SLOVENSKI STANDARD
SIST EN 1493:1999+A1:2009

01-marec-2009

Dvigala za servisiranje vozil

Vehicle lifts

Fahrzeug-Hebebühnen

Elévateurs de véhicules

Ta slovenski standard je istoveten z: **EN 1493:1998+A1:2008**

ICS:

43.180	Diagnostiļ na, vdrģevalna in preskusna oprema	Diagnostic, maintenance and test equipment
53.020.99	Druga dvigalna oprema	Other lifting equipment

SIST EN 1493:1999+A1:2009 **en,fr**

EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

EN 1493:1998+A1

December 2008

ICS 43.180; 53.020.99

Supersedes EN 1493:1998

English Version

Vehicle lifts

Elévateurs de véhicules

Fahrzeug-Hebebühnen

This European Standard was approved by CEN on 10 July 1998 and includes Amendment 1 approved by CEN on 9 November 2008.

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.

CEN members are the national standards bodies of 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.

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

Management Centre: rue de Stassart, 36 B-1050 Brussels

Ref. No. EN 1493:1998+A1:2008: E

Contents

Page

Foreword

This document (EN 1493:1998+A1:2008) has been prepared by Technical Committee CEN/TC 98 “Lifting platforms”, the secretariat of which is held by DIN.

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of an identical text or by endorsement, at the latest by June 2009, and conflicting national standards shall be withdrawn at the latest by December 2009.

This document includes Amendment 1, approved by CEN on 2008-11-09.

This document supersedes EN 1493:1998.

The start and finish of text introduced or altered by amendment is indicated in the text by tags [A1] 〈A1〉.

This document 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).

[A1] For relationship with EU Directive(s), see informative Annexes ZA and ZB, which are integral parts of this document. 〈A1〉

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

The object of this European Standard is to define rules for safeguarding persons against the risk of accidents associated with the operation of vehicle lifts.

While elaborating this standard it was assumed that only trained persons operate the vehicle lifts and that the working area is sufficiently lit. Furthermore it was assumed that no persons are permitted to stand under the vehicle during lifting and lowering.

The requirement concerning loading control is not deemed pertinent to this standard insofar as:

— Experience and the state of the art suggests that failing to observe this requirement has not historically given rise to unsafe situations;

— Such devices which would give protection against overall and local overloading are not currently available in forms which cover all eventualities;

— The weight and weight distribution is freely available for the type of vehicles to be lifted and as such it is the responsibility of the user to prevent an unsafe situation arising;

— Vehicle lifts are generally designed to suit the maximum weight of vehicle to which it would reasonably be subjected, hence the normal duty of a lift is substantially lower than the maximum.

The extent to which hazards are covered is indicated in the scope of this standard. ⟩A1⟨ In addition, machinery should comply as appropriate with EN ISO 12100-1 and EN ISO 12100-2 for hazards which are not covered by this European Standard. ⟨A1⟩

1 Scope

This standard applies to stationary, mobile and movable vehicle lifts, which are not intended to lift persons but which are designed to raise vehicles totally, for the purpose of examining and working on or under the vehicles whilst in a raised position. The vehicle lift may consist of one or more lifting units.

Power supply to the vehicle lift by internal combustion engines is not considered. The floor or ground supporting the vehicle lift in use is assumed to be horizontal.

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 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 applies.

⟩A1⟨ *deleted text* ⟨A1⟩

EN 414:1992, *Safety of machinery — Rules for drafting and presentation of safety standards*

⟩A1⟨ *deleted text* ⟨A1⟩

EN 954-1:1996, *Safety of machinery — Safety related parts of control systems — Part 1: General principles for design*

EN 982:1996, *Safety requirements for fluid power systems and components — Hydraulics*

EN 983:1996, *Safety requirements for fluid power systems and components — Pneumatics*

〚A1〛 EN 1760-2 〚A1〛, *Safety of machinery — Pressure sensitive protective devices — Part 2: General principles for the design and testing of pressure sensitive edges and bars*

EN 10025:1990, *Hot-rolled products of no-alloy structural steels — Technical delivery conditions*

EN 60204-1:1992, *Safety of machinery — Electrical equipment of machines — Part 1: General requirements*

EN 60529:1992, *Degrees of protection provided by enclosures*

EN 60947-5-1:1991, *Low-voltage switchgear and controlgear — Part 5-1: Control circuit devices and switching elements — Electromechanical control circuit devices*

〚A1〛 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 13850:2008, *Safety of machinery — Emergency stop — Principles for design (ISO 13850:2006)* 〚A1〛

3 Definitions

For the purposes of this standard the following definitions apply:

3.1
vehicle lift
Lifting device with guided load carrying device for lifting land based means of transport such as cars, motorcycles, lorries, buses, trams, rail vehicles, industrial trucks and similar, in the following named vehicle, and designed for working on or under the load. The guidance of the load carrying device is given by the supporting structure.

