

Third edition  
2011-11-15

AMENDMENT 2  
2022-03

---

---

## Machinery for forestry — General safety requirements

### AMENDMENT 2: Access to operator's station and maintenance locations

*Matériel forestier — Exigences de sécurité générales*

*AMENDEMENT 2: Accès au poste d'opérateur et emplacements de  
maintenance*

STANDARDSISO.COM : Click to view the full PDF of ISO 11850:2011/Amd 2:2022



Reference number  
ISO 11850:2011/Amd.2:2022(E)

© ISO 2022

STANDARDSISO.COM : Click to view the full PDF of ISO 11850:2011/Amd 2:2022



**COPYRIGHT PROTECTED DOCUMENT**

© ISO 2022

All rights reserved. Unless otherwise specified, or required in the context of its implementation, no part of this publication may be reproduced or utilized otherwise in any form or by any means, electronic or mechanical, including photocopying, or posting on the internet or an intranet, without prior written permission. Permission can be requested from either ISO at the address below or ISO's member body in the country of the requester.

ISO copyright office  
CP 401 • Ch. de Blandonnet 8  
CH-1214 Vernier, Geneva  
Phone: +41 22 749 01 11  
Email: [copyright@iso.org](mailto:copyright@iso.org)  
Website: [www.iso.org](http://www.iso.org)

Published in Switzerland

## 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](http://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](http://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](http://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 15, *Machinery for forestry*, in collaboration with the European Committee for Standardization (CEN) Technical Committee CEN/TC 144, *Tractors and machinery for agriculture and forestry*, in accordance with the Agreement on technical cooperation between ISO and CEN (Vienna Agreement).

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](http://www.iso.org/members.html).

STANDARDSISO.COM : Click to view the full PDF of ISO 11850:2011/Amd 2:2022

# Machinery for forestry — General safety requirements

## AMENDMENT 2: Access to operator's station and maintenance locations

### *Introduction*

Replace the introduction with the following:

This document is a type-C standard as stated in ISO 12100:2010.

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 organisations, 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 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.

### *Clause 1, first paragraph*

Replace the paragraph with the following:

This document specifies general safety requirements for self-propelled forestry machines and machines configured as forestry machines. It deals with all significant hazards, hazardous situations and events common to fellers, bunchers, delimiters, forwarders, log loaders, skidders, processors, harvesters, mulchers and multi-function versions of these machine types, as defined in ISO 6814:2009, when used as intended and under conditions of misuse which are reasonably foreseeable by the manufacturer.

Clause 2

Replace the undated references and update the dated references with the following:

ISO 2631-1:1997, *Mechanical vibration and shock — Evaluation of human exposure to whole-body vibration — Part 1: General requirements*. Amended by ISO 2631-1:1997/Amd 1:2010

ISO 2860:1992, *Earth-moving machinery — Minimum access dimensions*

ISO 3450:2011, *Earth-moving machinery — Wheeled or high-speed rubber-tracked machines — Performance requirements and test procedures for brake systems*

ISO 3457:2003, *Earth-moving machinery — Guards — Definitions and requirements*

ISO 3600:2015, *Tractors, machinery for agriculture and forestry, powered lawn and garden equipment — Operator's manuals — Content and presentation*

ISO 3767-1:2016, *Tractors, machinery for agriculture and forestry, powered lawn and garden equipment — Symbols for operator controls and other displays — Part 1: Common symbols*. Amended by ISO 3671-1:2016/Amd 1:2020

ISO 3767-4:2016, *Tractors, machinery for agriculture and forestry, powered lawn and garden equipment — Symbols for operator controls and other displays — Part 4: Symbols for forestry machinery*

ISO 3795:1989, *Road vehicles, and tractors and machinery for agriculture and forestry — Determination of burning behaviour of interior materials*

ISO 4413:2010, *Hydraulic fluid power — General rules and safety requirements for systems and their components*

ISO 5010:2019, *Earth-moving machinery — Rubber-tyred machines — Steering requirements*

ISO 5349-2:2001, *Mechanical vibration — Measurement and evaluation of human exposure to hand-transmitted vibration — Part 2: Practical guidance for measurement at the workplace*. Amended by ISO 5349-2:2001/Amd 1:2015

