

ANSI/SAIA A92.10 – 2009 (R2014)

AMERICAN NATIONAL STANDARD

for
Transport Platforms



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ANSI/SAIA
A92.10-2009
(R2014)

AMERICAN NATIONAL STANDARD
for TRANSPORT PLATFORMS

Secretariat
Scaffold & Access Industry Association, Inc.

Approved December 17, 2014
American National Standards Institute, Inc

AMERICAN NATIONAL STANDARD

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FOREWORD

This foreword is not part of American National Standard for Transport Platforms, ANSI/SAIA A92.10-2009 (R2014).

This standard is one of a series on aerial platforms developed under the committee procedures of the American National Standards Institute. The A92 standards committee was organized by the Institute in 1948. The Scaffold & Access Industry Association, Inc. serves as Secretariat.

The primary objective of this standard is to prevent accidents associated with the use of Transport Platforms by establishing requirements for design manufacture, installation, maintenance, performance, use and training.

Interpretations and Suggestions for Improvement

All inquiries requesting interpretation of the Committee’s approved American National Standards must be in writing and directed to the Secretariat. The A92 Committee shall approve the interpretation before submission to the inquirer. No one but the A92 Committee is authorized to provide any interpretation of this standard.

The A92 Committee solicits comments on and criticism of the requirements of the standards. The standards will be revised from time to time where necessary or desirable, as demonstrated by the experience gained from the application of the standards. Proposals for improvement of this standard will be welcome. Proposals should be as specific as possible, citing the paragraph number(s), the proposed wording, and a detailed rationale for the proposal including any pertinent documentation.

All requests for interpretation and all suggestions for improvement shall be forwarded in writing to the ASC A92 Committee, c/o Secretariat ~ Scaffold & Access Industry Association, 400 Admiral Boulevard, Kansas City, MO 64106

This Standard was processed and approved for submittal to ANSI by Accredited Standards Committee Aerial Platforms, A92 Aerial Work Platforms. The ASC A92 committee approval of the standard does not necessarily imply that all committee members voted for its approval. At the time the ASC A92 committee approved this standard, the A92 Aerial Work Platforms Committee had the following members:

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1 Scope, purpose and application

1.1 Scope

This standard applies to Transport Platforms that are primarily used as a tool of the trade to vertically transport authorized persons, along with materials and necessary tools, to various access levels on a building or structure for construction, renovation, maintenance or other types of work. (See Figure I and Figure II on the following pages for typical examples of equipment covered). Some of the key requirements of this standard include, but are not limited to the following:

- a) Only authorized persons as defined by this Standard are permitted to be on the Transport Platform. The authorized persons shall have the necessary knowledge or experience or shall have received training prior to being on the Transport Platform. As a minimum, the training for Transport Platforms shall be the same as training requirements for scaffolds as set out in OSHA-CFR Subpart L, Scaffolds -1926.454 -Training Requirements.¹ (end of document)
- b) the maximum number of authorized persons permitted on the platform shall be limited to the number equaling no more than 50% of the platform rated load capacity at 200 lbs per person
- c) the maximum vertical travel speed of the Transport Platform shall not exceed 40 ft/min (12 m/min)
- d) the Transport Platform shall operate at a safe minimum travel distance of 18 in. (0.46 m) from the building or structure
- e) the Transport Platform shall be operated from controls located on the platform by an authorized person trained by a competent person

1.2 Application

1.2.1

This standard is applicable to transport platforms elevated by a mechanical drive system and guided by and moving along their supporting masts, where the mast requires lateral restraint from separate supporting structures.

1.2.2

This standard is applicable to any combination of the

following alternatives:

- a) one or more masts
- b) mast of fixed or variable length
- c) vertical masts or inclined between 0° and 30° to the vertical
- d) driven using electric, pneumatic, hydraulic motors or internal combustion engines

1.3 Effective Dates

The design and manufacturing requirements of this standard apply to all Transport Platforms manufactured on or after the effective date of this standard. All other provisions of this standard apply to both new and existing units delivered by sale, lease, rental or for any form of beneficial use on or after the effective date.

1.4 Requirements

Requirements of this standard are meant to:

- a) assist in the prevention of personal injuries and accidents.
- b) establish the criteria for design, manufacture, performance, inspection, training, maintenance, testing and operation.
- c) allow designers, manufacturers, dealers, owners, authorized persons, users, lessors, and lessees to establish and understand their respective responsibilities.

