Transport Intermodal à transbordement vertical, autres que semi-remorques, aptes au transport sur wagons - Exigences minimales

Intermodale Ladeeinheiten für Vertikalumschlag, außer Sattelanhänger, zur Beförderung auf Wagen - Mindestanforderungen



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Summary

This leaflet catalogues the intermodal transport units (ITUs) other than semi-trailers which may be carried by rail.

It also lists the references for standardised ITUs and defines the minimum requirements for specific ITU types.

1 - Introduction

This leaflet catalogues the intermodal transport units (ITUs) other than semi-trailers which may be carried by rail.

It also lists the references for standardised ITUs and defines the minimum requirements for specific ITU types.

2 - Inventory of ITUs

The following table lists the reference texts and requirements to be complied with for each type of ITU (see Glossary - [page 43](#), standards, see Bibliography - [page 44](#) and points of the present leaflet).

	Type	Dimensions and ratings	Marking	Strength ^a
2.1.	ISO container	ISO 668	ISO 6346	ISO 1496-1 to 5
2.2.	Containers of classes 2 and 3 :	Appendix A	Appendix A and point 8	Point 6.2
2.3.	ITUs of class C	EN 284	Point 8	EN 283
2.4.	Stackable ITUs of class C	EN 13853	Point 8	EN 13853
2.5.	Refrigerated ITUs of class C	EN 12406	Point 8	EN 12406
2.6.	ITUs of class A	EN 452	Point 8	EN 452
2.7.	Stackable ITUs of class A	EN 14993	Point 8	EN 14993
2.8.	Refrigerated ITUs of class A	EN 12410	Point 8	EN 12410
2.9.	Tank ITUs	EN 1432	Point 8	EN 1432
2.10.	ITUs which do not fall under points 2.3 to 2.9 but whose dimensions allow them to be coded using <i>UIC Leaflet 596-6</i>	Must be suitable for transport on carrying wagons with accounting code C	Point 8	Point 6.3
2.11.	ITUs with a base width of > 2 600 mm	Appendix B	Point 8 ^b	Point 6.3
2.12.	ITUs which, due to their dimensions or weight, may not be freely loaded onto carrying wagons with accounting code C	Appendix C	Point 8	Point 6.3
2.13.	Non-standardised ITUs carried stacked	Reserved		

a. Strength is proven by the application of a CSC plate and/or a coding plate.

b. Specific marking.

3 - Requirements of the ITU/wagon interface

During its conveyance on the carrying wagon, the ITU shall be placed on the 4 lower corner fittings. The corner fittings shall comply with the distances indicated in point [D.1 - page 23](#). The dimensions of the corner fittings shall correspond to those given in Appendix [E - page 24](#).

The corner fittings shall be mounted such that in any loading situation, they lie with their entire surface in contact with the carrying wagon, and that this support is visible from the outside.

ITUs of a width greater than 2 500 mm but with an indent next to the securing devices thus giving a width of 2 500 mm, as provided for in Appendix [F - page 25](#), may be loaded onto pocket wagons as defined in *UIC Leaflet 571-4* (see [Bibliography - page 44](#)) and shall be marked with an additional plate as provided for in Appendix [G - page 26](#), to be positioned next to the code-number plate.

If the lower part of the ITU has more than 4 corner fittings, these pieces shall be marked as described in Appendix [H - page 27](#).

During their conveyance on pocket wagons or on wagons which do not allow other forms of support for swap bodies between the anchor points on the carrying wagon, ITUs shall be laid with their lower anchor points only on the support brackets. Pocket wagons as defined in *UIC Leaflet 571-4, point. 3.1.3.2* are provided with support brackets which support the ITU in the area of the main beams in the centre to limit vertical oscillations.

If due to their design ITUs of groups 40 to 49 and 91 to 97 also require an intermediary bearing during carriage by rail, provision shall be made for this particularity during construction (positioning and strength of support points).

The positioning and dimensions of intermediary bearings shall comply with Appendix [I - page 28](#).

The length codes with regard to the positioning of the corner fittings are given in Appendix [J - page 29](#).

4 - Requirements of the ITU/transshipment interface

In order to enable handling by crane or other means of transshipment, all ITUs shall be suitable for grab handling and shall be fitted with either:

- Upper corner fittings compliant with *ISO 1161* (see Bibliography - page 44) or Appendix K - page 31;
- Grab zones compliant with point D.2 - page 23, and with *EN 284* or *EN 452* (see Bibliography - page 44) depending on the length of the ITU.

5 - Minimum requirements for certain types of ITU

ITUs may be built to various types allowed by the relevant ISO and/or CEN standards (see [Glossary - page 43](#)).

For other ITUs, the following provisions apply.

5.1 - All ITUs

When an ITU, irrespective of type, is fitted with a ladder, each rung of this ladder shall be able to withstand a load of at least 200 kg.

5.2 - Refrigerated ITUs

ITUs suitable for temperature-controlled carriage shall comply with the provisions of the ATP (see [Glossary - page 43](#)) if vehicles are intended for use on convoys run under said agreement, and shall bear the marks provided for by *ATP Appendix 1, Annex 4*.

5.3 - Tank ITUs

5.3.1 - The tanks shall withstand an internal pressure of 0,3 bar, unless a more restrictive value is prescribed by RID/ADR (see [Glossary - page 43](#)).

5.3.2 - Tank units intended for the carriage of dangerous goods listed in the RID/ADR shall meet the provisions of these documents. The prescriptions of the present leaflet shall also be applied as long as they do not contradict the RID/ADR.

5.4 - ITUs with a rigid closed superstructure

Reserved.

5.5 - ITUs with a flexible closed superstructure

For ITUs which can be carried in both directions under SS conditions (120 km/h), their superstructure (in particular doors, shutters, collapsible sides/ends and their fastenings) shall withstand wind pressure and in particular the pressure increases and drops occurring when traversing tunnels or when passing another train.

In the case of ITUs covered by tarpaulins, the strength and the securing of the tarpaulin to the superstructure shall comply with the conditions of *EN 12641-1 or -2* (see [Bibliography - page 44](#)). When all or part of the walls is missing or not rigid, adjustments shall be made to ensure that the load may be fastened to the floor of the swap body. The number, configuration and positioning of lashing points are specified in *EN 12640* (see [Bibliography - page 44](#)).

5.6 - ITU beds with tarpaulin-covered sides (unit with side boards, tarpaulins and hoops)

The roofing shall be designed such as to avoid the formation of pools of water. The hoops and removable boards shall be correctly held in place to prevent them from becoming detached.

The equipment securing the tarpaulins on the ITU shall be designed such that they prevent any loosening or slackening during carriage, including under dynamic and aerodynamic influences.

The quality and securing of tarpaulins are defined in *EN 12641-1*.

5.7 - Curtain-sided ITUs

The equipment securing the tarpaulins on the ITU shall be designed such that they prevent any slackening or loosening during carriage, including under dynamic and aerodynamic influences.

The quality and securing of tarpaulins are defined in *EN 12641-1*.

5.8 - ITU beds

The floors of ITUs of this type shall be fitted with lashing devices as per *EN 12640*.

5.9 - ITU beds with end walls

During carriage by rail, the end walls will generally be raised. Loads placed on this type of ITU bed must not foul the loading gauge formed in the longitudinal or transverse plane by the end walls and/or raised stanchions.

If this type of ITU is carried empty in stacked form (homogenous stack, number of ITU beds depending on manufacturer data and requiring approval), a code plate shall be defined for the stack.

If this type of ITU is carried empty in stacked form (non-homogenous stack), then the conditions of the UIC Loading Guidelines shall apply; the profile number mentioned on the code plate does not apply.

In all cases, the ITUs shall be locked together; the mobile components in the upper part of the pile shall be double locked. It must be easy to check they have been locked.

See "coding plate" (see point 8 - page 11) on markings and "dynamic tests" (see point 6 - page 9).

5.10 - ITU beds without end walls

This type of ITU shall not be given a coding plate but an identification plate. The latter shall not contain the permitted profile number, which is replaced by the inscription "Flat". Convoys carried on this type of ITU shall undergo geometric profiling beforehand. An example of an identification plate is contained in Appendix L - page 32.

If this type of unit is carried empty in stacked form, the conditions of the UIC Loading Guidelines shall apply.

If this type of unit is carried in combined transport in stacked form, the conditions of point 5.9 - page 7 shall be complied with to the extent that they are applicable.

Stacking in accordance with point 5.9.

5.11 - ITUs suitable for the carriage of concentrated loads

ITUs suitable for the carriage of concentrated loads shall bear a marking to that end, which is to be applied to the side walls near the coding plate, e.g. as depicted in Fig. 16 - page 27.

ITUs which have been specially upgraded to carry steel coils or comparable concentrated loads must bear an inscription giving a loading diagram and specifying the maximum and minimum diameters and maximum permitted mass for each cradle, e.g. as depicted in Fig. 17 - page 27.

The application of these markings shall be immediate. On existing ITUs, the markings shall be applied by 31 December 2011.

6 - ITU strength tests

The ITU tested shall be considered satisfactory on condition that after each test, it presents no anomalies or deformation rendering it unsuitable for use or unable to comply with the dimensional prescriptions of the present leaflet as regards handling, securing and interchangeability.

For all static load tests, the test load shall be applied for a minimum of 5 minutes.

In the following tests, the letters R, P and n signify:

- R = maximum gross mass
- P = payload
- n = number of units forming the pile during the stacking test

6.1 - Strength tests on standardised ITUs

ITUs standardised against ISO and/or CEN are satisfactory as long as they meet the stated conditions.

6.2 - Strength tests for containers of class 2 and class 3

ITUs described in the present leaflet as containers of class 2 or class 3 are satisfactory if they meet the conditions of the strength tests in *ISO standards 1496-1 to 5* (see [Bibliography - page 44](#)) using the same procedures except for the stacking test, which may be conducted against the provisions of [Appendix N - page 34](#).

6.3 - Strength tests for non-standardised ITUs

Non-standardised ITUs shall meet the requirements of the tests indicated in [Appendix N](#).

7 - Approval and coding of ITUs

Each ITU used in combined transport shall comply with the following conditions.

7.1 - Approval

Other than those mentioned in point 2.1 of table (see point 2 - page 3), all ITUs shall be approved in line with the following procedure:

7.1.1 - Certification of prototype or prototype variant

The approval procedure for a prototype or prototype variant is described in Appendix O - page 40.

7.1.2 - Coding

The approval procedure for series ITUs is described in Appendix P - page 41.

7.2 - Coding

- ITUs as described in points 2.3 to 2.10 of table (see point 2 - page 3) shall be coded by a railway undertaking or combined transport company recognised in accordance with the terms of *UIC Leaflet 596-6* (see Bibliography - page 44).
- Authorisation to affix code plates as per *UIC Leaflet 596-6*, shall be given on the basis of the technical dossier, the approval certificate for the prototype ITU, and/or the series.
- The coding body shall keep a record of the codes allotted and shall make them available to other RUs if need be.

8 - ITU markings

All ITUs equipped with ladders shall be marked with a lightning bolt next to each ladder in accordance with Appendix Q - page 42.

8.1 - ITUs as per point 2.2 of table

(see point 2 - page 3)

Besides the general indications, ITUs compliant with point 2.2 of table (see point 2 - page 3) shall bear a marker plate if their dimensions do not correspond to the required dimensions or corner heights.

