BRITISH STANDARD

BS EN 284:2006

Swap bodies — Non-stackable swap bodies of class C — Dimensions and general requirements

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ICS 55.180.10

BSi British Standards

National foreword

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Caisses mobiles - Caisses mobiles non-gerbables de classe C - Dimensions et spécifications générales

Wechselbehälter - Nicht stapelbare Wechselbehälter der Klasse C - Maße und allgemeine Anforderungen

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Foreword

This document (EN 284:2006) has been prepared by Technical Committee CEN/TC 119 “Swap bodies for combined transport”, the secretariat of which is held by DIN.

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by April 2007, and conflicting national standards shall be withdrawn at the latest by April 2007.

This document supersedes EN 284:1992.

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Introduction

Non stackable swap bodies of class C are intended for use in the international exchange of goods and for their transportation by road and rail, including interchange between these modes of transport, but not intended for the carriage by container ships. They are equipped with bottom corner fittings positioned in accordance with ISO 668.

1 Scope

This European Standard specifies basic requirements for non-stackable swap bodies of class C, having a gross mass of not more than 16 t.

NOTE 1 "Swap bodies of class C" means that they are equipped with bottom fittings positioned according to the specification for 1 C (20') ISO containers (see ISO 668).

NOTE 2 Stackable swap bodies class C are specified in CEN/TS 13853.

2 Normative references

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

EN 283:1991, *Swap bodies — Testing*

EN 12640, *Securing of cargo on road vehicles — Lashing points on commercial vehicles for goods transportation — Minimum requirements and testing*

EN 12641-1, *Swap bodies and commercial vehicles — Tarpaulins — Part 1: Minimum requirements*

EN 12641-2, *Swap bodies and commercial vehicles — Tarpaulins — Part 2: Minimum requirements for curtainsiders*

EN 12642, *Securing of cargo on road vehicles — Body structure of commercial vehicles — Minimum requirements*

EN 13044, *Swap bodies — Coding, identification and marking*

ISO 1161, *Series 1 freight containers — Corner fittings — Specification*

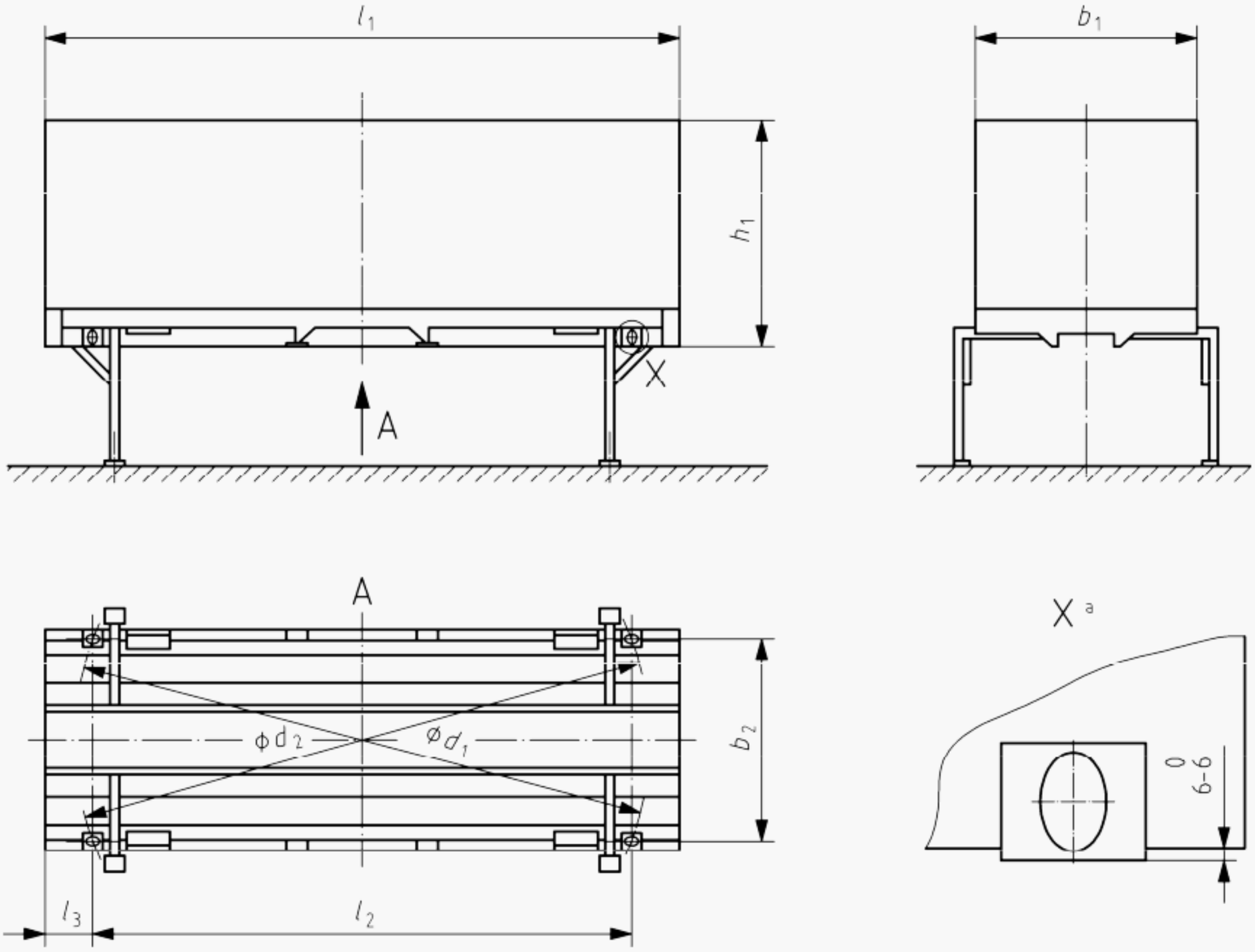
UIC[1)] 596-6; *Conveyance of road vehicles on wagons — Technical organisation — Conditions for coding combined-transport load units and combined-transport lines*

3 Dimensions and ratings

The external dimensions, tolerances and rating (*R*) of the swap bodies covered by this European Standard are specified in Figure 1 and Table 1. No part of the swap body shall project beyond the boundaries defined by the external dimensions.

1) Union Internationale des Chemins de Fer, 16, rue Jean Rey, F-75015 Paris (http://www.uic.asso.fr/).

Dimensions in millimetres



Key

a detail, showing the position of the lower corner castings

Figure 1 — Basic dimensions

Table 1 — Dimensions and rating

Dimensions in millimetres

Swap body designation	l_1	l_2	l_3	h_1 [a] (nominal)	b_1 [b]	b_2	$d_1 - d_2$ or $d_2 - d_1$	R
C 745	7450_{-20}^{0}	5853 ± 3	$798{,}5_{-3}^{0}$	2 750	2550_{-10}^{0}	2259 ± 3	13 max.	16 t max.
C 782 [c]	7820_{-20}^{0}		$983{,}5_{-3}^{0}$					

[a] The International Union of Railways code for line categories UIC 596-6 shall be taken into consideration to assure transportation without hindrance on the main railways lines of continental Europe.

[b] A maximum width of 2 600 mm is permitted for certain thermal bodies according to EC Directive No. 96/53/EC.

[c] According to present road vehicle legislation in certain countries, the transport of two swap bodies of this size on a road train is only feasible when used together with a short coupling.

4 Strength requirements

The strength requirements for non-stackable swap bodies are given in EN 283.

5 Design requirements

5.1 Bottom fittings

5.1.1 Swap bodies shall be equipped with four bottom fittings positioned in accordance with Figure 1 and Table 1.

5.1.2 The apertures and basic dimensions of the bottom fittings shall comply with Annex A.

5.2 Grappler arm lifting areas

5.2.1 Swap bodies shall be equipped with four grappler arm lifting areas located as shown in Figure 2. Requirements for the location and dimensions of these areas are given in Figures 3 and 4.

5.2.2 The total length of each grappler arm lifting area shall be in compliance with one of the following conditions:

a) 850 mm as measured from the axis of the adjacent bottom fittings – additional end stop in swap body longitudinal direction are not required;

b) 500 mm if fitted with additional end stop in swap body longitudinal direction on either side of that area.

5.2.3 The safety lip, which forms an integral part of the grappler arm lifting area, must have a minimum length of 500 mm, which ever of the two solutions above applied; i.e. if the total length of the grappler arm lifting area is 850 mm, the safety lip may be removed as shown in Figures 3d), 3e) and 4a), 4b), 4c) and 4d).

5.2.4 For box type swap bodies only the provision of a wear-resistant plate is recommended to protect the side walls. Such a plate shall not protrude beyond the outer plane of the grappler arm position, an offset of ≤ 2 mm is possible. For all other types (i.e. tarpaulin and curtainsiders) it is recommend that the curtain shall be reinforced in the grappler arm contact area.

