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Mobile elevating work platforms — Safety principles, inspection, maintenance and operation

Plates-formes élévatrices mobiles de personnel — Principes de sécurité, inspection, entretien, mise en oeuvre et utilisation

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Foreword

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The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received (see www.iso.org/patents).

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For an explanation on the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the WTO principles in the Technical Barriers to Trade (TBT) see the following URL: Foreword - Supplementary information

The committee responsible for this document is ISO/TC 214, *Elevating work platforms*.

This second edition cancels and replaces the first edition (ISO 18893:2004), which has been technically revised.

Introduction

This International Standard is one of a series of standards produced by ISO/TC 214 as part of its program of work regarding standardization of terminology, ratings, general principles (technical performance requirements and risk assessment), safety requirements, test methods, maintenance, and operation for elevating work platforms used to raise (elevate) and position personnel (and related work tools and materials).

Mobile elevating work platforms (MEWPs) are machines/devices which provide protection from falling when working at height.

The entities with responsibilities related to safe use of a MEWP are established by law in some countries. This International Standard provides guidance in the identification of those responsible.

The responsibility for safe operation of a MEWP lies with employers, managers, supervisors, operators, and others using these machines/devices. This International Standard provides requirements so that appropriate MEWPs are selected for use and positioned, used, maintained, and examined for safe use.

The safe operation of a MEWP requires the use of competent authorized persons and trained operators (see ISO 18878).

Mobile elevating work platforms — Safety principles, inspection, maintenance and operation

1 Scope

This International Standard applies to all mobile elevating work platforms (MEWPs) that are intended to position persons, tools and materials and which, as a minimum, consists of a work platform with controls, an extending structure and a chassis.

The technical safety requirements of this International Standard apply except where national or local regulations are more stringent.

For related information, see ISO 16368.

This International Standard applies to MEWPs to achieve the following objectives:

a) prevention of personal injuries, property damage, and accidents;

b) establishment of criteria for inspection, maintenance, and operation.

2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 16368, *Mobile elevating work platforms — Design, calculations, safety requirements and test methods*

ISO 18878, *Mobile elevating work platforms — Operator (driver) training*

IEC/TS 61813, *Live working — Care, maintenance and in-service testing of aerial devices with insulating booms*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 16368 and ISO 18878 and the following apply.

3.1
authorized person
person approved or assigned to perform a specific type of duty or duties at a specific location or locations at a work site

3.2
configuration
all positions in which a MEWP, chassis, extending structure, or work platform can be placed within intended operating limits, including creating variable rated loads

3.3
working envelope
space in which a work platform is designed to work within the specified loads and forces, under normal operation conditions

Note 1 to entry: A MEWP can have more than one working envelope.

3.4
delivery
transfer of custody, care, and control of a MEWP from a person or entity to another person or entity

3.5
maintenance
act of upkeep such as inspection, lubrication, refuelling, cleaning, adjustment, and scheduled parts replacement

3.6
modification
change(s) or addition(s) to a MEWP as originally manufactured which affects the operation, stability, safety factors, rated load, or safety of the MEWP

3.7
operation
performance of functions of a MEWP within the scope of its specifications and in accordance with the manufacturer's instructions, work rules, and applicable governmental regulations

3.8
operator
person who controls the operation of a MEWP

3.9
repair
act of restoring to good condition that which has been broken, damaged, or worn due to use, abuse, or other reasons

3.10
qualified person
person who, by possession of a recognized degree, certificate, or professional standing, or by extensive knowledge, training, and experience, has successfully demonstrated his/her ability to solve or resolve problems related to the subject matter, the work, or the project

3.11
safety-related bulletin
publication from the manufacturer of a MEWP that requires attention to ensure safe operation of the MEWP

3.12
stable
condition wherein the MEWP does not overturn, described technically as the condition in which the sum of the moments acting to overturn a MEWP is less than the sum of the moments tending to resist overturning

4 General requirements

4.1 Basic principles

The information in this International Standard shall be supplemented by good job management, safety control, and the application of sound principles of safety, training, inspection, maintenance, repair, application, and operation. All data available regarding the parameters of intended use and expected environment shall be considered. Those with direct control over the application and operation of MEWPs shall be responsible for the conformance with good safety practices. Decisions on the use and operation of the MEWPs shall always be made with due consideration for the fact that the machine will be carrying persons whose safety is dependent on those decisions as well as others in the operating vicinity.

The operation of any MEWP is subject to certain hazards that can be protected against only by the exercise of intelligence, care, and common sense and not by any device. It is essential to have qualified,

careful persons trained (see ISO 18878) in the intended use, safe operation, maintenance, and service of this type of equipment.

The operation of any MEWP used for working on energized conductors shall conform to the requirements of this International Standard and the requirements of IEC/TS 61813.

It is an essential requirement that:

a) the selection, positioning, operation, maintenance, and frequent and annual inspections of a MEWP are properly planned, appropriately supervised, and carried out in a safe manner;

b) having identified the hazards associated with the use of a MEWP, the qualified person evaluates the risks associated with these hazards and puts appropriate control measures in place as identified during the evaluation;

c) all MEWP operators be trained in accordance with ISO 18878;

d) all MEWP maintenance work be performed by a qualified person; and

e) all MEWP repair work shall be performed by a qualified person.

