



SLOVENSKI STANDARD
SIST EN 1846-2:2002+A3:2009
01-junij-2009

Gasilska in reševalna vozila - 2. del: Splošne zahteve - Varnost in obnašanje pri uporabi

Firefighting and rescue service vehicles - Part 2: Common requirements - Safety and performance

Feuerwehrfahrzeuge - Teil 2: Allgemeine Anforderungen - Sicherheit und Leistung

Véhicules des services de secours et de lutte contre l'incendie - Partie 2: Prescriptions communes - Sécurité et performances

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ICS:

13.220.10	Gašenje požara	Fire-fighting
43.160	Vozila za posebne namene	Special purpose vehicles

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EUROPEAN STANDARD

EN 1846-2:2001+A3

NORME EUROPÉENNE

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Firefighting and rescue service vehicles - Part 2: Common requirements - Safety and performance

Véhicules des services de secours et de lutte contre l'incendie - Partie 2: Prescriptions communes - Sécurité et performances

Feuerwehrfahrzeuge - Teil 2: Allgemeine Anforderungen - Sicherheit und Leistung

This European Standard was approved by CEN on 31 August 2000 and includes Amendment 1 approved by CEN on 14 October 2004, Amendment 2 approved by CEN on 12 July 2006, Corrigendum 1 issued by CEN on 24 January 2007, Corrigendum 1 to Amendment 1 issued by CEN on 24 January 2007 and Amendment 3 approved by CEN on 8 February 2009.

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 CEN Management Centre or to any CEN member.

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 CEN Management Centre has the same status as the official versions.

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Contents

	page
Foreword.....	3
Introduction.....	4
1 Scope	4
2 Normative references	5
3 Terms and definitions, symbols and abbreviated terms	6
4 List of significant hazards	10
5 Requirements	15
6 Verification	32
7 Information for use	39
Annex A (informative) Example of an exhaust coupling.....	42
Annex B (informative) Removal heights from equipment lockers.....	43
Annex C (informative) Examples of technical measures for noise reduction.....	44
Annex D (normative) General conditions for the verification procedures described in clause 6	45
Annex E (informative) Acceptance test on delivery.....	46
Annex F (normative) Noise test code for the noise emission values declaration (see 7.1.2.3) (Grade 3 of accuracy).....	47
Annex G (informative) List of abbreviations used in this standard	51
Annex H (informative) A1 Conformity assessment A1	52
Annex ZA (informative) A3 Relationship between this European Standard and the Essential Requirements of EU Directive 98/37/EC A3	53
Annex ZB (informative) A3 Relationship between this European Standard and the Essential Requirements of EU Directive 2006/42/EC A3	54
Bibliography.....	55

Foreword

This document (EN 1846-2:2001+A3:2009) has been prepared by Technical Committee CEN/TC 192 "Fire service equipment", the secretariat of which is held by BSI.

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 September 2009, and conflicting national standards shall be withdrawn at the latest by December 2009.

This European Standard was approved by CEN on 31 August 2000 and includes Amendment 1 approved by CEN on 14 October 2004, Amendment 2 approved by CEN on 12 July 2006, Corrigendum 1 issued by CEN on 24 January 2007, Corrigendum 1 to Amendment 1 issued by CEN on 24 January 2007 and Amendment 3 approved by CEN on 8 February 2009.

This European Standard supersedes 1846-2:2001.

The start and finish of text introduced or altered by amendment is indicated in the text by tags **A1**, **A1**, **A2**, **A2** and **A3**, **A3**.

The modifications of the related CEN Corrigendum have been implemented at the appropriate places in the text and are indicated by the tags **AC**, **AC**.

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).

A3 For relationship with EU Directive(s), see informative Annexes ZA and ZB, which are integral parts of this document. **A3**

EN 1846 "Firefighting and rescue service vehicles" is composed of three parts:

- Part 1: *Nomenclature and designation*;
- Part 2: *Common requirements - Safety and performance*;
- Part 3: *Permanently installed equipment - Safety and performance*.

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

EN 1846-2:2001+A3:2009 (E)**Introduction**

A3 This European Standard is a type C standard as stated in EN ISO 12100.

The machinery concerned and the extent to which hazards, hazardous situations and events are covered are indicated in the scope of this European Standard.

