

INTERNATIONAL STANDARD

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Road vehicles — Mechanical coupling between tractors and semi-trailers — Interchangeability

*Véhicules routiers — Liaisons mécaniques entre tracteurs et semi-remorques —
Interchangeabilité*



Reference number
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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 approval before their acceptance as International Standards by the ISO Council. They are approved in accordance with ISO procedures requiring at least 75 % approval by the member bodies voting.

International Standard ISO 1726 was prepared by Technical Committee ISO/TC 22, *Road vehicles*.

This second edition cancels and replaces the first edition (ISO 1726 : 1973) : the values in 2.1 have altered, 2.2 is new, and clauses 3 and 4, and the figures have all been revised and extended.

Annex A of this International Standard is given for information only.

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Road vehicles — Mechanical coupling between tractors and semi-trailers — Interchangeability

1 Scope

This International Standard specifies the various elements and dimensions of a tractor vehicle and a coupled semi-trailer which together constitute an articulated vehicle, in order to ensure interchangeability.

It specifies certain interchangeability dimensions of the gooseneck contour and operating dimensions relating to some angle values.

The requirements of this International Standard permit use of the same semi-trailer with two-axle or three-axle tractors.

NOTE — The dimensions of the 50 mm and 90 mm fifth-wheel coupling pins are specified in ISO 337^[1] and ISO 4086^[2] respectively. Mounting zones for pneumatic braking couplings are specified in ISO 1728^[3].

The articulated vehicles are intended for commercial transport of cargo of the greatest possible variety: this International Standard does not necessarily cover special combination types (e.g. high-cube vehicles, low-bed vehicles, tipper vehicles).

Limitations of maximum gross mass and overall dimensions are generally laid down by legislative requirements.

2 Interchangeability dimensions

2.1 Height of fifth wheel of laden tractor

The height of the fifth wheel of a laden tractor above GRP, h (see figure 1), in millimetres, shall be $1\,200\text{ mm} \pm \frac{100}{50}\text{ mm}$.

To establish conformity, the height of the fifth wheel of the laden tractor, h , in millimetres, may be determined according to the following formula (see figures 1, 2 and 3):

$$h > 0,137 l_1 + 0,095 b + r + r_1 - 143,5$$

where

l_1 is the distance between the coupling axis and the axis of the rearmost axle of the tractor;

b is the total width of the tyres at the rearmost axle of the tractor;

r is the radius of the tyres, unladen;

r_1 is the radius of the tyres, laden.

2.2 Height of fifth wheel of unladen tractor

The height of the fifth wheel of an unladen tractor above GRP, h (see figure 1) shall be 1 400 mm max.

2.3 Forward clearance zone radius of semi-trailer

The forward clearance zone radius of the semi-trailer, d (see figure 4), shall be 2 040 mm max.

