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Agricultural machinery - Safety - Part 18: Forage loader wagons and forage transport wagons (ISO/DIS 4254-18:2026)

Landmaschinen - Sicherheit - Teil 18: Ladewagen und Häckseltransportwagen (ISO/DIS 4254-18:2026)

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Part 18: Forage loader wagons and forage transport wagons

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Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

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).

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For an explanation on 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 the following URL: 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 conservation*.

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.

Introduction

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

This document is of relevance, in particular, for the following stakeholder groups representing the market players with regard to machinery safety:

— machine manufacturers (small, medium and large enterprises);

— health and safety bodies (regulators, accident prevention organizations, market surveillance, etc.).

Others can be affected by the level of machinery safety achieved with the means of the document by the above-mentioned stakeholder groups:

— machine users/employers (small, medium and large enterprises);

— machine users/employees (e. g. trade unions, organizations for people with special needs);

— service providers, e. g. for maintenance (small, medium and large enterprises);

— consumers (in the case of machinery intended for use by consumers)

The above-mentioned stakeholder groups have been given the possibility to participate at the drafting process of this document.

The machinery concerned and the extent to which hazards, hazardous situations or hazardous events are covered are indicated in the Scope of this document.

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 requirements 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 forage loader wagons,

— trailed forage cutter-loader wagons,

— trailed forage transport wagons,

— silage and forage bodies 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 forage loader wagons, self-propelled forage cutter 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 document take precedence over the requirements of ISO 4254-1 for machines that have been designed and built according to the requirements of this document.

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. Requirements for remote controls are not dealt with.

This document is not applicable to machines manufactured before the date of its publication.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 3600:2015, *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 4254-12:2012, *Agricultural machinery — Safety — Part 12: Rotary disc and drum mowers and flail mowers*

ISO 11684:2023, *Tractors, machinery for agriculture and forestry, powered lawn and garden equipment — Safety labels — General principles*

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

ISO 13857:2019, *Safety of machinery — Safety distances to prevent hazard zones being reached by upper and lower limbs*

ISO 17101-1:2012, *Agricultural machinery — Thrown-object test and acceptance criteria — Part 1: Rotary mowers*

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 loading by means of an integrated pick-up device, transporting and unloading of chopped crop

Note 1 to entry: Unloading is done by a power-driven device which is integrated in the machine (for example conveyor, pusher, moveable floor, etc.) and can include powered distribution devices (for example beater/agitator, cross conveyor belt).

Note 2 to entry: See Figure B.1 as an example.

3.2
forage cutter-loader wagon
machine for chopping by means of an integrated rotary mower, loading, transporting and unloading of crop

Note 1 to entry: Unloading is done by a power-driven device which is integrated in the machine (for example conveyor, pusher, moveable floor, etc.) and can include powered distribution devices (for example beater/agitator, cross conveyor belt).

Note 2 to entry: See Figure B.2 as an example.

3.3
forage transport wagon
machine for transporting and unloading of chopped crop which is filled by means of a separate machine

Note 1 to entry: Unloading is done by a power-driven device which is integrated in the machine (for example conveyor, pusher, movable floor, etc.) and can include powered distribution devices (for example beater/agitator, cross conveyor belt).

Note 2 to entry: See Figure B.3 as an example.

3.4
push-off device
powered surface that moves horizontally through the *loading space* (3.17) to push the chopped crop

3.5
pick-up
device for gathering a cut crop and conveying it into the wagon

3.6
rotary mower
mower in which one or more functional components cut or shear forage crop by impact without mulching and rotate about a vertical axis

Note 1 to entry: Definition taken from ISO 4254-12:2012, 3.1

3.7
articulated drawbar
device used to connect the machine to the tractor that is adjustable to adapt the position of the machine to the working conditions

3.8
floor conveyor
powered device integrated in the bottom of the *load body* (3.18), consisting of a non-rigid tension device that is pulled around at least one sprocket/roller for the purpose of moving the chopped crop

3.9
moving floor
bottom of the *load body* (3.18) that is movable for the purpose of moving the chopped crop

3.10
beater/agitator
powered tool for the purpose of distribution of chopped crop

3.11
service door
device that allows access for operator to the loading space for maintenance, inspection and cleaning

3.12
discharge gate
moveable device that is part of the *load body* (3.18) and which can be opened to unload the machine

3.13
entry point
location where the conveyor engages a sprocket/roller

3.14
cross conveyor
powered device for unloading of chopped crop in a direction perpendicular to the direction of travel of the machine

3.15
load body extension
Movable portion of the *load body* (3.18) that increases the *loading space* (3.17)

3.16
feeding element
device between the pick-up or the rotary mower and the loading space that transfers the crop from the pick-up or the rotary mower to the *loading space* (3.17)

EXAMPLE stuffer, rotor

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

3.17
loading space
volume that is intended to contain chopped crop

3.18
load body
physical structure that establishes the *loading space* (3.17)

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

4.1 General

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

4.1.2 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.

