
Agricultural vehicles — Mechanical connections between towed and towing vehicles — Dimensions of ball-type coupling device (80 mm)

Véhicules agricoles — Liaisons mécaniques entre véhicules remorqueurs et véhicules remorqués — Dimensions des dispositifs d'attelage de type à boule (80 mm)



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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 2.

The main task of technical committees is to prepare International Standards. 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.

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ISO 24347 was prepared by Technical Committee ISO/TC 23, *Tractors and machinery for agriculture and forestry*, Subcommittee SC 4, *Tractors*.

Introduction

The aim of this International Standard is to ensure the interchangeability of the mechanical connections on agricultural towing vehicles.

Agricultural vehicles — Mechanical connections between towed and towing vehicles — Dimensions of ball-type coupling device (80 mm)

1 Scope

This International Standard specifies the dimensions and location of a ball-type coupling device of 80 mm nominal diameter, whose male part fitted to an agricultural towing vehicle and female part fitted to a towed, non-balanced vehicle provides mechanical connection between the two vehicles, where the downwards vertical static load does not exceed 40 kN.

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.

ISO 500-1:2004, *Agricultural tractors — Rear-mounted power take-off types 1, 2 and 3 — Part 1: General specifications, safety requirements, dimensions for master shield and clearance zone*, corrected by ISO 500-1:2004/cor.1:2005

ISO 500-2:2004, *Agricultural tractors — Rear-mounted power take-off types 1, 2 and 3 — Part 2: Narrow-track tractors, dimensions for master shield and clearance zone*

ISO 5673-2:2005, *Agricultural tractors and machinery — Power take-off drive shafts and power-input connection — Part 2: Specification for use of PTO drive shafts, and position and clearance of PTO drive line and PIC for various attachments*

3 Dimensions and marking

3.1 Dimensions (see Figures 1 to 4)

3.1.1 The dimensions of the ball-type coupling device shall be in accordance with Figures 1 and 2. The keeper shall be contained within the maximum metal outline.

3.1.2 The minimum clearance zone for the keeper (see Figure 4) is defined by the required movement of the trailer shank according to 3.1.4 and the dimensioning of the shank as shown in Figure 2. It shall be considered in all rotational degrees of freedom.

3.1.3 The manufacturer of the ball-type coupling device is responsible for both the design and the manufacturing quality of the ball-type coupling device such that unintentional uncoupling of the female part from the male part when subject to the maximum design load shall be prevented. The distance between the keeper and the ball centre shall be (65 ± 1) mm (see Figure 3).

3.1.4 With the specified ball-type trailer shank fixed to the tractor attachment, the shank shall be free to turn so that the angles formed with the horizontal situated in the tractor's plane of symmetry and passing through the coupling point have the following minimum values.

— **Angle of yaw:** rotation around a vertical axis passing through the coupling point — minimum value of 60° on both sides.

- **Angle of pitch:** rotation around a horizontal axis passing through the coupling point and perpendicular to the vehicle's longitudinal plane of symmetry — minimum value of 20°, top and bottom. Allowance should be made for the towing vehicle being up to ± 3° from the horizontal, due to the front or rear tyre sizes.
- **Angle of roll:** rotation around a horizontal axis passing through the coupling point and located in the vehicle's plane of symmetry — minimum value of 20°, top and bottom.

3.1.5 The yaw requirement of ± 60°, as shown in Figure 4, may be exceeded when smaller tyres and/or wide track settings are used on the towing vehicle. Decal(s) and the operator's manual of the tractor should inform of this possibility, which could result in interference.

3.1.6 Examples of dimensions for the trailer shank are given in Annex A.

3.2 Marking

The ball-type coupling device shall be permanently marked "ISO 80", with this marking located on the top or side of the trailer shank. The trailer mating connection shall be permanently and visibly marked with a size identification.

4 Location

4.1 The location of the ball-type coupling device shall be in accordance with Figure 5.

4.2 The ball-type coupling device shall be mounted in the plane of the tractor longitudinal axis.

4.3 The centre of the ball shall be located at the distance shown rearwards from the end of the power take-off (PTO) shaft in Figure 5, and as high as possible — without any part of the ball-type coupling or its construction, keeper-plate, etc. entering the clearance zone as specified in ISO 500-1 and ISO 500-2 for the PTO and in ISO 5673-2 for the PTO drive shaft.