In this case, the manufacturer or its nominee shall request authorisation from the coding body, supplying the manufacturer's confirmation and the type approval certificate from an accredited assessment body, as well as a cross-sectional drawing enabling the CT number to be calculated in accordance with *UIC Leaflet 596-6*.

On the basis of this documentation, the coding body shall obtain the data for the marker plate as provided for by point A.3.2 - page 17 and shall issue authorisation for this marker plate to be affixed to the ITUs concerned.

8.2 - ITUs as per point 2.12 of table

(see point 2)

The marking of these ITUs shall be carried out by the RU concerned as described in Appendix B - page 19, complying with any bi- or multilateral agreements.

8.3 - Code plate

A code plate shall be affixed in a visible manner at the bottom of each ITU side wall.

Code plates may take the shape of flexible self-adhesive printed sheets as long as the inscriptions comply with the dimensions set out in *UIC Leaflet 596-6*.

Appendix A - Containers of classes 2 and 3

A.1 - Vehicle gauge dimensions

A.1.1 - Standard containers of class 2¹:

Category	Length (in mm)	Width (in mm)	Max. height (in mm)
10	2 991 ⁰ ₋₅	2 500 ⁰ ₋₅	2 600
20	6 058 ⁰ ₋₅	2 500 ⁰ ₋₅	2 600
30	9 125 ⁰ ₋₁₀	2 500 ⁰ ₋₅	2 600
40	12 192 ⁰ ₋₁₀	2 500 ⁰ ₋₅	2 600
45	13 716 ⁰ ₋₁₀	2 500 ⁰ ₋₅	2 600

A.1.2 - Standard containers of class 3¹:

Category	Length (in mm)	Width (in mm)	Max height (in mm)
10	2 991 ⁰ ₋₅	2 600 ⁰ ₋₅	2 600
20	6 058 ⁰ ₋₆	2 600 ⁰ ₋₅	2 600
30	9 125 ⁰ ₋₁₀	2 600 ⁰ ₋₅	2 600
40	12 192 ⁰ ₋₁₀	2 600 ⁰ ₋₅	2 600
45	13 716 ⁰ ₋₁₀	2 600 ⁰ ₋₅	2 600

1. For the acceptance of containers of classes 2 and 3 on routes offered by EWS, prior approval is required from the operator.

A.1.3 - Maximum gross weight (tare + load) for containers of classes 2 and 3:

Category	Gross mass max ^a in kg	
	2	3
10	10 160	10 160
20	30 480	30 480
30	30 480	30 480
40	30 480	30 480
45	30 480	30 480

a. A higher gross mass is possible for categories 20, 30, 40 and 45, bearing in mind the capacity of wagons and cranes. For traffic to destinations at PKP and CIE, a prior agreement is required for traffic other than that using PKP lines for transit traffic.

A.2 - Loading gauge

A.2.1 - Loading gauges for containers of class 2 of a width of 2 500 mm

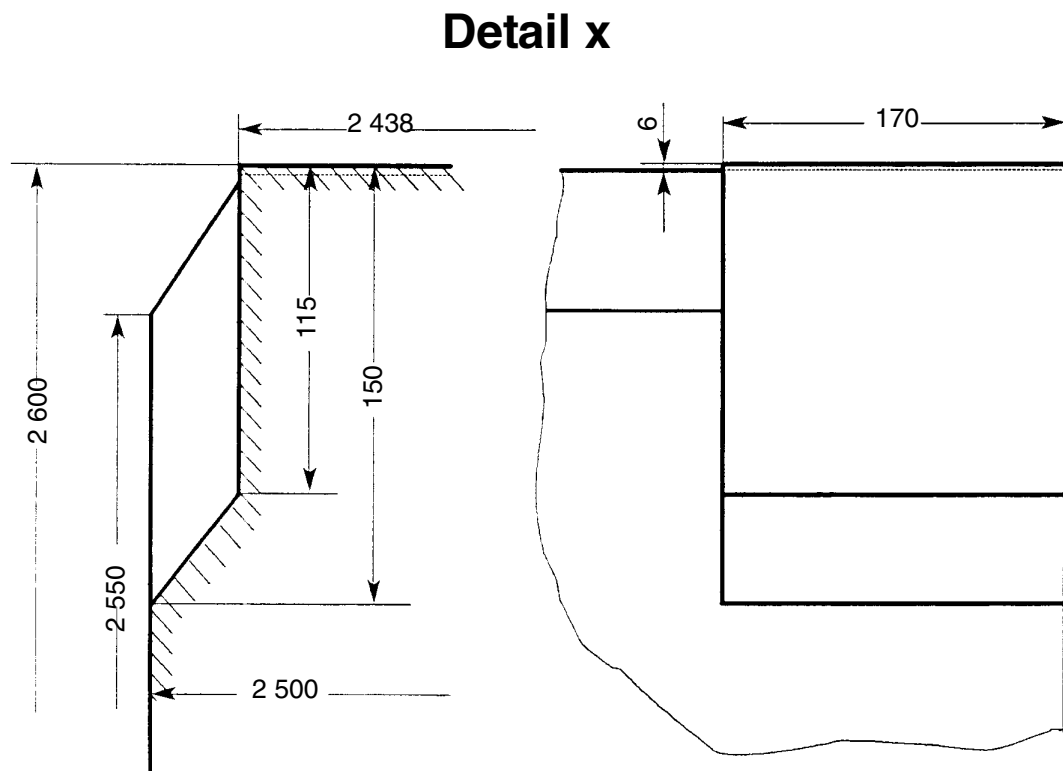
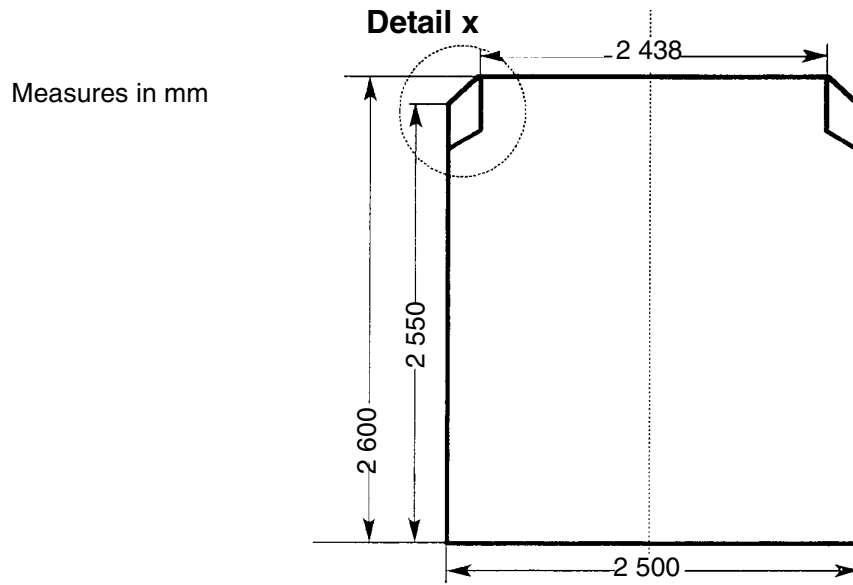


Fig. 1 - Loading gauges for containers of class 2 of a width of 2 500 mm

A.2.2 - Loading gauges for containers of class 3 of a width lower than or equal to 2 600 mm

Measures in mm

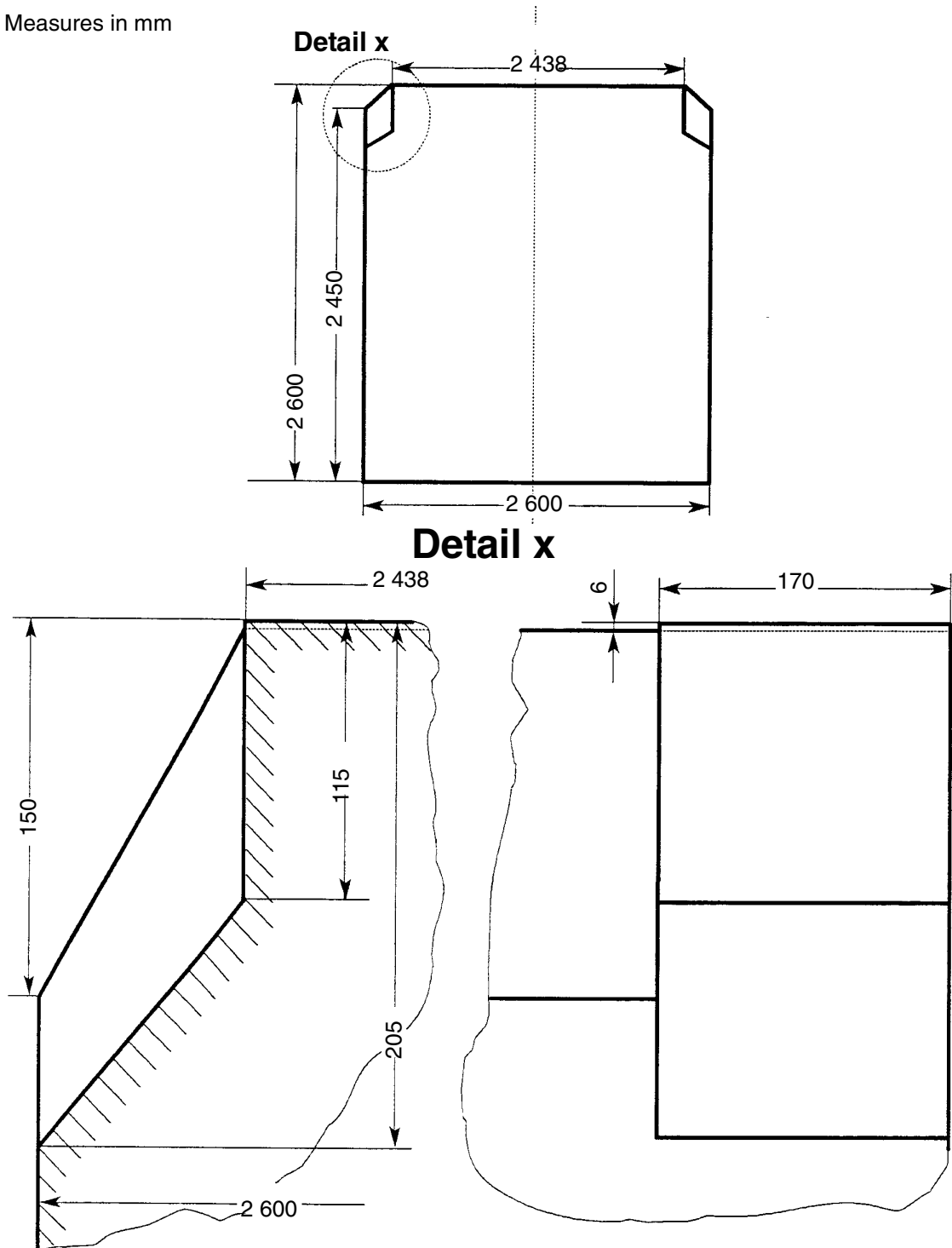


Fig. 2 - Loading gauges for containers of class 3 of a width lower than or equal to 2 600 mm

A.3 - Markings

A.3.1 - Distinctive marking for containers of classes 2 and 3

The upper group of digits indicates the height in metres to one decimal place (0,1 m). This height must not be less than the real height (the abbreviation "m" must not appear on the marking).

The lower group of digits indicates the width in metres to one decimal place. This width must not be less than the real width.

