

INTERNATIONAL STANDARD

IEC
60335-2-94

First edition
1999-12

**Safety of household and similar
electrical appliances –**

**Part 2-94:
Particular requirements for
scissors type grass shears**

Sécurité des appareils électrodomestiques et analogues –

*Partie 2-94:
Règles particulières pour les coupe-gazon de type ciseaux*



Reference number
IEC 60335-2-94:1999(E)

Numbering

As from 1 January 1997 all IEC publications are issued with a designation in the 60000 series.

Consolidated publications

Consolidated versions of some IEC publications including amendments are available. For example, edition numbers 1.0, 1.1 and 1.2 refer, respectively, to the base publication, the base publication incorporating amendment 1 and the base publication incorporating amendments 1 and 2.

Validity of this publication

The technical content of IEC publications is kept under constant review by the IEC, thus ensuring that the content reflects current technology.

Information relating to the date of the reconfirmation of the publication is available in the IEC catalogue.

Information on the subjects under consideration and work in progress undertaken by the technical committee which has prepared this publication, as well as the list of publications issued, is to be found at the following IEC sources:

- **IEC web site***
- **Catalogue of IEC publications**
Published yearly with regular updates
(On-line catalogue)*
- **IEC Bulletin**
Available both at the IEC web site* and as a printed periodical

Terminology, graphical and letter symbols

For general terminology, readers are referred to IEC 60050: *International Electrotechnical Vocabulary* (IEV).

For graphical symbols, and letter symbols and signs approved by the IEC for general use, readers are referred to publications IEC 60027: *Letter symbols to be used in electrical technology*, IEC 60417: *Graphical symbols for use on equipment. Index, survey and compilation of the single sheets* and IEC 60617: *Graphical symbols for diagrams*.

* See web site address on title page.

INTERNATIONAL STANDARD

IEC 60335-2-94

First edition
1999-12

Safety of household and similar electrical appliances –

Part 2-94: Particular requirements for scissors type grass shears

Sécurité des appareils électrodomestiques et analogues –

*Partie 2-94:
Règles particulières pour les coupe-gazon de type ciseaux*

© IEC 1999 — Copyright - all rights reserved

No part of this publication may be reproduced or utilized in any form or by any means, electronic or mechanical, including photocopying and microfilm, without permission in writing from the publisher.

International Electrotechnical Commission
Telefax: +41 22 919 0300

3, rue de Varembe Geneva, Switzerland
e-mail: inmail@iec.ch

IEC web site <http://www.iec.ch>



Commission Electrotechnique Internationale
International Electrotechnical Commission
Международная Электротехническая Комиссия

PRICE CODE

Q

For price, see current catalogue

CONTENTS

	Page
FOREWORD	3
Clause	
1 Scope	5
2 Definitions.....	5
3 General requirement.....	5
4 General conditions for the tests	5
5 Void	5
6 Classification	6
7 Marking and instructions	6
8 Protection against access to live parts	7
9 Starting of motor-operated appliances.....	7
10 Power input and current	8
11 Heating	8
12 Void	8
13 Leakage current and electric strength at operating temperature	8
14 Void	8
15 Moisture resistance.....	8
16 Leakage current and electric strength	8
17 Overload protection of transformers and associated circuits.....	8
18 Endurance	8
19 Abnormal operation.....	8
20 Stability and mechanical hazards.....	9
21 Mechanical strength.....	9
22 Construction	9
23 Internal wiring.....	10
24 Components.....	10
25 Supply connection and external flexible cords.....	10
26 Terminals for external conductors	11
27 Provision for earthing.....	11
28 Screws and connections	11
29 Creepage distances, clearances and distances through insulation	11
30 Resistance to heat, fire and tracking	11
31 Resistance to rusting	11
32 Radiation, toxicity and similar hazards	11
Figures	12
Annexes.....	16

INTERNATIONAL ELECTROTECHNICAL COMMISSION

**SAFETY OF HOUSEHOLD AND SIMILAR ELECTRICAL APPLIANCES –
Part 2-94: Particular requirements for scissors type grass shears**

