



UL 62841-4-2

STANDARD FOR SAFETY

Electric Motor-Operated Hand-Held Tools, Transportable Tools And Lawn And Garden Machinery – Safety – Part 4-2: Particular Requirements For Hedge Trimmers

UL Standard for Safety for Electric Motor-Operated Hand-Held Tools, Transportable Tools And Lawn And Garden Machinery – Safety – Part 4-2: Particular Requirements For Hedge Trimmers, UL 62841-4-2

First Edition, Dated September 13, 2019

Summary of Topics

This revision of ANSI/UL 62841-4-2 dated March 29, 2024 adopts IEC 62841-4-2 Amendment 1 published May 2022.

UL 62841-4-2 is an adoption of IEC 62841-4-2, Edition 1, published by the IEC December 2017 including Corrigendum 1 dated June 2018 and Amendment 1 dated May 2022.

Text that has been changed in any manner or impacted by ULSE's electronic publishing system is marked with a vertical line in the margin.

The new requirements are substantially in accordance with Proposal(s) on this subject dated December 22, 2023.

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Corrigendum 1 dated June 2018 and Amendment 1 dated May 2022.



ANSI/UL 62841-4-2-2024



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This ANSI/UL Standard for Safety consists of the First Edition including revisions through March 29, 2024. The most recent designation of ANSI/UL 62841-4-2 as an American National Standard (ANSI) occurred on March 29, 2024. ANSI approval for a standard does not include the Cover Page, Transmittal Pages, Title Page (front and back), or the Preface. The National Difference Page and IEC Foreword are also excluded from the ANSI approval of IEC-based standards.

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Preface

This is the harmonized CSA Group and ULSE standard for Electric Motor-Operated Hand-Held Tools, Transportable Tools And Lawn And Garden Machinery – Safety – Part 4-2: Particular Requirements For Hedge Trimmers. It is the First edition of CSA C22.2 No. 62841-4-2 and the First edition of UL 62841-4-2. This harmonized standard has been jointly revised on March 29, 2024. For this purpose, CSA Group and ULSE are issuing revision pages dated March 29, 2024.

This harmonized standard is based on IEC Publication 62841-4-2: First edition, Electric Motor-Operated Hand-Held Tools, Transportable Tools And Lawn And Garden Machinery – Safety – Part 4-2: Particular Requirements For Hedge Trimmers, issued December 2017, as revised by Corrigendum 1 issued June 2018 and Amendment 1 issued May 2022. IEC 62841-4-2 is copyrighted by the IEC.

This harmonized standard was prepared by CSA Group and ULSE. The efforts and support of the International Harmonization Committee (IHC) for the adoption of the IEC series of standards for Hand-Held, Motor-Operated, and Transportable Tools and Lawn and Garden Machinery are gratefully acknowledged.

This standard is considered suitable for use for conformity assessment within the stated scope of the standard.

This standard was reviewed by the CSA Subcommittee on Safety of Hand-Held Motor-Operated Electric Tools, under the jurisdiction of the CSA Technical Committee on Consumer and Commercial Products and the CSA Strategic Steering Committee on Requirements for Electrical Safety, and has been formally approved by the CSA Technical Committee. This standard has been developed in compliance with Standards Council of Canada requirements for National Standards of Canada. It has been published as a National Standard of Canada by CSA Group.

Application of Standard

Where reference is made to a specific number of samples to be tested, the specified number is to be considered a minimum quantity.

Note: Although the intended primary application of this standard is stated in its scope, it is important to note that it remains the responsibility of the users of the Standard to judge its suitability for their particular purpose.

CSA C22.2 No. 62841-4-2 is to be used in conjunction with the First edition of CAN/CSA-C22.2 No. 62841-1. The requirements for hedge trimmers are contained in this Part 4 Standard and CAN/CSA-C22.2 No. 62841-1. Requirements of this Part 4 Standard, where stated, amend the requirements of CAN/CSA-C22.2 No. 62841-1. Where a particular subclause of CAN/CSA-C22.2 No. 62841-1 is not mentioned in CSA C22.2 No. 62841-4-2, the CAN/CSA-C22.2 No. 62841-1 subclause applies.

UL 62841-4-2 is to be used in conjunction with the First edition of UL 62841-1. The requirements for hedge trimmers are contained in this Part 4 Standard and UL 62841-1. Requirements of this Part 4 Standard, where stated, amend the requirements of UL 62841-1. Where a particular subclause of UL 62841-1 is not mentioned in UL 62841-4-2, the UL 62841-1 subclause applies.

Level of harmonization

This standard adopts the IEC text with national differences.

This standard is published as an equivalent standard for CSA Group and ULSE.

An equivalent standard is a standard that is substantially the same in technical content, except as follows: Technical national differences are allowed for codes and governmental regulations as well as those

recognized as being in accordance with NAFTA Article 905, for example, because of fundamental climatic, geographical, technological, or infrastructural factors, scientific justification, or the level of protection that the country considers appropriate. Presentation is word for word except for editorial changes.

All national differences from the IEC text are included in the CSA Group and ULSE versions of the standard. While the technical content is the same in each organization's version, the format and presentation may differ.

Reasons for Differences From IEC

National differences from the IEC are being added in order to address safety and regulatory situations present in the US and Canada.

Interpretations

The interpretation by the standards development organization of an identical or equivalent standard is based on the literal text to determine compliance with the standard in accordance with the procedural rules of the standards development organization. If more than one interpretation of the literal text has been identified, a revision is to be proposed as soon as possible to each of the standards development organizations to more accurately reflect the intent.

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For CSA Group, the text, figures, and tables of International Electrotechnical Commission Publication 62841-4-2, Electric Motor-Operated Hand-Held Tools, Transportable Tools And Lawn And Garden Machinery – Safety – Part 4-2: Particular Requirements For Hedge Trimmers, copyright 2022, are used in this standard with the consent of the International Electrotechnical Commission. The IEC Foreword and Introduction are not a part of the requirements of this standard but are included for information purposes only.