Dimensions in millimetres

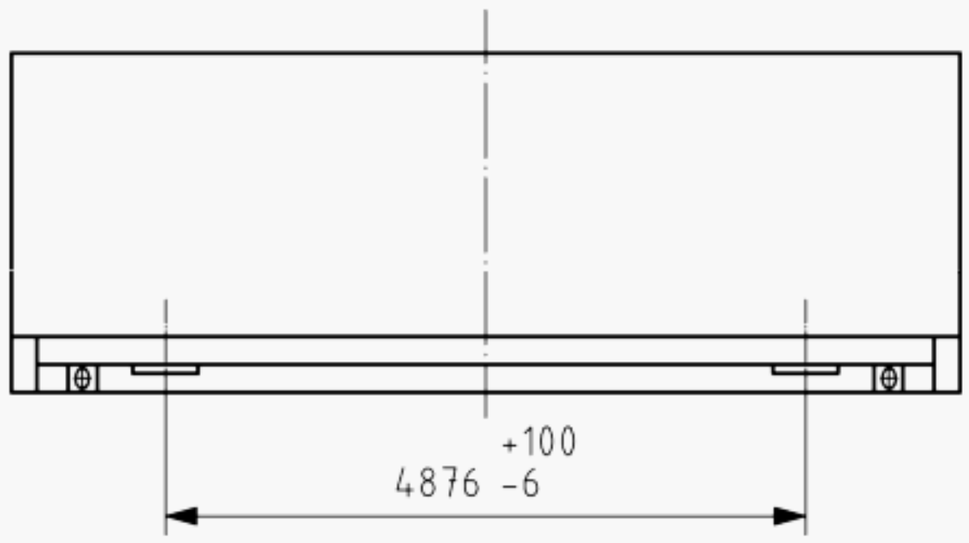


Figure 2 — Side view with grappler arm lifting areas

Dimensions in millimetres

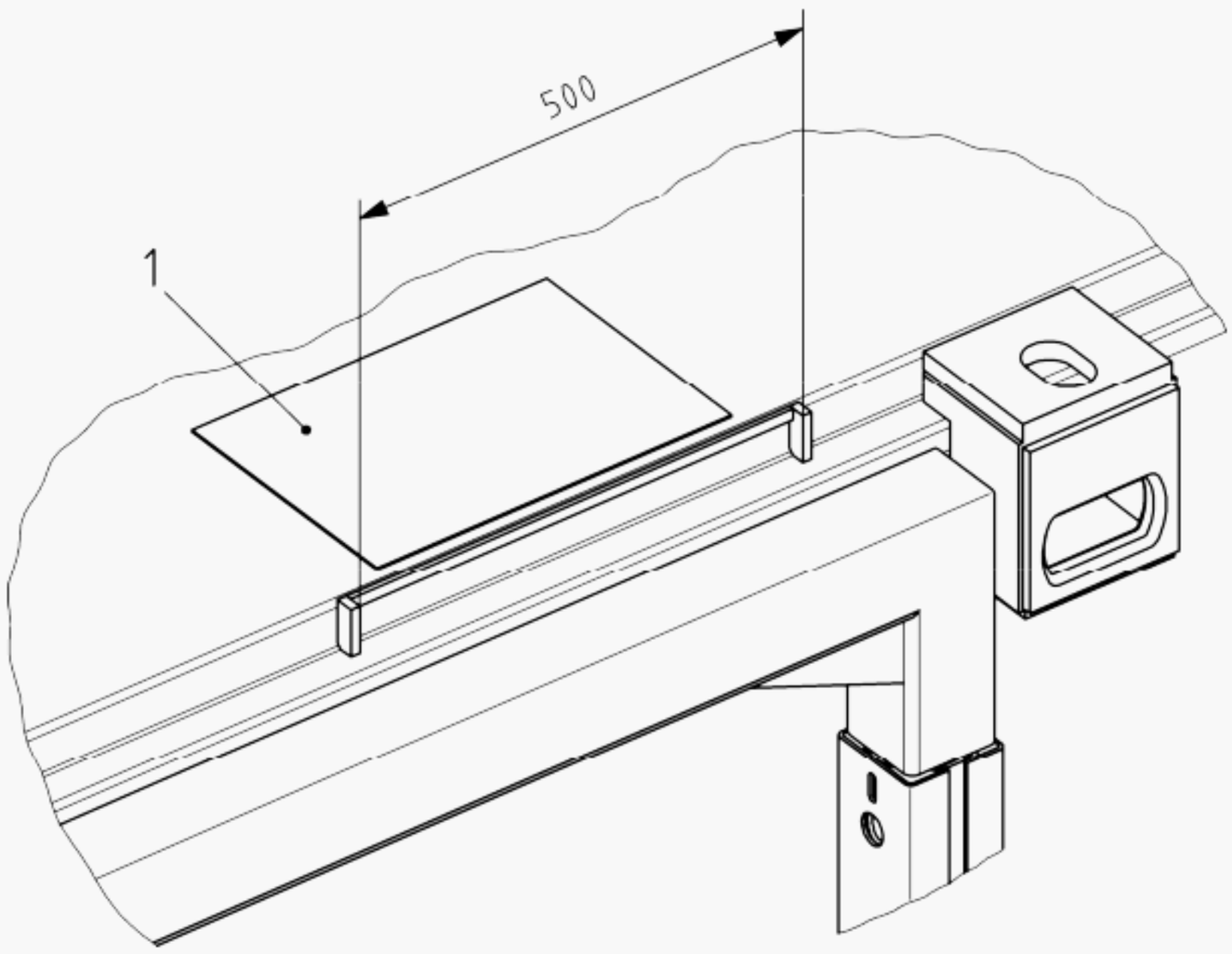


Figure 3a) — Grappler flange safety lip, end stops and wear-resistant plate – three dimensional view, seen from the bottom

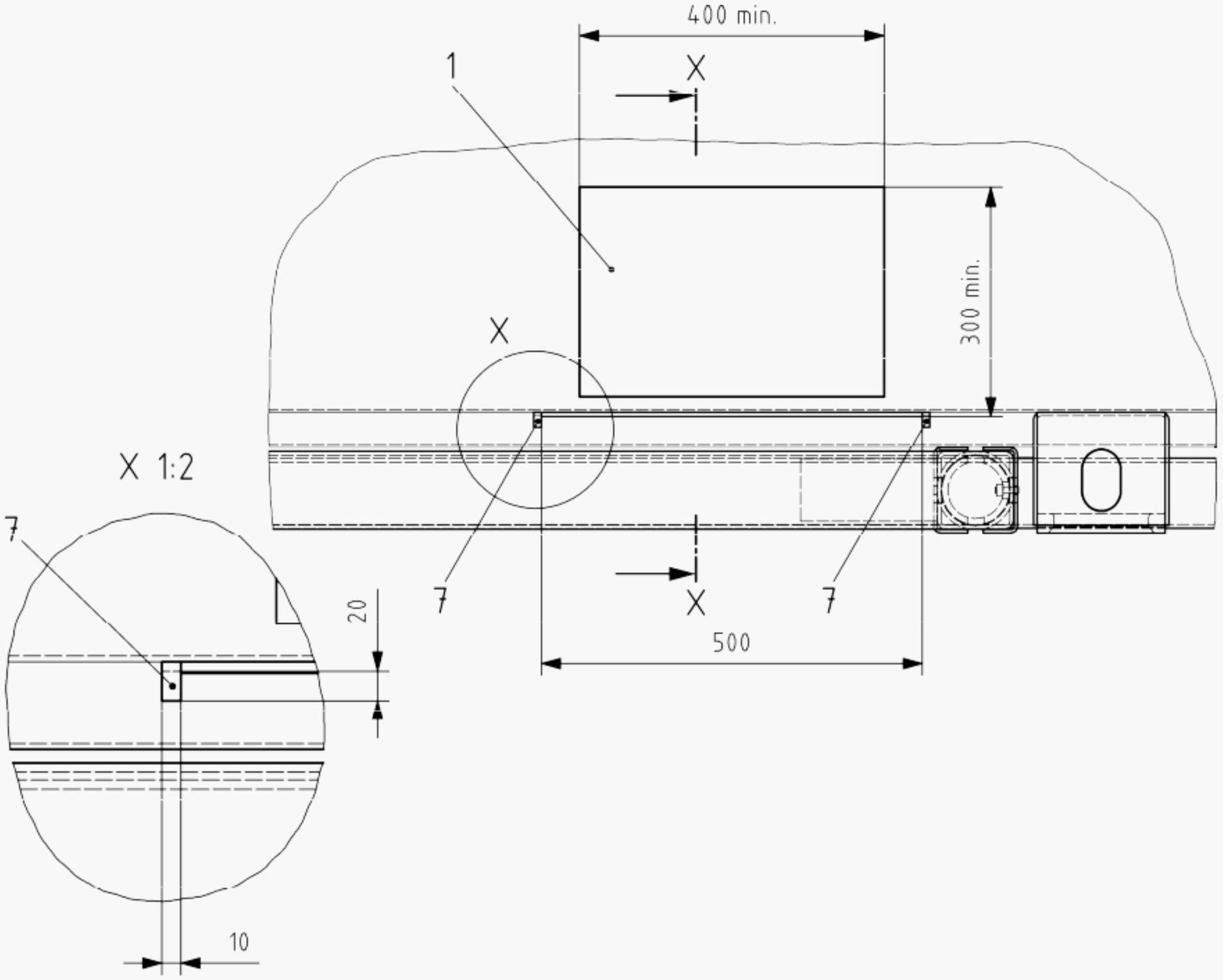


Figure 3b) — Grappler flange safety lip, end stops and wear-resistant plate – side view

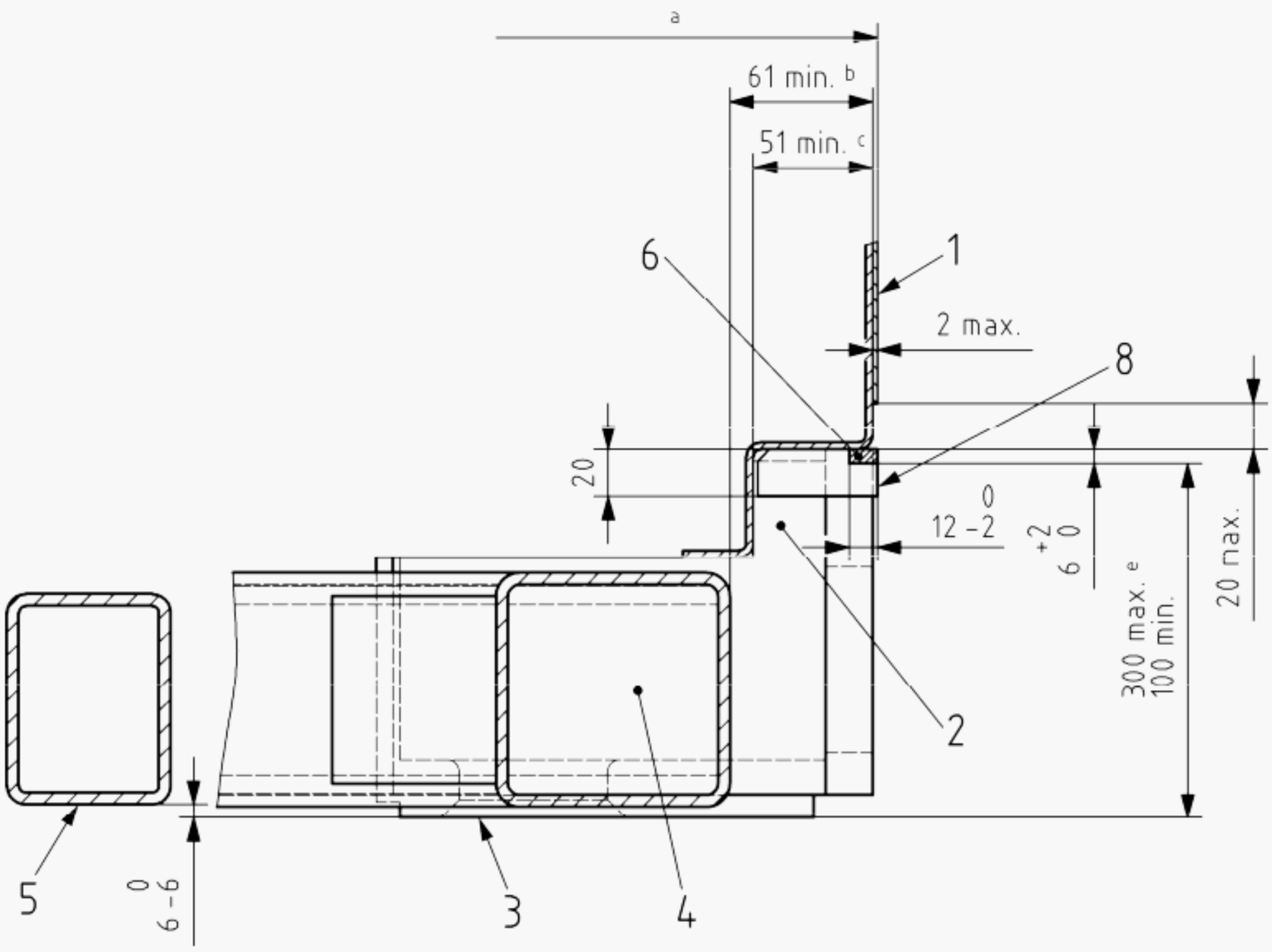


Figure 3c) — Grappler flange safety lip, end stops and wear-resistant plate – Section X-X

