

AS/NZS 62841.4.4:2021
IEC 62841-4-4:2020



Australian/New Zealand Standard™

Electric motor-operated hand-held tools, transportable tools and lawn and garden machinery — Safety

**Part 4.4: Particular requirements for lawn trimmers, lawn edge trimmers,
grass trimmers, brush cutters and brush saws**



AS/NZS 62841.4.4:2021

This Joint Australian/New Zealand Standard™ was prepared by Joint Technical Committee EL-002, Safety of Household and Similar Electrical Appliances and Small Power Transformers and Power Supplies. It was approved on behalf of the Council of Standards Australia on 20 October 2021 and by the New Zealand Standards Approval Board on 6 October 2021.

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Australian/New Zealand Standard™

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Part 4.4: Particular requirements for lawn trimmers, lawn edge trimmers, grass trimmers, brush cutters and brush saws

Originated as AS/NZS 60335.2.91:2002.
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STANDARDS AUSTRALIA/STANDARDS NEW ZEALAND

AS/NZS 62841.4.4:2021

**ELECTRIC MOTOR-OPERATED HAND-HELD TOOLS, TRANSPORTABLE TOOLS
AND LAWN AND GARDEN MACHINERY –
SAFETY –****Part 4.4: Particular requirements for lawn trimmers, lawn edge trimmers, grass trimmers, brush cutters and brush saws****Foreword**

This Standard was prepared by the Joint Standards Australia/Standards New Zealand Committee EL-002 - Safety of Household and Similar Electrical Appliances and Small Power Transformers to supersede AS/NZS 60335.2.91:2008 three years from the date of publication of this Standard. During this period AS/NZS 60335.2.91:2008 will also remain current. Regulatory authorities that reference this Standard in regulation may apply these requirements at a different time. Users of this Standard should consult with these authorities to confirm their requirements.

The objective of this Standard is to provide manufacturers, designers, regulatory authorities, testing laboratories and similar organizations with safety requirements designed to give the user protection against hazards that might occur during normal operation and abnormal operation of the appliance and which may be used as the basis for approval for sale or for connection to the electricity supply mains in Australia and New Zealand.

The text of IEC 62841-4-4 Ed 1, prepared by IEC Technical Committee TC 116, was submitted to the Standards Australia/Standards New Zealand Combined Procedure (dual public comment and committee vote) for adoption of the IEC standard as a Standards Australia/Standards New Zealand joint standard.

This Standard is an adoption with national modifications of the first edition of IEC 62841-4-4 *Electric motor-operated hand-held tools, transportable tools and lawn and garden machinery – Safety – Part 4-4 Particular requirements for lawn trimmers, lawn edge trimmers, grass trimmers, brush cutters and brush saws*. It has been varied as indicated to take account of Australian and New Zealand conditions.

This part of AS/NZS 62841 has to be used in conjunction with the latest edition of AS/NZS 62841.1 *Electric motor-operated hand-held tools, transportable tools and lawn and garden machinery – Safety – Part 1: General requirements* and its Amendments. It was established on the basis of AS/NZS 62841.1:2015.

This part of AS/NZS 62841 supplements or modifies the corresponding clauses of Part 1 of AS/NZS 62841 so as to convert it into the Australian/New Zealand Standard: Safety requirements for lawn trimmers, lawn edge trimmers, grass trimmers, brush cutters and brush saws.

When a particular subclause of Part 1 of AS/NZS 62841 is not mentioned in this part of AS/NZS 62841, that subclause applies as far as is reasonable. When this standard states "addition", "modification" or "replacement", the relevant text of Part 1 of AS/NZS 62841 is to be adapted accordingly.

NOTE 1 The following numbering system is used:

- subclauses, tables and figures that are numbered starting from 101 are additional to those in AS/NZS 62841.1;
- unless notes are in a new subclause or involve notes in AS/NZS 62841.1, they are numbered starting from 101, including those in a replaced clause or subclause;
- additional annexes are lettered AA, BB, etc.;
- subclauses, notes and annexes that are additional to those in the IEC standard are prefixed with the letters AZ.

NOTE 2 The following print types are used:

- requirements: in roman type;

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- *test specifications: in italic type;*
- notes: in small roman type.

Words in **bold** in the text are defined in Clause 3.

p NOTE 3 In this document, p is used in the margin to indicate instructions for preparing a consolidated version.

The essential safety requirements in AS/NZS 3820¹ that could be applicable to requirements for lawn trimmers, lawn edge trimmers, grass trimmers, brush cutters and brush saws are covered by this standard.

The national variations to IEC 62841-4-4 Ed 1 form the Australian and New Zealand national variations for purposes of the IECEE scheme for recognition of results of testing to standards for safety of electrical equipment (the CB scheme).

¹ AS/NZS 3820 *Essential safety requirements for electrical equipment*

The text of the International Standard IEC 62841-4-4 Ed 1 was approved as a joint Australia/New Zealand Standard with the agreed national variations as given below.

AUSTRALIAN NATIONAL VARIATIONS

There are no national variations to this part of AS/NZS 62841 other than those listed in the national variations in AS/NZS 62841.1:2015.

NEW ZEALAND NATIONAL VARIATIONS

There are no national variations to this part of AS/NZS 62841 other than those listed in the national variations in AS/NZS 62841.1:2015.

**Annex ANZ
(normative)**

**Normative references to international publications with their corresponding joint
Australia/New Zealand publications**

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.

NOTE When an international publication has been modified by national variations the relevant joint Australia/New Zealand publications applies if the national variations are needed to ensure the safety of the appliance for Australia/New Zealand conditions. These international publications are indicated by (mod). If an international publication is not so indicated, then either it or the listed Australia/New Zealand publication may be used.

<u>Publication</u>	<u>Year</u>	<u>Title</u>	<u>AS/NZS</u>	<u>Year</u>
IEC 60664-3		<i>Insulation coordination for equipment within low-voltage systems – Part 3: Use of coating, potting or moulding for protection against pollution</i>		
IEC 60664-4		<i>Insulation coordination for equipment within low-voltage systems – Part 4: Consideration of high-frequency voltage stress</i>		
ISO 354	2003	<i>Acoustics – Measurement of sound absorption in a reverberation room</i>		
ISO 683-4	2016	<i>Heat-treatable steels, alloy steels and free-cutting steels – Part 4: Free-cutting steels</i>		
ISO 3744	2010	<i>Acoustics – Determination of sound power levels and sound energy levels of noise sources using sound pressure – Engineering methods for an essentially free field over a reflecting plane</i>		
ISO 7918	1995	<i>Forestry machinery – Portable brush-cutters and grass-trimmers – Cutting attachment guard dimensions</i>		
ISO 11201	2010	<i>Acoustics – Noise emitted by machinery and equipment – Determination of emission sound pressure levels at a work station and at other specified positions in an essentially free field over a reflecting plane with negligible environmental corrections</i>		
ISO 22868	2011	<i>Forestry and gardening machinery – Noise test code for portable hand-held machines with internal combustion engine – Engineering method (Grade 2 accuracy)</i>		

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

ELECTRIC MOTOR-OPERATED HAND-HELD TOOLS, TRANSPORTABLE TOOLS AND LAWN AND GARDEN MACHINERY – SAFETY –**Part 4-4: Particular requirements for lawn trimmers, lawn edge trimmers, grass trimmers, brush cutters and brush saws**

FOREWORD

- 1) The International Electrotechnical Commission (IEC) is a worldwide organization for standardization comprising all national electrotechnical committees (IEC National Committees). The object of IEC is to promote international co-operation on all questions concerning standardization in the electrical and electronic fields. To this end and in addition to other activities, IEC publishes International Standards, Technical Specifications, Technical Reports, Publicly Available Specifications (PAS) and Guides (hereafter referred to as "IEC Publication(s)"). Their preparation is entrusted to technical committees; any IEC National Committee interested in the subject dealt with may participate in this preparatory work. International, governmental and non-governmental organizations liaising with the IEC also participate in this preparation. IEC collaborates closely with the International Organization for Standardization (ISO) in accordance with conditions determined by agreement between the two organizations.
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- 8) Attention is drawn to the Normative references cited in this publication. Use of the referenced publications is indispensable for the correct application of this publication.

International Standard IEC 62841-4-4 has been prepared by IEC technical committee 116: Safety of motor-operated electric tools.

The text of this International Standard is based on the following documents:

FDIS	Report on voting
116/468/FDIS	116/479/RVD

Full information on the voting for the approval of this International Standard can be found in the report on voting indicated in the above table.

This document has been drafted in accordance with the ISO/IEC Directives, Part 2.

