

Firefighting and rescue service vehicles —

Part 2: Common requirements — Safety and performance

ICS 13.220.10

National foreword

This British Standard is the UK implementation of EN 1846-2:2001+A3:2009. It supersedes BS EN 1846-2:2001, including amendments A1:2004 and A2:2006.

The start and finish of text introduced or altered by amendment is indicated in the text by tags. Tags indicating changes to CEN text carry the number of the CEN amendment. For example, text altered by CEN amendment A1 is indicated by A1 A1.

The UK participation in its preparation was entrusted by Technical Committee FSH/17, Fire brigade equipment, to Subcommittee FSH/17/3, Fire appliances.

A list of organizations represented on this subcommittee can be obtained on request to its secretary.

EN 1846-2:2001 is a candidate “harmonized” European Standard and fully takes into account the requirements of the European Commission mandate M109, *Fire alarm / detection, fixed firefighting, fire and smoke control and explosion suppression products*, given under the EU Machinery Directive (98/37/EC), and intended to lead to CE marking. The date of applicability of EN 1846-2:2001 as a “harmonized” European Standard, i.e. the date after which this standard may be used for CE marking purposes, is subject to an announcement in the *Official Journal of the European Communities*.

EN 1846-2:2001 is the subject of transitional arrangements agreed under the European Commission mandate. The Member States have agreed a nominal transition period for the co-existence of EN 1846-2:2001 and their corresponding national standard(s). It is intended that this period will comprise a nominal nine month period during which any required changes to national regulations are to be made, followed by a further nominal twelve month period for the implementation of CE marking. At the end of this co-existence period, the national standard(s) will be withdrawn. In the UK, there is no corresponding national standard.

Users of this British Standard are requested to read the additional information given in National annex NA.

This publication does not purport to include all the necessary provisions of a contract. Users are responsible for its correct application.

Compliance with a British Standard cannot confer immunity from legal obligations.

This British Standard, having been prepared under the direction of the Health and Environment Sector Policy and Strategy Committee, was published under the authority of the Standards Policy and Strategy Committee on 16 October 2002

Amendments/corrigenda issued since publication

Amd. No.	Date	Comments
15441	7 February 2005	Implementation of CEN amendment A1:2004
15618 Corrigendum No. 1	1 March 2005	Insertion of Annex NA
16686	31 October 2006	Implementation of CEN amendment A2:2006
	31 May 2009	Implementation of CEN amendment A3:2009

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ISBN 978 0 580 62801 6

English Version

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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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** and **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.

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.

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 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).

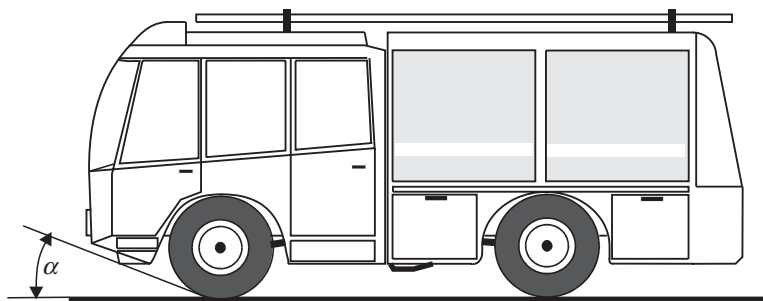


Figure 1

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).

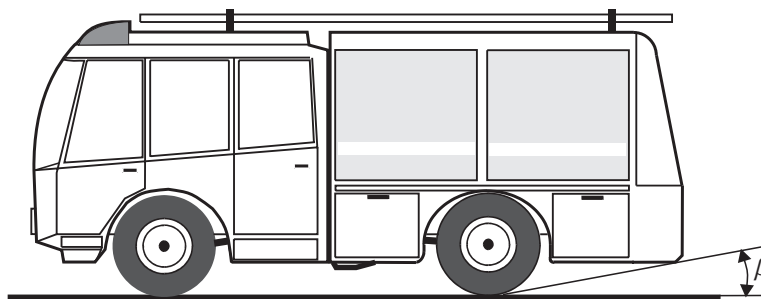


Figure 2

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.

