
**Machinery for forestry — Safety
requirements and testing for pole-
mounted powered pruners —**

**Part 2:
Machines for use with backpack
power source**

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*Matériel forestier — Exigences de sécurité et essais pour les perches
élagueuses à moteur —*

Partie 2: Machines pour utilisation avec source motrice portée à dos

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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).

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 17, *Manually portable (hand-held) powered lawn and garden equipment and forest machinery*, 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).

This third edition cancels and replaces the second edition (ISO 11680-2:2011), which has been technically revised.

The main changes compared to the previous edition are as follows:

- in [4.1](#), the references to ISO 11680-1:2021 have been updated to its latest edition;
- in [4.3](#), the requirements for the harness have been reworded and aligned with the requirements for double shoulder harnesses in ISO 11680-1:2021.

A list of all parts in the ISO 11680 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 12100:2010.

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.

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Machinery for forestry — Safety requirements and testing for pole-mounted powered pruners —

Part 2: Machines for use with backpack power source

1 Scope

This document specifies safety requirements and measures for their verification for the design and construction of portable, hand-held, pole-mounted powered pruners with a backpack power unit (hereafter referred to as “machine”). These machines use a power transmission shaft to transmit power to a cutting attachment consisting of a combination of saw-chain and guide bar, a reciprocating saw blade or a single-piece circular saw blade with a 205 mm maximum outside diameter. Methods for the elimination or reduction of hazards arising from the use of these machines and the type of information on safe working practices to be provided by the manufacturer are specified.

This document, together with the relevant sections of ISO 11680-1:2021, deals with all significant hazards, hazardous situations or hazardous events, with the exception of electric shock from contact with overhead electric lines (apart from warnings and advices for inclusion in the instructions) and whole-body vibration from the backpack power unit, relevant to these machines when they are used as intended and under conditions of misuse which are reasonably foreseeable by the manufacturer.

NOTE 1 A standardized test procedure for measuring whole-body vibration from the backpack power unit is not available at the date of publication. [ISO 11680-2:2021](https://standards.iteh.ai/catalog/standards/sist/20d67c4d-ae10-4483-b97b-11680-2-2021)

NOTE 2 See [Annex A](#) for a list of significant hazards. <https://standards.iteh.ai/catalog/standards/sist/20d67c4d-ae10-4483-b97b-11680-2-2021>

This document is applicable to portable, hand-held, pole-mounted powered pruners with backpack power unit manufactured after its date of 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 4413:2010, *Hydraulic fluid power — General rules and safety requirements for systems and their components*

ISO 4414:2010, *Pneumatic fluid power — General rules and safety requirements for systems and their components*

ISO 11680-1:2021, *Machinery for forestry — Safety requirements and testing for pole-mounted powered pruners — Part 1: Machine fitted with an integral combustion engine*

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*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 11680-1:2021, ISO 12100:2010 and the following apply.