This Part 4-4 is to be used in conjunction with the first edition of IEC 62841-1:2014

This Part 4-4 supplements or modifies the corresponding clauses in IEC 62841-1, so as to convert it into the IEC Standard: Particular requirements for lawn trimmers, lawn edge trimmers, grass trimmers, brush cutters and brush saws.

Where a particular subclause of Part 1 is not mentioned in this Part 4-4, that subclause applies as far as reasonable. Where this standard states "addition", "modification" or "replacement", the relevant text in Part 1 is to be adapted accordingly.

The following print types are used:

- requirements: in roman type;
- *test specifications: in italic type;*
- notes: in small roman type.

The terms defined in Clause 3 are printed in **bold typeface**.

Subclauses, notes, tables and figures which are additional to those in Part 1 as well as Annexes of Part 1, except as described for Annex K and Annex L below, are numbered starting from 101.

Subclauses, notes, tables and figures in Annex K and Annex L which are additional to those in the main body of this Part 4-4 are numbered starting from 301.

A list of all parts of the IEC 62841 series, under the general title: *Electric motor-operated hand-held tools, transportable tools and lawn and garden machinery – Safety*, can be found on the IEC website.

The committee has decided that the contents of this document will remain unchanged until the stability date indicated on the IEC website under "<http://webstore.iec.ch>" in the data related to the specific document. At this date, the document will be

- reconfirmed,
- withdrawn,
- replaced by a revised edition, or
- amended.

NOTE The attention of National Committees is drawn to the fact that equipment manufacturers and testing organizations may need a transitional period following publication of a new, amended or revised IEC publication in which to make products in accordance with the new requirements and to equip themselves for conducting new or revised tests.

It is the recommendation of the committee that the content of this publication be adopted for implementation nationally not earlier than 36 months from the date of publication.

INTRODUCTION

The International Electrotechnical Commission (IEC) draws attention to the fact that it is claimed that compliance with this document may involve the use of patents concerning prevention of inadvertent starting given in Subclause 21.18.101.

IEC takes no position concerning the evidence, validity and scope of this patent right.

The holders of these patent rights have assured the IEC that they are willing to negotiate licences under reasonable and non-discriminatory terms and conditions with applicants throughout the world. In this respect, the statements of the holders of these patent rights are registered with IEC. Information may be obtained from:

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Husqvarna AB
SE-561 82 Huskvarna
Sweden

Robert Bosch GmbH
Postfach 30 02 20
D-70442 Stuttgart, Germany

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights other than those identified above. IEC shall not be held responsible for identifying any or all such patent rights.

ISO (www.iso.org/patents) and IEC (<http://patents.iec.ch>) maintain on-line data bases of patents relevant to their standards. Users are encouraged to consult the data bases for the most up to date information concerning patents.

ELECTRIC MOTOR-OPERATED HAND-HELD TOOLS, TRANSPORTABLE TOOLS AND LAWN AND GARDEN MACHINERY – SAFETY –

Part 4-4: Particular requirements for lawn trimmers, lawn edge trimmers, grass trimmers, brush cutters and brush saws

1 Scope

This clause of Part 1 is applicable, except as follows:

Addition:

This document applies to hand-held and **walk-behind lawn trimmers** and **lawn edge trimmers**, used by a standing operator for cutting grass, weeds or similar soft vegetation, and **grass trimmers**, **brush cutters** and **brush saws** used by a standing operator for cutting grass, weeds, brush, bushes, saplings and similar vegetation.

This document does not apply to

- hand-held machines having a mass of 18 kg or greater;
- self-propelled **lawn trimmers** or **lawn edge trimmers**;
- scissors type **lawn trimmers** and **lawn edge trimmers**;
- machines equipped with metallic **cutting accessories** consisting of more than one piece, e.g. pivoting chains or flail blades;
- edgers with rigid and/or metallic cutting devices.

NOTE 101 Freely pivoting non-metallic **cutting elements** are considered not to be rigid cutting devices.

NOTE 102 Edgers with rigid or metal cutting devices will be covered by a future part of IEC 62841-4.

NOTE 103 Annex EE provides an informative summary of characteristics for **lawn trimmers**, **lawn edge trimmers**, **grass trimmers**, **brush cutters** and **brush saws**.

Brush cutters and **brush saws** covered by this document are designed only to be operated with the machine to the right of the operator.

2 Normative references

This clause of Part 1 is applicable, except as follows:

Replacement of undated normative reference for ISO 3744:

ISO 3744:2010, *Acoustics – Determination of sound power levels and sound energy levels of noise sources using sound pressure – Engineering methods for an essentially free field over a reflecting plane*

Addition:

IEC 60664-3, *Insulation coordination for equipment within low-voltage systems – Part 3: Use of coating, potting or moulding for protection against pollution*

IEC 60664-4, *Insulation coordination for equipment within low-voltage systems – Part 4: Consideration of high-frequency voltage stress*

ISO 354:2003, *Acoustics – Measurement of sound absorption in a reverberation room*

ISO 683-4:2016, *Heat-treatable steels, alloy steels and free-cutting steels – Part 4: Free-cutting steels*

ISO 7918:1995, *Forestry machinery – Portable brush-cutters and grass-trimmers – Cutting attachment guard dimensions*

ISO 11201:2010, *Acoustics – Noise emitted by machinery and equipment – Determination of emission sound pressure levels at a work station and at other specified positions in an essentially free field over a reflecting plane with negligible environmental corrections*

ISO 22868:2011, *Forestry and gardening machinery – Noise test code for portable hand-held machines with internal combustion engine – Engineering method (Grade 2 accuracy)*

3 Terms and definitions

This clause of Part 1 is applicable, except as follows:

Addition:

3.101 barrier

device attached to the machine, designed to maintain a minimum distance between the operator and the **cutting accessory** when the machine is being operated

3.102 blade thrust

sudden sideways, forward or backward motion of the machine, which may occur when the **cutting accessory** jams or catches on an object such as a sapling or a tree stump

3.103 brush cutter

machine with a rotating **cutting accessory** intended to cut weeds, scrub, brush, and similar vegetation

Note 101 to entry: See Figure 101.

3.104 brush saw

machine with a rotating circular metal **cutting accessory** having peripheral cutting teeth, designed to cut wood, such as small trees and saplings, by continuously removing material

Note 101 to entry: See Figure 102.

3.105 cutting accessory

rigid cutting device made of metal or plastic, used on **brush cutters** and **brush saws**

3.106 cutting element

single non-metallic filament line or freely pivoting non-metallic cutter

3.107 cutting head

support and retention system for the **cutting means**

Note 101 to entry: **Cutting heads** are used on **lawn trimmers**, **lawn edge trimmers** and **grass trimmers**.

3.108

cutting means

assembly of non-metallic filament line(s) or freely pivoting non-metallic cutter(s) that rotates about an axis perpendicular to the cutting plane, used to provide the cutting action by one or more **cutting elements**

Note 101 to entry: **Cutting means** are used on **lawn trimmers**, **lawn edge trimmers** and **grass trimmers**.

3.109

grass trimmer

machine with a **cutting means**, intended to cut small weeds, grass or similar soft vegetation, where the **cutting means** operates in a plane approximately parallel to the ground

Note 101 to entry: See Figure 103.

3.110

hand-held trimmer

lawn trimmer or **lawn edge trimmer** which is supported by hand, possibly assisted by wheel(s), skids or harness, etc. and constructed such that it cannot maintain its operating position without being held by an operator

3.111

lawn edge trimmer

machine with a **cutting means** for cutting grass or similar soft vegetation where the **cutting means** operates in a plane approximately perpendicular to the ground

Note 101 to entry: See Figure 104.

Note 102 to entry: The maximum kinetic energy for **cutting elements** on **lawn edge trimmers** is specified in 21.101.

3.112

lawn trimmer

machine with a **cutting means** for cutting grass or similar soft vegetation where the **cutting means** operates in a plane approximately parallel to the ground

Note 101 to entry: See Figure 105.

Note 102 to entry: The maximum kinetic energy for **cutting elements** on **lawn trimmers** is specified in 21.101.