4.1.3 The compliance with the safety requirements and / or protective/risk reduction measures shall be verified in accordance with clause 5.

4.1.4 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 13857:2019.

4.2 Controls

4.2.1 Controls shall be located such that the operator cannot reach them when inside the loading space.

4.2.2 Controls shall be located such that the operator cannot reach unguarded moving working tools while the control(s) are being actuated.

4.2.3 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.

4.2.4 Unintentional actuation of the controls shall be avoided by design, location or other means.

4.2.5 The requirements of 4.5 of ISO 4254-1:2013 apply.

4.2.6 In addition, at least one of the following steps shall be taken in the given order, with respect to the function of the machine:

— the distance between manual controls and hazardous zones of the machine shall be ≥ 850 mm; or

— the actuation of the controls shall require 2 hands and the controls shall be hold-to-run type; or

— a disconnect device shall be provided to disengage power from all moving mechanisms, after the primary power input. The disconnect device shall be readily accessible from the manual controls. Following activation of the disconnect device, reengagement of power shall require an intentional action at a location ≥ 850 mm from the manual controls.

4.3 Stability in parking position

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

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

4.4 Articulated drawbar

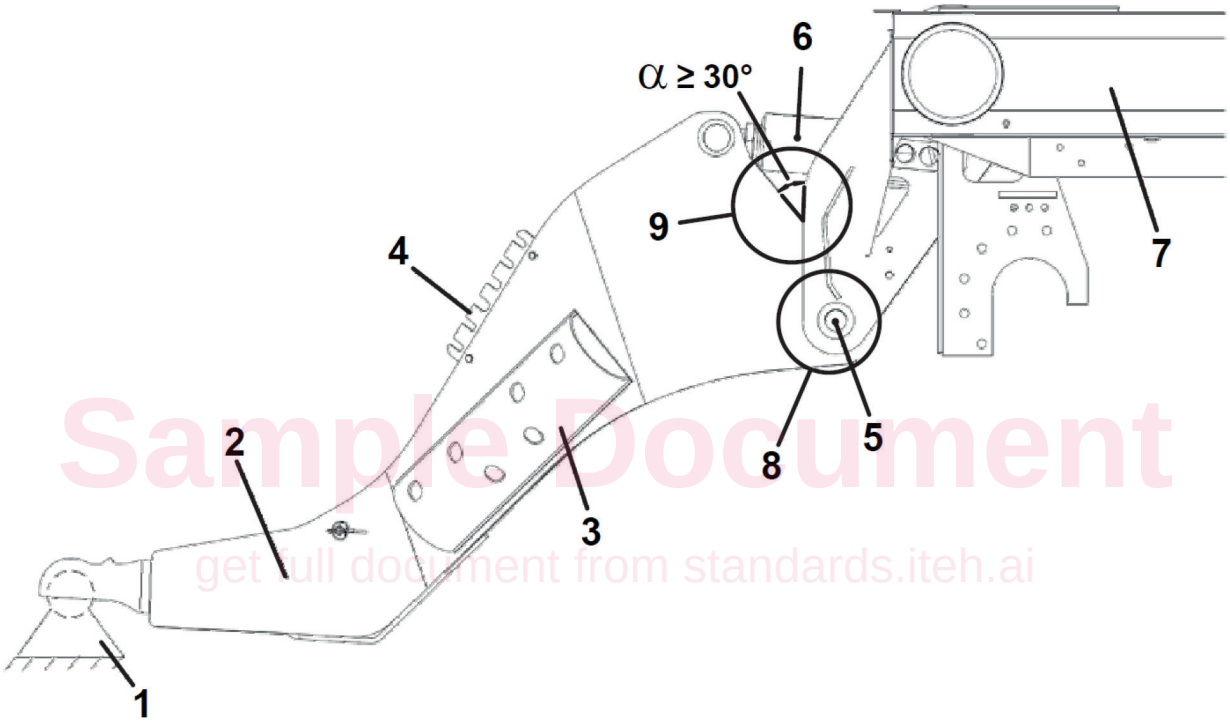
4.4.1 Crushing and shearing points in the area of the articulated drawbar shall be protected by at least one of the following methods:

— safety distances are maintained according to the requirements of ISO 13857:2019, Tables 1, 3, 4 and 6 as appropriate;

— in any position of the traversable stroke of the articulated drawbar:

  — parts moving toward fixed parts maintain a safety distance of ≤ 8 mm or ≥ 25 mm; and

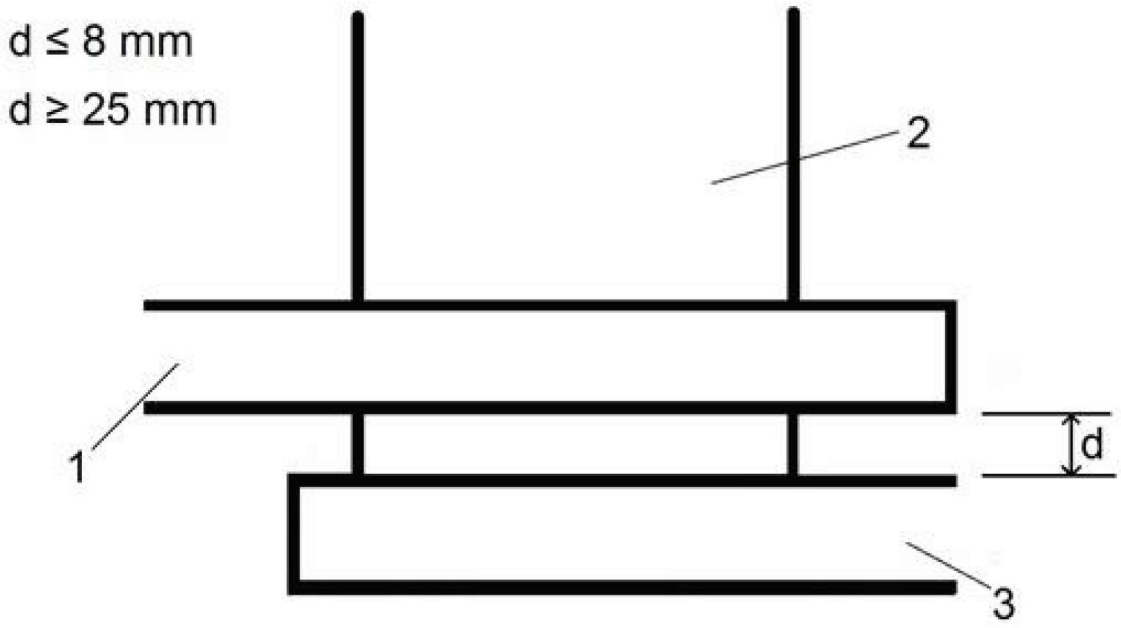
  — parts shearing past each other maintain an angle α of ≥ 30° or a safety distance of ≥ 25 mm (see Figures 1 and 2).



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
8	crushing point
9	shearing point

Figure 1 — Articulated drawbar – Side view



Key

1	articulated drawbar
2	connection bolt articulated drawbar – frame (pivot point)
3	vehicle body

Figure 2 — Articulated drawbar – Top view

4.4.2 The articulated drawbar shall be protected against unintentional activation according to 4.11 of ISO 4254-1:2013 in order to avoid lowering of the vehicle for example, during maintenance work.

4.5 Requirements for the pick-up device

4.5.1 Protection against inadvertent contact with the pick-up device shall be provided by parts of the machine, guards, barriers or a combination of these. The position of parts which may be adjustable shall always remain within the limits specified in 4.5.2. The projection on a horizontal plane of these protective devices shall be continuous.