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

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

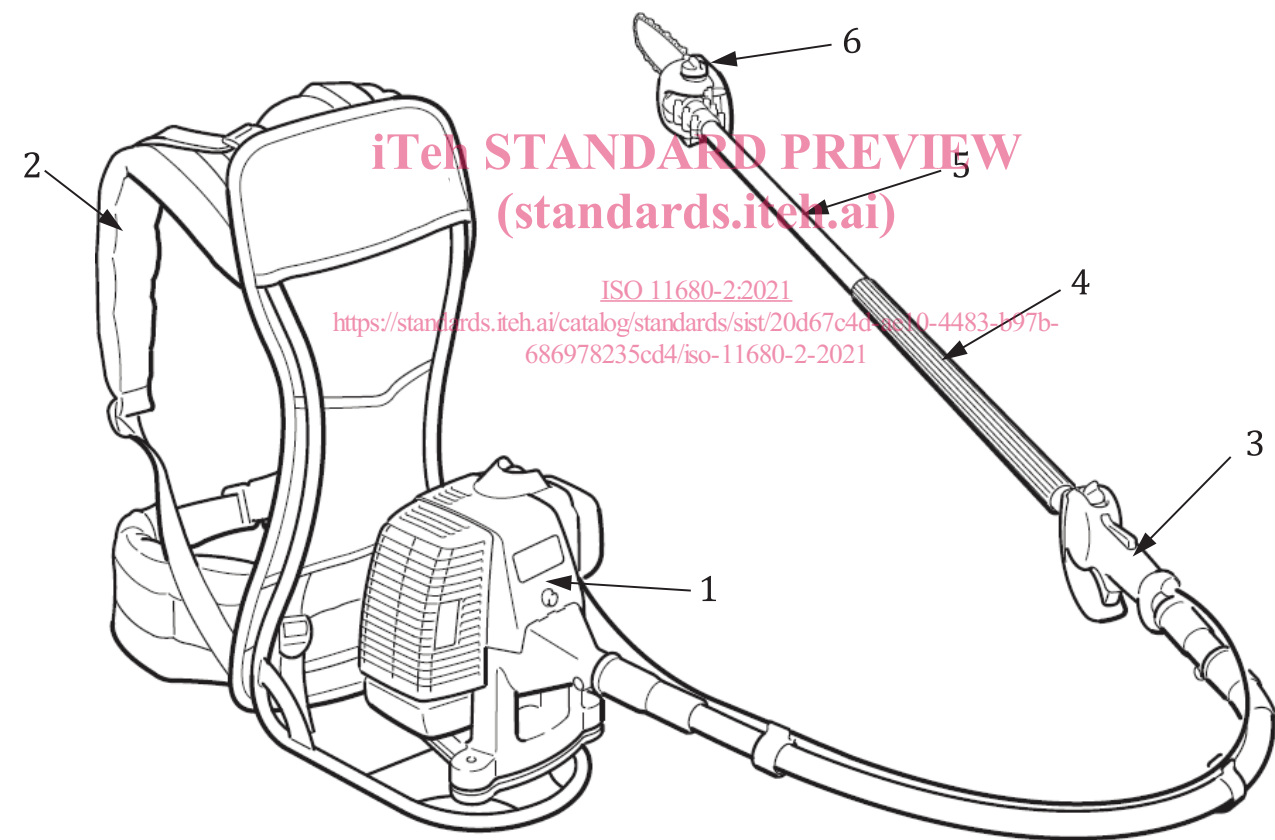
3.1
appliance

assembly of shaft tube, cutting attachment with retainer and guard, and handles

3.2
machine

pole-mounted powered pruner, including backpack power unit and *appliance* (3.1), designed to enable an operator to cut the branches of standing trees

Note 1 to entry: See [Figure 1](#) for an example.



Key

- | | | | |
|---|---------------------------------|---|--------------------------|
| 1 | backpack power unit | 4 | front handle |
| 2 | harness for backpack power unit | 5 | power transmission shaft |
| 3 | rear handle | 6 | cutting attachment |

Figure 1 — Example of pole-mounted powered pruner with backpack power unit and appliance with saw-chain cutting attachment

4 Safety requirements and/or protective measures

4.1 General

Machines shall conform with the safety requirements and/or protective measures of this clause. In addition, the machine shall be designed according to the principles of ISO 12100:2010 for relevant but not significant hazards which are not dealt with by this document.

Machines shall conform with ISO 11680-1:2021, Clause 4, except for 4.4, 4.5.3 and 4.20.

The safe operation of a machine also depends on the safe environment associated with the use of personal protective equipment (PPE), such as gloves, boots and eye and hearing protective equipment, as well as safe working procedures (see ISO 11680-1:2021, 5.1).

Except where otherwise specified in this document, the safety distances specified in ISO 13857:2019, 4.2.4.1 and 4.2.4.3, shall be met.

4.2 Hand grip on backpack power unit

4.2.1 Requirements

A hand grip shall be available which may be a part of the frame and which shall allow an operator to grasp the backpack power unit for handling and transport.

The hand grip shall be designed such that

- it can be fully gripped by an operator when wearing gloves,
- it provides the necessary sureness of grip by its shaping and surface,
- its length is at least 100 mm and where, for a bail or closed hand grip, this length is straight or curved at a radius greater than 100 mm together with any blend radius, but not more than 10 mm at one or both ends of the gripping surface.

4.2.2 Verification

The hand grip design shall be verified by inspection, measurement and functional testing.

4.3 Harness for backpack power unit

4.3.1 Requirements

All machines shall be equipped with a double shoulder harness. The harness shall be adjustable to the size of the operator and shall be:

- designed in a way for easy removal; or
- equipped with a quick release mechanism that ensures that the machine can be removed or released quickly from the operator.

A double shoulder harness is considered to be designed in a way for easy removal, if the left and right shoulder straps are not connected to each other in front of the operator's body.

If straps to connect the left and right shoulder straps are provided, it is also considered to be designed in a way for easy removal when the straps connecting the left and right shoulder straps can be released under the load of the machine by using one hand and have no more than two release points.

NOTE An example of a release point is a buckle that requires squeezing between the thumb and finger before releasing, for example side release buckles.

A quick release mechanism, if provided, shall be positioned either at the connection between the machine and the harness or between the harness and the operator. The quick release mechanism shall only function by deliberate action of the operator.

It shall be possible to open the quick release mechanism while under load using only one hand and it shall have no more than two release points.

4.3.2 Verification

The harness, its functionality and its adjustment shall be verified by inspection. The quick-release mechanism shall be verified by a functional test, carried out by a person wearing the harness and with a vertical load of three times the dry weight of the backpack power unit acting on the suspension point.

4.4 Hydraulic and pneumatic pipes and hoses

4.4.1 Requirements

Hydraulic systems shall conform with the safety requirements of ISO 4413:2010. Pneumatic systems shall conform with the safety requirements of ISO 4414:2010.

Hydraulic and pneumatic pipes and hoses subject to internal pressures in excess of 500 kPa shall be shielded so that, in the event of rupture during operation of the machine, the fluid cannot be discharged directly onto the operator.

4.4.2 Verification

The shielding of pipes and hoses shall be verified by inspection.

5 Information for use

The instructions to be provided with the machine shall comply with ISO 11680-1:2021, 5.1.

The machine shall be marked and carry warnings in accordance with ISO 11680-1:2021, 5.2.