4.2 System of work

The system of work shall be created by the employer or user and shall include the following:

a) planning of the operation, including procedures for the recovery of persons and/or the machine in the event of an emergency (see 6.1.2.8);

b) selection, provision, and use of a suitable MEWP and work equipment associated with it;

c) preparation and maintenance of the site, as required, for use of the MEWP;

d) MEWP maintenance, including inspection(s) and repairs as recommended by the manufacturer;

e) properly trained personnel authorized to operate the MEWP;

f) prior to the start of work, familiarization of the MEWP operator with the specific machine to be used, including any local site requirements, warning of the hazards in the areas where the MEWP will be operated;

g) monitoring of the performance and supervision of the work of the operator to ensure compliance with provisions of this International Standard;

h) prevention of unauthorized use of the MEWP;

i) safety of persons not involved in the operation of the MEWP; and

j) documentation of activities required by this International Standard.

4.3 Manuals (handbooks)

The manufacturer's information which is intended to be readily available and which is necessary for the operation and daily inspection/maintenance of the MEWP shall be provided with each rental, lease, or sale delivery. The manufacturer's maintenance information shall be made available for use by trained personnel of the entity responsible for maintaining the MEWP.

The user/employer shall make sure that the operator is capable of reading and understanding the manuals (handbooks) provided by the manufacturer.

In case the manufacturer no longer exists, and the manufacturer's manuals (handbooks) are not available from other sources, the replacement manuals (handbooks) shall be provided by a qualified person.

4.4 Record retention

The following records shall be created and retained by the entity responsible (owner) for each MEWP. All records included under items b) and c) below shall be transferred to the new owner of the MEWP in conjunction with delivery.

a) Name and address of each owner of a MEWP by serial number and date of delivery shall be retained for a minimum of three years after the sale of the MEWP or until the MEWP is permanently removed from service.

b) Written records of the pre-delivery, frequent, and annual inspections on the MEWP shall include the date of inspection, deficiencies found, corrective action accomplished, and identification of the person(s) performing the inspection. These records shall be retained for a minimum of three years after the sale of the MEWP or until the MEWP is permanently removed from service.

c) Written records of all repairs, manufacturer recalls, upgrades, and approved modifications accomplished on the MEWP shall include the date work is completed, a description of the work accomplished, and identification of the person(s) performing the repair. These records shall be retained for a minimum of three years after the sale of the MEWP or until the MEWP is permanently removed from service.

4.5 Modifications

Modifications, additions, or alterations to a MEWP, or the fabrication or attaching of any framework or mounting of any attachments for holding tools or materials onto the platform or the guardrail system shall be made only with prior written permission of the manufacturer. In case the manufacturer no longer exists, modifications to MEWP shall be made in accordance with the instructions from a qualified person.

NOTE CE-approved MEWPs that have been modified might require re-certification.

5 Maintenance

5.1 Preventive maintenance

A preventive maintenance programme shall be established in accordance with the manufacturer's recommendations. The preventive maintenance programme shall be increased based on the environment and severity of use of the MEWP. The manufacturer's recommendations shall be the minimum requirements.

The preventive maintenance programme shall include the frequent and annual inspections as defined in this International Standard. All malfunctions identified shall be corrected before the MEWP is placed or returned to service.

5.2 Maintenance inspections

5.2.1 General

The MEWP shall have maintenance inspections as required to ensure proper operation. The frequency of maintenance inspections shall be determined by the manufacturer's recommendations and the operating conditions. The frequency of the maintenance inspections can be increased to be compatible with operating conditions and the severity of the operating environment, but the manufacturer's recommendations shall be the minimum requirements. MEWPs that are not in proper operating condition shall be corrected by a qualified person and the repairs shall be in conformance with the manufacturer's recommendations.

5.2.2 Pre-delivery inspection

MEWP's shall be inspected, repaired, and adjusted in accordance with the manufacturer's specifications prior to each delivery by sale, lease, rental, or loan.

5.2.3 Pre-start inspection

Before use each day or at the beginning of each shift, the MEWP shall be given a visual inspection and functional test by the operator, including but not limited to the following:

a) operating and emergency controls;

b) safety features;

c) personal protective equipment;

d) air, hydraulic, and fuel system for leaks;

e) cables and wiring harness;

f) loose, damaged, worn, or missing guards or parts;

g) tyres (where applicable, tyre pressure), wheels, and wheel fasteners;

h) instructions, warnings, control markings, and operating manual(s);

i) structural items, extending structure, and stabilizers;

j) work platform, including guardrail system, floor, anchorage, and mounting;

k) cleanliness and general signs of damage;

l) brake operation and performance;

m) lights (when applicable);

n) fluid levels including engine coolant, engine oil, and hydraulic oil;

o) pins and pin-securing devices and visible damage to the prime means of support for the work platform and extending structure;

p) operation of stabilizers/outriggers, extendable, and oscillating axles; and

q) other items specified by the manufacturer.

5.2.4 Frequent inspection

A frequent inspection shall be performed in accordance with the manufacturer's instruction on the MEWP. Unless it is determined that the frequent inspection is current, it shall be performed upon transfer of custody, for a unit that has been out of service for a period longer than three months, or unless environmental conditions require a shorter period.