FOREWORD

- 1) The IEC (International Electrotechnical Commission) is a worldwide organization for standardization comprising all national electrotechnical committees (IEC National Committees). The object of the 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, the IEC publishes International Standards. 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. The IEC collaborates closely with the International Organization for Standardization (ISO) in accordance with conditions determined by agreement between the two organizations.
- 2) The formal decisions or agreements of the IEC on technical matters express, as nearly as possible, an international consensus of opinion on the relevant subjects since each technical committee has representation from all interested National Committees.
- 3) The documents produced have the form of recommendations for international use and are published in the form of standards, technical specifications, technical reports or guides and they are accepted by the National Committees in that sense.
- 4) In order to promote international unification, IEC National Committees undertake to apply IEC International Standards transparently to the maximum extent possible in their national and regional standards. Any divergence between the IEC Standard and the corresponding national or regional standard shall be clearly indicated in the latter.
- 5) The IEC provides no marking procedure to indicate its approval and cannot be rendered responsible for any equipment declared to be in conformity with one of its standards.
- 6) Attention is drawn to the possibility that some of the elements of this International Standard may be the subject of patent rights. The IEC shall not be held responsible for identifying any or all such patent rights.

International Standard IEC 60335-2-94 has been prepared by IEC subcommittee 61F: Safety of hand-held motor-operated electric tools, of IEC technical committee 61: Safety of household and similar electrical appliances.

The text of this standard is based on the following documents:

FDIS	Report on voting
61F/281/FDIS	61F/312/RVD

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

This part 2 is to be used in conjunction with the latest edition of IEC 60335-1 and its amendments. It was established on the basis of the third edition (1991) of that standard and its amendment 1 (1994).

This part 2 supplements or modifies the corresponding clauses in IEC 60335-1, so as to convert it into the IEC standard: Safety requirements for scissors type grass shears.

Where a particular subclause of part 1 is not mentioned in this part 2, that subclause applies as far as is reasonable. Where this standard states “addition”, “modification” or “replacement”, the relevant text in part 1 is to be adapted accordingly.

NOTE 1 The following print types are used:

- requirements proper: in roman type;
- *test specifications: in italic type;*
- Notes: in small roman type;

Words in **bold** in the text are defined in clause 2. When a definition of part 1 concerns an adjective, the adjective and the associated noun are also in **bold**.

NOTE 2 Subclauses, tables and figures which are additional to those in part 1 are numbered starting from 101.

Annex AA is for information only.

A bilingual version of this publication may be issued at a later date.

IECNORM.COM : Click to view the full PDF of IEC 60335-2-94:1999
Withdrawn

SAFETY OF HOUSEHOLD AND SIMILAR ELECTRICAL APPLIANCES – Part 2-94: Particular requirements for scissors type grass shears

1 Scope

This clause of part 1 is applicable except as follows:

Addition:

This standard applies to mains operated hand-held **scissors type grass shears**, and sickle-bar grass shears with a maximum cutting width of 200 mm designed primarily for cutting grass.

2 Definitions

This clause of part 1 is applicable except as follows:

Replacement:

2.2.9

normal operation

operation of the appliance at rated voltage with the load necessary to obtain rated input

2.6.2 *Addition:*

NOTE This also includes appliances which will not maintain their normal operating position unless supported by hand, possibly assisted by wheels, skids or similar.

2.101

width of cut

the effective cutting width 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

2.102

scissors type grass shears

a grass cutting machine with at least two blades of which at least one reciprocates along a straight or curved path

3 General requirement

This clause of part 1 is applicable.

4 General conditions for the tests

This clause of part 1 is applicable.

5 Void

6 Classification

This clause of part 1 is applicable except as follows:

6.1 Replacement:

Scissors type grass shears shall be of class II or III.

Compliance is checked by inspection and by the relevant tests.

7 Marking and instructions

This clause of part 1 is applicable except as follows:

7.1 Addition:

Grass shears shall be marked with the following:

WARNING: Read operator's manual.

Do not expose the grass shears to moisture.

Keep hands away from blades.

Symbols according to ISO 3767 may be used as appropriate.

Colours shall be in accordance with ISO 3864 unless the symbols are cast, embossed or stamped, when colours are not required. Instead of the warning texts, pictograms such as those shown in annex AA are allowed. If pictograms are used, their significance shall be described in the user instructions.

