

INTERNATIONAL STANDARD

IEC
60335-2-94

Second edition
2002-07

**Household and similar electrical appliances –
Safety –**

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

*Appareils électrodomestiques et analogues –
Sécurité –*

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



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CONTENTS

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

Figure 101 – Device for impact test.....	15
Figure 102 – Hand-safety-guard against the scissors type tool.....	16
Figure 103 – Hand rest.....	16
Figure 104 – Guard and handle strength test.....	17

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

**HOUSEHOLD AND SIMILAR ELECTRICAL APPLIANCES –
SAFETY –****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.
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- 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.

This part of International Standard IEC 60335 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.

This second edition cancels and replaces the first edition published in 1999. It constitutes a technical revision.

The text of this part of IEC 60335 is based on the following documents:

FDIS	Report on voting
61F/450/FDIS	61F/470/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 fourth edition (2001) of that standard.

NOTE 1 When "Part 1" is mentioned in this standard, it refers to IEC 60335-1

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

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

NOTE 2 The following numbering system is used:

- subclauses, tables and figures that are numbered starting from 101 are additional to those in Part 1;
- unless notes are in a new subclause or involve notes in Part 1, they are numbered starting from 101, including those in a replaced clause or subclause;
- additional annexes are lettered AA, BB, etc.

NOTE 3 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 3. When a definition concerns an adjective, the adjective and the associated noun are also in bold.

The committee has decided that the contents of this publication will remain unchanged until 2004. At this date, the publication will be

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

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

INTRODUCTION

It has been assumed in the drafting of this international standard that the execution of its provisions is entrusted to appropriately qualified and experienced persons.

This standard recognizes the internationally accepted level of protection against hazards such as electrical, mechanical, thermal, fire and radiation of appliances when operated as in normal use taking into account the manufacturer's instructions. It also covers abnormal situations that can be expected in practice.

This standard takes into account the requirements of IEC 60364 as far as possible so that there is compatibility with the wiring rules when the appliance is connected to the supply mains. However, national wiring rules may differ.

If an appliance within the scope of this standard also incorporates functions that are covered by another part 2 of IEC 60335, the relevant part 2 is applied to each function separately, as far as is reasonable. If applicable, the influence of one function on the other is taken into account.

This standard is a product family standard dealing with the safety of appliances and takes precedence over horizontal and generic standards covering the same subject.

An appliance that complies with the text of this standard will not necessarily be considered to comply with the safety principles of the standard if, when examined and tested, it is found to have other features that impair the level of safety covered by these requirements.

An appliance employing materials or having forms of construction differing from those detailed in the requirements of this standard may be examined and tested according to the intent of the requirements and, if found to be substantially equivalent, may be considered to comply with the standard.

HOUSEHOLD AND SIMILAR ELECTRICAL APPLIANCES – SAFETY –

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

1 Scope

This clause of Part 1 is replaced by the following.

This standard deals with the safety of 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, their **rated voltage** being not more than 250 V for single-phase appliances and 480 V for other appliances.

As far as is practicable, this standard deals with the common hazards presented by appliances that are encountered by all persons in and around the home. However, in general, it does not take into account

- the use of appliances by young children or infirm persons without supervision;
- playing with the appliance by young children.

NOTE 101 Attention is drawn to the fact that

- in many countries additional requirements are specified by the national health authorities, the national authorities responsible for the protection of labour, the national water supply authorities and similar authorities.

2 Normative references

This clause of Part 1 is applicable except as follows.

ISO 3767-1:1998, *Tractors, machinery for agriculture and forestry, powered lawn and garden equipment – Symbols for operator controls and other displays – Part 1: Common symbols*

ISO 3767-3: 1995, *Tractors, machinery for agriculture and forestry, powered lawn and garden equipment – Symbols for operator controls and other displays – Part 3: Symbols for powered lawn and garden equipment*

ISO 3864, *Safety colours and safety signs*

3 Definitions

This clause of Part 1 is applicable except as follows.

3.1.9 Replacement:

normal operation

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

3.5.2 Replacement:

hand-held appliance

portable appliance intended to be held in the hand during normal use, including appliances which will not maintain their operating position unless supported, possibly assisted by wheels, skids or similar

3.101

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

3.102

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

4 General requirement

This clause of Part 1 is applicable.

5 General conditions for the tests

This clause of Part 1 is applicable.

