
**Commercial road vehicles — Mechanical
coupling between towing vehicles with
rear-mounted coupling and drawbar
trailers — Interchangeability**

*Véhicules routiers utilitaires — Accouplement mécanique entre véhicules
tracteurs à dispositif d'attelage arrière et remorque à train avant
directeur — Interchangeabilité*



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Foreword

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International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 3.

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.

Attention is drawn to the possibility that some of the elements of this International Standard may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights.

International Standard ISO 11406 was prepared by Technical Committee ISO/TC 22, *Road vehicles*, Subcommittee SC 15, *Interchangeability of components of commercial vehicles and buses*.

This second edition cancels and replaces the first edition (ISO 11406:1993), which has been technically revised.

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

Commercial road vehicles — Mechanical coupling between towing vehicles with rear-mounted coupling and drawbar trailers — Interchangeability

1 Scope

This International Standard specifies the requirements for the various elements and dimensions of towing vehicles with rear-mounted coupling and of drawbar trailers, to ensure interchangeability.

NOTE Annex B gives examples of different configurations of vehicle combinations; this International Standard deals only with No. B.1.1.

This International Standard is applicable to road trains for commercial transport of cargo of the greatest possible variety; it does not cover dedicated or special combinations. 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 mounted forward and below (which form the subject of ISO 11407^[1]).

2 Interchangeability dimensions

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

The distance between drawbar coupling axis and rear end of towing vehicle (dimension *A* in Figure 1) shall not exceed 550 mm.

NOTE It is recommended that dimension *A* lie within the range of 420 mm to 550 mm if compliance with the following conditions is required (e.g. in Europe):

- road train with a total length of 18,75 m (in accordance with Directive 96/53/EC^[2]);
- loading length/body length equal to $2 \times 7,45$ m (two C745 swap bodies in accordance with EN 284^[3]);
- $S_{\min} = 80$ mm (in accordance with 2.2);
- no close-coupling system.

When dimension *A* exceeds 420 mm, a device that enables coupling actuation at a maximum distance of 420 mm from the outer bord of the body is required.

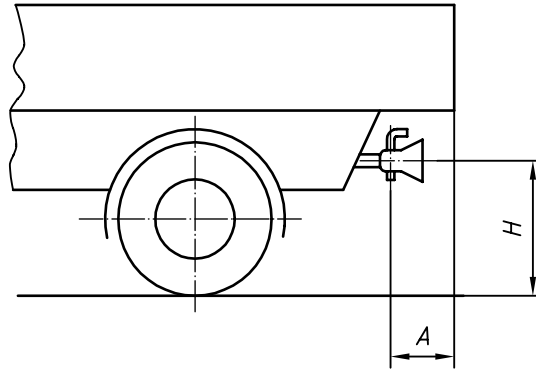


Figure 1 — Rear end of towing vehicle

2.2 Front corner radius of trailer

The front corner radius of the trailer, dimension C in Figure 2, is the minimum horizontal distance between the drawbar coupling axis and the front corner of the trailer.

The minimum value of C in a vehicle combination, dimension C_{\min} in Figure 2, in millimetres, is determined by the equation

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

where

W is the towing vehicle width, in millimetres;

A is the distance between drawbar coupling axis and rear end of towing vehicle, in millimetres;

S is the minimum clearance between adjacent corners of the towing vehicle and the trailer, in millimetres.

Based on practical experience, S shall not be less than 80 mm. This ensures that no contact is possible between the towing vehicle and the front of the trailer under normal operation.

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

NOTE A smaller value of C , if required by the owner of the trailer, can allow contact and damage. Such a combination is considered a dedicated combination and is not covered by this International Standard.

2.3 Heights of towing attachments on towing vehicle and of drawbar articulation axis on trailer

The height of towing attachments on towing vehicle, dimension H shown in Figure 1, and the height of drawbar articulation axis on trailer shall be as given in Table 1. These requirements apply equally to laden or unladen vehicles.

Table 1 — Heights

Dimensions in millimetres

| Total laden mass of vehicle or trailer, m t | Height of towing attachment on towing vehicle, H | Height of drawbar articulation axis on trailer |
|--|--|--|
| $6 < m \leq 10$ | 700 ± 150 | 700 ± 100 |
| $10 < m \leq 14$ | 850 ± 150 | 850 ± 100 |
| $14 < m$ | 900 ± 150 | 900 ± 100 |