1.5 Exclusions

This standard does not specify the requirements for dealing with the hazards involved in the maneuvering, erection or dismantling, fixing or removing of any materials or equipment that are not part of the Transport Platform. Neither does it deal with the handling of specific hazardous materials.

1.6

This standard specifically deals with the requirements for delivering authorized persons and materials to fixed landing levels.

1.7

Transport Platforms are generally intended for use over level surfaces. Normally, they are not intended for use near electrically energized circuits nor are

they intended to be used in hazardous locations. Thus, when such service is intended, special design considerations must be worked out between the manufacturer and user and the limits of safe use must be specifically stated in written instructions.

1.8 Equipment Not Covered

This standard does not apply to equipment listed below:

- a) Ladder and ladder stands such as those covered in American National Standards for Ladder and Ladder Stands, ANSI A14 series.
- b) Temporary construction elevators such as those covered in Safety Requirements for Personnel Hoists and Employee Elevators for Construction and Demolition Operations, ANSI A10.4.
- c) Material hoist such as those covered in Safety Requirements for Material Hoists – American National Standard for Construction and Demolition Operations, ANSI A10.5.
- d) Scaffolding such as those covered in American National Standard for Construction and Demolition Operations Scaffolding Safety Requirements, ANSI A10.8 .
- e) Vehicle mounted elevating and rotating aerial platforms such as those covered in American National Standard for Vehicle-Mounted Elevating and Rotating Aerial Devices, ANSI/SIA A92.2.
- f) Non self propelled elevating aerial platforms such as those covered in American National Standard for Manually Propelled Elevating Aerial Platforms, ANSI/SIA A92.3.
- g) Self propelled elevating aerial platforms such as those covered in American National Standards for Boom-Supported Elevating Work platforms, ANSI/SIA A92.5.
- h) Self propelled elevating aerial platforms such as those covered in American National Standard for Self-Propelled Elevating Work platforms, ANSI/SIA A92.6.
- i) Safety requirements for airline ground support vehicle mounted vertical lift devices, American National Standard for Airline Ground Support Vehicle Mounted Vertical Lift Devices, ANSI/SIA A92.7.
- j) Vehicle Mounted Bridge Inspection and Maintenance Devices, ANSI/SIA A92.8.
- k) Mast-climbing work platforms such as those

covered in American National Standard for Mast-Climbing Work Platforms, ANSI/SIA A92.9.

- l) Suspended Powered Platforms for Exterior Building Maintenance, ANSI A120.1.
- m) Vertically adjustable equipment used primarily to raise and lower materials and equipment from one elevation to another such as American National Standards in the A17 and B56 series.
- n) Fire fighting equipment such as that covered in American National Standard for Automotive Fire Apparatus, ANSI/NFPA 1901.
- o) Construction and demolition operation digger derricks such as those covered in American National Standard for Construction and Demolition Digger Derricks Safety Requirements, Definitions and Specifications, ANSI A10.31.

1.9 References & related standards

1.9.1 Reference Standards

This standard is intended to be used in conjunction with the following Standards. When these referenced standards are superseded by a revision approved by the Appropriate authority, the revision shall apply to Transport Platforms manufactured on or after the effective date of the revision:

ANSI Z535.1 Safety Colors.

ANSI Z535.3 Criteria for Safety Symbols.

ANSI Z535.4 Product Safety Signs and Labels.

ANSI/ASME B15.1 Safety Standard for Mechanical Power Transmission Apparatus.

ANSI/AWS D1.1 Structural Welding Code Steel.

ANSI/AWS D1.2 Structural Welding Code Aluminum.

ANSI/NFPA 70 National Electrical Code.

ANSI/NFPA 505 Powered Industrial Trucks, Including Type Designations, Areas of Use, Maintenance, and Operation

AISC-ASD Manual of Steel Construction-Allowable Stress Design

AISC-LRFD Load and Resistance Factor Design Specification for Structural Steel Buildings

ANSI/ASCE 7-02 Minimum Design Loads for Buildings and Other Structures

ANSI/NFPA 1901 Automotive Fire Apparatus

ANSI/ABMA 9 Load Ratings and Fatigue Life for Ball Bearings

ASTM A535 Standard Specifications for Special-Quality Ball and Roller Bearings Steel

