

# INTERNATIONAL STANDARD

**ISO**  
**1103**

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## **Road vehicles — Coupling balls for caravans and light trailers — Dimensions**

*Véhicules routiers — Boules d'attelage pour caravanes et remorques  
légères — Caractéristiques dimensionnelles*



Reference number  
ISO 1103:1996(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 1103 was prepared by Technical Committee ISO/TC 22, *Road vehicles*, Subcommittee SC 4, *Caravans and light trailers*.

This third edition cancels and replaces the second edition (ISO 1103:1976), of which it constitutes a technical revision.

Annex A of this International Standard is for information only.

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# Road vehicles — Coupling balls for caravans and light trailers — Dimensions

## 1 Scope

This International Standard lays down the dimensions necessary for the compatibility of mechanical coupling devices between light trailers or caravans and towing vehicles when the latter are fitted with a coupling ball. The clearance space around the coupling ball is intended to allow coupling and decoupling of towed vehicles, and safe operation during coupling and uncoupling of mechanical devices.

This International Standard applies to coupling balls designed for caravans and light trailers of categories  $O_1$  and  $O_2$ <sup>1)</sup>, which have a maximum authorized total mass (ISO-M08), as defined in ISO 1176, less than or equal to 3,5 t. It does not necessarily apply to special trailers drawn by special vehicles.

## 2 Normative references

The following standards contain provisions which, through reference in this text, constitute provisions of this International Standard. At the time of publication, the editions indicated were valid. All standards are subject to revision, and parties to agreements based on this International Standard are encouraged to investigate the possibility of applying the most recent editions of the standards indicated below. Members of IEC and ISO maintain registers of currently valid International Standards.

ISO 1176:1990, *Road vehicles — Masses — Vocabulary and codes.*

ISO 3853:1994, *Road vehicles — Towing vehicle coupling device to tow caravans or light trailers — Mechanical strength test.*

## 3 Dimensional characteristics

### 3.1 Coupling ball

**3.1.1** The dimensions and tolerances of coupling balls shall conform to those shown in figure 1 and the requirements of 3.1.2 to 3.1.5.

**3.1.2** The diameter of the spherical part of the surface of the coupling ball shall be  $50 \text{ }^{0}_{-0,39} \text{ h13}$  (50 mm).

**3.1.3** The surface referred to in 3.1.2 is the portion of a sphere, the upper part of which is limited by a horizontal plane which forms a flat circular surface of diameter  $(17 \pm 2) \text{ mm}$ . The lower part is limited by a horizontal plane which is located at least 15 mm below the centre of the sphere.

**3.1.4** The connecting radius between the ball and the neck should be tangential both to the neck and to the lower horizontal surface as defined in 3.1.3.

**3.1.5** The diameter of the neck of the ball shall be between 27 mm and 29 mm, down to a horizontal plane situated at not less than 32 mm below the centre of the sphere.

1) Definitions from UN-ECE Regulation No. 13, incorporating the 06 series of amendments:

**Category  $O_1$ :** Single-axle trailers, other than semi-trailers, with a maximum mass not exceeding 0,75 t.

**Category  $O_2$ :** Trailers with a maximum mass not exceeding 3,5 t other than trailers of category  $O_1$ .

### 3.2 Installation dimensions

**3.2.1** The axis of the ball neck passes through the centre of the ball and shall be vertical down to a horizontal plane located not less than 32 mm below the centre of the ball.

**3.2.2** The centre of the ball shall be located at a distance from the ground between 350 mm and 420 mm when the vehicle has maximum design total mass (ISO-M07), conforming to ISO 1176, and the load is distributed on the axles as defined by the vehicle manufacturer.

**3.2.3** The clearance space to be maintained around the coupling ball shall be as indicated in figure 2. This clearance space is provided to allow normal coupling and uncoupling operations with angles  $\alpha$  less than  $10^\circ$  and  $\beta$  less than  $60^\circ$ , and free movement angles

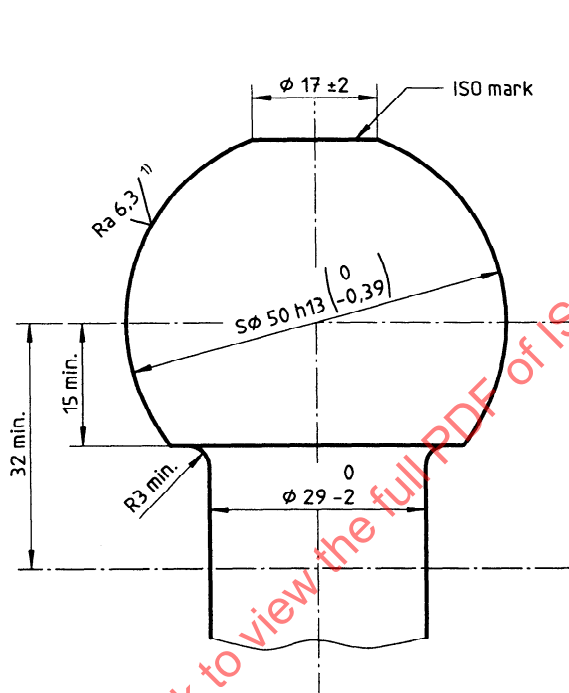
of the coupling head with angles  $\alpha$  less than  $25^\circ$  and  $\beta$  less than  $60^\circ$ , in the locked position.

