SVENSK STANDARD
SS-ISO 26322-1:2013

Fastställd/Approved: 2013-03-20
Publicerad/Published: 2013-04-04
Utgåva/Edition: 1
Språk/Language: engelska/English
ICS: 65.060.10

Traktorer för lantbruk och skogsbruk – Maskinsäkerhet – Del 1: Standardtraktorer (ISO 26322-1:2008, IDT)

Tractors for agriculture and forestry – Safety – Part 1: Standard tractors (ISO 26322-1:2008, IDT)

Standarder får världen att fungera

SIS (Swedish Standards Institute) är en fristående ideell förening med medlemmar från både privat och offentlig sektor. Vi är en del av det europeiska och globala nätverk som utarbetar internationella standarder. Standarder är dokumenterad kunskap utvecklad av framstående aktörer inom industri, näringsliv och samhälle och befrämjar handel över gränser, bidrar till att processer och produkter blir säkrare samt effektiviserar din verksamhet.

Delta och påverka
Som medlem i SIS har du möjlighet att påverka framtida standarder inom ditt område på nationell, europeisk och global nivå. Du får samtidigt tillgång till tidig information om utvecklingen inom din bransch.

Ta del av det färdiga arbetet
Vi erbjuder våra kunder allt som rör standarder och deras tillämpning. Hos oss kan du köpa alla publikationer du behöver – allt från enskilda standarder, tekniska rapporter och standard-paket till handböcker och onlinetjänster. Genom vår webbtjänst e-nav får du tillgång till ett lättnavigerat bibliotek där alla standarder som är aktuella för ditt företag finns tillgängliga. Standarder och handböcker är källor till kunskap. Vi säljer dem.

Utveckla din kompetens och lyckas bättre i ditt arbete
Hos SIS kan du gå öppna eller företagsinterna utbildningar kring innehåll och tillämpning av standarder. Genom vår närhet till den internationella utvecklingen och ISO får du rätt kunskap i rätt tid, direkt från källan. Med vår kunskap om standarders möjligheter hjälper vi våra kunder att skapa verklig nytta och lönsamhet i sina verksamheter.

Vill du veta mer om SIS eller hur standarder kan effektivisera din verksamhet är du välkommen in på www.sis.se eller ta kontakt med oss på tel 08-555 523 00.

Standards make the world go round

SIS (Swedish Standards Institute) is an independent non-profit organisation with members from both the private and public sectors. We are part of the European and global network that draws up international standards. Standards consist of documented knowledge developed by prominent actors within the industry, business world and society. They promote cross-border trade, they help to make processes and products safer and they streamline your organisation.

Take part and have influence
As a member of SIS you will have the possibility to participate in standardization activities on national, European and global level. The membership in SIS will give you the opportunity to influence future standards and gain access to early stage information about developments within your field.

Get to know the finished work
We offer our customers everything in connection with standards and their application. You can purchase all the publications you need from us - everything from individual standards, technical reports and standard packages through to manuals and online services. Our web service e-nav gives you access to an easy-to-navigate library where all standards that are relevant to your company are available. Standards and manuals are sources of knowledge. We sell them.

Increase understanding and improve perception
With SIS you can undergo either shared or in-house training in the content and application of standards. Thanks to our proximity to international development and ISO you receive the right knowledge at the right time, direct from the source. With our knowledge about the potential of standards, we assist our customers in creating tangible benefit and profitability in their organisations.

If you want to know more about SIS, or how standards can streamline your organisation, please visit www.sis.se or contact us on phone +46 (0)8-555 523 00

Den internationella standarden ISO 26322-1:2008 gäller som svensk standard. Detta dokument innehåller den officiella engelska versionen av ISO 26322-1:2008.

The International Standard ISO 26322-1:2008 has the status of a Swedish Standard. This document contains the official version of ISO 26322-1:2008.

Upplysningar om sakinnehållet i standarden lämnas av SIS, Swedish Standards Institute, telefon 08-555 520 00. Standarder kan beställas hos SIS Förlag AB som även lämnar allmänna upplysningar om svensk och utländsk standard.