A vehicle lift may have the ability to tilt the load carrying device about a horizontal axis parallel to or perpendicular to the main axis of the lifted vehicle.

The following types of vehicle lift are examples of those covered by this definition: single and multi-column lifts, single and multi-cylinder lifts, mobile column lifts, scissor and parallelogram lifts, short stroke lifts, which support vehicle wheels, chassis or other designated lifting points (see Annex B (informative)).

NOTE Short stroke lifts are floor mounted vehicle lifts with a maximum vertical travel of not more than 500 mm, which are not designed for working under the raised load.

3.2
manually driven vehicle lift
vehicle lift where the load carrying device is driven by manual effort

3.3
power driven vehicle lift
vehicle lift where the load carrying device is not driven by manual effort

3.4
fixed vehicle lift
vehicle lift fixed permanently to its location

3.5
movable vehicle lift
vehicle lift which can fulfil its function without being fixed to the floor and may be designed to be transportable

3.6
mobile vehicle lift
movable vehicle lift equipped with wheels, rollers etc. such that it can be moved from one place to another with or without load

3.6.1
manually mobile vehicle lift
mobile vehicle lift which is moved by manual effort alone

3.6.2
vehicle lift with powered mobility
mobile vehicle lift which is not moved by manual effort

3.7
initial position
lower limit position of the carrying device

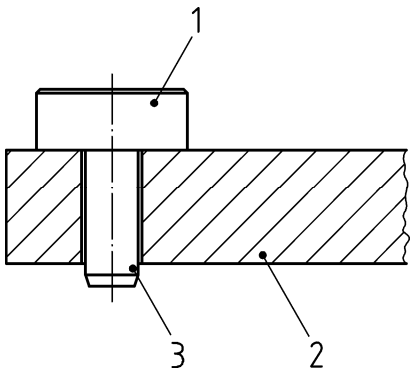
3.8
rated load
maximum load that a lift has been designed to carry

3.9
load carrying device
Part(s) of the vehicle lift which supports the load either by direct contact with the vehicle or through contact with pick-up plates or pads.

Load carrying devices include tracks, carrying arms or other mechanical devices designed to raise and support a vehicle by designated lifting points.

3.10
carrying arm
Load carrying device attached at one end, directly or indirectly to the lifting element and supporting the load at its other end. Carrying arms are usually used on two column lifts.

3.11
pick-up plate
part of the load carrying device, e.g. on two column lifts with carrying arms, which has direct contact to the vehicle and which has an assigned position on the load carrying device (see figure 1)



Key

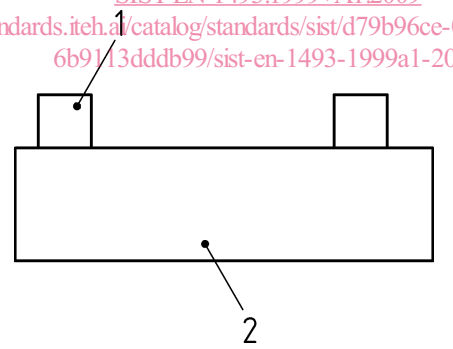
1 pick-up plate

2 load carrying device

3 pin

Figure 1 — Pick-up plate

3.12
pick-up pad
vehicle supporting pad which has direct contact with the vehicle but which does not have an assigned position, e.g. pads used on wheel free systems with platforms (see figure 2)



Key

1 pick-up pad

2 platform

Figure 2 — Pick-up pad

3.13
lifting element
Medium through which the force is transmitted from the power source to the load carrying device. Lifting elements include hydraulic and pneumatic cylinders, lead screw and nut systems as well as any flexible connections such as steel wire ropes and chains.