**3.2.4** The clearance space may be occupied by equipment which is not demountable such as a spare wheel. It is recommended that such equipment is mounted to one side of the coupling, to allow adequate access and to reduce the risk of (hand) injuries to users during coupling or uncoupling.

### 4 Marking

Coupling balls complying with the requirements of this International Standard shall have the marking "ISO 50" applied on the flat circular surface of diameter  $(17 \pm 2)$  mm as defined in 3.1.3. This marking, which only implies dimensional conformity, shall be complemented if necessary by the marking prescribed in ISO 3853.

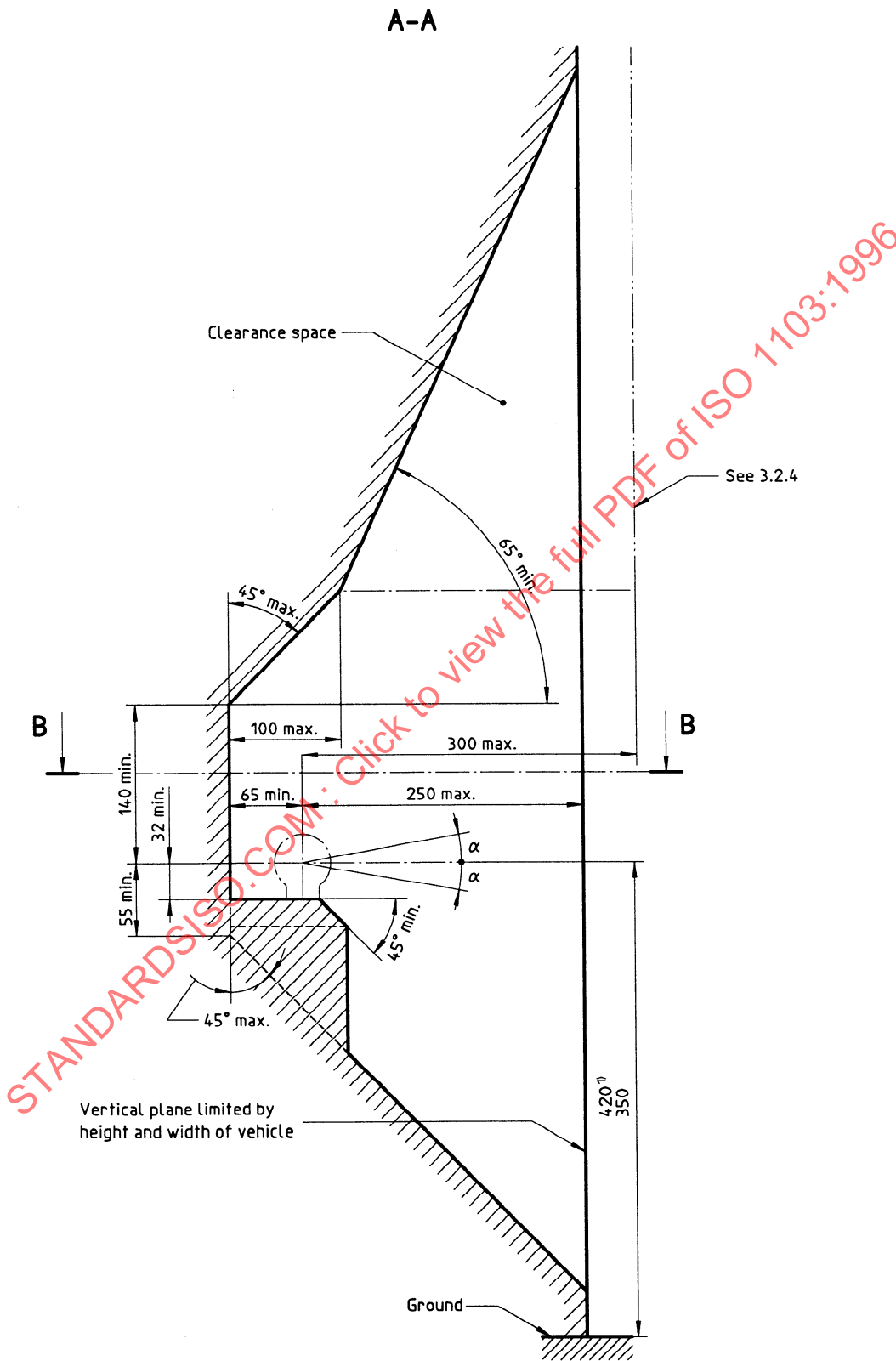
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1) Corresponds to roughness grade N9 of ISO 1302:1978.

