

Learner's Guide

Operate Vertical Personnel Platform

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Operate Vertical Personnel Platform

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Course Information

Why this course

This course is designed for workers who need to use and operate a MEWP (Vertical Personnel Platform) in any form of work, to do so in a much safer work environment.

This is also a mandatory course in line with Workplace Safety and Health (Operation of Cranes) Regulations for individuals who are assigned to carry out the lifting operation of load involving a Lifting Machine.

Learning objectives for the course:

- Select an appropriate MEWP, including risk assessment for the task to be carried out
- State the safety requirements under the Workplace Safety and Health Act and the Code of Practice for Working Safely At Height related to MEWP
- Carry out pre-start inspection
- State factors affecting stability
- Identify common hazards during traveling, setup, operation and parking of MEWP and their control measures
- Conduct workplace inspection
- State function of all MEWPs controls, including emergency controls and emergency procedures
- Use personal protective equipment appropriate to the task, worksite and environment as a result of risk assessment conducted and according to the manufacturer's guidelines.
- Operate MEWP safely

Competency Element

1. Prepare to carry out vertical personnel platform operations
2. Carry out vertical personnel platform operations
3. Conduct post operation of vertical personnel platform

Underpinning Knowledge

- UK 1.1. Types of hazards
- UK 1.2. Factors affecting stability
- UK 1.3. Factors for selection appropriate vertical personnel platforms
- UK 1.4. Fundamentals of vertical personnel platforms pre-use
- UK 1.5. Main components of vertical personnel platform
- UK 1.6. Safe working load of vertical personnel platform
- UK 1.7. Safety devices, signage, labels and vertical personnel platform controls
- UK 1.8. Legislations and industry guidelines relating to vertical personnel platform operations
- UK 1.9. Types of Personal Protective Equipment (PPE)
- UK 1.10. Operational procedures relating to vertical personnel platform operations

- UK 2.1. *Safe work practices* for vertical personnel platform operation
- UK 2.2. *Modes of manoeuvring*

- UK 3.1. *Standard operating procedures* for post-operation of vertical personnel platform

- UK 3.2. Routine post-operation checks
- UK 3.3. Reporting *procedures* for damage and defects

Performance Criteria

- PC 1.1. Identify hazards and safe routes to be taken for vertical personnel platform operations
- PC 1.2. Observe and apply safe work practices when preparing to operate vertical personnel platform
- PC 1.3. *Prepare work area* for safe operation of the vertical personnel platform
- PC 1.4. Use appropriate personal protective equipment in accordance with organisational procedures
- PC 1.5. Perform pre-use inspection on vertical personnel platform, its associated components and safety devices/signage/labels
- PC 1.6. Perform *function checks* on vertical personnel platform
- PC 1.7. Report all damage and defects according to procedures, and take appropriate action as per *organisational procedures*

- PC 2.1. Apply *safe work practices* when carrying out vertical personnel platform operations
- PC 2.2. *Manoeuvre* vertical personnel platform according to operator manual
- PC 2.3. Travel the identified route to, from or within the work area
- PC 2.4. *Operate vertical personnel platform* in stable position according to operator manual

- PC 3.1. Park and Shut down of vertical personnel platform
- PC 3.2. Carry out routine post-operational vertical personnel platform checks and maintenance according to safe work procedures
- PC 3.3. Report all damage and defects according to safe work procedures, and appropriate action is taken.

Course Structure

This module comprises 8 hours of training and 1 hour 15 minutes of assessment as follows:

	Topic	Duration
Classroom Learning	<ul style="list-style-type: none"> • Prepare to carry out vertical personnel platform operations (CE 1) <ol style="list-style-type: none"> 1. What is MEWP? 2. Risk Management 3. MEWP Safety Legislative Requirements 4. Vertical personnel platform 5. Pre-Start Inspections • Carry out vertical personnel platform operations (CE 2) <ol style="list-style-type: none"> 6. Operation Safety 7. Emergency Response • Conduct post operation of vertical personnel platform (CE 3) <ol style="list-style-type: none"> 8. End of MEWP operations 	6 hour
Practical	Demonstration and Practice on Boom Lift	2 hour
Assessment	Written Assessment 45 min Practical Performance 30 min	1 hour 15 min

Assessment requirements

Summative assessment will be conducted after the end of the course in order to assess candidate's competence in this subject. This will comprise a 45-minute Written Assessment (WA) and a 30-minute Practical Performance (PP).

