



SLOVENSKI STANDARD
SIST EN 632:1996

01-januar-1996

Kmetijski stroji - Kombajni in silokombajni - Varnost

Agricultural machinery - Combine harvesters and forage harvesters - Safety

Landmaschinen - Mähdrescher und Feldhäcksler - Sicherheit

Matériel agricole - Moissonneuses batteuses et récolteuses-hacheuses - Sécurité

Ta slovenski standard je istoveten z: EN 632:1995

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ICS:

65.060.50 Oprema za spravilo pridelkov Harvesting equipment

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en

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EUROPEAN STANDARD

EN 632

NORME EUROPÉENNE

EUROPÄISCHE NORM

June 1995

ICS 65.060.50

Descriptors: agricultural machinery, self-propelled machines, harvest equipment, combines, mowers, safety of machines, accident prevention, human factor engineering, operating stations, dimensions, design, equipment specifications, hazards, maintenance, technical notices, marking

English version

Agricultural machinery - Combine harvesters and forage harvesters - Safety

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Matériel agricole - Moissonneuses-batteuses et récolteuses-hacheuses - Sécurité (standards.iteh.ai) Landmaschinen - Mährescher und Feldhäcksler - Sicherheit

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CEN

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Contents	Page
Foreword	3
0 Introduction	4
1 Scope	4
2 Normative references	4
3 Definitions	5
4 List of hazards	5
5 Safety requirements and/or measures	5
6 Special requirements for combine harvesters	14
7 Special requirements for forage harvesters	17
8 Information for use	18
Annex A (normative) List of hazards	20
Annex B (informative) Combine harvester; Example for location of hazards	24
Annex C (informative) Forrage harvester; Example for location of hazards	25

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Foreword

This European Standard has been prepared by the Technical Committee CEN/TC 144 "Tractors and machinery for agricultural and forestry", of which the secretariat is held by AFNOR.

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

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 December 1995, and conflicting national standards shall be withdrawn at the latest by December 1995.

According to the CEN/CENELEC Internal Regulations, the following countries are bound to implement this European Standard: Austria, Belgium, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland, United Kingdom.

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0 Introduction

The extent to which hazards are covered is indicated in the scope of this standard. The hazards that are common to all the agricultural and forestry machines will be dealt with in a general standard currently in preparation.

Until the publication of this general standard on common requirements machines shall comply - as appropriate - with EN 292 and especially with annex A of EN 292-2:1991 when EN 292 does not give precise requirements for hazards which are not dealt with.

1 Scope

This European Standard specifies safety requirements for design and construction of self-propelled, and tractor-driven combine harvesters and forage harvesters. It describes methods for the elimination or reduction of hazards arising from the use of these machines. In addition, it specifies the type of information to be provided by the manufacturer on safe working practices.

The environmental aspects have not been considered in this standard. The risks arising from dust, stability, braking and noise were not dealt with.

This European Standard applies primarily to machines which are manufactured after the date of issue of this standard.

2 Normative references

This European Standard incorporates, by dated or undated reference, provisions from other publications. These normative references are cited at the appropriate places in the text and the publications are listed hereafter. For dated references, subsequent amendments to or revisions of any of these publications apply to this European Standard only when incorporated in it by amendment or revision. For undated references the latest edition of the publication referred to applies.

EN 2	:1992	Classification of fires
EN 292-1	:1991	Safety of machinery- Basic concepts, general principles for design Part 1: Basic terminology, methodology
EN 292-2	:1991	Safety of machinery- Basic concepts, general principles for design Part 2: Technical principles and specifications
EN 294	:1992	Safety of machinery- Safety distances to prevent danger zones being reached by the upper limbs
EN 25353	:1988	Earth-moving machinery and tractors and machinery for agriculture and forestry - Seat index point (ISO 5353:1978, A1:1981, A2: 1984)
ISO 3767-1	:1991	Machinery for agriculture and forestry- Powered lawn and garden equipment- Symbols for operator controls and other displays - Part 1: Common symbols
ISO 3767-2	:1991	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 3795	:1989	Road vehicles and tractors and machinery for agriculture and forestry - Determination of burning behaviour of interior materials

3 Definitions

For the purpose of this Standard the definitions given in EN 292-1:1991 and EN 292-2:1991 apply together with the following:

- 3.1 combine harvester:** Mobile grain-harvesting machine for cutting or picking up grain or seed crops, threshing, separating, cleaning and conveying grain or seed into a holding tank and depositing harvest residue onto the ground.
- 3.2 header:** Portion of the combine harvester comprising the mechanism for gathering, and cutting, stripping or picking the crop.
- 3.3 forage harvester:** Mobile harvesting machine with intake provisions for proportioning and aligning crop material and conveying it at a consistent rate into the cutting or bruising mechanism.
- 3.4 compacting elements:** Elements in a forage harvester located between the intake and chopping mechanisms for compacting the crop.