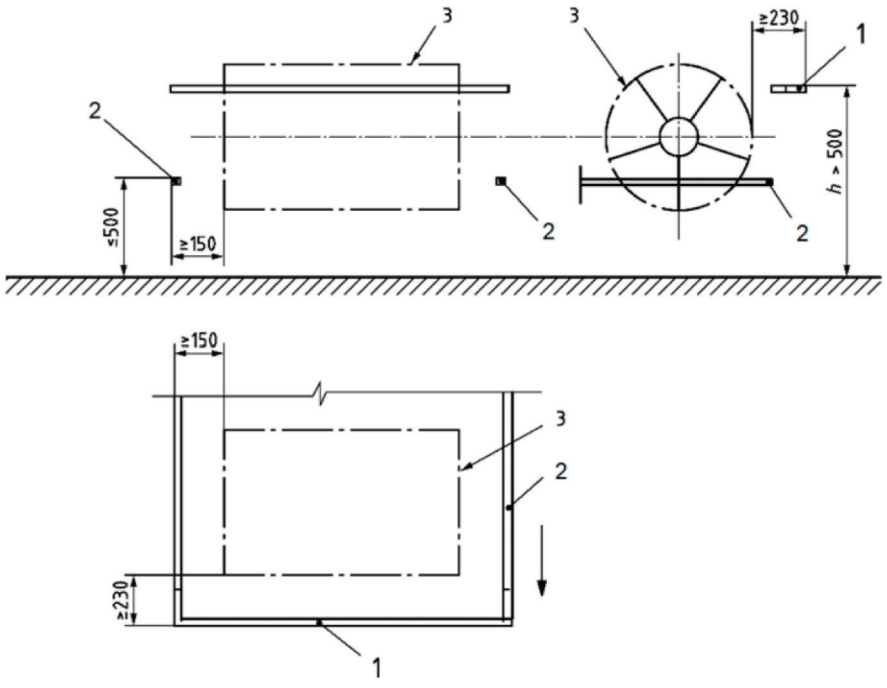
4.5.2 When the pick-up device is in the working position as defined in the operator's manual, these barriers shall be positioned as follows:

— the front barrier in a horizontal distance of at least 230 mm in front of the most forward point of the tine path and in a height h > 500 mm above the ground (see Figure 3a), or the horizontal distance of at least 100 mm if the height h ≤ 500 mm (see Figure 3b). The front barrier is not required if a part of the machine fulfils this function (i.e. deflector plate, role with reels);

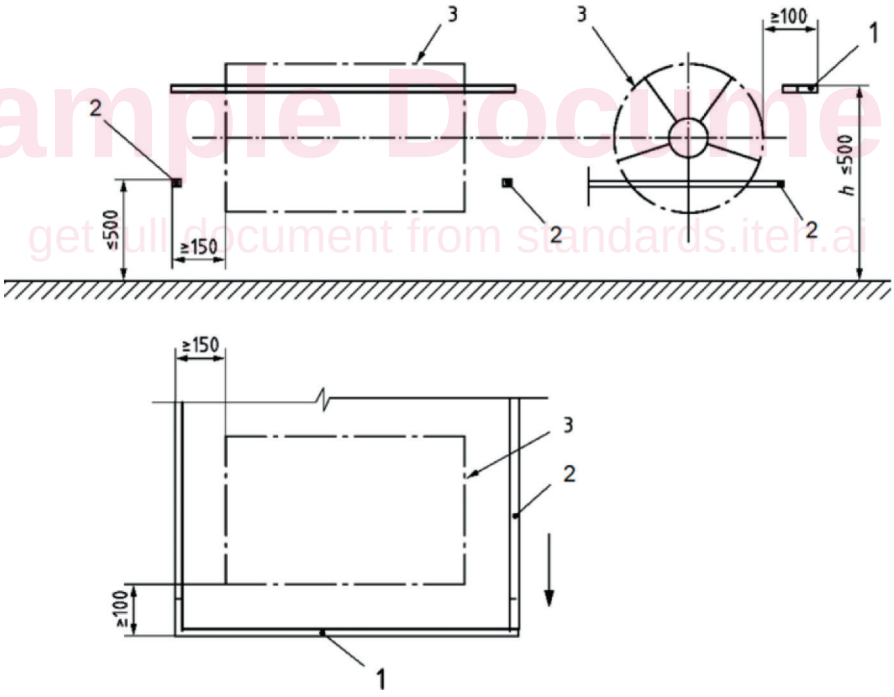
— the lateral barrier in a horizontal distance of at least 150 mm from the sides of the tine path and a height no more than 500 mm above the ground of (see Figure 3). The lateral barrier is not required if a part of the machine fulfils this function (i.e. contact wheel, see Figure 5) or if the tine path is totally covered by a part of the machine when viewed from the side, as defined and shown in Figure 4.

4.5.3 When the pick-up device is in the working position, side guards, if fitted, shall be located in accordance with Figure 4.

Dimensions in Millimetres



a)



b)

Key

1	front barrier
2	lateral barrier
3	tine path

Figure 3 — Protection of pick-up device by a combination of barriers