4.4 Annex B presents the geometrical conditions to be considered generally.

Dimensions in millimetres

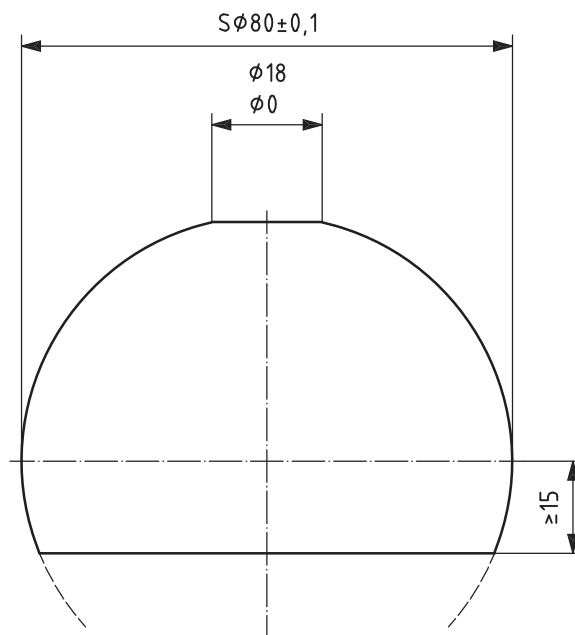
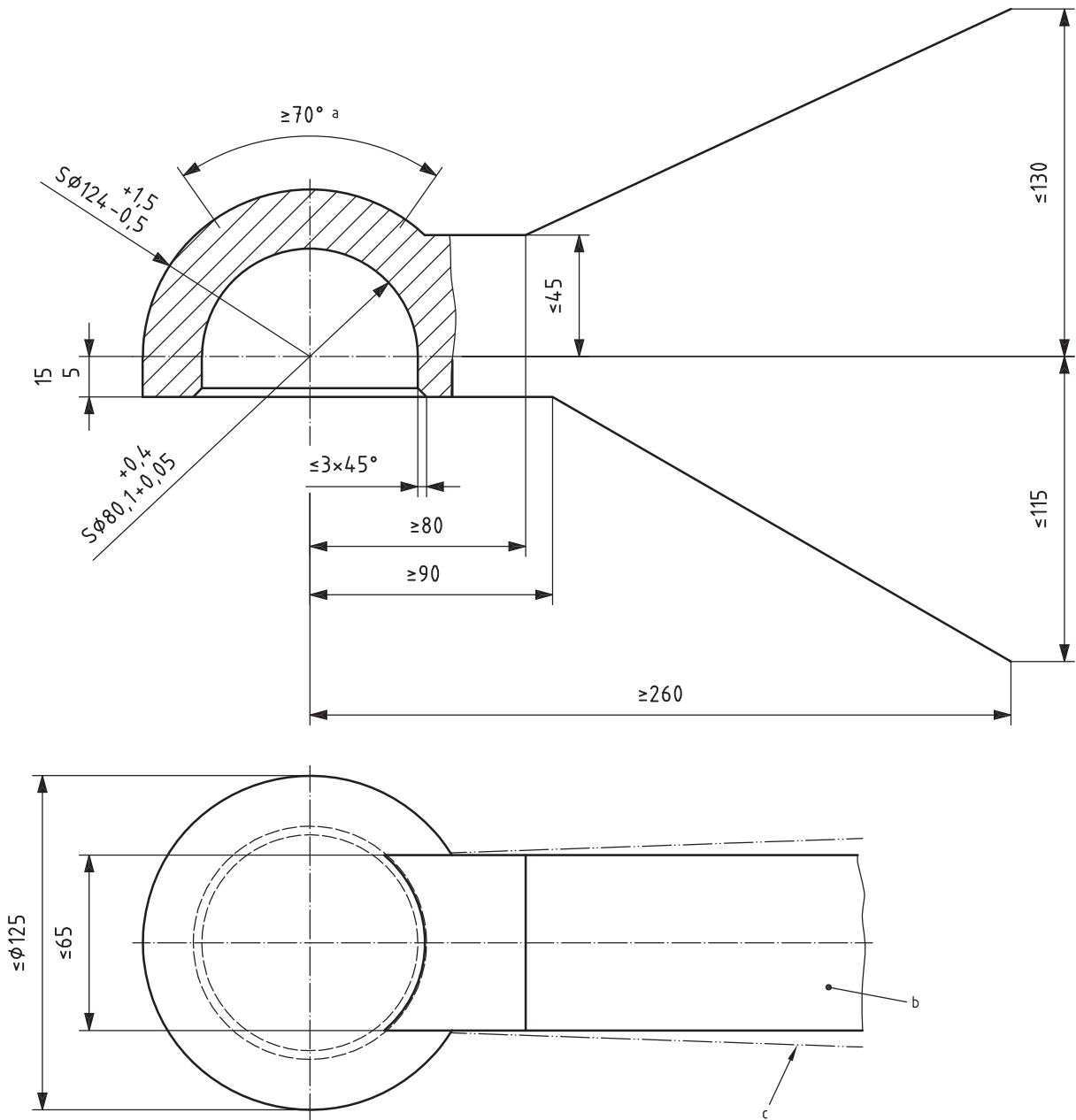


