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**Commercial road vehicles — Mechanical
coupling between towing vehicles with
coupling mounted forward and below, and
centre-axle trailers — Interchangeability**

iTeh STANDARD PREVIEW

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*Véhicules routiers utilitaires — Accouplement mécanique entre véhicules
tracteurs à dispositif d'attelage avancé et surbaissé et remorques à
essieux centraux — Interchangeabilité*

<https://standards.iteh.ai/catalog/standards/sis/02510707-e568-488d-b94f-ea8b0257272f/iso-11407-1993>



Reference number
ISO 11407:1993(E)

Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

International Standard ISO 11407 was prepared by Technical Committee ISO/TC 22, *Road vehicles*, Sub-Committee SC 15, *Interchangeability of components of commercial vehicles and buses*. [ISO 11407:1993](https://standards.iteh.ai/catalog/standards/sist/b23f69b4-c368-488d-b94f-c86625727218/iso-11407-1993)

Annexes A, B and C of this International Standard are for information only.

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Introduction

In many countries the total length of road trains is limited by law. In view of the increasing demand for large volume transports, vehicle manufacturers have developed solutions to optimize the loading space of road trains within the legal specification. Centre-axle trailers are a well proven means to reduce the necessary free space between towing vehicles and trailer, and thus increase the loading space within the legal limitations.

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Commercial road vehicles — Mechanical coupling between towing vehicles with coupling mounted forward and below, and centre-axle trailers — Interchangeability

1 Scope

This International Standard lays down the requirements for the various elements and dimensions of a towing vehicle coupling mounted forward and below, and of a centre-axle trailer to ensure interchangeability.

NOTE 1 Annex B gives examples of different vehicle combinations: this International Standard deals only with No. B.2.2.

This International Standard applies to road trains for commercial transport of low-density, high-volume cargo of the greatest possible variety: it does not cover dedicated or special combinations such as coupling systems with an extensible drawbar. Nor does it specify limitations of maximum gross mass and overall dimensions, which are generally laid down by legislative requirements.

Vehicles whose couplings form the subject of this International Standard are not interchangeable with vehicles whose couplings are rear-mounted (which form the subject of ISO 11406[2]).

Dimensions in millimetres

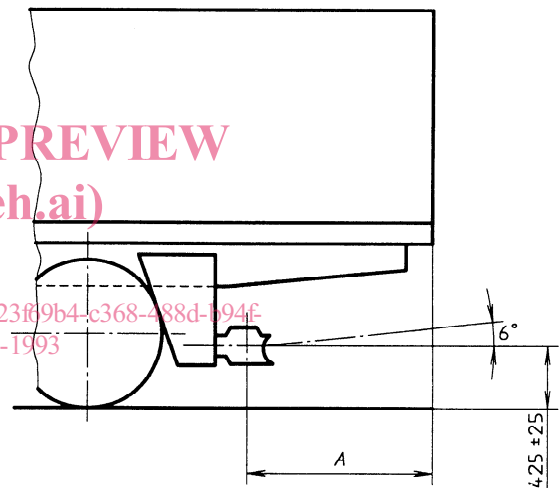


Figure 1 — Rear end of towing vehicle

2 Interchangeability dimensions

2.1 Distance between drawbar coupling axis and rear end of towing vehicle

This dimension, dimension *A* in figure 1, shall be selected from table 1.

Table 1 — Distances between drawbar coupling axis and rear end of towing vehicle

Class designation	Dimension <i>A</i>
	$\begin{matrix} 0 \\ -100 \\ \text{mm} \end{matrix}$
1 400	1 400
1 600	1 600
1 900	1 900

2.2 Turning front of trailer

The turning front of the trailer, dimension C in figure 2, is the distance between the drawbar coupling axis and the front of the trailer.

The minimum value of C , in millimetres, is determined by the equation

$$C_{\min} = \sqrt{\left(\frac{W}{2}\right)^2 + A^2} + S$$

where

- W is the vehicle width, in millimetres;
- A is as defined in 2.1;
- S is the clearance between the turning circles of the towing vehicle and the trailer, in millimetres.

S_{\min} shall be 250 mm. This ensures that no contact is possible between the towing vehicle and the front of the trailer under normal conditions of operation and turning.

Examples for C_{\min} are given in annex A.

NOTE 2 A smaller dimension C , if required by the client of the trailer manufacturer, does not exclude the risk of contact and damage to the bodies of towing vehicle and trailer, depending on the angle of articulation and on height of the vehicles. In this case, such a combination is considered a dedicated combination and is not covered by this International Standard.

