INTERNATIONAL STANDARD

ISO 5673-2

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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

Tracteurs et matériels agricoles — Arbres de transmission à cardans de prise de force et arbre récepteur de la machine —

Partie 2: Spécifications relatives à l'utilisation des arbres de transmission à cardans de prise de force, et position et dégagement de la ligne de transmission de prise de force et de l'arbre récepteur de la machine pour différents systèmes d'attelage

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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.

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.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights.

ISO 5673-2 was prepared by Technical Committee ISO/TC 23, *Tractors and machinery for agriculture and forestry*, Subcommittee SC 4, *Tractors*.

This first edition of ISO 5673-2, together with ISO 5673-1, cancels and replaces ISO 5673:1993, of which it constitutes a technical revision.

ISO 5673 consists of the following parts, under the general title *Agricultural tractors and machinery — Power take-off drive shafts and power-input connection*:

— *Part 1: General manufacturing and safety requirements*

— *Part 2: Specification for use of PTO drive shafts, and position and clearance of PTO drive line and PIC for various attachments*

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

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.

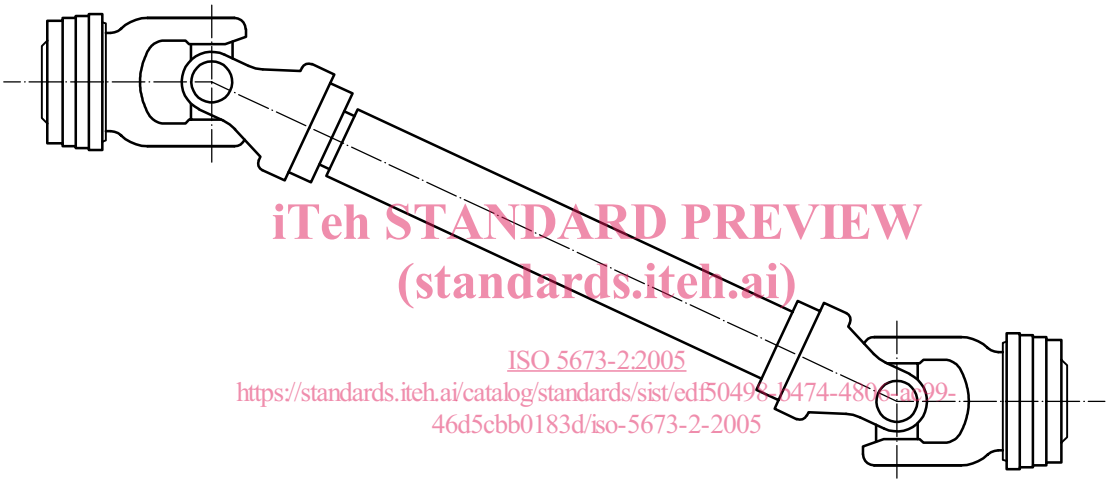


Figure 1 — PTO drive shaft — Form A

1) To be published.

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°.