The dimensions of the marking, measured from the outer edges of the black outline, must not be less than 115 x 155 mm. The digits must be as large as possible and easily readable.

The marking shall be applied on each large container in two places: at a distance less than or equal to 1,2 m (4') from the top of the container, and at a distance less than or equal to 0,6 m (2') from the side of the container underneath the identification number.

These ITUs shall have a BIC code.

A.3.1.1 - Example 1: Distinctive marking for containers of class 2

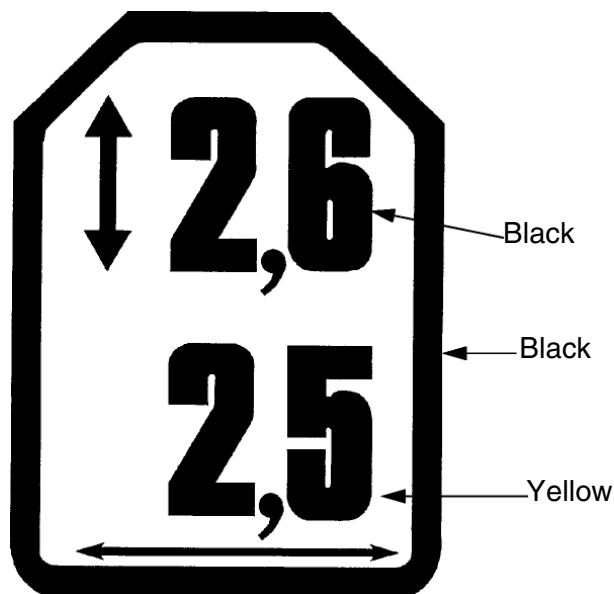


Fig. 3 - Example 1

A.3.1.2 - Example 2: Distinctive marking for containers of class 3

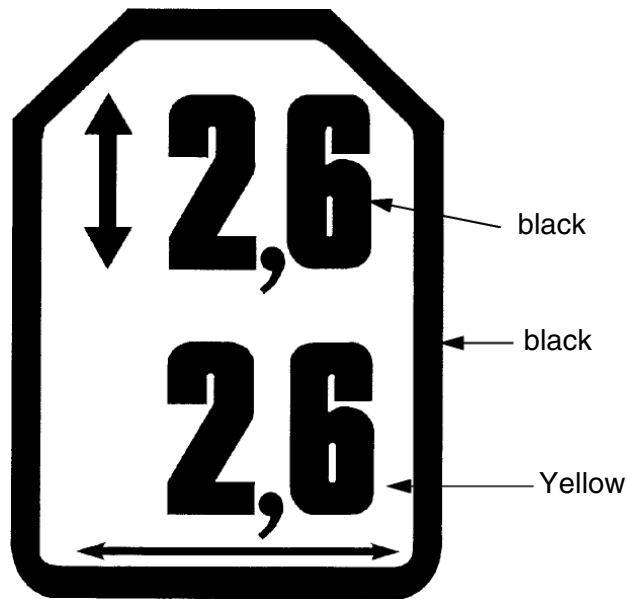


Fig. 4 - Example 2

A.3.2 - Additional markings if the profile exceeds the loading gauge under point A.3 - page 16 or > 2600 mm

These containers shall bear the marking prescribed by *UIC Leaflet 596-6* or the simplified markings listed hereafter. The distinctive markings as per point **A.3.1 - page 16** may indicate dimensions in metres to three decimal places (0,001).

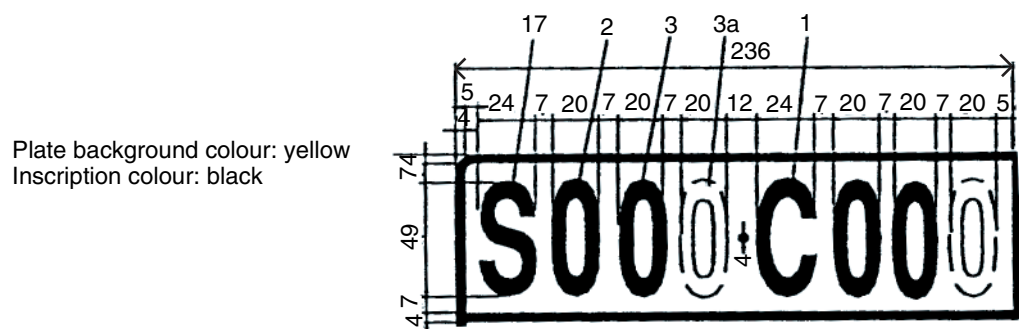


Fig. 5 - Additional markings

Technical numbers:

- 1 Wagon compatibility code.
- 2, 3 For large containers of a maximum width of 2,55 m as provided for by *UIC Leaflet 596-6, Appendix G*.
- 2, 3, 3a For large containers with a width in excess of 2,55 m and less than or equal to 2,60 m as provided for by *UIC Leaflet 596-6, Appendix G*.
- 17 Special profile as provided for by *UIC Leaflet 596-6, Appendix G*.

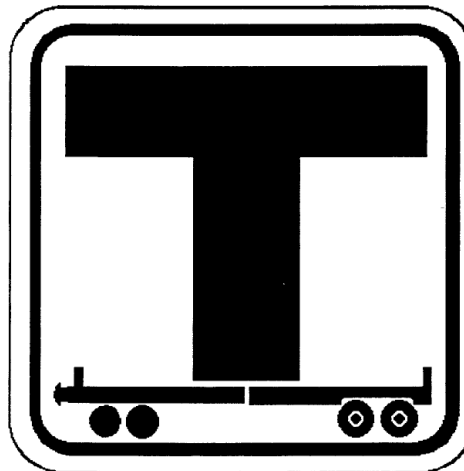
A.3.3 - Additional signs

Containers meeting the requirements of the present Appendix shall bear the following signs, which indicate that they are for rail/road use only:



The code of the approving RU shall be given below this plate

Fig. 6 - Additional signs



Outer dimensions of the picture: 300 x 300 mm

Fig. 7 - Additional signs

The characters and symbols of this sign shall be white in colour, on a blue background.

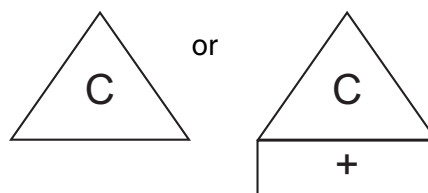
Appendix B - ITUs with a base width of > 2600 mm - Envelope of the lower part of ITUs described in point 2.11

These ITUs accept a base width in excess of the profiles defined in *UIC Leaflet 596-6, Appendix F*.

The envelope below enables strict compliance with the international loading gauge as defined in the *UIC Loading Guidelines, volume 1, table 11*

- These ITUs are prohibited in Great Britain and Iran.
- These ITUs may carry a code plate as provided for by *UIC Leaflet 596-6* without the compatibility code S
- These ITUs shall be loaded onto wagons as defined by *UIC Leaflet 596-6, point 3.3.2 and Appendix D*, and marked in accordance with the *GCU Appendix 11, point 3.2*.

The only wagons permitted are those marked:



Measures in millimeter

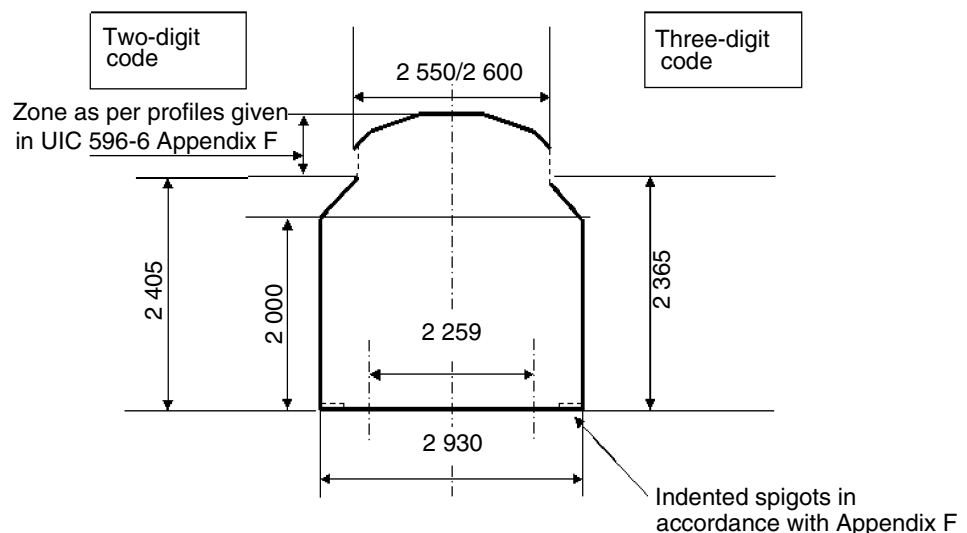


Fig. 8 - Permitted outsize profile

Appendix C - Particularities of ITUs requiring modified wagons

C.1 - General

In addition to the requirements of the present leaflet, the following provisions are to be complied with:

- ITUs requiring modified wagons are referred to as ITUs of type S
- The operation of such ITUs requires a multilateral agreement to be concluded between all parties involved in the carriage thereof (IM, RU).

C.2 - Conditions of carriage

- ITUs shall be fitted with plates on both sides as indicated under point [C.4 - page 21](#).
- ITUs may only be carried on rail vehicles suitable for this type of carriage and which possess markings of the type indicated under point [C.5 - page 22](#).

C.3 - Markings

- These ITUs shall be coded using the procedure provided for by *UIC Leaflet 596-6* but shall be given markings of the type indicated under point [C.4](#).
- Wagons to be used for such purposes shall also receive an identification plate, of the type indicated under point [C.5](#), on both sides.

C.4 - Identification plate for ITUs requiring modified wagons

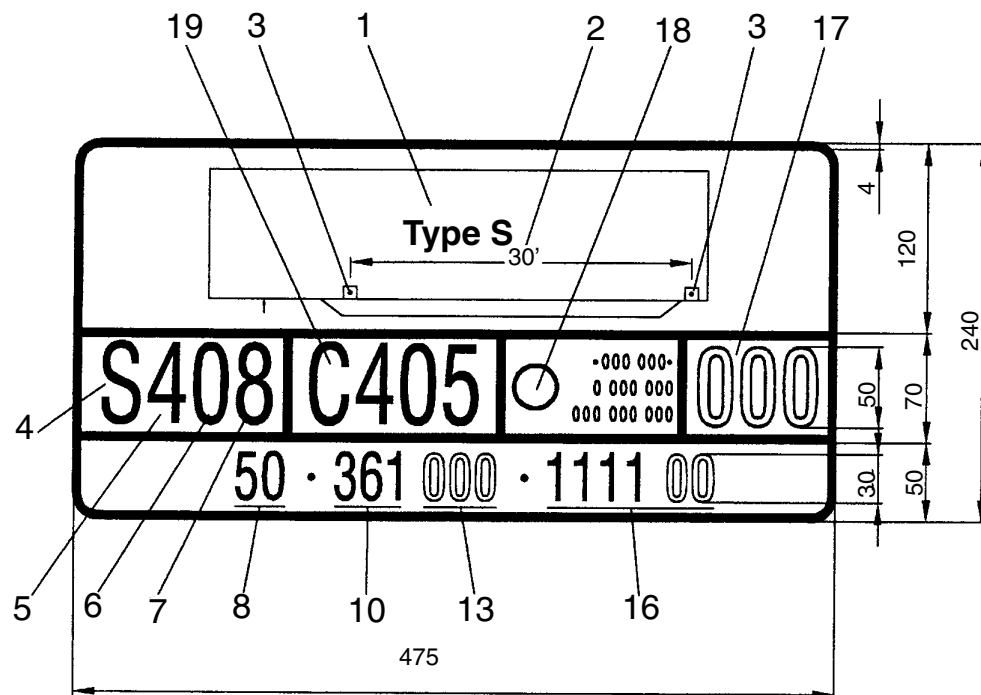


Fig. 9 - Identification plate for ITUs requiring modified wagons

- 1 Type S (ITU requiring modified wagons)
- 2 Distance between securing devices
- 3 Securing devices to be used
- 4 Special profile as per UIC Leaflet 596-6, Appendix 3.3
- 5 ITUs of a maximum width of 2 550 mm
- 7 Maximum width 2 600 mm
- 8 Nationality number of the combined transport company
- 10 Number of the owner within the national combined transport company
- 13 Number of the loading unit within the transport company
- 16 Digits left free
- 17 Length code
- 18 Accreditation stamp
- 19 Wagon compatibility code