2.3 Height of couplings

The height of the drawbar coupling on the laden towing vehicle shall be as shown in figure 1. The height of the towing eye on the laden centre-axle trailer shall be as shown in figure 3.

2.4 Drawbar contour

Drawbars shall comply with the dimensions shown in figures 3 and 4.

Dimensions of drawbar couplings are specified in ISO 1102[1]. However, centre-axle trailers may require reinforced drawbar eyes having dimensions larger than those specified in ISO 1102.

2.5 Rear end of towing vehicle

The configuration of the rear end of the towing vehicle shall take into account the worst case dimensions shown in figures 3 and 4.

2.6 Angle of inclination and articulation

The towing vehicle shall be so constructed that the towing vehicle and trailer components, except for those concerned with articulation, do not make contact with each other, when the angle of inclination of the centre-axle trailer relative to the towing vehicle does not exceed 6° (see figure 1).

Under manoeuvring conditions, the angle of articulation shall be able to reach 90° to either side of the towing vehicle median longitudinal plane and the angle of inclination shall be able to vary from 0 to 6°.

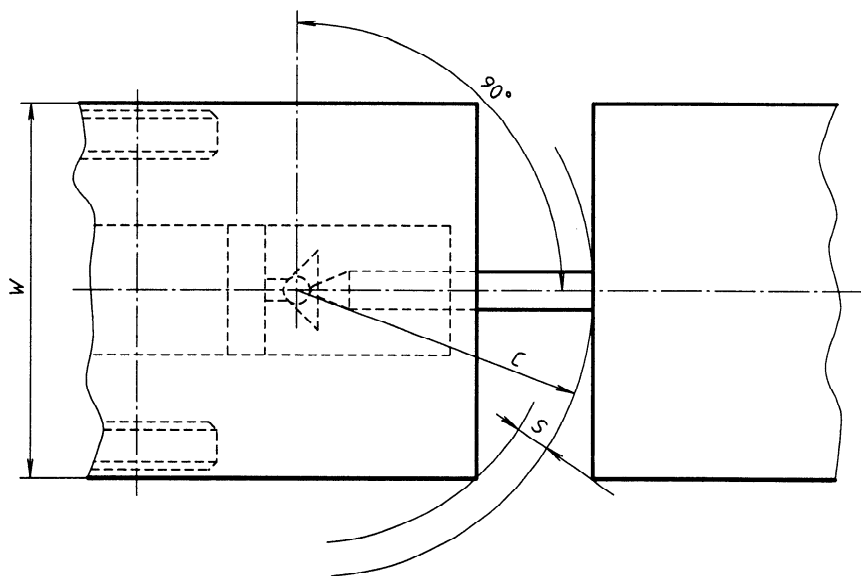


Figure 2 — Turning front of trailer

Dimensions in millimetres

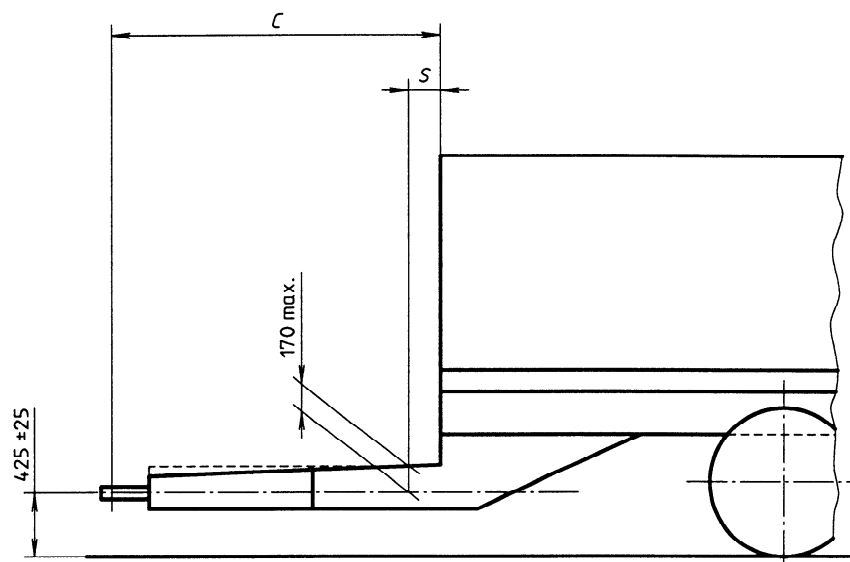


Figure 3 — Front end of centre-axle trailer
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Dimensions in millimetres