3.14
catching device
device which holds the load carrying device in case of failure of the lifting element

3.15
re-raising prevention device
device which prevents re-raising of the load carrying device from the initial position in the event of failure of the lifting element

3.16
unauthorised use
use by a person who has not received permission to operate the lift and instruction on its safe operation

3.17
hold-to-run control
control device which initiates and maintains operation of machine elements only as long as the manual control (actuator) is actuated and the manual control (actuator) automatically returns to the stop position when released ⟨A1⟩ (see 3.26.3 of EN ISO 12100-1:2003) ⟨A1⟩

3.18
braking

3.18.1
automatic brake
Braking device which is normally held on and which is released only by application of power. Operation is also instigated automatically by releasing the lift controls and by interruption of the power supply.

3.18.2
self braking system
system which, due to its inherent resistance to movement, stops the movement of the load carrying device when the drive power is interrupted

3.19
safety switch
Switch in which the opening contacts are directly connected to the control mechanism without springs or flexible elements. The whole of the specified opening of the contacts shall be achieved by operation of the control mechanism through its intended travel using the force stated by the manufacturer of the switch (see clause 2.1 of EN 60947-5-1:1991).

3.20
normative vehicle
road vehicle used for calculations in 5.6

3.21
wheel track
distance between the centre lines of the wheels on one axle or between centre lines of wheel pairs on twin wheel axles

3.22
wheel base
distance between the centres of wheels of front and rear axle or from the centre of the wheels on the front axle to a point mid way between axle pairs on twin axle vehicles

4 List of hazards

The following hazards from Annex A of EN 414:1992 are applicable in the situations described and could involve risks to persons if not reduced or eliminated. The corresponding requirements are designed to limit the risk or reduce these hazards in each situation.

"Not applicable" in table 1 means that this hazard does not exist on vehicle lifts.

"Not significant" in table 1 means that this hazard can exist on vehicle lifts, but it causes no risk to persons.

Table 1 — List of hazards

HAZARDS		CORRESPONDING REQUIREMENT
1	Mechanical hazards	5.6/5.8/5.16.1
1.1	Crushing hazards	5.2.1/5.5.1/5.5.2/5.16
1.2	Shearing hazard	5.2.1/5.5.1/5.5.2/5.16
1.3	Cutting or severing hazard	5.7.3.3/5.17
1.4	Entanglement hazard	5.3.3
1.5	Drawing-in or trapping hazard	5.3.4
1.6	Impact hazard	5.4, 5.7.3.1/5.7.3.2/5.10/5.11/5.12/5.13
1.7	Stabbing or puncture hazard	not applicable
1.8	Friction or/abrasion hazard	not applicable
1.9	High pressure fluid injection hazard	5.7.4.1/5.7.4.3/5.18.3
1.10	Ejection of parts (of machinery and processed material/workpieces)	not applicable
1.11	Loss of stability (of machinery and machine parts)	5.6.6
1.12	Slip, trip and fall hazards in relationship with machinery (because of their mechanical nature)	5.7.3.4/5.9
2	Electrical hazards	
2.1	Electrical contact (direct or indirect)	5.20.1,5.20.3
2.2	Electrostatic phenomena	not applicable
2.3	Thermal radiation or other phenomena such as ejection of molten particles, and chemical effects from short-circuits, overloads, etc.	not applicable
2.4	External influences on electrical equipment	5.20.1
3	Thermal hazards resulting in :	
3.1	Burns and scalds, by a possible contact of persons, by flames or explosions and also by the radiation of heat sources	not applicable
3.2	Health-damaging effects by hot or cold work environment	not applicable

Table 1 (*continued*)