ISO 6682:1986, *Earth-moving machinery — Zones of comfort and reach for controls*. Amended by ISO 6682:1986/Amd 1:1989

ISO 6683:2005, *Earth-moving machinery — Seat belts and seat belt anchorages — Performance requirements and tests*

ISO 6405-1:2017, *Earth-moving machinery — Symbols for operator controls and other displays — Part 1: Common symbols*

ISO 6750-1:2019, *Earth-moving machinery — Operator's manual — Content and format*

ISO 6814:2009, *Machinery for forestry — Mobile and self-propelled machinery — Terms, definitions and classification*

ISO 8082-1:2009, *Self-propelled machinery for forestry — Laboratory tests and performance requirements for roll-over protective structures — Part 1: General machines*. Amended by ISO 8082-1:2009/Amd 1:2021

ISO 8082-2:2011, *Self-propelled machinery for forestry — Laboratory tests and performance requirements for roll-over protective structures — Part 2: Machines having a rotating platform with cab and boom on the platform*

ISO 8084:2003, *Machinery for forestry — Operator protective structures — Laboratory tests and performance requirements*. Amended by ISO 8084:2003/Amd 1:2015

ISO 9533:2010, *Earth-moving machinery — Machine-mounted audible travel alarms and forward horns — Test methods and performance criteria*

ISO 10263-4:2009, *Earth-moving machinery — Operator enclosure environment — Part 4: Heating, ventilating and air conditioning (HVAC) test method and performance*

ISO 10532:1995, *Earth-moving machinery — Machine-mounted retrieval device Performance requirements*. Amended by ISO 10532:1995/Amd 1:2004

ISO 10533:1993, *Earth-moving machinery — Lift-arm support devices*. Amended by ISO 10533:1993/Amd 1:2005

ISO 10570:2004, *Earth-moving machinery — Articulated frame lock — Performance requirements*

ISO 11112:1995, *Earth-moving machinery — Operator's seat — Dimensions and requirements*. Amended by ISO 11112:1995/Amd 1:2001

ISO 11169:1993, *Machinery for forestry — Wheeled special machines — Vocabulary, performance test methods and criteria for brake systems*

ISO 11512:1995, *Machinery for forestry — Tracked special machines — Performance criteria for brake systems*

ISO 11837:2011, *Machinery for forestry — Saw chain shot guarding systems — Test method and performance criteria*

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

ISO 13766-1:2018, *Earth-moving and building construction machinery — Electromagnetic compatibility (EMC) of machines with internal electrical power supply — Part 1: General EMC requirements under typical electromagnetic environmental conditions*

ISO 13849-1:2015, *Safety of machinery — Safety-related parts of control systems — Part 1: General principles for design*

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

ISO 14269-2:1997, *Tractors and self-propelled machines for agriculture and forestry — Operator enclosure environment — Part 2: Heating, ventilation and air-conditioning test method and performance*

ISO 14982:1998, *Agricultural and forestry machinery — Electromagnetic compatibility — Test methods and acceptance criteria*

ISO 15818:2017, *Earth-moving machinery — Lifting and tying-down attachment points — Performance requirements*

Replace the reference to ISO 11839 with the following:

ISO 11839:2021, *Machinery for forestry — Thrown object guard — Test method and performance criteria*

Add the following new reference to include published noise test code:

ISO 18564:2016, *Machinery for forestry — Noise test code*

Replace the reference to EN 779:2002 with the following:

ISO 16890-1:2016, *Air filters for general ventilation — Part 1: Technical specifications, requirements and classification system based upon particulate matter efficiency*

*Clause 3*

Replace the paragraph with the following:

For the purposes of this document, the terms and definitions given in ISO 12100:2010 and ISO 6814:2009 apply.

ISO and IEC maintain terminology databases for use in standardization at the following addresses:

- ISO Online browsing platform: available at <https://www.iso.org/obp>
- IEC Electropedia: available at <https://www.electropedia.org/>

*4.1, second paragraph*

Replace the paragraph with the following:

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

*4.2, first paragraph*

Replace the paragraph with the following:

Unless otherwise specified in this document, safety distances shall be in accordance with the requirements of ISO 13857:2019, with the exception of ISO 13857:2019, 4.2.4.2. Guards and shields, including thermal guards, shall be in accordance with ISO 3457:2003, except that fasteners which retain fixed guards and shields in position shall be attached either to the guard or the machine.

