



SLOVENSKI STANDARD
SIST EN 709:1998

01-februar-1998

Številni kmetijski in gozdarski stroji - Pedestrijski nadzorani traktorji s priloženimi rotacijskimi obrabovalniki, motorji za kmetijske in gozdarske potrebe - Varnost

Agricultural and forestry machinery - Pedestrian controlled tractors with mounted rotary cultivators, motor hoes, motor hoes with drive wheel(s) - Safety

Maschinen für die Land- und Forstwirtschaft - Einachstraktoren mit angebaute Fräse, Motorhacken, Triebhacken - Sicherheit

Matériel agricole et forestier - Motoculteurs avec fraises portées, motobineuses et fraises à roue(s) motrice(s) - Sécurité

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Ta slovenski standard je istoveten z: EN 709:1997

ICS:

| | | |
|-----------|----------------------------------|--|
| 65.060.10 | Kmetijski traktorji in prikolice | Agricultural tractors and trailed vehicles |
| 65.060.20 | Oprema za obdelovanje tal | Soil-working equipment |

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EUROPEAN STANDARD

EN 709

NORME EUROPÉENNE

EUROPÄISCHE NORM

April 1997

ICS 65.060.20; 65.060.70

Descriptors: agricultural machinery, motor-cultivator, safety of machines, safety requirements, accident prevention, safety devices, specifications, inspection, hazards, hazardous area, technical notices, utilization, marking

English version

**Agricultural and forestry machinery - Pedestrian
controlled tractors with mounted rotary
cultivators, motor hoes, motor hoes with drive
wheel(s) - Safety**

Matériel agricole et forestier - Motoculteurs
avec fraises portées, motobineuses et fraises
à roue(s) motrice(s) - Sécurité

Maschinen für die Land- und Forstwirtschaft -
Einachstraktoren mit angebauter Fräse,
Motorhacken, Triebhacken - Sicherheit

This European Standard was approved by CEN on 1997-03-04. CEN members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration.

Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the Central Secretariat or to any CEN member.

The European Standards exist in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CEN member into its own language and notified to the Central Secretariat has the same status as the official versions.

CEN members are the national standards bodies of Austria, Belgium, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and United Kingdom.

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CEN

European Committee for Standardization
Comité Européen de Normalisation
Europäisches Komitee für Normung

Central Secretariat: rue de Stassart, 36 B-1050 Brussels

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Foreword

This European Standard has been prepared by Technical Committee CEN/TC 144 "Tractors and machinery for agriculture and forestry", the secretariat of which is held by AFNOR.

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by October 1997, and conflicting national standards shall be withdrawn at the latest by October 1997.

This European Standard has been prepared under a mandate given to CEN by the European Commission and the European Free Trade Association, and supports essential requirements of EU Directive(s).

The Annex A is normative and contains the "List of hazards".

According to the CEN/CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and the United Kingdom.

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0 Introduction

The extent to which hazards are covered is indicated in the scope of this standard. In addition, machines shall comply - as appropriate - with EN 292 for hazards which are not dealt with and especially with Annex A of EN 292-2:1991/A1:1995 when EN 292 does not give precise requirements.

1 Scope

This European Standard specifies safety requirements and testing for design and construction of, pedestrian controlled tractors with mounted rotary cultivators with the cultivator rotating axis horizontal and perpendicular to the direction of motion of the machine, motor hoes and motor hoes with drive wheel(s), all as used in agriculture, forestry, landscaping and gardening (including amenity use).

It describes methods for the elimination or reduction of risks arising from their use. In addition, it specifies the type of information to be provided by the manufacturer on safe working practices.

This European Standard does not cover the requirements to fulfill national road traffic regulations such as lights, steering and braking.

Environmental aspects have not been considered in this standard.

This European Standard applies primarily to machines which are manufactured after the date of issue of the standard.