ASTM A295 Standard Specifications for High-Carbon Anti-Friction Bearing Steel

SAE J514 Hydraulic Tubes Fittings

SAE J517D Hydraulic Hoses

ISO 76 Rolling Bearings-Static Load Ratings

ISO 281 Rolling Bearings-Dynamic Load Ratings And Rating Life

ASTM SI 10-02 Metric Practice Guide

OSHA-CFR Subpart L Scaffolds 1926.450

1.9.2 Related Standards

The standards listed here are for information only and are not essential for the completion of the requirements of this standard:

ANSI/SIA A92.2 Vehicle Mounted Elevating and Rotating Aerial Devices

ANSI/SIA A92.3 Manually Propelled Elevating Aerial Platforms

ANSI/SIA A92.5 Boom Supported Elevating Work Platforms

ANSI/SIA A92.6 Self Propelled Elevating Work Platforms

ANSI/SIA A92.7 Airline Ground Support Vehicle Mounted Vertical Lift Devices

ANSI/SIA A92.8 Vehicle Mounted Bridge Inspection and Maintenance Devices.

ANSI/SIA A92.9 Mast Climbing Work Platforms

1.9.3 Referenced Scaffold Industry Association Publication(s)

The standard is intended to be used in conjunction with the following SIA publication(s):

ANSI/SIA A92.10 Manual of Responsibilities for Dealers, Owners, Users, Operators, Lessors, Lessees and Brokers of Transport Platforms.

1.9.4 Related Scaffold Industry Association publication(s)

The publications listed here are for information only and are not essential for the completion of the requirements of this standard.

ANSI/SIA A92.2 Manual of Responsibilities for Dealers, Owners, Users, Operators, Lessors, Lessees and Brokers of Vehicle Mounted Elevating and Rotating Aerial Devices

ANSI/SIA A92.3 Manual of Responsibilities for Dealers, Owners, Users, Operators, Lessors, Lessees and Brokers of Manually Propelled Elevating Aerial Platforms

ANSI/SIA A92.5 Manual of Responsibilities for Dealers, Owners, Users, Operators, Lessors, Lessees and Brokers of Boom Supported Elevating Work Platform

ANSI/SIA A92.6 Manual of Responsibilities for Dealers, Owners, Users, Operators, Lessors, Lessees and Brokers of Self Propelled Elevating Work Platforms

ANSI/SIA A92.8 Manual of Responsibilities for Dealers, Owners, Users, Operators, Lessors, Lessees and

Brokers of Vehicle Mounted Bridge Inspection and Maintenance Devices

ANSI/SIA A92.9 Manual of Responsibilities for Dealers, Owners, Users, Operators, Lessors, Lessees and Brokers of Mast Climbing Work Platforms

1.10 Definitions

For the purposes of this standard the following definitions apply:

Note: The terms which are used in this standard, with reference to the definitions below, are indicated in figure I and figure II.

1.10.1 Attachment: The provision for lateral support consisting of a tie assembly and connection points.

1.10.2 Authorized personnel (authorized person): Personnel approved or assigned to perform a specific type of duty or duties at a specific location or locations at a work site.

1.10.3 Automatic brake: A device to decelerate and stop moving parts in case of interruption of the power supply.

1.10.4 Available platform area: The area of the Transport Platform measured at the platform floor level.

1.10.5 Base frame: The part of the Transport Platform which provides support for the mast and elevating assembly.

1.10.6 Broker: An independent business entity or person that arranges a lease or transfer of ownership of a Transport Platform, but does not own the Transport Platform. If the entity or person is an employee of the buyer, seller, lessor or lessee of the Transport Platform, he shall not be considered a broker.

1.10.7 Buffer: A device designed to stop the vertical movement of the platform beyond its normal limit of travel by storing or by absorbing and dissipating the kinetic energy of the platform.

1.10.8 Chassis: The part of the Transport Platform which provides mobility and support for the mast and elevating assembly.

1.10.9 Competent person: One who is capable of identifying existing and predictable hazards in the surroundings or working conditions that are unsanitary, hazardous or dangerous to employees and who has the authority to take prompt corrective measures to eliminate such hazards.

1.10.10 Counter roller: A roller used to counteract the gear meshing separation forces between a rack and pinion.

1.10.11 Dealer: A person or entity who buys, rents or leases from a manufacturer or distributor and who generally sells, rents, erects, and services Transport Platforms.

1.10.12 Delivery: Transfer of care, control and custody of the Transport Platform from one person or entity to another person or entity.