*4.3.2.1, second paragraph*

Replace the paragraph with the following:

Verification of conformity shall be by testing in accordance with ISO 8083:2006.

*4.3.2.2, first and second paragraphs*

Replace these paragraphs with the following:

All applicable machines within the scope of ISO 8082-1:2009 and ISO 8082-1:2009/Amd 1:2021 and ISO 8082-2:2011 shall be equipped with a ROPS meeting the requirements of ISO 8082-1:2009 and ISO 8082-1:2009/Amd 1:2021 or ISO 8082-2:2011, as applicable.

Verification of conformity shall be by testing in accordance with ISO 8082-1:2009 and ISO 8082-1:2009/Amd 1:2021 or ISO 8082-2:2011, as appropriate.

4.3.2.3, first paragraph

Replace these paragraphs with the following:

All applicable machines within the scope of ISO 8084:2003 and ISO 8084:2003/Amd 1:2015 shall have an OPS in accordance with ISO 8084:2003 and ISO 8084:2003/Amd 1:2015, including the constructional requirements of ISO 8084:2003 and ISO 8084:2003/Amd 1:2015, 5.2.

4.3.2.3, fourth paragraph

All machines equipped with a circular saw head shall have operator protection in accordance with ISO 11839:2021.

4.3.2.3, fifth paragraph

All machines equipped with a chain saw cutting system shall have a saw chain shot guarding system in accordance with ISO 11837:2011.

4.3.2.3, last paragraph

Verification of conformity shall be carried out by checking for conformance with ISO 8084:2003 and ISO 8084:2003/Amd 1:2015, ISO 11837:2011 or ISO 11839:2021, as appropriate.

4.3.2.6, first paragraph

Replace the paragraph with the following:

If a closed cab is provided, the cab shall be equipped with heating and ventilation systems in accordance with ISO 14269-2:1997 or ISO 10263-4:2009.

4.3.2.6, second paragraph

Replace the paragraph with the following:

The cab shall also be equipped with a filtration system with inlet air filter(s) of at least class ePM<sub>1</sub> ≥ 50 in accordance with ISO 16890-1:2016 or equivalent. The inlet air filter(s) shall be serviceable from inside the cab or from a service platform. If the intake air filter(s) are located before the fan, the system between the filter and fan shall be free from leakage.

4.3.2.6, last paragraph

Replace the paragraph with the following:

Verification of conformity shall be by checking for conformance with ISO 14269-2:1997 or ISO 10263-4:2009 and with ISO 16890-1:2016, as appropriate and by inspection.

4.3.3, first paragraph

Replace the paragraph with the following:

Machines shall be fitted with a seat in accordance with ISO 11112:1995 and ISO 11112:1995/Amd 1:2001 that positions the operator for ergonomic and stable operation of the machine controls.

4.3.4, first paragraph

Replace the paragraph with the following:

All machines shall be equipped with a seat belt system in accordance with ISO 6683:2005. Seat belts shall have a device to keep them off the floor when not in use.

4.4 a), first paragraph

Replace the paragraph with the following:

- a) The access shall permit a person to achieve three points of support if the operator station or daily maintenance surface is elevated by more than 550 mm above the ground and shall be in accordance with ISO 2860:1992 and ISO 2867:2011, with the following exceptions.
- Maximum first step height of 700 mm from the ground shall be allowed for wheeled skidders and wheeled feller-bunchers as defined in ISO 6814:2009.
  - Foot placement surfaces shall be slip-resistant and the design of the steps shall be such that accumulation of debris, mud, snow, etc. is minimized.

4.4 c), first paragraph, first sentence

Replace the sentence with the following:

The operator's station entry/exit opening dimensions shall be in accordance with ISO 2867:2011.

4.4 f)

Replace the sentence with the following:

Machines with articulated frames shall be equipped with articulated frame locks in accordance with ISO 10570:2004.

