SLOVENSKI STANDARD
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Traktorji ter kmetijski in gozdarski stroji - Priključne gredi in njihova zaščita - Varnost

Tractors and machinery for agriculture and forestry - Power take-off (PTO) drive shafts and their guards - Safety

Traktoren und Maschinen für die Land- und Forstwirtschaft - Gelenkwellen und ihre Schutzeinrichtungen - Sicherheit

Tracteurs et matériels agricoles et forestiers - Arbres de transmission à cardans de prise de force et leurs protecteurs - Sécurité

Ta slovenski standard je istoveten z: **prEN 12965**

ICS:

65.060.01	Kmetijski stroji in oprema na splošno	Agricultural machines and equipment in general

oSIST prEN 12965:2017 **en,fr,de**

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Will supersede EN 12965:2003+A2:2009

English Version

Tractors and machinery for agriculture and forestry - Power take-off (PTO) drive shafts and their guards - Safety

Tracteurs et matériels agricoles et forestiers - Arbres de transmission à cardans de prise de force et leurs protecteurs - Sécurité

Traktoren und Maschinen für die Land- und Forstwirtschaft - Gelenkwellen und ihre Schutzeinrichtungen - Sicherheit

This draft European Standard is submitted to CEN members for enquiry. It has been drawn up by the Technical Committee CEN/TC 144.

If this draft becomes a European Standard, CEN members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration.

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Recipients of this draft are invited to submit, with their comments, notification of any relevant patent rights of which they are aware and to provide supporting documentation.

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EUROPEAN COMMITTEE FOR STANDARDIZATION
COMITÉ EUROPÉEN DE NORMALISATION
EUROPÄISCHES KOMITEE FÜR NORMUNG

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European foreword

This document (prEN 12965:2017) has been prepared by Technical Committee CEN/TC 144 “Tractors and machinery for agriculture and forestry”, the secretariat of which is held by AFNOR.

This document is currently submitted to the CEN Enquiry.

This document will supersede EN 12965:2003+A2:2009.

This document has been prepared under a mandate given to CEN by the European Commission and the European Free Trade Association, and supports essential requirements of EU Directive(s).

For relationship with EU Directive(s), see informative Annex ZA, which is an integral part of this document.

Introduction

This European Standard is a type C standard as defined in EN ISO 12100:2010.

The machinery concerned and the extent to which hazards, hazardous situations and events are covered are indicated in the scope of this document.

When provisions of this type C standard are different from those which are stated in type A or B standards, the provisions of this type C standard take precedence over the provisions of the other standards, for machines that have been designed and built according to the provisions of this type C standard.

The hazards that are common to agricultural machines (self-propelled, mounted, semi-mounted and trailed) are dealt with in EN ISO 4254-1:2015.

1 Scope

This European Standard specifies safety requirements and their verification for the design and construction of power take-off (PTO) drive shafts and their guards linking a tractor or self-propelled machinery to the first fixed bearing of recipient machinery, by describing methods for the elimination or reduction of risks which need specific requirements. It is applicable only to those PTO drive shafts and guards mechanically linked to the shaft by at least two bearings.

In addition, it specifies the type of information on safe working practices to be provided by the manufacturer.

This European Standard does not deal with:

— the guards totally covering, but not mechanically linked to, the PTO drive shaft;

— the mechanical characteristics of PTO drive shafts, overrun devices and torque limiters;

— general hazards which are dealt with in EN ISO 4254-1:2015 (see introduction);

Environmental aspects have not been considered in this standard.

This document is not applicable to PTO drive shafts and their guards which are manufactured before the date of publication of this document by CEN.