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NATIONAL DIFFERENCES

National Differences from the text of International Electrotechnical Commission (IEC) Publication 62841-4-2, Electric Motor-Operated Hand-Held Tools, Transportable Tools and Lawn and Garden Machinery – Safety – Part 4-2: Particular Requirements for Hedge Trimmers, copyright 2022, are indicated by notations (differences) and are presented in bold text. The national difference type is included in the body.

There are five types of National Differences as noted below. The difference type is noted on the first line of the National Difference in the standard. The standard may not include all types of these National Differences.

DR – These are National Differences based on the **national regulatory requirements**.

D1 – These are National Differences which are based on **basic safety principles and requirements**, elimination of which would compromise safety for consumers and users of products.

D2 – These are National Differences from IEC requirements based on existing **safety practices**. These requirements reflect national safety practices, where empirical substantiation (for the IEC or national requirement) is not available or the text has not been included in the IEC standard.

DC – These are National Differences based on the **component standards** and will not be deleted until a particular component standard is harmonized with the IEC component standard.

DE – These are National Differences based on **editorial comments or corrections**.

Each national difference contains a description of what the national difference entails. Typically one of the following words is used to explain how the text of the national difference is to be applied to the base IEC text:

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Deletion / Delete - A deletion entails complete deletion of an entire numbered clause, subclause, table, figure, or annex without any replacement text.

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FOREWORD

ELECTRIC MOTOR-OPERATED HAND-HELD TOOLS, TRANSPORTABLE TOOLS AND LAWN AND GARDEN MACHINERY – SAFETY – PART 4-2: PARTICULAR REQUIREMENTS FOR HEDGE TRIMMERS

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IEC 62841-4-2 edition 1.1 contains the first edition (2017-12) [documents 116/346/FDIS and 116/352/RVD], its corrigendum (2018-06) and its amendment 1 (2022-05) [documents 116/578/FDIS and 116/586/RVD].

International Standard IEC 62841-4-2 has been prepared by IEC technical committee 116: Safety of motor-operated electric tools.

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

This Part 4-2 is to be used in conjunction with the first edition of IEC 62841-1 (2014).

This Part 4-2 supplements or modifies the corresponding clauses in IEC 62841-1, so as to convert it into the IEC Standard: Particular requirements for hedge trimmers.

Where a particular subclause of Part 1 is not mentioned in this Part 4-2, that subclause applies as far as relevant. 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, 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 4-2 as well as Annex K and Annex L of Part 1 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 the base publication and its amendment will remain unchanged until the stability date indicated on the IEC website under webstore.iec.ch in the data related to the specific publication. At this date, the publication 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.

101DV DE Modification: Add the following to the IEC Foreword:

The numbering system in the standard uses a space instead of a comma to indicate thousands and uses a comma instead of a period to indicate a decimal point. For example, 1 000 means 1,000 and 1,01 means 1.01.

102DV DE Modification: Add the following to the IEC Foreword:

For this Standard, all references to "Part 1" refer to CAN/CSA-C22.2 No. 62841-1 and UL 62841-1.

INTRODUCTION

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ELECTRIC MOTOR-OPERATED HAND-HELD TOOLS, TRANSPORTABLE TOOLS AND LAWN AND GARDEN MACHINERY – SAFETY – PART 4-2: PARTICULAR REQUIREMENTS FOR HEDGE TRIMMERS

1 Scope

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

Addition:

This standard applies to hand-held **hedge trimmers** which are designed for use by one operator for trimming hedges and bushes, including **extended-reach hedge trimmers** with a maximum length of 3,5 m.

NOTE 101 The measurement of the length for **extended-reach hedge trimmers** is specified in [21.101](#).

This standard is not applicable to **hedge trimmers** with a rotating blade.

This standard is not applicable to scissors type grass shears.

NOTE 102 Scissors type grass shears are covered by IEC 60335-2-94 or IEC 62841-4-5.

2 Normative references

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

Addition:

IEC 60664-3:2016, *Insulation coordination for equipment within low-voltage systems – Part 3: Use of coating, potting or moulding for protection against pollution*

IEC 60664-4:2005, *Insulation coordination for equipment within low-voltage systems – Part 4: Consideration of high-frequency voltage stress*

IEC 61672-1 *Electroacoustics – Sound level meters – Part 1: Specifications*

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

ISO 11684, *Tractors, machinery for agriculture and forestry, powered lawn and garden equipment – Safety signs and hazard pictorials – General principles*

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

Replacement:

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*

3 Terms and definitions

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

3.101

blade control

device activated by the operator's hand or fingers in order to start or stop the operation of the **cutting device**

3.102

blade stopping time

elapsed time from the release of the **blade control** until the moving parts of the **cutting device** stop

3.103

blade tooth

part of the **cutter blade** which is sharpened or has sharp edges to perform the shearing action (see [Figure 101](#) and [Figure 102](#))

3.104

blunt extension

blunt part of the **cutting device** or a part of an unsharpened plate fitted to the cutting device which extends beyond the **blade teeth** (see [Figure 101](#) and [Figure 102](#))

3.105

cutter blade

part of the cutting device having **blade teeth** which cut by shearing action either against other **blade teeth** or against a **shear plate** (see [Figure 101](#) and [Figure 102](#))

3.106

cutting device

part of the assembly of **cutter blade** and **shear plate** or of two **cutter blades** together with any supporting part which performs the cutting action, which may be either single or double sided (see [Figure 101](#), [Figure 102](#), [Figure 104](#) a) and [Figure 104](#) b))

3.107

cutting length

effective cutting length of the **cutting device** measured from the inside edge of the first **blade tooth** or **shear plate** tooth to the inside edge of the last **blade tooth** or **shear plate** tooth (see [Figure 103](#))

Note 1 to entry: Where both **cutter blades** move, the **cutting length** is measured when the first and last **blade teeth** are furthest apart.

