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AMENDMENT 1
2003-11-15

Machinery for forestry — Portable chain-saws — Safety requirements and testing —

Part 2: Chain-saws for tree service

AMENDMENT 1

Matériel forestier — Scies à chaîne portatives — Exigences de sécurité et essais —

Partie 2: Scies à chaîne pour l'élagage des arbres

AMENDEMENT 1

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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.

Amendment 1 to ISO 11681-2:1998 was prepared by Technical Committee ISO/TC 23, *Tractors and machinery for agriculture and forestry*, Subcommittee SC 17, *Manually portable forest machinery*.

Machinery for forestry — Portable chain-saws — Safety requirements and testing —

Part 2:
Chain-saws for tree service

AMENDMENT 1

Page v, Introduction

In order to reflect the changes made by this amendment, carry out the following modifications to the list in the Introduction specifying the differences between ISO 11681-2 and ISO 11681-1.

Modify the first and second points to read

"…

— clause 1: the tree service chain-saws are limited in size by the maximum allowed dry mass of 4,3 kg;

— clause 3: a definition of trained operator has been added and that for chain saws for tree service has been changed;

…"

Modify the fourth and fifth points to read

"…

— subclause 4.3: a requirement for the sideways balance, measured in accordance with a new Annex D, has been added with a limited holding moment of 6 N·m;

— subclause 4.4: the non-manual chain-brake system shall meet stricter requirements than those in ISO 13772 and the allowed kickback angle has been reduced to 25°;

…"

Delete the seventh and eleventh indents (those making reference to 4.9 and 4.10, and 4.18), and modify the fourteenth and fifteenth indents to read

"…

— subclause 6.3: new safety warnings have been added along with a new Annex E;

— subclause 6.4: new markings on the saw and information at the point of sale are requested, examples of the symbols to be used are given in a new Annex F.

…"

Page 1, Clause 1

Replace the first and second paragraphs of the Scope by the following.

> "This part of ISO 11681 specifies safety requirements and their verification for the design and construction of portable combustion-engine, hand-held chain-saws for tree service, designed for use by a trained operator for pruning and dismantling standing tree crowns.
>
> It is applicable to chain-saws having a maximum mass of the saw equal to 4,3 kg, without guide bar and saw chain and with empty tanks."

Pages 1 and 2, Clause 2

Add the dates as follows to the two remaining undated International Standards given in the list of normative references:

> "ISO 6531:1999, …"
>
> "ISO 9518:1999, …"

Page 2, Clause 3

Replace the first paragraph by the following.

> "For the purposes of this document, the definitions given in ISO 6531, with the exception of the definition of 3.1, and the following apply."

Replace definition 3.1 with

> " **3.1**
> **chain-saw for tree service**
> specialised chain-saw of limited mass designed for use by a trained operator (see 3.2) for pruning and dismantling standing tree crowns"

Replace 3.2, "attachment point" (defined in ISO 6531:1999), with the following term and definition.

> " **3.2**
> **trained operator**
> person who has competence and knowledge in
>
> — the use and particular hazards associated with using a chain-saw (for tree service work) manufactured in accordance with the requirements of this part of ISO 11681, and
>
> — the precautions to be taken to limit these hazards, including the wearing of the recommended personal protective equipment (PPE)"

Page 4, 4.3

Replace the entire text of the subclause by the following.

> "The chain-saw shall be balanced when fitted with the manufacturer's recommended guide-bars. The balance shall be tested in accordance with ISO 8334. The holding moment shall be a maximum 6 N·m, when determined in accordance with Annex C.

The maximum angle of the guide-bar shall not exceed 25° above and below the horizontal plane.

Sideways balance when measured in accordance with Annex D shall be 0° ± 10°."

Page 4, 4.4.1

Strengthen the requirements for the non-manually chain brake activation system by adding the following limitations on the threshold values, changing the second sentence of the second paragraph to read

"The performance of the system shall be determined in accordance with ISO 13772, but with the threshold level for activation modified to $y = 1\ 500$ m/s^2 and $x = 700$ m/s^2."

Replace the last paragraph with

"The computed kickback angle or chain stop angle, whichever is less, shall not exceed 25°."

Page 4, 4.4.2

Limit the allowed chain brake release force by replacing the first sentence with

"**4.4.2** The chain brake release force shall be between 20 N and 50 N."

Page 6, 4.12

Replace the second sentence by the following.

"The control for this device shall be so positioned that it can be operated by either hand when held in one hand, and by the right hand when held in both hands, whether or not the operator is wearing protective gloves."