4 List of hazards

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

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5 Safety requirements and/or measures [\(standards.iteh.ai\)](https://standards.iteh.ai/)

5.1 General

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Unless specified otherwise in this standard, the machine shall comply with the requirements stated in the tables 1, 3, 4 and 6 of EN 294:1992

5.2 Manual controls

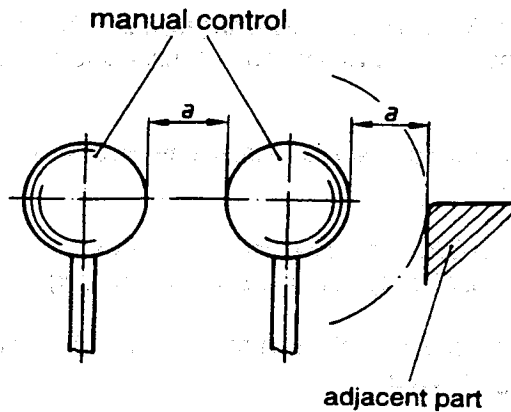
The manual controls and their different positions shall be identified. These identities shall be explained in the instruction handbook. If symbols are used they shall be in accordance with ISO 3767-1:1991 and ISO 3767-2:1991.

The controls shall be positioned so that they do not hinder personal access.

In the case of self-propelled machines the controls to move the machine shall be located in such a way that they can only be actuated from the driver's work station.

Controls requiring an actuating force ≥ 100 N measured at the grip shall have a minimum clearance of $a = 50$ mm between the outer contours. Controls requiring an actuating force of < 100 N shall have a minimum clearance of $a = 25$ mm (see figure 1). Fingertip controls are excluded from the above requirements, providing there is no risk of inadvertent operation of adjacent controls.

Dimensions in millimetres



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Figure 1: Clearance between controls
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5.3 Driver's work station

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5.3.1 Driver's seat

The driver's seat shall be suspended, damped and upholstered, have an upholstered backrest or lumbar support, and provide lateral support.

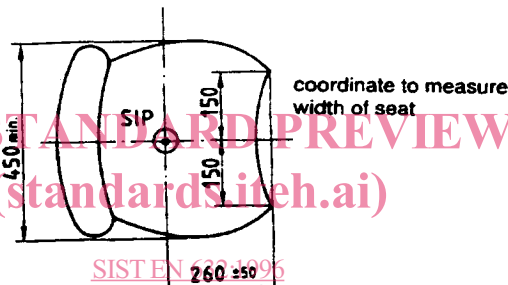
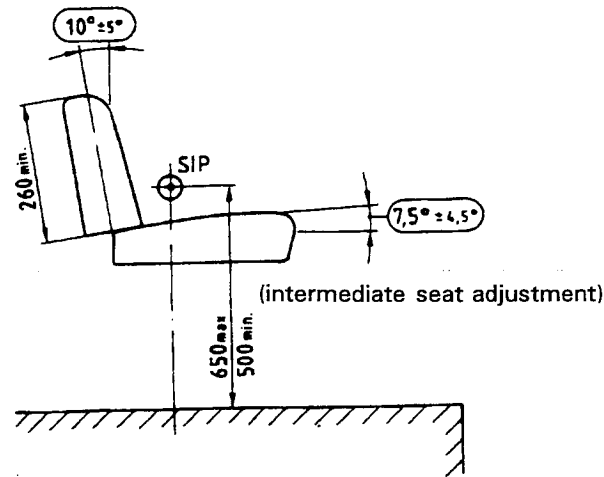
The dimensions shall conform to those shown in figure 2.

The seat location and its suspension shall be adjustable without the use of tools. Minimum horizontal movement of ± 50 mm as well a vertical movement of ± 30 mm shall be possible.

The vertical adjustment range shall be independent of the horizontal adjustment range. The seat adjustment shall be such that the seat will in a reliable way remain in the located position within its adjustment range. Unintended seat adjustment shall not be possible. The adjustment range shall be limited so that the seat does not leave its guides and fixing means.

The suspension system of the seat shall be adjustable to the weight of the driver.

Dimensions in millimetres



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Figure 2: Seat dimensions and height

5.3.2 Steering wheel

The centre of the steering wheel shall be on the longitudinal centerline of the seat with a maximum lateral offset of ± 50 mm. The clearance between the fixed parts and the steering wheel shall be as shown in figure 6.

5.3.3 Shearing and pinching points

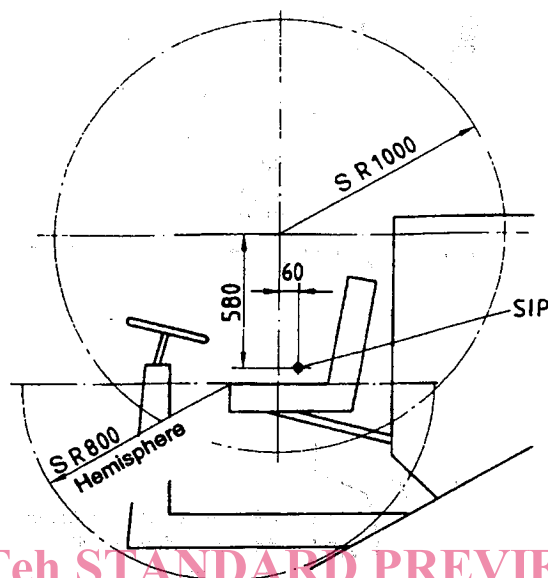
In the operator's workplace, there shall be no shearing or pinching points within reach of the operator's arms or feet.