C.5 - Wagon marker plate

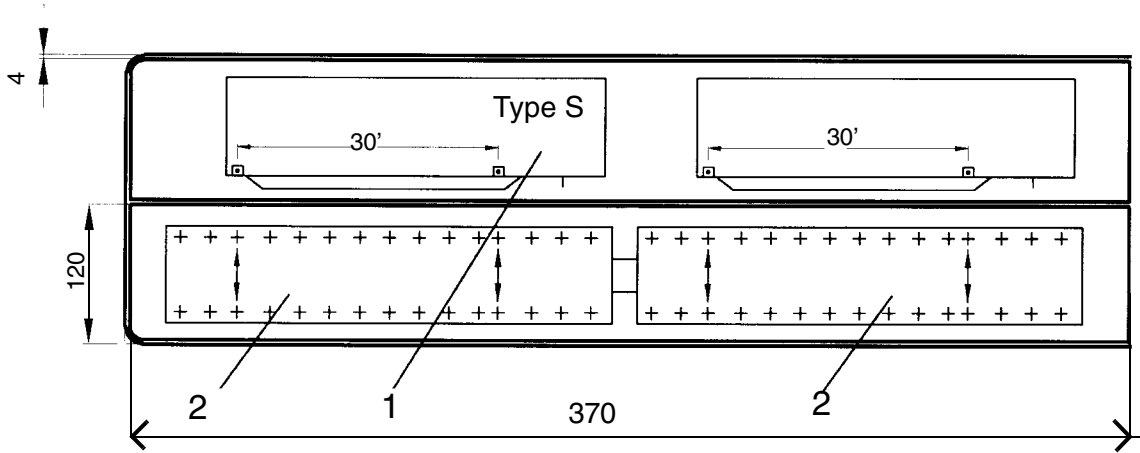


Fig. 10 - Wagon marker plate

- 1 Type of ITU provided for in multilateral agreement
- 2 Loading guidelines

Appendix D - Positioning of corner fittings and grab handling grooves for ITUs

D.1 - Positioning of corner fittings

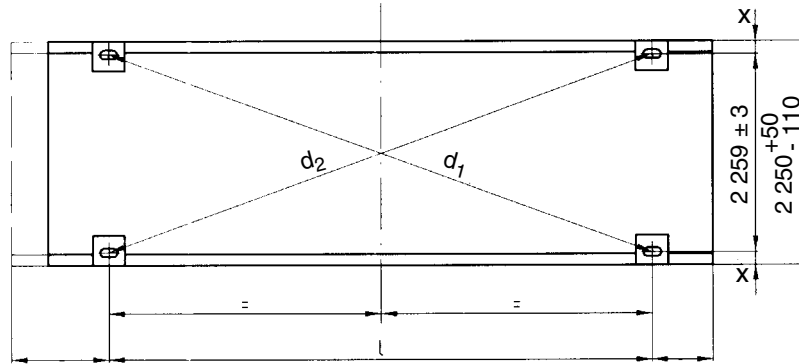


Fig. 11 - Positioning of corner fittings

See tables Appendix H.

Group Nos.	Max. L.	l^a	Max. $d_1 - d_2^a$
20 to 29 60	see UIC Leaflet 596-6	$5\ 853 \pm 3$ mm	13 mm
30 to 39 81 to 89		$8\ 918 \pm 4$ mm	16 mm
40 to 49 91 to 97		$11\ 985 \pm 5$ mm	19 mm

a. the values " l " and "max. $d_1 - d_2$ " also apply to ITUs with asymmetrical sides (see UIC Leaflet 596-6)

D.2 - Positioning of grab handling grooves

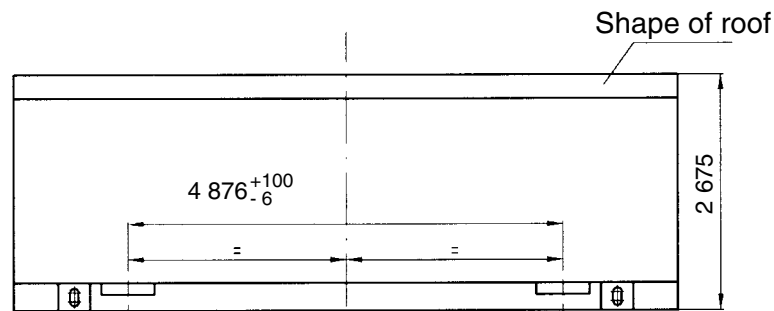


Fig. 12 - Positioning of grab handling grooves

Appendix E - Dimensions of lower securing devices on ITUs

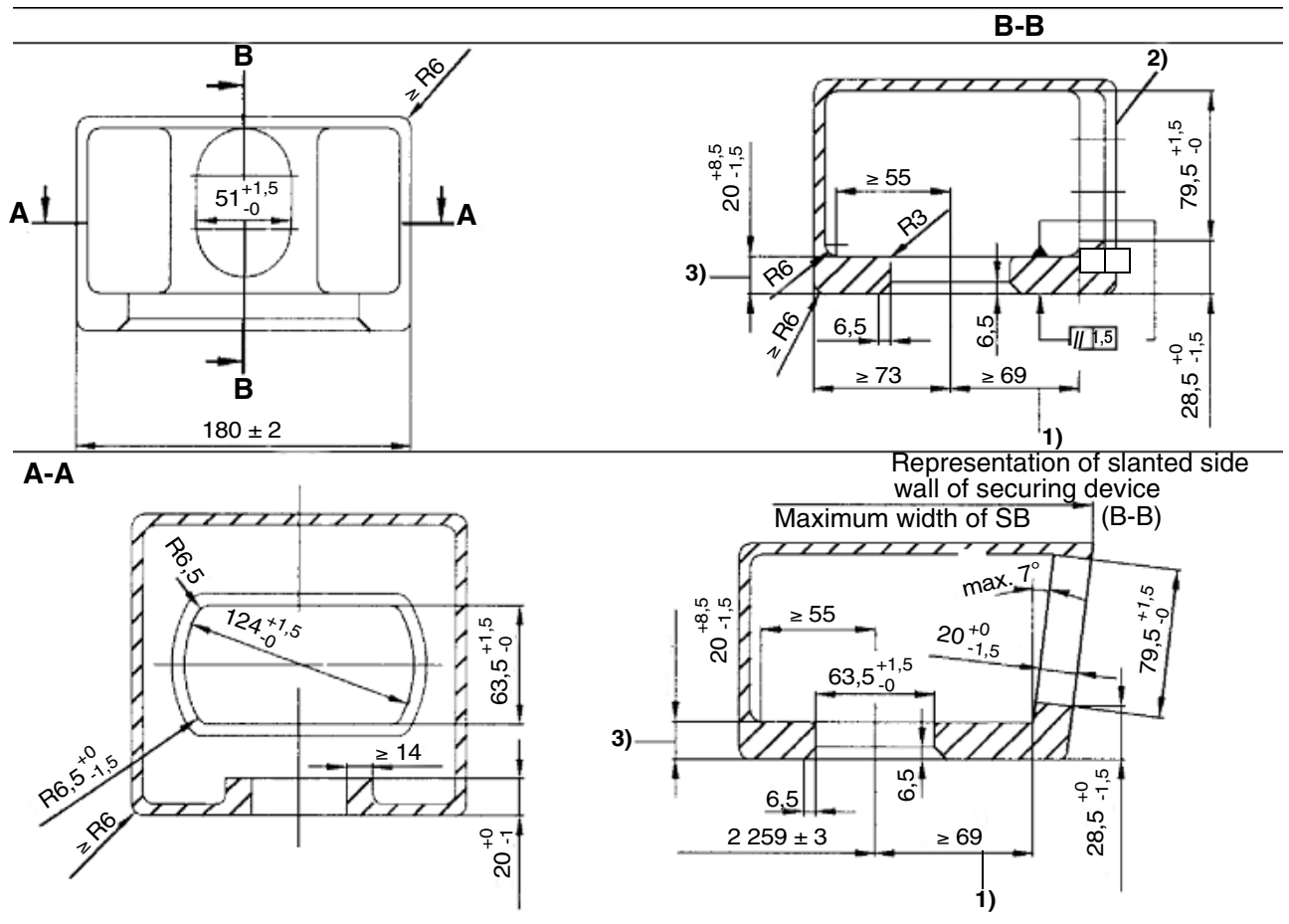


Fig. 13 - Dimensions of lower securing devices on ITUs

- 1) These dimensions are functional. The required width is thus to be chosen depending on the design.
- 2) The configuration of the side wall depends on the ITU's external contour. For inclining walls, the angle of inclination may not exceed 7°.
- 3) For swap bodies with a maximum gross weight > 16 000 kg, it is recommended that this dimension of $28,5^{+0}_{-1,5}$ mm be observed.

