

Agricultural machinery — Combine harvesters and forage harvesters — Safety

The European Standard EN 632 : 1995 has the status of a
British Standard

Committees responsible for this British Standard

The preparation of this British Standard was entrusted to Technical Committee AGE/23, Equipment for harvesting and conservation, upon which the following bodies were represented:

Agricultural Engineers' Association
British Agricultural and Garden Machinery Association Ltd.
Flour Milling and Baking Research Association
Health and Safety Executive
Ministry of Agriculture, Fisheries and Food
National Farmers' Union
Royal Agricultural Society of England
Scottish Centre for Agricultural Engineering (SCAE)
Silsoe College, Cranfield Institute of Technology
Silsoe Research Institute

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National foreword

This British Standard has been prepared by Technical Committee AGE/23 and is the English language version of EN 632 : 1995 *Agricultural machinery — Combine harvesters and forage harvesters — Safety* published by the European Committee for Standardization (CEN).

Cross-references

Publication referred to	Corresponding British Standard
EN 2 : 1992	BS EN 2 : 1992 <i>Classification of fires</i> BS EN 292 <i>Safety of machinery — Basic concepts, general principles of design</i>
EN 292-1 : 1991	Part 1 : 1991 <i>Basic terminology, methodology</i>
EN 292-2 : 1991	Part 2 : 1991 <i>Technical principles and specifications</i>
EN 294 : 1992	BS EN 294 : 1992 <i>Safety of machinery — Safety distances to prevent danger zones being reached by the upper limbs</i>
EN 25353 : 1988	BS 5631 : 1978 <i>Specification for earth moving machinery and tractors and machinery for agriculture and forestry — Seat index point</i> BS 4964 <i>Symbols for control markings and displays on tractors and machinery for agriculture and forestry, and on powered lawn and garden equipment</i>
ISO 3767-1 : 1991	Part 1 : 1993 <i>Specification for common symbols.</i>
ISO 3767-2 : 1991	Part 2 : 1993 <i>Specification for symbols for agriculture tractors and machinery</i>
ISO 3795 : 1989	BS AU 169a : 1992 <i>Method for determination of burning behaviour of interior materials for road vehicles, and tractors and machinery for agriculture and forestry</i>

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English version

Agricultural machinery — Combine harvesters and forage harvesters — Safety

Matériel agricole — Moissonneuses-batteuses
et récolteuses-hacheuses — Sécurité

Landmaschinen — Mähdrescher und
Feldhäcksler — Sicherheit

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Foreword

This European Standard was prepared by Technical Committee CEN/TC 144, Tractors and machinery for agriculture 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 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 and 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 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 by amendment or revision. For undated references the latest edition of the publication referred to applies.

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|-----------------|--|
| EN 2 : 1992 | <i>Classification of fires</i> |
| EN 292-1: 1991 | <i>Safety of machinery — Basic concepts, general principles for design — Part 1: Basic terminology, methodology</i> |
| EN 292-2 : 1991 | <i>Safety of machinery — Basic concepts, general principles for design — Part 2: Technical principles and specifications</i> |
| EN 294 : 1992 | <i>Safety of machinery — Safety distances to prevent danger zones being reached by the upper limbs</i> |

- 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 *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 : 1991 *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 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.

5 Safety requirements and/or measures

5.1 General

Unless specified otherwise in this standard, the machine shall comply with the requirements given in 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.

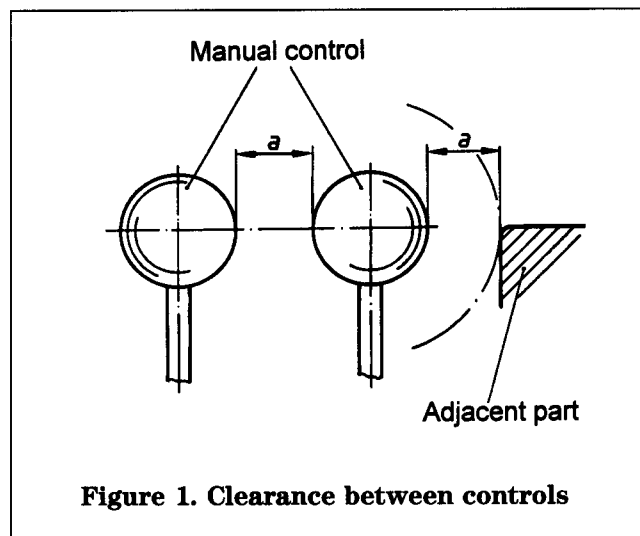


Figure 1. Clearance between controls

5.3 Driver's work station

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 as 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.

5.3.2 Steering wheel

The centre of the steering wheel shall be on the longitudinal centreline 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.

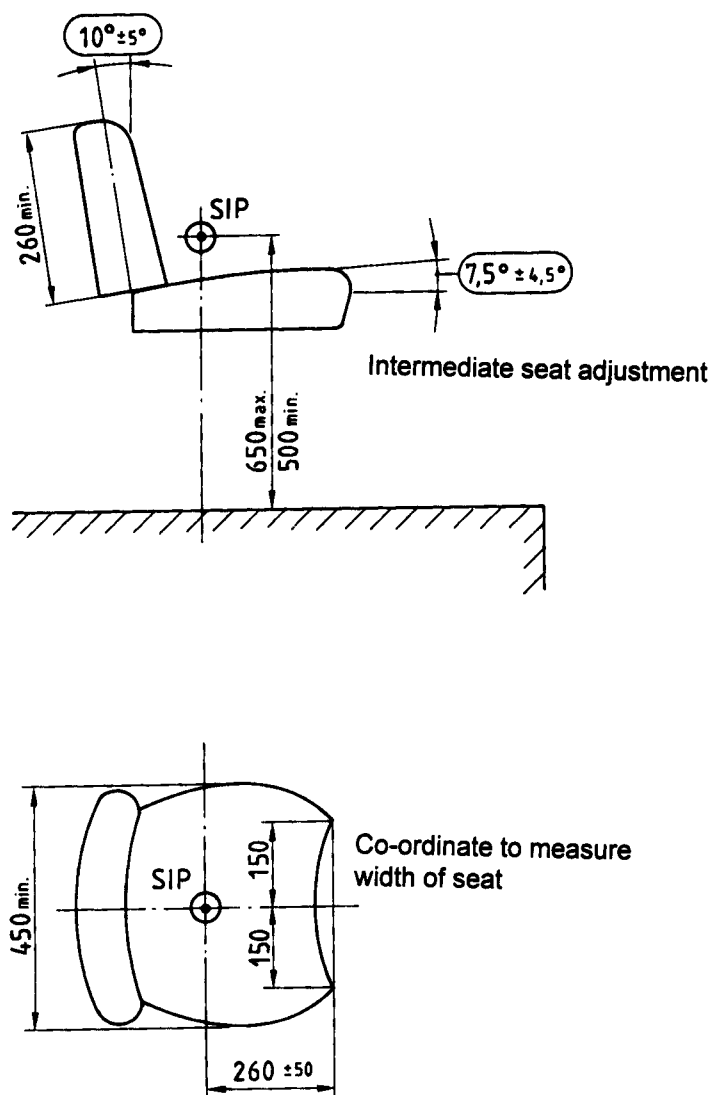
5.3.3 Shearing and pinching points

On 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 $R = 1000$ 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

Figure 2. Seat dimensions and height