3.108

extended-reach hedge trimmer

hedge trimmer with a fixed or adjustable elongated construction, including additional separable extensions, if any, such that the **cutting device** is distanced from the handles or grasping surfaces during use

3.109

front handle

grasping surface located at or towards the **cutting device** (see [Figure 104](#))

3.110

hedge trimmer

hand-held machine provided with a linearly reciprocating **cutting device** intended for trimming bushes and hedges

3.111

maximum speed

highest steady-state cutting device speed attainable under all conditions of normal use, including no-load, when adjusted in accordance with the manufacturer's specifications and/or instructions

Note 101 to entry: The steady-state **cutting device** speed excludes transients such as overshoot that may occur before attaining a steady-state condition.

3.112

operator presence sensor

device to detect the presence of an operator's hand

3.113

rear handle

grasping surface located furthest from the **cutting device** (see [Figure 104](#))

3.114

shaft

fixed or extendable element of an **extended-reach hedge trimmer** that distances the **cutting device** from the **rear handle**

3.115

shear plate

moving or stationary unsharpened part of the **cutting device** which assists cutting by shearing action against a **cutter blade** (see [Figure 101](#))

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:

5.8 Addition:

*If different **cutting devices** can be mounted on the **hedge trimmer** in accordance with [8.14.2 a\)](#) and [8.14.2 b\)](#), the **cutting devices** are regarded as **attachments**.*

5.17 Addition:

*The mass of the machine excludes the **cutting device** cover and shoulder harness, if any, but includes:*

– the auxiliary handle, if any;

and

*– for **extended-reach hedge trimmers**, the auxiliary extension **shaft** attachment, 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 a number of units is tested after assembly in accordance with [8.14.2](#).

5.102 Unless otherwise specified, for Clauses [19](#) and [21](#), machines are tested in each operating configuration as described in [8.14.2](#).

5.103 For machines that do not attain **maximum speed** under no load conditions, the manufacturer shall provide samples with special hardware and/or software in order to perform the required tests.

6 Radiation, toxicity and similar hazards

This clause of Part 1 is applicable.

7 Classification

This clause of Part 1 is applicable.

8 Marking and instructions

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

8.2 Addition:

Hedge trimmers shall be marked with safety information which shall be written in one of the official languages of the country in which the machine is to be sold or marked with the appropriate symbol.

For all **hedge trimmers**:

– "Wear ear protection", a relevant safety sign of ISO 7010 or the safety sign specified in [Figure AA.7](#). This marking may be omitted if the measured emission sound pressure level at the operator's ear in accordance with Annex I does not exceed 85 dB(A); and

– "⚠ DANGER – Keep hands away from blade" or the safety sign specified in [Figure AA.1](#) or the safety sign specified in [Figure AA.2](#).

The DANGER marking or symbol shall be readily visible to the user and shall not be located on the underside of the machine.

For all **hedge trimmers** with a degree of protection of less than IPX4:

– "⚠ WARNING – Do not expose to rain" or the safety sign specified in [Figure AA.3](#).

– "⚠ WARNING – Remove plug from the mains immediately if the cable is damaged or cut" or the safety sign specified in [Figure AA.4](#).

For all **hedge trimmers** except for Category 1 in [Table 101](#):

– "Wear eye protection" or a relevant safety sign of ISO 7010 or one of the safety signs shown in [Figure AA.5](#)."

Additionally, for **extended-reach hedge trimmers**:

– " DANGER – Keep sufficient distance away from electrical power lines" or symbol C.2.30 of ISO 11684.

– "Wear head protection" or a relevant safety sign of ISO 7010.

A combination of ISO safety signs, such as eye and head protection, is allowed. In addition, a combination of safety signs as specified in [Figure AA.6](#) is allowed.

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 or moulded, contrasting colours are not required.

8.14.1 Addition:

The additional safety instructions as specified in [8.14.1.101](#) shall be given for all **hedge trimmers**. The additional safety instructions as specified in [8.14.1.102](#) shall be given for all **extended-reach hedge trimmers**. 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 to 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 Safety instructions for hedge trimmers

For Category 1 **hedge trimmers** that can be converted to a grass shear, the term "hedge trimmer" may be replaced by alternate wording (e.g. "grass shear/hedge trimmer" or "grass shear/shrub shear"). For this case, the verbatim warnings below need not be repeated for the two configurations.

Hedge trimmer safety warnings:

a) **Do not use the hedge trimmer in bad weather conditions, especially when there is a risk of lightning.** *This decreases the risk of being struck by lightning.*

b) **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 by the blade.*

c) **Wear ear protection.** Adequate protective equipment will reduce the risk of hearing loss.

NOTE 101 This warning can be omitted if the measured emission sound pressure level at the operator's ear in accordance with Annex I does not exceed 85 dB(A).

d) **Hold the hedge trimmer by insulated gripping surfaces only, because the blade may contact hidden wiring or its own cord.** *Blades contacting a "live" wire may make exposed metal parts of the hedge trimmer "live" and could give the operator an electric shock.*

e) **Keep all parts of the body away from the blade. Do not remove cut material or hold material to be cut when blades are moving.** *Blades continue to move after the switch is turned off. A moment of inattention while operating the hedge trimmer may result in serious personal injury.*

f) **When clearing jammed material or servicing the hedge trimmer, make sure all power switches are off and the power cord is disconnected.** *Unexpected actuation of the hedge trimmer while clearing jammed material or servicing may result in serious personal injury.*

g) **Carry the hedge trimmer by the handle with the blade stopped and taking care not to operate any power switch.** *Proper carrying of the hedge trimmer will decrease the risk of inadvertent starting and resultant personal injury from the blades.*

h) **When transporting or storing the hedge trimmer, always use the blade cover.** *Proper handling of the hedge trimmer will decrease the risk of personal injury from the blades.*

