SLOVENSKI STANDARD
oSIST prEN 16246:2011

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Kmetijski stroji - Nakladalnik, priključen zadaj k traktorju - Varnost

Agricultural machinery - Backhoes - Safety

Landmaschinen - Heckbaggerlader - Sicherheit

Matériel agricole - Pelles rétro - Sécurité

Ta slovenski standard je istoveten z: **prEN 16246**

ICS:

65.060.10	Kmetijski traktorji in prikolice	Agricultural tractors and trailed vehicles

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Landmaschinen - Heckbaggerlader - Sicherheit

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

Management Centre: Avenue Marnix 17, B-1000 Brussels

Contents

Page

Foreword

This document (prEN 16246:2011) 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 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, see informative Annex ZA, which is an integral part of this document.

Introduction

This document is a type-C standard as specified in EN ISO 12100.

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

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

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.

1 Scope

This European Standard, intended to be used together with EN ISO 4254-1:2009 and EN 15811:2009, specifies the safety requirements and their verification for the design and construction of hydraulic backhoes mounted to the three point linkage of a tractor. It describes methods for the elimination or reduction of hazards arising from the intended use of these machines by one person (the operator) in the course of normal operation and service. In addition, it specifies the type of information on safe working practices to be provided by the manufacturer.

When requirements of this document are different from those which are stated in EN ISO 4254-1, the requirements of this document take precedence over the requirements of EN ISO 4254-1 for machines that have been designed and built according the provisions of this document.

This document, taken together with EN ISO 4254-1, deals with all the significant hazards, hazardous situations and events (as listed in Table 1) relevant to hydraulic backhoes mounted to the three point linkage of a tractor, when they are used as intended and under the conditions foreseen by the manufacturer.

NOTE Specific requirements related to road traffic regulations are not taken into account in this standard.

This document is not applicable to hydraulic backhoes which are manufactured before the date of publication of this document by CEN.

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.

EN 15811:2009, *Agricultural machinery - Guards for moving parts of power transmission - Guard opening with tool (ISO/TS 28923:2007 modified)*

EN ISO 4254-1:2009, *Agricultural machinery — Safety — Part 1: General requirements*

EN ISO 5353:1998, *Earth-moving machinery, and tractors and machinery for agriculture and forestry — Seat index point*

EN ISO 12100-1:2003+A1:2009, *Safety of machinery — Basic concepts, general principles for design — Part 1: Basic terminology, methodology*

EN ISO 12100-2:2003+A1:2009, *Safety of machinery — Basic concepts, general principles for design — Part 2: Technical principles*

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

EN ISO 14982:2009, *Agricultural and forestry machinery – Electromagnetic compatibility – Test methods and acceptance criteria (ISO 14982:1998)*

ISO 3600:1996, *Tractors, machinery for agriculture and forestry, powered lawn and garden equipment — Operator's manuals — Content and presentation*

ISO 3767-1, *Tractors, machinery for agriculture and forestry, powered lawn and garden equipment — Symbols for operator controls and other displays — Part 1: Common symbols*

ISO 3767-2, *Tractors, machinery for agriculture and forestry, powered lawn and garden equipment — Symbols for operator controls and other displays — Part 2: Symbols for agricultural tractors and machinery*

ISO 3776-1:2006, *Tractors and machinery for agriculture — Seat belts — Part 1: Anchorage location requirements*

ISO 3776-2:2007, *Tractors and machinery for agriculture — Seat belts — Part 2: Anchorage strength requirements*

ISO 4253:1993, *Agricultural tractors — Operator's seating accommodation — Dimensions*

ISO 4413:1998, *Hydraulic fluid power -- General rules relating to systems*

ISO 10968:2004, *Earth-moving machinery -- Operator's controls*

ISO 15077:2008, *Tractors and self-propelled machinery for agriculture — Operator controls — Actuating forces, displacement, location and method of operation*

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 terms and definitions given in EN ISO 12100-1, EN ISO 4254-1 and the following apply.