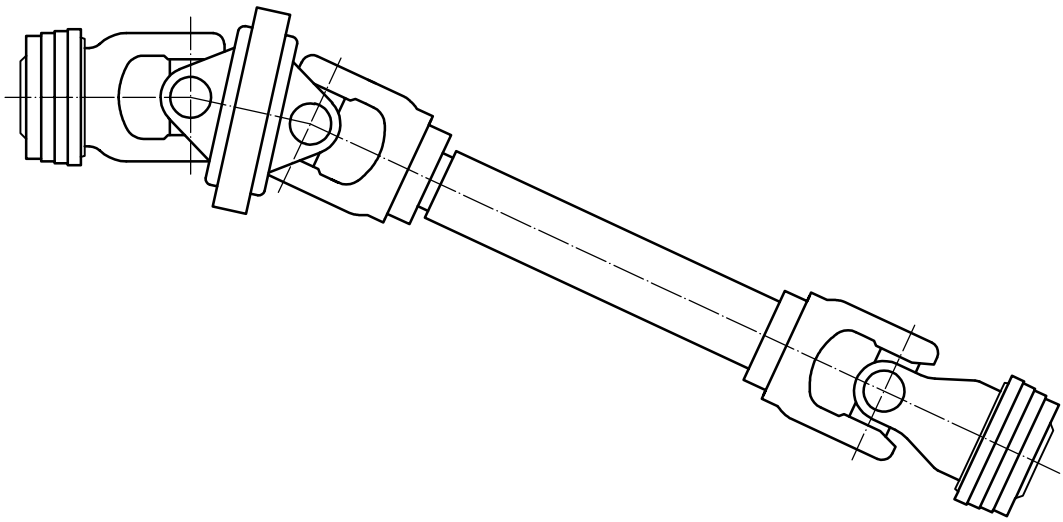


Figure 2 — PTO drive shaft — Form B

4.3 Form C

A PTO drive shaft of form C with two wide-angle constant velocity universal joints, as shown in Figure 3, compensates for variations in angle and length of the connecting shafts between PTO and PIC. Rotary motions is transmitted uniformly, even if different, or spatial bend angles are found.

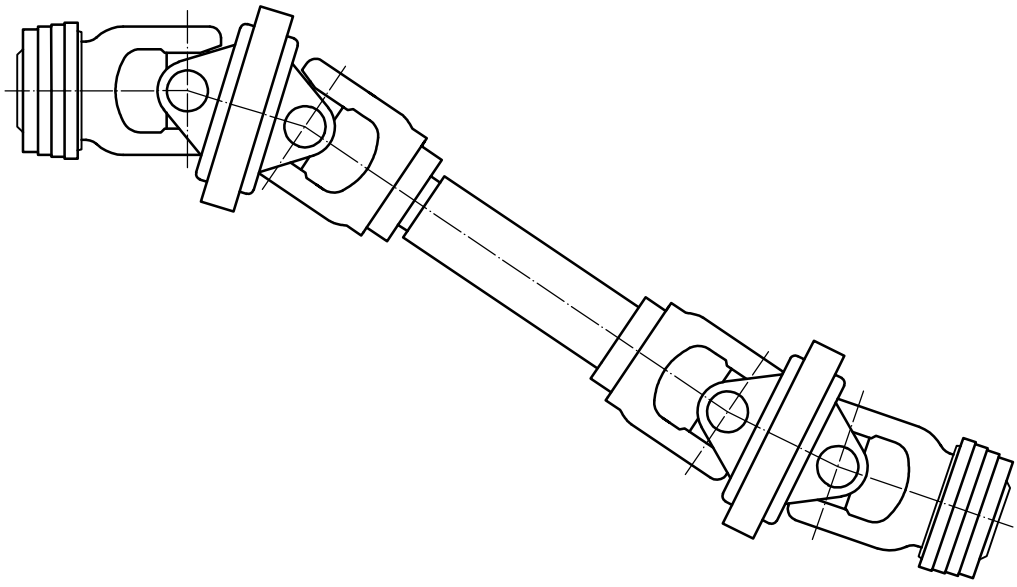


Figure 3 — PTO drive shaft — Form C

4.4 PTO drive shaft length

The length of the PTO drive shaft shall be chosen with regard to the maximum extended and minimum closed lengths that are expected during operation and manoeuvring.

4.5 Equal angle hitch

On a tractor implementing drive-line geometry, there shall be an equal distance from the tractor PTO to the drawbar pin and from the drawbar pin to the PIC.

5 Position and clearance of PIC for various attachments

5.1 General

The horizontal and vertical spacing of the implement PIC shall be as shown in Figures 4 to 11 and in accordance with Tables 1 to 8. To determine these dimensions, the tractor PTO shall be in the position specified in ISO 500-3.

Easy access to maintain the PTO drive shaft, e.g. greasing, shall be possible.