8.14.1.102 Additional safety instructions for extended-reach hedge trimmers

Extended-reach hedge trimmer safety warnings:

a) **Always use head protection when operating the extended-reach hedge trimmer overhead.** *Falling debris can result in serious personal injury.*

NOTE 101 Alternate wording for "extended-reach" is possible, e.g. "pole" or "long reach".

b) **Always use two hands when operating the extended-reach hedge trimmer.** *Hold the extended-reach hedge trimmer with both hands to avoid loss of control.*

c) **To reduce the risk of electrocution, never use the extended-reach hedge trimmer near any electrical power lines.** *Contact with or use near power lines may cause serious injury or electric shock resulting in death.*

8.14.2 a) Addition:

101) If applicable, information on **cutting devices** and **attachments** permitted to be used with the **hedge trimmer**, e.g. a device attached to the **cutting device** to aid removal of hedge trimmings.

8.14.2 b) Addition:

101) Advice to check the hedges and bushes for foreign objects, e.g. wire fences and hidden wiring;

102) Recommendation for the use of a **residual current device** with a tripping current of 30 mA or less;

103) Identification of gripping surfaces of handle(s) and grasping surface(s) required by [19.101](#) and [19.102](#);

104) Instruction to hold the **hedge trimmer** properly, e.g. with both hands if two handles are provided;

105) Advice that the **hedge trimmer** is intended to be used by the operator at ground level and not on ladders or any other unstable support;

106) Advice that before operating the **hedge trimmer**, the user should make sure the locking device(s) of any moving elements (e.g. the extended **shaft** and pivoting element), if any, are in the locked position;

107) Instructions for location and use of **blade control(s)** for the operation of the **hedge trimmer**;

108) Instructions for configuring the machine, including any handle or **cutter blade** adjustment;

109) Instructions for the use and adjustment of any provided shoulder harness in accordance with [19.110](#) and instructions for release or removal;

110) Identification of centre position and other operating positions for handles that can rotate while in operation as allowed in [19.101.3](#).

8.14.2 c) Addition:

101) If applicable, advice to have any adjustable stopping mechanism maintained at regular intervals.

Replacement of the NOTE:

NOTE In Europe (EN IEC 62841-4-2), the following additional requirements apply:

Emissions

1) The noise emission, measured in accordance with Clause [1.2](#), 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;

– the A-weighted measured and guaranteed sound power levels L_{WA} ;

2) Recommendation for the operator to wear hearing protection.

3) The vibration total value and its uncertainty measured in accordance with Clause [1.3](#). When the vibration total value does not exceed $2,5 \text{ m/s}^2$, this shall be stated. When the vibration total value exceeds $2,5 \text{ m/s}^2$, its value shall be given in the instructions.

4) The following information:

– that the declared vibration total value(s) and the declared noise emission 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) and the declared noise emission value(s) may also be used in a preliminary assessment of exposure.

5) A warning:

– that the vibration 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).

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.

12 Heating

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

12.2.1 Replacement:

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

*The machine is operated with a torque load applied such that **rated input** or **rated current** is drawn. The machine is operated for 30 min in its most unfavourable configuration in accordance with [8.14.2 b\)](#) 108). During this period, the torque load is adjusted as necessary to maintain **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:

14.2.1 Replacement:

The machine is not connected to the supply.

The machine is placed in its normal rest position on a perforated turntable. The turntable is then turned continuously at $(1 \pm 0,1)$ r/min during the test.

***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.

14.2.2 Add the following new text:

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. 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 Modification:

This subclause of Part 1 is applicable as for **hand-held tools**.

Addition:

The machine is operated in its most unfavourable configuration in accordance with [8.14.2](#) b) 108).

Care shall be taken to avoid overheating the **cutting device** by operating continuously and therefore appropriate interruptions for cooling and lubrication may be introduced.

18 Abnormal operation

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

18.5 Modification:

The requirements for tools other than **lawn and garden machinery** are applicable.

18.8 Replacement of [Table 4](#) by the following:

Table 4
Required performance levels

Type and purpose of SCF	Minimum performance level (PL)
Blade control(s) – prevent unwanted switch-on	c
Blade control(s) – provide desired switch-off for any category in Table 101 or Table 102	b
Blade control(s) – blade stopping time not exceeding 1 s more than the required time for Category 3a, 3b and 4 only in Table 101 or Table 102	a

Table 4 Continued on Next Page

Table 4 Continued

Type and purpose of SCF	Minimum performance level (PL)
Prevent exceeding thermal limits as in Clause 18	a
Any device to prevent operation in a configuration not permitted by this standard as required in 19.101.1.1	a
Operator presence sensor as in 21.18.102	a
Lock-off function as required in 21.18.102	a
Visible or audible indicator as referenced in 21.18.102	Not an SCF
Prevent self-resetting as required in 23.3	a

19 Mechanical hazards

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

19.1 *Replacement of the first paragraph:*

All power-driven hazardous parts (e.g. gears), other than those moving parts (e.g. **cutting device**), barriers and covers which are separately covered by [19.102](#), [19.103](#), [19.105](#) and [19.106](#), shall be so positioned or enclosed to provide adequate protection. The requirements of this subclause apply to all operating configurations as described in [8.14.2](#).

19.3 This subclause of Part 1 is not applicable.

19.4 This subclause of Part 1 is not applicable.

NOTE Requirements for handles are given in [19.101](#).

