
Kmetijski stroji - Varnost - 18. del: Nakladalniki in stroji za prevoz krme (ISO/DIS 4254-18:2019)

Agricultural machinery - Safety - Part 18: Loader wagons and forage transport wagons (ISO/DIS 4254-18:2019)

Landmaschinen - Sicherheit - Teil 18: Ladewagen und Häckseltransportwagen (ISO/DIS 4254-18:2019)

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65.060.01	Kmetijski stroji in oprema na splošno	Agricultural machines and equipment in general
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Agricultural machinery — Safety —

Part 18:

Forage loader wagons and forage transport wagons

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Foreword

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The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular, the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received (see www.iso.org/patents).

Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

For an explanation of the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT), see www.iso.org/iso/foreword.html.

This document was prepared by Technical Committee ISO/TC 23, *Tractors and machinery for agriculture and forestry*, Subcommittee SC 7, *Equipment for harvesting and coservation*.

A list of all parts in the ISO 4254-series can be found on the ISO website.

Any feedback or questions on this document should be directed to the user's national standards body. A complete listing of these bodies can be found at www.iso.org/members.html.

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Introduction

The structure of safety standards in the field of machinery is as follows:

- a) type-A standards (basic standards) giving basic concepts, principles for design, and general aspects that can be applied to machinery;
- b) type-B standards (generic safety standards) dealing with one or more safety aspects or one or more types of safeguards that can be used across a wide range of machinery:
 - type-B1 standards on particular safety aspects (e.g. safety distances, surface temperature, noise);
 - type-B2 standards on safeguards (e.g. two-hand controls, interlocking devices, pressure-sensitive devices, guards);
- c) type-C standards (machinery safety standards) dealing with detailed safety requirements for a particular machine or group of machines.

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

The machinery concerned and the extent to which hazards, hazardous situations or hazardous events are covered are indicated in the Scope of this part of ISO 4254. These hazards are specific to mounted, semi-mounted and trailed bale wrappers for bales of agricultural harvesting products, including wrappers which are combined or integrated with pick-up balers.

Significant hazards that are common to all the agricultural machines (self-propelled ride-on, mounted, semi-mounted and trailed) are dealt with in ISO 4254-1.

When requirements of this type-C standard are different from those which are stated in type-A or type-B standards the requirements of this type-C standard take precedence over the requirements of the other standards for machines that have been designed and built according to the provisions of this type-C standard.

Agricultural machinery — Safety —

Part 18:

Forage loader wagons and forage transport wagons

1 Scope

This document, intended to be used together with ISO 4254-1, specifies the safety requirements and their verification for the design and construction of

- trailed loader wagons,
- trailed forage transport wagons,
- silage and forage body intended to be affixed to a carrier vehicle,
- trailers with a load push/push-off device, slats or alternating moving floor

which is intended for the use by only one person (operator). In addition, it specifies the type of information on safe working practices including residual risks to be provided by the manufacturer.

This document is not applicable to:

- self-propelled loader wagons and self-propelled forage transport wagons,
- trailers with a tipping body, balanced or semi-mounted, used in agriculture.

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

This document, taken together with ISO 4254-1, deals with all the significant hazards, hazardous situations and events relevant to loader wagons and forage transport wagons, when they are used as intended and under the conditions of misuse that are reasonably foreseeable by the manufacturer (see [Annex A](#)). It is not applicable to hazards by presence of other persons than the operator and hazards related to noise and moving parts of the power transmission, excluding strength requirements for guards and barriers.

This document is not applicable to loader wagons and forage transport wagons manufactured before the date of publication of this document.

2 Normative references

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.

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

ISO 4254-1:2013, *Agricultural machinery — Safety — Part 1: General requirements*

ISO 12100:2010, *Safety of machinery — General principles for design — Risk assessment and risk reduction*

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

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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 ISO 4254-1 and ISO 12100 and the following apply.

**3.1
forage loader wagon**
machine for automatically load, transport and unload of chopped crops by means of a pick-up device

Note 1 to entry: Unloading is done by power-driven distribution devices which are integrated in the machine (for example conveyor) and can be done without or with powered distribution devices (for example dosage or distributor cylinders, cross conveyor belt).

