International Standard ISO 5395/2

INTERNATIONAL ORGANIZATION FOR STANDARDIZATION•МЕЖДУНАРОДНАЯ ОРГАНИЗАЦИЯ ПО СТАНДАРТИЗАЦИИ•ORGANISATION INTERNATIONALE DE NORMALISATION

Power lawn mowers, lawn tractors, and lawn and garden tractors with mowing attachments — Safety requirements and test procedures — Part 2 : Basic requirements

Tondeuses à gazon à moteur, tracteurs de pelouse, tracteurs de jardin et de pelouse avec équipements de tonte adaptables — Règles de sécurité et méthodes d'essai — Partie 2 : Spécifications communes

First edition — 1981-07-01

STANDARDSISO.COM : Click to view the full PDF of ISO 5395-2:1981

UDC 631.352 **Ref. No. ISO 5395/2-1981 (E)**

Descriptors : horticultural machinery, lawn mowers, motorized horticultural machinery, safety requirements.

Price based on 3 pages

Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards institutes (ISO member bodies). The work of developing International Standards is carried out through ISO technical committees. Every member body interested in a subject for which a technical committee has been set up has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work.

Draft International Standards adopted by the technical committees are circulated to the member bodies for approval before their acceptance as International Standards by the ISO Council.

International Standard ISO 5395/2 was developed by Technical Committee ISO/TC 23, *Tractors and machinery for agriculture and forestry*, and was circulated to the member bodies in June 1978.

It has been approved by the member bodies of the following countries :

Australia	India	South Africa, Rep. of
Austria	Iran	Spain
Belgium	Ireland	Sweden
Bulgaria	Italy	Switzerland
Canada	Korea, Dem. P. Rep. of	Turkey
Chile	Korea, Rep. of	United Kingdom
Czechoslovakia	Mexico	USA
Denmark	Portugal	USSR
France	Romania	Yugoslavia

The member bodies of the following countries expressed disapproval of the document on technical grounds :

Finland
Germany, F. R.
New Zealand

STANDARDSISO.COM : Click to view the full PDF of ISO 5395-2:1981

© International Organization for Standardization, 1981 •

Printed in Switzerland

Power lawn mowers, lawn tractors, and lawn and garden tractors with mowing attachments — Safety requirements and test procedures — Part 2 : Basic requirements

0 Introduction

This International Standard forms part of a series covering safety requirements and test procedures for power lawn mowers, lawn tractors, and lawn and garden tractors with mowing attachments. The complete list of parts will be as follows :

Part 1 : Definitions.[1)]

Part 2 : Basic requirements.

Part 3 : Requirements for rotary mowers.

Section one : General construction.

Section two : Test procedures.

Section three : Pedestrian controlled machines — Requirements.

Section four : Ride-on (riding) machines — Requirements.

Section five : Towed units — Requirements.

Part 4 : Requirements for cylinder (reel) mowers.[2)]

Section one : General construction.

Section two : Test procedures.

Section three : Pedestrian controlled machines — Requirements.

Section four : Ride-on (riding) machines — Requirements.

Section five : Towed units — Requirements.

Part 5 : Noise measurement.[1)]

1 Scope and field of application

This International Standard specifies safety requirements applicable to powered rotary and cylinder (reel) mowers, including pedestrian controlled and ride-on (riding) types, ride-on (riding) lawn tractors, and lawn and garden tractors with mower attachments, designed primarily for use at and around the home, and having a width of cut greater than 300 mm.

NOTES

1 This International Standard does not apply to Sulky-type attachments, flail mowers, or sickle bar mowers, and the electrical aspects of electrically driven machines with voltages above 42 V are not covered.

2 Additional requirements for ride-on (riding) lawn tractors and lawn and garden tractors, having a drawbar pull up to 6 600 N, are specified in ISO 500.

3 Where applicable, the requirements of this International Standard could be applied to professional (commercial) power lawn mowers, lawn and garden tractors and lawn tractors.