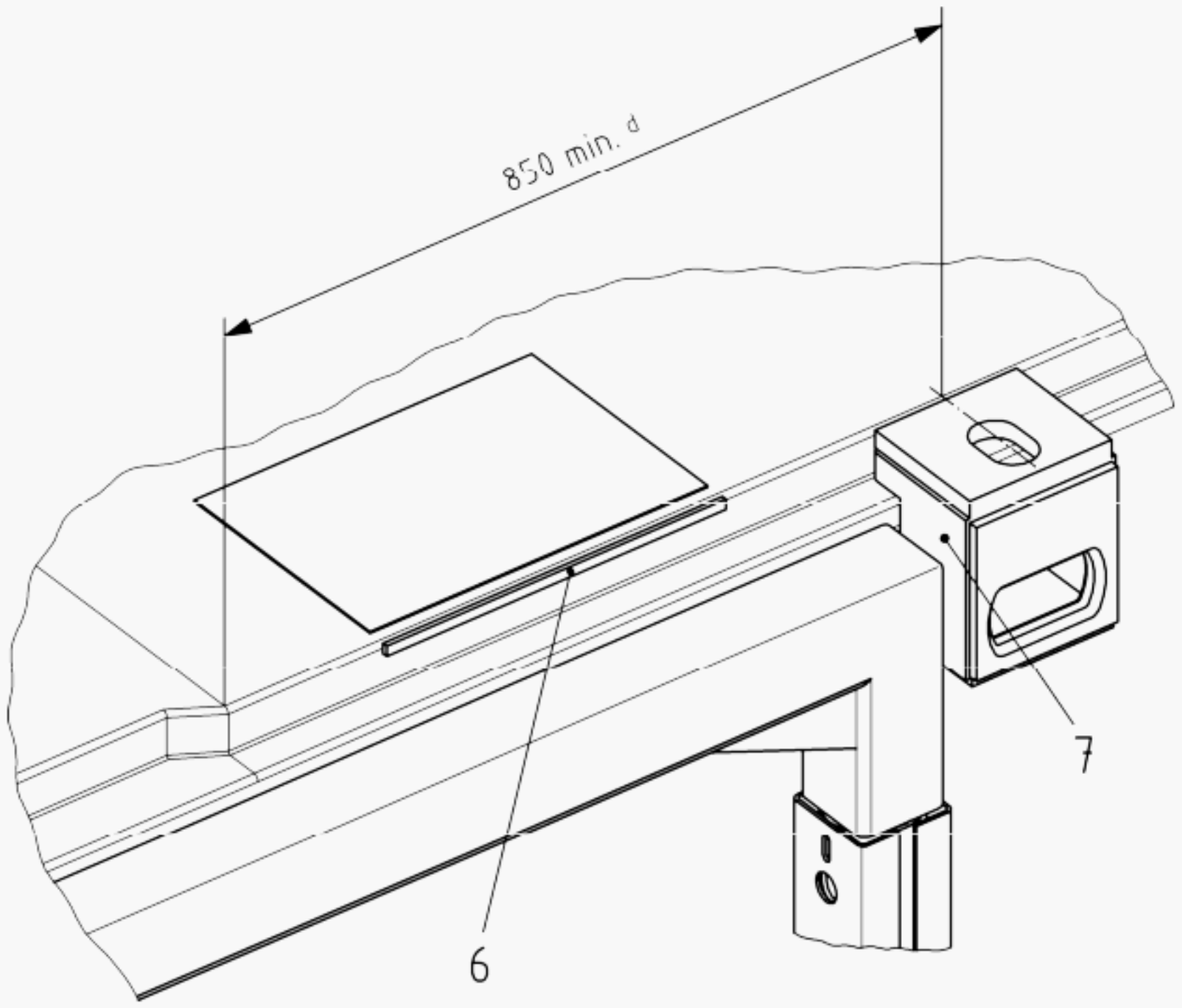


Figure 3d) — Grappler flange safety lip with corner casting as end stop – three dimensional view, seen from the bottom

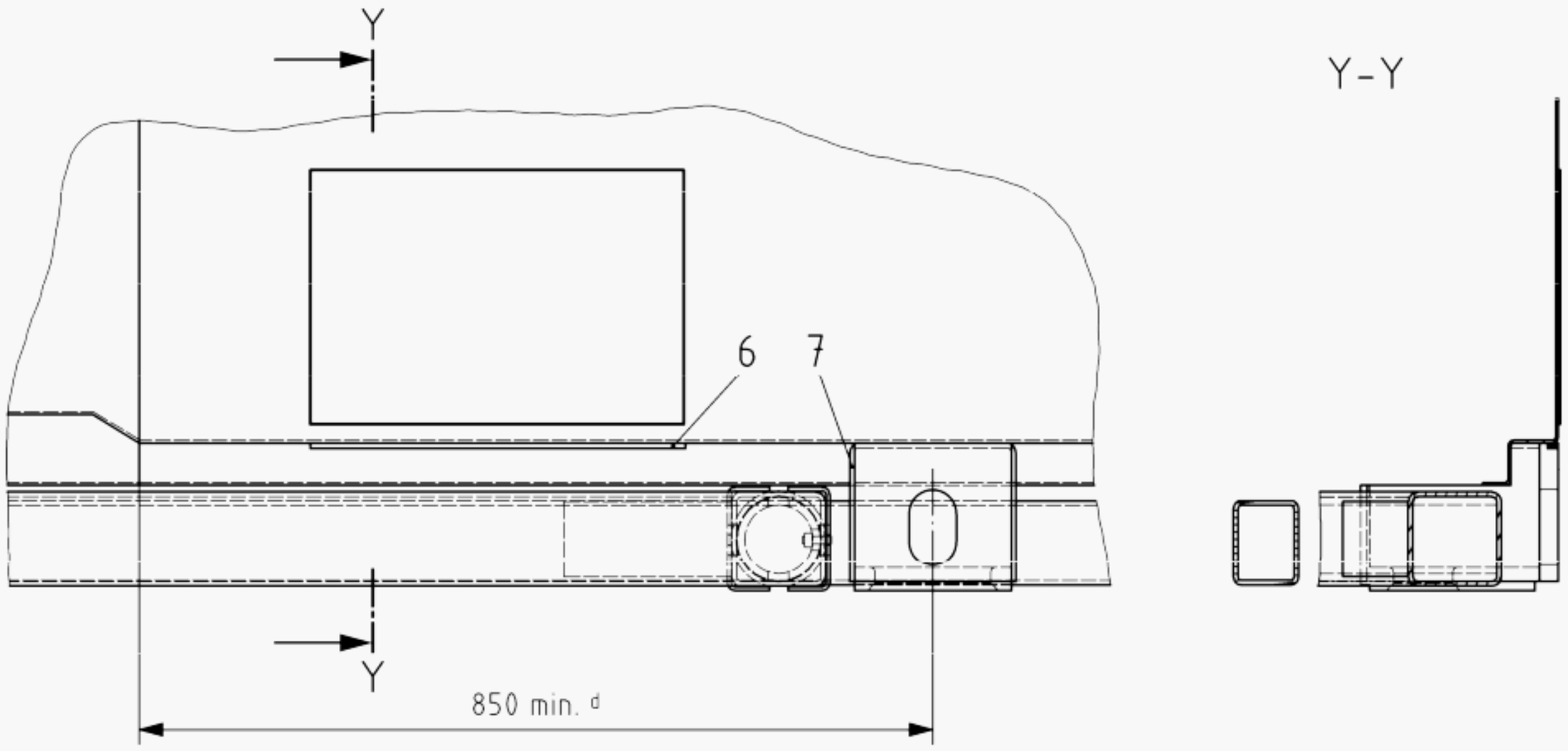


Figure 3e) — Grappler flange safety lip with corner casting as end stop – side view with section

Key

1 wear-resistant plate – this part of the wall shall not project behind the bed stop of the grappler flange
2 free space, neither rigid (≥ 51 mm) nor mobile parts (≥ 61 mm) of the swap body shall protrude into this area
3 basic level, plane of the bottom faces of the corner castings
4 supporting leg
5 lower surface steering tunnel
6 safety lip
7 end stop
8 maximum width of the swap body (equivalent to the outer surface of the grappler flange)
[a] maximum swap body width
[b] in case of mobile parts, this value is valid to keep the area (2) free
[c] in case of rigid parts this value is valid to keep the area (2) free
[d] total length of the grappler arm load transfer area
[e] it is recommended that this dimension be larger than 100 mm and shorter than 300 mm (the greater this free area, the easier it will be to locate the grappler arms in the lifting position)

Figure 3 — Swap body – Box design – Details for the design of the grappler arm lifting areas