When provisions of this type C standard are different from those which are stated in type A or B standards, the provisions of this type C standard take precedence over the provisions of the other standards, for machines that have been designed and built according to the provisions of this type C standard. **A3**

This part of this European Standard also deals with the performance requirements which are common to all firefighting and rescue service vehicles as defined in the scope.

The noise test code considered in this part of this European Standard (see annex F) will allow experience to be gained in the measurement of noise emission in view of future revisions.

1 Scope

1.1 This part of this European Standard specifies the minimum requirements for safety and performance of firefighting and rescue service vehicles as designated in EN 1846-1:1998.

NOTE 1 Categories and mass classes of these vehicles are given in EN 1846-1:1998.

Firefighting and rescue service vehicles normally use a commercial chassis-cab or vehicle. A special chassis may be used for specialised vehicles to meet particular requirements.

NOTE 2 Both chassis and vehicle are considered to be standard commercially available items when the manufacturer proposes them for sale in all their standard or special versions, on the basis of catalogues distributed via its commercial network, including chassis and vehicles that are manufactured solely for fire service use.

Further requirements for aerial appliances are contained within other European Standards (see **A3** EN 1777 **A3**, Hydraulic platforms for firefighting and rescue services - Safety requirements and testing, **A3** EN 14043, High rise aerial appliances for fire service use — Turntable ladders with combined movements — Safety and performance requirements and test methods **A3** and **A3** EN 14044, High rise aerial appliances for fire service use — Turntable ladders with sequential movements — Safety and performance requirements and test methods) **A3**.

A3 NOTE 3 Additional regulations, not dealt with in this document, may apply in relation with the use of the vehicles on public roads. **A3**

For the purpose of this part of this European Standard, the normal ambient temperature range is - 15 °C to + 35 °C.

NOTE 4 In the case of utilisation outside this temperature range, the particular temperature range should be specified by the customer.

1.2 This part of this European Standard does not apply to:

- personnel carrying vehicles;
- vehicles with a gross laden mass not exceeding 2 t;
- boats;
- aircraft;

- trains;
- ambulances;
- airport vehicles complying with International Civil Aviation Organisation (ICAO) recommendations.

1.3 This part of this European Standard deals with the technical requirements to minimise the hazards listed in clause 4 which can arise during the commissioning, the operational use and the routine checking of firefighting and rescue service vehicles when carried out in accordance with the specifications given by the manufacturer or his authorised representative.

It does not cover the hazards generated by:

- radiation (low frequency, radio frequency, radiation, micro-waves);
- errors in the software;
- use in potentially explosive atmospheres;
- construction, transportation, maintenance and decommissioning;
- wind pressure in and out of use;
- static electricity problems;
- remote control;
- electromagnetic compatibility.

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This part of this European Standard also deals with performance requirements.

1.4 This part of this European Standard is not applicable to machines which are manufactured before its date of publication.

2 Normative references

A3 The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

EN 659, *Protective gloves for firefighters*

EN 842:1996, *Safety of machinery — Visual danger signals — General requirements, design and testing*

EN 981:1996, *Safety of machinery — System of auditory and visual danger and information signals*

EN 1846-1:1998, *Firefighting and rescue service vehicles — Part 1: Nomenclature and designation*

EN ISO 3746:1995, *Acoustics — Determination of sound power levels of noise sources using sound pressure — Survey method using an enveloping measurement surface over a reflecting plane (ISO 3746:1995)*

EN ISO 4165, *Road vehicles — Electrical connections — Double-pole connection (ISO 4165:2001)*

EN ISO 4871:1996, *Acoustics — Declaration and verification of noise emission values of machinery and equipment (ISO 4871:1996)*

EN ISO 5353:1998, *Earth moving machinery, and tractors and machinery for agriculture and forestry — Seat index point (ISO 5353:1995)*


EN 1846-2:2001+A3:2009 (E)

EN ISO 11202:1995, *Acoustics — Noise emitted by machinery and equipment — Measurement of emission sound pressure levels at a work station and at other specified positions – Survey method in situ (ISO 11202:1995)*

EN ISO 12100-1:2003, *Safety of machinery — Basic concepts, general principles for design — Part 1: Basic terminology, methodology (ISO 12100-1:2003)*

EN ISO 12100-2:2003, *Safety of machinery — Basic concepts, general principles for design — Part 2: Technical principles (ISO 12100-2:2003)*

EN ISO 14122-2:2001, *Safety of machinery — Permanent means of access to machinery — Working platforms and walkways (ISO 14122:2001)*

ISO/DIS 10085:2000, *Firefighting vehicles and equipment — Symbols for operator controls and other displays* 

3 Terms and definitions, symbols and abbreviated terms

For the purpose of this part of this European Standard, the definitions given in EN 1070:1998 and EN 1846-1:1998 apply together with the following.