Page 6, 4.14

Replace the entire text of the subclause by the following.

"The chain-saw shall have a clutch so designed that the chain does not run when the engine rotates at any speed less than 1,25 times the idling speed as specified in the instruction handbook. (See 6.2.1.)"

Page 10, 6.3

Add the following points at the end of the list in 6.3 d).

"…

— for the effects of vibration, there shall be instructions for the use of gloves;

— instruction that the chain-saw, when held in both hands, shall be held with the right hand on the rear handle and the left hand on the front handle;

— descriptions of how to use the saw. See the examples given in Annex E."

Add the following point at the end of the list in 6.3 e).

"…

— the provision of sufficient information to enable the user to maintain the safety system throughout the life of the product and explain the consequences of improper maintenance, use of non-conforming replacement components, or the removal or modification of safety components. In particular the replacement chain shall have the same or lower kickback characteristics as that originally supplied."

Page 12, 6.4

Add the following subclause title below 6.4:

"**6.4.1 Information on the chain saw**"

Replace the second and third points in the second list of 6.4 (additional information that chain-saws are to bear) by the following.

"…

— a symbol indicating the necessity of wearing appropriate eye, hearing and head protection;

— a prominent mark, "**WARNING — THIS SAW IS FOR TRAINED TREE SERVICE OPERATORS ONLY. SEE INSTRUCTION HANDBOOK.**"; (this text may be replaced by a pictorial — see Annex F for an example);

…"

Add a new point at the end of the second list in 6.4:

"…

— a symbol indicating that appropriate protective clothing is necessary (e.g. for feet, legs, hands and fore-arms), see example in Annex F.

Add the following new subclause.

"**6.4.2 Information at the point of sale**

Visible information or labelling shall be provided for the point of sale of the chain-saw such that it can be seen by the potential buyer giving, as a minimum, the following information in the language of the country of sale:

'WARNING — THIS SAW IS FOR TRAINED TREE SERVICE OPERATORS ONLY. SEE INSTRUCTION HANDBOOK'."

Annexes

Add the following new annexes D, E and F.

Annex D
(normative)

Sideways balance test procedure

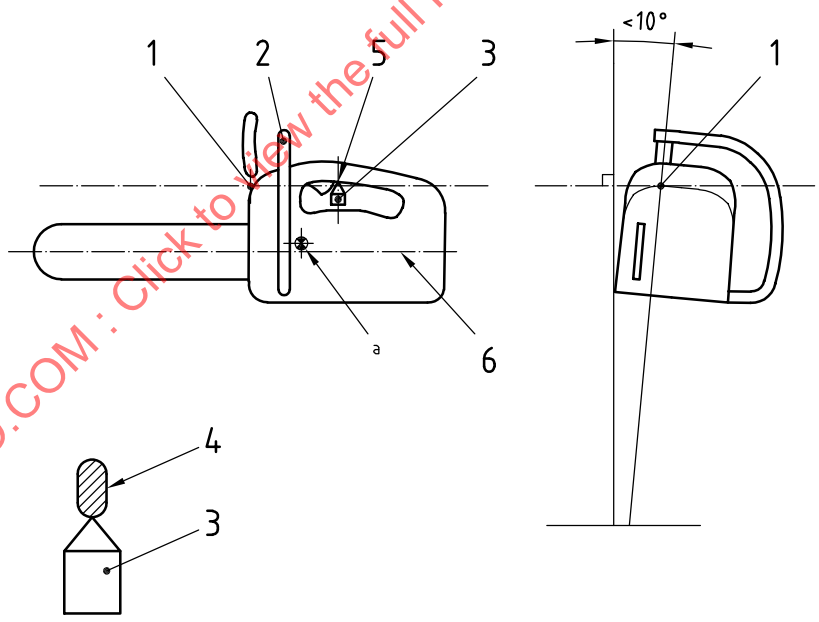
To determine the sideways balance of a chain-saw, with its standard cutting attachment and tanks full, carry out the following procedure.

a) Balance the chain-saw by, and support it on, two points. One of these contact points shall be on the centre line of the throttle trigger, as close as possible behind that trigger. The second point, used to stabilize the saw so that the guide bar remains horizontal, shall be located in front of the throttle trigger on a line parallel to the centre line of the guide bar. If needed, rigidly apply a device (e.g. plastic block) to the machine in order to facilitate the determination of the front supporting point; the mass from this device shall not affect the balance.

b) Use a support pin constructed of steel rod with a maximum diameter of 10 mm and having a point of 45° maximum. If the chain saw will not remain on the rear handle contact point because of handle design, it is permissible to drill a recess hole for locating the support pin. The recess hole diameter and depth shall be such as to provide positive location of the support pin without interfering with chain saw movement.

c) Ensure that the angle of the plane of the cutting attachment to the vertical plane is no larger than 10°.