The frequent inspection shall be made by a qualified person. This inspection shall include all items specified by the manufacturer for a frequent inspection and shall include the following:

a) all functions and their controls, including controls for emergency operation, for speed(s), smoothness, and limits of motion;

b) base- or ground-level controls, including the provisions for overriding of work platform controls;

c) all chain and wire rope mechanisms, for adjustment and worn or damaged parts;

d) all emergency controls, guards, and safety features are in place and in good working order;

e) lubrication of all moving parts, inspection, and replacement of filter element(s) if required, hydraulic oil, engine oil, and coolant;

f) visual inspection of structural components and other critical components such as fasteners, pins, shafts, turntable attachment devices, and locking devices;

g) instructions, warnings, and control markings are in place and legible;

h) hydraulic or pneumatic systems, for proper fluid or pressure levels and observable for proper operation, damage, leaks, or external wear;

i) electrical systems, for signs of damage, deterioration, dirt, or moisture accumulation;

j) pneumatic tyres, if applicable, for proper inflation and damage;

k) wheel nuts and bolts are in place and properly tightened;

l) lights, if applicable, for proper operation and illumination;

m) batteries, checked for adequate fluid level and connections free from corrosion, if applicable, before use of the MEWP and before recharging;

n) drive systems, brakes, steering, and speed controls for proper operation;

o) audible or light alarms, if applicable, for proper operation; and

p) communication system, if any, between platform and ground level is working properly.

The MEWP shall not be placed into service until all malfunctions and safety-related problems have been corrected.

5.2.5 Annual inspection

The MEWP owner shall ensure that an annual inspection be performed no later than 13 months from the date of the prior annual inspection. The inspection shall be performed by a qualified person for the specific make and model of MEWP. The annual inspection shall include all items specified by the manufacturer for an annual inspection.

An annual inspection shall be performed upon transfer of custody of the MEWP, unless it is determined that the annual inspection is current.

A MEWP shall not be placed back into service until all malfunctions and problems identified in the inspection have been corrected.

NOTE Some countries require that annual inspections be performed by a third party.

5.3 Maintenance personnel training

Maintenance personnel shall be trained by a qualified person to inspect and maintain the MEWP in accordance with the manufacturer's recommendations and this International Standard.

5.4 Maintenance and repair safety precautions

Before maintenance or repairs are started on MEWPs, the following precautions shall be taken, as applicable:

a) instructions and precautions provided by the MEWP manufacturer have been read and understood;

b) that only qualified personnel are performing maintenance or repair on MEWP has been ensured;

c) power plant stopped and means of starting rendered inoperative;

d) all controls in the “off” position and all operating systems secured from inadvertent motion;

e) work platform lowered to the full down position, if possible, or otherwise secured to prevent dropping;

f) hydraulic oil pressure relieved from all hydraulic circuits before loosening or removing hydraulic components; and

g) safety props or latches installed where applicable as prescribed by the manufacturer.

Certain maintenance work might require the MEWP to be in conditions other than those described in items a) to g). In this case, safety measures shall be followed as described in the manufacturer’s maintenance instructions.

Repairs to any part of the MEWP structure shall be carried out in accordance with the requirements of the manufacturer.

5.5 Replacement parts

When a part or component is replaced, it shall be identical or equivalent to the original MEWP part or component.

5.6 Manufacturer’s safety bulletins

The owner shall ensure that the MEWP is registered with the manufacturer so safety bulletins are received and addressed as specified by the manufacturer. Safety-related bulletins as received from the manufacturer or its authorized representative shall be complied with. Records shall be retained in accordance with 4.4 of this International Standard and/or as instructed by the safety-related bulletin.

6 Operation

6.1 Planning

6.1.1 General

The extent of the planning required depends on the nature of the task to be carried out and the hazards associated with it but the following planning steps shall be taken. Planning shall be the responsibility of the entity that has care and custody of the MEWP. It is the employer’s or user’s responsibility to make sure the planning is carried out with the operator.

6.1.2 Stages of planning

6.1.2.1 Communicate the plan to all persons involved

One of the most important aspects of successful planning is to ensure that the contents of the plan are communicated effectively to the parties involved, taking into account language differences. Review the plan before the job starts.

Immediately before a job starts and periodically throughout a long-term job, the plan shall be reviewed to check if any parts of the task or the working environment has changed and the effect that could have on the safety of the operation. If any modifications to the plan are required, these should be communicated to all those involved.

6.1.2.2 Identify the task to be undertaken

As the first stage in the planning process, the task to be undertaken should be clearly identified, together with the location and timing.

6.1.2.3 Select an appropriate MEWP

There are many different types of MEWPs with various rated capacities, working heights, and reaches. The correct machine should be selected for the task to be undertaken, taking into account the constraints of the work site, ground conditions, site access, and proximity to the public or other workers.

If the area in which the MEWP is to be working is a hazardous environment (see 6.7), a MEWP designed/designated for this environment shall be selected.

6.1.2.4 Assessment of the risks associated with the task

Assessment of the risks associated with the task shall be identified. These might be associated with the location where the work is to be carried out, the nature of the MEWP or the personnel, and materials and equipment to be carried.

6.1.2.5 Identify control measures

Once the hazards and the risks involved in the task have been identified, the procedures and measures required to control them shall be identified.

6.1.2.6 Develop the method to be used

Having identified the hazards, evaluated the risks, and worked out the control measures required to carry out the task safely, a selection of the method from the control measures shall be developed into a plan that will be communicated and implemented. The plan shall include any contingency measures and rescue procedures.

6.1.2.7 Record the planning

Once the plan has been developed, it shall be recorded.