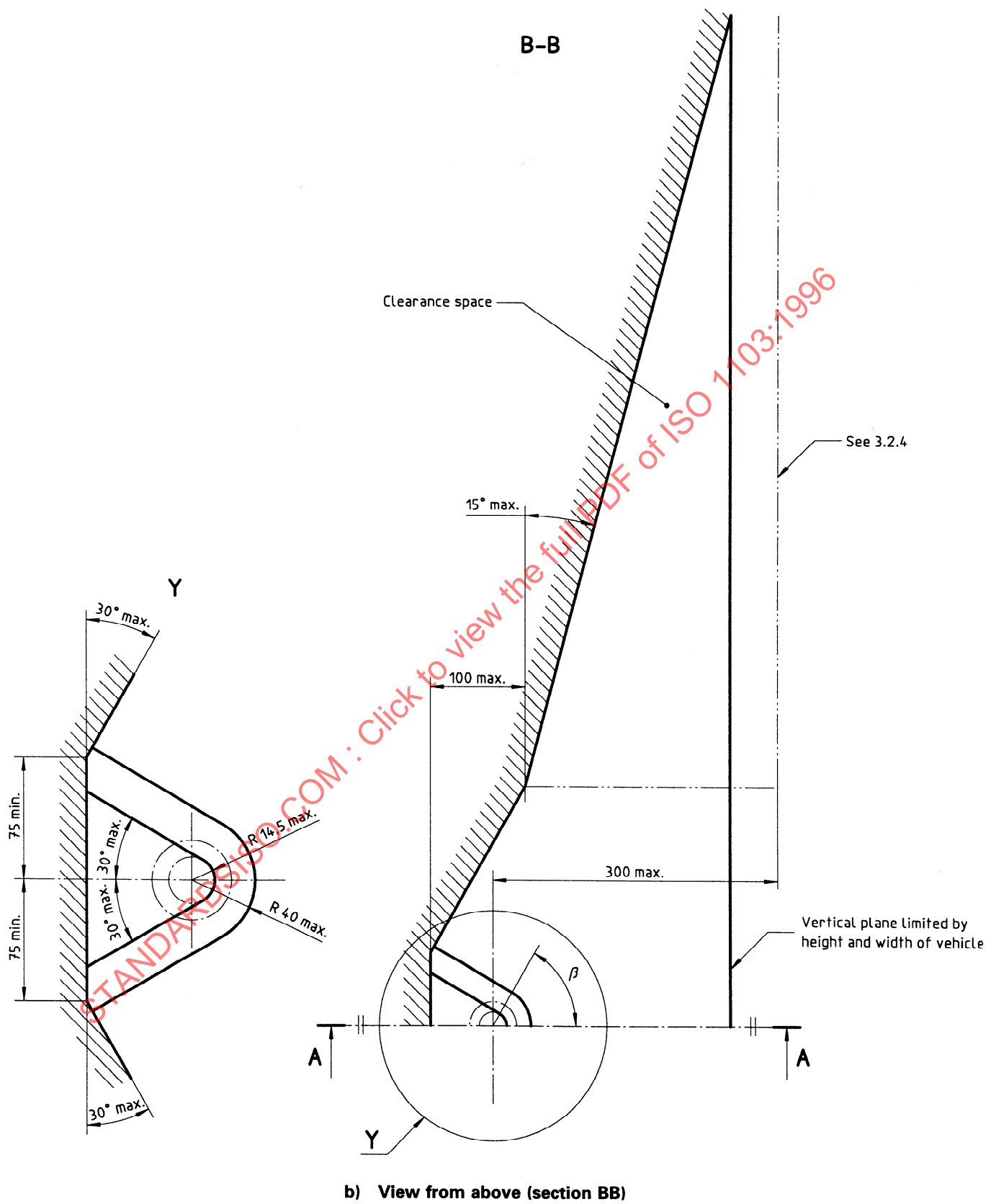
**Figure 1 — Dimensions of the coupling ball**

Dimensions in millimetres



1) See 3.2.2.

a) Profile view (section AA)



**Figure 2 — Clearance space around the coupling ball**

## **Annex A**

(informative)

### **Bibliography**

- [1] ISO 286-2:1988, *ISO system of limits and fits — Part 2: Tables of standard tolerance grades and limit deviations for holes and shafts.*
- [2] ISO 468:1982, *Surface roughness — Parameters, their values and general rules for specifying requirements.*
- [3] ISO 1302:1992, *Technical drawings — Method of indicating surface texture.*
- [4] UN-ECE Regulation No. 13, *Uniform provisions concerning the approval of vehicles with regard to braking*, incorporating the 06 series of amendments.

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