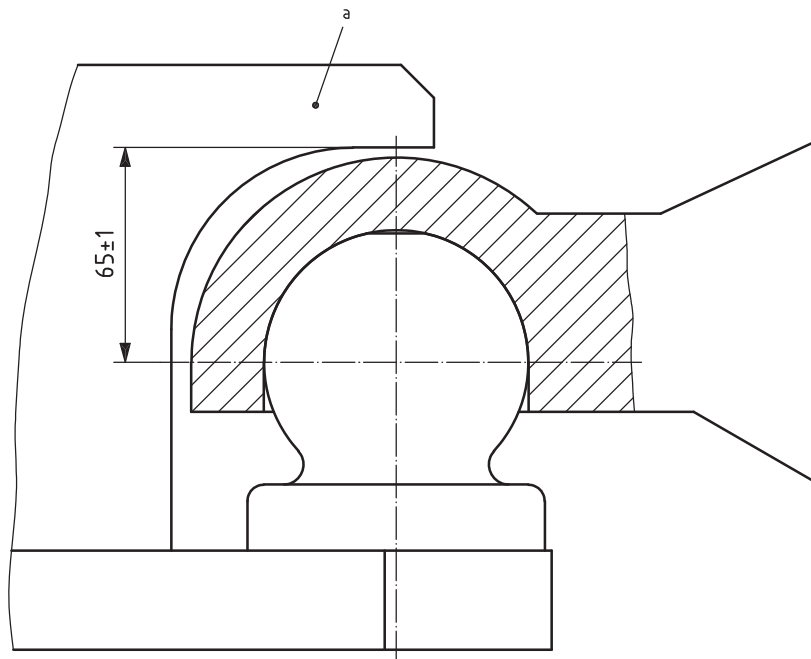
Figure 1 — Ball dimensions

Dimensions in millimetres



- a Within area, 70° min. rotating around vertical centre line.
- b Dimension of flange and/or welding versions (see Annex A)
- c Forging draft permissible.

Figure 2 — Dimensions of ball-type trailer shank



^a Keeper shape optional.