3.113

maximum speed

highest output speed attainable under all conditions of **normal use**, including no load

3.114

operator presence sensor

device to detect the presence of an operator's hand

3.115

shaft

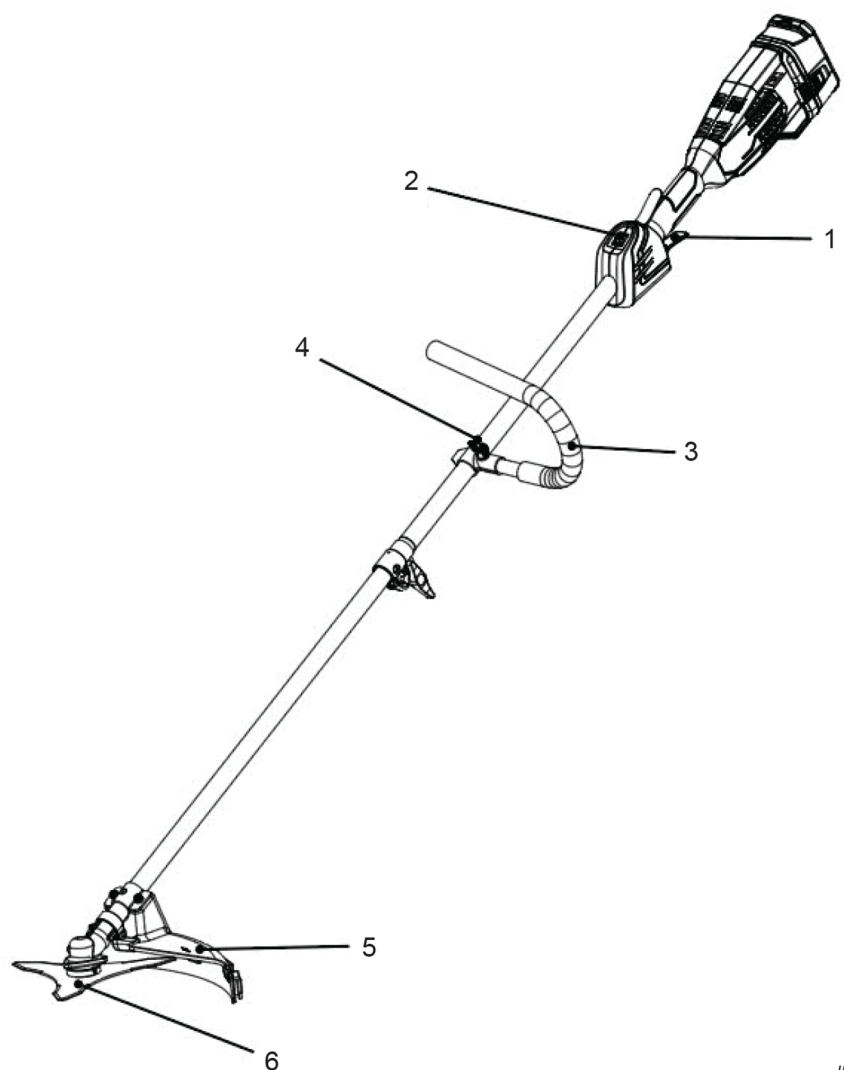
element of the machine that distances the **cutting accessory** or **cutting means** from the handles

3.116

walk-behind trimmer

lawn trimmer or **lawn edge trimmer** which is ground supported, controlled by an operator walking behind and constructed such that it maintains its operating position without being held by an operator

Note 101 to entry: See Figure 106.

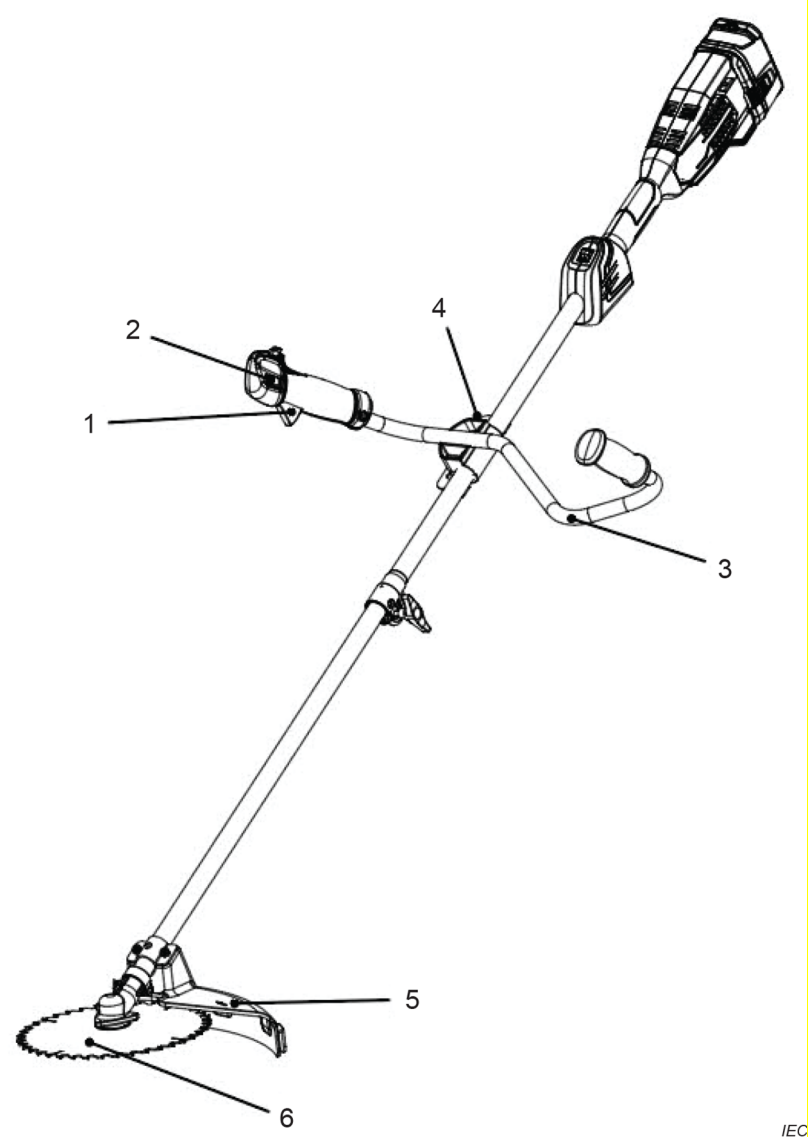


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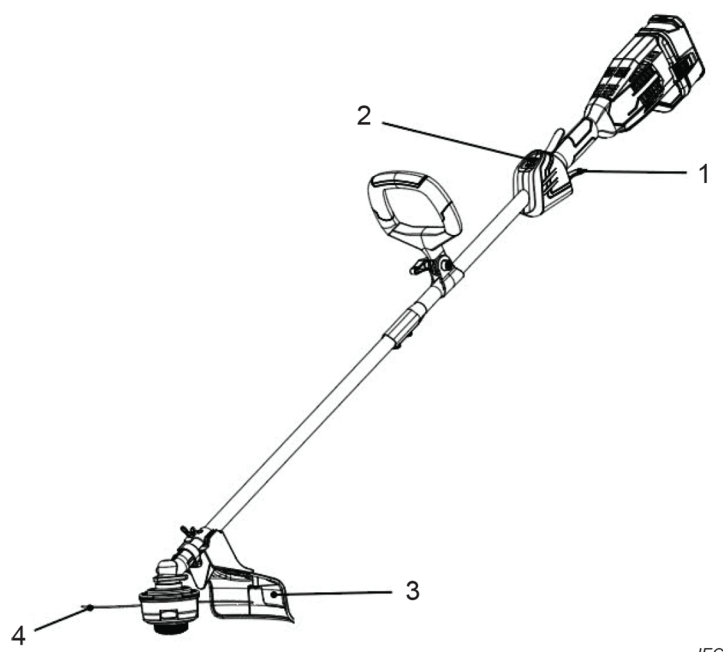
- 1 **power switch**
- 2 lock-off device
- 3 **barrier**
- 4 suspension point
- 5 **cutting accessory guard**
- 6 **cutting accessory**

Figure 101 – Example of a brush cutter

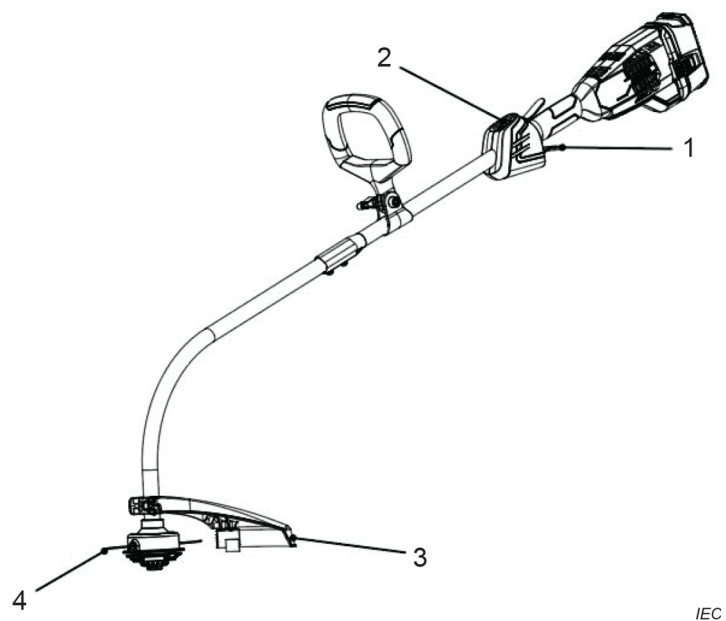
**Key**

- 1 **power switch**
- 2 **lock-off device**
- 3 **barrier**
- 4 **suspension point**
- 5 **cutting accessory guard**
- 6 **cutting accessory**

