



SLOVENSKI STANDARD

SIST EN 1853:1999

01-december-1999

Kmetijski stroji - Prikolice z dvižnim kesonom - Varnost

Agricultural machinery - Trailers with tipping body - Safety

Landmaschinen - Anhänger mit Kippaufbauten - Sicherheit

Matériel agricole - Remorques à benne basculante - Sécurité

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EUROPEAN STANDARD
NORME EUROPÉENNE
EUROPÄISCHE NORM

EN 1853

June 1999

ICS 65.060.10

English version

Agricultural machinery - Trailers with tipping body - Safety

Matériel agricole - Remorques à benne basculante -
Sécurité

Landmaschinen - Anhänger mit Kippaufbauten - Sicherheit

This European Standard was approved by CEN on 26 April 1999.

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This European Standard exists 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, Czech Republic, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and United Kingdom.

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EUROPEAN COMMITTEE FOR STANDARDIZATION
COMITÉ EUROPÉEN DE NORMALISATION
EUROPÄISCHES KOMITEE FÜR NORMUNG

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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of an identical text or by endorsement, at the latest by December 1999, and conflicting national standards shall be withdrawn at the latest by December 1999.

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).

For relationship with EU Directive(s), see informative Annex ZA, which is an integral part of this standard.

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

Annexes A and B are normative. Annex A contains the "List of hazards"

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0 Introduction

The extent to which hazards are covered is indicated in the scope of this standard. These hazards are specific to trailers with tipping body.

The hazards that are common to all agricultural machines (self-propelled, mounted, semi-mounted and trailed) will be dealt with in a standard currently in preparation (prEN 1553).

1 Scope

This standard specifies specific safety requirements and their verification for the design and construction of agricultural trailers with a tipping body, balanced and semi mounted, where the term agricultural trailer refers to a vehicle used in agriculture only for transportation and which, through its design, is adapted and intended for towing by a tractor or a self-propelled agricultural machine.

This standard is not applicable to trailers with a de-mountable body.

NOTE : Braking requirements are not included in this standard. These will be studied during its revision depending on the development of European regulations.

In addition, it specifies the type of information on safe working practices to be provided by the manufacturer.

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.

Environmental aspects have not been considered in this standard.

This 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 (including amendment A1:1995) |
| EN 294 | : 1992 | Safety of machinery - Safety distances to prevent danger zones being reached by the upper limbs |
| prEN 1553 | : 1998 | Agricultural machinery - Agricultural self-propelled, mounted, semi-mounted and trailed machines - Common safety requirements |

| | | |
|------------|------|---|
| ISO 5676 : | 1983 | Tractors and machinery for agriculture and forestry - Hydraulic coupling - Braking circuit |
| ISO 5692 : | 1979 | Agricultural vehicles - Mechanical connections on towed vehicles - Hitch rings - Specifications |

3 Definitions

For the purpose of this standard, the definitions given in EN 292-1:1991 and EN 292-2:1991 apply together with the following :

NOTE 1 : The examples given in the following figures are functional representations of trailers and do not illustrate the safety measures required by this standard.

3.1 balanced trailer : Trailer from which no vertical load is transferred to the towing vehicle, see figure 1.



Figure 1 : Examples of balanced trailer

3.2 semi-mounted trailer : Trailer from which part of vertical load is transferred to the towing vehicle, see figure 2.