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 **class 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 3767-1 and ISO 3767-3 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 substance 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 aging;
- 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;
- WARNING: 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 rated 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 7) 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 7) 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 $70\text{ }^{\circ}\text{C} \pm 2\text{ }^{\circ}\text{C}$ 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 $-10\text{ }^{\circ}\text{C} \pm 2\text{ }^{\circ}\text{C}$ 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, breakdowns or flashovers 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 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 Transient overvoltages

This clause of Part 1 is applicable.

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.

20.101

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).

Compliance is checked by inspection and measurement.

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 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 insulation** 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 $70\text{ }^{\circ}\text{C} \pm 2\text{ }^{\circ}\text{C}$ 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 $-10\text{ }^{\circ}\text{C} \pm 2\text{ }^{\circ}\text{C}$.

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.

24.1.3 Addition:

Switches shall have a contact separation in all poles that provide full disconnection under overvoltage category III conditions.

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 60320-1.

Compliance is checked by inspection.

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 Clearances, creepage distances and solid insulation

This clause of Part 1 is applicable.

30 Resistance to heat and fire

This clause of Part 1 is applicable except as follows.

30.2.3 Not applicable.

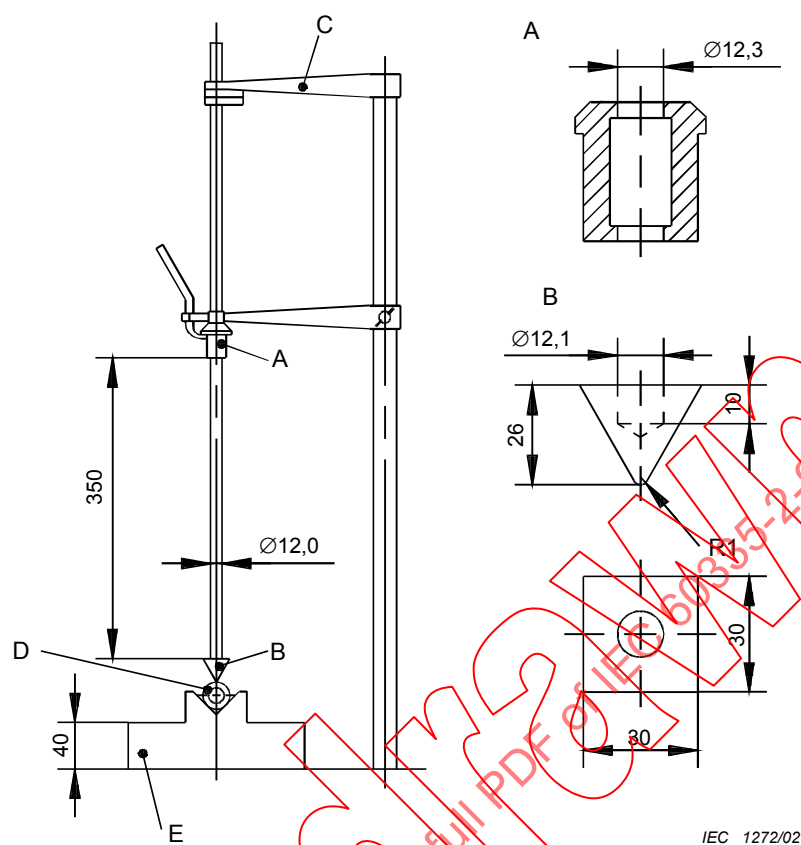
31 Resistance to rusting

This clause of Part 1 is not applicable.

32 Radiation, toxicity and similar hazards

This clause of Part 1 is not applicable.

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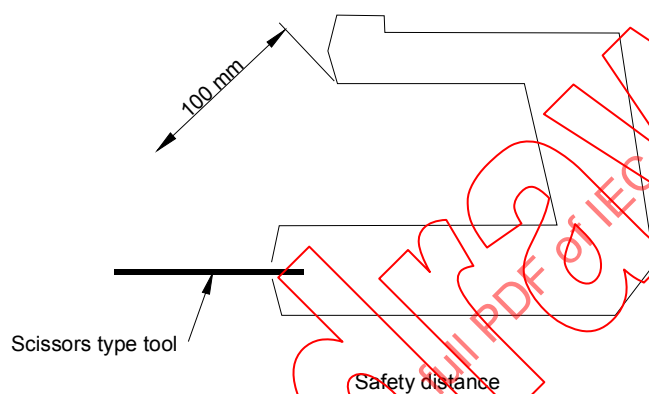
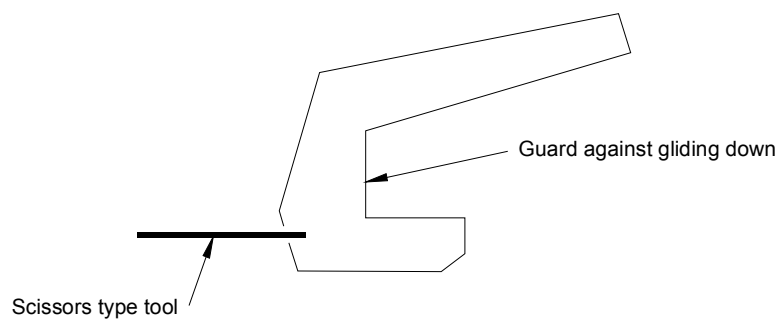