7.12 Addition:

The operator's manual shall include, where appropriate and in the appropriate order, the sense of the following safety instructions which are to be followed in the preparation for use, operation and maintenance of the appliance, together with the warning marked on the appliance which is detailed in 7.1:

- check the supply cord and any extension cord(s) regularly for damage or signs of ageing;
- do not use the appliance if the supply or extension cords are damaged or worn;
- details of the type of extension cords which may be used in accordance with 25.7;
- ATTENTION! DANGER! Blade(s) continue to move after the motor is switched off;
- keep supply and extension cords away from blades;
- unplug from the mains supply before adjusting, cleaning or maintaining the grass shears or before disentangling the mains supply cord or checking for damage;
- use of controls;
- assembly of the appliance if not supplied ready for use;
- danger to feet and hands from the blades;
- unplug from the mains supply before leaving the appliance;
- never allow children or people unfamiliar with these instructions and warnings to use the appliance;
- use the appliance only in daylight or good artificial light;

- switch on the motor only when the hands and feet are away from the cutting means;
- use only the manufacturer's recommended replacement parts and accessories;
- wear stout shoes while using the appliance;
- instructions for the safe operation of the grass shear, including a recommendation that the appliance should be supplied via a residual current device (RCD) with a tripping current of not more than 30 mA;
- the appliance should be inspected and maintained regularly. Repairs should be carried out only by an authorised repairer;
- details of maintenance and adjustments which can be carried out by the user;
- keep ventilation slots clear of debris.

8 Protection against access to live parts

This clause of part 1 is applicable except as follows:

8.1 Addition:

Class II grass shears shall have handles either of insulating material or metal coated with an insulating material which requires an additional insulation according to the prescribed test procedure in 16.3 (table 5) as well as 21.101.

The handles shall be so constructed that there is no possibility within the appropriate usage to touch with the operator's hand metal parts which are connected to the scissors cutting device. These requirements are also valid for grass shears attachments used with multipurpose tools.

Compliance is checked by inspection and by the tests of 16.3 (table 5) and 21.101, and by the following additional test of the insulating coating of metal handles.

An insulating coated handle will be heated at a temperature of $70\text{ °C} \pm 2\text{ °C}$ for seven days (168 h), after which the test sample will be cooled to approximately ambient temperature. The coating shall not shrink to the extent that the required insulation does not function. The coating shall not peel off so that it is possible to move it longitudinally. After this test procedure, the test sample is cooled at a temperature of $-10\text{ °C} \pm 2\text{ °C}$ for 4 h.

The test sample is then submitted to the impact test according to figure 101, whereby the weight A with a mass of 300 g will be used. The weight A is dropped from a height of 350 mm onto a hardened steel chisel, the tip of which is lying on the test sample. The impact test is practicable in all positions of the handle. The distance between the impacts shall be not less than 10 mm.

After this test, the coating shall not show any sign of peeling off.

The efficiency of the insulation of the coating is checked by a high voltage test applied between the coated metal parts of the handle and a wrapped metal foil. A test voltage of 2 500 V is applied for 1 min. During the test, blow-outs or sparkovers are not allowed.

9 Starting of motor-operated appliances

This clause of part 1 is not applicable.

10 Power input and current

This clause of part 1 is not applicable.

11 Heating

This clause of part 1 is applicable except as follows:

11.7 Replacement:

Scissors type grass shears are operated at **normal operation** until steady conditions are established.

12 Void

13 Leakage current and electric strength at operating temperature

This clause of part 1 is applicable.

14 Void

15 Moisture resistance

This clause of part 1 is applicable.

16 Leakage current and electric strength

This clause of part 1 is applicable.

17 Overload protection of transformers and associated circuits

This clause of part 1 is applicable.

18 Endurance

This clause of part 1 is not applicable.

19 Abnormal operation

This clause of part 1 is applicable.

20 Stability and mechanical hazards

This clause of part 1 is applicable except as follows:

20.1 Addition:

Hand protection

From any handle it shall not be possible to touch the moving cutter blade with fingers stretched out.

All handles shall be so located that the test distance from the cutter blade to the side furthest from the cutter blade of any handle is not less than 120 mm. The distance shall be measured along the shortest path from the side of the handle furthest from the cutter blade to the nearest cutting edge of the cutter blade (see figure 102). If there is a guard, the distance shall be measured from the furthest side of the handle to the guard and from there to the nearest cutting edge of the cutting blade (see figure 103).

21 Mechanical strength

This clause of part 1 is applicable except as follows:

Replacement of the third paragraph:

The appliance is rigidly supported and three blows are applied to every point of the enclosure that is likely to be weak.

The impact energy will be $1,0 \pm 0,05$ J and blows shall also be applied to handles, levers, knobs, handle shafts and cutting elements.