Resources

Workplace legislation and regulations can be obtained at the following websites:

- Workplace Safety and Health Act 2006
<http://statutes.agc.gov.sg/aol/search/display/view.w3p;orderBy=numUp;page=0;query=DocId%3A5525537d-d1b0-4e3c-b540-473ba43a9b9d%20Depth%3A0%20Status%3Ainforce;rec=0;whole=yes>
- WSH (General Provisions) Regulations 2006
<http://statutes.agc.gov.sg/aol/search/display/view.w3p;orderBy=numUp;page=0;query=DocId%3A66dc2d58-77b7-495e-baa3-46674c0c6f60%20Depth%3A0%20Status%3Ainforce;rec=0;whole=yes>
- WSH (Construction) Regulations 2007
<http://statutes.agc.gov.sg/aol/search/display/view.w3p;orderBy=numUp;page=0;query=DocId%3A5bf883a-7b67-409e-9fe7-fe433611edf0%20Depth%3A0%20Status%3Ainforce;rec=0;whole=yes>
- Workplace Safety and Health (Risk Management) Regulations
<http://statutes.agc.gov.sg/aol/search/display/view.w3p;ident=424fe219-0674-4888-aa4f-62bef7cd9604;orderBy=numUp;page=0;query=DocId:cd9437b7-419b-40de-99a3-09f2e7b8c90a%20Depth:0%20Status:inforce;rec=0>
- Workplace Safety and Health (Work at Heights) Regulations 2013
<http://statutes.agc.gov.sg/aol/search/display/view.w3p;query=DocId%3A42f4cdee-375a-4fc5-8d42-5e2617b37464%20Depth%3A0%20Status%3Ainforce;rec=0;whole=yes>

CE 1

Prepare to carry out vertical personnel platform operations

- 1. What is MEWP?**
- 2. Risk Management**
- 3. MEWP Safety Legislative Requirements**
- 4. Vertical Personnel Platform**
- 5. Pre-Start Inspections**

Prepare to carry out vertical personnel platform operations

Carry out vertical personnel platform operations

Conduct post operation of vertical personnel platform

1**What is a MEWP?****Objective:**

At the end of this section, the participant should be able to understand and/or successfully perform the following:

- Factors for selection appropriate vertical personnel platforms (*UK 1.3*)
- Fundamentals of vertical personnel platforms pre-use (*UK 1.4*)

1

What is a MEWP?

A mobile elevated work platform (MEWP) is a mobile machine that has a lifting work platform with edge protection, a control system and an extending structure that can position persons; tools and materials at height.

MEWPs include scissor lifts, vertical personnel platforms and boom lift.

Types of MEWP

Selection of MEWP



Scissor Lift

Vertical Personnel Platforms

Boom Lift

Types of MEWP

Vertical Personnel Platform (VPP)

- Primary action is up and down
- Usually only a one person operation
- Battery operated
- Can be manual or mobilised



Manual VPP

Mobilised VPP

Scissor Lift

There are 2 types of scissor lift: Slab and Rough Terrain.

1. Scissor - Slab

- Usually for indoor use and under stable condition
- Usually battery operated
- Some are for indoor use only and not wind rated
- Extended decks on most
- Some machines can only allow 1 person in the basket if operated outdoor
- Most are fitted with pothole protectors
- Platform height usually between 4.5 – 12m (15 – 39ft)



Scissor – Rough Terrain

- To be used on rough terrain and sites with a lot of inclines
- Usually fitted with stabilisers and 4-wheel-drive
- Usually diesel powered
- Larger scissiors have a greater SWL
- Can get up to 32m (105ft) lift