**3.1.1
dual-purpose wagon**
forage loader wagon which additionally fulfils the characteristics of a forage transport wagon

**3.2
forage transport wagon**
machine for transport and unloading of chopped crop which is filled from outside the machine

Note 1 to entry: Unloading is done by power-driven distribution devices which are integrated in the machine (for example conveyor, retractable floor, movable bulkhead) and can be done without or with powered distribution devices (for example dosage or distributor cylinders, cross conveyor belt).

**3.2.1
push-off wagon**
forage transport wagon, where the unloading is done by means of power-driven distribution devices which are integrated in the machine (moving floor with bulkhead)

Note 1 to entry: Unloading can be performed without or with powered distribution devices (for example dosage or distributor cylinders, cross belt conveyor).

**3.3
pick-up**
device for gathering a crop from a windrow and conveying the cut crop into the wagon

**3.6
articulated drawbar**
adjustable device to change the ground clearance at the front of trailed machines

**3.7
conveyor**
powered device consisting of two or more chains and connected conveyor slats for the purpose of conveying the shredded crop to the loading platform

**3.8
moving floor with bulkhead (push-off device)**
hydraulically movable unit for push-off wagons which is horizontally movable from the front end of the loading space to the rear unloading edge

**3.9
dosage / distributer cylinders**
powered tools for the purpose of equal distribution of chopped crop

**3.10
side door / door / hood**
access for operator to the loading space for maintenance and inspection

3.11**tailgate**

moveable device at the rear of the machine which serves as the rear limit of the load body and which can be opened to unload the machine

3.12**entry point**

precise location at which the conveyor chain engages with the drive sprocket(s)

3.13**nip point**

precise location at which the conveyor slats pass by fixed parts of the machine

3.14**reverse operation of the conveyor**

temporary movement of the conveyor opposite the direction of the work

3.15**cross-belt conveyer**

powered conveying device for unloading of harvested crops perpendicular to the direction of travel of the machine

3.16**scissors gate body**

foldable load body for the purpose of extension of the loading volume

3.17**feeding elements**

devices between the pick-up and the loading space that transfer the material from the pick-up to the bale chamber (for example, stuffer, rotor)

Note 1 to entry: These devices can convey the material towards the centre of the machine (for example, auger).

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4 Safety requirements and/or protective/risk reduction measures for all machines

4.1 General

Machinery shall comply with the safety requirements and/or protective/risk reduction measures of this clause.

In addition, the machine shall be designed in accordance with the principles of ISO 12100:2010, clause 4, for hazards relevant, but not significant, which are not dealt with by this part of ISO 4254.

The compliance with the safety requirements and / or protective/risk reduction measures shall be verified in accordance with [clause 5](#).

Unless otherwise specified in this part of ISO 4254, the machine shall comply with the requirements of ISO 4254-1 and with Tables 1,3, 4 and 6 of ISO 13857:2008.

4.2 Controls

4.2.1 General

The operator shall be unable to reach controls when inside the loading space.

The control(s) shall be located so that it is not possible for the operator to reach unguarded moving working tools when actuating the control(s). This requirement is deemed to be fulfilled when the distance between the controls and each unguarded moving working tool during operation is ≥ 850 mm.

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Controls for machines where actuation from the driver's seat is required, shall be designed so that the operator can reach them for example by means of adjustable position of the controls or possibility of installation inside the tractor.

These requirements have to be verified by measurement and inspection.

4.2.2 Manual controls

For manual controls the requirements of 4.5 and 6.1 of ISO 4254-1:2013 apply.

In addition,

- unintentional activation of manual controls shall be avoided by design, location or other means;
- the distance between manual controls and hazardous zones of the machine shall exceed 850 mm. If for the knife sharpening device, the distance of minimum 850 mm cannot be fulfilled, the actuation of the controls shall be by 2 hands and the controls shall be of hold-to-run type.

4.2.3 Remote controls (with cables or cableless)

Note Proposals expected during next enquiry.