Appendix F - Indent next to securing devices for the loading of ITUs with a width of between 2 500 mm and 2 930 mm on pocket wagons

(UIC Leaflets 571-4 and 596-5)

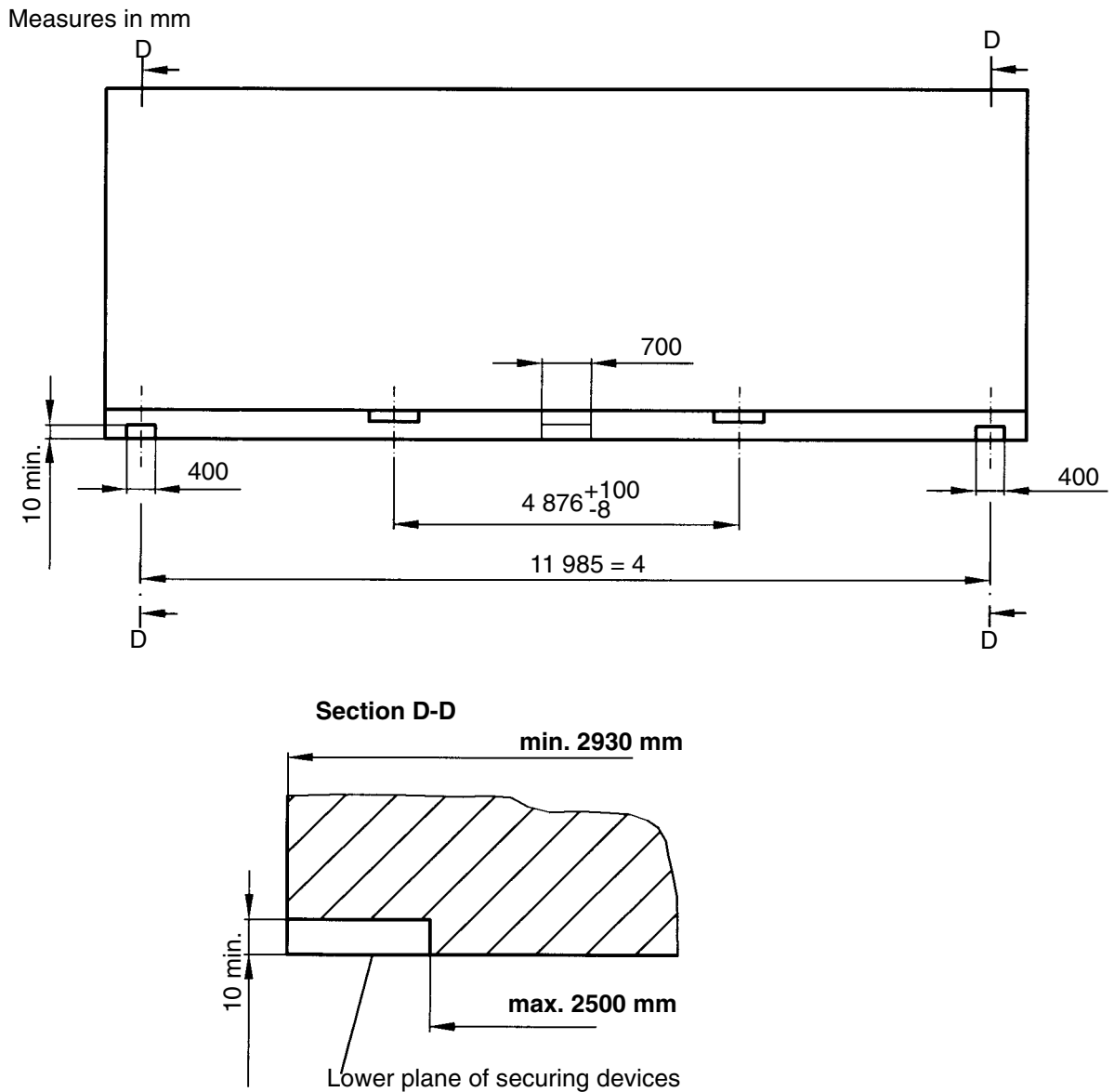


Fig. 14 - Indent next to securing devices for the loading of ITUs with a width of between 2 500 mm and 2 930 mm on pocket wagons

Appendix G - Markings for ITUs suitable for loading on pocket wagons

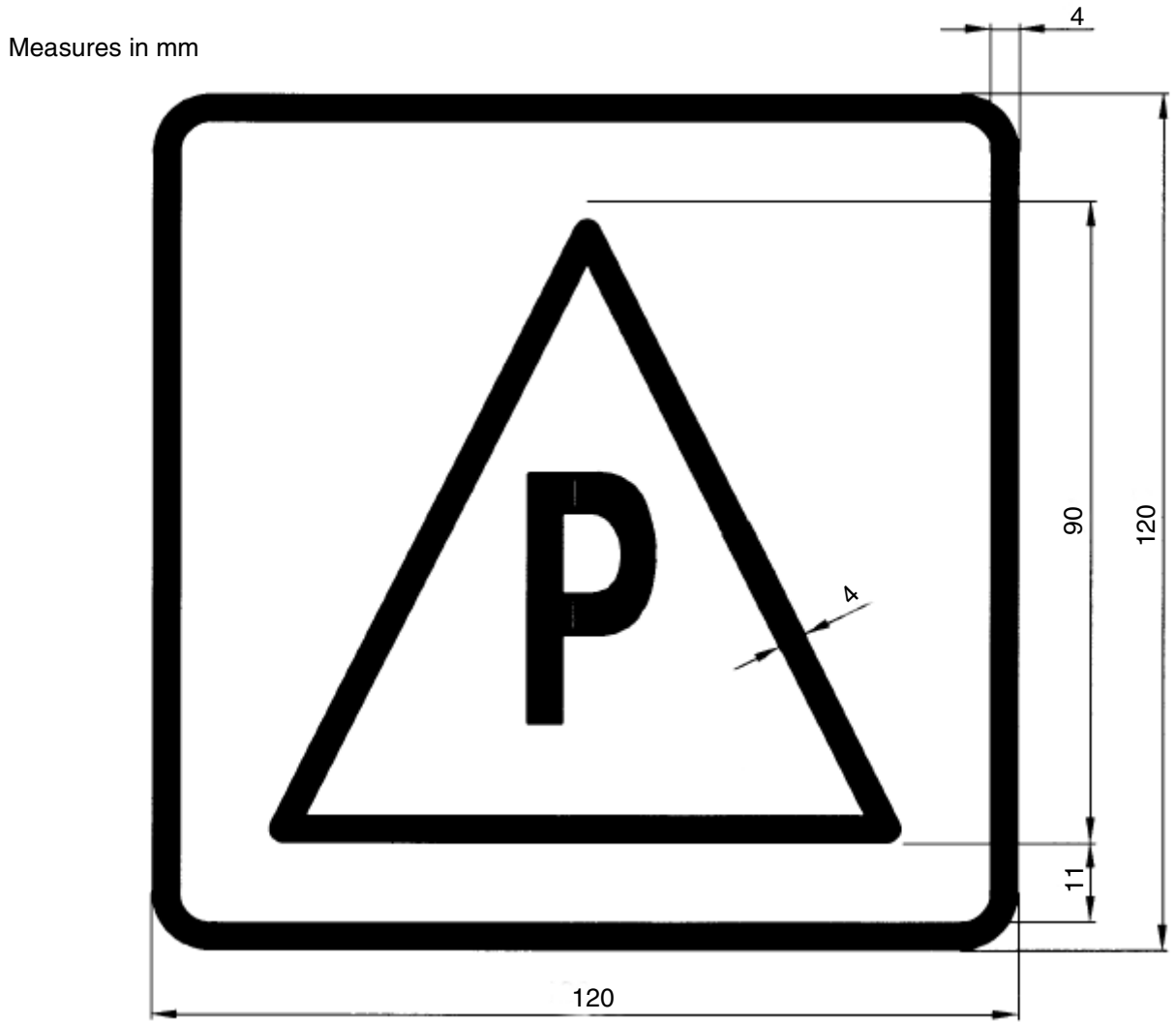


Fig. 15 - Markings for ITUs suitable for loading on pocket wagons

Appendix H - Marks and markings for securing devices to be used in rail transport

Measures in mm

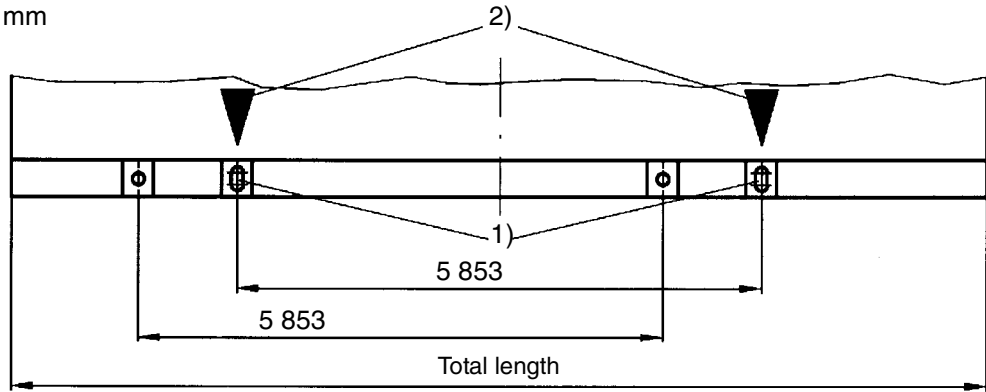


Fig. 16 - ITUs fitted with more than 4 securing devices in their floor

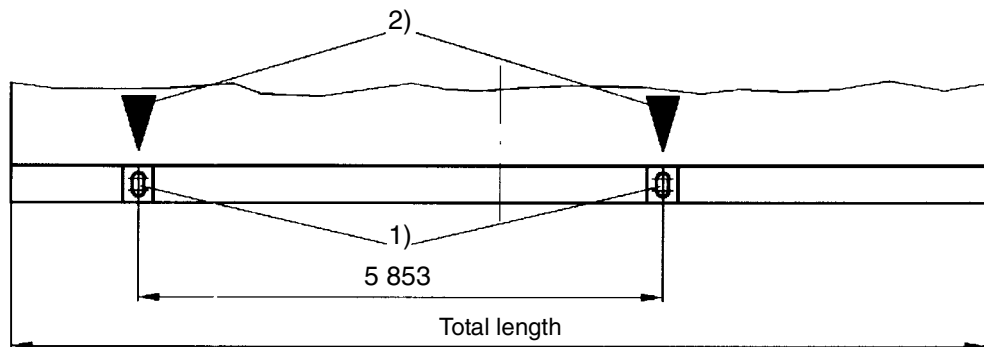


Fig. 17 - ITUs fitted with asymmetrical securing devices in their floor

Legend

- 1) Securing device for rail transport
- 2) Marking for the securing devices to be used during rail transport

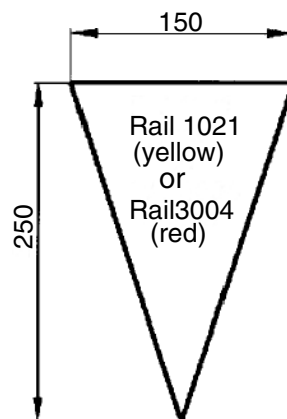


Fig. 18 - Example of marking 2)

