

ANSI/ASABE AD5673-2:2005 SEP2014

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



**American Society of
Agricultural and Biological Engineers**

**S
T
A
N
D
A
R
D**

ASABE is a professional and technical organization, of members worldwide, who are dedicated to advancement of engineering applicable to agricultural, food, and biological systems. ASABE Standards are consensus documents developed and adopted by the American Society of Agricultural and Biological Engineers to meet standardization needs within the scope of the Society; principally agricultural field equipment, farmstead equipment, structures, soil and water resource management, turf and landscape equipment, forest engineering, food and process engineering, electric power applications, plant and animal environment, and waste management.

NOTE: ASABE Standards, Engineering Practices, and Data are informational and advisory only. Their use by anyone engaged in industry or trade is entirely voluntary. The ASABE assumes no responsibility for results attributable to the application of ASABE Standards, Engineering Practices, and Data. Conformity does not ensure compliance with applicable ordinances, laws and regulations. Prospective users are responsible for protecting themselves against liability for infringement of patents.

ASABE Standards, Engineering Practices, and Data initially approved prior to the society name change in July of 2005 are designated as "ASAE", regardless of the revision approval date. Newly developed Standards, Engineering Practices and Data approved after July of 2005 are designated as "ASABE".

Standards designated as "ANSI" are American National Standards as are all ISO adoptions published by ASABE. Adoption as an American National Standard requires verification by ANSI that the requirements for due process, consensus, and other criteria for approval have been met by ASABE.

Consensus is established when, in the judgment of the ANSI Board of Standards Review, substantial agreement has been reached by directly and materially affected interests. Substantial agreement means much more than a simple majority, but not necessarily unanimity. Consensus requires that all views and objections be considered, and that a concerted effort be made toward their resolution.

CAUTION NOTICE: ASABE and ANSI standards may be revised or withdrawn at any time. Additionally, procedures of ASABE require that action be taken periodically to reaffirm, revise, or withdraw each standard.

Copyright American Society of Agricultural and Biological Engineers. All rights reserved.

ASABE, 2950 Niles Road, St. Joseph, MI 49085-9659, USA, phone 269-429-0300, fax 269-429-3852, hq@asabe.org

ANSI/ASABE AD5673-2:2005 SEP2014

Approved September 2014 as an American National Standard

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

These materials are subject to copyright claims of ISO and ASABE. No part of this publication may be reproduced in any form, including an electronic retrieval system, without the prior written permission of ASABE. All requests pertaining to ANSI/ASABE AD5673-2:2005 SEP2014 standard should be submitted to ASABE.

This standard was reviewed and approved for adoption by the ASABE Power and Machinery Tractors and Tractor Implement Interface/PTO Technical committees, and has been formally approved. Adopted by ASABE September 2014; approved as an American National Standard September 2014.

Keywords: Clearance PTO drive line, Clearance zone, Dimensions, Implement power-input connection (PIC), Power take-off (PTO) drive shafts

0 Foreword

0.1 ANSI/ASABE AD5673-2:2005, 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, is an adoption with deviations of the identically titled ISO 5673-2:2005. 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 AD5673-2:2005 gives the forms and applications of power take-off (PTO) drive shafts for tractors and self-propelled machines used in agriculture, and specifies the dimensions for, and clearance zone around, the implement power-input connection (PIC) for a variety of attachments. Its intent is to ensure proper clearance between the PTO drive line and adjacent components on the implement and tractor when both implement and tractor have compatible power levels. It is not intended as a complete guide for drive-line design and does not, for example, contain information on preventing drive-line vibration or sizing a torque limiting device. It is not applicable to combinations of implements with tractors having high ground clearance, such as those working in standing vegetable crops or sugar cane, nor to agricultural tractors designed for low ground clearance, such as for lawn mowing or ground care, which require a low centre of gravity; neither is it applicable to implements non-symmetrical in design by necessity due to their function.

0.3 Seven normative references are listed in ISO 5673-2:2005. The responsible ASABE committee has reviewed these references and approved the following deviations:

0.3.1 Replace ISO 500-3:2004, Agricultural tractors — Rear-mounted power take-off types 1, 2 and 3 — Part 3: Main PTO dimensions and spline dimensions, location of PTO, with ASABE adoption ASABE/ISO 500-3:2004, Agricultural tractors — Rear-mounted power take-off types 1, 2 and 3 — Part 3: Main PTO dimensions and spline dimensions, location of PTO. Any reference to ISO 500-3:2004 in the printed portion of ISO 5673-2:2005 shall be replaced by ASABE/ISO 500-3:2004.

0.3.2 Replace ISO 730-1:1994, Agricultural wheeled tractors — Rear-mounted three-point Linkage. Categories 1N, 1, 2N, 2, 3N, 3, 4N and 4, with ANSI/ASABE AD730:2009, Agricultural wheeled tractors — Rear-mounted three-point Linkage. Categories 1N, 1, 2N, 2, 3N, 3, 4N and 4. Any reference to ISO 730-1:1994 in the printed portion of ISO 5673-2:2005 shall be replaced by ANSI/ASABE AD730:2009.