Information about the content of the standard is available from the Swedish Standards Institute (SIS), telephone +46 8 555 520 00. Standards may be ordered from SIS Förlag AB, who can also provide general information about Swedish and foreign standards.

Denna standard är framtagen av kommittén för Lantbruksmaskiner, SIS/TK 228.

Har du synpunkter på innehållet i den här standarden, vill du delta i ett kommande revideringsarbete eller vara med och ta fram andra standarder inom området? Gå in på www.sis.se - där hittar du mer information.

Contents

Page

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.

International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 2.

The main task of technical committees is to prepare International Standards. Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

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.

ISO 26322-1 was prepared by Technical Committee ISO/TC 23, *Tractors and machinery for agriculture and forestry*, Subcommittee SC 4, *Tractors*.

This first edition of ISO 26322-1 cancels and replaces ISO 4254-3:1992, of which it constitutes a technical revision. Additional requirements have been included in order to take account of the technical evolution of the tractors and changes in their use that have occurred since publication of the replaced International Standard.

ISO 26322 consists of the following parts, under the general title *Tractors for agriculture and forestry — Safety*:

— *Part 1: Standard tractors*

— *Part 2: Narrow-track and small tractors*

Tractors for agriculture and forestry — Safety —

Part 1:
Standard tractors

1 Scope

This part of ISO 26322 specifies general safety requirements and their verification for the design and construction of standard tractors used in agriculture and forestry. These tractors have at least two axles for pneumatic-tyred wheels, with the smallest track gauge of the rear axle exceeding 1 150 mm, or tracks instead of wheels, with their unballasted tractor mass being greater than 600 kg.

NOTE Tractors having an unballasted mass not greater than 600 kg and a smallest adjustable track gauge of the axle bearing the larger tyres of $\leqslant$ 1 150 mm are dealt with in ISO 26322-2.

In addition, this part of ISO 26322 specifies the type of information on safe working practices (including residual risks) to be provided by the manufacturer, as well as technical means for improving the degree of personal safety of the operator and others involved in a tractor's normal operation, maintenance and use.

It is not applicable to vibration or braking.

2 Normative references

The following referenced documents are indispensable for the application 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 500-1, *Agricultural tractors — Rear-mounted power take-off types 1, 2 and 3 — Part 1: General specifications, safety requirements, dimensions for master shield and clearance zone*

ISO 3463, *Tractors for agriculture and forestry — Roll-over protective structures (ROPS) — Dynamic test method and acceptance conditions*

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

ISO 3776-1, *Tractors and machinery for agriculture — Seat belts — Part 1: Anchorage location requirements*

ISO 3776-2, *Tractors and machinery for agriculture — Seat belts — Part 2: Anchorage strength requirements*

ISO/OECD 3776-3, *Tractors and machinery for agriculture — Seat belts — Part 3: Requirements for assemblies* [1)]

ISO 3795, *Road vehicles, and tractors and machinery for agriculture and forestry — Determination of burning behaviour of interior materials*

ISO 4252, *Agricultural tractors — Operator's workplace, access and exit — Dimensions*

1) To be published.

ISO 4413:1998, *Hydraulic fluid power — General rules relating to systems* [2)]

ISO 5131:1996, *Acoustics — Tractors and machinery for agriculture and forestry — Measurement of noise at the operator's position — Survey method*

ISO 5700, *Tractors for agriculture and forestry — Roll-over protective structures (ROPS) — Static test method and acceptance conditions*

ISO 7216, *Acoustics — Agricultural and forestry wheeled tractors and self-propelled machines — Measurement of noise emitted when in motion*

ISO 8759-1, *Agricultural wheeled tractors — Front-mounted equipment — Part 1: Power take-off and three-point linkage*

ISO 10998, *Agricultural tractors — Requirements for steering*

ISO 11684, *Tractors, machinery for agriculture and forestry, powered lawn and garden equipment — Safety signs and hazard pictorials — General principles*