Appendix I - Intermediary bearings for ITUs of groups 40 to 49 and 91 to 97

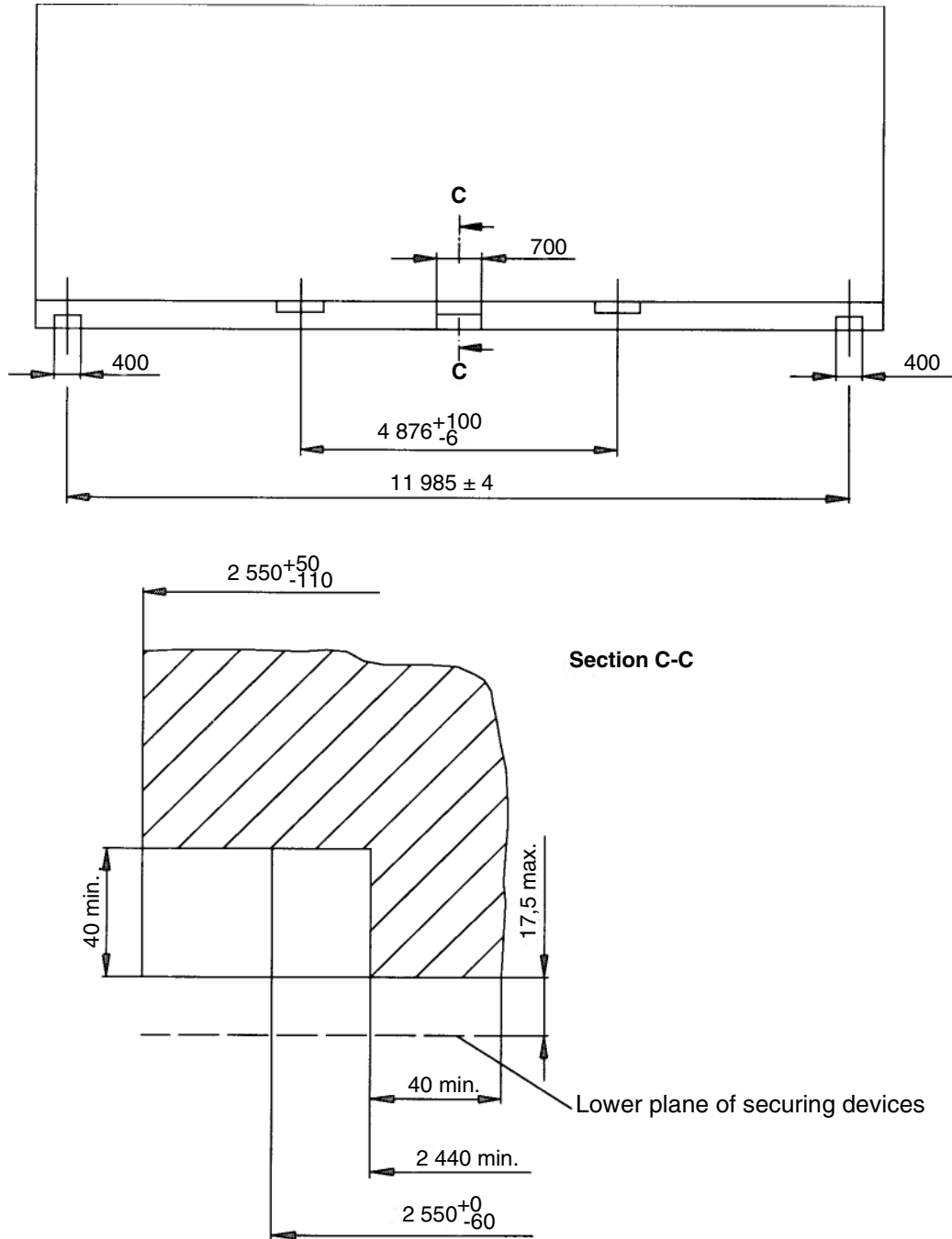


Fig. 19 - Intermediary bearings for ITUs of groups 40 to 49 and 91 to 97

Appendix J - Length codes with regard to the positioning of corner fittings

J.1 - ITUs with symmetrical dimensions

NB : if these ITUs are provided with asymmetric protrusions, the value of the largest protrusion shall be used as the basis for both sides when determining the group number, taking the length range into account.

Group No. ^a	Maximum length (in mm) ^b	Maximum overhang (in mm)	Distance between centres of securing devices (in mm)	Maximum overhang (in mm)	Securing devices	Width (in mm)	Maximum height of sides (in mm)				
(20)	6 058 (= 20')	102,5	5 853 ± 3	102,5		2 400 to 2 550 ^c	See ^d				
(21)	6 250	198,5	5 853 ± 3	198,5							
22	7 150	648,5	5 853 ± 3	648,5							
23	7 450	798,5	5 853 ± 3	798,5							
24	7 820	983,5	5 853 ± 3	983,5							
(26)	8 150	1 148,5	5 853 ± 3	1 148,5							
(30)	9 125 (= 30')	103,5	8 918 ± 4	103,5				2 400 to 2 550 ^c	See ^d		
(31)	9 300	191,0	8 918 ± 4	191,0							
40	12 192 (= 40')	103,5	11 985 ± 5	103,5						2 400 to 2 550 ^c	See ^d
42	12 500	257,5	11 985 ± 5	257,5							
(44)	13 100	557,5	11 985 ± 5	557,5							
(45)	13 716 (= 45')	865,5	11 985 ± 5	865,5							

a. Where necessary, three-figure sub-groups are allowed. Group members without () correspond to the CEN coding. Preference should be given to use these ITUs.

b. In the case of swap bodies with a distance of 30' and 40' between centres of securing devices and fitted with a protruding cooling unit, the latter shall be included in the overall length of the swap body.

c. The maximum width of 2 600 mm is permitted.

d. Each RU fixes the marking of swap bodies in accordance with UIC Leaflet 596-6

J.2 - UTI with asymmetric dimensions

Group No. ^a	Maximum length (in mm) ^b	Maximum overhang (in mm)	Distance between centres of securing devices (in mm)	Maximum overhang (in mm)	Securing devices	Width (in mm)	Maximum height of sides (in mm)
(60)	8 543	1 190	5 853 ± 3	1 500	20'	2 400 to 2 550 ^c	See ^d
(81)	9 275	103,5	8 918 ± 4	253,5	30'		
(82)	9 330	103,5	8 918 ± 4	308,5			
(84)	10 040	103,5	8 918 ± 4	1 018,5			
(85)	10 200	103,5	8 918 ± 4	1 178,5			
(86)	10 900	103,5	8 918 ± 4	1 878,5			
(91)	12 500	103,5	11 985 ± 5	411,5			
(94)	12 750	103,5	11 985 ± 5	661,5			
(95)	13 200	257,5	11 985 ± 5	957,5			
96	13 600	715,5	11 985 ± 5	900,5			
(97)	14 040	715,5	11 985 ± 5	1 340,5			

- a. Where necessary, three-figure sub-groups are allowed. Group members without () correspond to the CEN coding. Preference should be given to use these ITUs.
- b. In the case of swap bodies with a distance of 30' and 40' between centres of securing devices and fitted with a protruding cooling unit, the latter shall be included in the overall length of the swap body.
- c. The maximum width of 2 600 mm is permitted.
- d. Each RU fixes the marking of swap bodies in accordance with UIC Leaflet 596-6

Appendix K - Simplified upper corner fittings

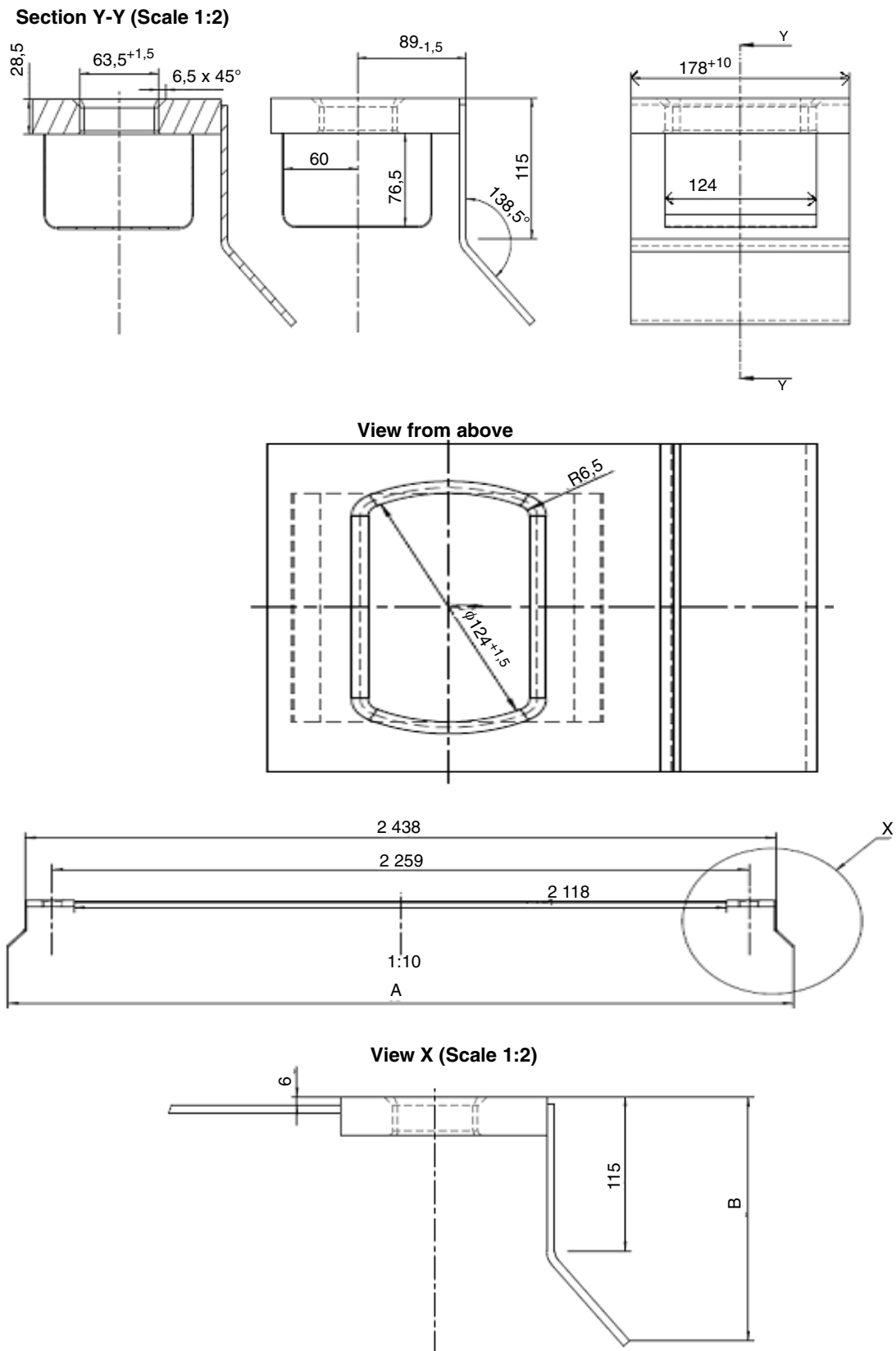


Fig. 20 - Simplified upper corner fittings

Appendix L - Identification plate

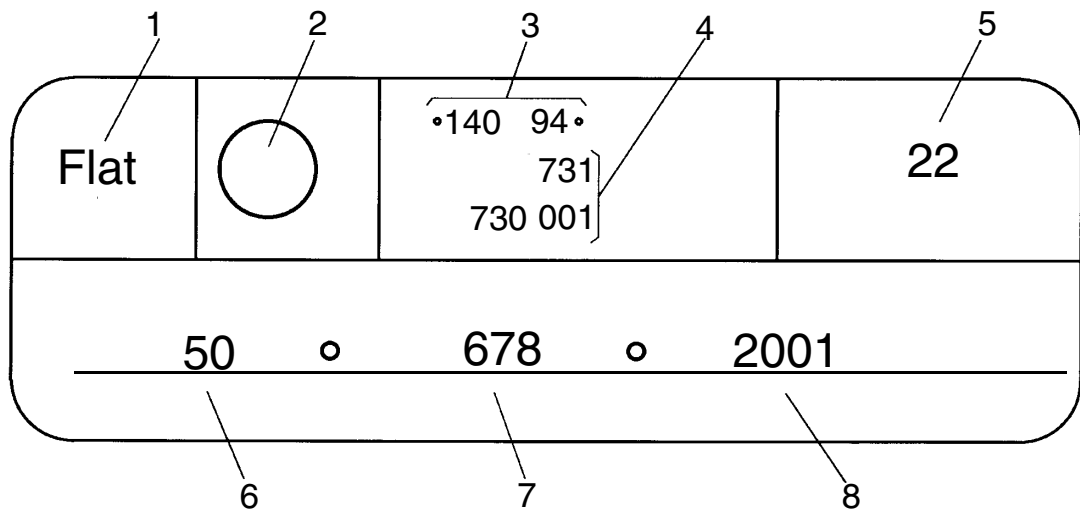


Fig. 21 - Identification plate

- 1 Swap-body type
- 2 Agreement seal
- 3 Year of manufacture
- 4 Frame number
- 5 Length code
- 6 Nationality code of intermodal transport company
- 7 Code number of company within national intermodal transport company
- 8 Number of loading unit within intermodal transport company

Appendix M - Marking of ITUs upgraded to carry concentrated loads

Max concentrated load
0 000 Kg/m²

Fig. 22 - Example of marking on a swap body upgraded to carry concentrated loads

	1	2	3
∅ min. (mm)	1 130	1 130	1 130
∅ max. (mm)	1 900	1 900	1 900
Max. weight. (t)	x	30,5	x
	15,5	x	15,5
	10,5	10,5	10,5

Fig. 23 - Example of marking on a swap body upgraded to carry steel coils

Appendix N - Tests on non-standardised ITUs

Remark: Given the ongoing revision of *EN 283* (see Bibliography - page 44) the new requirements resulting from this revision will have to be complied with, in particular

- the test conditions for ITUs suitable for carrying concentrated loads,
- the strength of floors,
- the consideration of additional stresses by the load restraint assemblies as provided for by *EN 12195-1*.