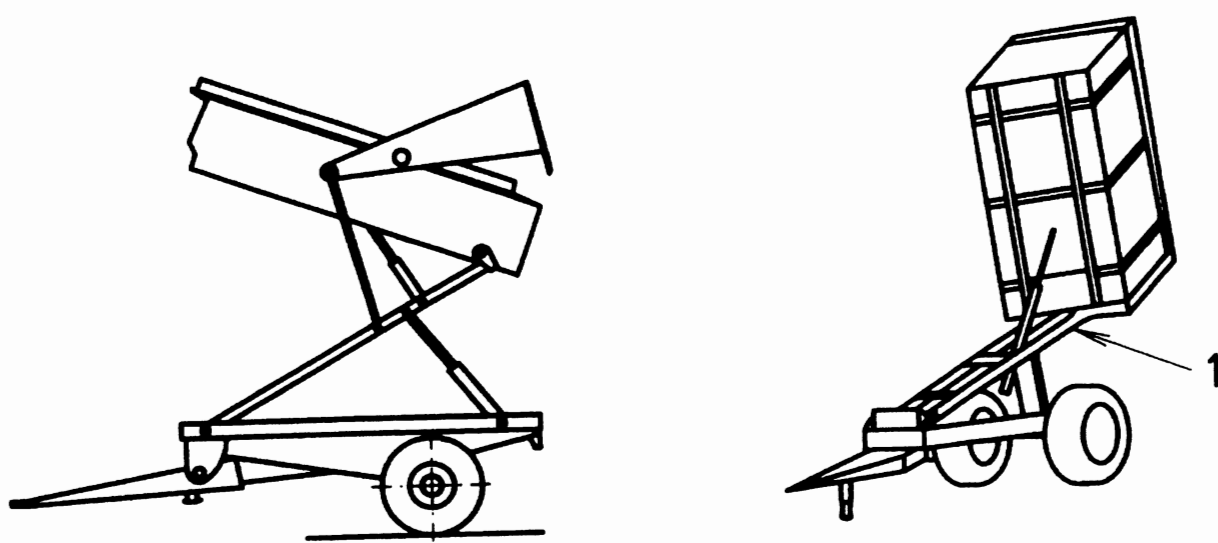


Figure 2: Examples of semi-mounted trailer

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3.3 high-tip trailer : Trailer equipped with a system to raise the tipping axis in relation to the chassis, see figure 3.



1 – Tipping axis

Figure 3 : Examples of high-tip trailer

3.4 sideboard : Fixed or movable wall that constitutes the load retaining side of the body and which may be hinged on the platform of the trailer.

3.5 tipping : Action that allows the load carried in the trailer to be discharged by tilting the body.

NOTE 2 : The tipping can be lateral or to the rear.

4 Safety requirements and/or measures

4.1 General

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.

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Unless otherwise specified in this standard, the trailer shall comply with the requirements of prEN 1553:1998 and with tables 1, 3, 4 and 6 of EN 294:1992.

4.2 Stability

4.2.1 Stability of the detached trailer

Trailers shall be designed to comply with the stability requirements given in 4.3.2.1 of prEN 1553:1998.

When the trailer is parked on a horizontal surface, containing a uniform load equal to the maximum permissible load declared by the manufacturer, any supporting devices other than wheels shall have a bearing surface designed to limit the ground pressure to a maximum of 400 kPa.

The design shall ensure that the detached trailer does not move (e.g. by the provision of blocks). This requirement shall be checked by standing the trailer, loaded at its maximum permissible load, and with any steerable axles in the straight ahead position on a firm surface with a slope of 8,5°. This test shall be carried out with the trailer positioned on the slope in the most unfavourable orientation which shall be recorded.

During the test, the trailer shall not move.

If blocks are required to prevent any movement of the detached trailer, a location shall be provided on the trailer for their storage when they are not used.

4.2.2 Stability in the raised position when tipping

Trailers shall be so designed that they remain stable on a slope of 5° when raised to the highest position used for tipping.

Conformity with this requirement shall be verified by tests described in annex B. These tests are only applicable to rear tipping trailers.

NOTE : The tests for lateral tipping trailers and for high-tip trailers will be considered at the revision of the standard.

4.2.3 Load on the drawbar hitch

The vertical downward load on the drawbar of semi-mounted trailers, measured at the hitch point with the trailer on a horizontal firm surface and the trailer body empty, shall be at least 3 % of the weight of the empty trailer with the trailer in lowered position, and at least 500 N in all tipping positions.