Figure 3 — Vertical location of keeper

Dimensions in millimetres

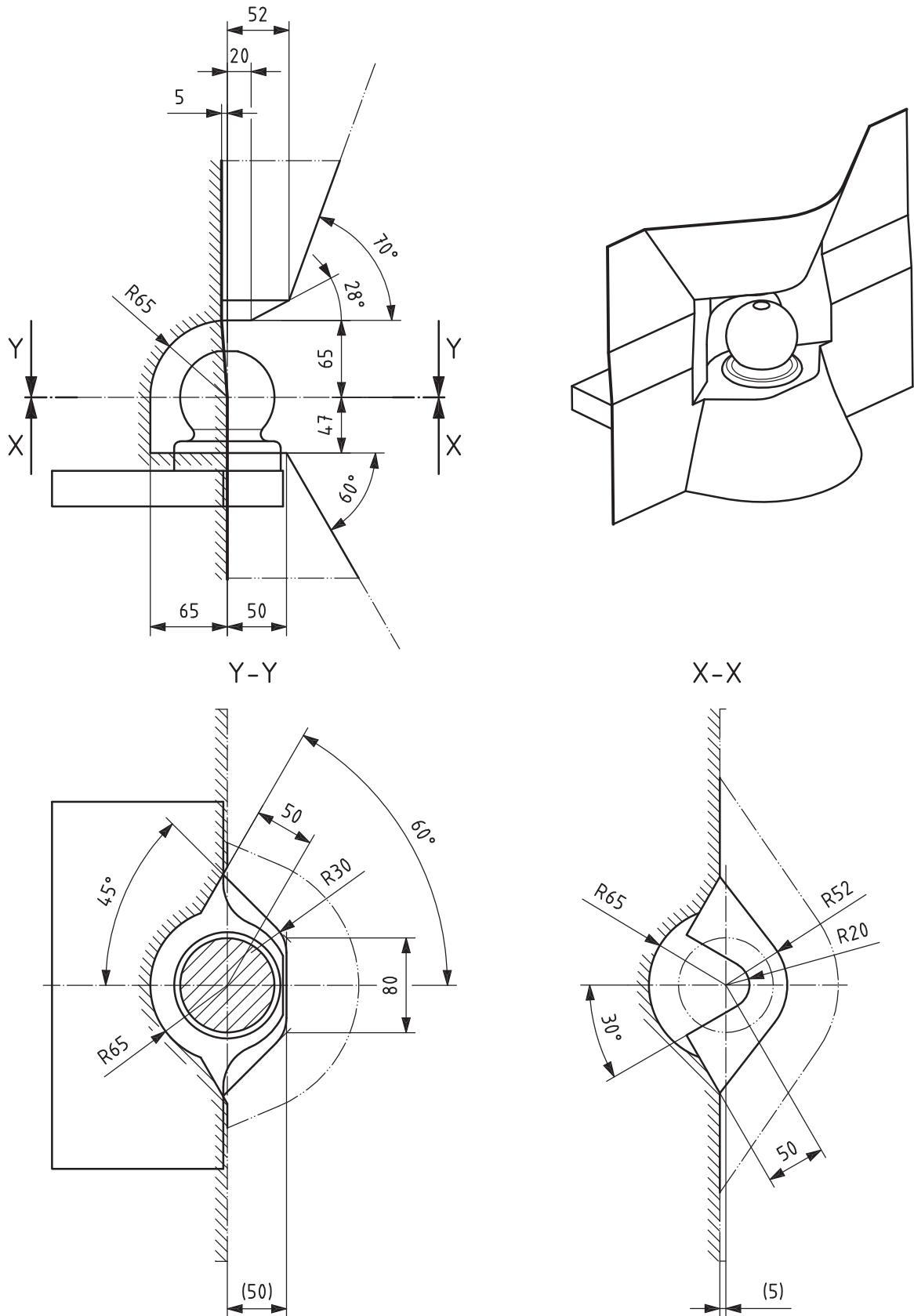
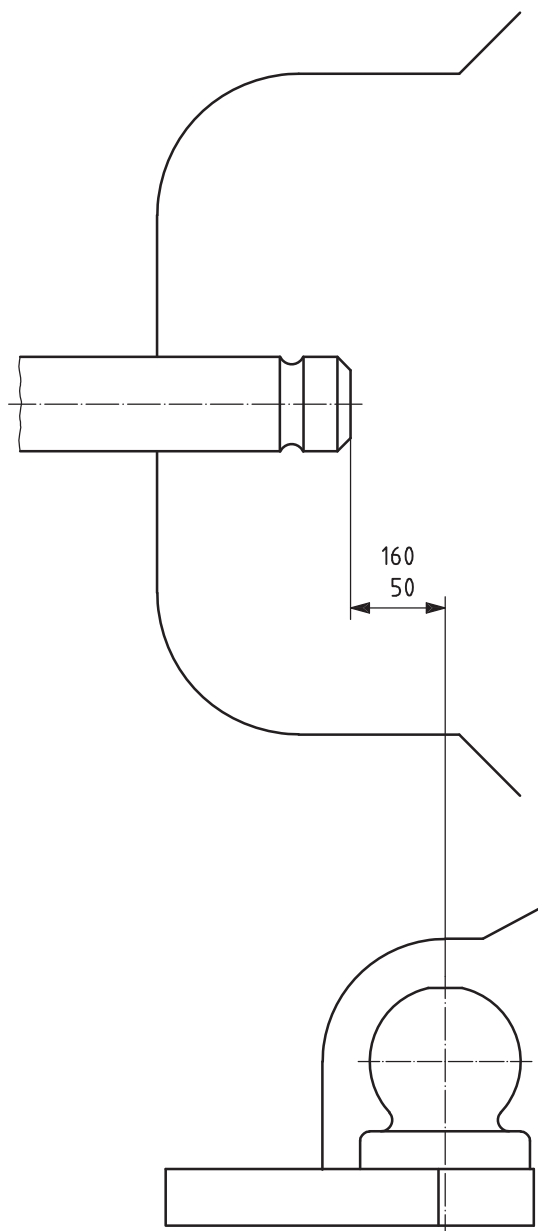