NOTE The length and detail of this document depends on the complexity of the task to be undertaken and on the risks involved. A simple low-risk job such as routine maintenance work in a factory might only require the use of a brief generic plan statement while a more complex and high-risk job will require a more detailed job specific plan.

6.1.2.8 Rescue from height

As part of the plan, consideration shall be given to the rescue of MEWP work platform occupants if the machine is unable to be lowered for any reason, such as machine malfunction or work platform entanglement. Rescue might also be necessary in the event of illness, injury, or risk of exposure. Any rescue procedure shall take into account the reasons why the platform might be stranded at height and any need for urgent action.

Wherever possible, rescue should be carried out by an appropriately trained person, if available, using the machine's ground controls or secondary lowering system.

Rescue using another MEWP should only be carried out once a site review has been carried out and a plan is created. The plan should take into account the applicable hazards highlighted in ISO 16368:2010, Annex H together with the following:

a) the rescue machine should be positioned to enable the rescue procedure to be carried out without compromising the safety of personnel involved in the rescue;

b) the work platforms of both machines shall be adjacent to each other with a minimal gap between them. The power controls on both machines should be switched off during the transfer;

c) the person being rescued should be fitted with a full body harness with an adjustable lanyard and the lanyard should be attached to the anchor points on the rescue machine before the transfer takes place; and

d) it is essential that care is taken not to overload the rescue machine. This could mean making more than one trip to complete the rescue.

If there is injury, illness, or risk of exposure, emergency personnel shall be called. Suspension trauma can occur if a person has been suspended at height for a period of time. If communication cannot be established with personnel in the work platform, emergency personnel shall be called.

6.1.3 Site surveys

A number of the planning steps outlined in 6.1 should be dealt with as part of a site survey. This involves visiting the location where the task is to be carried out, preferably with site personnel or their representatives who can identify hazards associated with the area and ground on which the MEWP is required to operate. For simple tasks the remainder of the planning process may be completed at the same time, while for more complicated jobs the site surveyor might need to complete the process off site.

6.2 Operator training

The employer shall ensure that the operator has been trained under the direction of a qualified person in accordance with ISO 18878 and this International Standard before operating the MEWP.

6.3 Familiarization

It is the employer's or user's responsibility to make sure the operator is familiarized with the location and presence of the machine operations manual, purpose and function of the platform and ground controls, and the safety features and operating characteristics of each model of MEWP they are authorized to operate.

Before operating the controls of a MEWP, the operator shall check that they know the position, function, and correct operation of both the emergency/auxiliary lowering controls and the emergency stop switch.

Emergency controls shall not be used for purposes other than lowering the work platform in an emergency.

6.4 Assistance to operators

If an employer is unable to answer an operator's question relating to rated capacity, intended use, maintenance, repair, inspection, or operation of the MEWPs, the employer shall obtain the proper information from the dealer or manufacturer.

This information shall be obtained from a qualified person if the manufacturer is no longer in business.

6.5 Before operation

Safe operation of a MEWP requires the following:

a) understanding of the task to be performed;

b) selection of a MEWP appropriate for the task to be performed;

c) knowledge of the intended purpose and function of each control;

d) authorization by the employer;

e) that stabilizers, such as outriggers, extendible axles, or other stability-enhancing means, are used as required by the manufacturer;

f) that guardrails are installed and access gates or openings are closed or in appropriate positions per manufacturer's instructions;

g) that loads and their distribution on the work platform and any platform extension are in accordance with the manufacturer's rated load for that specific configuration;

h) understanding of the manufacturer's operating instruction(s) and user safety rules, or having them explained by a qualified person;

i) understanding by reading or by having a qualified person explain all decals, warnings, and instructions displayed on the MEWP;

j) use of appropriate personal protective equipment for the conditions, including the environment in which the MEWP will be operated; and

k) ensuring that another responsible person is on the job site, who is not working on the platform, and knows how to use the emergency controls.

6.6 Work place inspection

Before and during the use of the MEWP, the area in which the MEWP is to be used shall be checked by the operator for possible hazards, such as but not limited to the following:

a) drop offs or holes (including those concealed by water, ice, mud, etc.);

b) slopes;

c) bumps, floor obstructions, and electric cables;

d) debris;

e) overhead obstructions;

f) electrical conductors;

g) hazardous locations and environments;

h) surfaces inadequate to sustain the ground-bearing pressures imposed by the MEWP in all operating configurations;

i) wind and weather conditions; and

j) presence of other personnel and other mobile equipment.

6.7 Understanding of hazardous locations

If a MEWP is to be used in a hazardous environment where flammable or explosive gases or particles are present, a MEWP designed/designated for this environment shall be used as recommended by the manufacturer or a qualified person.

6.8 Specific requirements of operation

6.8.1 Wind and storm considerations

6.8.1.1 Effect of wind forces on MEWPs

All MEWPs, except those designed specifically for indoor use, are designed to operate in maximum wind speed conditions which are marked on the machine. No modifications or additions to the MEWP that affect its wind loading and, consequently, its stability shall be made without the manufacturer's approval, e.g. modifications to or addition of signs, panels, or attachments. Where this approval cannot be obtained because the manufacturer has gone out of business, advice shall be obtained from a competent engineer.

6.8.1.2 Effect of wind on equipment in the work platform

Care shall be taken when handling building materials, sheet materials, panels, and other such materials which can act as sails.