19.6 This subclause of Part 1 is not applicable.

19.7 This subclause of Part 1 is not applicable.

19.8 This subclause of Part 1 is not applicable.

19.101 Handles

19.101.1 Hedge trimmer handles

19.101.1.1 General

For all **hedge trimmers** except for **extended-reach hedge trimmers**, the minimum number of handles shall be in accordance with [Table 101](#).

If a part containing the motor complies with the dimensions for a handle, it may be considered as a handle.

The handles shall be designed in such a way that each one can be grasped with one hand. Handles shall be suitably shaped to be grasped securely and have a perimeter P between 63 mm and 170 mm as illustrated in [Figure 105 a](#)), [Figure 105 b](#)) or [Figure 105 c](#)). The perimeter is determined by a chain measurement with the **blade control**, if any, fully depressed. The gripping length of the handle(s) required in [Table 101](#) shall be at least 100 mm.

If applicable, the part of the handle containing the **blade control** shall be counted as part of the handle gripping length.

If there are finger grips or similar superimposed profiles, the handle gripping length shall not be measured along the surface, but only the arc or straight line distance of the gripping surface, as applicable, shall be taken into account.

Handles shall be locked in position during operation except as allowed by [19.101.3](#). If they are adjustable without tools to different positions in accordance with [8.14.2 b\)](#), it shall not be possible to operate the machine when adjusted to a position which contravenes other provisions of this standard.

NOTE The requirements for endurance and integrity of adjustments are covered in [19.107](#) and [19.108](#).

Compliance is checked by inspection and by measurements.

19.101.1.2 Dimensions of bail or closed handles

On bail or closed handles (U-shaped handles) the gripping length is related to the inner length of the gripping surface. There shall be a minimum radial clearance of 25 mm around the gripping length. In addition, for a handle incorporating a **blade control**, there shall be a minimum radial clearance of 25 mm around the **blade control** actuator with the **blade control** not depressed.

If a bail or closed handle is used, the gripping length L in [Figure 105 a\)](#) shall be measured using lengths A and B as follows:

- the length A is measured within region X where the radius is at least 100 mm;
- the length(s) B are measured within region(s) Y where the transition radius is less than 100 mm, but each length B cannot exceed 10 mm in each region Y of the gripping surface.

Compliance is checked by inspection and by measurements.

19.101.1.3 Dimensions of handles supported centrally (T-type)

If a handle is supported centrally (i.e. T-type), there shall be a minimum radial clearance of 25 mm around the gripping length. The gripping length shall be calculated as follows (see [Figure 105 b\)](#)):

- for handles with a perimeter P (not including the support) of less than 80 mm, the gripping length is the sum of the two parts of the gripping length $X + Y$ on either side of the support;
- for handles with a perimeter P (not including the support) of 80 mm or more, the gripping length is the complete length Z from end to end.

In addition, for a handle incorporating a blade control, there shall be a minimum radial clearance of 25 mm around the blade control actuator with the blade control not depressed.

Compliance is checked by inspection and by measurements.

19.101.1.4 Dimensions of handles that are formed by the shaft

The gripping length L in [Figure 105 c\)](#) shall be measured using the straight portion of the handle, not including any transition radius, finger grips or similar superimposed profiles.

Compliance is checked by inspection and by measurements.

19.101.2 Extended-reach hedge trimmer handles

19.101.2.1 General

For **extended-reach hedge trimmers**, the minimum number of handles shall be in accordance with [Table 102](#).

If a part containing the motor complies with the dimensions for a handle, it may be considered as a handle.

A **shaft** may be used as a handle if specified in accordance with [8.14.2](#).

The handles shall be designed in such a way that each one can be grasped with one hand. Handles shall be suitably shaped to be grasped securely and have a perimeter P between 63 mm and 170 mm as illustrated in [Figure 105 a\)](#), [Figure 105 b\)](#) or [Figure 105 c\)](#). The perimeter P is determined by a chain measurement with the **blade control**, if any, fully depressed. The gripping length of the **front handle** and the **rear handle** shall be at least 100 mm long. In addition, for a handle incorporating a **blade control**, there shall be a minimum radial clearance of 25 mm around the **blade control** actuator with the **blade control** not depressed.

If applicable, the part of the handle containing the **blade control** shall be counted as part of the handle gripping length.

If there are finger grips or similar superimposed profiles, the handle gripping length shall not be measured along the surface, but only the arc or straight line distance of the gripping surface, as applicable, shall be taken into account.

If handles are adjustable to different positions without tools in accordance with [8.14.2 b\)](#), it shall not be possible to inadvertently operate the machine when locked in a position which contravenes other provisions of this standard. This may be achieved by at least one **blade control** requiring two separate and dissimilar actions before the **cutting device** operates as described in [21.18.102](#) for **power switches** and also meet the requirements of 21.17.1 for self-restoring lock-off devices.

Compliance is checked by inspection and by measurements.

19.101.2.2 Dimensions of bail or closed handles

On bail or closed handles (U-shaped handles), the gripping length is related to the inner length of the gripping surface. There shall be a minimum radial clearance of 25 mm around the gripping length. In addition, for a handle incorporating a **blade control**, there shall be a minimum radial clearance of 25 mm around the **blade control** actuator with the **blade control** not depressed.

If a bail or closed handle is used, the gripping length L in [Figure 105 a\)](#), shall be measured using lengths A and B as follows:

- the length A is measured within region X where the radius is at least 100 mm;
- the length(s) B are measured within region(s) Y where the transition radius is less than 100 mm, but each length B cannot exceed 10 mm in each region Y of the gripping surface.

Compliance is checked by inspection and by measurements.

19.101.2.3 Dimensions of handles supported centrally (T-type)

If a handle is supported centrally (i.e. T-type), there shall be a minimum radial clearance of 25 mm around the gripping length. The gripping length shall be calculated as follows (see [Figure 105 b](#)):

- for handles with a perimeter P (not including the support) of less than 80 mm, the gripping length is the sum of the two parts of the gripping length $X + Y$ on either side of the support;
- for handles with a perimeter P (not including the support) of 80 mm or more, the gripping length is the complete length Z from end to end.