NOTE Examples of the machine types covered by this standard are illustrated in Annex A.

3.1
rear-mounted hydraulic backhoe
machine mounted to the rear three point linkage of the tractor, used for various operations, such as excavating, elevating, swinging, discharging and others, with an attachment and hydraulic arms

3.2
primary loading arm
loading arm located between the frame of the machine and the secondary arm

3.3
secondary loading arm
loading arm located between the primary loading arm and the attachment

3.4
telescopic arm
arm capable of being extended in longitudinal direction

3.5
swinging tower
device which pivotally connects the frame with the primary loading arm, in order to let it swing about a vertical axis

3.6
outriggers
devices to keep the machine stable and levelled on the ground

3.7
side shifting
device to let the swinging tower change its position in respect of an horizontal axis

3.8
attachment
tool or interchangeable equipment that can be attached to the secondary loading arm, such as a bucket or an inverted bucket, as indicated by the manufacturer

3.9
inverted bucket
rearward facing bucket for the excavating, elevating, swinging and discharging of the material

4 List of significant hazards

Table 1 gives the significant hazard(s), the significant hazardous situation(s) and event(s) covered by this Standard that have been identified by risk assessment as being significant for this type of machine, and which require specific action by the designer or manufacturer to eliminate or to reduce the risk.

Attention is drawn to the necessity to verify that the safety requirements specified in this standard apply to each significant hazard presented by a given machine and to validate that the risk assessment is complete.

Table 1 — List of significant hazards associated with hydraulic backhoes

No. [a]	Hazard	Hazardous situation and event	Clause/subclause of EN ISO 4254-1:2009	Clause/subclause of this Standard
A.1	**Mechanical hazard**			
A.1.1	Crushing hazard	— Controls — Boarding means — Platforms — Working tools — Service/maintenance — Shearing/pinching points — Moving the machine — Stability — Mounting of machines	4.4.3; 5.1.3.2; 5.1.8; 6.1 4.5.1.1.2; 4.5.1.2.5; 4.5.2; 4.6 6.4 4.7 4.14.6 5.1.2.3 5.1.4 5.2 6.2 6.2.2; 6.2.3; 6.3	5.3.1 5.1, 5.5 5.1, 5.4.1 5.7.1 6.3 5.1 5.8, 5.9 5.2
A.1.2	Shearing hazard	— Controls — Boarding means — Platforms — Working tools — Service/maintenance — Shearing/pinching points — Moving the machine — Stability — Mounting of machines	4.4.3; 5.1.3.2; 5.1.8; 6.1 4.5.1.1.2; 4.5.1.2.5; 4.5.2; 4.6 6.4 4.7 4.14.6 5.1.2.3 5.1.4 5.2 6.2 6.2.2; 6.2.3; 6.3	5.3.1 5.1, 5.5 5.1, 5.4.1 5.7.1 6.1, 6.3 5.1 5.8, 5.9 5.2
A.1.6	Impact hazard	— Boarding means	4.5.1.2.5	5.1, 5.4, 5.5
A.1.8	Friction or abrasion hazard	— Controls — Electrical equipment — Boarding means	4.4.3; 5.1.3.2 4.9.1 4.5.1.1.2	5.3.1 5.6 5.4, 5.5
A.1.9	High-pressure fluid injection or ejection hazard	— Hydraulic components	4.10; 6.5	5.7
A.2	**Electrical hazards**			
A.2.1	Contact of persons with live parts (direct contact)	— Electrical equipment	4.9; 5.3; 6.5	5.6
A.2.2	Contact of persons with parts which have become live under faulty conditions (indirect contact)	— Electrical equipment	4.9.1	-