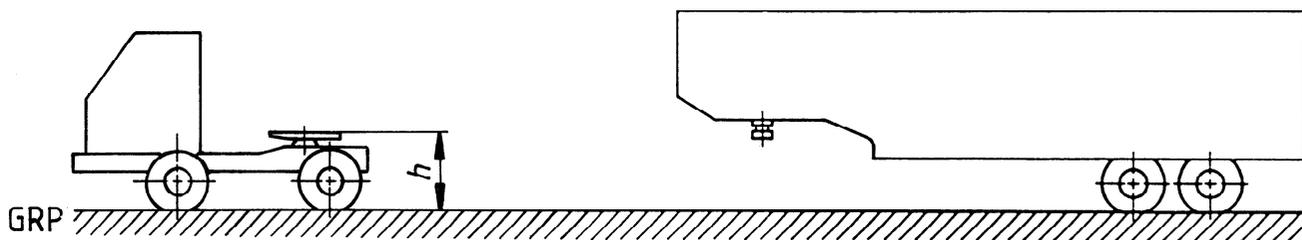


Figure 1 — Height of fifth wheel



Figure 2 — Horizontal position of fifth wheel

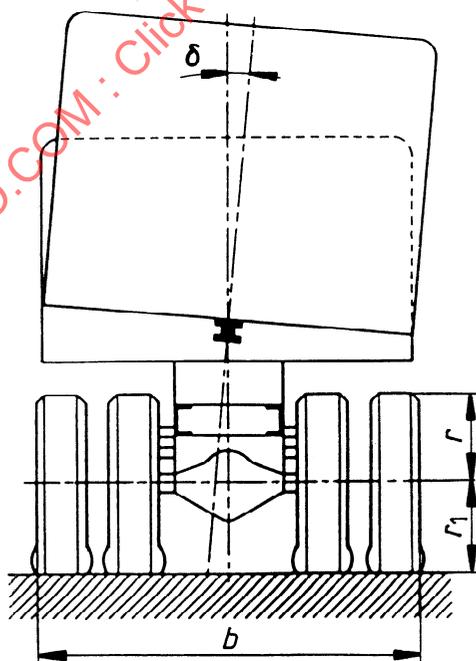


Figure 3 — Lateral inclination

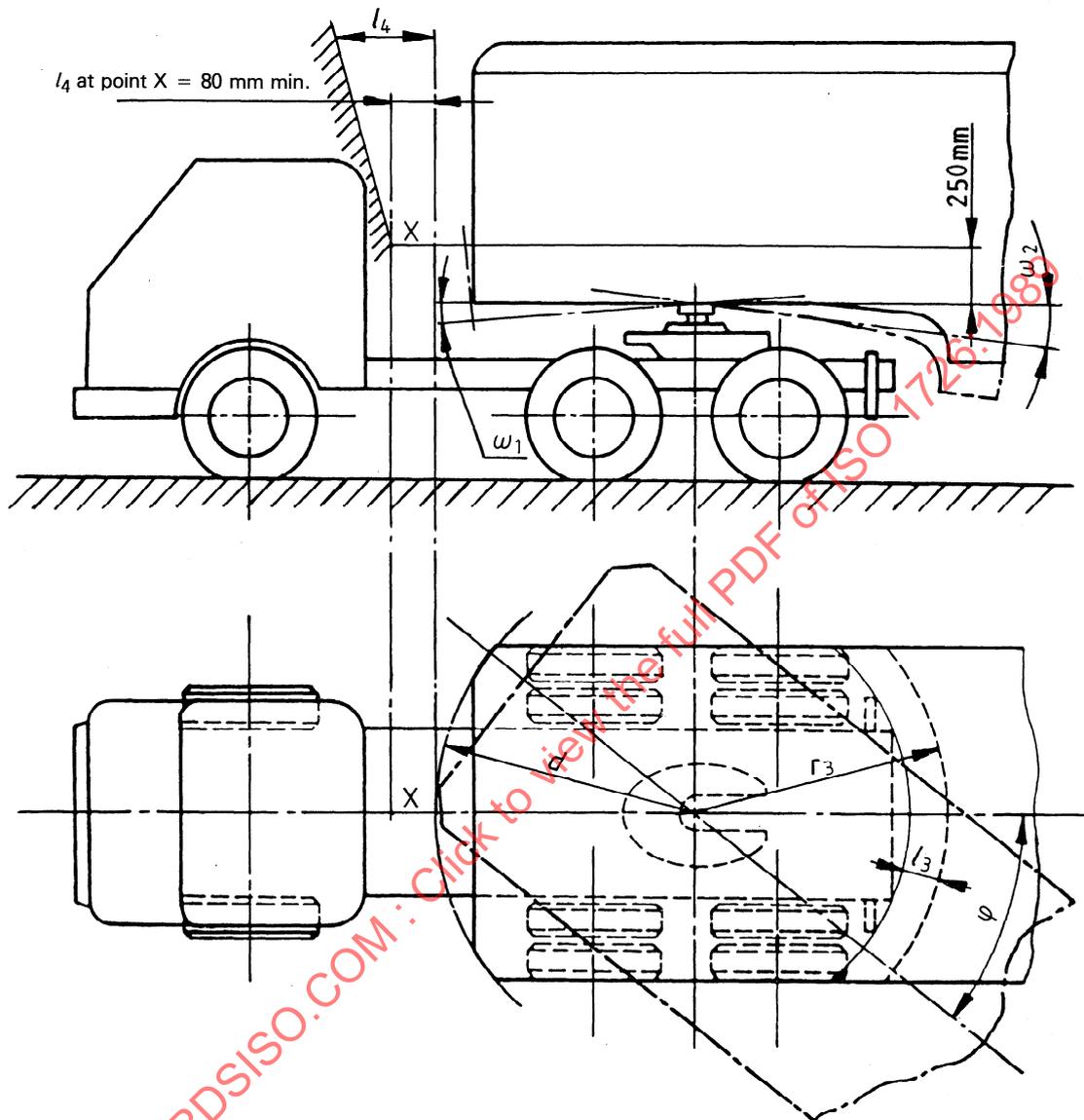


Figure 4 — Free space between tractor and semi-trailer

2.4 Gooseneck contour

The gooseneck shall be located on the outside of the surface of revolution generated about the vehicle coupling vertical axis, as shown in figure 5 and described below.

The generator is constituted as follows:

- a part AB of length l_2 , situated in the horizontal plane of the centre of the coupling and in the median longitudinal plane of the semi-trailer;
- a part BC situated in the same median plane making an angle γ with the horizontal plane;
- an arc of a circle of radius r_2 , tangential on one hand to the portion BC previously defined and on the other hand to a vertical portion DE situated in the median at a distance and radius r_3 from the coupling axis.

During the rotation of the generator, AB describes a horizontal plane, BC describes a conical surface of revolution, the arc of the circle describes a portion of a torus, and the vertical axis DE describes a portion of the surface of a cylinder of revolution.

The values adopted for these elements of the generator are as follows:

$$l_2 = 750 \text{ mm}$$

$$\gamma = 4^\circ$$

$$r_2 = 450 \text{ mm}$$

$$r_3 = 2\,300 \text{ mm}$$

These dimensions allow the determination of the centre of the circle of radius r_2 .

3 Operating dimensions

3.1 Angles of inclination of semi-trailer in relation to tractor

The tractor shall be so constructed that the tractor and the semi-trailer components, except for those concerned with articulation, do not make contact with each other when the articulated vehicle is running in a straight line, when the angle of inclination of the semi-trailer relative to the tractor does not exceed the following values (see figure 4):

$$\omega_1 = 6^\circ \text{ towards the front;}$$

$$\omega_2 = 7^\circ \text{ towards the rear.}$$