6.8.1.3 Local wind effects

The shielding and funnelling effects of buildings can cause high wind speeds and turbulence on days when the wind speed in open areas is low. Other sources of local high wind speed which should also be considered in relation to safety at work sites are aircraft slipstreams at airports and high-sided vehicles on road ways.

6.8.1.4 Use in thunderstorms

MEWPs shall not be used where subject to the effects of thunderstorms.

6.8.2 Ground condition considerations

6.8.2.1 General

The stability of MEWPs, and their safety, are affected by poor ground conditions which can lead to the machine becoming out of level and unstable. If the level indicator indicates that the operating limits are nearing the MEWPs specified limits, then the operator shall lower and reset the machine in a level position.

6.8.2.2 Inadequate outrigger foundations

Some soil types, moist soils, and soils which have not been compacted, as well as some paved areas, are not capable of supporting the pressures of outrigger pads. Some form of foundation or spreader pad is required to reduce the ground pressure to an acceptable level. Spreader pads shall have sufficient size, stiffness, and strength to spread the load over the required area.

6.8.2.3 Floors, cellars, and basements

The strength of the supporting surface, taking into consideration subsurface voids such as cellars, basements, and pipes, shall be taken into consideration when using a MEWP.

6.8.3 Transporting and travelling on public roads

Where MEWPs are unloaded from or loaded upon a transporting vehicle on a public road or a MEWP travels on a public road between work sites, measures shall be taken to protect the persons involved from traffic. These measures include but are not limited to:

a) warning cones;

b) road signs and signalling devices; and

c) flag personnel to warn other vehicles of the presence of the MEWP and any associated vehicles.

When it is necessary for a MEWP to travel between work sites, an escort vehicle equipped with appropriate signalling devices shall be used, if necessary, due to the distance that must be travelled.

6.8.4 Slope and grade

The MEWP shall not be operated on grades, slopes, ramps, or uneven surfaces exceeding those for which the MEWP is rated by the manufacturer.

6.8.5 Deployment of stability enhancing means

Stabilizers such as outriggers, extendible axles, oscillating axles, or other stability-enhancing means shall be deployed and locked into place as required by the manufacturer.

6.8.6 Guardrail system

Guardrails shall be in place and access gates or openings shall be closed per the manufacturer's instructions. The guardrails of the MEWP shall not be used to carry materials.

6.8.7 Distribution of load

Load and its distribution on the MEWP and any MEWP extension(s) shall be in accordance with the manufacturer's requirements.

6.8.8 Maintaining clearance from obstructions

The operator shall ensure adequate clearance is maintained from obstructions.

6.8.8.1 Before moving the work platform or MEWP

The operator shall visually inspect the area around the MEWP in the direction of planned travel as well as the direction the MEWP will move in conjunction with the activation of controls.

6.8.8.2 When moving the work platform or MEWP

The operator shall:

a) continuously visually inspect the area in the direction of movement, including above and below the work platform;

b) move at speeds that are appropriate for safe operation;

c) allow for the distance the work platform moves or MEWP will travel when controls are released or returned to neutral position;

d) move the work platform clear of obstructions before using the MEWP travel or using the MEWP controls at full speed;

e) not lean on or over the guardrails while the MEWP is elevating or travelling close to obstructions;

f) not lean his/her body over the work platform control panel at any time;

g) not place objects on the work platform control panel; and

h) provide for the safety of any others in the work platform during any MEWP movement.

6.8.8.3 Travelling to, from, or within the work area

The operator shall:

a) adjust the platform position to ensure adequate clearance with overhead obstructions and other obstacles in the direction of travel; and

b) allow for the platform movements due to the effects when travelling over uneven surfaces, slopes, and ramps.

6.8.8.4 While working at height

The operator shall use available features to deactivate the controls on the work platform, whenever possible.

6.8.8.5 Distractions

The operator shall:

a) give full attention while moving the MEWP;

b) not engage in horseplay;

c) not use a mobile phone except in an emergency; and

d) ensure materials on the work platform floor are secured and do not pose a hazard.

6.8.9 Electrocution hazards

Electrical conductors shall be considered energized until determined to be otherwise by tests or other appropriate methods or means, and properly grounded.

All electrical conductors, including those which appear to be insulated, shall be considered not insulated until determined to be otherwise by tests or other appropriate methods or means.

NOTE The following requirements do not apply to conductors that are protected by insulation and are in a physical enclosure.

Minimum approach distance (MAD) to above-ground electrical conductors shall be maintained consistent with Table 1 for the MEWP operator who has no specialized training regarding working near electrical conductors. National/local MADs for workers with specialized training can vary from Table 1.

Table 1 — Minimum approach distances

Voltage range (phase to phase) kV	Minimum approach distance (MAD) m
<0,7	1
≥0,7 to 7	1,2
>7 to 50	3
>50 to 220	4
>220 to 500	5
>500 to 750	10
>750 to 1 000	13
>1 000 to 1 250	16

6.8.10 Footing for personnel

Persons shall maintain a firm footing on the MEWP floor while working thereon. Climbing by occupants on the toeguards, intermediate guardrails, or top guardrails of the MEWP is prohibited. The use of planks, ladders, or any other devices on the work platform for achieving additional height or reach is prohibited.

6.8.11 Precaution for other moving equipment

When other moving equipment and vehicles are present, special precautions shall be taken to comply with local ordinances or safety standards established for the workplace. Warnings such as, but not limited to, flags, roped-off areas, flashing lights, traffic cones, and barricades shall be used as appropriate.