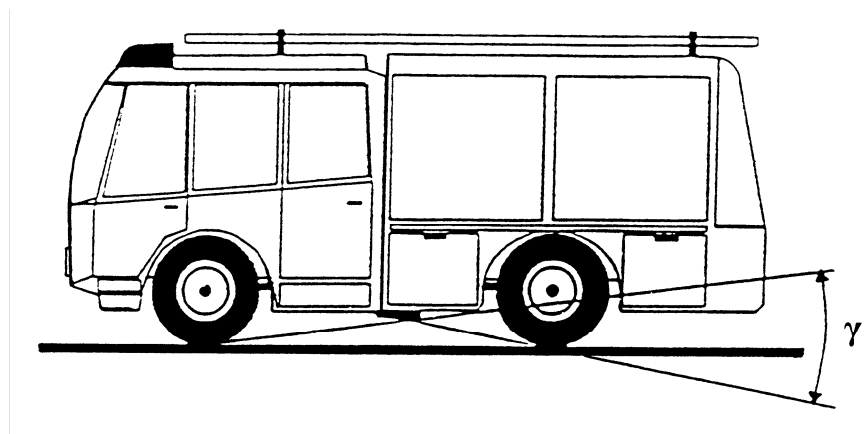


Figure 3

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.

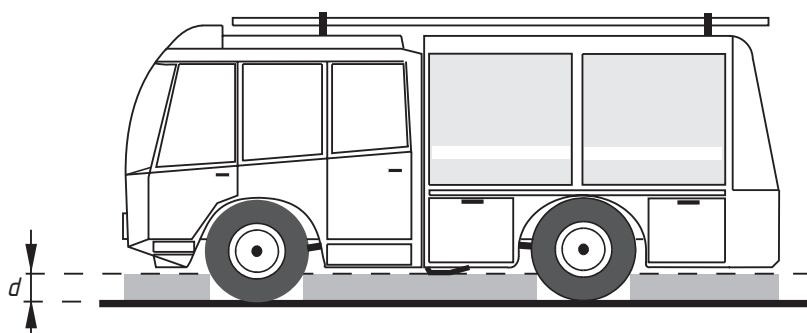
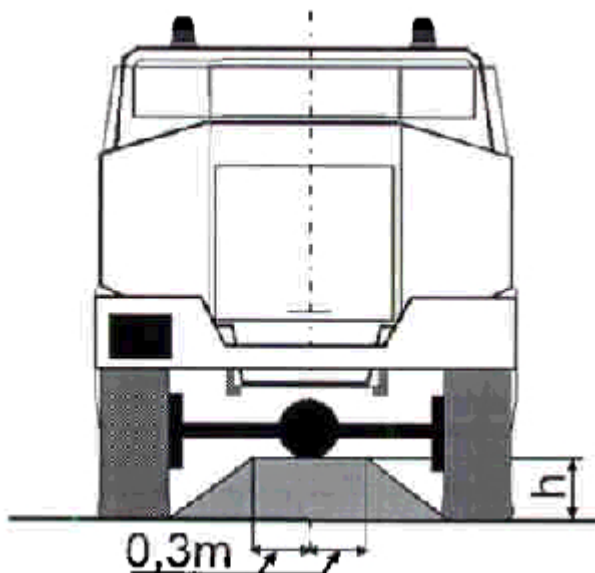


Figure 4

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).

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).