21.101 *The strength of handles and guards of scissors type grass shears shall be tested by means of the following drop test.*

Each of three samples of the complete machine is to be dropped three times so that the guard (handle) falls through a vertical distance of 0,9 m onto a smooth horizontal concrete surface in such a manner as to test the guard most severely (see figure 104).

After the test, the guard (handle) shall not have become detached nor show any visible cracks; screws and retaining clips shall still be secure and the requirements of 20.1 and 20.2 shall be met.

22 Construction

This clause of part 1 is applicable except as follows:

22.12 Addition:

Hand-held scissors type grass shears shall be fitted with a handle having a gripping surface of not less than 100 mm (figures 102 and 103).

Grass shears shall be delivered with a guard which prevents injury during transportation.

22.30 Addition:

Scissors type grass shears shall be constructed so as to prevent bridging of **supplementary and reinforced insulation** by grass cuttings or other debris.

22.35 Addition:

For **class II appliances** handles and operator controls which are held when operating the appliance shall either be of insulating material or covered by insulating material having a thickness of at least 1 mm, or separated by insulation equivalent to **supplementary insulation** from other accessible metal parts.

Compliance is checked by inspection, by measurement and for the insulating material covering on handles, operator controls and handle shafts, by the following tests.

A sample of the covered part is conditioned at a temperature of $(70 \pm 2)^\circ\text{C}$ for seven days (168 h). After conditioning, the sample is allowed to attain approximately room temperature.

Inspection shall show that the covering has not shrunk to such an extent that the required length or the required insulation is no longer provided or that the covering has not peeled off, so that it can move longitudinally.

After this, the sample is maintained for 4 h at a temperature of $(-10 \pm 2)^\circ\text{C}$.

While still at this temperature, the sample is then subjected to impact by means of the apparatus shown in figure 101. The weight A having a mass of 300 g is dropped from a height of 350 mm onto the chisel B of hardened steel, the tip of which is placed on the sample.

One impact is applied to each place where the covering is likely to be weak or damaged in intended use, the distance between the points of impact being at least 10 mm.

After this test, inspection shall show that the covering has not peeled off and an electric strength test is made between metal parts and metal foil wrapped around the covering in the area required to be insulated.

The test voltage of 2 500 V is applied for 1 min.

During this test, no flashover or breakdown shall occur.

22.40 Addition:

The switch adapter shall require two separate and dissimilar actions before the shear blades can be driven. There shall be no means of locking this control in the "on" position and the movement of the cutting element shall come to rest when the control is released.

23 Internal wiring

This clause of part 1 is applicable.

24 Components

This clause of part 1 is applicable except as follows:

24.1 Addition:

Switches shall disconnect all poles and shall have a contact separation of at least 3 mm for each pole. Switches shall be suitable for 10 000 operations.

25 Supply connection and external flexible cords

This clause of part 1 is applicable except as follows:

25.1 Replacement:

The **scissors type grass shears** shall be provided with a power supply cable or an appliance inlet.

Appliance inlets shall not allow the introduction of a connector complying with IEC 60320.

25.7 Replacement of the first paragraph:

Power supply cords shall not be lighter than:

- if rubber insulated, ordinary polychloroprene sheathed flexible cord (code designation 60245 IEC 57);
- if polyvinyl chloride insulated, ordinary polyvinyl chloride sheathed flexible cord (code designation 60227 IEC 53).

26 Terminals for external conductors

This clause of part 1 is applicable.

27 Provision for earthing

This clause of part 1 is not applicable.

28 Screws and connections

This clause of part 1 is applicable.

29 Creepage distances, clearances and distances through insulation

This clause of part 1 is applicable.

30 Resistance to heat, fire and tracking

This clause of part 1 is applicable except as follows:

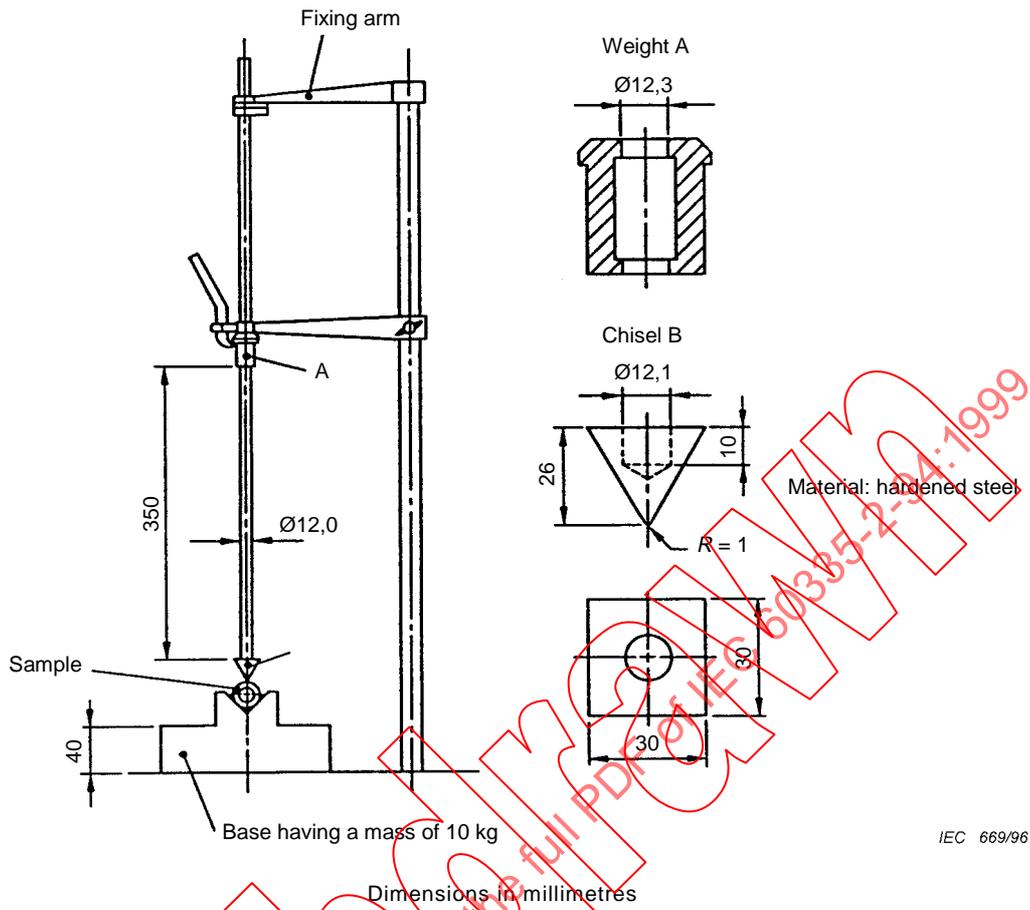
30.2.3 Not applicable.

31 Resistance to rusting

This clause of part 1 is not applicable.

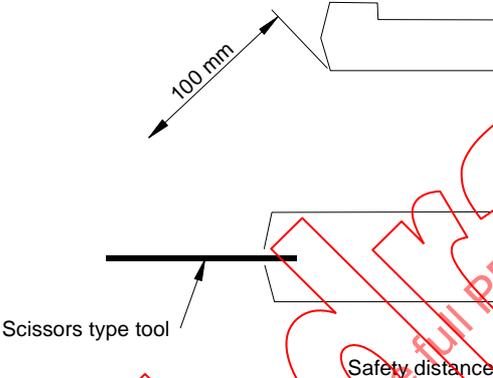
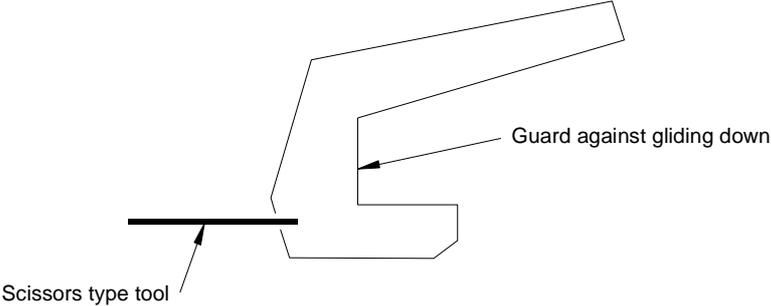
32 Radiation, toxicity and similar hazards

This clause of part 1 is not applicable.