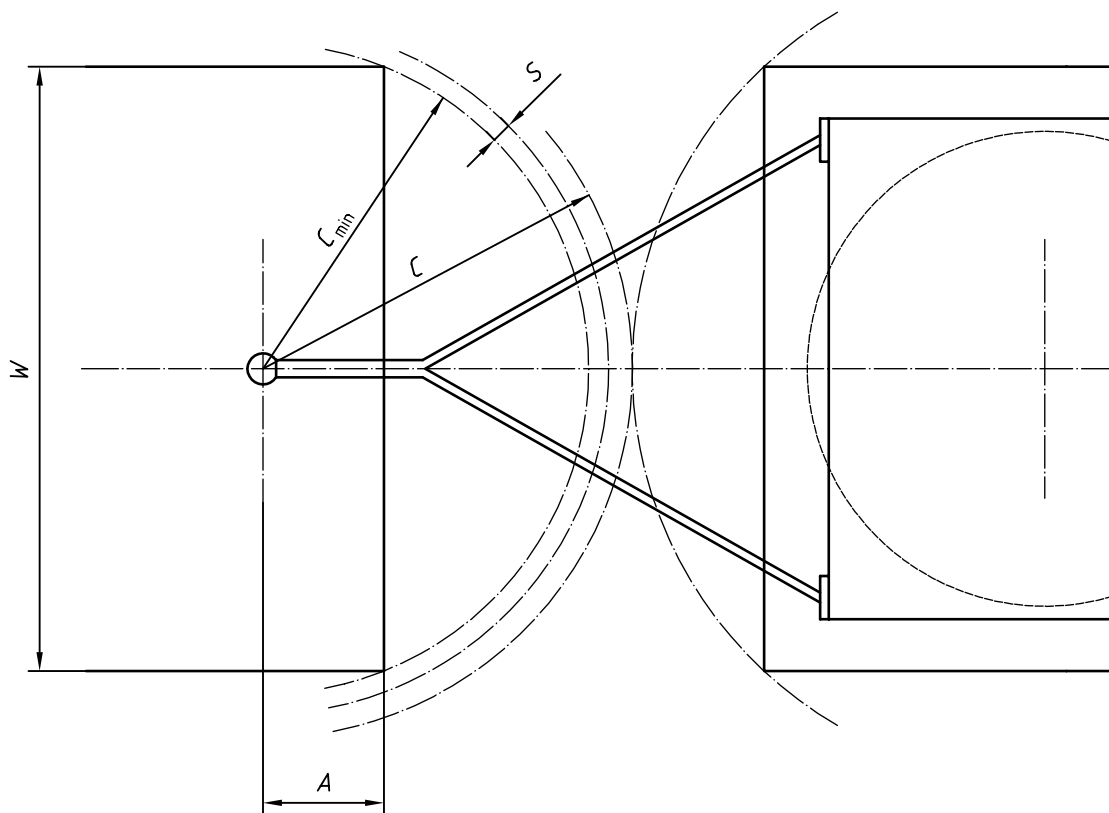


Figure 2 — Front corner radius of trailer

Annex A (informative)

Determination of dimension C_{\min}

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

Table A.1

Dimensions in millimetres

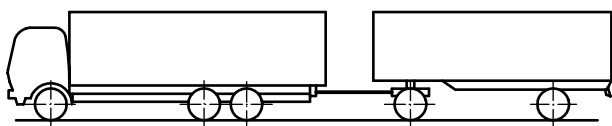
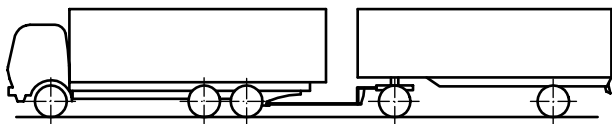
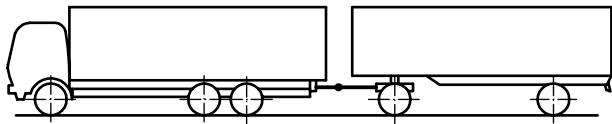
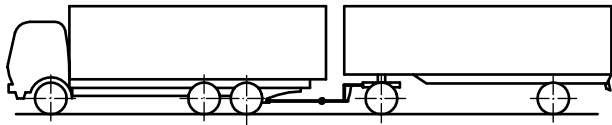
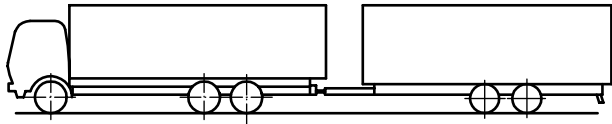
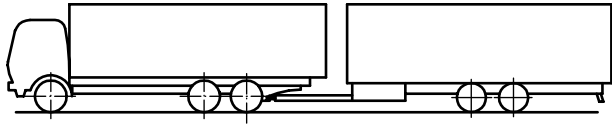
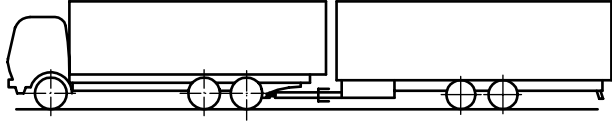
| Dimension | Example | |
|-----------------------------|---------|-------|
| | 1 | 2 |
| A | 420 | 420 |
| W | 2 500 | 2 600 |
| S_{\min} | 80 | |
| C_{\min}^a | 1 400 | 1 450 |
| ^a Rounded values | | |

Annex B (informative)

Examples of different configurations of vehicle combinations

Examples are given in Table B.1

Table B.1

| No. | Description | Figure |
|--------------|--|--|
| B.1 | Drawbar trailers | |
| B.1.1 | Towing vehicle with rear-mounted coupling and drawbar trailer. |  |
| B.1.2 | Towing vehicle with coupling mounted forward and below, and drawbar trailer. |  |
| B.1.3 | Towing vehicle with rear-mounted coupling and close-coupled drawbar trailer (extensible connection). |  |
| B.1.4 | Towing vehicle with coupling mounted forward and below, and close-coupled drawbar trailer (extensible connection). |  |
| B.2 | Centre-axle trailers | |
| B.2.1 | Towing vehicle with rear-mounted coupling and centre-axle trailer. |  |
| B.2.2 | Towing vehicle with coupling mounted forward and below, and centre-axle trailer. |  |
| B.2.3 | Towing vehicle with coupling mounted forward and below, and close-coupled centre-axle trailer (extensible connection). |  |

Bibliography

- [1] ISO 11407, *Commercial road vehicles — Mechanical coupling between towing vehicles with coupling mounted forward and below, and centre-axle trailers — Interchangeability.*
- [2] Council Directive 96/53/EC, *Directive 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.*
- [3] EN 284, *Swap bodies — Swap bodies of class C — Dimensions and general requirements.*