For the purposes of the measurement of ω_1 and ω_2 , the fifth-wheel plate is assumed to be situated in a horizontal plane. The tractor shall be set at the attitude which corresponds to the design laden condition when the tractor is standing on a horizontal plane.

3.2 Lateral inclination

When the trailer is at a lateral inclination, δ (see figure 3), of a maximum of 3° relative to the tractor chassis, there shall be no contact between the tractor chassis and the semi-trailer.

3.3 Angle of articulation

The angle of articulation, φ (see figure 4), is the projection of the angle between the longitudinal axes of the tractor and semi-trailer in the horizontal plane.

3.3.1 The articulation of the vehicle shall be such that no contact is made between the semi-trailer and the tyres of the tractor, taking into account the maximum value $\omega_2 = 7^\circ$ for all angles φ up to 25° , for both two-axle and three-axle tractors.

3.3.2 Under manoeuvring conditions, the angle of articulation φ shall be able to reach 90° and the angle of inclination ω_2 vary from 7° to 3° as the angle φ varies from 25° to 90° .

3.4 Free space between tractor and semi-trailer

The free space between the tractor and semi-trailer is measured as follows (see figure 4).

3.4.1 l_3 is the distance between two cylinders of revolution, both having the kingpin axis as their axis. One of these cylinders has radius r_3 (lower part of the gooseneck) and the other is the cylinder of smallest radius within which all points of the rear part of the tractor are located:

$$l_3 = 100 \text{ mm min.}$$

3.4.2 l_4 is the clearance between the surface of the cylinder of revolution having as its axis the axis of the fifth wheel coupling, and of radius d , and a conical surface of revolution having the same axis. This conical surface is generated by a line making an angle of 6° from the vertical towards the front of the tractor. A point X of this surface is positioned on the plane of symmetry of the semi-trailer at a height of 250 mm above the fifth-wheel coupling face.

$$\text{At this point, } l_4 = 80 \text{ mm min.}$$