2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

EN 15811 *Agricultural machinery - Fixed guards and interlocked guards with or without guard locking for moving transmission parts*

EN ISO 4254-1:2015, *Agricultural machinery - Safety - Part 1: General requirements (ISO 4254-1:2013)*

EN ISO 5674, *Tractors and machinery for agriculture and forestry - Guards for power take-off (PTO) drive-shafts - Strength and wear tests and acceptance criteria (ISO 5674)*

EN ISO 12100:2010, *Safety of machinery - General principles for design - Risk assessment and risk reduction (ISO 12100:2010)*

EN ISO 13857:2008, *Safety of machinery - Safety distances to prevent hazard zones being reached by upper and lower limbs (ISO 13857:2008)*

ISO 500-3, *Agricultural tractors — Rear-mounted power take-off types 1, 2, 3 and 4 — Part 3: Main PTO dimensions and spline dimensions, location of PTO*

ISO 11684:1995, *Tractors, machinery for agriculture and forestry, powered lawn and garden equipment — Safety signs and hazard pictorials — General principles*

3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

3.1
power take-off (PTO) drive shaft
assembly consisting of two joints, telescopic members and a guard which is mechanically linked to the shaft by at least two bearings used to transmit rotational power from the PTO of a tractor or self-propelled machine to the PIC of an implement

Note 1 to entry: See Figure 1 - only shown as an example

3.2
restraining system
part of the PTO drive shaft guard which prevents rotation of the guard when the PTO drive shaft rotates

Note 1 to entry: See Figure 1, key 28 - only shown as an example

3.3
universal joint
mechanical device which can transmit torque and/or rotational motion

Note 1 to entry: See Figure 1, key 12 - only shown as an example

3.4
wide-angle universal joint
mechanical device which can transmit torque and/or rotational motion at a constant velocity at fixed or varying angles, generally equal or higher than 50°

Note 1 to entry: See Figure 1, key 16 - only shown as an example

3.5
overrun device
device that permits the transmission of motion only in one direction (from the tractor towards the recipient machinery)

Note 1 to entry: It is normally used with recipient machine having high value inertia

3.6
torque limiter
device that cuts or limits the transmission of motion between tractor and recipient machinery, when the torque reaches a prefixed value

3.7
locking system
device on the PTO yoke and PIC yoke which allows locking of the PTO drive shaft mechanically to the tractor's PTO and to the PIC of the recipient machinery

Note 1 to entry: See Figure 1, key 27 - only shown as an example

3.8
guard cone
guard of the inner yokes of the PTO drive shaft, integrally fixed to the guard tubes of the inner and outer telescopic members of the PTO drive shaft

Note 1 to entry: See Figure 1, key 19 - only shown as an example

3.9
wide-angle guard cone
guard of the wide-angle universal joint of the PTO drive shaft

