INTERNATIONAL STANDARD

ISO 11680-2

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

Part 2: Machines for use with back-pack power source

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

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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 11680-2 was prepared by Technical Committee ISO/TC 23, *Tractors and machinery for agriculture and forestry*, Subcommittee SC 17, *Manually portable forest machinery*.

This second edition cancels and replaces the first edition (ISO 11680-2:2000), which has been technically revised to reflect the state of the art, and, together with ISO 11806-2, cancels and replaces ISO 14740:1998.

ISO 11680 consists of the following parts, under the general title *Machinery for forestry — Safety requirements and testing for pole-mounted powered pruners*:

— *Part 1: Machines fitted with an integral combustion engine*

— *Part 2: Machines for use with back-pack power source*

Introduction

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 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.

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

Part 2:
Machines for use with back-pack power source

1 Scope

This part of ISO 11680 gives safety requirements and measures for their verification for the design and construction of portable, hand-held, pole-mounted powered pruners with a back-pack power unit and using a drive shaft to transmit power to a cutting attachment consisting of a saw chain or reciprocating or circular saw blade (hereafter referred to as “machine”). 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 part of ISO 11680, together with the relevant sections of ISO 11680-1, 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 advice for inclusion in the instruction handbook) and whole-body vibration from the back-pack 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 presently not available.

NOTE 2 See Annex A for a list of significant hazards.

This part of ISO 11680 is applicable to portable, hand-held, pole-mounted powered pruners with back-pack power unit manufactured after its date of publication.

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

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

ISO 11680-1:2011, *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 13857:2008, *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 and ISO 12100 and the following apply.

3.1
appliance
assembly of drive-shaft tube, cutting attachment with its sprocket cover and handles

3.2
machine
pole-mounted powered pruner, including power source and appliance, designed to enable an operator to cut the branches of standing trees

NOTE See Figure 1 for an example.

4 Safety requirements and/or protective measures

4.1 General

Machines shall comply 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 for relevant but not significant hazards which are not dealt with by this part of ISO 11680.

Machines shall comply with ISO 11680-1:2011, Clause 4, except for 4.3.

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 11680-1:2011, 5.1).

Except where otherwise specified in this part of ISO 11680, the safety distances specified in ISO 13857:2008, 4.2.4.1 and 4.2.4.3, shall be met.

4.2 Hand-grip on back-pack 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 back-pack power unit for handling and transport.

