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**Agricultural machinery — Safety —**  
**Part 1:**  
**General requirements**  
**AMENDMENT 1**

*Matériel agricole — Sécurité —*  
*Partie 1: Exigences générales*  
**AMENDEMENT 1**

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This document was prepared by Technical Committee ISO/TC 23, *Tractors and machinery for agriculture and forestry*, Subcommittee SC 3, *Safety and comfort*, in collaboration with CEN/TC 144, *Tractors and machinery for agriculture and forestry*, in accordance with the agreement on technical cooperation between ISO and CEN (Vienna Agreement).

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# Agricultural machinery — Safety —

## Part 1: General requirements

### AMENDMENT 1

#### *Scope*

Add a bullet and NOTE to the third paragraph:

- machine-specific performance levels (PL or AgPL).

NOTE Machine-specific standards can give the required PL or AgPL.

#### *Normative references*

Update the reference to ISO 3600 by deleting the year of edition.

Add the following reference:

ISO 9533, *Earth-moving machinery — Machine-mounted audible travel alarms and forward horns — Test methods and performance criteria*

#### 3.3

Modify 3.3 to read:

#### **3.3 three-point contact**

system which permits a person to simultaneously use two hands and a foot or two feet and one hand to keep contact with the machine

#### 4.7.1.2

Modify 4.7.1.2.1 to read:

**4.7.1.2.1** The height of the first step shall not exceed 550 mm when measured with the specified tyres and with the maximum diameter at specified inflation pressure [see 8.2.3 w)]. The vertical distance between successive steps shall be equal within a tolerance of  $\pm 20$  mm. Each step shall have a slip-resistant surface, a lateral stop at each end and be so designed (for example mudguards, perforated steps) that an accumulation of mud and/or snow is minimized under normal work conditions.

A flexible connection(s) between the first and second steps is permitted.

*Figure 3*

Add a new key "E" to Figure 3.

Add "E Height of first step" to the key table.

*Table 1*

Add the dimension of 550 mm for both ladders and steps to Table 1.

4.8

Replace 4.8.2 with the following:

**4.8.2 Place to stand**

**4.8.2.1** A place provided for standing shall be a minimum of 300 mm width, be flat and have a slip-resistant surface. Depending on the machine configuration, it may consist of two separate surfaces and may use machine components. In case of separate surfaces, each surface shall be a minimum of 150 mm width and on the same height level with a tolerance of  $\pm 50$  mm. It shall be positioned so the operator can maintain stability while carrying out the service required.

**4.8.2.2** Handhold(s) and/or railings shall be provided in order to allow three-point contact. Parts of the machine can be considered to fulfil this requirement.

**4.8.2.3** When access is needed above or next to the PTO (power take-off) drive shaft, an adequate place to stand and boarding means shall be provided in order to eliminate the need to use the PTO drive shaft or its guard as a step or a place to stand.

Add a new subclause:

**4.8.4 Walkways**

Walkways shall be a minimum of 300 mm width. It is allowable for the width to reduce to 250 mm for short distances to accommodate handrail support members or machine components if it does not create additional hazards.

4.19

Modify the NOTE to read:

NOTE ISO 13850:2006 is not applicable to wireless emergency stop devices. Requirements for wireless remote control devices that require emergency stop devices of ISO 13850:2015 can be given in relevant machine-specific standards.

## 4.20

Replace 4.20 with the following:

Safety-related parts of control systems shall be in accordance with ISO 25119-1 to ISO 25119-4 or ISO 13849-1 and ISO 13849-2.

NOTE Annex E provides guidance for risk assessment and determination of performance levels.

## 5.1.7

Replace 5.1.7.1 with the following:

**5.1.7.1** The design and position of the operator's station shall be such that the operator has adequate visibility direct or indirect to operate the machine and view the work area of the machine.

If during driving operation direct visibility to the area just behind the machine is not possible, an appropriate device, or combination of devices, shall be provided, such as:

- means for indirect visibility (such as mirrors, CCTV);
- an audible reverse warning alarm which is automatically engaged when reverse drive is selected and in accordance with ISO 9533;
- visual warning signal;
- protective device, to detect the presence of persons and stop the machinery or warn the driver.