4.3 Boarding means

Exterior boarding means in conformity with 4.1.6 of prEN 1553:1998 shall be provided on a trailer with sideboards when the tops of the sideboards are higher than 1,5 m from the ground. When dismountable sideboards are not in place and the platform is higher than 1 m from the ground, similar boarding means shall be provided. One or more handholds shall be provided on top of the boarding means.

Trailers with sideboards higher than 900 mm measured from the trailer platform shall be fitted with an interior boarding means in conformity with 4.1.6 of prEN 1553:1998. This boarding means shall be on the same sideboard and opposite to the exterior one.

NOTE : The boarding means should preferably be placed on the left side of the front of the trailer relative to the direction of motion.

4.4 Tipping

4.4.1 It shall always be possible to actuate the tipping control(s) (up and down) from the driving position.

When (an) additional control(s) is (are) provided on the trailer, it (they) shall be of the hold-to-run type and shall conform with 4.3.1 of prEN 1553:1998.

4.4.2 The hydraulic tipping system and the hydraulic braking system shall not be controlled by the same hydraulic circuit.

4.4.3 Trailers shall be constructed so that the highest permissible tipping position cannot be exceeded.

4.5 Interconnections

4.5.1 Mechanical interconnection

The hitch ring of a trailer equipped with a low hitch i.e. located below the power-take-off, shall conform to ISO 5692:1979.

4.5.2 Hydraulic, pneumatic and electrical interconnections

When the hydraulic braking system of the trailer is intended to be coupled to the tractor service braking system, then the coupling defined in ISO 5676 shall be used. This coupling shall only be fitted in the braking circuit.

4.6 Additional requirement for high-tip trailers

It shall always be possible to actuate the control for raising or lowering the tipping axis from the driving position.

When (an) additional control(s) is (are) provided on the trailer, it (they) shall be of the hold-to-run type and shall conform with 4.3.1 of prEN 1553:1998.

4.7 Other requirements

4.7.1 A mechanical support hinged to the trailer, in conformity with the requirements given in 4.1.7.3 of prEN 1553:1998 shall be provided to secure the body in high position during maintenance operations.

4.7.2 Sideboard and discharge gate locking devices shall be so located that the operator can actuate them from outside the swinging range of the board or gate.

5 Verification of the safety requirements and/or measures

Dimensions, where given, shall be verified by measurements. Controls shall be verified by a functional test and positional measurements.

6 Information for use

6.1 Instruction handbook

Comprehensive instructions and information on all aspects of maintenance and the safe use for the trailer shall be provided in the instruction handbook. It shall comply with 5.5 of EN 292-2:1991.

In particular the following points shall be emphasized :

- a) the density of the main transportable materials to avoid exceeding the maximum load ;
- b) that tipping and, if applicable, raising of the body are only to be done :
 - when the trailer is hitched to the tractor; and
 - on stable and flat ground; and
 - with nobody in the unloading zone; and
 - when there are no high cross winds ;
- c) that attention is to be drawn to the hazards of hitting overhead power lines during tipping operations ;
- d) the hazards which can occur when moving the trailer with the body raised or tipped ;
- e) to take care to avoid crushing fingers and hands during opening and closing of discharge gates ;
- f) that, when hitching or unhitching semi mounted trailers, there can be a risk due to the upward or downward force that can be exerted on the hitch ring ;
- g) that the vertical load transferred from a semi-mounted trailer to the towing vehicle can affect the manoeuvrability of that vehicle ;
- h) that for repair and servicing work that require the body to be raised, the body shall be empty and secured against any inadvertent lowering by means of the mechanical support ;
- i) the relevant characteristics of the original tyres (load, speed, dimensions and inflation pressure) ;
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- j) the maximum design travel speed ;
- k) the need to ensure, before moving the trailer, that the braking system is connected and that it functions correctly ;
- l) the need to use a PTO drive shaft equipped with a guard in good condition, if relevant ;