SLOVENSKI STANDARD
SIST EN 12525:2000+A2:2010

01-julij-2010

Kmetijski stroji - Sprednji nakladalnik - Varnost

Agricultural machinery - Front loaders - Safety

Landmaschinen - Frontlader - Sicherheit

Matériel agricole - Chargeurs frontaux - Sécurité

Ta slovenski standard je istoveten z: **EN 12525:2000+A2:2010**

ICS:

65.060.10	Kmetijski traktorji in prikolice	Agricultural tractors and trailed vehicles

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English Version

Agricultural machinery - Front loaders - Safety

Matériel agricole - Chargeurs frontaux - Sécurité

Landmaschinen - Frontlader - Sicherheit

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COMITÉ EUROPÉEN DE NORMALISATION
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Foreword

This document (EN 12525:2000+A2:2010) 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 European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by September 2010, and conflicting national standards shall be withdrawn at the latest by September 2010.

This document includes Amendment 1, approved by CEN on 2006-03-16 and Amendment 2, approved by CEN on 2010-01-24.

This document supersedes EN 12525:2000.

The start and finish of text introduced or altered by amendment is indicated in the text by tags ⟦A1⟩ ⟨A1⟧ and ⟦A2⟩ ⟨A2⟧.

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⟦A2⟩ For relationship with EU Directive(s), see informative Annexes ZA and ZB, which are integral parts of this document. ⟨A2⟧

⟦A2⟩ The following changes were introduced compared to the previous version:

— technical changes of Clauses 1, 4.5.1, 7.1.5 and Table A.2;

— minor changes of Clauses 2, 3 and 4, 7.2 and Table A.1;

— editorial modifications of Annex ZA;

— addition of Annex ZB. ⟨A2⟧

According to the CEN/CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland and United Kingdom.

⟦A2⟩ *deleted text* ⟨A2⟧

Introduction

The extent to which hazards are covered is indicated in the scope of this standard.

[A2] This document is a type C standard as stated in EN ISO 12100. The machinery concerned and the extent to which hazards, hazardous situations and hazardous 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. [A2]

1 Scope

This [A2] European Standard [A2] specifies safety requirements and their verification for the design and construction of front loaders designed to be mounted on agricultural and forestry wheeled tractors (as defined in the [A2] Directive 2003/37/EC [A2]).

Hazards related to mounting the lifting arms to the frame mounted on the tractor, and also hazards related to devices for mounting attachments to the arm are covered.

Hazards related to mounting the frame to the tractor (carried out by the dealer of the loader and/or of the tractor), the mounted attachments and hazards due to loss of mechanical strength of the structure are excluded.

[A1] *deleted text* [A1]

Hazards related to the transport of passengers are not covered.

This [A2] European Standard [A2] describes methods and requirements for the elimination or reduction of risks which need specific requirements to front loaders. In addition, it specifies the type of information on safe working practices to be provided by the manufacturer.

The list of significant hazards dealt with in this standard is given in annex A. Annex A also indicates the hazards which have not been dealt with.

[A2] This European Standard is not applicable to front loaders which are manufactured before the date of its publication as EN. [A2]

2 Normative references

[A1] The following referenced documents are indispensable for the application of this European Standard. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies. [A1]

[A2] *deleted text* [A2]

EN 982, *Safety of machinery — Safety requirements for fluid power systems and their components — Hydraulics*

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

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

ISO 8935, *Tractors for agriculture and forestry — Mountings and apertures for external equipment controls*

ISO 10448:1994, *Agricultural tractors — Hydraulic pressure for implements*

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

3 Definitions

For the purposes of this document, the terms and definitions given in EN ISO 12100-1:2003 apply.

3.1
front loader
detachable unit consisting of lifting arms and fastening devices designed to be mounted on a frame on the front of a tractor and equipped with devices for mounting various allowable attachments