Dimensions in millimetres

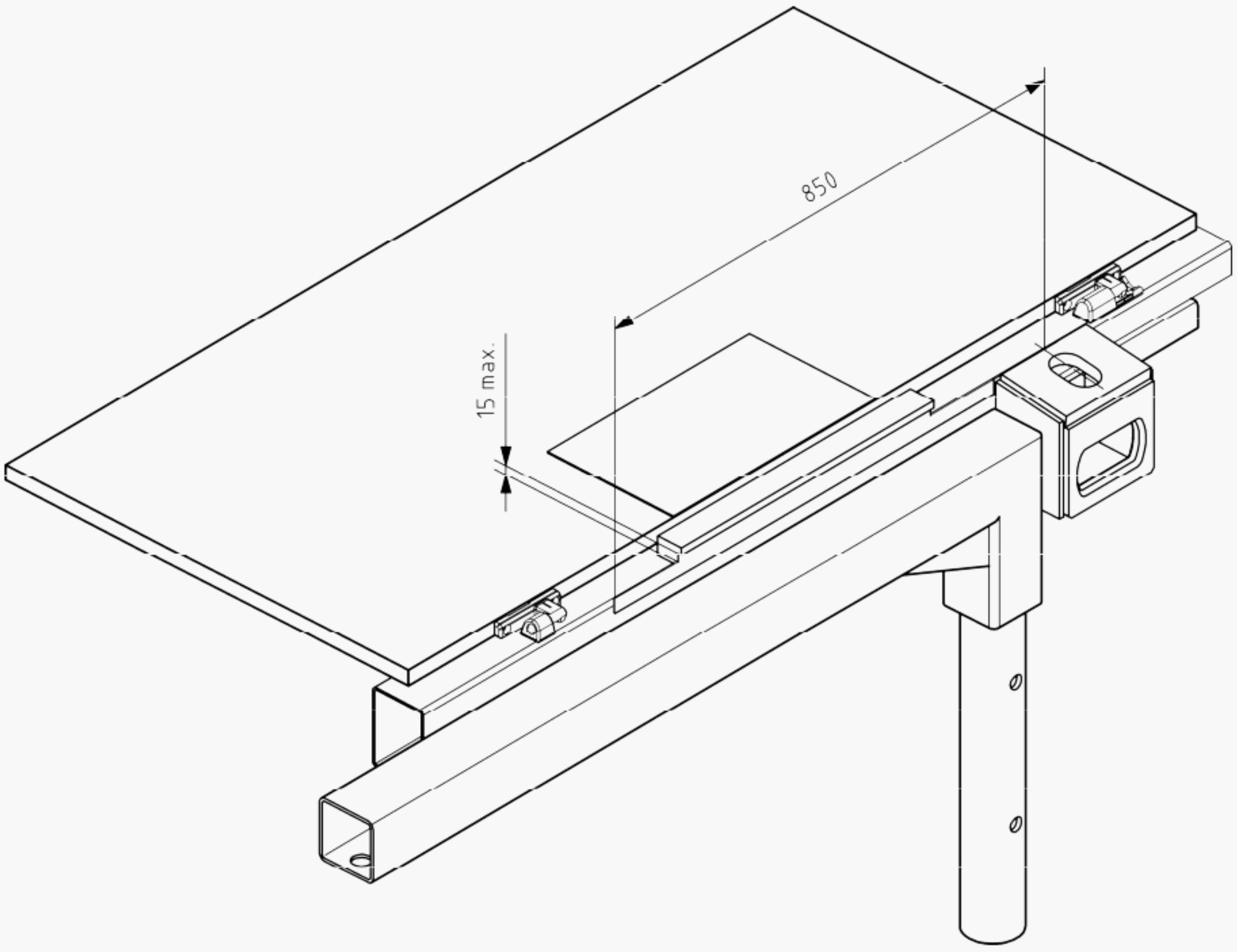


Figure 4a) — Notched grappler flange – three dimensional view (drop side swap bodies), seen from the bottom

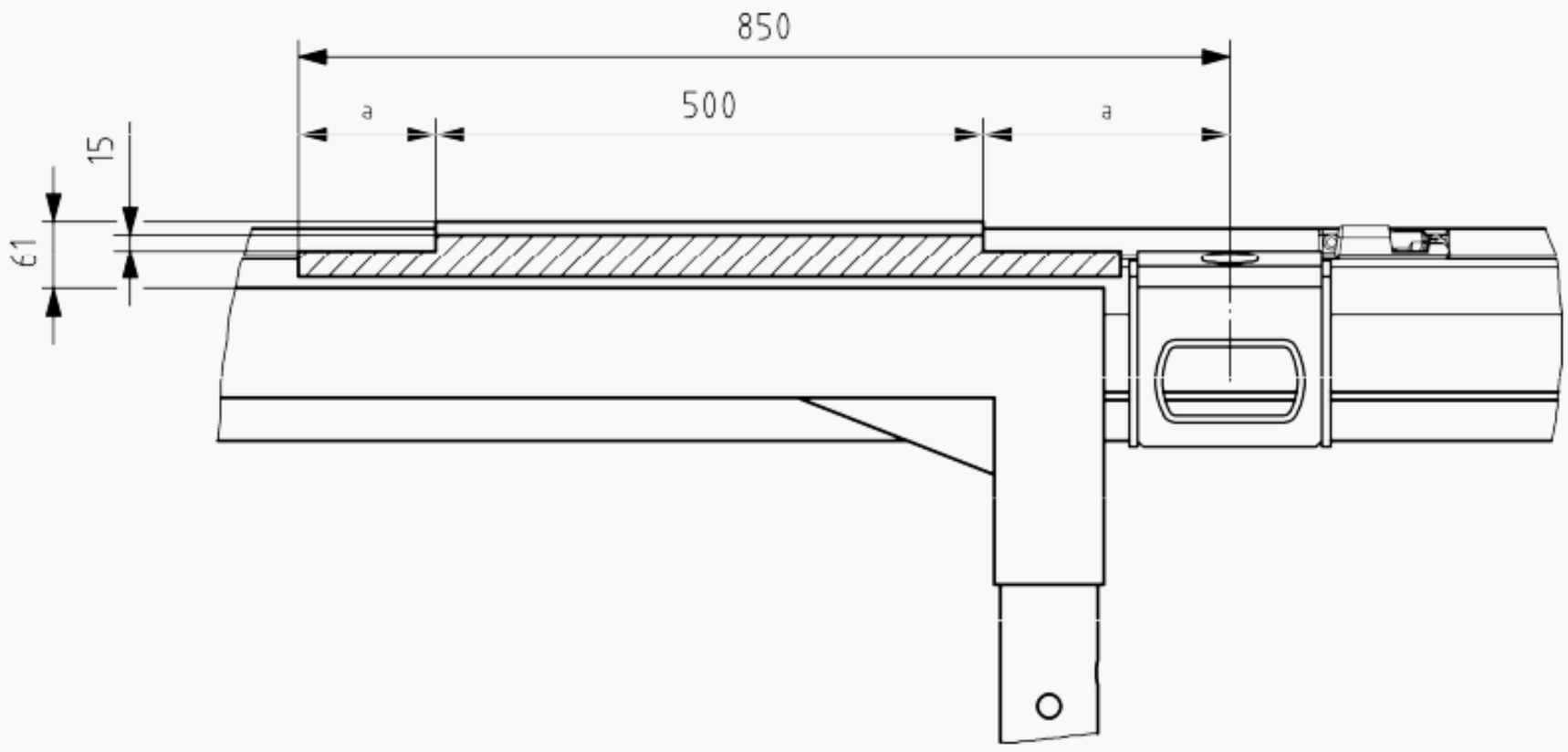


Figure 4b) — Notched grappler flange – three dimensional view (drop side swap bodies), seen from the bottom

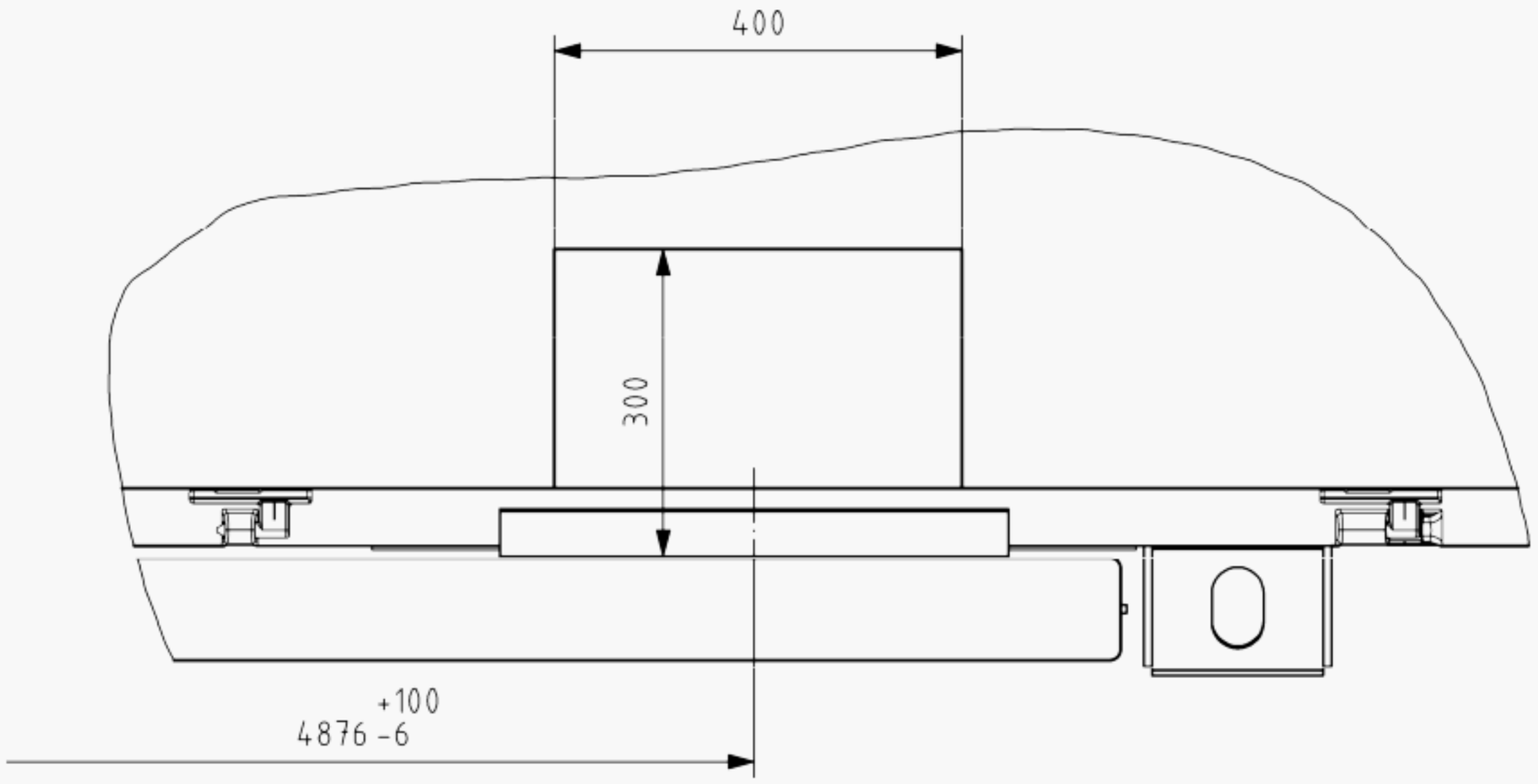


Figure 4c) — Notched grappler flange – side view (drop side swap bodies)