In the case of ITUs with tarpaulins, the strength and the securing of the tarpaulin to the superstructure shall meet the conditions of *EN 12641-1* and *EN 12641-2* (see Bibliography - page 44).

NB : when conducting the tests, the test load shall be evenly distributed across the ITU. For units suitable for the carriage of concentrate loads, the test loads shall be applied appropriately. During testing, the load shall be secured with the appropriate devices.

N.1 - Strength tests demonstrating resistance to stresses occurring during carriage

This test is intended to ensure that the base structure and the floor structure of the unit are able to withstand stresses occurring during carriage by rail.

N.1.1 - ITUs without intermediary bearings

The ITU, with its load uniformly distributed such that its total mass is equal to 1,5 R, shall rest on 4 rigid stands placed beneath each of the lower securing devices. These stands shall be on the same level, centred under the securing devices, and shall have approximately the same dimensions as the latter. The unit must be able to sag freely.

For ITUs of groups 40 to 49 and 91 to 97 without intermediary bearings, the total uniformly laden mass shall be 2 R under identical test conditions.

N.1.2 - ITUs with intermediary bearings (groups 40 to 49 and 91 to 97)

The test shall take place on 4 stands at 1,5 R as in point N.1.1. Moreover, during a second test, intermediary bearings shall be placed at the same level as those placed at the extremities. During the test, the force acting on either side of the intermediary bearings shall not exceed the maximum value of 75 kN.

If it is not possible to conduct the test as indicated, the approving body shall be free to accept the manufacturer's own calculations.

N.2 - Grab lifting tests

This test is intended to demonstrate that the unit is able to withstand the forces resulting from grab lifting.

The ITU, with its load uniformly distributed such that its total mass is equal to 1,25 R, shall be lifted by means of 4 grabs or similar appliances, inserted in its grab-handling grooves. The bearing surface must measure approx. 30 x 260 mm.

The dimensions of the grab-handling grooves shall be checked following this test.

N.3 - Longitudinal fatigue test

This test is intended to demonstrate that the ITU structure is able to withstand longitudinal external stresses in dynamic conditions at an acceleration of 2 g. The test shall be conducted under the conditions given in points [N.3.1](#) and [N.3.2](#).

N.3.1 - Static longitudinal fatigue test

The ITU, with its load uniformly distributed such that its total mass is equal to 1 R, shall be immobilised longitudinally on rigid anchor points through the lower corner fittings of one of its ends. The ITU shall be subjected first to a compressive, then to a tensile longitudinal force of 2 R (1 R per side), which shall be applied on the lower apertures of the lower corner fittings at the other end of the ITU.

N.3.2 - Dynamic longitudinal fatigue test

The ITU, with its load uniformly distributed to 1 R with material filling as much of the available interior space as possible, shall be positioned centrally on a carrying wagon. The stationary carrying wagon shall then undergo an impact produced by an 80 t wagon such that an acceleration of 2 g can be measured on the securing devices, with a low-pass filter at 16 Hz. This test shall be conducted in both operating directions, meaning that the rear securing devices are to be installed first, then the front securing devices.

N.4 - Strength test on end walls

This test is intended to demonstrate that the ITU superstructure is able to withstand dynamic stresses at a deceleration of 2 g. The test shall be conducted in accordance with the conditions of points [N.5.1](#) and [N.5.2 - page 36](#).

N.4.1 - Static strength test on end walls

The test shall be conducted on both end walls if one of them incorporates a door. If the two walls are of symmetrical design, a single test shall suffice.

The inner surface of each end wall shall undergo an equal, evenly distributed load of 0,4 P, administered such that it enables each wall to bend freely.

N.4.2 - Dynamic strength test on end walls

This test shall be conducted concurrently with the test in point N.5.2. In both cases, buffing must be conducted in both directions in the aforementioned conditions.

N.5 - Strength test on side walls

This test is intended to demonstrate the unit's ability to withstand the forces generated by transverse accelerations during ground transport.

N.5.1 - Strength test on side walls for van ITUs

A load of 0,3 P uniformly distributed across the lower part of each side wall shall be applied. If the side walls are of symmetrical design, a single test shall suffice.

N.5.2 - Strength test on side walls for ITU beds with tarpaulin-covered sides ("savoyarde")

A load of 0,24 P uniformly distributed over the inner surface of each side wall shall be applied. The maximum height for the application of this partial load shall be the top of the curtains. In addition, a load of 0,06 P uniformly distributed across the inner surface of each side wall shall be applied. The minimum height for the application of this partial load shall be the bottom edge of the lowest slats and the maximum height for the application of the load shall be the upper edge of the highest slats. The tarpaulin frame may be included in load resistance.

N.5.3 - Strength test on side walls for curtain-only ITUs

A load of 0,3 P uniformly distributed across the lower surface of each side wall shall be applied. The maximum height for the application of the load shall be the top of the curtains. If chains linking the side walls are used in service, they may put in place during the test.

N.6 - Floor strength test

This test is intended to demonstrate whether a unit can withstand concentrated dynamic stresses produced by loading and unloading using forklift trucks or similar appliances.

The test shall be conducted using a test vehicle fitted with tyres. The vehicle shall have an axle load of 5 460 kg, i.e. 2 730 kg per wheel. The nominal width of the wheels shall be 180 mm and the distance between the wheels shall be 760 mm. The contact surface shall therefore represent a rectangle measuring 185 mm (wheel width) x 100 mm. Each wheel shall have an effective contact surface of 142 cm² within the aforementioned area. The test vehicle shall move about the entire floor surface of the ITU. During the test, the ITU shall rest on its four lower corner fittings on four identically-sized stands in order that the floor structure may bend freely.

The test vehicle shall spend at least 5 minutes on the weakest area of the floor.

N.7 - Additional test for stackable ITUs

The CSC provisions apply (tests and markings).

N.8 - Lifting by upper corner fittings

This test is intended to demonstrate whether the stackable units may be lifted using lifting gear acting vertically on the four longitudinal external openings of the upper corner fittings.

The ITU shall be loaded uniformly such that the total mass of the swap body is 2R. The unit shall be lifted with caution by its four corners, such that no excessive acceleration or deceleration stresses occur.

N.9 - Lifting by lower corner fittings (side openings of lower corner fittings)

This test is intended to demonstrate whether the ITU can be lifted using hooking gear attached only to the lower corner fittings (on the longitudinal side outer openings) and secured to its jib above the centre of the unit.

The ITU shall be loaded uniformly such that the total mass of the unit is 2 R. The ITU shall be lifted with precaution by the four lower openings of the corner fittings such that no excessive acceleration or deceleration stresses occur.

The lifting forces are applied for the various groups at the following angles:

- groups 20 to 26 and 60: 45°
- groups 30 and 31, 81 to 86: 37°
- groups 40 to 45, 91 to 97: 30°

relative to the horizontal plane.

The distance between the lines of action of the lifting forces and the outer surfaces of the ITU must not exceed 38 mm. During lifting, the lifting gear may act only on the lower corner fittings.

The same test shall also be conducted on the other side openings, located more towards the interior of the securing parts, if the latter have lifting openings compatible with the ISO standard.

N.10 - Lifting by lower side openings

This test is intended to demonstrate that the ITU is suitable for lifting by the lower roping openings. The ITU, with its load uniformly distributed such that its total mass is equal to 1,5 R, shall be lifted - without significant acceleration or deceleration - through the roping openings provided to this end. The lifting forces shall act more or less vertically.

The lifting gear may not exert any thrust upon the ITU side walls. The lines of action of the lifting forces shall be located 38 mm from the ITU side walls.

N.11 - Lifting test for forklift pockets

This test applies to ITUs provided with forklift pockets.

The ITU, with its load uniformly distributed such that its total mass is equal to 1,6 R, shall be positioned on two horizontal bars each 200 mm wide and introduced $1\ 828 \pm 3$ mm into the forklift pockets. The latter value shall be measured from the outer face of the wall of the unit. The bars shall be centred in the pockets.

N.12 - Roof test (if rigid)

This test is intended to demonstrate the ITU's ability to withstand the weight of persons working on the roof.

The weakest part of the ITU's roof shall be subjected to a load of 300 kg distributed uniformly over a surface of 600 mm x 300 mm.

N.13 - Additional tests on tank ITUs

For tank ITUs intended to carry dangerous goods, the value of the test stress in points [N.3.1](#) and [N.3.2](#) - [page 35](#) is 2 R.

N.13.1 - Longitudinal loads - dynamic testing

The tank ITU is loaded to a maximum of 97 % of its capacity with water or other suitable liquid. For the test, it must be loaded such that the total mass comprising the tank ITU and its content is equal to 1 R.

If, however, the load resulting from filling of the ITU is different from the load required for approval (total mass) of the tank swap body, the acceleration or deceleration to be attained must be adjusted in line with the following formula:

- G = Acceleration 2 g
- R = Maximum gross mass
- G1 = Modified acceleration
- R1 = Reduced maximum gross mass

$$G1 = (G \times R) / R1$$

NB : $G = 2\ g$
 $2\ g \leq G1 \leq 6\ g$

During testing, the unit shall rest with its four lower corner fittings or lower side girders on the wagon or on the corresponding securing spigots on a flat surface.

The longitudinal axis of the tank unit shall be horizontal during the impact. Forces must only be transmitted by the two lower openings of the lower corner fittings located on the side of the impact.

The tank ITU, with its load uniformly distributed to 1 R and with material filling as much of the available interior space as possible, shall be positioned centrally on a carrying wagon. The stationary carrying wagon shall then undergo an impact produced by an 80 t wagon such that an acceleration of 2 g can be measured on the securing devices, with a low-pass filter at 16 Hz. This test shall be conducted in both operating directions, meaning that the rear securing devices are to be installed first, then the front securing devices.

The same test shall be performed for tank swap bodies intended to carry dangerous goods, but the initial acceleration in this case shall be 4 g. The modified acceleration shall be determined in accordance with the limit conditions $4 \text{ g} \leq G1 \leq 6 \text{ g}$.

N.13.2 - Strength test demonstrating resistance to the effects of lateral inertia

The tank swap body shall be loaded with a total mass comprising the tank and the test load = 1 R.