NOTE Consider operating conditions such as regularly moving backward and forward on the farmyard.

If a cabin is provided, provisions to install devices for defrosting and demisting the front window(s) shall be made and glare from sunshine or artificial lighting shall be minimized by adjustable shielding, by location or other means.

## 5.1.8.1

Modify 5.1.8.1 to read:

**5.1.8.1** To avoid unauthorized activation of the engine starting, means such as the following shall be provided:

- key-operated ignition or starting switch;
- lockable cab;
- lockable cover for the ignition or starting switch;
- security ignition or starting lock;
- lockable battery disconnecting switch.

Information to avoid unauthorized starting shall be provided in the operator's manual [see 8.2.3 f)].

6.4

Add the following NOTE at the end of 6.4.1:

NOTE It is intended to move the specifications of 6.4.1 into another standard in the future (for example ISO 5673-1).

8.2

Modify 8.2.3 b) to read

- b) compatibility with the tractors, for example hitching system, PTO drive shaft, vertical load at hitching point, engine power, stability (see 6.3.1, 6.3.2, 6.4.1), including instructions where replacement of the drive shaft and/or PIC guard are needed; to be clear, concise, and maintain the safety level of the elements that are replaced. When applicable, the information shall include:
- type of connections on the PTO side;
  - type of connections on the PIC side;
  - maximum allowed diameter of the guards for compatibility with the PIC guard;
  - type of allowed locking system(s);
  - type and setting of overload protection device;
  - power and speed to be transmitted;
  - length and procedure to adapt the length;

Add the following to 8.2.3:

- z) information on the use of the PTO-drive-shaft for PTO-driven equipment, such as:
- information about the interaction between PTO-drive-shaft guarding and PIC guard;
  - information, if necessary, on how to attach the restraining system;
  - the need to and how to use a support for the PTO drive shaft when it is not in use, that is different from the restraining system and which does not cause such damage to the guard that the telescoping of the inner and outer tubes is prevented.

*Annex E*

Add a new Annex E:



## ANNEX E

### (informative)

## Guidance for risk assessment and determination of performance levels for safety-related parts of control systems

**E.1** Risk assessment was used to determine the requirements of ISO 4254-1 and the requirements of associated machine specific type-C standards. This annex provides some basic guidance for the use of risk assessment when determining requirements either of related machine specific standards or for hazards not covered by those documents, including the required performance level for safety-related parts of control systems. Additional requirements to deal with hazards not covered by ISO 4254-1 and associated machine specific type-C standards are outside the scope of those standards.

Risk assessment and the allocation of required performance levels are not simple issue and should be carried out by suitably qualified and experienced persons (see E.3). The requirements of ISO 12100 for risk assessment and ISO 13849 (all parts) or ISO 25119 (all parts) for performance levels should be taken into account as they provide a more detailed approach.

The specification and verification of the performance level should cover the whole of the safety-related control system from input sensors to final switching devices (e.g. to stop hazardous motion).

**E.2** To achieve optimum results, the machine design accompanying risk assessment and the determination of the required performance level are considered in parallel. This is due to the interdependence of the machine's safety concept (for example inherently safe design, protective measures, etc.) with the determination of the required performance level. Specification of the required performance level without consideration of the machine's limits and architecture is not an appropriate approach.

**NOTE** The consideration of the machine/system limits, its architecture, functions, etc. is of relevance in both cases – the manufacturer's product development and the standardization process.

All relevant and appropriate aspects should be considered by machine designers when addressing hazardous situations.

**EXAMPLE** Analysis of hazards related to the opening and closing of the rear door of a trailer with a tipping body can include various aspects such as

- design related aspects, for example
  - height of the door above the ground when open and closed
  - speed of opening and closing
  - closing force
  - angle of opening and final position of the door when open
  - control system (on machine and for interchangeable equipment on the tractor)
- operation related aspects, for example
  - view to the danger zone by the operator
  - actuation of controls (for example hold-to-run)
  - manual or automatic locking/unlocking of the door