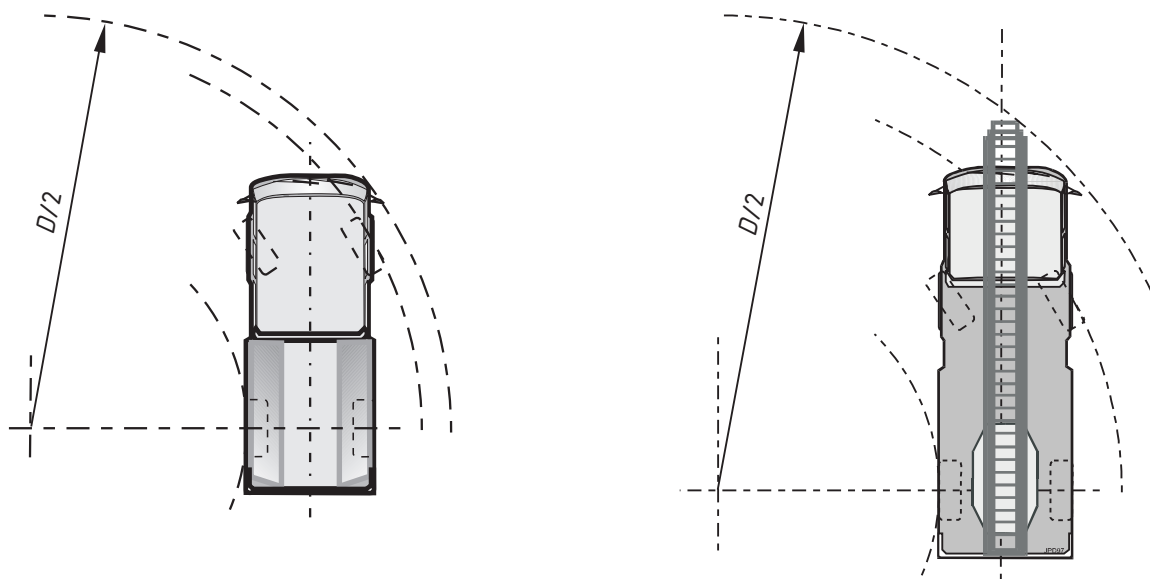
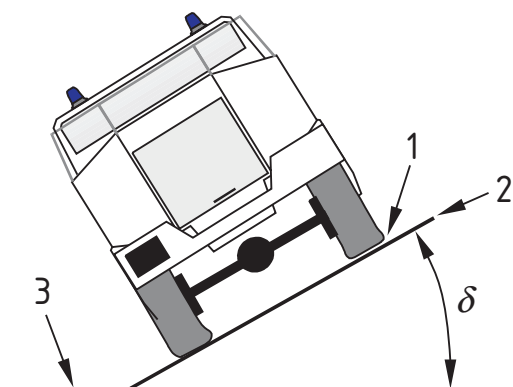


Figure 6

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).



Key

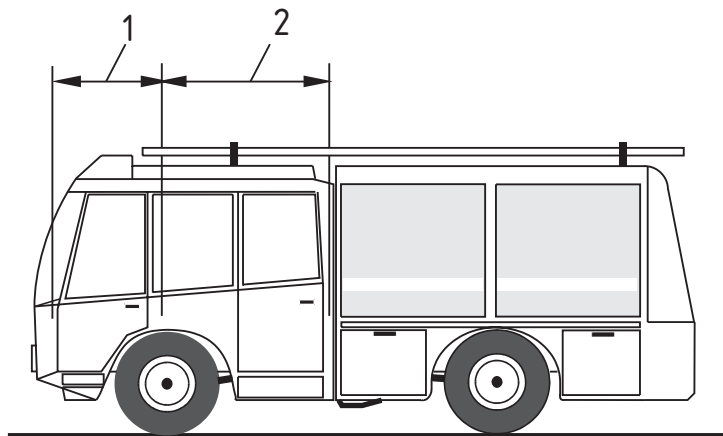
- 1 Loss of contact
- 2 Ground contact plane
- 3 Horizontal plane

Figure 7

3.12

cabin

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



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□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)

Table 1 — List of hazards (continued)