1.10.13 Elevating assembly: The platform, drive mechanisms, and all other components that travel on the mast.

1.10.14 Equivalent entity: An organization, agency, or individual who, by possession of an appropriate technical degree, certificate, professional standing, or skill, and who, by knowledge, training, and experience, has equivalent ability to deal with the problems relating to the subject matter, the work or the project of the entity referenced.

1.10.15 Guardrail system: A vertical barrier intended to protect personnel and objects from falling to lower levels.

1.10.16 Guides: The parts of the mast, which provide guiding for the Transport Platform.

1.10.17 Hazardous location: Any location that contains, or has the potential to contain, an explosive or flammable atmosphere as defined in

ANSI/NFPA 505 Powered Industrial Trucks.

1.10.18 Instability: A condition in which the sum of the moments which tend to overturn the Transport Platform exceeds the sum of the moments tending to resist overturning.

1.10.19 Interlock: A control or mechanism that, under specified conditions, automatically allows or prevents the operation of another control or mechanism.

1.10.20 Landing level safety gate: A sliding or hinged portion of the landing level guardrail protection that closes the platform access opening and provides access to or from the platform and landing level.

1.10.21 Lessee: A person(s) or entity to whom a Transport Platform is provided by lease, rental, loan, or other arrangement. A lessee may also be a dealer, owner, user or operator.

1.10.22 Lessor: A person(s) or entity who leases, rents, loans, or otherwise provides a Transport Platform to another party for the beneficial use of that party (the user). A lessor may also be a dealer, owner, lessee, user or operator.

1.10.23 Load diagram: A notice displayed on the Transport Platform showing the permitted number of persons and/or the weight and distribution of materials for the particular configuration.

1.10.24 Main platform: That part of the Transport Platform which is built up using primary structural elements.

1.10.25 Manual of Responsibilities: A document containing the definitions (Section 3) and the requirements mandated in this Standard for the following entities: Dealers (Section 5.3); Owners (Section 5.4); Users (section 5.5); Operators (Section 5.6); Lessors (section 5.7); and Lessees (Section 5.8); and Brokers (Section 5.9).

1.10.26 Manufacturer: A person or entity who makes, builds or produces a Transport Platform.

1.10.27 Mast: A structure that supports and guides the platform.

1.10.28 Mast tie: The system used to provide lateral restraint to the mast from the building or other structure.

1.10.29 Modification, modified: To make a change(s) to a Transport Platform which affects the operation, stability, safety factors, or rated load of the Transport Platform in any way.

1.10.30 Operator: An authorized person qualified to control the movement of a Transport Platform.

1.10.31 Outriggers: Supports at the base frame level or chassis; used to maintain or increase the stability of the Transport Platform within specified conditions. Outriggers may also be used for leveling.

1.10.32 Outrigger beam: That part of an outrigger assembly that moves in a substantially horizontal plane and may be powered or operated manually.

1.10.33 Overspeed: Any speed above rated speed.

1.10.34 Overspeed detector: A device which, when the transport platform attains a predetermined speed above the rated speed, causes the overspeed safety device to be applied.

1.10.35 Overspeed safety device: A mechanical device for stopping and maintaining the Transport Platform stationary on the mast in the event of overspeed.

1.10.36 Owner: A person or entity that has possession of a Transport Platform by virtue of proof of purchase or legal possession of a Transport Platform.

1.10.37 Platform: The vertical traveling part of the installation upon which the persons, equipment and materials are carried from level to level. This is as

1.10.38 Platform height: The vertical distance measured from the floor of the platform to the surface upon which the Transport Platform is being supported.

1.10.39 Qualified person: One who by possession of a recognized degree, certificate, or professional standing, or who by extensive knowledge, training and experience, has successfully demonstrated the ability to solve or resolve problems relating to the subject matter, the work, or the project.

1.10.40 Ratchet drive system: A drive system that operates by attaching a ratcheting device to the rungs or other element of the mast in an alternating manner and elevates or lowers the platform a predefined distance. The platform may be supported by a pawl or similar device while the drive mechanism is not engaged.

1.10.41 Rack & pinion drive: A drive system using a gearing arrangement consisting of a cylindrical gear (pinion) which engages a linear gear (rack) attached to the mast.

1.10.42 Rated load: The load for which the Transport Platform has been designed to carry in normal operation as stated in the load diagram.