ISO 12100-1:2003, *Safety of machinery — Basic concepts, general principles for design — Part 1: Basic terminology, methodology*

ISO 13854:1996, *Safety of machinery — Minimum gaps to avoid crushing of parts of the human body*

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

ISO 15077, *Tractors and self-propelled machinery for agriculture — Operator controls — Actuating forces, displacement, location and method of operation*

ISO 23205, *Agricultural tractors — Instructional seat*

3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

3.1
normal operation and service
use of the tractor for the purpose intended by the manufacturer by an operator familiar with the tractor characteristics and complying with the information for operation, service and safe practices, as specified by the manufacturer in the operator's manual and by signs on the tractor

3.2
three-point contact support
system which permits a person to simultaneously use two hands and a foot or two feet and one hand when boarding, or dismounting from, a tractor

3.3
guarded by location
guarding where a hazard is guarded by other parts or components of the tractor that are not themselves guards, or when the hazard cannot be reached by the upper and lower limbs

2) Under revision.

3.4
inadvertent contact
unplanned exposure of a person to a hazard resulting from the person's action during normal operation and service of the tractor

3.5
hazard
machinery parts which can cause injury upon direct contact or by entanglement of personal apparel

NOTE These parts include, but are not limited to, pinch points, nip points, and projections on rotating parts.

4 Safety requirements

4.1 Fundamental principles, design guidance

4.1.1 The tractor shall be designed according to the principles of risk reduction specified in ISO 12100-1:2003, Clause 5, for hazards relevant but not significant.

4.1.2 Unless specified otherwise in this part of ISO 26322, safety distances shall be in accordance with ISO 13857:2008, Tables 1, 3, 4 and 6, and ISO 13854:1996, Table 1, as appropriate.

4.1.3 Tractor engine cover(s) that can be opened without tools may be considered an acceptable guard for rotating components provided that the engine cover is removable from the tractor only by the use of tools.

4.2 Noise

4.2.1 Noise at the operator's position

Noise tests and measurements shall be made in accordance with ISO 5131.

NOTE ISO 5131:1996, Annex A, gives procedures specific to agricultural and forestry tractors.

4.2.2 Noise emitted when in motion

Noise tests and measurements shall be made in accordance with ISO 7216.

4.3 Controls

4.3.1 General

4.3.1.1 Controls such as steering wheels or steering levers, gear levers, control levers, cranks, pedals and switches shall be chosen, designed, constructed and arranged so that their locations and methods of operation are in accordance with ISO 15077.

4.3.1.2 Hand-operated controls shall have minimum clearances in accordance with ISO 4252. This requirement does not apply to fingertip operation controls, such as push-buttons, electric switches.

4.3.2 Starting and stopping the engine

4.3.2.1 A means shall be provided to enable prevention of inadvertent and/or unauthorized starting of the engine. Examples of such means include but are not limited to:

— an ignition or start switch with a removable key;

— a lockable cab;

— a lockable cover over the ignition or start switch;

— a security ignition or starting lock (e.g. key card activated);

— a lockable battery disconnect switch.

4.3.2.2 Tractors equipped with starter interlocks as per ISO 15077 on only the traction control clutch or combination traction clutch and brake control shall include means to prevent the operator from starting the tractor from the ground while, for example, holding the control(s) disengaged by hand.

4.3.2.3 It shall not be possible to start the engine with the PTO (power take-off) activated.

A means shall be provided which prevents the PTO shaft from transmitting torque at engine start-up.

EXAMPLE 1 An interlock switch which prevents engine cranking when the PTO control is in the run position.

EXAMPLE 2 PTO clutch left disengaged until engagement is commanded after engine start.

4.3.2.4 Starting the engine shall not move the three-point linkage.

4.3.3 External control(s) for three-point linkage

4.3.3.1 External controls for either the front or rear three-point linkage shall operate under either one or the other of the following limitations:

— movement of the linkage, as measured at the lower hitch points, shall be limited to a maximum of 100 mm for each activation of the control;

— movement of the linkage shall occur only while the control is held in the activation position.