Hazard reference	Situation/area	Clause reference in this standard
11 Missing and/or incorrectly positioned safety related measures/means	Absence of safety measures for operational use	7.1.2
12 Inadequate lighting of moving/working areas	Tripping in area of the operating position. Bad area lighting	5.1.3.3
13 Sudden movement, instability during handling	Tilting cabin	5.1.2.2.1
	Injuries due to unexpected movement of equipment (doors, lockers, canopy, steps, masts, etc).	5.1.2.4 5.1.3.1
14 Inadequate/non ergonomic design of driving/operating position		
14.3 Inadequate seat/seating	Loss of control when driving category 3 vehicles as defined in EN 1846-1 on suspended seat	5.1.2.2.4
	Personal injury from sudden movement during travel	5.1.2.2.2 5.1.2.2.4
14.4 Inadequate design/positioning of controls	Dangerous operation of equipment, risk of error	5.1.2.2.1 5.1.2.5 5.1.4
14.5 Starting/moving of self propelled machinery	Unexpected or sudden movement of the vehicle or apparatus	5.1.1.2 5.1.1.3.1 5.1.4.1
15 Mechanical hazards due to mobility		
15.1 Hazards to exposed persons due to uncontrolled movement	Unexpected or sudden movement of the vehicle or apparatus	5.1.1.2 5.1.1.3.1 5.1.4.1
	Unexpected tilting of cabin during movement (category 3 as defined in EN 1846-1)	5.1.2.2.1
15.3 Hazards due to rolling over	Rolling over of vehicle (category 3 as defined in EN 1846-1)	5.1.2.2.1
15.7 Hazards due to batteries, fire emissions etc.	Contact with acids of batteries	5.1.3.2

(continued)

Table 1 — List of hazards (concluded)

Hazard reference	Situation/area	Clause reference in this standard
20 Relating to the travelling function		
20.1 Movement when starting the engine	Unauthorised movement of the vehicle	5.1.1.3.1
20.2 Movement without a driver at the driving position	Unauthorised movement of the vehicle	5.1.1.4
20.3 Movement without all parts not in a safe position	Movement of the vehicle	5.1.4.1
20.6 Insufficient ability of machinery to be slowed down, stopped and immobilised	Dangerous movement of the vehicle. Loss of control of the vehicle	5.1.1 5.1.1.2
21 Linked to the work position		
21.10 Insufficient means for evacuation/emergency exit	Inadequate emergency exit	5.1.2.2.5

5 Requirements

Methods to verify the requirements in the following subclauses are given in the equivalent subclauses of clause 6.

Modifications or additions to the vehicle chassis-cab shall take into account any recommendations made by the chassis manufacturer.

5.1 Safety requirements and/or measures

Vehicles shall comply with the safety requirements and/or measures of this subclause and in addition with  EN ISO 12100:2003  for hazards relevant but not significant which are not dealt with in this part of this European Standard.

5.1.1 General

The permanently installed equipment, the load and the locks of doors, flaps and drawers shall be firmly secured against unintended release. The locks and holding devices that are used shall be easy to open.

The filler-opening of fuel tank(s) shall be designed to avoid the risk of fuel contacting any hot parts of the vehicle or equipment.

For category 3 vehicles (see EN 1846-1:1998) all electrical wiring, fuel lines, brake pipes, hoses shall be protected from mechanical damage by rough ground/terrain. In cases of specific use (e.g. fire in natural environment) these components shall also be protected against direct contact with flames and incandescent particles.

NOTE Electrical cables complying with HD 22-3, EN 50265-2-1:1998 and HD 586-1 are deemed to be fire resistant.

 When fixed guards, or parts of the machine acting as such, are not permanently fixed e.g. by welding, their fixing systems shall remain attached to the guards or to the machinery when the guards are removed. 

5.1.1.1 Static stability

The design of the complete vehicle, at GLMgross laden mass (GLM) shall be such that the centre of gravity (CG) of the stationary vehicle is within the chassis manufacturers recommended limits.

The vehicle shall comply with the tilt angles given in Table 2.