1.10.43 Rated speed: The vertical or horizontal speed for which the transport platform has been designed.

1.10.44 Remanufacture: The modification of a transport platform, either by the original manufacturer or entity authorized by the manufacturer, so that the transport platform will comply with the ANSI standard in effect on the date the modification is complete.

1.10.45 Re-rent: A transaction in which an entity not owning the Transport Platform benefits in some manner by arranging its utilization by a user.

1.10.46 Screw drive system: A drive system that consists of a mast-mounted rack which meshes

with a powered drive screw attached to the platform. Rotation of the powered drive screw elevates or lowers the platform.

1.10.47 Shall: The word shall is to be understood as mandatory.

1.10.48 Stability: A condition in which the sum of the moments that tend to overturn the Transport Platform is less than the sum of the moments tending to resist overturning.

1.10.49 Stabilizers: Devices that increase the stability of the Transport Platform, and are not capable of lifting and leveling the Platform.

1.10.50 Transfer: Any horizontal movement of the Transport Platform from one position to another on the same working site.

1.10.51 Transfer condition: The configuration of the Transport Platform in which the Transport Platform is moved from one position to another on the same working site.

1.10.52 Transfer and transport interlocks: Any design features on the Transport Platform that prevent unsafe transfer or transportation.

1.10.53 Transfer and transport loads and forces: Inertia forces plus any load permitted by the manufacturer on the Transport Platform shall be taken into account when the transport platform is subject to transfer conditions. Including any limitation on the weather and the load or person on the transport platform.

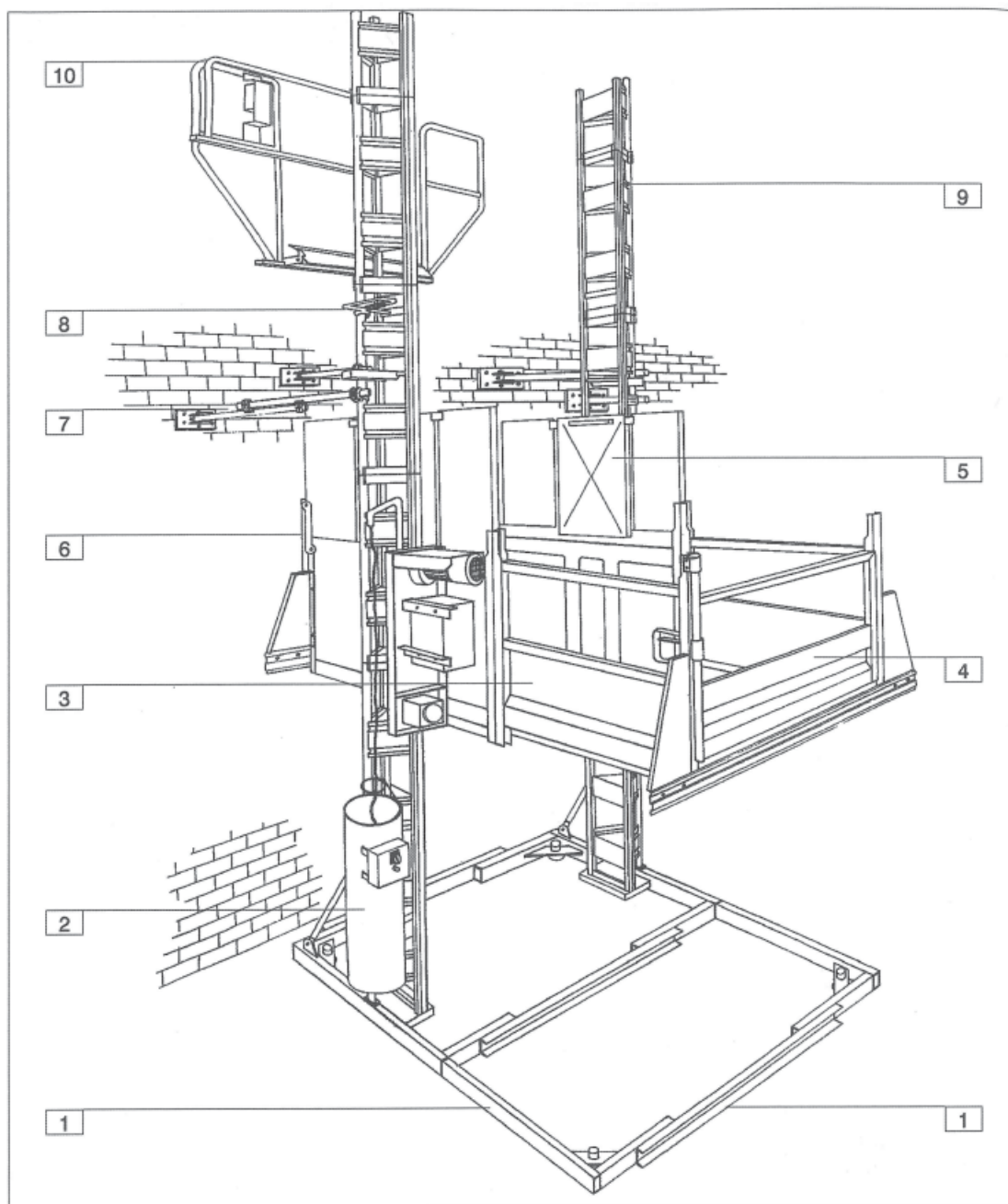
1.10.54 Transport: Any movement of the Transport Platform outside the boundaries of the working site.