2 References

ISO 500, *Agricultural tractors — Power take-off and drawbar — Specifications.*

ISO 3600, *Agricultural tractors and machines — Operator manuals and technical publications — Presentation.*

ISO 3767/1, *Tractors, machinery for agriculture and forestry, powered lawn and garden equipment — Symbols for operator's controls and other displays — Part 1 : Common symbols.*[2)]

ISO 3789/3, *Tractors, machinery for agriculture and forestry, powered lawn and garden equipment — Location and method of operation of operator's controls — Part 3 : Controls for powered lawn and garden equipment.*[2)]

ISO 3864, *Safety colours and safety signs.*[3)]

ISO 4254, *Agricultural tractors and machinery — Technical means for providing safety.*[2)]

1) In preparation.

2) At present at the stage of draft.

3) At present at the stage of draft. (Revision of ISO/R 408-1964 and ISO/R 557-1967.)

STANDARDSISO.COM : Click to view the full PDF of ISO 5395-2:1981

IEC Publication 335-1, *Safety of household and similar electrical appliances — Part 1 : General requirements.*

IEC Publication 335-18, *Safety of household and similar electrical appliances — Part 18 : Guidelines for the safety of battery-powered, motor-driven and magnetically-driven appliances for household and similar appliances and their charging and battery assemblies.*

3 Basic requirements

3.1 Safety protection

3.1.1 Power-driven components

Power-driven gears, chains, sprockets, belts, friction drives, pulleys, fans, fan wheels and reciprocating parts whenever they create a pinch point capable of causing injury, during normal starting, mounting and operating of the machine, shall be so positioned or guarded by shields or similar attachments to prevent the operator's accidental contact with these components.

Driving belts and chains having fastenings shall be guarded along their whole length; other belt or chain drives shall be guarded at least at the run on points. Drive shafts, shall be fully guarded.

Rotating covers or discs shall have a continuous unbroken or smooth surface. Mowers shall not be equipped with a starter operated by means of a loose rope, with the exception of auxiliary starting devices designated for emergency starts.

Access doors, shields, or guards shall be provided to prevent inadvertent contact by the operator with hazardous servicing points.

The requirements of 3.1.1 do not apply to :

1) any component functioning in contact with the soil; and

2) any axle of a ground wheel.

3.1.2 Heat protection

A guard or shield shall be provided to prevent inadvertent contact with any exposed components which are hot and may cause burns during normal starting, mounting and operation of the machine.

3.1.3 Guard attachment

All guards or shields (other than grass catchers) required under 3.1.1 and 3.1.2 shall be either permanently attached or secured to prevent removal without the use of tools.

3.1.4 Protection from exhaust fumes

Engine exhaust, where provided, shall be directed downward below the horizontal plane or away from the operator's zone.

On machines equipped with an enclosure for the operator, the engine exhaust shall be directed away from the enclosure.

3.2 Identification of controls

The controls used for traction speed, gear selection, power source shut-off, PTO, service brake, parking brake and traction clutch (unless dead-man type) shall be identified by a durable label (see 3.3).

Controls, other than those whose operation is self evident, shall have the direction and method of operation clearly identified. (see ISO 3789/3).

Easily understood detailed instructions on the operation of all controls shall be provided in an operator's manual.

3.2.1 Operator symbols

See ISO 3767/1.

3.3 Label (name plates)

Every basic machine and major attachment unit shall be fitted with a permanent name plate identifying the manufacturer or supplier, model number or serial number.

Labels provided for mower name plate, directional or cautionary information, shall satisfy the following requirements :

— the label shall have a durable bond with the base material surface;

— the label shall be weather resistant and under normal cleaning procedures shall not fade, discolour, crack, craze, or blister and shall remain legible;

— the label shall not curl at the edges and legibility shall not be affected by spilled gasoline or oil.

A plate (for example, embossed, cast, moulded, stamped metal, etched plate, or plastic plate mechanically secured) fastened with rivets or equivalent means shall be considered as meeting the requirements of clause 3.3.