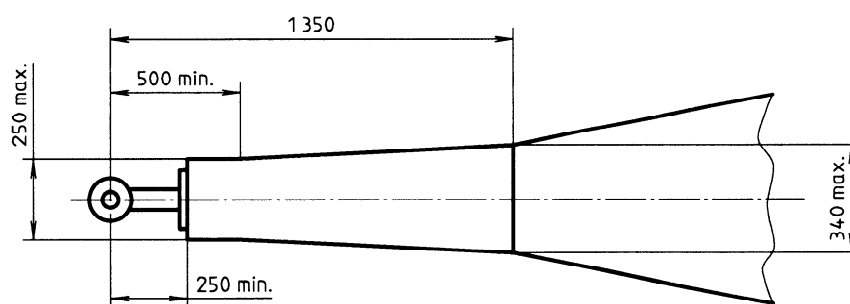


Figure 4 — Drawbar

3 Marking

Possible combinations of towing vehicle and trailers are shown in table 2.

So as to ensure easy recognition of the important but variable parameter dimension A, it is recommended

that towing vehicles and trailers which comply with this standard be marked as follows.

A plate measuring 150 mm × 150 mm min. is affixed permanently on the rear end of the towing vehicle and the front of the trailer. Markings on the plate are as shown in figure 5.

Table 2 — Combinations of towing vehicle and trailers

		Towing vehicle		
		1 400	1 600	1 900
Trailer	Class			
	1 400	⊗		
	1 600	×	⊗	
	1 900	×	×	⊗

⊗ = ideal combination
 × = possible combination

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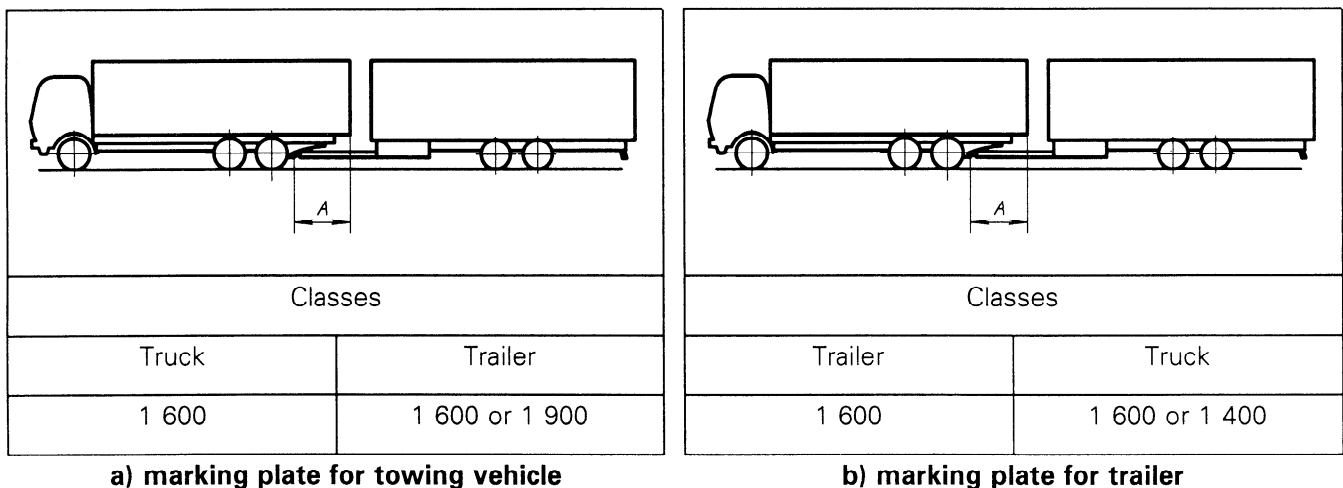


Figure 5 — Examples of markings

Annex A (informative)

Determination of dimension C

Dimension C_{\min} (see figure 2) is calculated with the equation in 2.2. Table A.1 gives classes of dimensions.

Table A.1

Dimensions in millimetres

Dimension	Example					
	1	2	3	4	5	6
A 1)	1 900	1 600	1 400	1 900	1 600	1 400
W	2 500			2 600		
S_{\min}	250					
C_{\min} 2)	2 550	2 300	2 160	2 550	2 300	2 160
1) For the class indicated (see table 1). 2) Rounded values.						

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