1.10.55 Transport condition: The configuration of the Transport Platform in which the Transport Platform is moved outside the boundaries of the working site (for example road transport).

1.10.56 User: A person or entity that has care custody and control of the Transport Platform. This person or entity may also be the employee of the operator, a dealer, owner, Lessor, lessee, broker or the operator.

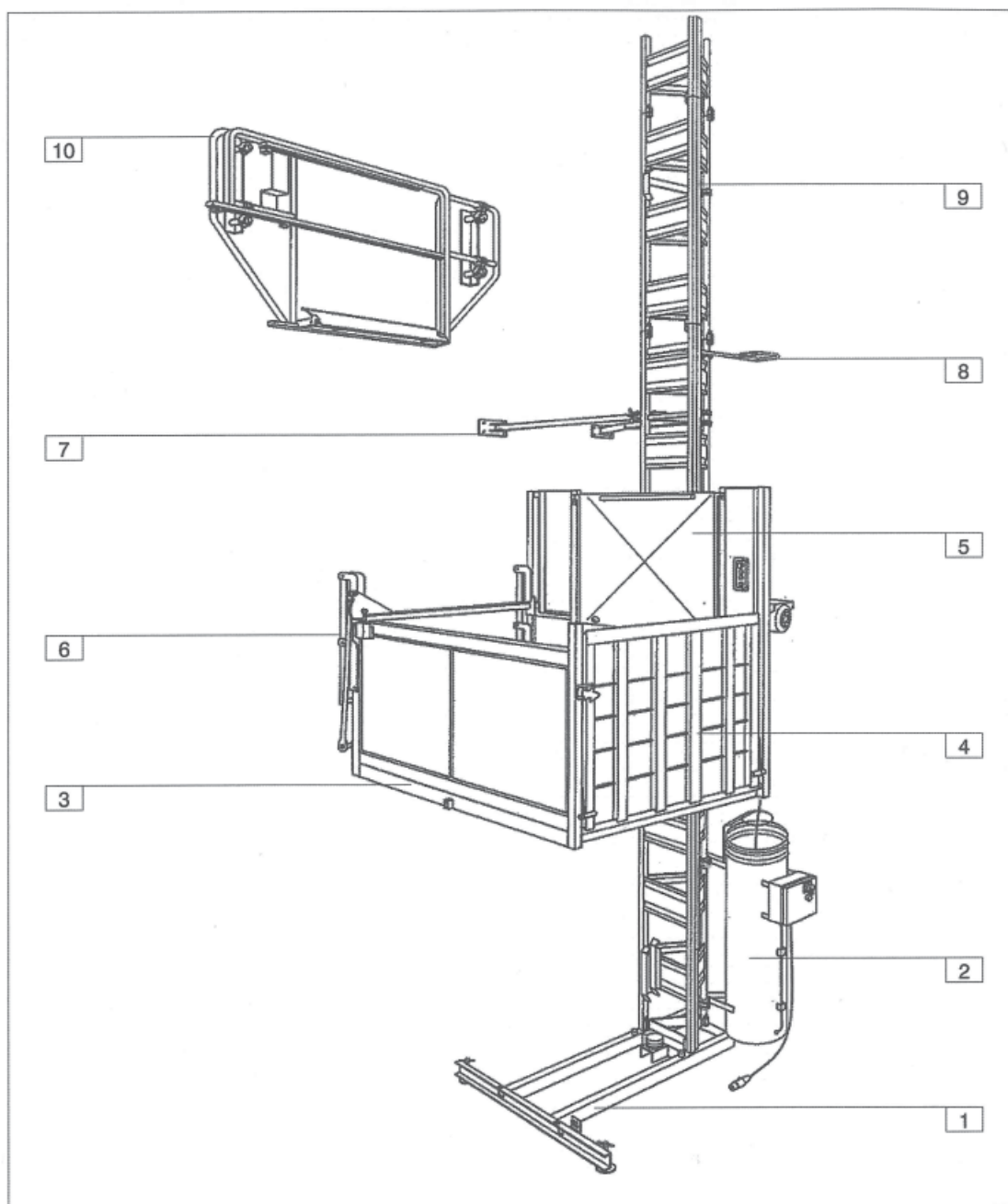
1.10.57 Upper & lower limit devices: Means to limit the maximum and minimum platform height, usually by mechanical or electrical means, or both.