IEC 669/96

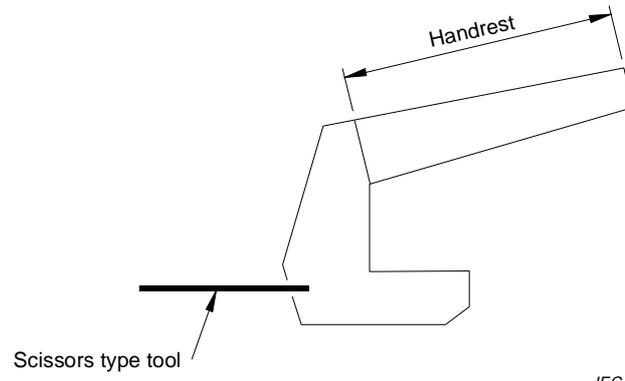
Figure 101 - Device for impact test



IEC 1797/99

Figure 102 - Hand-safety-guard against the scissors type tool

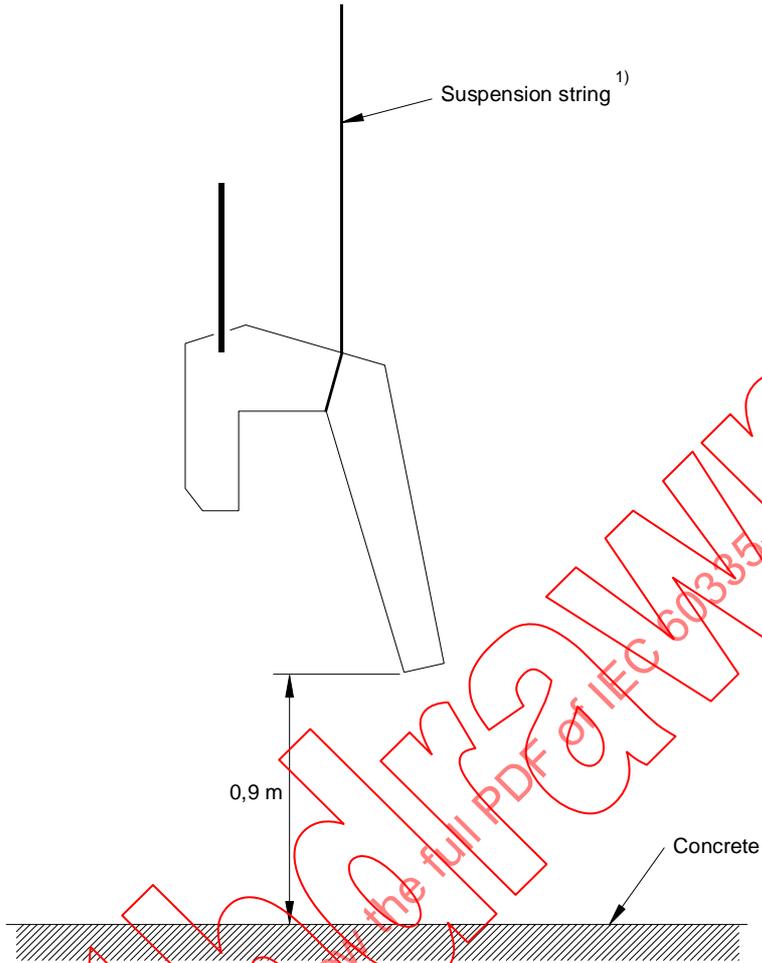
IECNORM.COM : Click to view the full PDF of IEC 60335-2-94:1999



IEC 1798/99

Figure 103 – Hand rest

IECNORM.COM : Click to view the full PDF of IEC 60335-2-94:1999



IEC 1799/99

1) For the tests a string should be used to suspend the machine so that the desired orientation of the machine can be achieved. Cutting the string will allow the machine to fall in the correct orientation to test the guard or the drive unit.

Figure 104 – Guard and handle strength test

Annexes

The annexes of part 1 are applicable except as follows:

Annex A (normative)

Normative references

Addition:

ISO 3767, *Tractors, machinery for agriculture and forestry, powered lawn and garden equipment*

ISO 3864: 1984, *Safety colours and safety signs*

Annex C (normative)

Ageing test on motors

This annex of part 1 is applicable.

Annex D (normative)

Alternative requirements for protected motor units

This annex of part 1 is not applicable.

Annex F (normative)

Motors not isolated from the supply mains and having basic insulation not designed for the rated voltage of the appliance

This annex of part 1 is not applicable.

Annex AA
(informative)

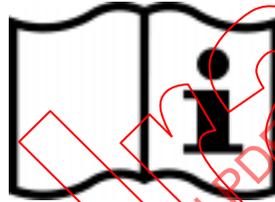
Pictograms – Scissors type grass shears

WARNING



IEC 1800/99

READ OPERATOR'S MANUAL



IEC 1801/99

DO NOT EXPOSE TO MOISTURE



IEC 1802/99

NOTE If these pictograms are used, their significance shall be described in the operator's manual.