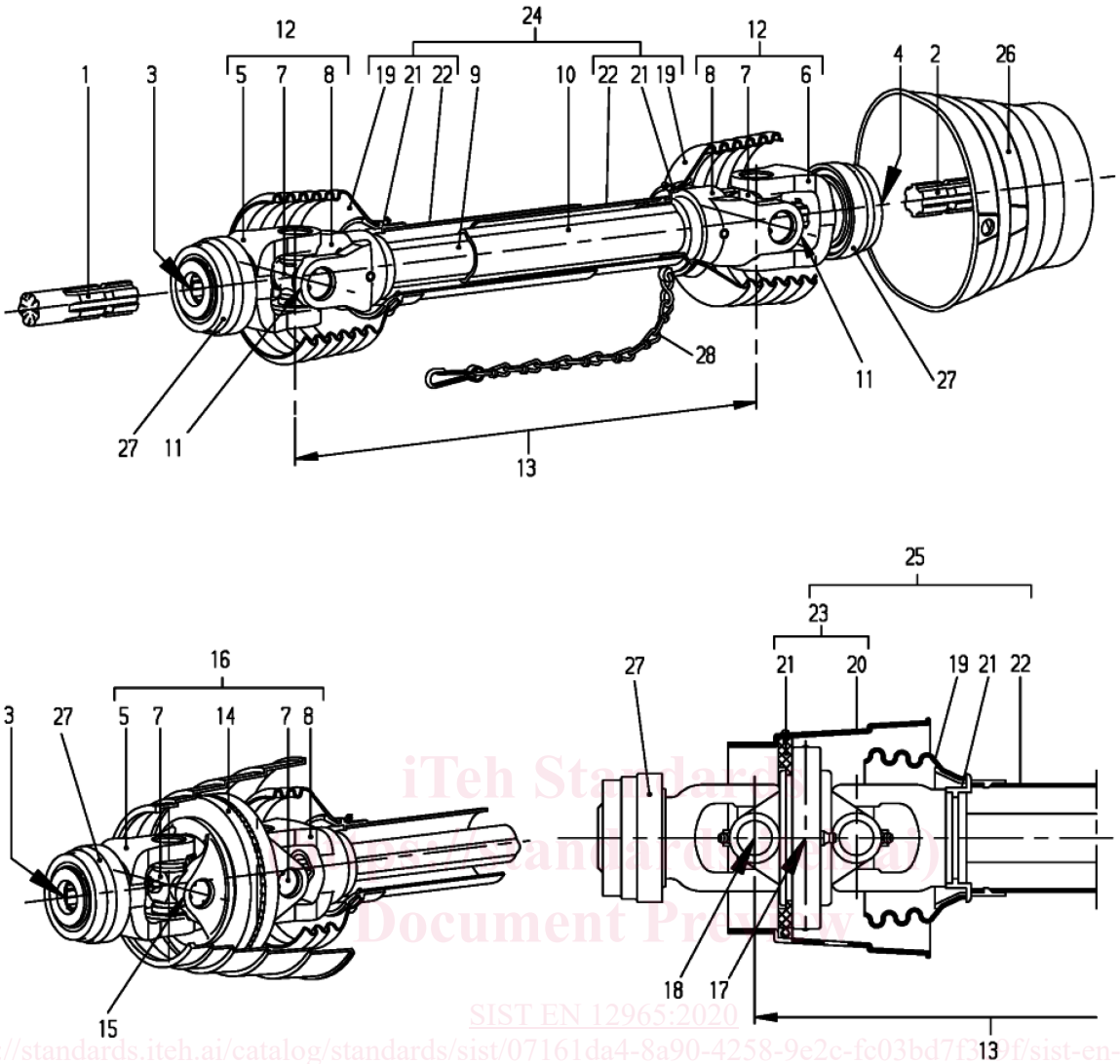
Note 1 to entry: See Figure 1, key 20 – only shown as an example

3.10
fully enclosed guard cone
guard on PIC side of the PTO drive shaft covering the universal or wide-angle universal joint, including its locking system and the PIC of the recipient machinery, and which also includes other devices, if any (e.g. torque limiter, overrun device)

Note 1 to entry: See Figure 2, key 4 – only shown as an example

3.11
PTO drive shaft guard
guard attached to the PTO drive shaft by bearings, designed to be able to be held stationary by a restraining system while the shaft is rotating

Note 1 to entry: See Figure 1, keys 24 and 25 – only shown as an example



Key

1	power take off shaft (PTO)	15	end of double yoke of outer joint
2	power-input connection (PIC)	16	wide-angle universal joint
3	PTO yoke bore	17	centre of articulation of wide-angle universal joint
4	PIC yoke bore	18	centre of outer joint
5	PTO yoke	19	guard cone
6	PIC yoke	20	wide angle guard cone
7	journal cross-assembly	21	guard bearing
8	inner yoke	22	guard tube
9	inner telescopic member	23	separate guard of wide angle universal joint
10	outer telescopic member	24	PTO drive shaft guard
11	end of inner yoke of universal joint	25	PTO drive shaft guard (in case of wide-angle PTO drive shaft)
12	universal joint	26	PIC guard
13	PTO drive shaft, closed and extended length	27	locking system
14	double yoke	28	restraining system (as an example)

Figure 1 — Example of PTO drive shaft and guard