Boom Lift



1. Telescopic Boom Lift

- Electric / diesel, self-propelled, 2 or 4-wheel-drive
- Boom can only rise in a straight line to its destination
- Usually used during maintenance work on landscape or already completed projects
- Usually used on work that will not require access to areas below the worksite

2. Articulated Boom Lift

- Diesel / Electric, self-propelled, 2 or 4-wheel-drive
- Boom lift can stretch and bend thus also known as knuckle lift
- Working platform can easily bend to reach around obstacles
- Boom allows the user to extend up and over an obstacle to reach the needed working height



Selection of MEWP

MEWPs come in various rated capacities, working heights and reach. Some are intended for indoor use only while others are designed for rough terrain.

Select a suitable and adequate MEWP for the task to be undertaken.

Consider the following when choosing a MEWP to work with:

- What work needs to be done
- Indoor/outdoor use
- Ground conditions/stability (rough, prepared, finished surface etc.)
- Restrictions (what access is there to the site)
- Obstacles (how much base area is available at the work position)
- What terrain and gradient will the MEWP have to cross to get to the work area?
- Is visibility and work area adequate for the manoeuvre?
- Ground bearing capacity at the work area and along the route to and from the work area.
- Weight that is to be elevated, including number of people to be lifted
- Type and size of material to be lifted
- Height/outreach required for work
- Is the MEWP expected to move in the elevated position?
- Any overhead power lines on site?
- Any overhead structures which the operator could be crushed against
- Any interfacing with other vehicles and pedestrian?
- What wind loads is expected
- Budget



Types of MEWP

Selection of MEWP

The above considerations must be thought through during the risk assessment and planning for the lifting operation. **VPPs are used for indoor operations**

2**Risk Management****Objective:**

At the end of this section, the participant should be able to understand and/or successfully perform the following:

- Types of hazards (*UK 1.1*)
- Factors affecting stability (*1.2*)

2

Risk Management

Risk management involves identifying hazards, assessing risk, implementing appropriate control measures and monitoring and reviewing those measures.

What is a Hazard?

Anything with the potential to cause injury or harm.

Risk Assessment

What is a Risk?

A Risk is the likelihood of a hazard causing injury or harm.

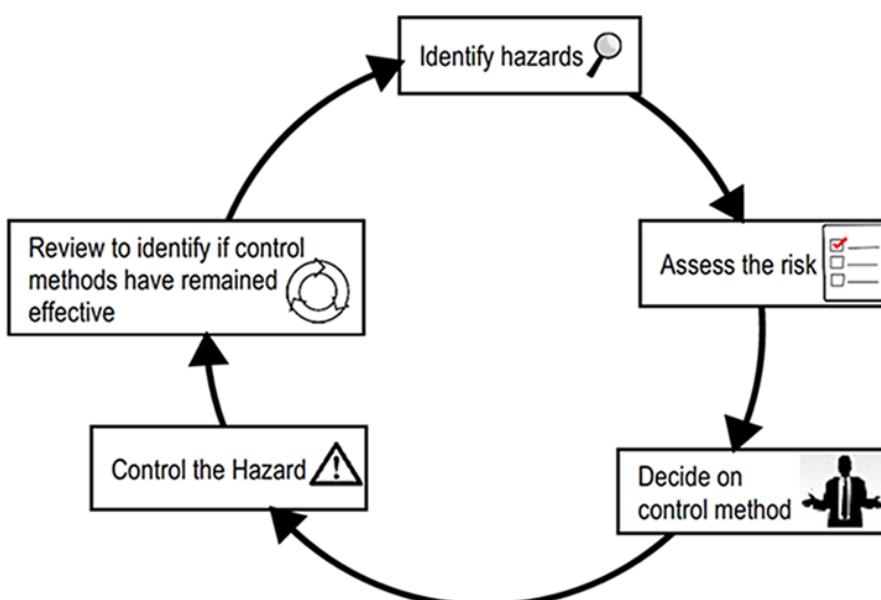
Risk Control Measures

Risk Assessment

A risk assessment is the overall process of identifying all the hazards and risks to and from an activity and assessing each potential impact.