Table 2 — Tilt angle values

Mass class (see EN 1846-1:1998)	L (Light) 2 t < GLM ≤ 7,5 t			M (Medium) 7,5 t < GLM ≤ 14 t			S (Super) GLM > 14 t		
Category (see EN 1846-1:1998)	1 (urban)	2 (rural)	3 (all terrain)	1 (urban)	2 (rural)	3 (all terrain)	1 (urban)	2 (rural)	3 (all terrain)
tilt angle δ (°)	≥ 32	≥ 27	≥ 27	≥ 32	≥ 27	≥ 25	≥ 32	≥ 27	≥ 25
The tilt angle for all vehicles fitted with a demountable system (but not including the demountable unit) shall be greater than or equal to 35 ° NOTE These values do not apply to aerial appliances.									

5.1.1.2 Dynamic stability

5.1.1.2.1 Stability during braking

During braking, the vehicle shall not deviate from its course by more than 20 % of its width to either side .

5.1.1.2.2 Gradient capability

At gross laden mass, the vehicle shall comply with the gradient capability given in Table 3.

Table 3 — Gradient capability values

Mass class (see EN 1846-1:1998)	L (Light) 2 t < GLM ≤ 7,5 t			M (Medium) 7,5 t < GLM ≤ 14 t			S (Super) GLM > 14 t		
Category (see EN 1846-1:1998)	1 (urban)	2 (rural)	3 (all terrain)	1 (urban)	2 (rural)	3 (all terrain)	1 (urban)	2 (rural)	3 (all terrain)
gradient capability P (°)	Not applicable	≥ 17	≥ 27	≥ 14	≥ 17	≥ 27	≥ 14	≥ 17	≥ 27

5.1.1.3 Engine

5.1.1.3.1 General

If it is possible to start the vehicle remote from the driving position, a safety interlock to prevent the vehicle moving shall be fitted.

Where there is a Power Take Off (PTO) fitted, there shall be an automatic or manual provision to control the engine speed as intended by the manufacturer. Manual controls shall be located at the operating position (see 3.13).

5.1.1.3.2 Exhaust

The exhaust system shall be designed and installed to protect the operator and crew from exhaust gases or burns. The temperature of readily accessible elements of the exhaust system shall not exceed 63 °C.

Exhaust systems fitted to category 3 vehicles (see EN 1846-1:1998) shall be designed to prevent the release of sparks. Hot parts of the exhaust system on the underside of category 3 vehicles shall be shielded from contact with vegetation.

The end of the exhaust pipe(s) shall be designed or located so that detachable exhaust couplings and/or stationary exhaust systems may be used.

NOTE An example of an exhaust coupling is given in annex A.

5.1.1.4 Driven components

Driven components shall not be exposed to contact by personnel during operational use.

For vehicles designed for PTO operation only when stationary, a safety system shall inhibit all unintended travel movement of the vehicle. This safety system shall be automatically activated for vehicles fitted with an automatic gearbox.

For vehicles designed for PTO operation when mobile or stationary, moving the vehicle shall require an additional action by the driver or information shall be given at the driving position.

5.1.1.5 Axle loading

The minimum and maximum permitted axle loads shall be in accordance with the values specified by the chassis manufacturer in all recommended load conditions.

5.1.1.6 Brakes

NOTE European Directive 71/320/EEC, or national regulations if these are more stringent, apply to the braking system.

5.1.1.7 Tyres

It shall be possible to inflate, deflate and check the tyre pressure of M.3 and S.3 vehicles (see EN 1846-1:1998) when stationary, by the use of equipment that is installed or carried by the vehicle.

5.1.1.8 Reversing of vehicle

 Vehicles for which the driver has insufficient visibility to the zone behind it (directly or indirectly, e.g. with mirrors or Closed Circuit Television Cameras "CCTV") shall be fitted with one of the following:

- a provision for detecting the presence of a person behind the vehicle when a reverse movement is to be started, or
- acoustic and visual warning signals functioning automatically when the reversing command is initiated. In this case, for allowing exposed persons to leave the danger zone or to prevent the effective reversing movement