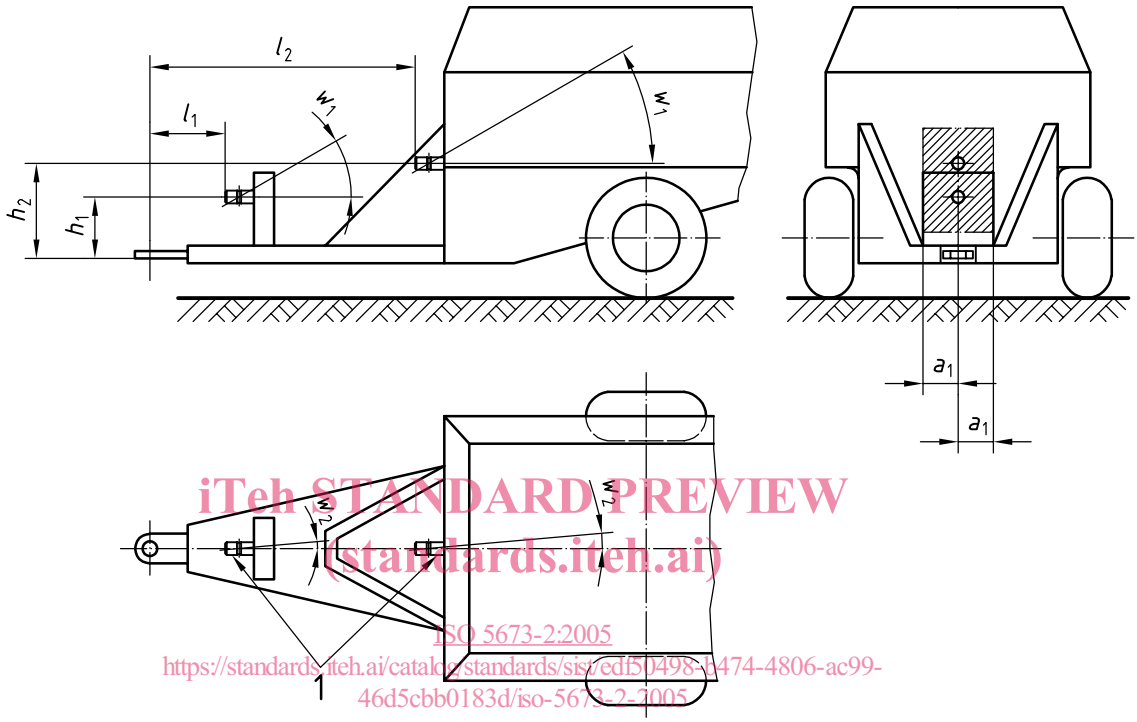
The extreme values of PIC location and clearance zone for each category according to Tables 1 to 8 shall not be used at the same time.

5.2 Drawbar attachment

5.2.1 Position of PIC

To determine these dimensions, the drawbar attachment shall be in the positions specified in ISO 6489-3. The axis of the tractor PTO and PIC shall be aligned on the same vertical plane.

See Figure 4 and Table 1.



Key

1 PIC

Figure 4 — Drawbar attachment

Table 1 — Horizontal and vertical distances for drawbar attachment

Required PTO power	Hitch category [a]	Equal angle hitch						Angle hitch not equal [b]					
kW		$h_{1\ min}$ mm	$h_{1\ max}$ mm	$a_{1\ max}$ mm	$l_1 \pm 10$ mm	w_1 °	w_2 °	$h_{2\ min}$ mm	$h_{2\ max}$ mm	$a_{1\ max}$ mm	$l_{2\ max}$ [c] mm	w_1 [c] °	w_2 [c] °
up to 28	0	200	250	25	400	0	0	b	700	100	1 000	30	5
up to 48	1	220	350	25	400	0	0						
up to 115	2	250	350	25	400	0	0						
up to 185	3	260	350	25	500	0	0						
up to 275	4	280	400	25	500	0	0						
up to 400	5	310	450	25	500	0	0						

[a] See ISO 6489-3.

[b] In order to provide clearance between the drive line and the drawbar clevis, for l_2 greater than l_1 the PIC distance above the drawbar shall increase at 5° min. angle from the position l_1 and h_1.

[c] To prevent excessive vibration in the drive line, wide-angle universal joints may be required, or the PIC shaft may need to be angled to be in line with the PTO drive shaft.