When a MEWP is to be operated in conjunction with a crane or some other appliance, the work shall be properly planned and a safe system of work developed and explained to all persons who are participating in the operation. Each person should also be instructed on how to deal with any foreseeable emergencies. Arrangements should be made for operators to be able to communicate clearly with each other during the operation.

6.8.12 Reporting safety-related problems or malfunctions

The operator shall immediately report to an authorized person any safety-related problem(s) or malfunction(s) that become(s) evident during operation. Consult with a qualified person if necessary so that all problem(s) or malfunction(s) that affect the safety of operations are eliminated prior to continued use.

6.8.13 Reporting potentially hazardous locations

The operator shall immediately report to an authorized person any potentially hazardous location(s), such as potentially flammable or explosive gases or particles.

6.8.14 Hazardous location operation

Operation of a MEWP not approved and marked for operation in a hazardous location, such as potentially flammable or explosive gases or particles, shall be prohibited.

6.8.15 Entanglement

Cables or hoses coming from the work platform shall be supported or stowed. Particular care shall be taken to prevent striking or interfering with the MEWP controls.

6.8.16 Load transfer

Adding materials or personnel loads to the work platform at height shall be done only if the work platform will not be overloaded. Load-sensing systems do not provide protection in these situations.

6.8.17 Work area

The operator shall ensure that the area surrounding the MEWP is clear of persons and equipment before raising, lowering, or slewing (if applicable) the MEWP.

6.8.18 Fuelling

The engine (if applicable) shall be shut down while fuel tanks are being filled. Fuelling shall be done in a well-ventilated area free of flame, sparks, or other hazards that can cause fire or explosion.

6.8.19 Battery charging

Batteries produce explosive gas when being charged. Batteries shall be charged in a well-ventilated area free of flame, sparks, or other hazards that can cause fire or explosion.

Battery acid is highly corrosive. Caution shall be taken when filling batteries to avoid splash or spillage.

6.8.20 Improper MEWP stabilization

The MEWP shall not be positioned against, tied to, or restrained by another object.

6.8.21 Misuse as a crane or elevator

The MEWP shall not be used as a crane or elevator unless specifically approved by the manufacturer or a qualified person.

6.8.22 Use of MEWP for grounding

A MEWP shall not be used for the electrical grounding to the earth when welding adjacent structures unless specifically approved by the manufacturer or a qualified person.

6.8.23 Climbing the extending structure

Climbing of the extending structure is prohibited.

6.8.24 Unusual operating support conditions

The MEWP shall not be operated from a position on trucks, trailers, railway cars, floating vessels, scaffolds, or similar equipment unless the application and the method are approved in writing by the manufacturer or a qualified person. (See 4.5.)

6.8.25 Travelling

Before and during travelling, the operator shall:

a) comply with the manufacturer's requirements for travelling;

b) maintain a clear view of the support surface and route of travel;

c) allow for the distance the work platform moves or MEWP will travel when controls are released or returned to neutral position;

d) ensure that persons in the work site area (reference 6.8.8.3) are aware of the movement of the MEWP as required to protect against personal injury;

e) maintain a safe distance from obstacles, debris, drop offs, holes, depressions, ramps, and other hazards to ensure safe travel;

f) maintain a safe distance from overhead obstacles;

g) limit travel speed according to conditions, including the condition of the support surface, congestion, visibility, slope, location of persons, and other factors; and

h) not travel in elevated positions unless permitted by the manufacturer.

6.8.26 Stunt driving

Stunt driving and reckless operations are prohibited.

6.8.27 Securing the MEWP

The operator shall use the means provided to protect against use by an unauthorized person(s).

6.8.28 Interference with safety devices

Safety devices shall not be altered or disabled.

6.8.29 Snagged MEWP

If the work platform or extending structure becomes caught, snagged, or otherwise prevented from normal motion by adjacent structures or other obstacles such that control reversal does not free the MEWP, all persons shall be removed from the work platform before attempts are made to free the MEWP using lower controls.

6.8.30 Vacating (or entering) a MEWP at height

MEWPs are not specifically designed to transfer personnel from one level to another or for leaving or entering the work platform at height. Consideration shall be given to assessing other options to accomplish these tasks.

Local regulations should also be considered relative to vacating or entering a MEWP at height.

When allowed by the manufacturer, vacating (or entering) a MEWP at height shall only be done after addressing the following hazards:

a) falling of persons during transfer between the work platform and the structure;

b) falling of tools and materials during transfer between the work platform and the structure;

c) sudden movement of the MEWP or work platform;

d) additional loads or changing of loads imposed on the MEWP for which it was not designed, which could affect stability or overload the machine;

e) dynamic and impact loads from personal fall protection equipment;

f) damage to the MEWP or structure by an unintentional movement of the MEWP;

g) stranding of people;

h) use of extending decks and gates;

i) use of double lanyards and ensuring that one leg of the lanyard is connected to the structure or work platform being moved to;

j) maintenance or replacement of fall protection measures for persons while they are on the structure;

k) distance between transfer surfaces, both horizontally and vertically; and

l) potential for movement of transfer surface with changing loads.

6.8.31 Carrying materials larger than the work platform

The operator shall ensure that only properly secured tools and materials which are evenly distributed and can be safely handled by a person(s) working from the work platform are moved. Such operations shall be performed according to the manufacturer's instructions.