2 Normative references

This European Standard incorporates by dated or undated reference, provisions from other publications. These normative references are cited at the appropriate places in the text and the publications are listed hereafter. For dated references, subsequent amendments to or revisions of any of these publications apply to this European Standard only when incorporated in it by amendment or revision. For undated references the latest edition of the publication referred to applies.

| | | |
|---------------------------|------|--|
| EN 292-1 | 1991 | Safety of machinery - Basic concepts, general principles for design - Part 1: Basic terminology, methodology |
| EN 292-2 | 1991 | Safety of machinery - Basic concepts, general principles for design - Part 2: Technical principles and specifications |
| EN 292-2:1991/ A1:1995 | | Safety of machinery - Basic concepts, general principles for design - Part 2: Technical principles and specifications |
| EN 294 | 1992 | Safety of machinery - Safety distances to prevent danger zones being reached by the upper limbs |
| EN 563 | 1994 | Safety of machinery - Temperatures of touchable surfaces - Ergonomics data to establish temperature limit value for hot surfaces |
| EN 1033 | 1995 | Hand-arm vibration - Laboratory measurement of vibration at the grip surface of hand-guided machinery - General |
| prEN 1553 | 1996 | Agricultural, forestry, landscaping and garden machinery - Common requirements - Safety |

| | | |
|---------------|------|--|
| EN ISO 3767-1 | 1995 | Tractors, machinery for agriculture and forestry, powered lawn and garden equipment - Symbols for operator controls and other displays - Part 1: Common symbols |
| EN ISO 3767-3 | 1996 | 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 |

3 Definitions

For the purposes of this standard, the definitions given in EN 292-1:1991 apply together with the following:

3.1 pedestrian controlled tractor: Agricultural self-propelled machine designed to be pedestrian controlled, capable of driving and/or pulling different working tools (see Figure B.1).

3.2 tool: Working element which can be adapted to a pedestrian controlled tractor.

3.3 mounted rotary cultivator: Tool used for working the soil composed of a group of rotating elements which can be adapted to a pedestrian controlled tractor.

3.4 motor hoe: Agricultural self-propelled machine designed to be pedestrian controlled with or without support wheel(s), in such a way that its working elements act as hoeing tools to ensure propulsion (see figure B.2).

3.5 motor hoe with drive wheel(s): Agricultural self-propelled machine designed to be pedestrian controlled and propelled by one or various wheels directly actuated from the engine and equipped with hoeing tools (see figure B.3).

3.6 handlebar: Device equipped with grips enabling the machine to be manually controlled.

4 List of hazards

The list of significant hazards dealt with in this standard is given in Annex A.

Annex A also indicates the hazards which have not been dealt with.

5 Safety requirements and/or measures

5.1 General

Unless otherwise specified in this standard, the machine shall comply with the requirements of tables 1, 3, 4 and 6 of EN 294:1992.

The requirements of prEN 1553 apply where relevant.

5.2 Starting device

In addition to the hold-to-run controls (see 5.5), the machines shall be equipped with a device which prevents the engine starting if the start-up can induce rotation of the wheels or movement of the tool.

The type of device which can be considered as fulfilling this requirement is one which, for example, by a mechanical linkage only allows the engine to start when the gear lever is in neutral and the tool is declutched.

Such a device is not necessary if, when starting the machine according to the instructions, the operator is not required to be in the danger zone. The danger zone is taken as the longitudinal band defined by the width of the machine and tool extending both forward and rearwards from it. If the machine is not provided with reverse gear, the danger zone to the rear of the machine is limited to a distance of 550 mm as measured from the rear extremity of the protective devices for moving parts (see figure 1).

In the case of a machine provided with reverse gear, the danger zone to the rear includes the whole longitudinal zone limited by the working width of the equipment.

Should the operator have to lean on the machine to start the engine, the appropriate place shall be indicated or an identified support provided with a corresponding indication.

With the exception of hand cranks (see ISO/DIS 11102-1 and ISO/DIS 11102-2), starting devices shall be integral with the machine (e.g. recoil pull start). Loose belts, cables, etc. are not accepted.

If starting is achieved by means of a hand crank it shall be equipped with a device that disconnects the hand crank immediately when the engine starts and prevents its connection when the engine is running or kick-back during starting.