1.10.58 Vertical barrier: A device designed primarily to protect personnel from fall hazards identified in local, state and federal codes.

**Figure I**

- 1 Base section with base masts
- 2 Cable bin or cable drum
- 3 Load platform
- 4 Door
- 5 Mast guard

- 6 Loading ramp
- 7 Mast tie assembly
- 8 Cable guide
- 9 Mast section
- 10 Landing level safety gate

**Figure II**

- | | |
|--------------------------------|------------------------------|
| 1 Base section with base masts | 6 Loading ramp |
| 2 Cable bin or cable drum | 7 Mast tie assembly |
| 3 Load platform | 8 Cable guide |
| 4 Door | 9 Mast section |
| 5 Mast guard | 10 Landing level safety gate |

**Documents**

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Section 2 – HAZARDS

The following Tables show the hazards which have been identified and where the corresponding sections are located in this standard in order to limit the risk or reduce these hazards in each situation. This list indi-

cates likely hazards, but may not be all inclusive.

Table 2.1 List of hazards

Hazards	Description	Relevant clauses in this standard
1	Mechanical hazards	
1.1	Crushing	3.2.1.3; 3.3.2; 3.4.1
1.2	Shearing	3.2.1.3; 3.3.2; 3.4.1
1.3	Cutting or severing	3.3.2; 3.4.1
1.4	Entanglement	3.4.1
1.5	Drawing in or trapping	3.2.1.3; 3.3.2; 3.4.1
1.6	Impact	3.4
1.7	Stabbing or puncture	NA
1.8	Friction or abrasion	NA
1.9	High pressure fluid ejection	3.10
1.10	Ejection of parts	3.2.1.4; 3.2.1.5
1.11	Loss of stability	3.1.5; 3.2; 3.2.5
1.12	Slip, trip and fall	3.3.1.3
2	Electrical hazards	
2.1	Electrical contact	3.8; 5.1.2.7
2.2	Electrostatic phenomena	NA
2.3	Thermal radiation	NA
3	Hazards generated by materials and substances processed, used or exhausted by machinery	
3.1	Contact with or inhalation of harmful fluids, gases, mists, fumes and dusts	3.9; 3.10
3.2	Fire or explosion	3.9; 3.10
3.3	Biological and microbiological	3.9; 3.10
4	Hazards generated by neglecting ergonomic principles in machine design	
4.1	Unhealthy postures or excessive effort	3.2.1.6; 3.2.5.2; 3.6.2; 3.12
4.2	Inadequate consideration of human hand/arm or foot/leg anatomy	NA
4.3	Neglected use of personal protection equipment related measures/means	5.1.2.7; 5.1.2.12
4.4	Inadequate area lighting	5.1.2.6
4.5	Mental overload or underload, stress	NA
4.6	Human error	3.2.2.1; 3.12
5	Hazard combinations	3.1.1.1; 3.1.1.2; 3.1.3; 3.2.1.3; 3.7.1.7; 5.1.2.9; 5.1.2.12; 5.5.9; 5.6.7; 5.6.8
6	Hazards caused by failure of energy supply, breaking down of machinery parts and other functional disorders	
6.1	Failure of energy supply	3.4.1.7; 3.4.4.2.1; 3.5; 3.7.1.6; 3.8; 3.10.1
6.2	Unexpected ejection of machine parts or fluids	3.4.1.2; 3.9.1; 3.9.5; 3.10
6.3	Failure or malfunction of control system	3.4.4.2.1; 3.4.5.1.1; 3.5.1.1; 3.5.2.2.1; 3.5.3
		3.6.1; 3.7; 3.8; 3.11; 3.12; 3.13.5;
4.1.2.2.2		
6.4	Errors of fitting	3.1.2.11; 3.1.5.1.5; 3.2.4; 3.4
6.5	Overturn, unexpected loss of machine stability	3.1.1.2; 3.1.2.3; 3.1.2.5; 3.1.2.11; 3.1.3; 3.1.5;
		3.2.1.4; 3.2.2.2; 3.2.2.3; 3.2.5.1;
3.4.1.6; 5.1.2.6		
7	Hazards caused by missing and/or incorrectly positioned safety related measures and means	
7.1	Guards	3.2.1.3; 3.3.2; 3.4.1.2; 5.1.2.6; 5.1.2.9; 5.2.2
7.2	Safety related (protection) devices	3.2.1.2; 3.2.1.4; 3.2.1.5; 3.4.4.2; 3.6;