In addition, for a handle incorporating a **blade control**, there shall be a minimum radial clearance of 25 mm around the **blade control** actuator with the **blade control** not depressed.

Compliance is checked by inspection and by measurements.

19.101.2.4 Dimensions of handles that are formed by the shaft

The gripping length L in [Figure 105 c](#)) shall be measured using the straight portion of the handle, not including any transition radius, finger grips or similar superimposed profiles.

Compliance is checked by inspection and by measurements.

19.101.3 Handles that are adjustable during operation

19.101.3.1 **Hedge trimmers**, except for **extended-reach hedge trimmers**, with handles that are adjustable by side-to-side axial rotation about an axis between them without the use of a tool while the **cutting device** is operating as permitted in [Table 101](#) shall comply with the requirements of [19.101.3.2](#) to [19.101.3.6](#).

No more than one of the handles to be held in operation may be adjustable while the machine is operating.

Extended-reach hedge trimmers shall not incorporate handles that are intended to be adjusted in accordance with [8.14.2](#) while the **cutting device** is operating.

Compliance is checked by inspection, by manual test and by the requirements of [19.101.3.2](#) to [19.101.3.6](#).

19.101.3.2 Any adjustable handle shall have a defined centre position. The handle shall have a locking detent at the centre position and at any other intended handle adjustment position of operation as described in [8.14.2](#). These other operating positions shall not locate the handle further than 95° from the centre position about their axis of rotation. See [Figure 106](#) and [Figure 107](#). The handle movement, when locked by the detent and subjected to a torque of $(2 \pm 0,1)$ Nm, shall be limited to 5° rotation. The handle shall have a handle release control as required in [19.101.3.3](#) that releases the handle from the detent position.

The handle shall automatically lock into each detent position when adjusting the handle, unless the handle release control is operated.

Compliance is checked by inspection and by measurement.

19.101.3.3 Limitation of movement of adjustable handles

19.101.3.3.1 **Hedge trimmers** with handles that are adjustable during operation shall be designed to prevent uncontrolled movement by fulfilling either [19.101.3.3.2](#) or [19.101.3.3.3](#).

19.101.3.3.2 The ease of rotation of an adjustable handle shall be limited after the handle release control is activated.

Compliance is checked by the following test:

*With the **cutting device** clamped securely and the handle release control activated, a 1 Nm torque is applied to the adjustable handle about its axis of rotation. There shall be no more than 5° of rotation of the handle within 2 s. The test is then repeated in the opposite direction of rotation.*

19.101.3.3.3 After the release of the handle from the centre position by the momentary activation of the handle release control, the extent of movement of the adjustable handle of the machine shall be limited.

The rotating handle shall have

- a maximum rotation of 60°; or
- one or more intermediate locking detents limiting rotation to a maximum of 60°

measured from the centre position in either direction about the axis of rotation between the handle positions.

The intermediate locking detent(s) may be intentionally overridden by operation of the handle release control.

NOTE For the case where this requirement is fulfilled by the use of one or more intermediate locking detents, the requirement for maximum rotation is specified in [19.101.3.2](#).

Compliance is checked by inspection and by measurement.

19.101.3.3.4 An adjustable handle shall be provided with a momentary handle release control to unlock the handles from a locked detent position. Operation of the handle release control shall not adversely affect physical control of the **hedge trimmer**. The handle release control, while intentionally activated, may allow the handle to bypass the detent position without locking.

Compliance is checked by inspection and by manual test.

19.101.3.5 Accessibility of handle release control

19.101.3.5.1 The handle release control shall be located, designed or guarded so that unintentional activation is unlikely.

Compliance is checked by fulfilling one of the requirements specified in [19.101.3.5.2](#), [19.101.3.5.3](#) or [19.101.3.5.4](#).

19.101.3.5.2 The handle release control shall be located outside the gripping surface of the handle, indicated in [8.14.2](#) b) 103).

Compliance is checked by inspection.

19.101.3.5.3 It shall not be possible to activate the handle release control when a rigid sphere with a diameter of (100 ± 1) mm is applied to the handle release control in any direction with a single linear motion.

Compliance is checked by inspection and by manual test.

19.101.3.5.4 The handle release control shall require two separate and dissimilar actions before the handle is released. It shall not be possible to achieve these two actions with a single grasping motion or a straight line motion.

Compliance is checked by inspection and by manual test.

19.101.3.6 A handle release control shall have adequate strength and shall be sufficiently durable.

Compliance is checked by inspection and by the following test:

The handle release control is actuated a total of 2 000 times, engaging all locking detent positions over the full range of travel of the adjustable handle, in both directions.

Each handle release control actuation consists of the following steps a) to d):

- a) Starting from any locking detent position, activate the handle release control;*
- b) Begin rotation of the adjustable handle to the next locking detent position;*
- c) Release the handle release control at approximately the halfway point to the next locking detent position;*
- d) Continue rotation of the adjustable handle until the handle engages with the next locking detent position.*

After the test, the machine shall withstand the electric strength test of Annex D between live parts and accessible parts and live parts shall not have become accessible, as specified in Clause [9](#), if the adjustment would cause stress on internal wiring.

At the conclusion of the conditioning, the handle release control shall perform as intended and shall comply with the following test:

While a handle is in any locking detent position, a torque of 6 Nm is applied for 1 min in line with the direction of its intended handle rotation, and it is applied in each direction of rotation.