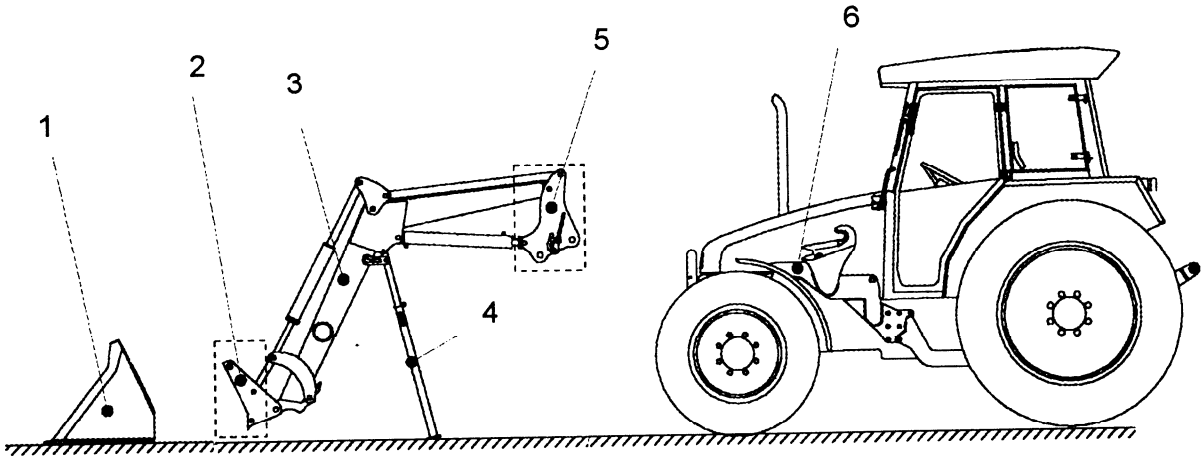
NOTE See figure 1.

3.2
allowable attachment
working attachment, approved by the front loader manufacturer for mounting and operating with specified front loaders (and tractors)

3.3
supporting device
device for supporting the lifting arms in a stable position when it is dismounted from the tractor

NOTE For example, for storage, see figure 1.

3.4
manual controls of the front loader
control equipment supplied with the front loader to enable the loader and attachments to be operated from the driving position of the tractor



Key

1 - attachment
2 - device for mounting attachments
3 - lifting arm
4 - supporting devices
5 - fastening devices
6 - frame mounted on the tractor

Figure 1 — Front loader

4 Safety requirements and/or measures

〈A2〉 Front loaders shall comply with the safety requirements and/or protective measures of this clause. In addition, the machine shall be designed according to the principles of EN ISO 12100 for hazards relevant but not significant, which are not dealt with by this document. 〈A2〉

4.1 Mounting of the front loader on a tractor

4.1.1 Intended use

The front loader manufacturer shall state which tractors are suitable for the mounting and use with the front loader taking into account the specific technical characteristics of the tractor and the intended use of the combined unit.

4.1.2 Stability of the combined tractor/front loader

The stability of the combined tractor/front loader is dependent on the range and capacity of the attachment, the arrangement of the front loader on the tractor together with the type of tractor. Improvements in stability can be achieved by fitting a counterweight or ballasting the rear wheels and observing limits to driving and operating conditions.

For further guidance see Annex B.

4.1.3 Frame for mounting the front loader on a tractor

The front loader manufacturer shall design the mounting frame and its fastening elements so that the maximum loads expected in accordance with the intended usage are transferred safely to the structure of the tractor.

4.2 Dismounting and storing of the lifting arms

4.2.1 Supporting devices

Devices shall be provided to support the dismounted lifting arms when stored on the ground. They shall:

— be so designed that the strength of the structure is able to hold the weight of the lifting arms and of the heaviest allowable attachment under the conditions specified in 4.2.2;

— have a supporting surface area which exerts a ground pressure of not more than 400 kPa. This requirement shall be met with any allowable attachment in the lowered position;

— have a locking device to prevent inadvertent lowering and creation of drawing-in or trapping hazards at the supporting devices themselves;

— be available at any time when dismounting the lifting arms. They shall be attached to the lifting arms or stored separately from the front loader somewhere on the vehicle.

The supporting devices shall be so designed that they can be fastened and have their height adjusted by the operator standing beside the lifting arms or sitting on the seat of the tractor.

4.2.2 Stability

When the lifting arms are standing dismounted on horizontal, hard ground in a position recommended in the instruction book, they shall be capable of resisting a force of 400 N applied in any direction, without tilting.

4.3 Mounting of attachments on the lifting arms

4.3.1 Intended use

The front loader manufacturer shall specify the type and capacity of the allowable attachments that can be fitted and safely operated.

4.3.2 Device for mounting attachments

The device shall be so designed that mounting and dismounting of an attachment can be done by the driver alone.