4.3.3.2 External controls shall be located such that the operator can activate them while standing on the ground outside of the hazard zone between the tractor and the implement. This does not apply to external control system measures that eliminate or minimize the risks. For example, a control may be achieved by limiting the maximum rate of travel of the three-point hitch linkage.

The preferred maximum height of the control(s) above the ground is 1 800 mm, or 2 000 mm if technically justified.

4.3.3.3 Provision shall be made to prevent unintentional actuation of control(s).

4.3.3.4 Other arrangements are permitted provided they have an effect at least equivalent to the requirements set out in 4.3.3.1, 4.3.3.2 and 4.3.3.3.

4.3.4 PTO external control(s)

4.3.4.1 The driver shall be able to operate the control(s) from a location which allows the operator to avoid contact with the PTO shaft or the IID (implement input device) and which also allows the operator to verify that no person is in a hazardous location between the tractor and attached implement. The height of control(s) above the ground shall not exceed 2 000 mm.

4.3.4.2 Provision shall be made to prevent unintentional engagement of the PTO clutch. The control or controls shall be clearly identified and shall not be subject to confusion with other external control(s), if provided (e.g. three-point linkage control or controls).

4.3.4.3 The start control shall work according to the “hold-to-run principle” for at least the first 3 s of actuation.

4.3.4.4 Engagement of the PTO using the external control(s) shall occur with no delay greater than that experienced when using the main PTO control.

4.3.4.5 It shall always be possible to shut off the PTO(s) from the operator's seat position as well as from the associated external control(s).

4.3.5 Pedals

Pedals shall have an appropriate size, space and be adequately spaced. Pedals shall have a slip-resistant surface and shall be easy to clean.

In order to avoid confusing the driver, the pedals (clutch, brake and accelerator) shall have the same function and arrangement as those of a motor vehicle.

4.4 Operator station

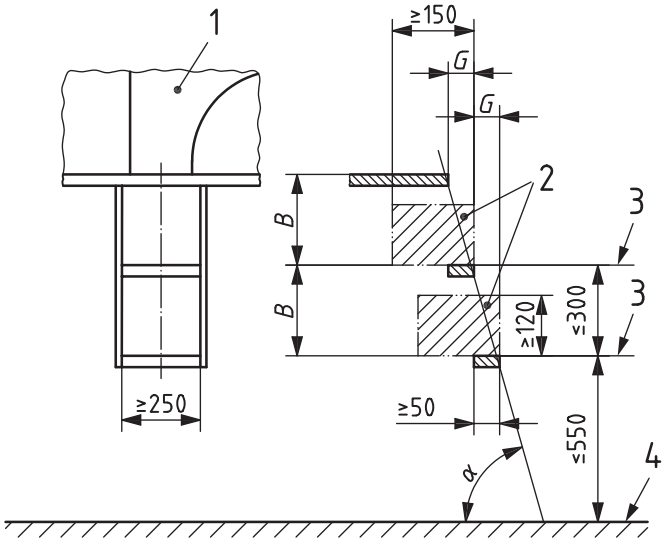
4.4.1 Boarding means

4.4.1.1 General

4.4.1.1.1 If the vertical height of the operator station floor above ground level exceeds 550 mm, when measured on level ground, with the tyres as specified, of maximum diameter and at the specified inflation pressure, or with the largest tracks, a boarding means shall be provided. The dimensions shall be as shown in Figure 1 or Figure 2 and as specified in 4.4.1.2.

4.4.1.1.2 Shielding shall be provided on the back of steps or ladders if a protruding hand or foot may contact a hazardous part of the tractor, e.g. wheel or track.

Dimensions in millimetres



Key

1 exit
2 clearance zone
3 upper edge of step
4 ground
B vertical distance between steps
G horizontal distance between steps

A width of less than 250 mm may be used only if justified for technical reasons. Where this is the case, the aim should be to achieve the greatest width practicable. In no case shall the width be less than 150 mm.

Figure 1 — Dimensions of boarding means for operator stations