Dimensions in millimetres

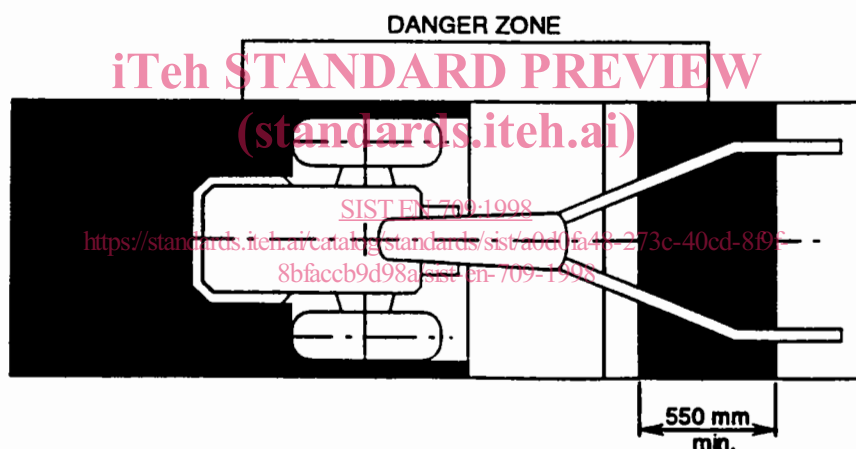


Figure 1: Limits of the danger zone when operating the starting device for machines with no reverse gear

5.3 Manual controls

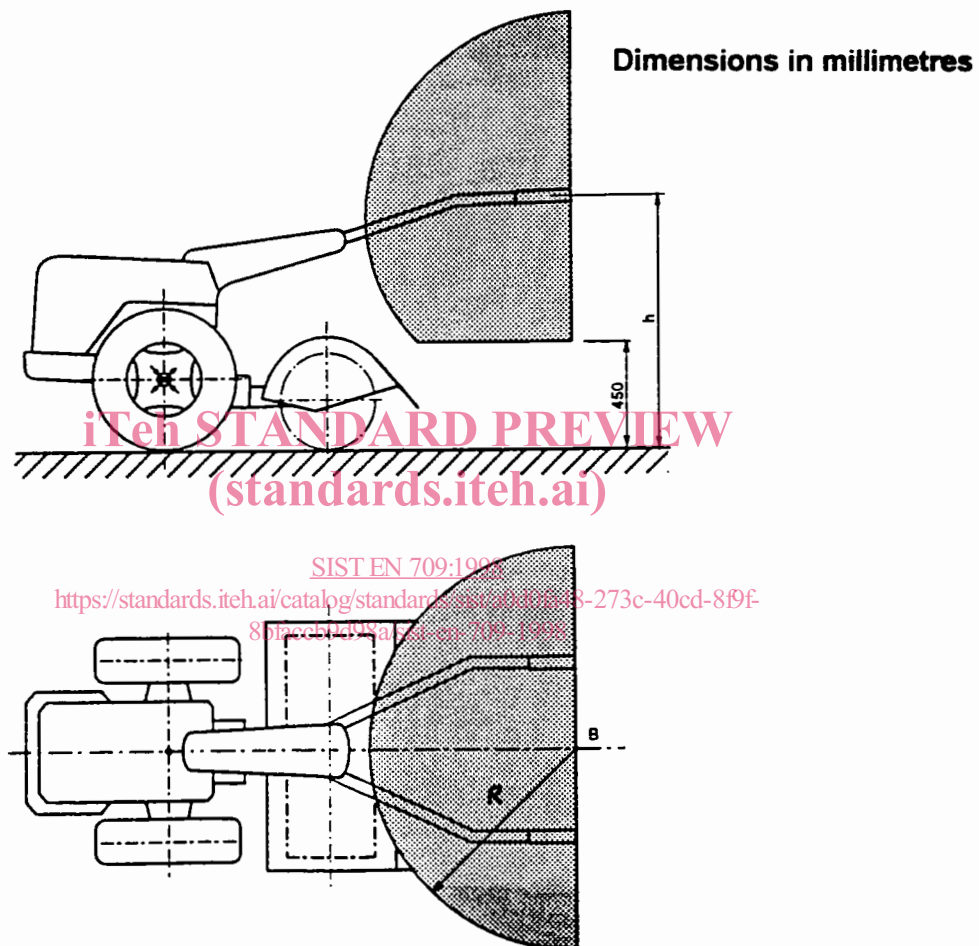
The height of the handlebar grips in relation to the ground shall be adjustable.