If the moving seat creates shearing and pinching points between the seat and adjacent components, a safety clearance of at least 25 mm shall be maintained between component and seat.

For the seating position a spherical radius of $R = 1\ 000$ mm from the driver's seat and the passenger's seat is to be regarded as within arm's reach of the driver or passenger. The spherical centre point is located 60 mm in front of the seat index point (SIP) as defined in EN 25353: 1988 on a plane, the vertical height of which is 580 mm above the SIP.

If the feet are exposed to zones of hazard, protection devices shall be provided within a hemispherical space of $R = 800$ mm extending from the centre of the front edge of the seat downwards, when the seat is in its central position (see figure 3).

Dimensions in millimetres



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Figure 3: Arm and foot reach

5.3.4 Boarding means

If the vertical height of the work station floor above ground level exceeds 550 mm a means of boarding shall be provided. The dimensions shall be as shown in figure 4. If step-ladders are used their inclination shall be between 70° and 90°.

For inclinations less than 70° the distance between steps shall be $(2B + G) \leq 700$ mm where B is the vertical distance and G the horizontal distance between steps. The other dimensions shall be as shown in figure 4.

NOTE: The dimension 150 min. indicates clearance distance and is not a dimension for the depth of the steps. The dimension 550 max. should be achieved even with the largest tyres fitted (normal inflation pressure). In special cases (rice combine harvesters, tracked combine harvesters, slope compensation) the dimension may be 700 mm.

The vertical distance between successive steps shall be equal within a tolerance of ± 20 mm. The steps shall have a non-slip surface, shall include two lateral stops and be so designed that accumulation of mud is prevented.

When any movable parts of the means of boarding are operated they shall not cause shearing, pinching or uncontrollable movement (e.g. gravitational force) hazard. The operating force shall not exceed 200 N.

Any inadvertent contact of feet with moving parts of wheels (e. g. tyres) shall be prevented.

Whenever the lower part of the boarding means is located in line and immediately forward of a wheel, provision shall be made for a railing to be located on the wheel side, so as to make it safer for a person when climbing aboard and to prevent him from falling under the wheel.

Dimensions in millimetres

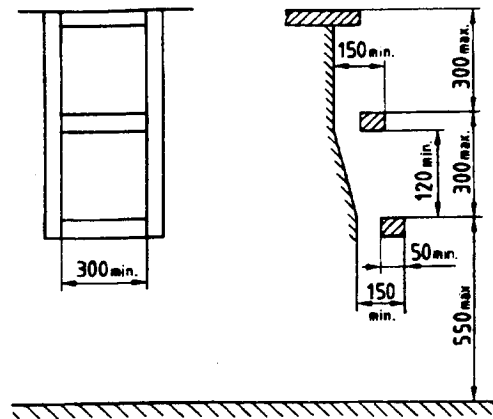


Figure 4: Dimensions of boarding means

5.3.5 Handrails and handholds

Handrails or handholds shall be provided on both sides of the boarding means.

These shall be so designed that the operator can maintain 3-point contact at all times. The largest dimension of diameter of handrail/handhold shall be between 25 mm and 35 mm. The lower end of the handrail/handhold shall be located not higher than 1 600 mm from the ground surface. A minimum clearance of 50 mm shall be provided for hand clearance behind the handrail/handhold and the adjacent parts.

A handrail/handhold grab should be provided at a height of 1 000 mm maximum above the uppermost step/rung of the means of boarding. The handhold should be at least 150 mm long.

5.3.6 Platforms

Platforms shall be flat and have a slip-resistant surface and, if necessary, a drainage.

The platform shall be equipped with either:

- a foot guard, which shall be fitted around the edge of the platform, or not more than 50 mm outside it, and shall be at least 75 mm high. A hand rail shall be provided not less than 1 000 mm and not more than 1 100 mm above the platform. An intermediate rail shall be provided so that the vertical distance between any two rails and the foot guard does not exceed 500 mm; or
- static machine components that afford protection at least equal to that provided by a footguard or handrail and which do not present other hazards e.g. sharp edges, hot surfaces.

Work platforms and access platforms shall be provided and be kept clear for persons or for the moving of materials. During machine operation the access shall be capable of being railed or chained off.

5.3.7 Access to the driver's seat

Access to the driver's seat shall be possible by the alternate use of each foot. For this purpose the floor area shall have a minimum width of 300 mm. Except for possible switches used to indicate the driver's presence, controls shall not be located in the access space in any of their positions.