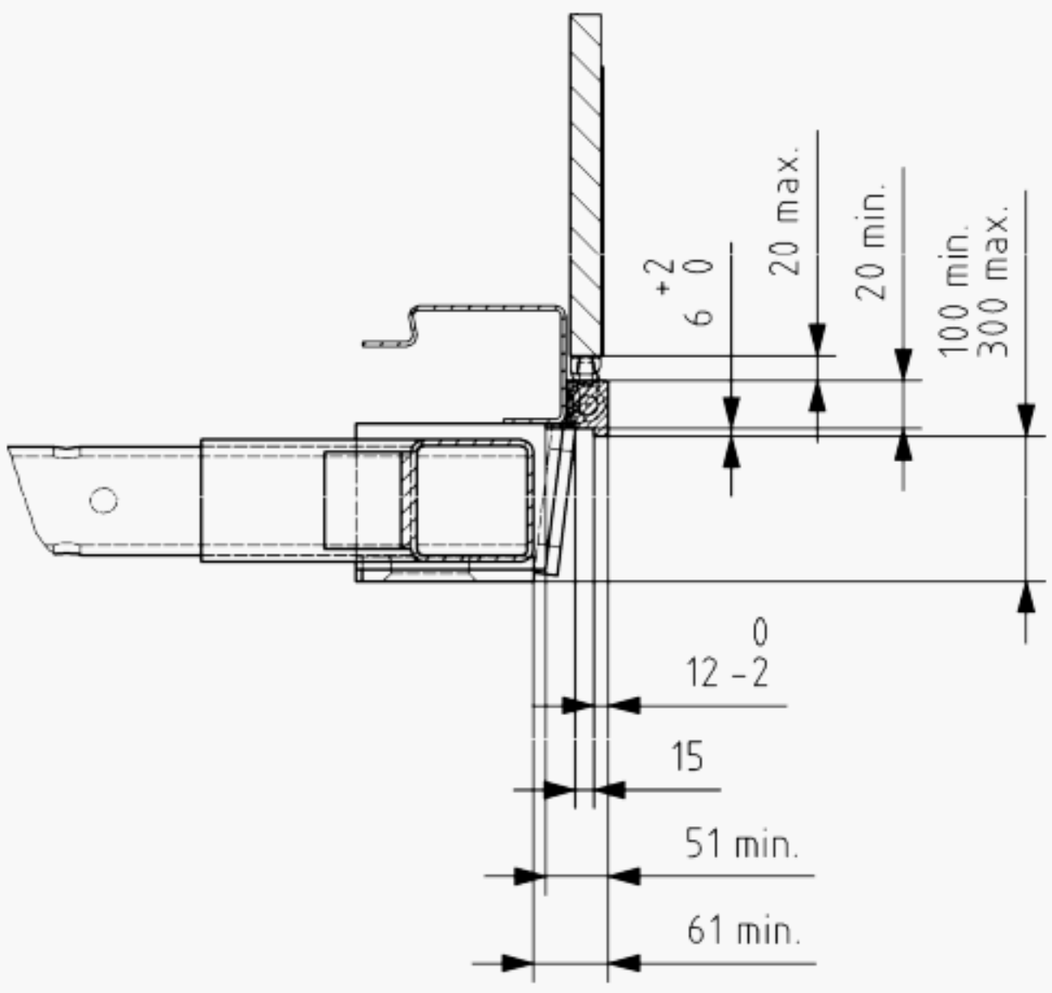


Figure 4d) — View A

Key

[a] allowed notch

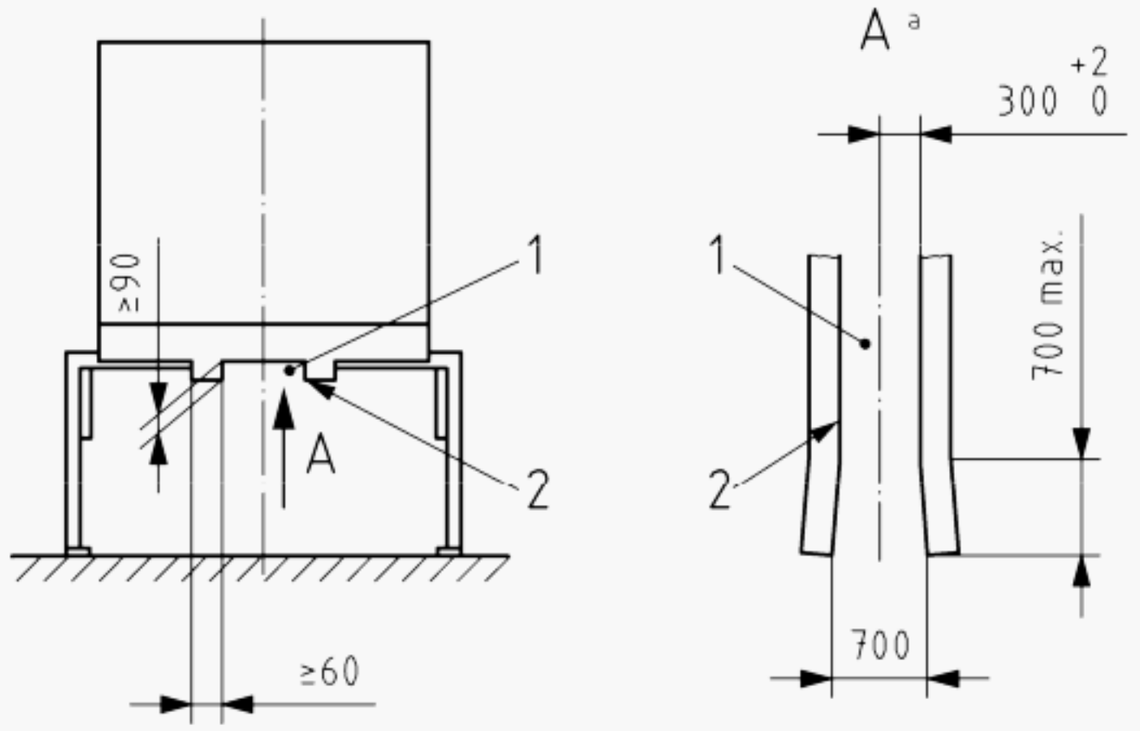
Figure 4 — Swap body with drop sides – Details for the design of the grappler arm lifting areas

5.3 Steering tunnel

Swap bodies shall have a steering tunnel incorporated in their base structure on the longitudinal centreline in accordance with Figure 5. The tunnel shall pass through the entire length of the base structure and be configured to provide load bearing surface at its lower outer edges. These load bearing surfaces shall be in one plane located up to a maximum of 6 mm above the lower surface of the bottom fittings.

A funnel may be provided at the both ends of the steering tunnel in order to ease loading onto a vehicle. Where provided, the dimensions specified in Figure 5 shall not be exceeded.

Dimensions in millimetres



Key
1 free space (steering tunnel) over entire length (≥ 60 mm wide)
2 load transfer area over entire length
[a] centricity of the tunnel (bottom view)

Figure 5 — Steering tunnel

5.4 Front stop

Swap bodies shall be equipped with a stop at the front end wall. The front face of the horizontal arranged front stop shall be in accordance with dimension l_3 (see Table 1) and have a minimum width of 800 mm, a minimum height of 8 mm and shall be centred within a zone measuring 800 mm x 160 mm, as illustrated in Figure 6. The front stop may be integrated in the front wall of the swap body.

Dimensions in millimetres

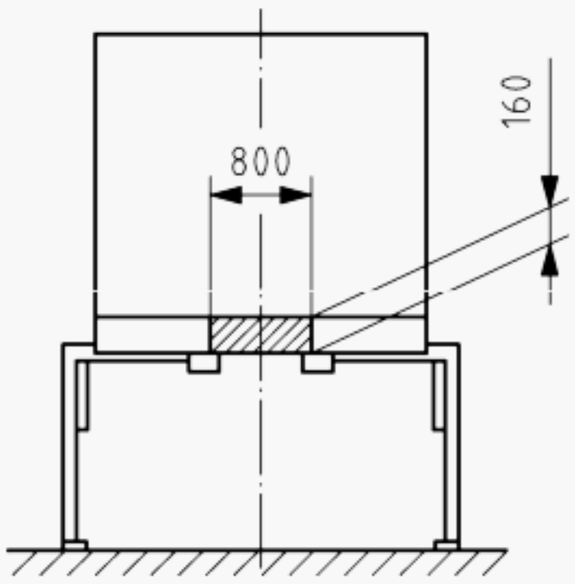


Figure 6 — Front stop

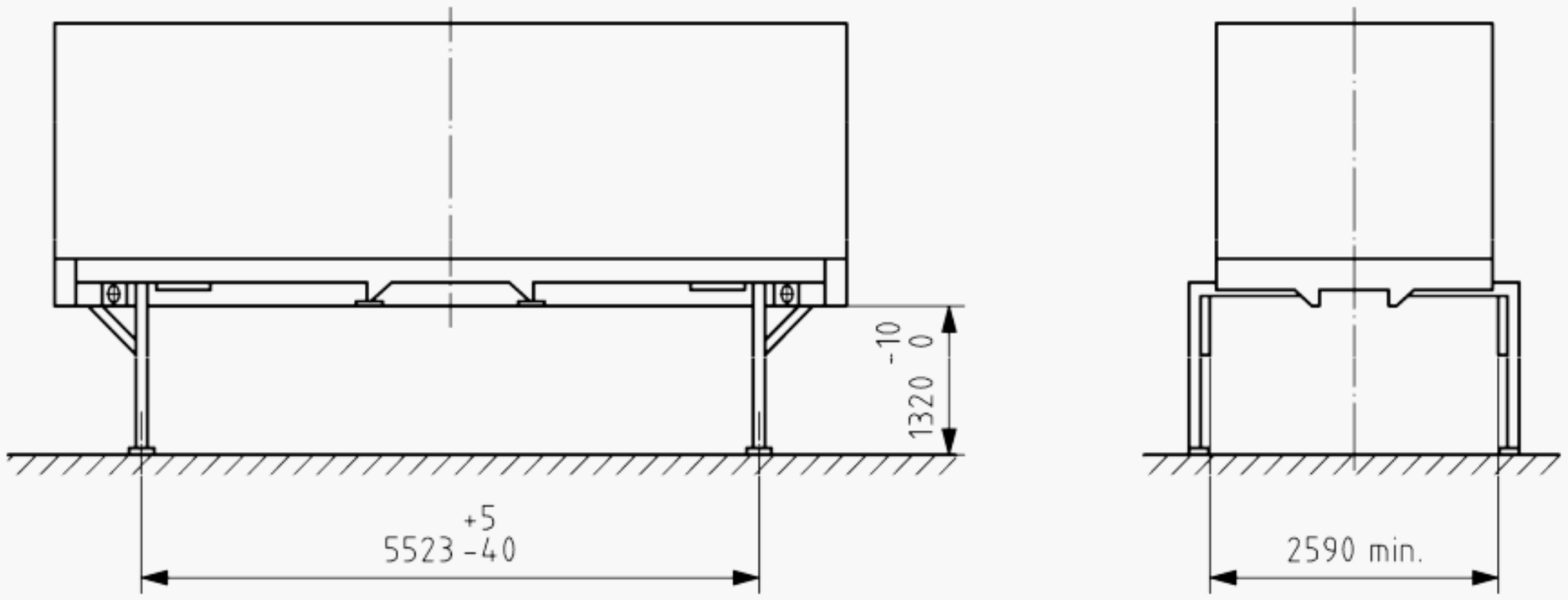
5.5 Supporting legs

5.5.1 Swap bodies shall be fitted with four foldable supporting legs in accordance with Annex B, located as shown in Figures 7.