The following manually operated controls shall be within the "hand reach zone" from the normal operator working position:

- clutch;
- brakes;
- gearbox (within the selected range);
- reversing device;
- steering system;
- engine working speed;
- hold-to-run control (see 5.5);
- tool clutch lever;
- stop control.

The "hand reach zone" (see figure 2) is defined as the truncated hemispherical volume of radius $R = 800$ mm with its centre at the midpoint (point B in figure 2) of a line joining the handlebar grip ends when the grips are set to a height of 800 mm above the ground, or set to the next available lowest height setting where this is not available, with its flat face on the vertical plane tangential to the handlebar grip ends and facing rearwards, and truncated below by a plane parallel to the ground positioned 450 mm above the ground.

The engine stopping device shall not depend on sustained manual pressure for its operation.



5.4 Identification of controls

The controls used for driving the working tool and for locking the differential in their different positions shall be marked.

The gear positions (including the neutral position) shall be durably and clearly marked and located within the field of vision of the operator.

Detailed instructions on the operation of all controls shall be provided in the instruction handbook.

Symbols in accordance with EN ISO 3767-1 :1995 and EN ISO 3767-3 : 1996 shall be used as appropriate.

5.5 Controls of the movement of the machine and of the tool

All movements of the machine and of the working tool shall be stopped when the hold-to-run control(s) is (are) released.

The hold-to-run control(s) shall not extend beyond the end of the handlebar grips.

The movement of the machine or of the tools shall not start unless the operator is able to grip both the control(s) and the handlebar grip.

5.6 Reverse gear

In all machines with reverse gear, it shall not be possible to go directly from forward to reverse motion. This requirement is fulfilled, for example, by providing a neutral position.

In the case of pedestrian controlled tractors and motor hoes with drive wheel, it shall not be possible to operate the working tool and the reverse gear simultaneously (e.g. by having a mechanical interlock on the reverse gear).

For motor hoes without drive wheel, the maximum design reverse speed at rated engine speed shall not exceed 1 m/s.

5.7 Guards for moving parts

5.7.1 General

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5.7.1.1 Moving transmission parts which generate hazards shall be protected by means of fixed guards.

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5.7.1.2 If, according to the instruction handbook, frequent access is foreseen e.g. for adjustment or maintenance, guards shall be used which remain attached to the machine (e.g. by means of hinges), and which can only be opened by using a tool and which automatically lock without the use of a tool.

5.7.1.3 If this type of guard is not used, movable guards as specified in 4.2.2.3 of EN 292-2:1991 shall be provided, which:

- cause the dangerous movement to stop before reaching the danger zone; or
- do not open until the dangerous movement ceases.

5.7.2 Soil working tool

The operator driving the machine shall be protected by the design of the machine from unintentional contact with the soil working tool.

The protective device shall be designed with a minimum thickness of 2 mm of steel or equivalent material, and fulfill the requirements in 5.7.2.1 and in 5.7.2.2.

NOTE: Subsequent revision of this standard will provide adequate test methods.

5.7.2.1 Pedestrian controlled tractors and motor hoes with drive wheel

The tools shall have a full cover from over the full working width with no openings. The cover shall extend forward by an angle of at least 60° to the vertical plane which cuts through the rotating axis of the working tool (see figure 3).

The upper covering shall also extend rearwards and downwards (depending on the length of the handlebars) so that the minimum values indicated in table 1 for m and n are reached (see figure 3). Hinged covering is allowed providing that it always remains in contact with the soil without any external action during work.

