SLOVENSKI STANDARD
SIST EN 1493:2010

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Dvigala za servisiranje vozil

Vehicle lifts

Fahrzeug-Hebebühnen

Élévateurs de véhicules

Ta slovenski standard je istoveten z: **EN 1493:2010**

ICS:

43.180	Diagnostična, vzdrževalna in preskusna oprema	Diagnostic, maintenance and test equipment
53.020.99	Druga dvigalna oprema	Other lifting equipment

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Vehicle lifts

Elévateurs de véhicules

Fahrzeug-Hebebühnen

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Foreword

This document (EN 1493:2010) 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of an identical text or by endorsement, at the latest by February 2011, and conflicting national standards shall be withdrawn at the latest by February 2011.

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This document supersedes EN 1493:1998+A1:2008.

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).

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

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, Croatia, 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 the United Kingdom.

Introduction

This document is a type C standard as stated in EN ISO 12100-1:2003.

The machinery concerned and the extent to which hazards, hazardous situations and hazardous events are covered are indicated in the scope of this document. In addition, machinery should comply as appropriate with EN ISO 12100-1 for hazards which are not covered by this 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.

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 authorized persons operate the vehicle lifts and that the working area is sufficiently lit.

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.

1 Scope

This European 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.

This document is applicable to vehicle lifts which are manufactured ½ year after the date of its publication as EN.

2 Normative references

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 982:1996+A1:2008, *Safety of machinery — Safety requirements for fluid power systems and their components — Hydraulics*

EN 983:1996+A1:2008, *Safety of machinery — Safety requirements for fluid power systems and their components — Pneumatics*

EN 60204-1:2006, *Safety of machinery — Electrical equipment of machines — Part 1: General requirements (IEC 60204-1:2005, modified)*

EN 60204-32:2008, *Safety of machinery — Electrical equipment of machines — Part 32: Requirements for hoisting machines (IEC 60204-32:2008)*

EN 60529:1991, *Degrees of protection provided by enclosures (IP Code) (IEC 60529:1989)*

EN 60947-5-1:2004, *Low-voltage switchgear and controlgear — Part 5-1: Control circuit devices and switching elements — Electromechanical control circuit devices (IEC 60947-5-1:2003)*

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 13849-1:2008, *Safety of machinery — Safety-related parts of control systems — Part 1: General principles for design (ISO 13849-1:2006)*

EN ISO 13849-2:2008, *Safety of machinery — Safety-related parts of control systems — Part 2: Validation (ISO 13849-2:2003)*

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

ISO 4308-1:2003, *Cranes and lifting appliances — Selection of wire ropes — Part 1: General*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in EN ISO 12100-1:2003 and the following 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

NOTE 1 The guidance of the load carrying device is given by the supporting structure.

NOTE 2 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.

NOTE 3 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 4 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 referring to the normative vehicle or to special vehicles mentioned in 5.7.4.4

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

EXAMPLE 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

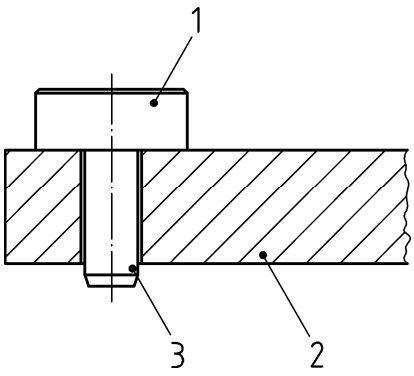
NOTE Carrying arms are usually used on two column lifts.

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

NOTE See Figure 1.

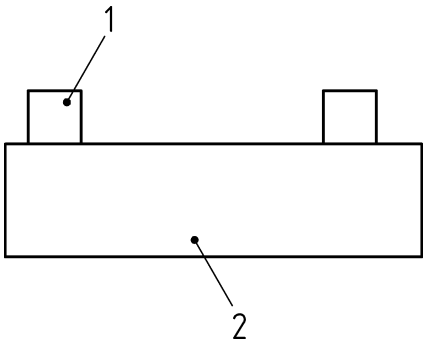
3.12
pick-up pad
vehicle supporting pad which has direct contact with the vehicle but which does not have an assigned position, e.g. pads used on wheel free systems with platforms

NOTE See Figure 2.



Key
1 pick-up plate
2 load carrying device
3 pin

Figure 1 — Pick-up plate



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

NOTE 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 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
braking

3.17.1
automatic brake
braking device which is normally held on and which is released only by application of power

NOTE Operation is also instigated automatically by releasing the lift controls and by interruption of the power supply.

3.17.2
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

3.18
safety switch
switch in which the opening contacts are directly connected to the control mechanism without springs or flexible elements

NOTE The whole of the specified opening of the contacts should be achieved by operation of the control mechanism through its intended travel using the force stated by the manufacturer of the switch (see K.2.1 of EN 60947-5-1:2004).