6.8.32 Carrying materials outside the work platform

Carrying materials outside the work platform is prohibited, except when using a carrier designed for this purpose and with written authorization from the manufacturer or a qualified person.

6.8.33 Rated manual and special forces

The operator shall not permit the manufacturer's rated manual forces and/or special forces to be exceeded.

6.8.34 Protection against unauthorized use

The operator shall not provide the MEWP to other persons for any use without authorization.

6.8.35 Misuse as a jack

A MEWP shall not be used as a jack, a prop, or a tie to support itself, other structures, or machines, for example, using the boom and/or work platform of the MEWP to jack the wheels off the ground, unless approved by the manufacturer or a qualified person.

6.8.36 Moving overhead obstructions

When a MEWP operates within the area of moving overhead obstructions, steps shall be taken to prevent a collision with the MEWP.

6.8.37 Parking of MEWP

Wherever possible, MEWPs shall be parked in a secure compound or in a supervised area inaccessible to unauthorized persons. All keys shall be removed from the MEWPs when not in use. Keys shall be issued only to authorized operators and retained by them until the end of the work period.

Upon completion of the work, the MEWP shall be parked in the designated parking area with the engine or motor switched off, the work platform lowered to its parking position, and the brakes applied.

6.8.38 Transport

The MEWP, including its stabilizers, shall be in the manufacturer's recommended configuration when being transported.

Annex A
(informative)

Pictograms of MEWP misuse

A.1 Misuse of scissor-type MEWPs

Pictograms of the misuse of scissor-type MEWPs are shown in Table A.1.

Table A.1 — Examples of scissor type MEWP misuse

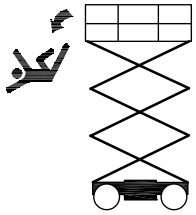
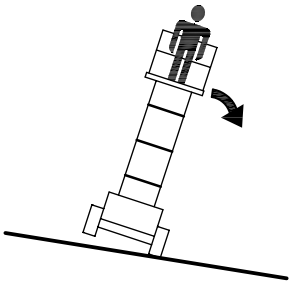
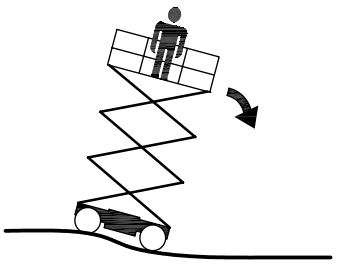
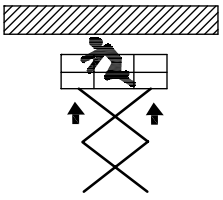
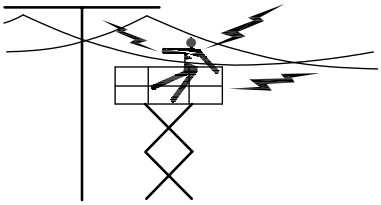
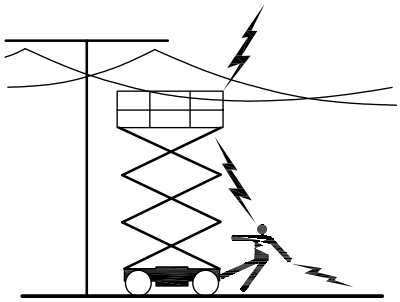
Number	Description	Pictogram
A.1.1	Fall hazard — platform	
A.1.2	Tipping hazard — side	
A.1.3	Tipping hazard — front/back	
A.1.4	Crushing hazard — head	

Table A.1 *(continued)*

Number	Description	Pictogram
A.1.5	Electrocution hazard — overhead wires	
A.1.6	Electrocution hazard — ground	

A.2 Misuse of boom-type MEWPs

Pictograms of the misuse of boom-type MEWPs are shown in Table A.2.

Table A.2 — Examples of boom-type MEWP misuse

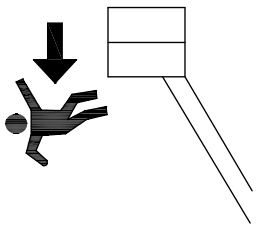
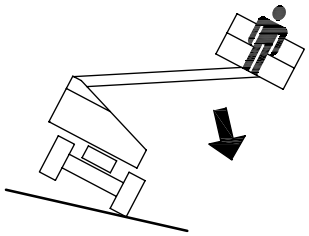
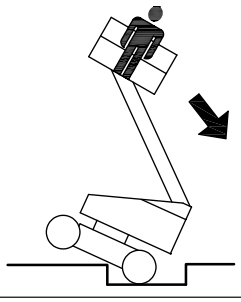
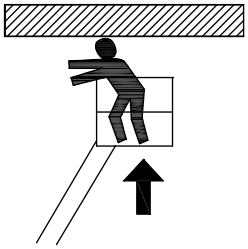
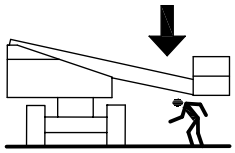
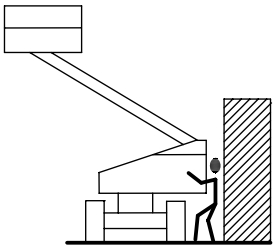
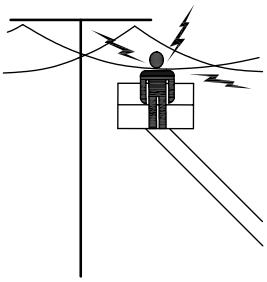
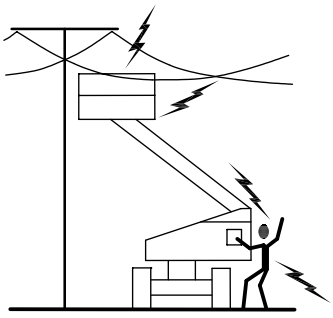
Number	Description	Pictogram
A.2.1	Fall hazard — platform	
A.2.2	Tipping hazard — side	
A.2.3	Tipping hazard — front/back	