No. [a]	Hazard	Hazardous situation and event	Clause/subclause of EN ISO 4254-1:2009	Clause/subclause of this Standard
A.2.3	Approach to live parts under high voltage	— Overhead power lines	8.1.3	8.1
A.2.4	Thermal radiation or other phenomena such as the projection of molten particles and chemical effects from short circuits, overloads, etc.	— Electrical equipment	4.9.2; 5.3.1	5.6
A.3	**Thermal hazards**			
	Burns, scalds and other injuries by possible contact of persons with objects or materials with an extreme high or low temperature, by flames or explosions and also by the radiation of heat sources	— Operating fluids — Cab material — Hot surfaces	4.12 5.1.6 5.5	5.7
A.4	**Hazards generated by noise**			
	Hearing loss (deafness), other physiological disorders (e.g. loss of balance, loss of awareness) Accidents due to interference with speech communication and accoustic warning signals	— Noise	4.2	5.1
A.5	**Hazards generated by materials and substances**			
A.5.1	Hazards from contact with, or inhalation, of harmful fluids, gases,	— Operating fluids	4.10; 5.4	5.7

No. [a]	Hazard	Hazardous situation and event	Clause/subclause of EN ISO 4254-1:2009	Clause/subclause of this Standard
	mists, fumes and dusts			
A.6	**Hazards generated by neglecting ergonomic principles in machinery design**			
A.6.1	Unhealthy postures or excessive effort	— Controls — Boarding means — Service and maintenance — Operator station	4.4 4.5; 4.6 4.14.2; 4.14.4 5.1.1; 5.1.3; 5.1.5.2	5.3 5.4, 5.5 6.1, 6.3 5.4
A.6.2	Inadequate consideration of hand–arm or foot–leg anatomy	— Controls — Boarding means — Operator station	4.4 4.5; 4.6 5.1	5.3 5.4, 5.5 5.4
A.6.3	Neglected use of personal protective equipment	— Operator's manual	8.1.3	8.1
A.6.5	Mental overload and under load, stress	— Controls	4.4	5.3
A.6.6	Human error, human behaviour	— Controls — Operator's manual — Signs	4.4 8.1 8.2	5.3 8.1 8.2
A.6.7	Inadequate design, location or identification manual controls	— Controls	4.4; 5.1.3; 6.1	5.3
A.7	**Combination of hazards**	— Individual assemblies — Operator's manual	4.13 8.1	- 8.1
A.8	**Unexpected start-up, unexpected overrun/overspeed**			
A.8.1	Failure/disorder of the control system	— Service and maintenance — Electrical equipment — Connections	4.8 4.9 6.5	5.7 5.6 5.6
A.8.3	External influences on electrical equipment	— Cables	4.9.1	5.6
A.8.4	Other external influences (gravity, wind, etc.)	— Stability	6.2.1.1; 6.2.1.2	5.3, 5.6

No. [a]	Hazard	Hazardous situation and event	Clause/subclause of EN ISO 4254-1:2009	Clause/subclause of this Standard
A.8.5	Errors made by the operator (due to mismatch of machinery with human characteristics and abilities	— Controls — Boarding means — Operator station — Moving the machine — Mounting of machines — Service and maintenance — Operator's manual	4.4; 6.1.2 4.5; 4.6 5.1 5.2 6.2; 6.3 4.14 8.1.3	5.3 5.4, 5.5 5.4 5.8 5.2 6 8.1
A.9	**Impossibility of stopping the machine in the best possible conditions**	— Controls	4.4; 6.1	-
A.11	**Failure of power supply**	— Supports — Electrical equipment — Connections	4.8 4.9 6.5	5.7 5.6
A.13	**Errors of fitting**	— Mounting of machines — Operator's manual	6.2; 6.3 8.1.3	5.2 8.1
A.14	**Break-up during operation**	— Hydraulic components	4.10	5.7
A.15	**Falling or ejected objects or fluids**	— Hydraulic components	4.10	5.7
A.16	**Loss of stability/overturning of machinery**	— Stability — Roll-over	6.2 5.1.2.3	5.8 5.9
A.17	**Slip, trap and fall of persons (related to machinery)**	— Boarding means	4.5; 4.6	5.4, 5.5