0.3.3 Replace ISO 6489-3:2004, Agricultural vehicles — Mechanical connections between towed and towing vehicles — Part 3: Tractor drawbar, with ASABE adoption ANSI/ASABE AD6489-3:2004, Agricultural vehicles — Mechanical connections between towed and towing vehicles — Part 3: Tractor drawbar. Any reference to ISO 6489-3:2004 in the printed portion of ISO 5673-2:2005 shall be replaced by ANSI/ASABE AD6489-3:2004.

0.3.4 Replace ISO 24347, Agricultural vehicles — Mechanical connections between towed and towing vehicles — Dimensions of ball-type coupling device (80 mm), with ASABE adoption ASABE/ISO 24347:2005, Agricultural vehicles — Mechanical connections between towed and towing vehicles — Dimensions of ball-type coupling device (80 mm). Any reference to ISO 24347 in the printed portion of ISO 5673-2:2005 shall be replaced by ASABE/ISO 24347:2005.

0.4 This standard has been approved as an American National standard by ANSI (American National Standards Institute). The original content of ISO 5673-2 was based on ANSI/ASAE S207 and US input.

0.5 This standard deviates from ISO 5673-2:2005 as follows:

0.5.1 See Section 0.3 for normative reference deviations.

Text of 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, follows.

1 Scope

This part of ISO 5673 gives the forms and applications of power take-off (PTO) drive shafts for tractors and self-propelled machines used in agriculture, and specifies the dimensions for, and clearance zone around, the implement power-input connection (PIC) for a variety of attachments. Its intent is to ensure proper clearance between the PTO drive line and adjacent components on the implement and tractor when both implement and tractor have compatible power levels. It is not intended as a complete guide for drive-line design and does not, for example, contain information on preventing drive-line vibration or sizing a torque limiting device. It is not applicable to combinations of implements with tractors having high ground clearance, such as those working in standing vegetable crops or sugar cane, nor to agricultural tractors designed for low ground clearance, such as for lawn mowing or ground care, which require a low centre of gravity; neither is it applicable to implements non-symmetrical in design by necessity due to their function.

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 500-3:2004, Agricultural tractors — Rear-mounted power take-off types 1, 2 and 3 — Part 3: Main PTO dimensions and spline dimensions, location of PTO

ISO 730-1:1994, Agricultural wheeled tractors — Rear-mounted three-point linkage — Part 1: Categories 1, 2, 3 and 4

ISO 6489-1:2001, Agricultural vehicles — Mechanical connections between towed and towing vehicles — Part 1: Dimensions of hitch-hooks

ISO 6489-2:2002, Agricultural vehicles — Mechanical connections between towed and towing vehicles — Part 2: Specifications for clevis coupling 40

ISO 6489-3:2004, Agricultural vehicles — Mechanical connections between towed and towing vehicles — Part 3: Tractor drawbar

ISO 6489-4:2004, Agricultural vehicles — Mechanical connections between towed and towing vehicles — Part 4: Dimensions of piton-type coupling

ISO 24347, Agricultural vehicles — Mechanical connections between towed and towing vehicles — Dimensions of ball-type coupling device (80 mm)¹

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 5673-1 apply.

4 Application and use of PTO drive shafts

4.1 Form A

A PTO drive shaft of form A with two universal joints, as shown in Figure 1, compensates for variations in angle and length of the connecting shafts between PTO and PIC. Equal angles in W- and Z-bends will ensure uniform transmission of rotary motion.

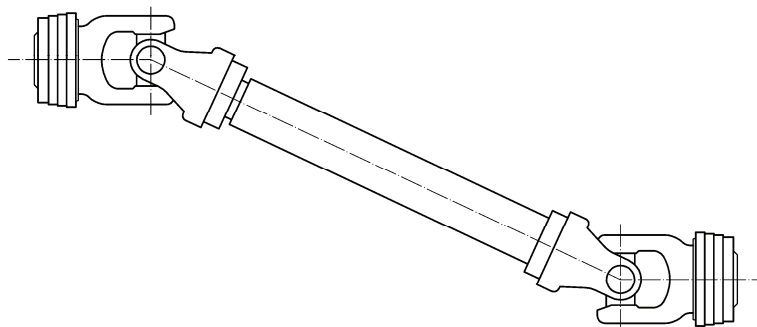


Figure 1 – PTO drive shaft — Form A

4.2 Form B

A PTO drive shaft of form B with one wide-angle constant velocity universal joint and one universal joint, as shown in Figure 2, compensates for variations in angle and length of the connecting shafts between PTO and PIC. Rotary motions will be transmitted uniformly, as long as the single joint is aligned straight or at an angle below 10°.

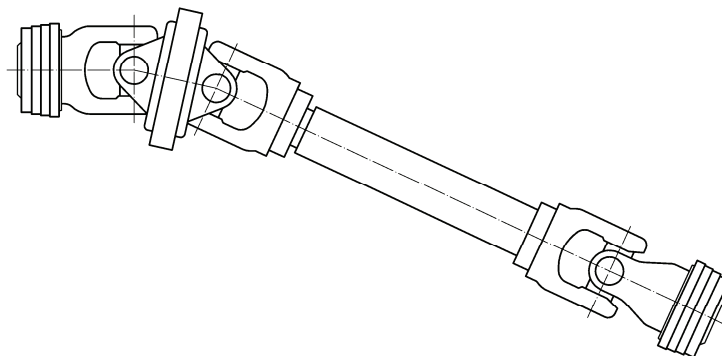


Figure 2 – PTO drive shaft — Form B

¹ To be published.