Figure 102 – Example of a brush saw



a) Grass trimmer with straight shaft

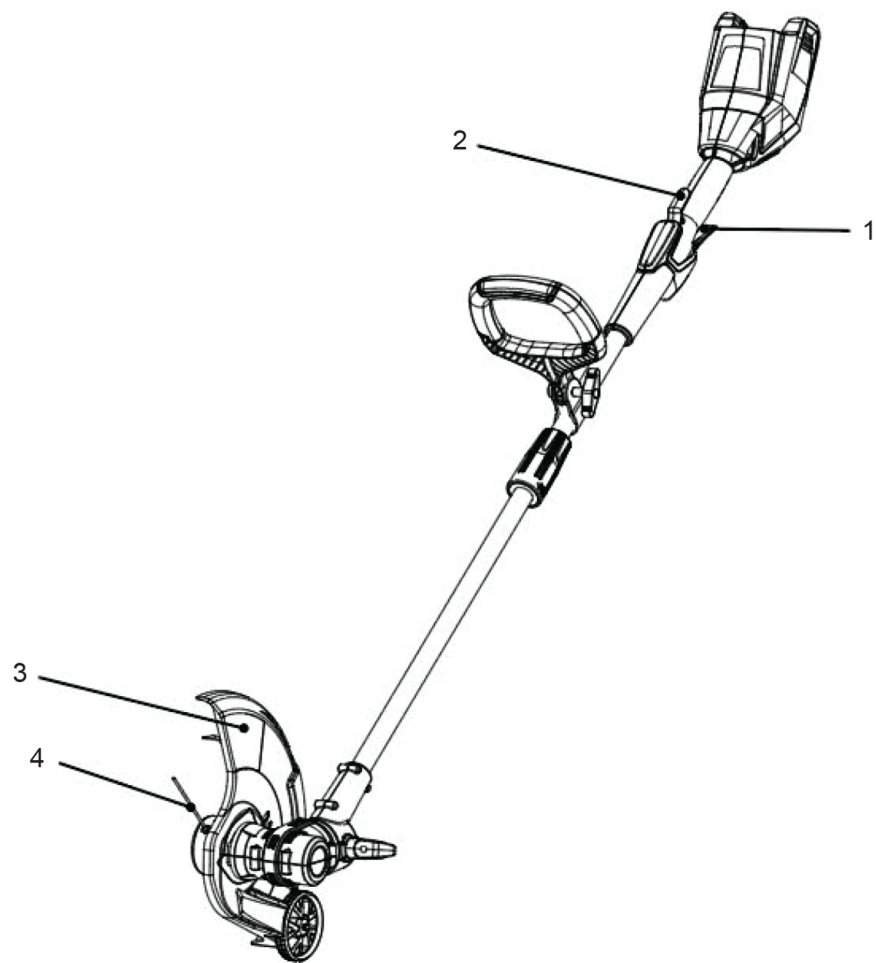


b) Grass trimmer with curved shaft

Key

- 1 **power switch**
- 2 **lock-off device**
- 3 **cutting means guard**
- 4 **cutting means**

Figure 103 – Examples of grass trimmers



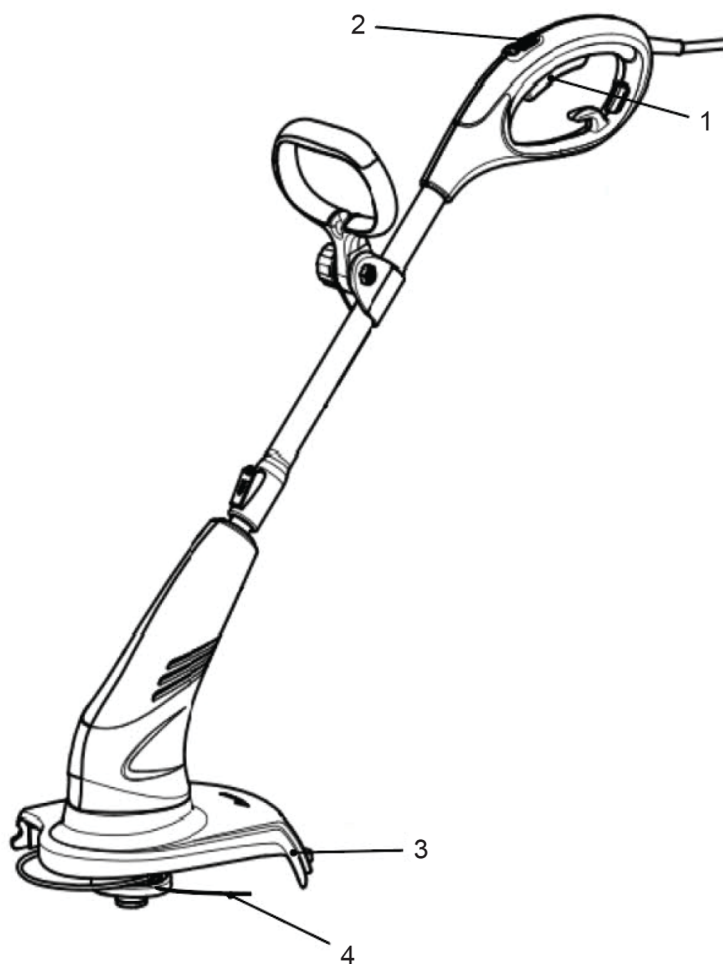
IEC

Key

- 1 **power switch**
- 2 **lock-off device (if any)**
- 3 **cutting means guard**
- 4 **cutting means**

Figure 104 – Example of a lawn edge trimmer

– 15 –



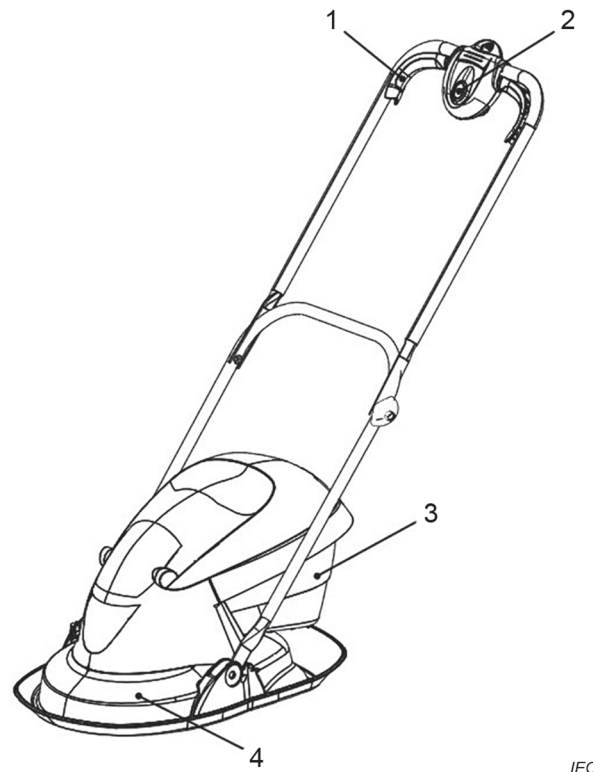
IEC

Key

- 1 **power switch**
- 2 **lock-off device (if any)**
- 3 **cutting means guard**
- 4 **cutting means**

Figure 105 – Example of a lawn trimmer

– 16 –



IEC

Key

- 1 **power switch**
- 2 lock-off device (if any)
- 3 grass catcher (if any)
- 4 **cutting means guard**

Figure 106 – Example of a walk-behind trimmer

4 General requirements

This clause of Part 1 is applicable.

5 General conditions for the tests

This clause of Part 1 is applicable, except as follows:

5.4 Addition:

Handle positions that are used for storage or transportation purposes are not included in this requirement.