5.5.2 Each leg shall be fitted with a square foot-plate of not less than 95 mm x 95 mm and shall be equipped with two secures in both the operational and folded positions. In transport position, the position of the second securing device shall be clearly visible with their functionality. When folded, no part of the supporting legs shall project beyond the boundaries defined by the external dimensions or impede its handling.

5.5.3 The clear width and clear height underneath a swap body placed in its supporting legs shall be as specified in Figure 7.

Dimensions in millimetres



NOTE Alternative parking heights may be provided for, by the use of vertically adjustable legs.

Figure 7 — Position of supporting legs (supporting leg type A2)

6 Optional features

6.1 Fork-lift pockets

Fork-lift pockets used for handling type C swap bodies in the loaded or unloaded condition may be provided as optional features.

They shall, if provided, have the dimensions specified in Figure 8 and shall pass completely through the base structure of the swap body so that lifting devices can be inserted from either side. It is not necessary for the base of the fork-lift pockets to be there over the full width of the swap body but it shall be provided in the vicinity of each end of the fork pockets.

NOTE For safe handling of swap bodies using the fork-lift pockets, the eccentricity of the centre of gravity should not exceed 10 % of the length of the swap body.

Dimensions in millimetres

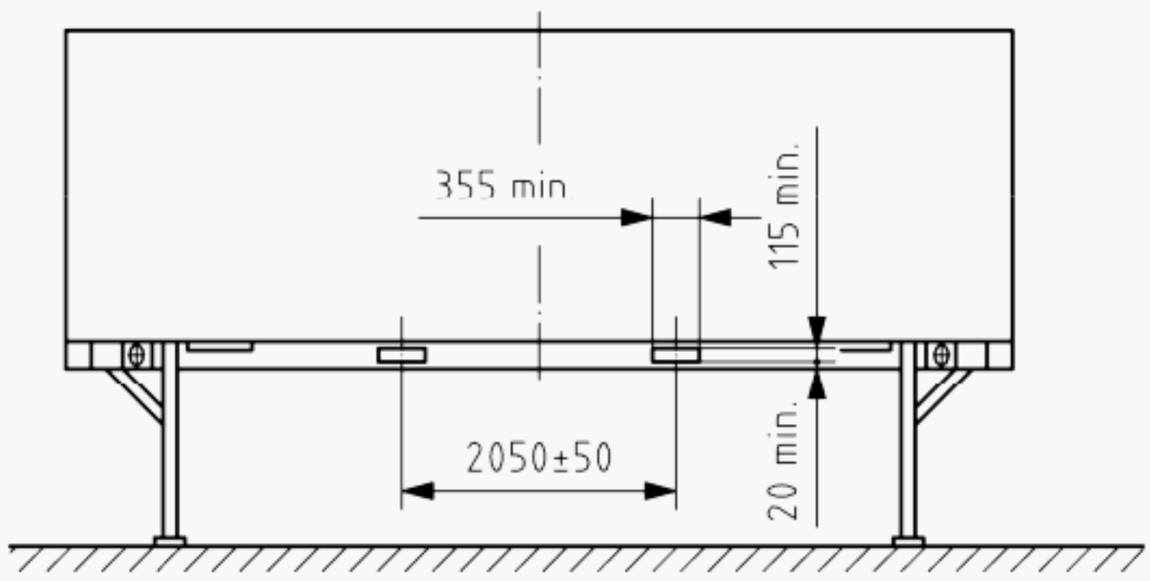


Figure 8 — Fork-lift pockets

6.2 Tarpaulins

6.2.1 Drop sided swap bodies

Where fitted, tarpaulins and their fitting devices used for open sided swap bodies shall be in compliance with EN 12641-1.

6.2.2 Curtainsiders

Tarpaulins used for curtainsider swap bodies shall be in compliance with EN 12641-2.

6.3 Cargo securing devices

Cargo securing devices may be provided in swap bodies as optional features, subject to agreement between manufacturer and client. However, for curtainsider swap bodies, cargo securing devices are mandatory.

Where fitted, cargo securing devices shall meet the requirements of EN 12640 and EN 12642.

7 Marking

7.1 The swap body may be marked in accordance with EN 13044.

7.2 For UIC railroad operation an additional plate is required in accordance with UIC 596-6.

7.3 A warning sign as shown in Figure 9 shall be fitted. It shall indicate the maximum front axle load of a fork-lift truck which the empty swap body resting on its supporting legs can resist without tipping when being loaded or unloaded from one end.

NOTE The calculation of the maximum front axle load is defined in EN 283.

This warning sign shall be fitted at the door end so as to be clearly visible to any person accessing the swap body.

Dimensions in millimetres

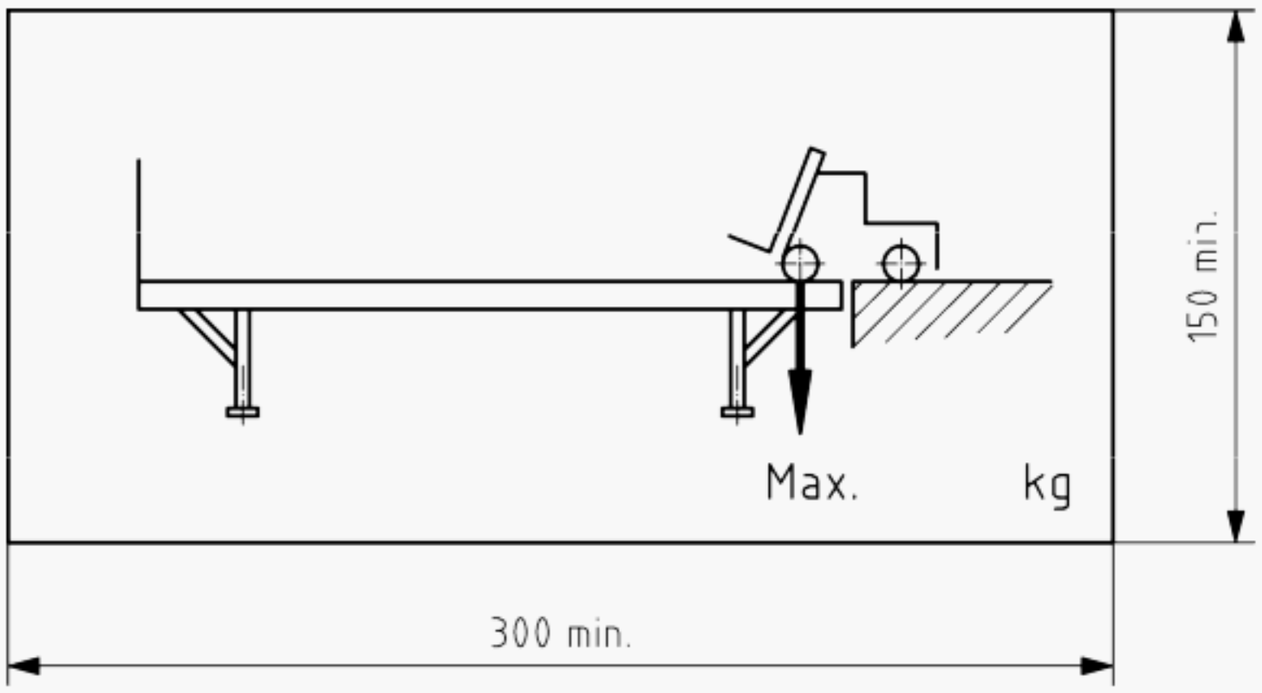


Figure 9 — Warning sign illustrating risk of overturning

7.4 Supporting legs shall be marked according to B.4.

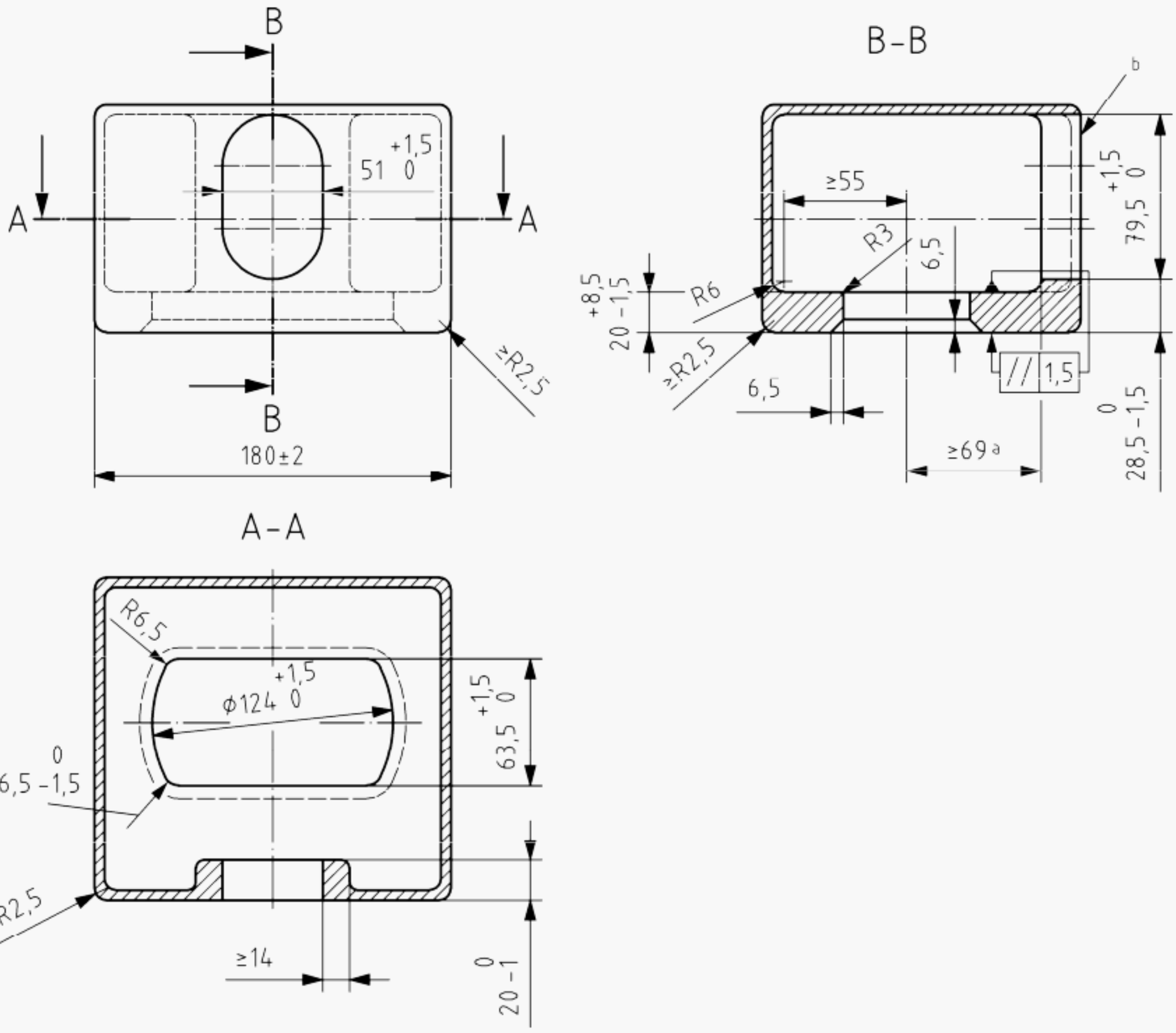
7.5 The grappler arm lifting areas including the safety lip shall be marked in yellow over a length of at least 400 mm and a height of at least 100 mm. If the whole swap body is painted yellow, the grappler arm lifting areas shall be marked in a contrasting colour.