Figure 4 — Minimum clearance zone for ball-type coupling device

Dimensions in millimetres



NOTE The range of horizontal location could interfere with the PTO clearance zone (see Figure B.1) in some applications.

Figure 5 — Location of ball-type trailer shank in relation to PTO

Annex A (informative)

Examples of trailer shank configurations and dimensions

See Figures A.1 to A.4.

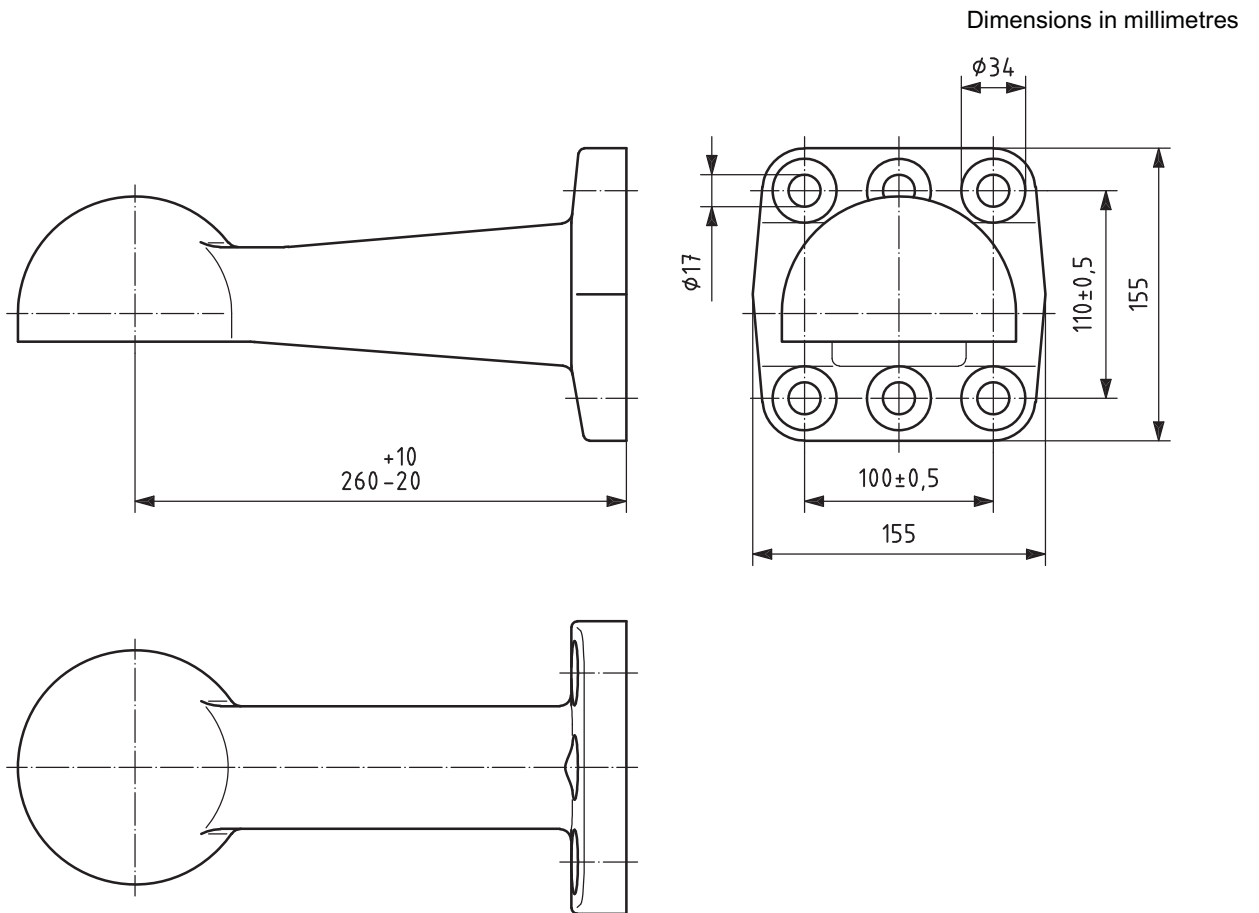