3.1**unladen mass**

The mass of the vehicle, including the driver (75 kg) and all items needed to operate the vehicle including a full capacity of cooling water, fuel and oil and all permanently installed equipment, but excluding the spare wheel and extinguishing agents.

3.2**gross laden mass (GLM)**

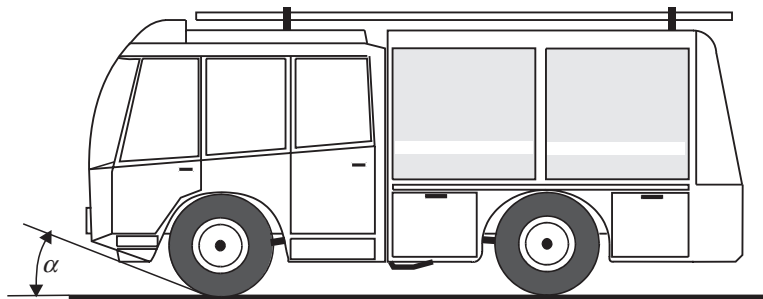
The unladen vehicle mass as defined in 3.1, plus the mass of the remainder of the crew for which the vehicle is designed and the mass of the extinguishing agents and other equipment to be carried (the mass is calculated as 90 kg for each crew member and his equipment, an additional 15 kg for the driver's equipment).

3.3**permissible total laden mass (PTLM)**

The maximum permitted gross laden mass as declared by the chassis manufacturer (see European Directive 70/156/EEC).

3.4**approach angle (α)**

The angle α between the horizontal ground contact plane and the plane tangent to the tyres of the front wheels, such that no rigid part ahead of the first axle of the vehicle is located between these planes (see Figure 1).

**Figure 1****3.5****departure angle (β)**

The angle β between the horizontal ground contact plane and the plane tangent to the tyres of the rearmost wheels such that no rigid part of the vehicle behind the last axle is between these planes (see Figure 2).

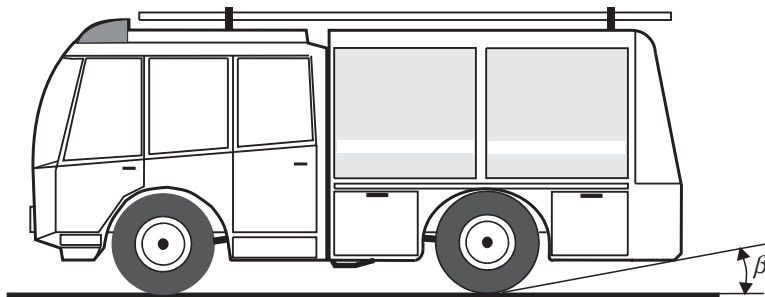


Figure 2

3.6 angle of slope (γ)

The smallest angle γ measured between two planes tangential to the innermost front and rear tyres which intersect at the lowest rigid point or surface of the underside of the vehicle between these tyres (see Figure 3). This angle defines the largest ramp over which the vehicle can pass.

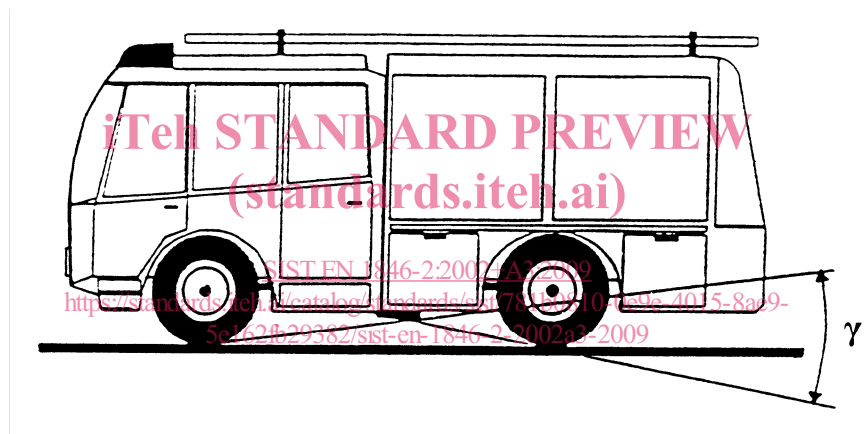


Figure 3

3.7 ground clearance (d)

The distance d between the horizontal ground contact plane and the lowest fixed point on the vehicle, other than the axles, measured when the vehicle is at its gross laden mass (see 3.2 and Figure 4).