The transverse axis of the tank unit must be positioned at an angle relative to the horizontal of:

- 30 degrees for non-dangerous goods,
- 90 degrees for dangerous goods,

It shall be maintained in this position for at least 5 minutes by means of brackets which horizontally and vertically immobilise only the two lower corner fittings of the floor of the tank unit, and using anchoring equipment acting on the two securing devices at the upper end of the floor in such a way that they absorb the horizontal stresses only.

Only one side is to be tested, other than in cases where the end walls of the tank swap body are not symmetrical with regard to their central vertical axis.

N.13.3 - Pressure test

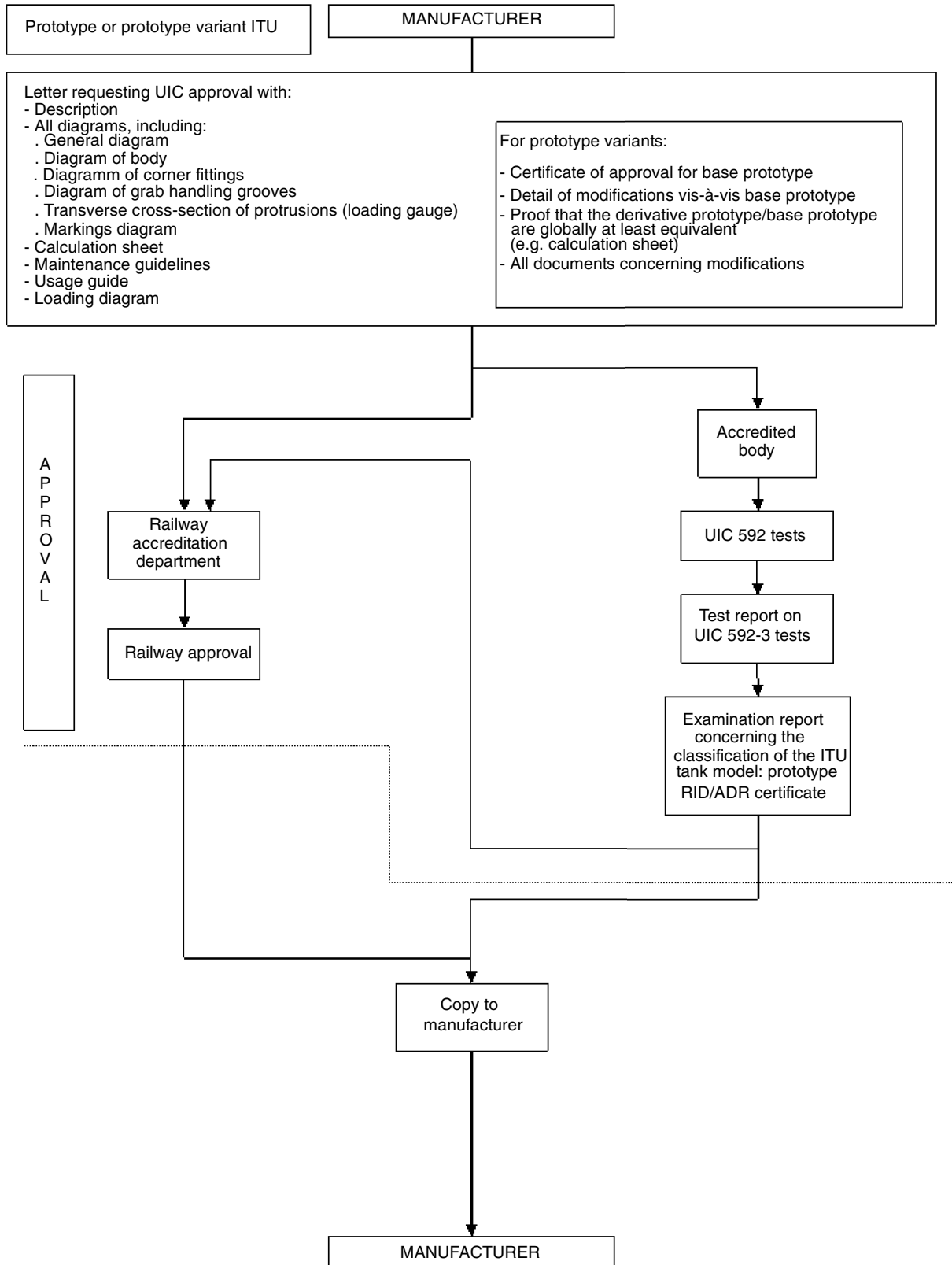
This test shall be executed:

- on the prototype after all the other tests,
- on each unit in the series.

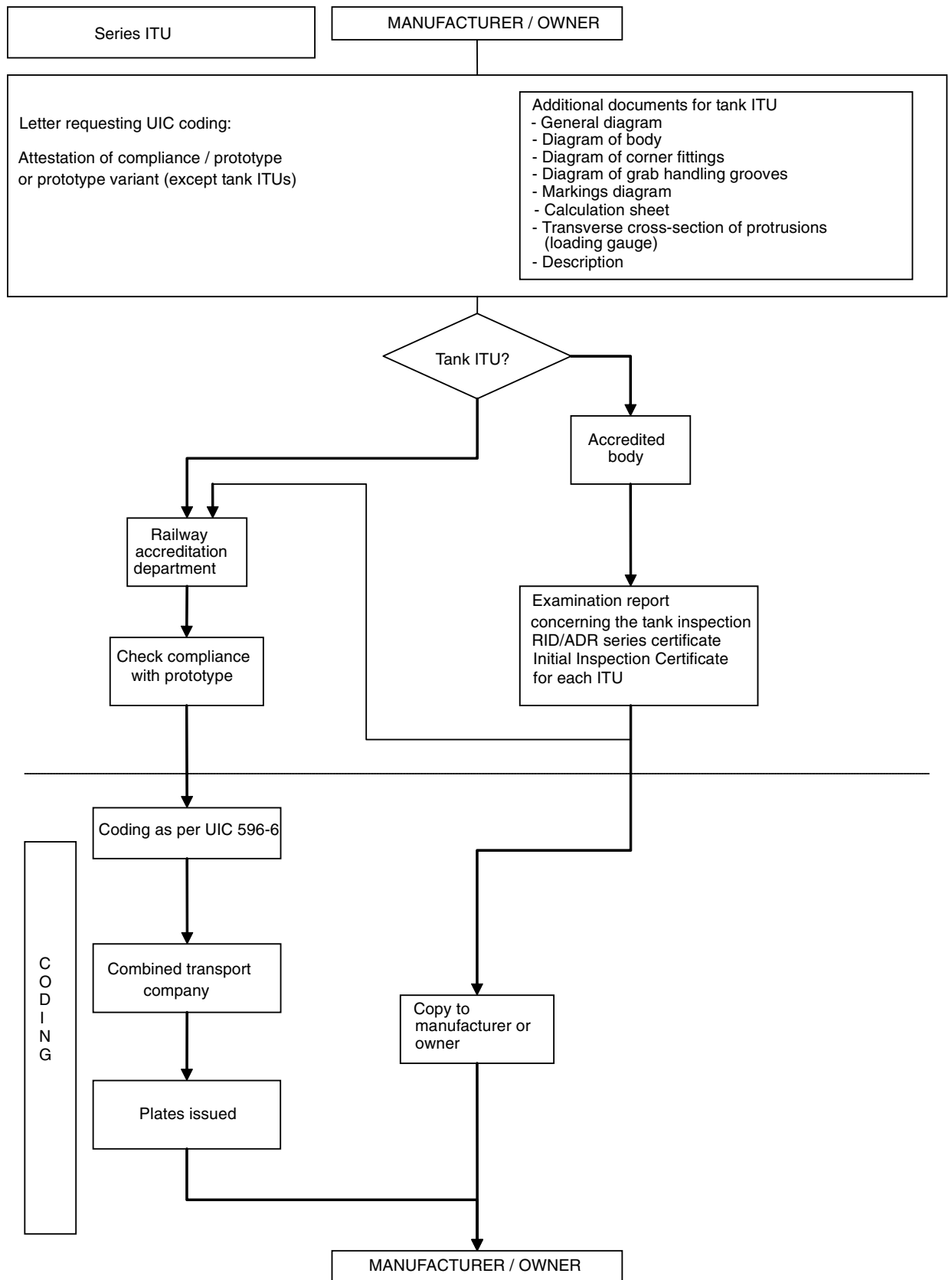
The tank shall be tested at a hydraulic pressure whose value, defined by the competent authorities, shall determine the classification of the swap body design.

For swap bodies with several compartments, each compartment shall be tested at the test pressure with the adjacent compartment empty and vented to atmosphere.

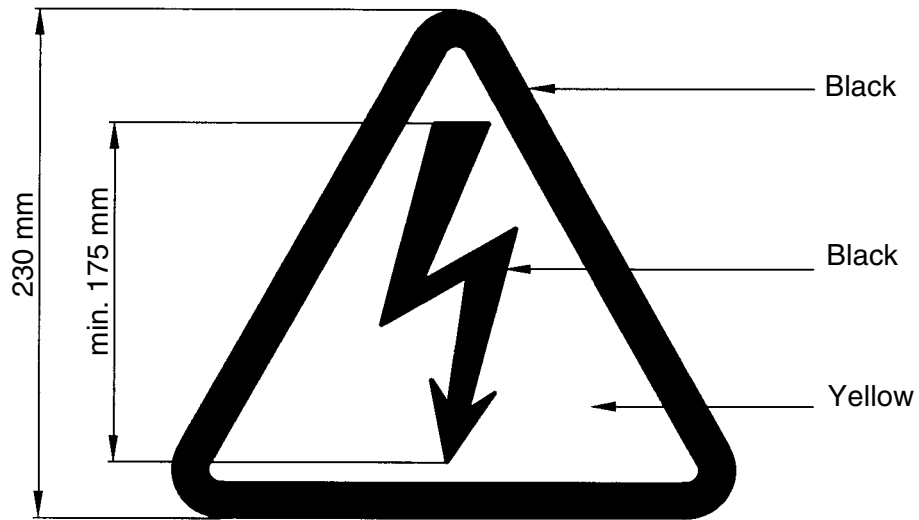
Appendix O - Approval of prototype or prototype variant ITUs



Appendix P - Coding for series ITUs



Appendix Q - Sign for ITUs with ladders enabling access to the upper part



Glossary

ADR	European Agreement concerning the international carriage of dangerous goods by road
ATP	Agreement on the international carriage of perishable foodstuffs drawn up by the United Nations Economic Commission for Europe
BIC	Bureau International des Containers et du Transport Intermodal (International Container Bureau)
CEN	European Committee for Standardisation (Comité Européen de Normalisation)
CIE	Coras Iompair Eireann
CSC	International Convention for Safe Containers of 1972
EWS	English Welsh & Scottish railway
GCU	General Contract of Use for wagons
IM	Infrastructure Manager
ISO	International Organization for Standardization
ITU	Intermodal Transport Unit
PKP	Polskie Koleje Państwowe
RID	Regulation concerning the International carriage of Dangerous goods by rail
RU	Railway Undertaking
UIC	International Union of Railways (Union Internationale des Chemins de Fer)

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4. Miscellaneous

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XP CEN/TS 14993 : Swap bodies for combined transport - Stackable swap bodies type A 1371 - Dimensions, design requirements and testing, May 2005

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