5.17 Addition:

*For **brush cutters** and **brush saws**, the mass of the machine includes the heaviest **cutting accessory** in accordance with 8.14.2 a) 101) and 8.14.2 a) 104), but excludes the **cutting accessory** cover, harness and hip pad, if any.*

*For **lawn trimmers**, **lawn edge trimmers** and **grass trimmers**, the mass of the machine includes the **cutting head***

- with freely pivoting non-metallic cutters, if any; and*
- with a spool for non-metallic filament line, if any;*
- without the non-metallic filament line, if any;*

*and for **hand-held trimmers**, wheels or skids, if any.*

5.101 *The tests are carried out on the machine as supplied. However, a machine constructed as a single machine but supplied in an unassembled state is tested after assembly in accordance with 8.14.2.*

5.102 *Unless otherwise specified, for Clause 19 and Clause 21, machines are tested in each operating configuration as described in 8.14.2.*

5.103 *For tests that are performed at **maximum speed** and no load, the manufacturer may need to provide special hardware and/or software.*

6 Radiation, toxicity and similar hazards

This clause of Part 1 is applicable.

7 Classification

This clause of Part 1 is applicable, except as follows:

7.1 Replacement:

Machines shall be of one of the following classes with respect to protection against electric shock:

class II tool (machine), **class III tool** (machine)

Compliance is checked by inspection and by the relevant tests.

7.2 Addition:

Walk-behind trimmers that are a **class II tool** (machine) shall be classified at least as IPX4.

8 Marking and instructions

This clause of Part 1 is applicable, except as follows:

8.1 Addition:

Grass trimmers, brush cutters and brush saws shall be marked with the **maximum speed** of the spindle assigned by the manufacturer.

The **cutting head** for **grass trimmers** and the **cutting accessories** for **brush cutters** and **brush saws** shall be marked with their maximum permitted rotational speed.

8.2.101 Additional safety markings

8.2.101.1 General

Machines shall be marked with cautionary statements or instructions as specified in 8.2.101.2 to 8.2.101.8. A combination of ISO safety signs, such as eye, ear and head protection, is allowed. In addition, a combination of safety signs as specified in Figure AA.1, Figure AA.2 and Figure AA.3 is allowed.

Compliance is checked by inspection.

8.2.101.2 For all machines, unless otherwise specified:

- "Wear eye protection" or a relevant safety sign of ISO 7010 or one of the safety signs specified in Figure AA.4. This marking may be omitted for **walk-behind trimmers** with 360 degree guarding of the **cutting means**;
- "Wear ear protection" or a relevant safety sign of ISO 7010 or the safety sign specified in Figure AA.5. This marking may be omitted if the measured A-weighted emission sound pressure level at the operator position in accordance with Annex I does not exceed 85 dB(A);
- the primary direction of rotation of the spindle, by a legible and durable mark that is visible when operating the machine. This marking may be on the **guard**. This marking may be omitted for **walk-behind trimmers**, machines with no primary direction (i.e. dual direction) of rotation of the spindle, or machines with 360 degree guarding of the **cutting means**.

8.2.101.3 For all hand-held machines with a degree of protection of less than IPX4:

- "Do not expose to rain" or the safety sign specified in Figure AA.6.

8.2.101.4 For **lawn trimmers** and **lawn edge trimmers**:

- "⚠️WARNING – Keep bystanders away" or one of the safety signs specified in Figure AA.7.

8.2.101.5 For **grass trimmers, brush cutters and brush saws**:

- "⚠️WARNING – The distance between the machine and bystanders shall be at least 15 m", where "15 m" may be replaced by either "50 ft" or "15 m (50 ft)" or one of the safety signs specified in Figure AA.8;

- "⚠️ WARNING – Beware of thrown objects", or the safety sign specified in Figure AA.9.

8.2.101.6 For **brush cutters** and **brush saws**:

- "Wear head protection" or a relevant safety sign of ISO 7010 or the safety sign specified in Figure AA.10;
- "Wear hand protection" or a relevant safety sign of ISO 7010 or the safety sign specified in Figure AA.11;
- "Wear slip-resistant footwear" or the safety sign specified in Figure AA.12;
- "⚠️ WARNING – Beware of blade thrust", or one of the safety signs specified in either Figure AA.13 or Figure AA.14.

8.2.101.7 For **grass trimmers** that cannot be converted to a **brush cutter** or **brush saw** in accordance with 8.14.2 a) 104):

- "Do not use metal blades", or the safety sign specified in Figure AA.15.

8.2.101.8 For mains supplied machines:

- "⚠️ WARNING – Remove plug from the mains immediately if the cable is damaged or cut" or the safety sign specified in Figure AA.16.

8.3.101 For **grass trimmers**, **brush cutters** and **brush saws**, the **cutting head** or **cutting accessory** shall be marked with the following information:

- intended direction of rotation, if any;
- name or trade mark of the manufacturer.

8.3.102 For **grass trimmers**, **brush cutters** and **brush saws**, where the minimum handle distance is not prevented by design, the machine shall be marked with an indication on the machine as to the placement of the handle to meet the minimum handle distance requirement of 19.102.1.2.

8.4 *Replacement of the first paragraph:*

Markings specified in 8.1 to 8.3 shall not be on a **detachable part** of the machine, except for

- the marking of the primary direction of rotation of the spindle required in 8.2; and
- the markings required in 8.2, 8.2.101 and 8.3.101

which may be on the **guard**.

8.6 *Modification of the following unit:*

n_0 **maximum speed**

8.12 *Replacement of the first paragraph:*

Markings required by the standard shall be legible and durable. Signs shall be in contrast such as colour, texture, or relief, to their background such that the information or instructions provided by the signs are clearly legible when viewed with normal vision from a distance of (500 ± 50) mm. Signs need not be in accordance with the colour requirements of ISO 3864-2. If markings are embossed, stamped, etched, engraved or moulded, contrasting colours are not required.

8.14.1 Addition:

The additional safety instructions as specified in 8.14.1.101 to 8.14.1.103 shall be given. This part may be printed separately from the "General Machine Safety Warnings".

NOTE 101 "General Machine Safety Warnings" are referred to as "General Power Tool Safety Warnings" in Part 1.

8.14.1.1 Addition for item 2) c):

For machines classified at least IPX4, the warning may be replaced as specified below.

- c) **Do not operate the machine in rain or wet conditions.** *Water entering the machine may increase the risk of electric shock or malfunction that could result in personal injury.*

8.14.1.101 Lawn trimmer and lawn edge trimmer safety warnings

- a) **Do not use the machine in bad weather conditions, especially when there is a risk of lightning.** *This decreases the risk of being struck by lightning.*
- b) **Thoroughly inspect the area for wildlife where the machine is to be used.** *Wildlife may be injured by the machine during operation.*
- c) **Thoroughly inspect the area where the machine is to be used and remove all stones, sticks, wires, bones, and other foreign objects.** *Thrown objects can cause personal injury.*
- d) **Before using the machine, always visually inspect to see that the cutter and the cutter assembly are not damaged.** *Damaged parts increase the risk of injury.*
- e) **Before use, check the supply cord and any extension cord for signs of damage or aging. Do not use the machine if the cord is damaged or worn. If the cord is damaged or worn during use, switch off the machine and do not touch the cord before disconnecting it from the supply.** *A damaged supply cord or extension cord may result in electric shock, fire and/or serious injury.*
- f) **Check the grass collector frequently for wear or deterioration.** *A worn or damaged grass collector may increase the risk of personal injury.*

NOTE 101 The warning in item f) above is omitted if the machine does not have a provision for fitting a grass collector.

NOTE 102 The term "collector" can be replaced by the term "catcher" or "bag".

- g) **Keep guards in place. Guards must be in working order and be properly mounted.** *A guard that is loose, damaged, or is not functioning correctly may result in personal injury.*
- h) **Keep all cooling air inlets clear of debris.** *Blocked air inlets and debris may result in overheating or risk of fire.*
- i) **Wear eye protection and ear protection.** *Adequate protective equipment will reduce personal injury.*

NOTE 103 The ear protection portion of the warning can be omitted if the measured A-weighted emission sound pressure level at the operator's ear in accordance with Annex I does not exceed 85 dB(A).

NOTE 104 The eye protection portion of the warning can be omitted for **walk-behind trimmers** with 360 degree guarding of the **cutting means**.

NOTE 105 The warning in item i) is omitted for **walk-behind trimmers** with 360 degree guarding of the **cutting means** and where the measured A-weighted emission sound pressure level at the operator's ear in accordance with Annex I does not exceed 85 dB(A).