*During the test, the handle shall not disengage from the locking detent position(s), and the handle shall still operate correctly after the test. Electrical connections shall not have worked loose, and there shall be no deterioration impairing safety in **normal use**.*

19.102 Hand protection

19.102.1 An operator's hand shall be protected from inadvertent contact with the moving **cutter blade** while holding the **front handle** as required in [Table 101](#) or [Table 102](#). Requirements for **hedge trimmers**, except for extended-reach hedge trimmers, are specified in [19.102.2](#). Requirements for **extended-reach hedge trimmers** are specified in [19.102.3](#)

19.102.2 Hand protection for hedge trimmers except for extended-reach hedge trimmers

19.102.2.1 The **front handle** shall be located so that the distance from the nearest cutting edge of the **cutter blade** to the furthest side of any handle, except for Category 1, is not less than 120 mm as shown in [Figure 108 a\)](#) and [Figure 108 b\)](#).

For Category 1, the shortest distance between the front of the handle grip and the nearest **blade tooth** shall be at least 120 mm (see [Figure 111](#)). The distances shall be measured along the shortest path from the front of the handle grip to the nearest cutting edge of the **cutter blade**.

For all categories in [Table 101](#), if there is a front hand barrier, then the x_1 and x_2 distances in [Figure 108 a\)](#) and [Figure 108 b\)](#) shall be measured along the shortest path from the furthest side of the handle, via the edge of the front hand barrier, to the nearest cutting edge of the **cutter blade**. The front hand barrier shall not have any openings with a minor dimension larger than 10 mm.

Additionally, for category 3a **hedge trimmers**, the front hand barrier shall have a minimum shape described by:

- a height y_1 of 90 mm measured perpendicularly from the cutting plane; and
- a width y_2 of 50 mm on either side of the centreline of the **cutting device**.

Both the y_1 and y_2 measurements are made with the **cutting device** in the 0° position, if axially rotatable. See [Figure 109](#).

Compliance is checked by inspection and by measurement.

19.102.2.2 In addition, for category 3a **hedge trimmers** where the **cutting device** can be rotated left or right along an axis of rotation, the front hand barrier shall have a width that extends a minimum of 25 mm beyond the **cutting device** when the **cutting device** is adjusted to its full left and right rotational position (see [Figure 110](#)).

Compliance is checked by inspection and by measurement.

19.102.2.3 In addition, for category 1 **hedge trimmers**, the handle shall be constructed such that it is attached to the machine at the front of the handle grip (see [Figure 111](#)).

Compliance is checked by inspection.

19.102.3 For **extended-reach hedge trimmers**, the **front handle** shall be located so that the shortest distance from the nearest cutting edge of the **cutter blade** to

- the backside of the handle for bail and T-type handles as shown in [Figure 112 a\)](#); or
- the nearest point of any gripping surface on a **shaft** used as a handle in accordance with [8.14.2](#) as shown in [Figure 112 b\)](#)

shall be at least 250 mm, with the **cutting device** in the most unfavourable configuration in accordance with [8.14.2](#) where it is possible for the machine to operate.

In addition, the machine shall be constructed such that in any operating configuration described in [8.14.2 b\)](#), the shortest distance measured between the point of the **blade control** in the **rear handle** closest to the **cutter blade** and the nearest cutting edge of the **cutter blade** shall be at least 1 000 mm, otherwise

the requirements of Clause [19](#) for **hedge trimmers** that are not **extended-reach hedge trimmers** shall also apply.

Compliance is checked by inspection and by measurement.

19.103 Cutting device

19.103.1 To safeguard against contact with the **cutter blade**, **hedge trimmers** shall be constructed to meet the requirements of one of the categories given in

– [Table 101](#) for all **hedge trimmers**, except for **extended-reach hedge trimmers**;

or

– [Table 102](#) for **extended-reach hedge trimmers**.

Compliance is checked by inspection and by measurement.

Table 101
Hedge trimmer categories (excluding extended-reach hedge trimmers)

Items with requirements	Category number and requirements				
	1	2	3a	3b	4
Cutting length	≤ 200 mm	Not applicable	Not applicable	Not applicable	Not applicable
Maximum blade stopping time (Subclause 19.104)	No	No	3 s	2 s	1 s
Minimum number of handles	1	2	2	2	2
Minimum number of handles with blade control	1	1	1	2 (two with simultaneous actuation)	2 (two with simultaneous actuation)
Location of blade control	rear handle	rear handle	rear handle	Not applicable	Not applicable
Blade configuration figure	114	114	115	115	116
Lower barrier required (Subclause 19.105)	No	No	Yes	No	No
Adjustable handle during operation permitted (Subclause 19.101.3)	No	Yes	Yes	Yes	Yes
Front hand barrier required (Subclause 19.102.2)	No	No	Yes	No	No

NOTE 1 In Europe (EN 62841-4-2), Category 3a is not applicable.

NOTE 2 In Europe (EN 62841-4-2), the maximum **blade stopping time** for Category 3b machines is 1 s.

Table 102
Extended-reach hedge trimmer categories

Items with requirements	Category number and requirements				
	1	2	3a	3b	4
Cutting length	≤ 200 mm	Not applicable	Not applicable	Not applicable	Not applicable
Maximum blade stopping time (Subclause 19.104)	3 s	3 s	3 s	3s	3 s
Minimum number of handles	2	2	2	2	2
Minimum number of handles with blade control	1	1	1	1	1
Location of blade control	rear handle	rear handle	rear handle	rear handle	rear handle
Blade configuration figure	114	114	115 (if blunt extensions are required)	115 (if blunt extensions are required)	116 (if blunt extensions are required)
Lower barrier required (Subclause 19.105)	No	No	No	No	No
Front hand barrier required	No	No	No	No	No

19.103.2 Blunt extensions

19.103.2.1 **Blunt extensions** as indicated in [19.103.2.2](#) through [19.103.2.4](#) shall extend a distance of at least 400 mm

– from any point of the rear face of the **front handle**; or

– if applicable for **extended-reach hedge trimmers**, from the nearest point of any gripping surface on a **shaft** used as a handle in accordance with [8.14.2](#).