See Figure D.1.



Key

1	front support	4	rear handle
2	front handle	5	pivot axis
3	steel support pin	6	guide bar centre line

a Centre of gravity.

Figure D.1 — Principle set-up for balance test

Annex E
(informative)

Working with tree service chain-saws from rope and harness

E.1 Overview

This annex sets out working practices aimed at reducing the risk of injury from tree service chain-saws when working at height from a rope and harness. While it may form the basis of guidance and training literature, it should not be regarded as a substitute for formal training. The guidance given in this annex is only an example of best working practice. National laws and regulations should always be followed.

It presents

— general requirements that should be met before using a tree service chain-saw for work at height from a rope and harness,

— preparations for using a tree service chain-saw from a rope and harness, and

— use of a tree service chain-saw for pruning and dismantling, including secure work positioning for two-handed use, starting the chain-saw, cutting with the chain-saw, restrictions on one-handed use and freeing a trapped saw.

This annex does not deal with techniques to control sections of branches and stems cut by the saw. Nor does it cover those aspects of safe use already dealt with in 6.3 of this part of ISO 11681.

E.2 General requirements

Operators of tree service chain-saws working at height from a rope and harness should never work alone. A ground worker trained in appropriate emergency procedures should assist them.

Operators of tree service chain-saws for this work should be trained in general safe climbing and work positioning techniques and be properly equipped with harnesses, ropes, strops, karabiners and other equipment for maintaining secure and safe working positions for both themselves and the saw.

E.3 Preparing to use the saw in the tree

The chain-saw should be checked, fuelled, started and warmed up by the ground worker and then switched off before it is sent up to the operator in the tree.

The chain-saw should be fitted with a suitable strop for attachment to the operator's harness (see Figure E.1):

a) secure the strop around the attachment point on the rear of the saw;

b) provide suitable karabiners to allow indirect (i.e. via the strop) and direct attachment (i.e. at the attachment point on the saw) of the saw to the operator's harness;

c) ensure the saw is securely attached when it is being sent up to the operator;

d) ensure the saw is secured to the harness before it is disconnected from the means of ascent.

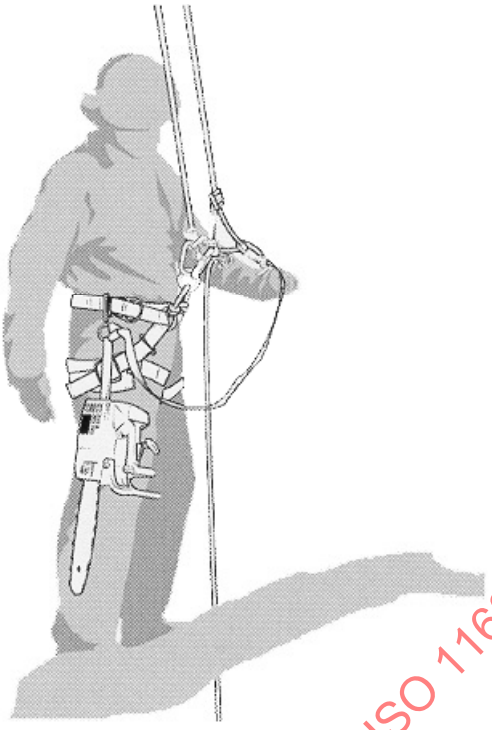


Figure E.1 — Example of attachment of chain-saw to operator's harness

The ability to directly attach the saw to the harness reduces the risk of damage to equipment when moving around the tree. Always switch the saw off when it is directly attached to the harness.

The saw should only be attached to the recommended attachment points on the harness. These may be at mid-point (front or rear) or at the sides. Where possible, attach the saw to centre rear mid-point to keep it clear of climbing lines and to support its weight centrally down the operator's spine. See Figure E.2.

When moving the saw from any one attachment point to another, operators should ensure it is secured in the new position before releasing it from the previous attachment point.