Multiple axle sets are considered as a single axle.

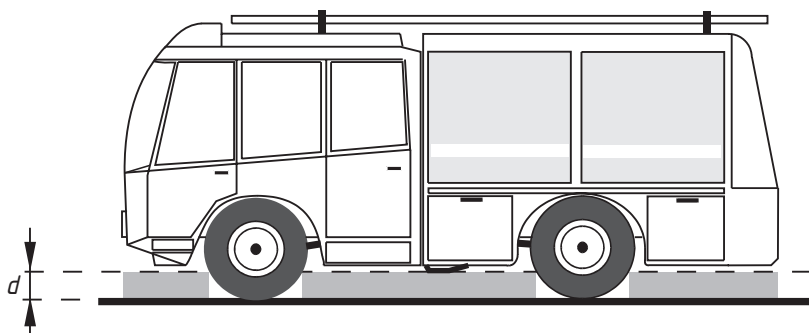


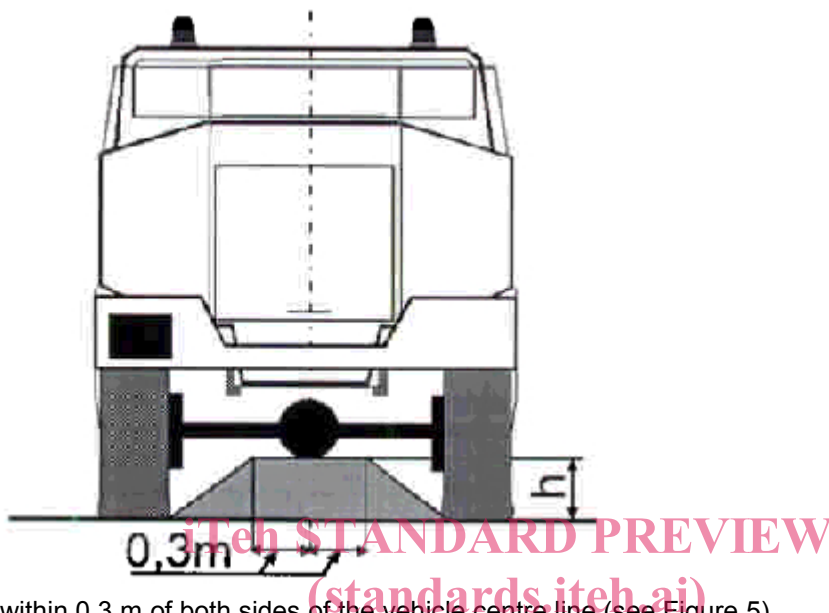
Figure 4

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3.8

ground clearance under axle (h)

The distance h determined by the highest part of a quadrilateral having its base as the ground contact plane between the innermost wheels on an axle and its upper plane as the lowest rigid part of the vehicle falling between



the wheels and within 0,3 m of both sides of the vehicle centre line (see Figure 5).

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Figure 5

3.9

cross-axle capability (c)

The ability of the vehicle to remain functional and with no unintended interference between the various components of the vehicle including cabin and bodywork, when driven onto two blocks of specified height c simultaneously disposed diagonally on a horizontal plane.

3.10

turning circle between walls (D)

The diameter D of the smallest imaginary cylinder within which the vehicle can turn at maximum steering lock (see Figure 6).