See [Figure 113](#). If the **front handle** is located part way along the **cutting device**, the **blunt extensions** shall start at the first **blade tooth** and continue beyond the rear of the **front handle** until the 400 mm minimum distance is reached.

Compliance is checked by inspection and by measurement.

19.103.2.2 Hedge trimmer categories 1 and 2 (see [Figure 114](#))

The **blade tooth** opening distance (d_1) shall be no greater than 8 mm.

The minimum depth of the **blunt extensions** (d_2), if required in accordance with [19.103.2.1](#), shall be no less than 8 mm.

Compliance is checked by inspection and by measurement.

19.103.2.3 Hedge trimmer categories 3a and 3b (see [Figure 115](#))

The distance between adjacent **blunt extensions**, if required in accordance with [19.103.2.1](#), shall not allow a (19,0 +0/-0,1) mm test cylinder, applied with a force not exceeding 1 N, to contact any **blade tooth**, when the test cylinder is positioned perpendicular to the plane of the **cutting device**.

Compliance is checked by inspection and by manual test.

19.103.2.4 Hedge trimmer category 4 (see [Figure 116](#))

The minimum depth of the **blunt extensions**, if required in accordance with [19.103.2.1](#), shall be no less than 8 mm as shown in [Figure 116 a](#)).

In addition, the distance between the **blade teeth** and the side of a (120 +1/-0) mm test cylinder shall not be less than 4 mm when the test cylinder is positioned perpendicular to the plane of the **cutting device** and between two **blunt extensions** as shown in [Figure 116 a](#)).

For machines with **blunt extensions** that are not an integral part of the **cutting device**, the following additional requirement shall be met:

The distance between the end of the cutting plane between the **cutter blades** and the side of the test cylinder shall not be less than 4 mm when the test cylinder is positioned as shown in [Figure 116 a](#)) and then tilted around the ends of the **blunt extensions** up to an angle of 40° as shown in [Figure 116 b](#)).

Blunt extensions are not required for category 4 **hedge trimmers** with a blade configuration where there are only two handles and the **front handle** is a stick-type handle that is permanently fixed to the smooth side of a single sided **cutting device** (see [Figure 104 b](#))).

Compliance is checked by inspection and by manual test.

19.103.3 Adjustable cutting devices

19.103.3.1 Adjustable **cutting devices** that permit orientation of the **cutting device** relative to the body of the machine and that do not require the use of a tool shall comply with [19.103.3.2](#) through [19.103.3.6](#). Adjustable **cutting devices** shall not contravene other provisions of this standard for each operating configuration in accordance with [8.14.2 b](#)).

19.103.3.2 For adjustable **cutting devices** with side to side axial rotation, the operating positions shall not locate the **cutting device** further than 95° from the centre position about their axis of rotation. See [Figure 117](#) for an example of side to side axial rotation.

Compliance is checked by inspection and by measurement.

19.103.3.3 The adjustable **cutting device** shall have locking detents for each operating configuration in accordance with [8.14.2 b](#)). The **cutting device** shall automatically lock into each locking detent position when adjusting the **cutting device** unless the **cutting device** release control is operated.

Compliance is checked by inspection and by manual test.

19.103.3.4 An adjustable **cutting device** shall be provided with a momentary cutting device release control to disengage the **cutting device** from a locked position. A handle in accordance with [8.14.2 b](#)) 108) shall be provided for adjusting the position of the cutting device such that contact with the **cutting device** is not required. The requirements of [21.30](#) shall not apply to the **cutting device** adjusting handle.

Compliance is checked by inspection and by manual test.

19.103.3.5 The **cutting device** release control shall be located outside the gripping surface of the handle, indicated in [8.14.2 b](#)) 103). For **hedge trimmers** that are not **extended-reach hedge trimmers**, it shall not be possible for a single operator, by use of a hand, to disengage the **cutting device** from a locked position while the machine is operating.

Compliance is checked by inspection and by manual test.

19.103.3.6 A **cutting device** release control shall have adequate strength and shall be sufficiently durable.

Compliance is checked by the following test:

The **cutting device** release control is actuated in accordance with [8.14.2 b\) 108](#)) a total of 2 000 times, engaging all locking detent positions over the full range of travel of the adjustable **cutting device**, in both directions.

*Each **cutting device** release control actuation consists of the following steps a) to d):*

*a) starting from any locking detent position, activate the **cutting device** release control;*

*b) begin adjustment of the **cutting device** to the next locking detent position;*

*c) release the **cutting device** release control at approximately the halfway point to the next locking detent position;*

*d) continue adjustment of the **cutting device** until the **cutting device** engages with the next locking detent position.*

After the test, the machine shall withstand the electric strength test of Annex D between live parts and accessible parts and live parts shall not have become accessible, as specified in Clause [9](#), if the adjustment would cause stress on internal wiring.

*At the conclusion of the conditioning, the **cutting device** release control shall perform as intended and shall comply with the following test:*

*While the **cutting device** is in any locking detent position, a torque of 6 Nm is applied for 1 min in line with the direction of its intended **cutting device** rotation, and it is applied in each direction of rotation.*

*During the test, the **cutting device** shall not disengage from the locking detent position(s), and the **cutting device** shall still operate correctly after the test. Electrical connections shall not have worked loose, and there shall be no deterioration impairing safety in **normal use**.*

19.103.4 For category 3a **hedge trimmers**, except for **extended-reach hedge trimmers**, the **cutting device** shall have a band of highly visible colour other than green, brown or black (e. g. red, yellow or orange) that:

- is at least 10 mm wide;
- is located on the top surface of the **cutting device**;
- extends for at least 90 % of the **cutting length**; and
- fulfils the requirements of [8.12](#).

Compliance is checked by inspection, by measurement and by test.