Dimensions in millimetres

Key

- A Weight
- B Harden steel chisel
- C Base having a mass of 10 kg
- D Sample
- E Fixing arm

Figure 101 – Device for impact test

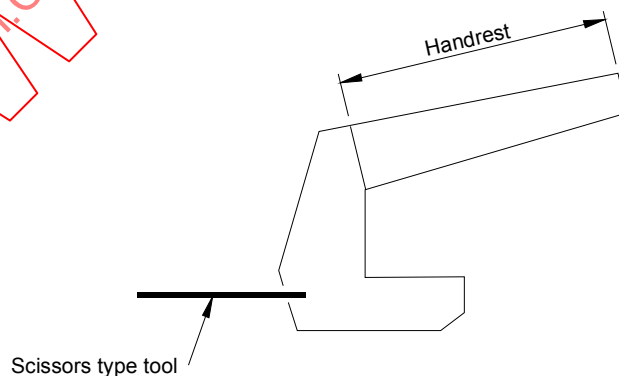


IEC 1797/99

Key

- A Scissors type tool
- B Guard against gliding down
- C Safety distance

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

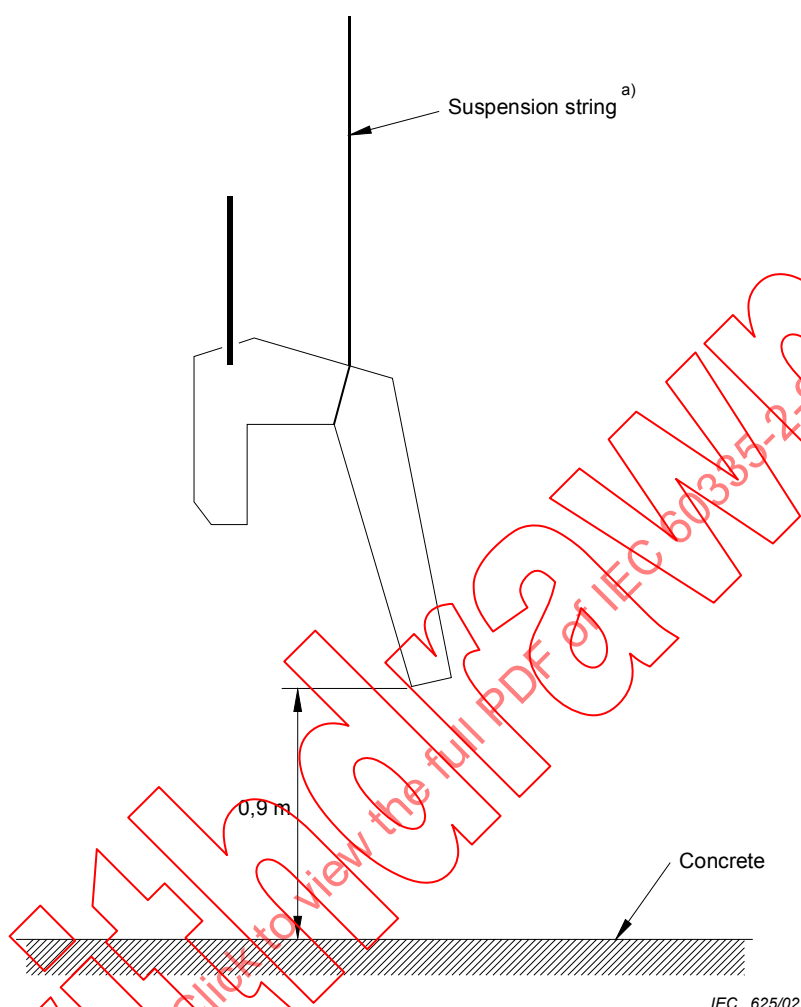


IEC 1798/99

Key

- A Scissors type tool
- B Handrest

Figure 103 – Hand rest



- a) 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.

Key

- A Suspension string
B Concrete

Figure 104 – Guard and handle strength test