Annex A
(normative)

Bottom fittings

Apertures of bottom fittings shall be in compliance with ISO 1161.

Dimensions in millimetres



Key

[a] functional dimension. The necessary width is to be selected as a function of the swap body design

[b] configuration of the side wall is dependent on the outer contour of the swap body. The outer area of the side wall may jump back with a maximum of 15 mm behind the flange safety lip in direction of the swap body centre (see also Figure 4b). For slopping side walls, the slope angle shall be not more than 9°.

Figure A.1 — Bottom fittings

Annex B
(normative)

Supporting legs with safety device

B.1 General

Supporting legs are used to support the swap body when removed from the carrier vehicle, and to replace it on the vehicle, using on-board means. This annex specifies type A2 of supporting legs type A2, for swap bodies of classes C 745 and C 782.

NOTE Supporting legs of Type A1 for swap bodies class C 715 are not specified in this standard, since this class of swap bodies are not requested anymore from the market.

B.2 Safety devices

B.2.1 Requirements

B.2.1.1 A safety bolt shall be provided on the side of the support bearing for the retracted or extended supporting leg.

B.2.1.2 In the retracted position (transport position) the supporting leg shall be provided with a supporting device and secured by a further safety device. The latter device shall be readily visible from the outside, and a visual check of its effectiveness shall be possible. False operation shall be precluded.

B.2.1.3 When in transport position, the bracing strut shall be secured against inadvertent loosening.

B.2.1.4 When the supporting leg is operated, the bracing strut shall remain secured to prevent handling injuries.

B.2.1.5 A safety stop shall prevent the complete removal of the supporting leg. This axial safety stop shall be adjustable and able to withstand an axially applied force up to 4 000 N without permanent deformation. The safety stop shall be demountable by means of simple tools.

B.2.2 Interchange ability

B.2.2.1 Supporting legs shall be designed so that they can be fitted on either side of the swap body.

B.2.2.2 Replacement of a supporting leg shall be possible after release of the safety stop.

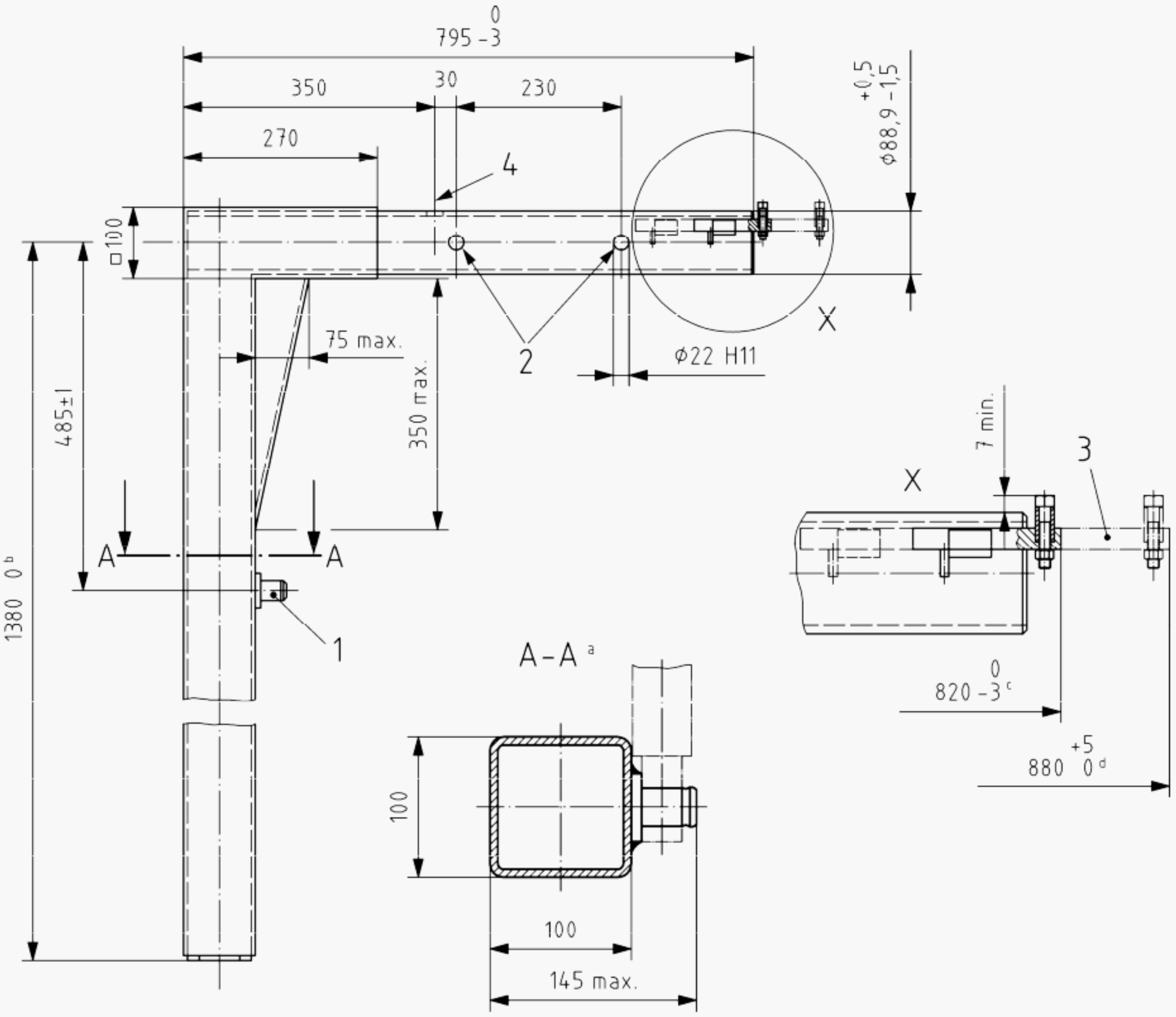
B.2.3 Mechanical strength

After being tested as specified in EN 283:1991, 5.11, supporting legs shall not show any permanent deformation nor changes which may render them unsuitable for use.

B.3 Dimensions

This annex contains dimensions essential to the interchangeability of supporting legs. The dimensions are specified in Figures B.1 to B.8. Details which are not indicated shall be selected as appropriate.

Dimensions in millimetres

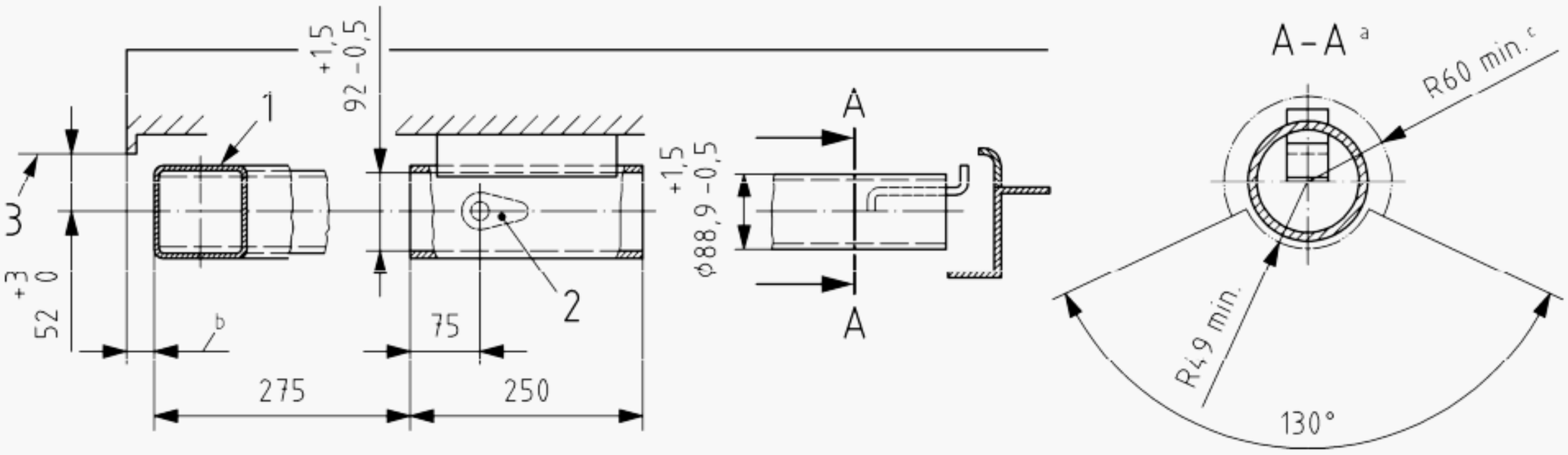


Key

1 support for brace (left to the discretion of the manufacturer)
2 two holes
3 telescopic safety stop, pulled out
4 hole
a section through the leg enlarged
b this dimension shall also be complied with telescopic supporting legs
c safety stop retracted
d safety stop extended