WSH CO: 1 Code of Practice for Working Safely at Height 15.3.5:

“A risk assessment of the work area must be done by the operator before commencing any work. This is to identify any unsafe conditions of the workplace or the need to implement and additional control measures.”

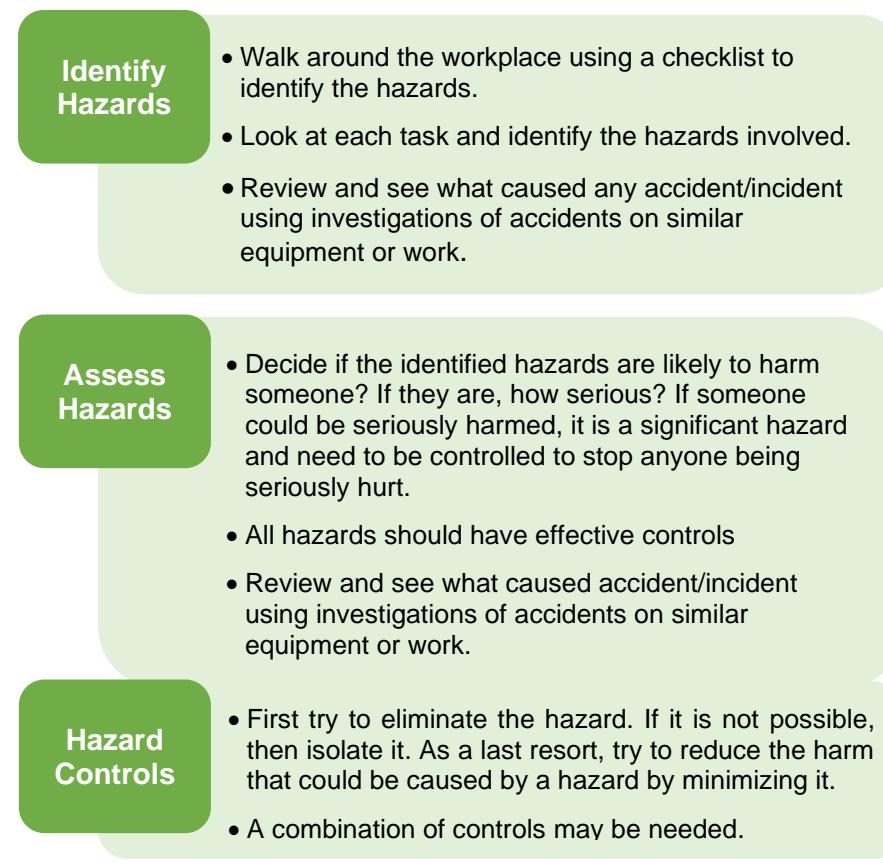


Risk Control Measures

MEWP can seriously injure people in the following ways:

Entrapment	An operator can get trapped between the work platform and a fixed structure when moving in tight overhead areas of structures. Operators can be trapped against the platform controls and not be able to stop the MEWP timely.
Overturning	On uneven surface, the MEWP can overturn throwing the operator from the work platform.
Falling	An operator can fall from the platform while working. This can happen when the wheels go into a hole and they can be catapulted out.
Collision	The MEWP may hit co-workers or nearby vehicles (e.g. forklifts) or overhead obstructions.

Planning a safe way to work can help identify the hazards of any work using MEWPs and prevent the above from happening. This process known as Hazard Management includes:



The following are some examples of the hazards of using MEWPs and their recommended control measures for the operator:

Confined overhead working	<ul style="list-style-type: none"> Must be briefed on the risks of working in and around structures where they could be trapped or pinned between the platform and the structure. Must be aware of their working environment at all times Must wear hardhats, secured by a chin strap.
Ground conditions	<ul style="list-style-type: none"> Use the MEWP on firm and level ground where possible. Make sure the MEWP is rated for any slopes it may face.
Outriggers	<ul style="list-style-type: none"> Set the outriggers correctly before using the MEWP. Use the manufacturer's instructions to set the outriggers before raising the platform.
Fall prevention	<ul style="list-style-type: none"> Ensure the work platform has effective guard rails and toe boards if it is not fully enclosed. Use an appropriate harness system if there is a risk of falling injury from the MEWP. Harness must be secured to a certified anchor point within the MEWP.
Falling objects	<ul style="list-style-type: none"> Isolate the area around the MEWP so that falling tools or objects do not strike anyone below. Those working nearby must wear a hard hat.
Handling materials	<ul style="list-style-type: none"> If the MEWP is being used to install materials, check the weight, dimensions and distribution of the materials so it does not exceed the rated capacity of the MEWP. Do not use handrails to support loads. Make sure workers can handle the materials safely. Use lifting equipment to move materials to the work position if needed.
Nearby hazards	<ul style="list-style-type: none"> Check the area for nearby hazards such as overhead power lines, traffic or dangerous machinery. Use barriers to keep pedestrians and traffic separated from where MEWPs are working.
Travelling between work areas	<ul style="list-style-type: none"> The operator must face the direction which the MEWP is travelling in. Always lower the MEWP when travelling between work areas.

Work Environments that Pose a Fall from Height Risk

- Raised work surfaces such as slopes
- Slippery work surfaces (wet, oily, dusty or glazed)
- Uneven work surface (e.g. broken ground or profiled roof sheeting)
- Cramped work surfaces
- Work surfaces cluttered with tools, work materials and debris
- Workers working in adverse weather conditions, e.g. in rain, strong or gusty winds, extreme heat or high humidity or very cold conditions
- Unprotected edges
- Work on temporary structures such as scaffolding and formwork
- Building materials, large tools, or equipment that need to be manually carried
- Overloading of working platform which may lead to collapse
- Struck by moving object or equipment, e.g. load from lifting operation

Source: WSHC, Code of Practice for Working Safely at Heights

Sample of a Risk Assessment Form

Department:					RA Leader: NAME				Approved by: Supervisor Name Signature: Supervisor Signature			Reference No.				
Process:		Repair Guttering			RA Leader 1: NAME											
Process/Activity Location:		Warehouse Roof (north side)			RA Leader 2: NAME											
Original Assessment Date:		DD/MM/YYYY			RA Leader 3: NAME				Name:							
Last review Date:		DD/MM/YYYY			RA Leader 4: NAME				Designation:							
Next review Date:		DD/MM/YYYY			RA Leader 5: NAME				Date:							
Hazard Identification			Risk Evaluation						Risk Control							
Ref	Work Activity	Hazard	Possible Injury/Ill-health	Existing Risk Controls	S	L	RPN	Addditional Controls	S	L	RPN	Implementation Person	Due Date	Remarks		
1	Elevate MEWP to guttering	Tipping MEWP over	Worker falling from platform causing injury	MEWP Training	5	3	15	Thorough Ground inspection. Wear harness.	5	2	10	MEWP Operator	Immediate			
2	Reaffix gutter brackets	Dropping tools	Hitting people under MEWP causing injury	Lanyards on Tools	3	4	12	Barricade work area underneath MEWP	1	4	4	MEWP Operator	Immediate			
3	ETC				Likelihood Severity Catastrophic (5) Major (4) Moderate (3) Minor (2) Negligible (1)			Rare (1)		Remote (2)		Occasional (3)	Frequent (4)	Almost Certain (5)		
4				5				10		15		20		25		
5				4				8		12		16		20		
6				3				6		9		12		15		
7				2				4		6		8		10		
				1				2		3		4		5		

3**MEWP Safety Legislative Requirements****Objective:**

At the end of this section, the participant should be able to understand and/or successfully perform the following:

- Legislations and industry guidelines relating to vertical personnel platform operations
(UK 1.8)

3

MEWP Safety Legislative Requirements

The following include some but not all acts, regulations, approved codes of practice and guidelines related to MEWPs in Singapore context (for reference only).