4.3 Stability in parking position

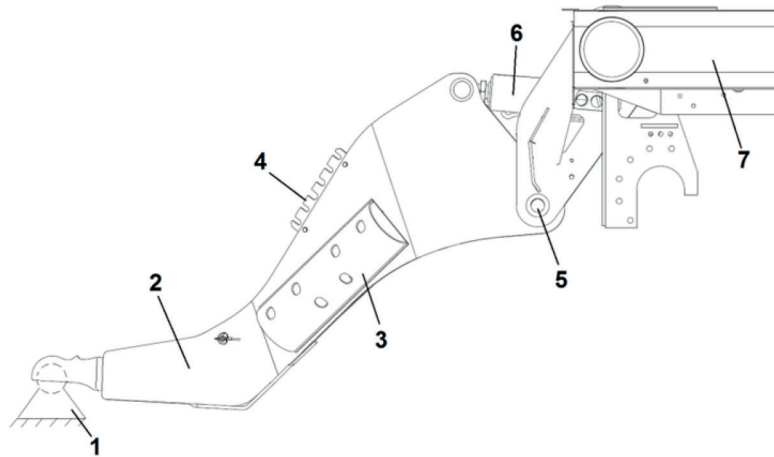
For the stability in parking position, the requirements under 6.2.1 of ISO 4254-1:2013 apply.

Safe means shall be provided to prevent the machine from rolling away when parked.

4.4 Articulated drawbar

Crushing and shearing points in the area of the move parts of the articulated drawbar shall be protected. Protection can be achieved by:

- safety distances complying with the requirements of ISO 13857:2008, Tables 1, 3, 4 and 6 as appropriate; or
- in any position of the traversable stroke of the articulated drawbar it has to be met:
- a safety distance of either ≤ 8 mm or ≥ 25 mm between moving and fixed parts;
- an angle α of $\geq 30^\circ$ or a safety distance of ≥ 25 mm for parts shearing against one another (see [figures 1, 2 and 3](#)).



Key

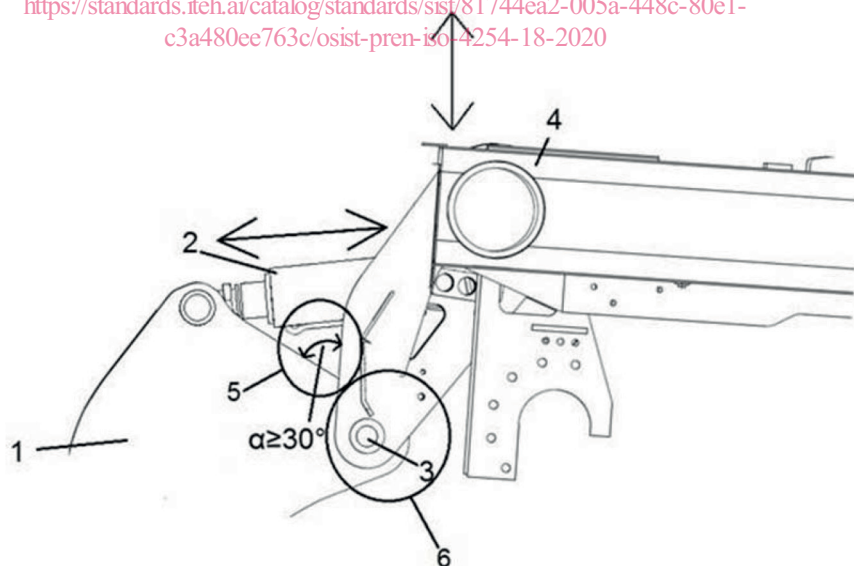
- 1 Ball-type coupling device
- 2 Drawbar
- 3 Angle of yaw limiter
- 4 Hydraulic hose retainer
- 5 Connection point drawbar – frame (pivot point)
- 6 Articulated drawbar cylinder
- 7 Vehicle body

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Figure 1 — Articulated drawbar in lowered position

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Key

- | | |
|---|------------------|
| 1 Articulated drawbar | 4 Vehicle frame |
| 2 Articulated drawbar cylinder | 5 Shearing point |
| 3 Connection bolt articulated drawbar – frame (pivot point) | 6 Crushing point |

Figure 2 — Cylinder of articulated drawbar in extended position