- j) **While operating the machine, always wear non-slip and protective footwear. Do not operate the machine when barefoot or wearing open sandals.** *This reduces the chance of injury to the feet from contact with the moving cutter.*
- k) **Always wear clothing such as trousers that covers the operator's legs while operating the machine.** *Contact with the moving cutter or line may cause injury.*

- l) **Keep bystanders away while operating the machine.** *Thrown debris can result in serious personal injury.*
- m) **Do not operate the machine above waist height.** *This helps prevent unintended cutter contact and enables better control of the machine in unexpected situations.*
- n) **Exercise caution when operating the machine in wet grass. Walk, never run.** *This reduces the risk of slipping and falling which may result in personal injury.*
- o) **Do not operate the machine on excessively steep slopes.** *This reduces the risk of loss of control, slipping and falling which may result in personal injury.*
- p) **When working on slopes, always be sure of your footing, always work across the face of slopes, never up or down and exercise extreme caution when changing direction.** *This reduces the risk of loss of control, slipping and falling which may result in personal injury.*
- q) **Keep all power cords and cables away from cutting area.** *Power cords or cables may be hidden in hedges or bushes and can be accidentally cut or damaged by the line or cutter.*
- r) **Keep all parts of the body away from the moving trimmer cutter or line. Do not clear material from the machine until it has been disconnected from the power source.** *The moving trimmer cutter or line may result in serious personal injury.*
- s) **Carry the machine with the machine switched off and away from your body.** *Proper handling of the machine will reduce the likelihood of accidental contact with a moving trimmer cutter or line.*
- t) **Only use replacement cutting heads and trimmer cutters or lines specified by the manufacturer. Do not replace the trimmer cutters or lines with metal wires or blades.** *Incorrect replacement parts may cause loss of control, breakage and injury.*

8.14.1.102 Grass trimmer, brush cutter and brush saw safety warnings

- a) **Do not use the machine in bad weather conditions, especially when there is a risk of lightning.** *This decreases the risk of being struck by lightning.*
- b) **Thoroughly inspect the area for wildlife where the machine is to be used.** *Wildlife may be injured by the machine during operation.*
- c) **Thoroughly inspect the area where the machine is to be used and remove all stones, sticks, wires, bones, and other foreign objects.** *Thrown objects can cause personal injury.*
- d) **Before using the machine, always visually inspect to see that the cutter or blade and the cutter or blade assembly are not damaged.** *Damaged parts increase the risk of injury.*
- e) **Before use, check the supply cord and any extension cord for signs of damage or aging. Do not use the machine if the cord is damaged or worn. If the cord is damaged or worn during use, switch off the machine and do not touch the cord before disconnecting it from the supply.** *A damaged supply cord or extension cord may result in electric shock, fire and/or serious injury.*
- f) **Follow instructions for changing accessories.** *Improperly tightened blade securing nuts or bolts may either damage the blade or result in it becoming detached.*
- g) **The rated rotational speed of the blade must be at least equal to the maximum rotational speed marked on the machine.** *Blades running faster than their rated rotational speed can break and fly apart.*

NOTE 101 This warning is omitted for **grass trimmers** that cannot be converted to a **brush cutter** or a **brush saw** in accordance with 8.14.2 a) 104).

NOTE 102 It is possible to replace the term "blade" with the term "cutter".

- h) **Wear eye, ear, head and hand protection.** *Adequate protective equipment will reduce personal injury by flying debris or accidental contact with the cutting line or blade.*

NOTE 103 The ear protection portion of the warning can be omitted if the measured A-weighted emission sound pressure level at the operator's ear in accordance with Annex I does not exceed 85 dB(A).

- i) **While operating the machine, always wear non-slip and protective footwear. Do not operate the machine when barefoot or wearing open sandals.** *This reduces the chance of injury to the feet from contact with the moving cutters or lines.*

NOTE 104 This warning is applicable for **grass trimmers** that cannot be converted to a **brush cutter** or **brush saw** in accordance with 8.14.2 a) 104).

- j) **While operating the machine, always wear safety footwear. Do not operate the machine when barefoot or wearing open sandals.** *This reduces the chance of injury to the feet from contact with a moving cutter, line or blade.*

NOTE 105 This warning is applicable for **brush cutters**, **brush saws** and **grass trimmers** that can be converted to a **brush cutter** or **brush saw** in accordance with 8.14.2 a) 104).

- k) **While operating the machine, always wear long trousers.** *Exposed skin increases the likelihood of injury from thrown objects.*
- l) **Keep bystanders away while operating the machine.** *Thrown debris can result in serious personal injury.*
- m) **Always use two hands when operating the machine.** *Holding the machine with both hands will avoid loss of control.*
- n) **Hold the machine by insulated gripping surfaces only, because the cutting line or blade may contact hidden wiring or its own cord.** *Cutting line or blades contacting a "live" wire may make exposed metal parts of the machine "live" and could give the operator an electric shock.*
- o) **Always keep proper footing and operate the machine only when standing on the ground.** *Slippery or unstable surfaces may cause a loss of balance or control of the machine.*
- p) **Do not operate the machine on excessively steep slopes.** *This reduces the risk of loss of control, slipping and falling which may result in personal injury.*
- q) **When working on slopes, always be sure of your footing, always work across the face of slopes, never up or down and exercise extreme caution when changing direction.** *This reduces the risk of loss of control, slipping and falling which may result in personal injury.*
- r) **Keep the supply cord away from the cutter, line or blade.** *A damaged supply cord may result in electric shock, fire and/or serious injury.*

NOTE 106 It is possible to replace the term "blade" with the term "cutter".

- s) **Keep all parts of the body away from the cutter, line or blade when the machine is operating. Before you start the machine, make sure the cutter, line or blade is not contacting anything.** *A moment of inattention while operating the machine may result in injury to yourself or others.*
- t) **Do not operate the machine above waist height.** *This helps prevent unintended cutter or blade contact and enables better control of the machine in unexpected situations.*
- u) **When cutting brush or saplings that are under tension, be alert for spring back.** *When the tension in the wood fibres is released, the brush or sapling may strike the operator and/or throw the machine out of control.*
- v) **Use extreme caution when cutting brush and saplings.** *The slender material may catch the blade and be whipped toward you or pull you off balance.*
- w) **Maintain control of the machine and do not touch cutters, lines or blades and other hazardous moving parts while they are still in motion.** *This reduces the risk of injury from moving parts.*
- x) **When clearing jammed material or servicing the machine, make sure all power switches are off and the power cord is disconnected.** *Unexpected starting of the machine while clearing jammed material or servicing may result in serious personal injury.*
- y) **Carry the machine with the machine switched off and away from your body.** *Proper handling of the machine will reduce the likelihood of accidental contact with a moving cutter, line or blade.*

- z) **When transporting or storing the machine, always fit the cover on metal blades.** *Proper handling of the machine will reduce the likelihood of accidental contact with the blade.*

NOTE 107 This warning is omitted for **grass trimmers** that cannot be converted to a **brush cutter** or **brush saw** in accordance with 8.14.2 a) 104).

- aa) **Only use replacement cutters, lines, cutting heads and blades specified by the manufacturer.** *Incorrect replacement parts may increase the risk of breakage and injury.*

8.14.1.103 Blade thrust causes and related warnings

NOTE 101 The verbatim text of this subclause is omitted for **lawn trimmers**, **lawn edge trimmers** and **grass trimmers** that cannot be converted to a **brush cutter** or a **brush saw** in accordance with 8.14.2 a) 104).

Blade thrust is a sudden sideways, forward or backward motion of the machine, which may occur when the blade jams or catches on an object such as a sapling or a tree stump. It can be violent enough to cause the machine and/or operator to be propelled in any direction, and possibly lose control of the machine.

Blade thrust and its related hazards can be avoided by taking proper precautions as given below.

- a) **Maintain a firm grip with both hands on the machine and position your arms to resist blade thrust. Position your body to the left side of the machine.** *Blade thrust can increase the risk of injury due to the machine moving unexpectedly. Blade thrust can be controlled by the operator if proper precautions are taken.*
- b) **If the blade binds, or when interrupting a cut for any reason, switch the machine off and hold the machine motionless in the material until the blade comes to a complete stop. While the blade is binding, never attempt to remove the machine from the material or pull the machine backward while the blade is in motion, otherwise blade thrust may occur. Investigate and take corrective actions to eliminate the cause of blade binding.**
- c) **Do not use blunt or damaged blades.** *Blunt or damaged blades increase the risk of jamming or catching on an object, resulting in blade thrust.*
- d) **Always maintain good visibility of the material being cut.** *Blade thrust is more likely to occur in areas where it is difficult to see the material being cut.*
- e) **If you are approached by another person while operating the machine, switch the machine off.** *There is an increased risk of injury to other persons being struck by the moving blade in the event of blade thrust.*

8.14.2 a) Addition:

For **lawn trimmers** and **lawn edge trimmers**:

- 101) Instructions for configuring the machine for each intended use, including handles, **guards**, grass catcher (if any) or **cutting means** adjustment;
- 102) Instructions on which types of **accessories** and **guards** to be used for the intended applications of the machine;

For **grass trimmers**, **brush cutters** and **brush saws**, according to the type of supplied **cutting accessory**:

- 103) Explanation of the safety devices that the **grass trimmer**, **brush cutter** or **brush saw** incorporates as part of the original equipment;
- 104) Instructions for configuring the machine for each intended use, as applicable, including any handle(s), **guard**, **barrier**, **cutting means** or **cutting accessory** adjustment, as applicable, and the method to reconfigure the machine, if applicable;
- 105) Instruction that the **cutting accessory guard** and handle adjustments should be made with the motor stopped and disconnected from the mains supply or **battery removed**;

- 106) Instructions on which combinations of **cutting means**, **cutting accessories** and **guards** to be used for the intended applications of the machine.

