ANSI/ASABE AD24347:2005 JUN2014
Agricultural vehicles — Mechanical connections between towed and towing vehicles — Dimensions of ball-type coupling device (80 mm)

American Society of
Agricultural and Biological Engineers

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ANSI/ASABE AD24347:2005 JUN2014
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Agricultural vehicles — Mechanical connections between towed and towing vehicles — Dimensions of ball-type coupling device (80 mm)

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This standard was reviewed for adoption by the ASABE Power and Machinery Agricultural Machinery – Agricultural Tractor Technical subcommittee, and has been formerly approved by the Technical Committee. Adopted by ASABE September 2008. Approved as an American National Standard August 2009; adoption revised to adoption with deviations June 2014; approved by ANSI June 2014.

Keywords: Dimensions, Location, Mechanical connections, Power take-off, Tractors

0 Foreword

0.1 ANSI/ASABE AD24347:2005, Agricultural vehicles — Mechanical connections between towed and towing vehicles — Dimensions of ball-type coupling device (80 mm), is an adoption with deviations of the identically titled ISO standard ISO 24347:2005, Agricultural vehicles — Mechanical connections between towed and towing vehicles — Dimensions of ball-type coupling device (80 mm). Deviations noted in the following Foreword sections pertain to those provisions where harmonization could not be achieved between ASABE and the International Standard.

0.2 ANSI/ASABE AD24347 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.

This standard is intended for higher speed towing applications when the allowable speed exceeds 40 km/h.

0.3 Three normative references are listed in ISO 24347:2005. The responsible ASABE committee has reviewed these references and approved the following deviations:

0.3.1 Replace 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, with ANSI/ASABE AD500-1:2004 W/Cor.1 OCT2011, 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. Any reference to ISO 500-1:2004 in the printed portion of the ISO 24347:2005 text shall be replaced by ANSI/ASABE AD500-1:2004 W/Cor.1 OCT2011.

0.3.2 Replace 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, with ASABE/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. Any reference to ISO 500-2:2004 in the printed portion of the ISO 24347:2005 text shall be replaced by ASABE/ISO 500-2:2004.

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0.4 This standard has been approved as an American National standard by ANSI (American National Standard Institute).

0.5 This standard deviates from ISO 24347:2005 as follows:

0.5.1 See Section 0.3 for Normative reference deviations.

Text of ISO 24347:2005, Agricultural vehicles — Mechanical connections between towed and towing vehicles — Dimensions of ball-type coupling device (80 mm), follows.

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 1–4)

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.

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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 vehicles 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 vehicles 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

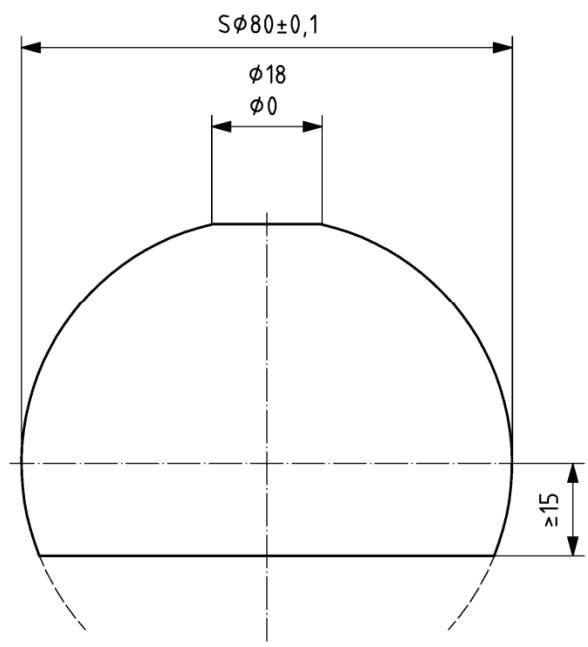

Figure 1 – Ball dimensions

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