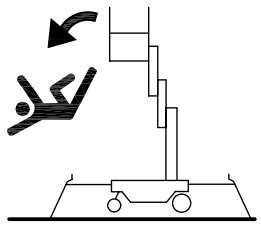
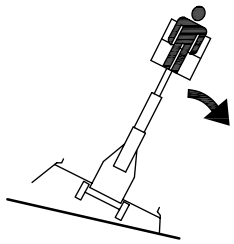
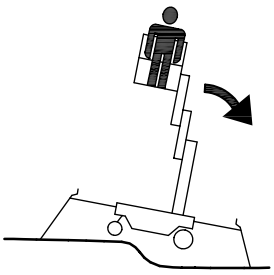
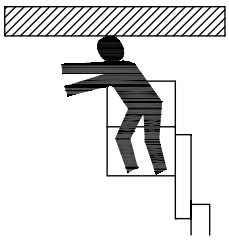
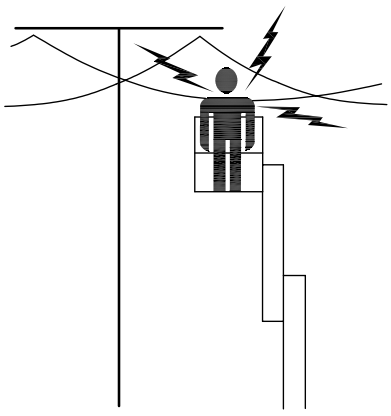
Table A.2 *(continued)*

Number	Description	Pictogram
A.2.4	Crushing hazard — head (raising)	
A.2.5	Crushing hazard — head (lowering)	
A.2.6	Crushing hazard — torso	
A.2.7	Electrocution hazard — overhead wires	
A.2.8	Electrocution hazard — ground	

A.3 Misuse of vertical mast type MEWPs

The pictograms of the misuse of vertical mast type MEWPs are shown in Table A.3.

Table A.3 — Examples of vertical mast type MEWP misuse

Number	Description	Pictogram
A.3.1	Fall hazard — platform	
A.3.2	Tipping hazard — side	
A.3.3	Tipping hazard — front/back	
A.3.4	Crushing hazard — head (raising)	
A.3.5	Crushing hazard — head (lowering)	
A.3.6	Electrocution hazard — overhead wires	

A.4 Misuse of vehicle-mounted MEWPs

Pictograms of the misuse of vehicle-mounted MEWPs are shown in Table A.4.

Table A.4 — Examples of vehicle-mounted MEWP misuse

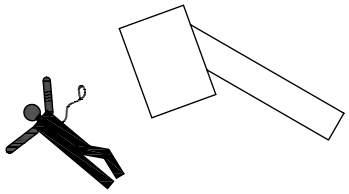
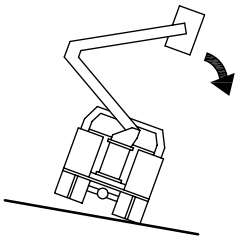
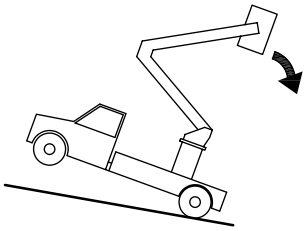
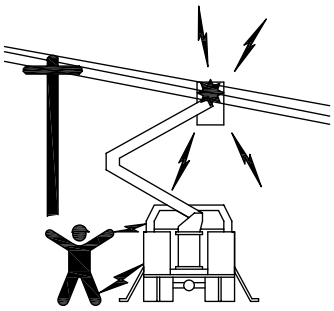
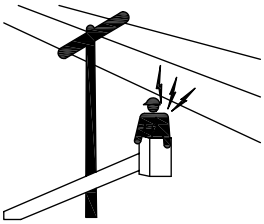
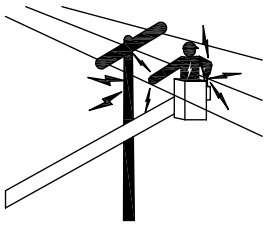
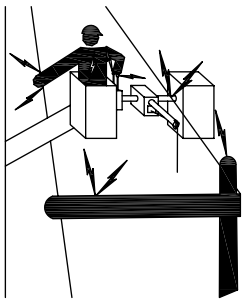
Number	Description	Pictogram
A.4.1	Fall hazard — platform	
A.4.2	Tipping hazard — side	
A.4.3	Tipping hazard — rear	
A.4.4	Electrocution hazard — ground	
A.4.5	Electrocution hazard — overhead wires	

Table A.4 *(continued)*

Number	Description	Pictogram
A.4.6	Electrocution hazard — boom tip continuity	
A.4.7	Electrocution hazard — boom tip continuity (dual platforms with material handling system)	

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[1] IEC 61057, *Aerial devices with insulating booms used for live working*

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