8.14.2 b) Addition:

- 101) Advice to inspect machine for damage upon striking a hard object or if there appears to be excessive vibration;
- 102) Recommendation for the use of a **residual current device** with a tripping current of 30 mA or less;
- 103) Instruction to keep hands away from any sharp device intended to limit the length of the filament line, if any;
- 104) Instruction on how to extend and/or replace **cutting element(s)**, **cutting means** or **cutting accessory**, as applicable;
- 105) Instruction to secure the locking device(s) of any adjustable elements (e.g. extendable **shafts** and/or pivoting elements), if any;
- 106) Instruction on the normal position of use of the machine;
- 107) Instructions on starting and stopping techniques, with particular reference to safety;
- 108) Instructions on cutting techniques, including the materials that can be cut;
- 109) Instructions for the use and adjustment of handles;
- 110) Instructions for the use and adjustment of any provided shoulder harness in accordance with 21.106 and instructions for release or removal; if any;
- 111) Instructions not to simultaneously wear multiple belt harnesses or multiple shoulder harnesses;
- 112) Instructions, that when wearing a harness, no other wearable interferes with the release and removal of the harness;
- 113) Instructions on how to avoid situations which may be encountered while performing typical tasks, such as blockage of the **cutting accessory** or **cutting head**;
- 114) Instructions on how to clear blockages of the **cutting accessory** or **cutting head**;
- 115) Instruction to position the **supply cord** so that it will not be cut or caught on objects during operation;
- 116) Information on the **maximum speed** of the spindle, if required to be marked in accordance with 8.1;

8.14.2 c) Addition:

- 101) Advice to keep any ventilation openings clear of debris;
- 102) Recommendations for cleaning and maintenance before storage;
- 103) Instructions on the selection of replacement **cutting elements**, **cutting means**, **cutting heads** or **cutting accessories**, as applicable;

Additionally, for **brush cutters** and **brush saws**:

- 104) Instructions on sharpening and maintenance of the **cutting accessory** and/or a recommendation to have sharpening and maintenance of the **cutting accessory** performed by authorised service centres, with particular emphasis on the effects of **blade thrust** behaviour that may result if specifications are not followed. Or as an alternative, **cutting accessory** sharpening techniques, including the use of gloves;
- 105) Instruction on how to use the **cutting accessory** cover.

Replacement of NOTE:

NOTE In Europe (EN 62841-4-4), the following additional requirements apply:

Emissions

- 1) The noise emission, measured in accordance with Clause I.2, as follows:
 - A-weighted emission sound pressure level L_{pA} and its uncertainty K_{pA} , where L_{pA} exceeds 70 dB(A). Where L_{pA} does not exceed 70 dB(A), this fact shall be indicated;
 - for **lawn trimmers** and **lawn edge trimmers**, the A-weighted measured and guaranteed sound power levels L_{WA} ;
 - for **grass trimmers**, **brush cutters** and **brush saws**, the A-weighted sound power level L_{WA} and its uncertainty K_{WA} , where the A-weighted sound pressure level L_{pA} exceeds 80 dB(A);
 - C-weighted peak emission sound pressure value L_{pCpeak} , where this exceeds 63 Pa (130 dB in relation to 20 μ Pa).
- 2) Recommendation for the operator to wear hearing protection.
- 3) The vibration total value and its uncertainty measured in accordance with Clause I.3.
When the vibration total value does not exceed 2,5 m/s², this shall be stated.
When the vibration total value exceeds 2,5 m/s², its value shall be given in the instructions.
- 4) The following information:
 - that the declared vibration total value(s) has been measured in accordance with a standard test method and may be used for comparing one machine with another;
 - that the declared vibration total value(s) may also be used and the declared noise emission value(s) may also be used in a preliminary assessment of exposure.
- 5) A warning:
 - that the vibration emission during actual use of the machine can differ from the declared total value depending on the ways in which the machine is used; and
 - of the need to identify safety measures to protect the operator that are based on an estimation of exposure in the actual conditions of use (taking account of all parts of the operating cycle such as the times when the machine is switched off and when it is running idle in addition to the trigger time).

8.14.3 Replacement:

If information about the mass or weight of the machine is provided, it shall be

- for **lawn trimmers**, **lawn edge trimmers** and **grass trimmers**, the mass specified in 5.17; and
- for **brush cutters** and **brush saws**, the mass without the **cutting accessory**, **cutting accessory** cover, harness and hip pad, if any.

Compliance is checked by inspection.

9 Protection against access to live parts

This clause of Part 1 is applicable.

10 Starting

This clause of Part 1 is applicable.

11 Input and current

This clause of Part 1 is applicable, except as follows:

Addition:

*For **lawn trimmers**, **lawn edge trimmers** and **grass trimmers**, the **cutting head** is fitted for this test, but **cutting elements** are removed.*

*For **brush cutters** and **brush saws**, the **cutting accessory** is removed for this test.*

12 Heating

This clause of Part 1 is applicable, except as follows:

12.2 Replacement:

*For machines with one or more **rated voltages**, the machine is operated at each **rated voltage** under the load conditions specified in 12.2.1. Without any further alteration of the applied torque, the voltage is then adjusted to 0,94 times the **rated voltage** and 1,06 times the **rated voltage**.*

The temperatures are measured at the most unfavourable of the two voltage settings. The temperatures that are measured by means of thermocouples are taken while the machine is operating.

*For machines with a **rated voltage range**, the machine is operated*

- at the lower limit of the **rated voltage range**, under the load conditions specified in 12.2.1, and without any further alteration of the applied torque, the voltage is then adjusted to 0,94 times the lower limit of the **rated voltage range**;*

and

- at the upper limit of the **rated voltage range**, under the load conditions specified in 12.2.1, and without any further alteration of the applied torque, the voltage is then adjusted to 1,06 times the upper limit of the **rated voltage range**.*

The temperatures are measured at the most unfavourable of the two voltage settings. The temperatures that are measured by means of thermocouples are taken while the machine is operating.

12.2.1 Replacement:

The load conditions for the heating test of 12.2 are as follows:

The machine is loaded by the application of a torque until thermal equilibrium is reached.

*For **lawn trimmers**, **lawn edge trimmers** and **grass trimmers** that cannot be converted to a **brush cutter** or **brush saw** in accordance with 8.14.2 a) 104), at the manufacturer's discretion, the torque may be applied by either*

- an external load; or*
- extending or modifying the **cutting elements***

*such that when supplied at **rated voltage** the machine operates at **rated input** or **rated current**.*

*For **brush cutters**, **brush saws** and **grass trimmers** that can be converted to a **brush cutter** or **brush saw** in accordance with 8.14.2 a) 104), the torque is applied by means of an external load such that when supplied at **rated voltage** the machine operates at **rated input** or **rated current**.*

13 Resistance to heat and fire

This clause of Part 1 is applicable.

14 Moisture resistance

This clause of Part 1 is applicable, except as follows:

14.2 Replacement of the first paragraph:

The enclosure of the machine shall provide the degree of protection against moisture in accordance with the marking (other than IPX0) of the machine.

14.2.1 Replacement:

The machine is not connected to the supply. Machines fitted with an appliance inlet or cable coupler shall be tested without the mating connector in place.

*For a **walk-behind trimmer**, the machine is placed on a non-perforated turntable. The front to rear centreline of the machine is aligned with the pivot axis of the oscillating tube at the start of test.*

*For a **hand-held tool** (machine), the machine is placed in its normal rest position on a perforated turntable.*

The turntable is turned continuously at $(1 \pm 0,1)$ r/min.

Detachable parts are removed and subjected, if necessary, to the relevant treatment with the main part. Movable covers that are non-**detachable parts** and are not self-restoring are placed in the most unfavourable position.