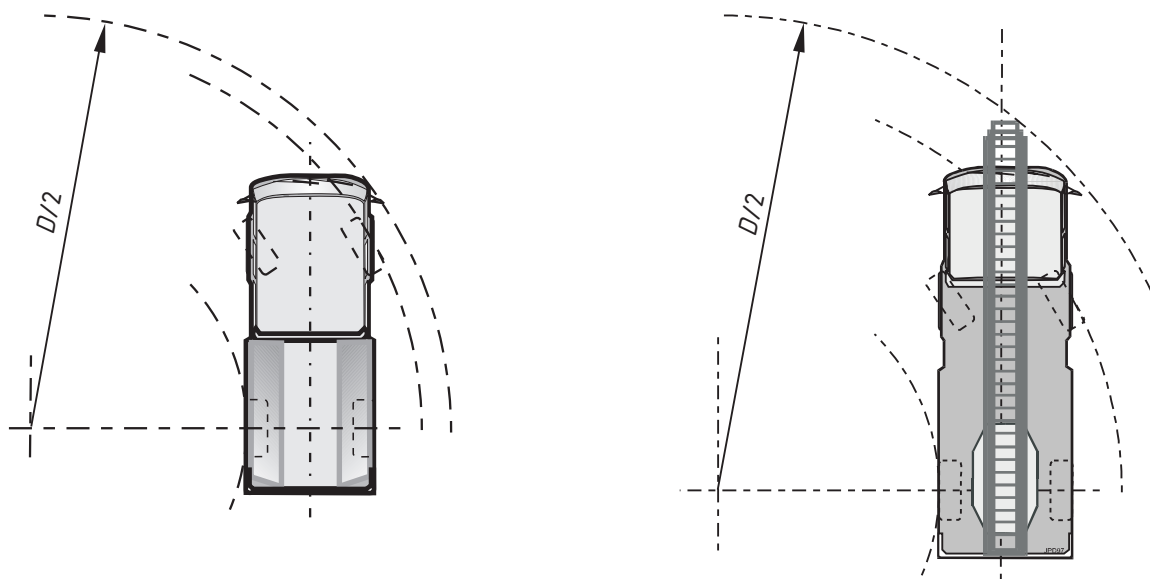
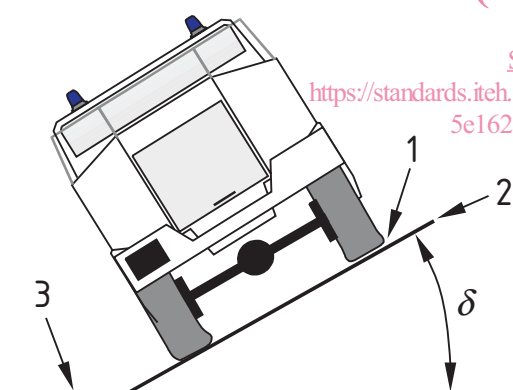


Figure 6

3.11

static tilt angle (δ)

The angle δ between the horizontal and ground contact planes at which the vehicle, when tilted along its longitudinal axis, loses stability. Loss of stability being the point at which the final upslope wheel loses contact with the ground contact plane, at the gross laden mass of the vehicle (see 3.2 and Figure 7).



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Key

- 1 Loss of contact
- 2 Ground contact plane
- 3 Horizontal plane

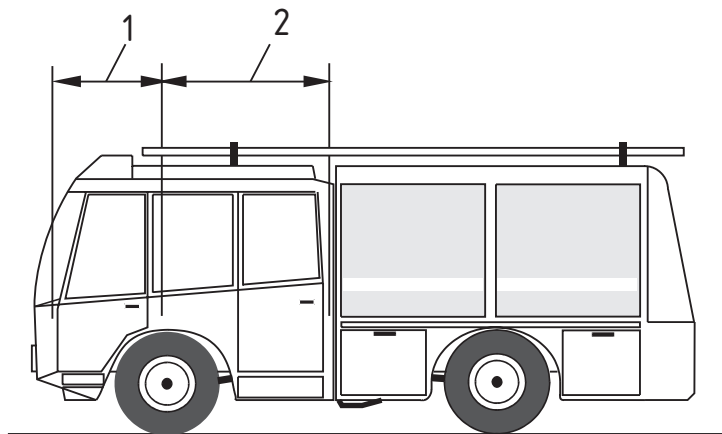
Figure 7

3.12

cabin

The driver's cab (including the first range of seats) and crew compartment (see Figure 8).

EN 1846-2:2001+A3:2009 (E)

**Key**

- 1 Driver's cab
- 2 Crew compartment (separate or not)

Figure 8
3.13
operating position

The position at which firefighters are located to operate firefighting or rescue equipment permanently installed on the vehicle.

3.14
gradient capability (P)

The ability of a vehicle at its gross laden mass (GLM) to start and stop on and to ascend or descend a slope.

4 List of significant hazards

The significant hazards relevant to firefighting and rescue service vehicles which are dealt with in this part of this European Standard are given in Table 1.