NOTE — Where required for a durability test on labels, samples of the label shall be exposed to the sun at an angle of 45° to the horizontal and facing south (facing north in the southern hemisphere). They shall remain legible and durable after a test period of 24 months in a temperate zone or 12 months in a tropical zone. An equivalent accelerated exposure test procedure can be used.

3.4 Maintenance and operational requirements

Each mower shall be provided with a manual giving operating, servicing, and maintenance instructions (see ISO 3600). The instructions should include those operations which can normally be performed by the operator (see ISO 5395/1).

The instructions shall include :

1) Instructions for the proper assembly of the mower for use, if the mower is not supplied in a completely assembled form.

STANDARDSISO.COM : Click to view the full PDF of ISO 5395-2:1981

2) Instructions for proper adjustment of the machine, including a warning of the danger of rotating blade(s); for example, "Caution — Do not touch rotating blade".

3) Instructions for the operation of the machine.

3.5 Electrical requirements

3.5.1 These electrical requirements apply only to battery-powered circuits of safety extra low voltage (at present less than 42 V) and are given for guidance. For the electrical requirements for mains-connected electrically driven machines, reference should be made to IEC Publication 335-1.

3.5.2 Battery powered circuits

3.5.2.1 Low voltage battery-powered circuits (not including magneto grounding circuits).

3.5.2.1.1 Electrical cables

Electrical cables shall withstand abrasion, unless otherwise protected or not in potentially abrasive contact with metal surfaces.

The wiring assembly shall, where possible, be grouped together, be properly supported, and be located so that no portion is in contact with the carburettor, metallic fuel lines, the exhaust system, moving parts, or sharp edges. Any edges of metal members likely to be in contact with the cables shall be rounded or protected to prevent possible damage to the cables by cutting or abrasion.

3.5.2.1.2 Battery installation

The compartment for a vented storage battery shall have openings to provide ventilation and drainage. When the battery is in the operating position, acid shall not leak onto parts that would be critically affected to the extent that a hazard would be created from corrosion.

3.5.2.1.3 Overload protection

All circuits, except starter motor and ignition circuits, shall be provided with overload protection devices on the battery terminals except that for two-wire, non-grounded systems the overload protection shall be located in either wire.

This requirement shall not, however, apply to battery powered machines capable of passing the following test :

With the motor stopped, connect it to its fully charged integral battery, and leave it in that condition until the battery is discharged or failure of any component takes place. The machine shall not emit flames or molten metal. Any internal explosion shall be contained so as not to cause any material to be ejected from the machine.

3.5.2.1.4 Terminals and uninsulated electrical parts

Terminals and uninsulated electrical parts and two-wire non-grounded systems shall be protected against short circuiting by the fuel can, or tools, during normal re-fuelling and lubrication servicing.

3.5.2.2 Ignition circuits

Ignition interruption or short-circuiting shall be provided and shall be fitted on the low-voltage side.

3.5.2.3 All high voltage parts of the circuit including spark plug terminals shall be electrically protected in such a manner that the operator cannot make accidental contact with them.

3.5.2.4 Spark plug wires shall be removable from the spark plug without requiring the use of tools.

3.6 Stopping and starting

3.6.1 A shut-off control device shall be provided on all battery-powered units and engine-powered units with battery starters to stop the operation of the engine (motor). This device shall require manual and intentional activation in order to restart the engine motor, and shall be accessible from starting and operating positions. A component which is not removable without the use of tools shall be provided to prevent unauthorized starting or use of the motor.

3.6.2 On engine driven mowers with manual starting, a means shall be provided to stop the engine. The stopping device shall not depend on sustained manual pressure for its continued operation. The device shall require manual and intentional activation to start the engine.

STANDARDSISO.COM : Click to view the full PDF of ISO 5395-2:1981

STANDARDSISO.COM : Click to view the full PDF of ISO 5395-2:1981