Workplace Safety and Health Act (WSHA)

The Workplace Safety and Health Act is a set of legal requirements and regulations issued by Ministry of Manpower to cultivate safety and health of workers and other people that are affected by the work being carried out.

It covers:

- A. All workplaces, unless exempted by the WSH Act
- B. Responsibilities of stakeholders
- C. Hazardous substances
- D. Machinery & equipment

It facilitates effective enforcement through the issuance of remedial orders and imposes higher penalties for non-compliance and risky behaviour.

The Workplace Safety and Health Act states a general maximum penalty for offences.

WSH Regulations

These Regulations are made under the Act and set out the general principles, providing the practical steps that should be followed in order to prevent injury and illness at work.

Everything in the Regulations is Law and must be followed.

Code of Practice

The Code of Practice provides practical guidance and clarifications on the Workplace Safety and Health (WSH) (Work at Heights) Regulations. It should be used in addition to the Act.

You are obligated to follow codes of practice unless you can apply another solution that is as good as or better than the Code of Practice.

WSH Act &
Regulations

Code of Practice on
Working Safely at
Height

Summary of the Act in relation to the use of:**1. Lifting machine:**

- A lifting machine shall not be operated except by a person trained and competent to use that machine
- No person below the age of 18 years shall be at work operating any lifting machine driven by mechanical power

2. Hazardous Substances:

- If any Hazardous substance is used, handled or stored, it must be accompanied by a **Safety Data Sheet** for that substance.
 - Take precautionary measures to ensure the safe use of the substance
 - Make the **Safety Data Sheet** available to all who are exposed to the substance
-

Workplace Safety & Health Act 2006 (Chapter 354A)

In general persons who have duties and responsibilities under the Act are listed below.

For more information please go to www.mom.gov.sg

Duties according to Different Capacities

Duty of occupier of workplace

11. It shall be the duty of every occupier of any workplace to take, so far as is reasonable practicable, such measure to ensure that –

(a) (c) any machinery, equipment, plant, article or substance kept on the workplace, are safe and without risks to health to every person within those premises, whether or not the person is at work or is an employee of the occupier.

Duties of employers (Duties of principals)

12.– (1) It shall be the duty of every employer to take, so far as is reasonable practicable, such measures as are necessary to ensure the safety and health of his employees at work.

(3) For the purposes of subsection (1), the measures necessary to ensure the safety and health of persons at work include –

(b) ensuring that adequate safety measures are taken in respect of any machinery, equipment, plant, article or process used by those persons;

(c) ensuring that those persons are not exposed to hazards arising out of the arrangement, disposal, manipulation, organization, processing, storage, transport, working or use of things –

**(i) in their workplace; or
(ii) near their workplace and under the control of the employer;**

(d) developing and implementing procedures for dealing with emergencies that may arise while those persons are at work; and

(e) ensuring that those persons at work have adequate instructions, informing, training and supervision as is necessary for them to perform their work.

Duties of principals

14-(4) For the purpose of subsection (1), the measures necessary to ensure the safety and health of persons at work include –

(b) ensuring that adequate safety measures are taken in respect of any machinery, equipment, plant, article or process used by those persons;

(e) ensuring that those persons at work have adequate instructions, information, training and supervision as is necessary for them to perform their work.

Additional duties of principals in relation to contractors

14A.– (1) It shall be the duty of every principal to take, so far as is reasonable practicable, such measures as are necessary to ensure that any contractor engaged by the principal on or after the date of commencement of section 5 of the Workplace Safety and Health (Amendment) Act 2011 –

(b) has taken adequate safety and health measures in respect of any machinery, equipment, plant, article or process used, or to be used, by the contractor or any employee employed by the contractor. [18/2011 wef 01/09/2011]

(2) The duty imposed on every principal under subsection (1)(a) includes ascertaining that the contractor engaged by the principal and any employee of the contractor –

(a) have sufficient experience and training to carry out the work for which the contractor is engaged by the principal to do; and

Duties of persons at work

15.– (1) It shall be the duty of every person at work –

(a) to use in such manner so as to provide the protection intended, any suitable appliance, protective clothing, convenience, **equipment** or other means or thing provided (whether for his use alone or for use by him in common with others) for securing his safety, health and welfare while at work; and

(2) No person at work shall willfully or recklessly interfere with or misused any appliance, protective clothing, convenience, **equipment** or other means or thing provided (whether for his use alone or for use by him in common with others) pursuant to any requirement under this Act for securing the safety, health or welfare of persons (including himself) at work.