Figure A.1 — Example 1

Dimensions in millimetres

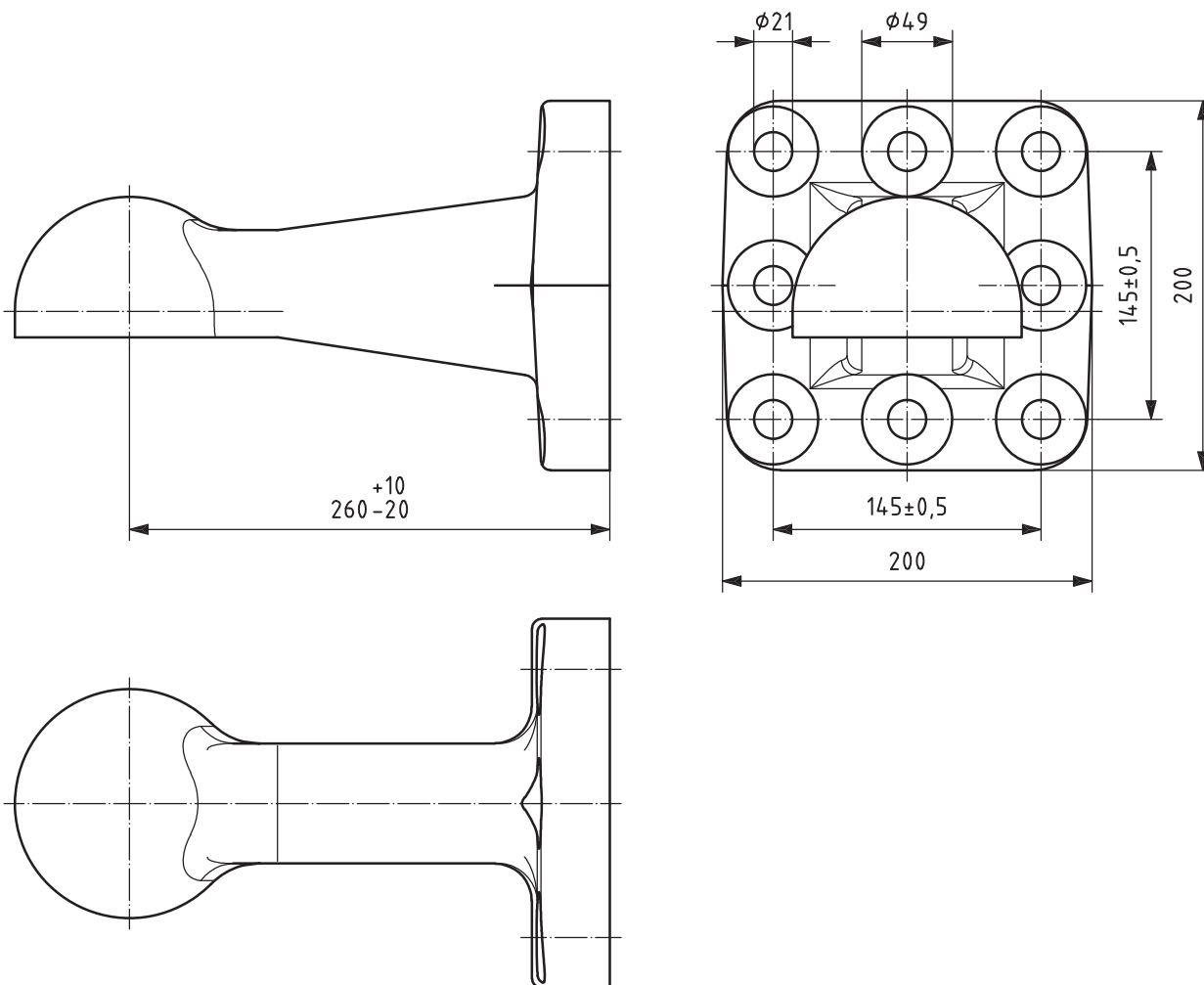


Figure A.2 — Example 2

Dimensions in millimetres

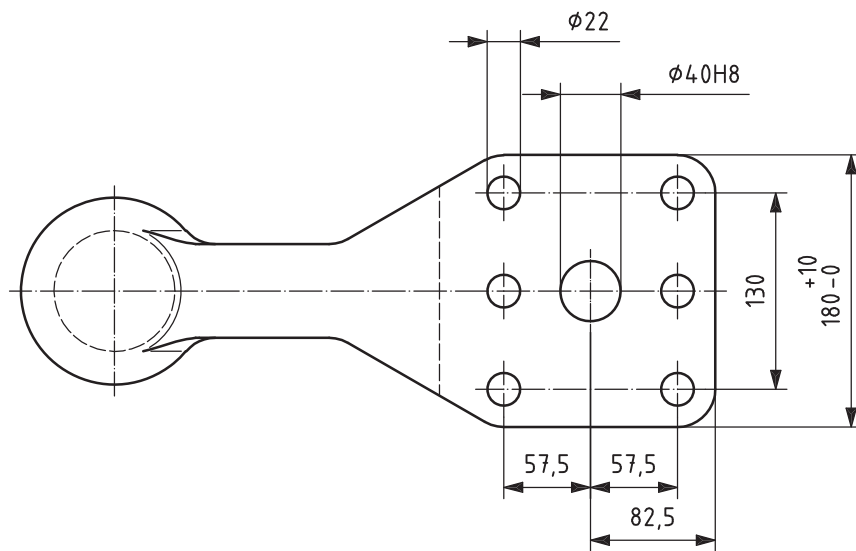
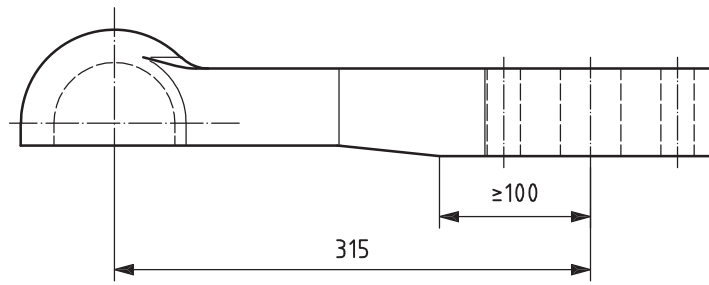