The hand-grip shall be designed such that

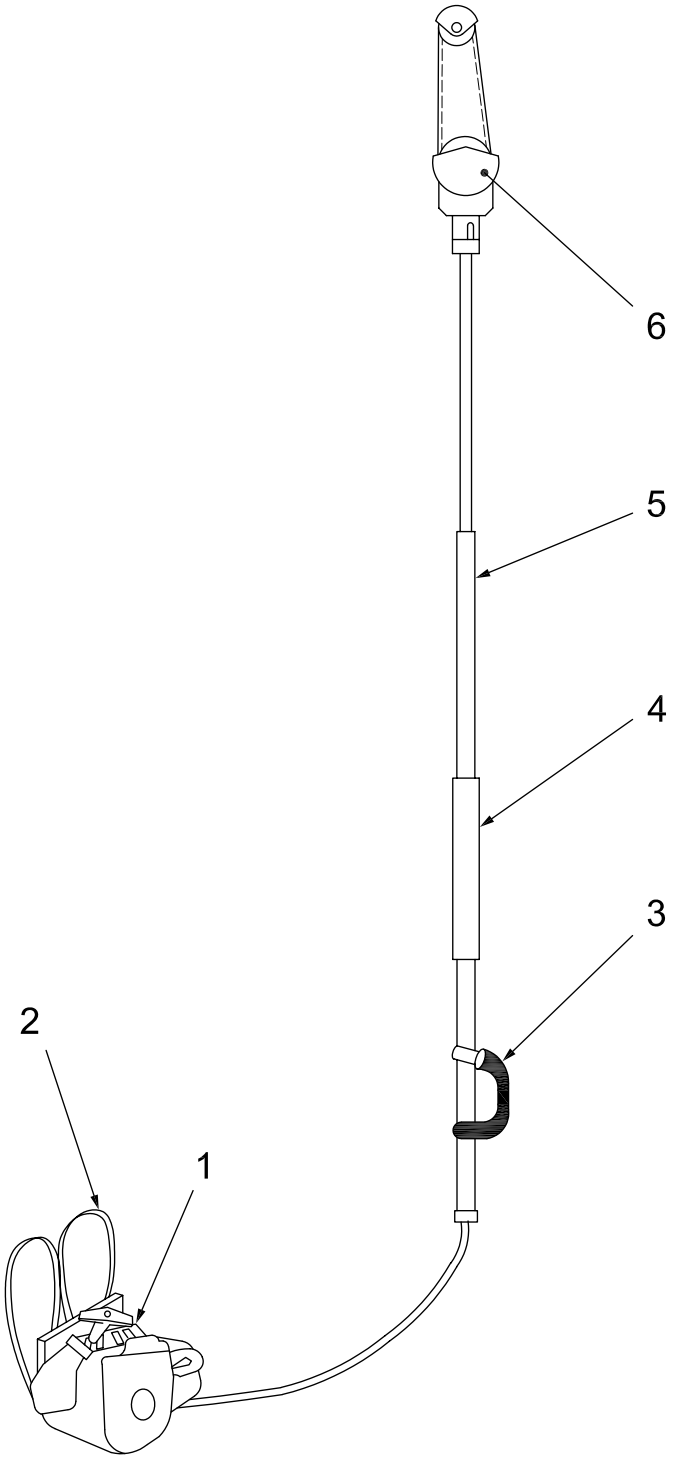
— it can be fully gripped by an operator when wearing gloves,

— 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.



Key

1 back-pack power unit
2 harness for back-pack power unit
3 rear hand-grip
4 front hand-grip
5 drive-shaft tube
6 cutting attachment

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

4.3 Harness for back-pack power unit

4.3.1 Requirements

The harness shall be equipped with a quick-release mechanism positioned either at the connection between the power source and the harness or between the harness and the operator. Either the design of the harness or the use of the quick-release mechanism shall enable the power source to be released quickly from the operator in the event of an emergency.

If a quick-release mechanism is provided, it shall be possible to open it under load to release the power pack using only one hand.

4.3.2 Verification

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

4.4 Hydraulic and pneumatic pipes and hoses

4.4.1 Requirements

Hydraulic systems shall comply with the safety requirements of ISO 4413. Pneumatic systems shall comply with the safety requirements of ISO 4414.

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

See ISO 12100:2010, 6.4.

The instruction handbook to be provided with the machine shall comply with ISO 11680-1:2011, 5.1.

The machine shall be marked in accordance with ISO 11680-1:2011, 5.2, and carry warnings in accordance with ISO 11680-1:2011, 5.3.

Annex A
(informative)

List of significant hazards

This annex specifies the additional significant hazards, hazardous situations and significant hazardous events that have been identified as being significant for the back-pack power source for pole-mounted powered pruners and which require specific action by the designer or manufacturer to eliminate or reduce the risk.

Table A.1 — List of significant hazards associated with back-pack power source for pole-mounted powered pruners

Ref. No.	Hazard		Subclause of this part of ISO 11680
	Origin (source)	Potential consequences	
1	**Mechanical hazards**		
	Hydraulic and pneumatic system	Injury from high-pressure fluid injection	4.4
2	**Combination of hazards**		
	Poor posture or excessive effort in combination with inadequate design or location of manual controls, including inadequate consideration of human hand–arm anatomy, related to handle design and machine balance	Discomfort, fatigue, injuries to locomotor apparatus, loss of control	4.2, 4.3

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