Figure B.1 — Type A2 supporting leg Type A2

Dimensions in millimetres

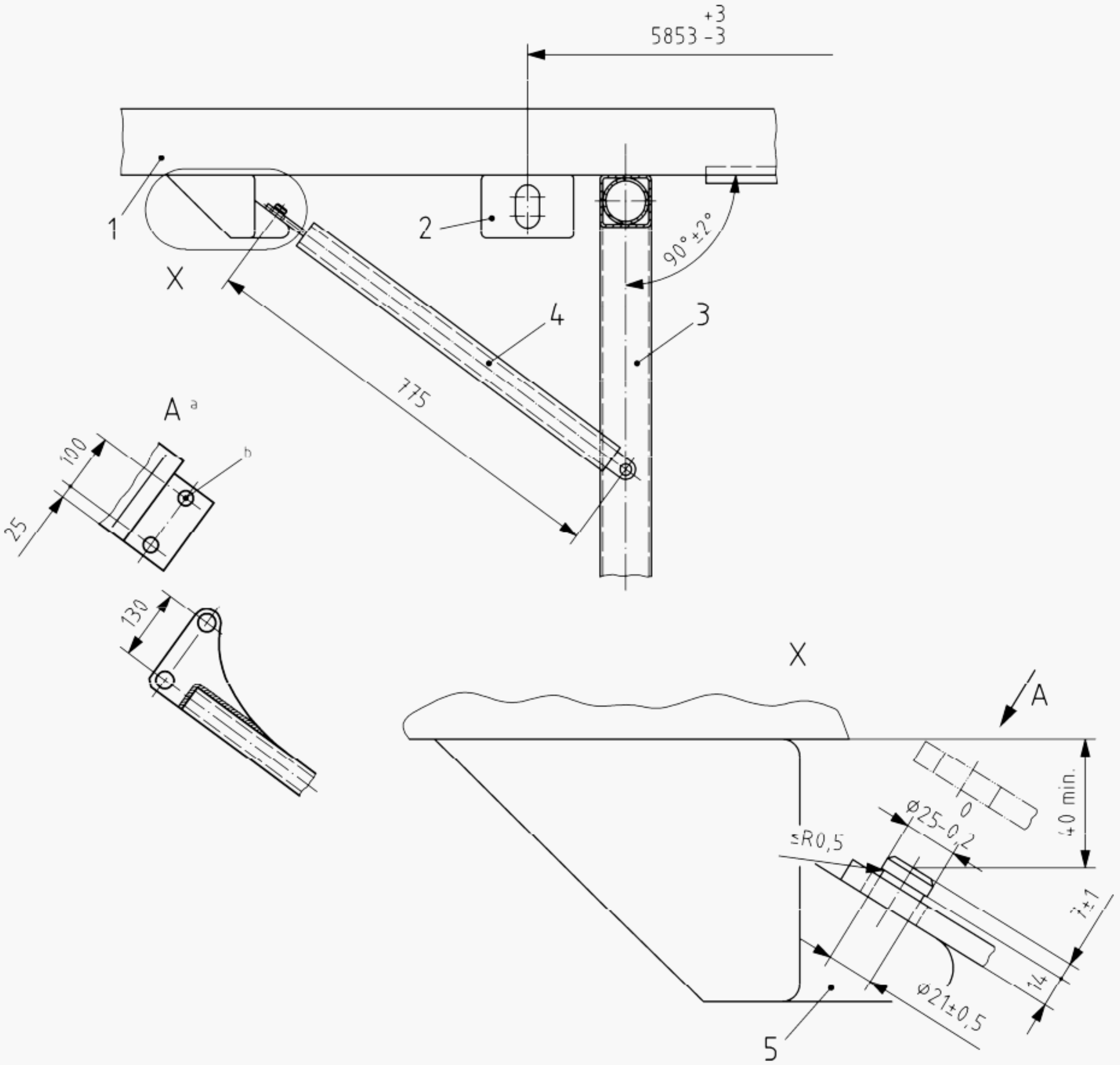


Key

1 supporting leg in transport position
2 major safety device
3 supporting area for supporting leg in parking position
[a] section A-A (enlarged), space in frame for telescopic safety stop
[b] 61 mm minimum free area up to the outer surface of the grappler arm lifting area
[c] free area for support tube and safety device

Figure B.2 — Bearing with supporting leg retracted (transport position), type A2

Dimensions in millimetres

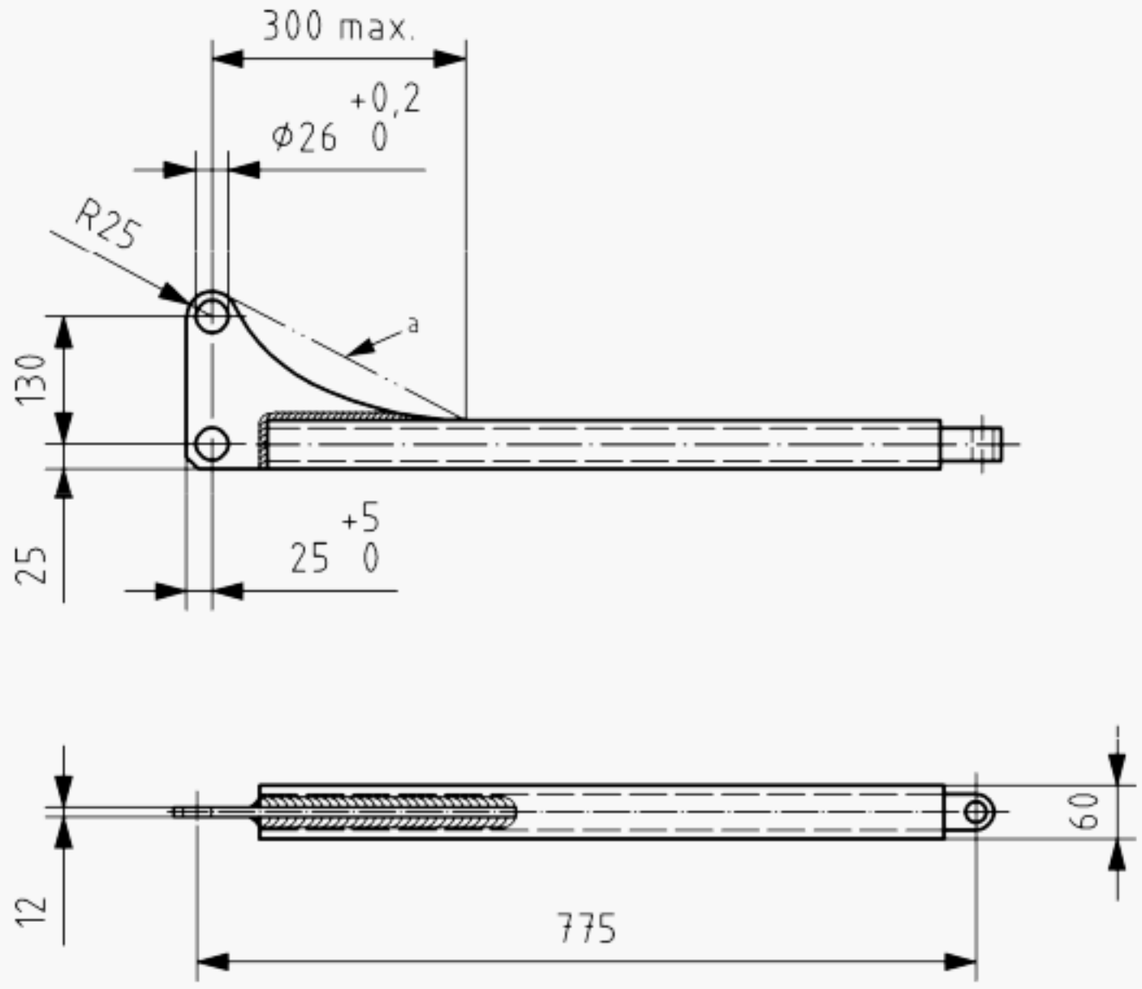


Key

1 swap body frame
2 bottom fitting
3 supporting leg
4 brace
5 heel of brace
[a] heel of brace, shown without swap body frame
[b] second bolt is optional and only required for drop side type

Figure B.3 — Supporting leg lowered (cargo loading position)

Dimensions in millimetres



Key

[a] exterior limit for space volume used for the brace

Figure B.4 — Brace

B.4 Marking

Supporting legs according to this standard shall be marked with the following particulars in an unexposed zone:

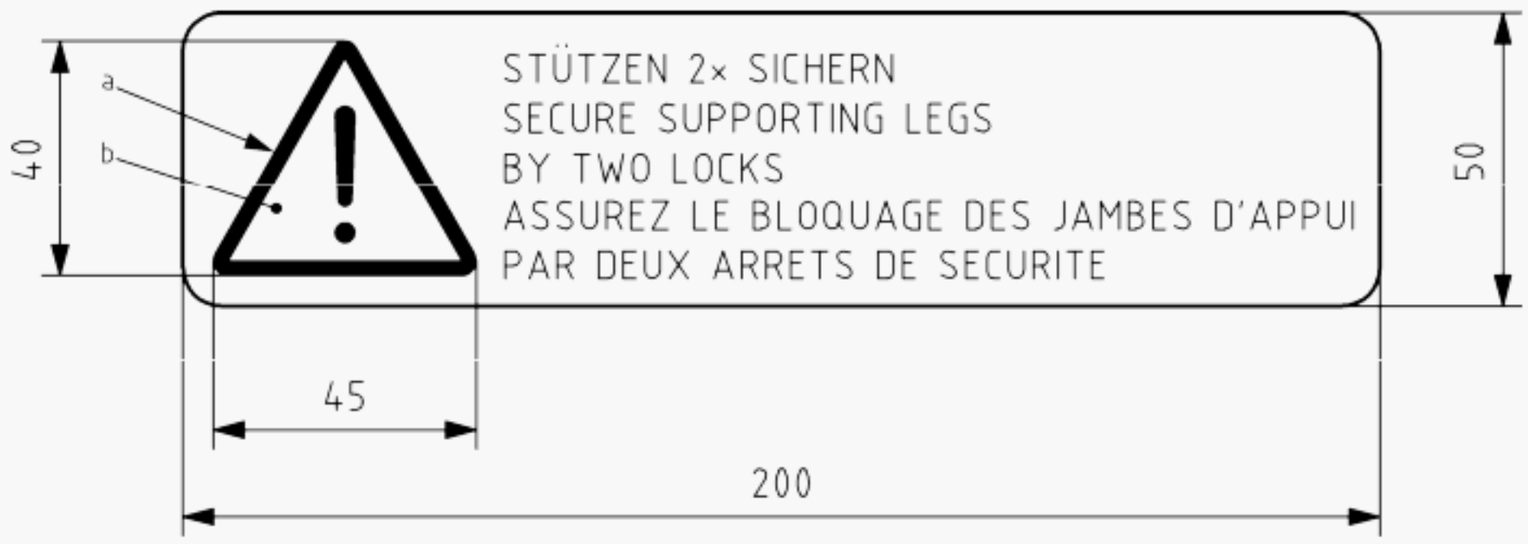
a) name or trademark of manufacturer;

b) type number;

c) rating of swap body;

d) number of this European Standard, i.e. EN 284.

Dimensions in millimetres



Key

[a] black

[b] yellow

Figure B.5 — Warning sign "Secure supporting legs by both safety devices"

Bibliography

[1] ISO 668, *Series 1 freight containers — Classification, dimensions and ratings*

[2] EN ISO 6346, *Freight containers — Coding, identification and marking (ISO 6346:1995)*

[3] CEN/TS 13853, *Swap bodies for combined transport — Stackable swap bodies type C745-S16 — Dimensions, design requirements and testing*

[4] UIC 592-4, *Swap bodies for grab handling and spreader gripping - Technical conditions*

[5] *Council Directive 96/53/EC of 25 July 1996 laying down for certain road vehicles circulating within the Community the maximum authorized dimensions in national and international traffic and the maximum authorized weights in international traffic, Official Journal L 235, 17/09/1996 P. 0059 - 0075 EC Directive No. 96/53/EC*