HAZARDS		CORRESPONDING REQUIREMENT
4	Hazards generated by noise	
4.1	hearing losses (deafness), other physiological disorders (e.g. loss of balance, loss of awareness, etc.)	not significant
4.2	interferences with speech communication, acoustic signals, etc.	not applicable
5	Hazards generated by vibration (resulting in a variety of neurological and vascular disorders)	not applicable
6	Hazards generated by radiation, especially by:	
6.1	electrical arcs	not applicable
6.2	lasers	not significant
6.3	ionizing radiation sources	not applicable
6.4	machines making use of high frequency electromagnetic fields	not applicable
7	Hazards generated by materials and substances processed, used or exhausted by machinery	
7.1	Hazards resulting from contact with or inhalation of harmful fluids, gases, mists, fumes and dust	5.7.4
7.2	Fire or explosion hazard	not applicable
7.3	Biological and micro-biological (viral or bacterial) hazards	not applicable
8	Hazards generated by neglecting ergonomic principles in machine design (mismatch of machinery with human characteristics and abilities) caused for example by	5.3/5.15.3
8.1	unhealthy postures or excessive efforts	5.15.5, 5.19
8.2	inadequate consideration of human hand-arm or foot-leg anatomy	5.3.1
8.3	neglected use of personal protection equipment	not applicable
8.4	inadequate area lighting	not applicable
8.5	mental overload or underload, stress, etc.	not applicable
8.6	human error	5.1/5.2.1/5.2.2/5.2.3/5.2.4/5.2.5
9	Hazards combinations	not applicable

Table 1 (*continued*)

HAZARDS		CORRESPONDING REQUIREMENT
10	Hazards caused by failure of energy supply, breaking down of machinery parts and other functional disorders	
10.1	failure of energy supply (of energy and/or control circuits)	5.7.4.4/5.7.4.5/5.7.4.6/5.7.5.4/5.7.5.5 5.7.5.6/5.14
10.2	unexpected ejection of machine parts or fluids	5.7.4.2/5.7.4.7/5.7.5.1/5.7.5.2/5.7.5.3
10.3	failure, malfunction of control system (unexpected start up, unexpected overrun)	5.2.1/5.7.1
10.4	errors of fitting	7.3.1
10.5	overturn, unexpected loss of machine stability	5.6.6
11	Hazards caused by (temporary) missing and/or incorrectly positioned safety-related measures/means.	
11.1	all kinds of guard	5.9/5.16.3
11.2	all kinds of safety related (protection) devices	5.6.5.1/5.16.3/5.17
11.3	starting and stopping devices	5.7.2
11.4	safety signs and signals	5.2.4
11.5	all kinds of information or warning devices	7.2/7.3
11.6	energy supply disconnecting devices	5.20.1, 5.20.2, 5.20.3
11.7	emergency devices	5.3.5
11.8	feeding/removal means of workpieces	not applicable
11.9	essential equipment and accessories for safe adjusting and/or maintaining	7.3
11.10	equipment evacuating gases, etc	not applicable
	HAZARDS DUE TO MOBILITY	
12	Inadequate lighting of moving/working area	5.3.1/5.3.3
13	Hazards due to sudden movement, instability etc. during handling	5.15.1/5.15.2
14	Inadequate/inergonomic design of driving/operating position	5.3.1
14.1	Hazards due to dangerous environments (contact with moving parts, exhaust gases etc.)	not applicable
14.2	inadequate visibility from driver's/operator's position	not applicable
14.3	inadequate seat/seating (seat index point)	not applicable

Table 1 (*concluded*)

HAZARDS		CORRESPONDING REQUIREMENT
14.4	inadequate/inergonomic design/positioning of controls	5.3.1
14.5	- starting/moving of self-propelled machinery	5.15.1/5.15.2
14.6	- road traffic of self-propelled machinery	not applicable
14.7	- movement of pedestrian controlled machinery	5.15.3
15	Mechanical hazards.	
15.1	hazards to exposed persons due to uncontrolled movement	5.15.1
15.2	hazards due to break-up and/or ejection of parts	not applicable
15.3	hazards due to rolling over (deflection limiting volume; DVL)	not applicable
15.4	hazards due to falling objects	not applicable
15.5	inadequate means of access	5.9
15.6	hazards caused due to towing, coupling, connecting, transmission etc.	not applicable
15.7	hazards due to batteries, fire, emissions etc.	5.20.3, 5.20.4
	HAZARDS DUE TO LIFTING OPERATION	
16.1	lack of stability	5.6
16.2	derailment of machinery	5.15.4
16.3	loss of mechanical strength of machinery and lifting accessories	5.6.5
16.4	hazards caused by uncontrolled movement	5.7.1/5.7.2/5.3.5
16.5	hazards due to falling loads	5.8.3, 5.8.5.1, 5.12, 7.3.1
17	Inadequate view of trajectories of the moving parts	5.33
18	hazards caused by lighting	5.33
19	hazards due to loading/overloading	5.7.4.1/5.7.5.2