4.3.3 Device for locking attachments

The device for locking attachments shall have a positive engagement and retention system to secure the attachment onto the lifting arms so that the attachment is held securely under any operating conditions (see Annex C for an example).

It shall not be possible for an attachment to become unintentionally disengaged by use or by failure of the securing system. This requirement can be met by use of a locking valve in the hydraulic system, for example.

4.4 Hydraulic circuit

4.4.1 Hydraulic power and pressures

The hydraulic circuit and its components shall be designed according to EN 982.

The system shall be so designed that it can transmit the full hydraulic power of the tractor or have the power limited by a pressure control valve supplied with the front loader.

Hoses, pipes and all connections shall withstand - without bursting - a pressure at least equal to four times the setting pressure of the hydraulic circuit of the tractor or of the front loader when fitted with a separate pressure control valve.

If the setting pressure of the hydraulic circuit is not known, then the pressure requirements of ISO 10448:1994 shall be used.

4.4.2 Pressure hoses near operator's seat

Unprotected pressure hoses having a pressure of more than 5 MPa (50 bar) shall be located at a distance of more than 1 m from the operator in his normal driving position. Hoses shall be protected in such a way that, in the case of failure, the operator cannot be reached by liquid at a temperature of more than 50 °C.

4.4.3 Connections

Connections shall be designed so that either incorrect coupling is not physically possible or they shall be marked so that they are clearly identified.

4.4.4 A1) Protection against unintended lowering

If the front loader is also designed for lifting operations requiring the presence of a person near to the load when the front loader is in the raised position the hydraulic system of the lifting arm cylinder(s) shall be equipped with the safety device according to Annex E to avoid unintentional lowering of the lifting arm which shall remain active in case of failure of the energy supply of the control circuit.

If this safety device can be switched on/off or be (de)activated for operations that do not require the presence of a person near to the load the following additional requirements apply:

— it shall be possible to switch on/off or to (de)activate the safety device from the driving position;

— it shall be possible to switch on or activate the safety device from the ground without being near to the load;

— manual control to switch off or to deactivate the safety device shall be designed and located so that it cannot be actuated unintentionally by the operator;

— condition (on/off or (de)activated) of the safety device shall be clearly indicated and clearly visible from the driving position and from the loading area.

The correct method of operation including warnings shall be explained in the instruction handbook in accordance with 7.1.2.

The front loader shall be equipped with a warning that for lifting operations requiring the presence of a person near to the load when the front loader is in the raised position the safety device shall be switched on (activated) (see 7.2).

The information for use of front loaders which are not designed for lifting operations requiring the presence of a person near to the load when the front loader is in the raised position shall comply with 7.1.4 and 7.2.

NOTE The characteristics of the safety device will be reviewed during the next revision of EN 12525 in order to take into account the state of the art and the results of research. A1

4.5 Manual controls

4.5.1 Design and arrangement

An example of mounting apertures for external equipment controls is given in ISO 8935.

A2 Control movements of the lifting arms and of the attachments shall be of the hold-to-run type, except the float position control which may be held in its position by a detent (see Annex D for an example). A2

The controls shall be designed and arranged so that they are:

— accessible and recognizable;

— marked on or near the control according to figures 2 or 3.

NOTE Control symbols where not specified as above should conform to EN ISO 3767- 2.

Unintentional operation of the loader controls shall be prevented by:

— positively isolating the controls from the hydraulic supply so they cannot be used; or

— locking of the controls so they cannot be operated; or

— the arrangement and design of the controls (e.g. by recessing fingertip controls).

If the internal controls of the tractor can be used to operate the loader, then all the necessary information about this shall be provided.

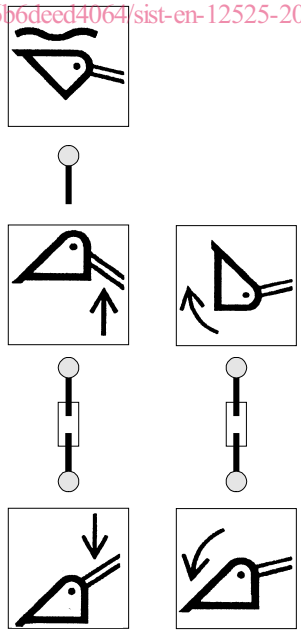


Figure 2 — Layout and marking two-lever control or one change-over lever control