4.5.3 a)

Replace the paragraph with the following:

The primary controls, i.e. controls used frequently or continuously by the operator, including machine controls, transmission, brakes, steering, engine speed and working tool controls, shall be located within the zones of comfort. Secondary controls, i.e. controls that are infrequently used by the operator, such as windscreen wipers, starter, heater and air conditioner, shall be within zones of reach in accordance with ISO 6682:1986 and ISO 6682:1986/Amd 1:1989. Control arrangement and function shall consider space requirements for arctic clothing in accordance with ISO 2860:1992 and ISO 3411:2007 unless a heated operator enclosure is provided.

4.5.3 b), *NOTE*

Replace the NOTE with the following:

NOTE See ISO 10968:2020 and ISO 15077:2020 for guidance.

4.5.4, *first paragraph*

Replace the paragraph with the following:

Machines shall be equipped with an operator-controlled alarm horn and back-up alarm in accordance with ISO 9533:2010.

4.5.5, *first and second paragraphs*

Replace the paragraphs with the following:

The safety and reliability of control systems using electronic components classified as safety functions (SRP/CS), in accordance with risk assessment, shall meet the requirements of ISO 13849-1:2015 when tested in accordance with ISO 15998:2008, Clause 7.

Verification of conformity shall be by inspection and by testing in accordance with ISO 15998:2008.

4.6, *second and last paragraphs*

Replace the paragraphs with the following:

For machines with an enclosed operator's station, a windscreen defrosting system shall be provided. The windscreen defrosting system shall be tested in accordance with ISO 10263-5:2009. The windscreen areas to be defrosted shall be at least as defined for excavators in ISO 10263-5:2009, Table 1. The minimum percentage of defrosted area after 1 h shall be in accordance with ISO 10263-5:2009, Table 2.

Verification of conformity shall be by inspection and by checking for conformance with ISO 10263-5:2009.

4.8, *first, second and third paragraphs*

Replace the paragraphs with the following:

The braking systems of wheeled machines shall be in accordance with ISO 11169:1993. The braking systems of those wheeled machines not within the scope of ISO 11169:1993 but covered by the present document shall be in accordance with ISO 3450:2011.

The braking systems of tracked machines shall be in accordance with ISO 11512:1995.

The braking systems of those tracked machines not within the scope of ISO 11512:1995 but covered by the present document shall have a minimum slope capability of 25° in accordance with ISO 10265:2008 for the service and parking brakes.

4.8, last paragraph

Verification of conformity shall be by inspection and by checking for conformance with ISO 11169:1993 or ISO 3450:2011 for wheeled machines and ISO 11512:1995 or ISO 10265:2008 for tracked machines.

4.9, first and last paragraphs

Replace the paragraphs with the following:

The steering of wheeled machines shall be in accordance with ISO 5010:2019; wheeled machines with a maximum travel speed 30 km/h shall be provided with the emergency steering specified in ISO 5010:2019.

Verification of conformity shall be by inspection and by checking for conformance with ISO 5010:2019.

4.10, first, second, third, and last paragraphs

Replace the paragraphs with the following:

Both the front and rear of the machine shall be equipped with a retrieval device or devices; constructional parts can serve as such devices. Such retrieval devices and constructional devices shall be in accordance with the strength requirements of ISO 10532:1995 and ISO 10532:1995/Amd 1:2004.

The machine shall be equipped with tie-down points/locations for transporting machines on trucks, trailers, etc., which shall meet the strength requirements of ISO 15818:2017.

The machine shall be equipped with lifting points/locations for attaching a machine to a crane or hoist, which shall meet the strength requirements of ISO 15818:2017.

Verification of conformity shall be by inspection and measurement and by checking for conformance with ISO 10532:1995 and ISO 10532:1995/Amd 1:2004 and ISO 15818:2017.

4.12, third and last paragraphs

Replace the paragraphs with the following:

Machine control systems, including processing systems, shall comply with ISO 13849-1:2015.

Verification of conformity shall be by inspection and by checking for conformance with ISO 15998:2008.

4.13, first and last paragraphs

Replace the paragraphs with the following:

Electromagnetic compatibility of the machines shall be in accordance with ISO 14982:1998 or ISO 13766-1:2018.

Verification of conformity shall be by checking for conformance with ISO 14982:1998 or ISO 13766-1:2018, as appropriate.