NOTE Examples of self-restoring covers include those that are spring loaded or close by gravity.

Air filters are not removed.

14.2.2 Replacement of the last paragraph:

*Immediately after the appropriate treatment, the machine shall withstand the electric strength test of Annex D between **live parts** and **accessible parts**, the test voltage being 2 500 V. Then the machine is connected to the supply. It shall not start with the **power switch** in the "off" position.*

*Afterwards, inspection shall show that there is no trace of water on insulation which could result in a reduction of **creepage distances** between bare conductors of different potential below the values specified in 28.1. For all instances where **creepage distances** could be reduced below the values specified in 28.1, a short circuit is introduced between adjacent conductors simultaneously. The machine is then evaluated for*

- *the risk of fire in accordance with item a) of 18.6.1; and*
- *the loss of any **SCF**, unless the machine is rendered into a safe state.*

15 Resistance to rusting

This clause of Part 1 is applicable.

16 Overload protection of transformers and associated circuits

This clause of Part 1 is applicable.

17 Endurance

This clause of Part 1 is applicable except as follows:

17.2 Replacement:

Lawn trimmers, lawn edge trimmers and grass trimmers are operated at **maximum speed**, with the **cutting means** adjusted to the maximum cutting length, if applicable.

Hand-held trimmers are operated for 15 h at a voltage equal to 1,1 times the highest **rated voltage** or 1,1 times the upper limit of the **rated voltage range**, and then for 15 h at a supply voltage equal to 0,9 times the lowest **rated voltage** or 0,9 times the lower limit of the **rated voltage range**. The machine may be operated for a number of periods in order to achieve the 15 h operating time. For machines that can be operated in various positions in accordance with 8.14.2, the test may be conducted in any single orientation or distributed in various orientations for each 15 h test duration.

Walk-behind trimmers are operated for 15 h at a voltage equal to 1,1 times the highest **rated voltage** or 1,1 times the upper limit of the **rated voltage range**, and then for 15 h at a supply voltage equal to 0,9 times the lowest **rated voltage** or 0,9 times the lower limit of the **rated voltage range**. The machine may be operated for a number of periods in order to achieve the 15 h operating time. During the test, the machine is placed in its normal operating position according to 8.14.2.

Grass trimmers, brush cutters and brush saws are fitted with the **cutting means** or **cutting accessory**, as applicable, that results in the highest power input. The machine is then operated at **maximum speed** for 24 h at a voltage equal to 1,1 times the highest **rated voltage** or 1,1 times the upper limit of the **rated voltage range**, and then for 24 h at a supply voltage equal to 0,9 times the lowest **rated voltage** or 0,9 times the lower limit of the **rated voltage range**. The machine may be operated for a number of periods in order to achieve the 24 h operating time.

During this test, replacement of the carbon brushes is allowed, and the machine is oiled and greased in accordance with 8.14.2 c) 1). If mechanical failure occurs and does not impair compliance with this standard, the part that failed may be replaced.

If the temperature rise of any part of the machine exceeds the temperature rise determined during the test of 12.1, forced cooling or rest periods may be applied, the rest periods being excluded from the specified operating time. If forced cooling is applied, it shall not alter the air flow of the machine or redistribute carbon deposits.

During these tests, overload protection devices incorporated in the machine shall not activate.

18 Abnormal operation

This clause of Part 1 is applicable, except as follows:

18.3 Replacement:

Lawn trimmers, lawn edge trimmers and grass trimmers incorporating a series motor are operated at a voltage equal to 1,3 times **rated voltage** for 1 min at no-load with the spool empty of any filament line and with any freely pivoting **cutting means** removed.

Brush cutters and brush saws incorporating a series motor are operated at a voltage equal to 1,3 times **rated voltage** for 1 min at no-load with the **cutting accessory** removed.

During the test, parts shall not be ejected from the machine. After this test, the machine need not be capable of further use.

An additional device incorporated in the machine to limit the speed may operate during the test.

18.5 Replacement:

Protection against electric shock shall not be impaired when a **class II tool** is subjected to running overload conditions.

*For **lawn trimmers, lawn edge trimmers and grass trimmers** that cannot be converted to a **brush cutter or brush saw** in accordance with 8.14.2 a) 104), with*

- motors having electronically commutated stator windings, compliance is checked by the test of 18.5.4;*
- series motors, compliance is checked by the test of 18.5.1;*
- other motors, compliance is checked by the test of 18.5.3.*

*For **brush cutters, brush saws and grass trimmers** that can be converted to a **brush cutter or brush saw** in accordance with 8.14.2 a) 104), with*

- motors having electronically commutated stator windings, compliance is checked by the test of 18.5.4;*
- other motors, compliance is checked by the test of 18.5.3.*

18.5.1 Addition:

*The method described in 12.2.1 may be used to achieve the load of 160 % of **rated current**.*

18.5.2 This subclause of Part 1 is not applicable.

18.8 Replacement of Table 4 by the following:

Table 4 – Required performance levels

Type and purpose of SCF		Minimum performance level (PL)
Power switch – prevent unwanted switch-on		
	– lawn trimmers ; – lawn edge trimmers ; and – grass trimmers that cannot be converted to a brush cutter or a brush saw	a
	– brush cutters ; – brush saws ; and – grass trimmers that can be converted to a brush cutter or a brush saw	c
Power switch – provide desired switch-off		
	– lawn trimmers ; – lawn edge trimmers ; and – grass trimmers that cannot be converted to a brush cutter or a brush saw	a
	– brush cutters ; – brush saws ; and – grass trimmers that can be converted to a brush cutter or a brush saw	b
Starting current limitation as in 10.2		Not an SCF
Prevent exceeding thermal limits as in Clause 18		a
Overspeed prevention		
	For machines covered by 19.6 to prevent output speed above 130 % of maximum speed	a
	For machines other than those covered by 19.6 or with output speed increases that do not exceed 130 % of maximum speed : Any speed limiting device	Not an SCF
	If such overspeed would result in exceeding the 5 J kinetic energy limit as specified in 19.101.1.4 by more than 1,5 J	a
	For machines provided with a reverse rotation selector as specified in 21.18.103: Prevent reverse rotational speed exceeding 30 % of the maximum speed	b
	For machines if such overspeed would result in exceeding the 10 J kinetic energy limit as specified in 21.101 by more than 2 J	a
Provide desired direction of rotation		
	For machines covered by 19.101.1.3	a
	For machines covered by 19.101.1.4	a
	For machines covered by 19.101.2	a
	For machines covered by 21.104 that will not loosen due to a change in the direction of rotation	Not an SCF
	For machines covered by 21.104 that will loosen due to a change in the direction of rotation	b
Prevent drive to the cutting accessory as required in 19.105.3		a
De-energizing means, if any, as specified in 19.106		a
Lock-off function as required in 21.18.101		a
Visual or audible indicator as referenced in 21.18.101		Not an SCF
Operator presence sensor as in 21.18.102		a
Prevent self-resetting as required in 23.3		a

19 Mechanical hazards

This clause of Part 1 is applicable, except as follows:

19.1 Addition:

The requirements of this subclause do not apply to those moving parts and **guards** which are separately covered by 19.101.

The requirements of this subclause apply to all operating configurations as described in 8.14.2.

Machines that are intended to be configured as a **lawn trimmer** and a **lawn edge trimmer** in accordance with 8.14.2 a) 101) shall comply with the guarding requirements of 19.101.1 and 19.101.2 respectively.

19.3 This subclause of Part 1 is not applicable.

19.4 This subclause of Part 1 is not applicable.

Addition:

NOTE 101 Requirements for handles are given in 19.102.

19.5

Addition:

This subclause of Part 1 is not applicable for **walk-behind trimmers** with 360 degree guarding of the **cutting means**.

19.6 Replacement:

For **grass trimmers**, **brush cutters** and **brush saws**, the **maximum speed** of the spindle at **rated voltage** shall not exceed 110 % of the **maximum speed** marked as specified in 8.1.

*Compliance is checked by measuring the speed of the spindle with the most unfavourable **cutting means** or **cutting accessory** fitted, as applicable, in accordance with 8.14.2 a) 106).*

19.7 This subclause of Part 1 is not applicable.

19.8 This subclause of Part 1 is not applicable.

19.101 Guarding of cutting means and cutting accessories

19.101.1 Lawn trimmers

19.101.1.1 General

Lawn trimmers shall be guarded such as to minimise the likelihood of debris being ejected outward towards the operator during use as specified in

- 19.101.1.2; and
- either 19.101.1.3 or 19.101.1.4, depending on the energy of the **cutting element** calculated as in 21.101.