Figure A.3 — Example 3

Dimensions in millimetres

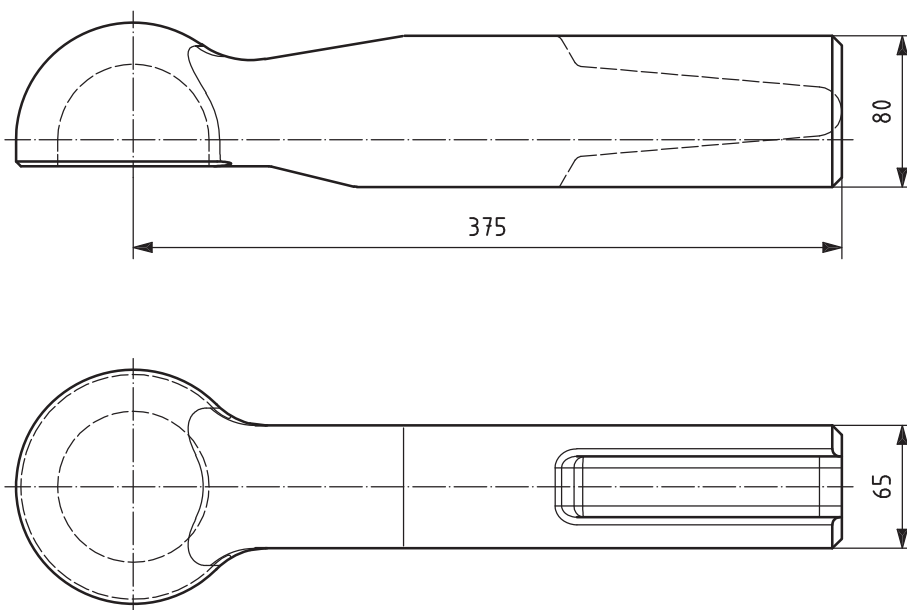
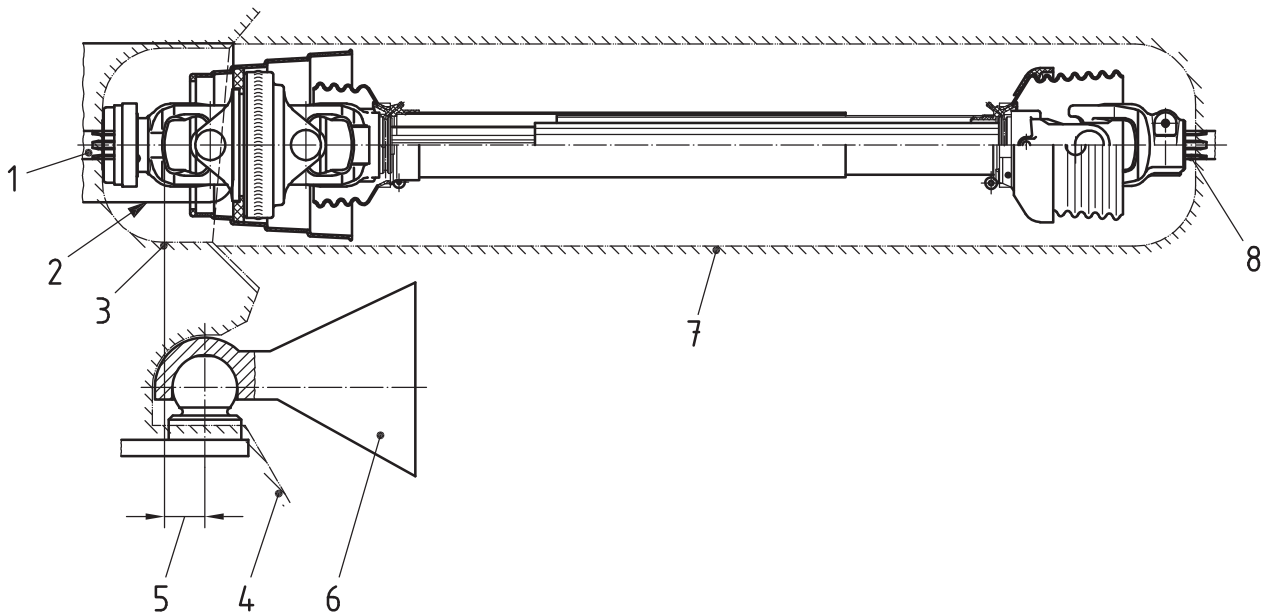


Figure A.4 — Example 4

Annex B
(informative)

Clearance zones

Figure B.1 shows the PTO, the coupling device and their clearance zones (see 4.3).



Key

- 1 tractor PTO (ISO 500-1, ISO 500-2)
- 2 tractor master shield (ISO 500-1, ISO 500-2)
- 3 PTO clearance zone, (ISO 500-1, ISO 500-2)
- 4 ball-type coupling min. clearance zone (Figure 4)
- 5 location of ball-type coupling in relation to PTO (Figure 5)
- 6 ball-type trailer shank (Figure 2)
- 7 PTO drive shaft clearance zone (ISO 5673-2)
- 8 implement PIC (ISO 5673-2)

Figure B.1 — PTO and coupling device clearance zones

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