Table 2.1 List of hazards (continued)

Hazards	Description.....	Relevant clauses in this standard
8	Inadequate lighting of moving/working area	5.1.2.6
9	Hazards due to sudden movement instability etc. during handling	3.1.5; 3.2.2
10	Inadequate/non ergonomic design of operating position	
10.1	Hazards due to dangerous environments (contact with moving parts, exhaust gases etc.)	3.2.2; 3.9; 3.3.1.3; 3.3.2; 3.3.3
10.2	Inadequate visibility from operators position	3.12.2; 3.12.5
10.3	Inadequate seat/seating	NA
10.4	Inadequate/non ergonomic design/positioning of controls	3.12
10.5	Starting/moving of self propelled machinery	3.12; 3.13
10.6	Road traffic of self propelled machinery	5.1.2.6; 5.1.2.12
10.7	Movement of pedestrian controlled machinery	5.1.2.6; 5.1.2.12
11	Mechanical hazards	3.1.1.1
11.1	Hazards to exposed persons due to uncontrolled movement	3.2.2.1; 3.2.4; 3.4.1; 5.1.2.7
11.2	Hazards due to breakup and/or ejection of parts	3.2.1.4; 3.2.1.5; 3.2.2.3
11.3	Hazards due to rolling over (ROPS)	3.1.5
11.4	Hazards due to failing objects (FOPS)	5.1.2.7
11.5	Inadequate means of access	3.3.3; 3.3.3.4
11.6	Hazards due to towing, coupling, connecting, transmission etc	3.4.1; 5.1.2.7; 3.2.2.4
11.7	Hazards due to batteries, fire, emissions etc	3.9.1; 3.9.2; 3.9.3; 3.9.4; 3.9.5; 3.9.6
12	Hazards due to lifting operations	
12.1	Lack of stability	3.1.5; 3.1.1.2; 3.2.2.3; 3.2.2.2; 3.2.5.1; 3.4.1.6
12.2	Derailment of machinery	5.2.2.4; 5.4.1.5; 3.4.2; 3.4.1.5; 3.12.2
12.3	Loss of mechanical strength of machinery and lifting accessories	3.1; 3.2.1.7; 3.2.1.8; 3.2.2.2; 3.2.2.3; 3.2.3.3
12.4	Hazards caused by uncontrolled movement	3.2.5.3; 3.3.1.4; 3.4.2; 3.4 3.2.2.3; 3.2.4; 3.4.1; 3.11; 3.2.5; 3.10.12.3
13	Inadequate view of trajectories of the moving parts	3.13.4
14	Hazards caused by lightning	5.1.2.6 -G
15	Hazards due to loading/overloading	3.5.2.2
16	Overloading or overcrowding of the platform	3.1.2; 3.5.2.2; 1.10 - B; 3.5.3-J
17	Unexpected movement of the platform in response to external controls or other movements of the machine	3.12.2; 3.8
18	Excess speed	3.5; 3.6.3; 3.4.4.1; 3.5.3-J
19	Persons falling from the platform	3.3.2
20	The platform falling or overturning	3.2.2.3; 3.5; 3.10; 3.2.3; 3.2.5
21	Excess acceleration or braking of the platform	3.5; 4.4.4.2.2; 3.4.5
22	Due to imprecise markings	3.2.2.5