Table 1: Clearance from the handlebar grips to the working tool and minimum dimensions of the guard devices (figure 3)

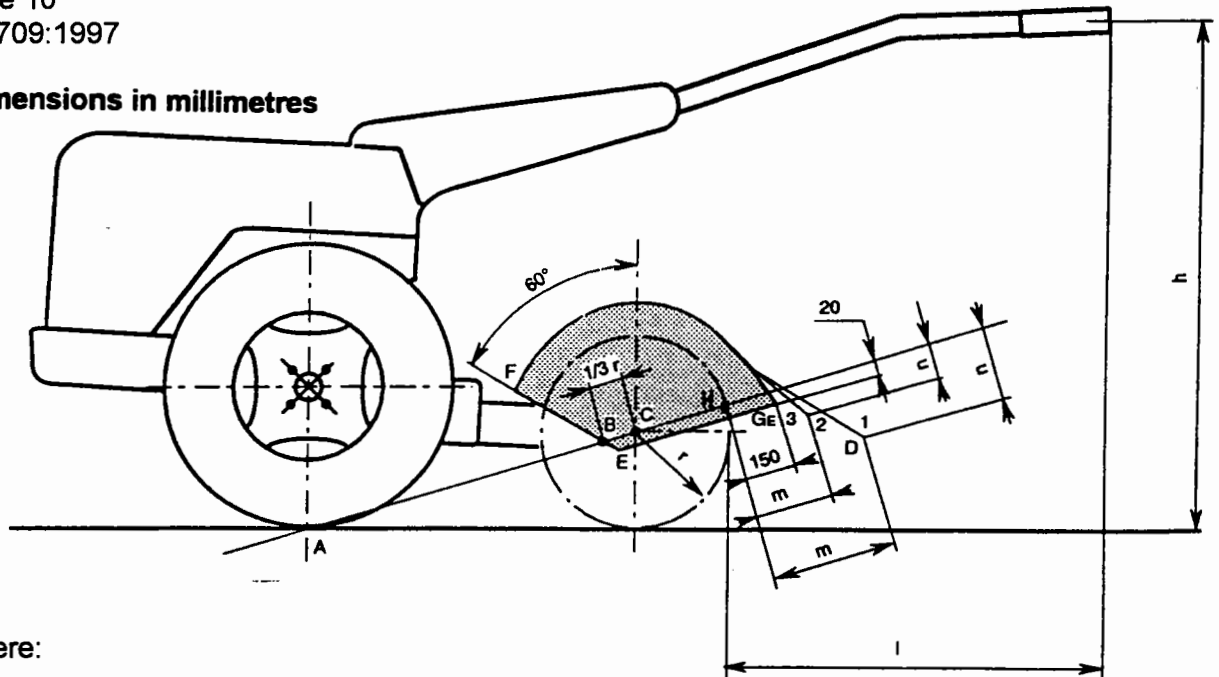
| Dimensions in millimetres | | | |
|---|-----|---------|---------------------|
| l | m | n | Position of point D |
| $l \geq 700$ | 150 | 20 | 3 (G) |
| $600 \leq l < 700$ | 180 | $1/3 r$ | 2 |
| $500 \leq l < 600$ ¹⁾ | 230 | $2/3 r$ | 1 |
| ¹⁾ Applicable only to machines having an engine power up to 4 kW or to machines having a mass less than 120 kg | | | |

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Dimensions in millimetres



Where:

A is the intersection of the ground line with the vertical from the centre of the wheel;

B is the point on the line AC located at $\frac{1}{3} r$ from C;

C is the axis of rotation of the working tool;

D is the rear end of the working tool's protective device;

E is the intersection of the extension of the straight line FB with a line parallel to and 20 mm below the line AC;

F is the intersection between the protective device and the line passing through B at an angle of 60° from the vertical passing through C;

G is the point on the straight line through E parallel to AC located 150 mm from the periphery of the working tool from the point H;

H is the rearmost point at which the extension of line AC intersects the periphery of the working tool;

h is the height of the end of the handlebar grips above the ground equal to 800 mm or the nearest available height setting;

l is the distance, parallel to the ground, between the rearmost periphery of the working tool and the vertical plane projected downwards from the ends of the handlebar grips when $h = 800\text{mm}$ or at the nearest available height setting;

m is the distance parallel to AC, between the rear end of guard D and the tangent to the periphery of the working tool at point H;

n is the distance to D from and perpendicular to the line AC;

r is the maximum turning radius of the working tool.

Figure 3: Clearance between the ends of the handlebar grips and the working tool and protection of the working tool