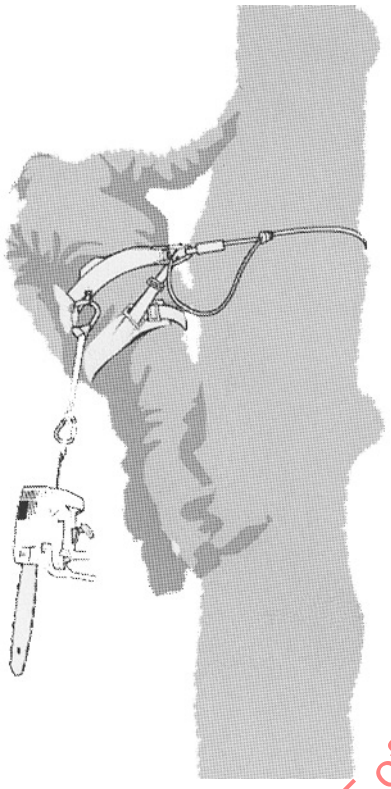


Figure E.2 — Example of attachment of chain-saw to centre rear mid-point on harness

E.4 Using the chain-saw in the tree

An analysis of accidents with these saws during tree service operations shows the primary cause as being inappropriate one-handed use of the saw. In the vast majority of accidents, operators fail to adopt a secure work position that allows them to hold both handles of the saw. This results in an increased risk of injury due to

— not having a firm grip on the saw if it kicks back,

— a lack of control of the saw such that it is more likely to come into contact with climbing lines and the operator's body (particularly the left hand and arm), and

— loss of control owing to an insecure work position and resulting in contact with the saw (unexpected movement during operation of the saw).

E.4.1 Securing the work position for two-handed use

In order to allow the saw to be held with both hands, as a general rule operators should aim for a secure work position in which they operate the saw at

— hip level when cutting horizontal sections, and

— solar plexus level when cutting vertical sections.

Where the operator is working close into vertical stems with low lateral forces on the work position, then a good footing could be all that is needed to maintain a secure work position. However, as operators move away from the stem, they will need to take steps to remove or counteract the increasing lateral forces by, for example, a redirect of the main line via a supplementary anchor point or using an adjustable strop direct from the harness to a supplementary anchor point (see Figure E.3).

Gaining a good footing at the working position can be assisted by the use of a temporary foot stirrup created from an endless sling (see Figure E.4).

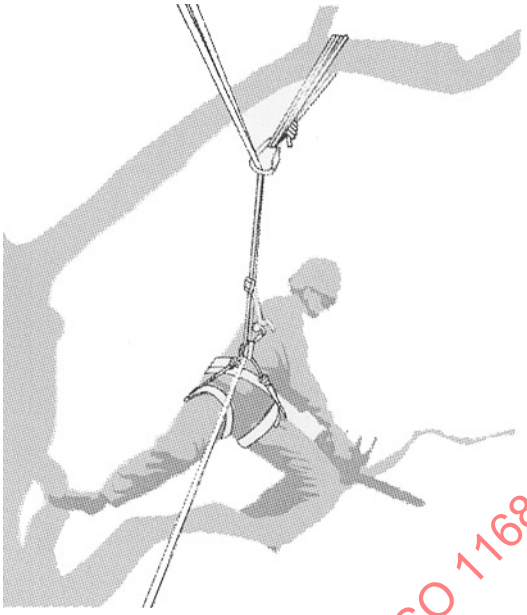


Figure E.3 — Example of redirection of the main line via supplementary anchor point

Figure E.4 — Example of temporary foot stirrup created from endless sling

E.4.2 Starting the saw in the tree

When starting the saw in the tree, the operator should

a) apply the chain brake before starting,

b) hold the saw on either the left or right of the body when starting,

   1) on the left side, hold the saw with the left hand on the front handle and thrust the saw away from the body while holding the pull starter cord in the right hand, or

   2) on the right side, hold the saw with the right hand on either handle and thrust the saw away from the body while holding the pull starter cord in the left hand.

The chain brake should always be engaged before lowering a running saw onto its strop.

Operators should always check that the saw has sufficient fuel before undertaking critical cuts.

E.4.3 One-hand use of the chain-saw

Operators should not use tree service chain-saws one-handed in place of unstable work positioning or in preference to a handsaw when cutting small diameter wood at the branch tips.

Tree service chain-saws should only be used one-handed where

— operators cannot gain a work position enabling two-handed use, and

— they need to support their working position with one hand, and

— the saw is being used at full stretch, at right angles to, and out of line with, the operator's body (see Figure E.5).

Figure E.5 — Example of one-handed chain-saw use

Operators should never

— cut with the kickback zone at the tip of the chain-saw guide bar,

— "hold and cut" sections, or

— attempt to catch falling sections.