3.19
normative vehicle
road vehicle used for calculations in 5.7

3.20
wheel track
distance between the centre lines of the wheels on one axle or between centre lines of wheel pairs on twin wheel axles

3.21
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

3.22
multiple lifting units
combination of independent couples of mobile column lifts or two or more vehicle lifts

3.23
wheel free system
lifting unit which is used in conjunction with a pit or vehicle lift with platform lifting the whole vehicle and allows the wheels to be removed

4 List of hazards

Table 1 contains a list of hazards which 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**	**5.7, 5.9, 5.17.1**
1.1	Crushing hazards	5.3.1, 5.6.1, 5.6.2, 5.17
1.2	Shearing hazard	5.3.1, 5.6.1, 5.6.2, 5.17
1.3	Cutting or severing hazard	5.8.3.3, 5.18
1.4	Entanglement hazard	5.4.3
1.5	Drawing-in or trapping hazard	5.4.4
1.6	Impact hazard	5.5, 5.8.3.1, 5.8.3.2, 5.11, 5.12, 5.13, 5.14
1.7	Stabbing or puncture hazard	not applicable
1.8	Friction or abrasion hazard	not applicable
1.9	High pressure fluid injection hazard	5.8.4.2, 5.8.4.4, 5.19.3
1.10	Ejection of parts (of machinery and processed materials/work pieces)	not applicable
1.11	Loss of stability (of machinery and machine parts)	5.7.6
1.12	Slip, trip and fall hazards in relationship with machinery (because of their mechanical nature)	5.10
2	**Electrical hazards**	
2.1	Electrical contact direct or indirect	5.21.1, 5.21.3
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	5.21.1
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
4	**Hazards generated by noise**	
4.1	Hearing losses (deafness), other physiological disorders (e.g. loss of balance, loss of awareness, etc.)	see Annex G

Table 1 — List of hazards *(continued)*

Hazards		Corresponding Requirement
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	Ionising 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	5.8.4
7.2	Fire or explosion hazard	not applicable
7.3	Biological and microbiological (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:**	**5.4, 5.16.3**
8.1	Unhealthy postures or excessive efforts	5.16.5, 5.20
8.2	Inadequate consideration of human hand-arm or foot-leg anatomy	5.4.1
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	5.2, 5.3.1, 5.3.2, 5.3.3, 5.3.4, 5.3.5
9	**Hazards combinations**	**not applicable**
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).	5.8.4.5, 5.8.4.6, 5.8.4.7, 5.8.5.5, 5.8.5.6, 5.8.5.7, 5.14
10.2	Unexpected ejection of machine parts or fluids	5.8.4.3, 5.8.4.8, 5.8.5.2, 5.8.5.3, 5.8.5.4
10.3	Failure/disorder of control system (unexpected start up, unexpected overrun)	5.3.1, 5.8.1
10.4	Errors of fitting	7.3.1
10.5	Overturn, unexpected loss of machine stability	5.7.6
11	**Hazards caused by (temporary) missing and/or incorrect positioned safety related measures/means**	
11.1	All kinds of guard	5.10, 5.17.3

Table 1 — List of hazards *(continued)*

Hazards		Corresponding Requirement
11.2	All kinds of safety related (protection) devices	5.7.5.1, 5.17.3, 5.18
11.3	Starting and stopping devices	5.8.2
11.4	Safety signs and tags	5.3.4
11.5	All kinds of information or warning devices	7.2, 7.3
11.6	Energy supply disconnecting devices	5.21.1, 5.21.2, 5.21.3
11.7	Emergency devices	5.4.5
11.8	Feeding/removal means of work pieces	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**	**5.4.1, 5.4.3**
13	**Hazards due to sudden movement, instability etc. during handling**	**5.16.1, 5.16.2**
14	**Inadequate/inergonomic design of driving/operating position**	**5.4.1**
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
14.4	Inadequate/inergonomic design/positioning of controls	5.4.1
14.5	Starting/moving of self-propelled machinery	5.16.1, 5.16.2
14.6	Road traffic of self-propelled machinery	not applicable
14.7	Movement of pedestrian controlled machinery	5.16.3
15	**Mechanical hazards**	
15.1	Hazards to exposed persons due to uncontrolled movement	5.16.1
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	5.10
15.6	Hazards caused due to towing, coupling, connecting, transmission etc.	not applicable
15.7	Hazards due to batteries, fire, emissions, etc.	5.21.3, 5.21.4
HAZARDS DUE TO LIFTING OPERATION		
16.1	Lack of stability	5.7
16.2	Derailment of machinery	5.16.4