Clauses 1 to 11 in hazard reference column of Table 1 have been extracted from EN 414:1992. Clauses 12 to 21 in hazard reference column of Table 1 have been extracted from EN 1050:1996.

Table 1 — List of hazards

Hazard reference	Situation/area	Clause reference in this standard
1 Mechanical hazards		
1.1 Crushing	Unintended movement of the vehicle	5.1.1.3.1
	Falling of tipping cabin	5.1.2.2.1
	Reversing of vehicle	5.1.1.8
	Rolling over of vehicle	5.1.1.1
	Forward movement of load/body work	5.1.2.2.2 5.1.2.2.3
1.2 Shearing	Injury from horizontally moving load carriers	5.1.2.4.2
1.3 Cutting or severing	Sharp edges of body and fixed equipment	5.1.2.1
	Unprotected objects in the cabin	5.1.2.2.2
1.4 Entanglement	Exposed PTO/transmission	5.1.1.4
1.5 Drawing in or trapping	Movement of the vehicle with doors lockers equipment etc., outside the body perimeter	5.1.2.1
1.6 Impact	Movement of crew at sudden stopping of vehicle	5.1.2.2.2 5.1.2.2.3 5.1.2.2.4
	Movement of equipment at sudden stopping of vehicle	5.1.1.1 5.1.2.2.2 5.1.2.2.3
1.11 Loss of stability	Overturning of vehicle	5.1.1 5.1.1.5 7.1.2
	Loss of lateral stability during braking	5.1.1.2.1 5.1.1.5 5.1.1.6
	Loss of stability due to unadapted tyres pressure	5.1.1.7

(continued)

Table 1 — List of hazards (continued)

Hazard reference	Situation/area	Clause reference in this standard
1.12 Slip, trip, fall	Falling from/through roof and working platforms	5.1.2.3.3 5.1.2.5
	Injury from leaving/entering crew compartment	5.1.2.3.1
	Leaving/entering the cabin	5.1.3.3
	Tripping in area of the operating positions	5.1.2.1 5.1.2.5 5.1.3.3
2 Electrical hazards		
2.1 Contact of persons with live parts (direct contact)	Connection of external power supply to vehicle	5.1.3.1 5.1.4.1
3 Thermal hazards		
3.1 Burns and scalds	Exposed exhaust systems	5.1.1.3.2
4 Hazards generated by noise		
4.1 Hearing loss	Noise at operating position	5.1.5
4.2 Interference with speech	Speech and acoustic signals not audible at operating position	5.1.5
7 Hazards generated by materials and substances processed, used or exhausted by machinery		
7.1 Fluids, gases, mists, fumes and dusts	Inhalation of exhaust gases	5.1.1.3.2
	Loss of acids from batteries	5.1.3.2
	Contact with harmful fluids and fumes	5.1.2.4.1

(continued)

Table 1 — List of hazards (continued)

Hazard reference	Situation/area	Clause reference in this standard
8 Hazards generated by neglecting ergonomic principles in machine		
8.1 Unhealthy postures, excessive efforts	Bad access to vehicle (crew compartment, equipment, roof.)	5.1.2.3 5.1.2.4.2
8.2 Human anatomy	Access and location of operating position	5.1.2.3.3 □ 5.1.2.5 □ 5.1.4.2
8.4 Area lighting	Tripping in area of the operating positions	5.1.3.3
8.6 Human error	Incorrect operations	5.1.4.1 7.1
8.7 Inadequate design, location or identification of manual controls	Lack of information or confusion at the operating position	5.1.4
10 Hazards caused by failure of energy supply, breaking down of machinery parts and other functional disorders		
10.1 Failure of energy	Falling of cabin during tilting	5.1.2.2.1
	Mechanical or flame damage (category 3 as defined in EN 1846-1)	5.1.1
10.3 Failure of control system	Unintentional moving of vehicle when PTO is in operation	5.1.1.4 5.1.4.1
10.4 Errors of fitting	Incorrect electric connection HI/LO (voltage - polarity)	5.1.3.1
10.5 Overturn, loss of stability	Loss of longitudinal and lateral stability (category 3 as defined in EN 1846-1)	5.1.1.1 5.1.1.2
	Loss of latitudinal stability of all vehicles (roll over)	5.1.1.1 7.1
	Loss of lateral control of the vehicle	5.1.1.2 5.1.1.5

(continued)