Duties of manufacturers and suppliers of machinery, equipment or hazardous substances used at work

16.– (1) Subject to this section, it shall be the **duty of any person who manufactures or supplies any machinery, equipment or hazardous substance for use at work to ensure, so far as is**

reasonably practicable –

- (a) that the following **information about the safe use of the machinery, equipment** or hazardous substance is available to any person to whom the machinery, equipment or hazardous substance is supplied for use at work;
- (c) that are relevant to its safe use;
- (b) that **the machinery, equipment** or hazardous substance **is safe, and without risk to health, when properly used**;
- (c) that **the machinery, equipment or hazardous substance is examined and tested** so as to comply with the obligation imposed by paragraph (b).

Duties of persons who erect, install or modify machinery or equipment and persons in control of machinery for use at work

17.– (a) It shall be the duty of any person who erects, **installs or modifies any machinery or equipment** for use at work to ensure, so far as is reasonable practicable, that the machinery or equipment is erected, installed or modified **in such a manner that it is safe, and without risk to health, when properly used**.

(3) Any person required under subsection (1) to ensure that any machinery or equipment is erected, installed or modified in such a manner that is safe, and without risk to health, when properly used shall be regarded as having complied with that subsection to the extent that –

(a) **the person ensured, so far as is reasonably practicable, that the erection, installation or modification was in accordance with the information supplied by the designer, manufacturer or supplier of the machinery or equipment regarding its erection, installation or modification; and**

Duties of occupiers of common areas

19. – (1) For the purposes of subsection (2), where a building comprises **one or more workplaces, any common property or limited common property of the building** (referred to in this section as the common area) which is used by persons at work in any such workplace or is used by such persons to move through shall be treated as part of their workplace.

(2) It shall be the duty of the occupier of the common area to comply any provision of this Act with respect to –

(a) electric generators and motors located in the common area;

(b) hoists and lifts, lifting gear, lifting appliances and lifting machines located in the common area;

(c) means of access into or egress from the common area; and

(d) any machinery or plant located in the common area which belongs to or is supplied by the owner or occupier of the common area.

(3) In this section – “common property” and “limited common property” have the same meanings as in the Building Maintenance and Strata Management Act (Cap. 30C);

“occupier”, in relation to a common area, includes the management corporation or subsidiary management corporation, as the case may be, having control of that common area.

Workplace Safety and Health (General Provisions) Regulations 2006

Lifting appliances and lifting machines

21. – (1) No lifting appliance or lifting machine shall be used unless an authorised examiner has –

(a) tested and examined the lifting appliance or lifting machine; and

(b) issued and signed a certificate of test and examination, **specifying the safe working load** of the lifting appliance or lifting machine.

(2) The certificate of test and examination referred to in paragraph

(1) (b) shall be kept available for inspection.

(3) Every lifting appliance and lifting machine shall be **thoroughly examined by an authorised examiner at least once every year or at such other intervals as the Commissioner may determine.**

(6) **Every lifting appliance and lifting machine –**

(a) shall be conspicuously marked with its safe working load or loads and a distinctive number or other means of identification; and

(7) No lifting appliance or lifting machine shall be loaded beyond its safe working load except by an authorised examiner or an inspector for the purpose of testing such lifting appliance or lifting machine.

(8) Every lifting appliance and lifting machine shall be adequately and securely supported and –

- (a) every rope, chain or wire;
- (b) every part of a stage, framework or other structure; and
- (c) every mast, beam, pole or other article of plant supporting any part of the lifting appliance or lifting machine,

Shall be of good construction sound material and adequate strength, having regard to the nature of the lifting appliance, its lifting and reaching capacity and the circumstances of its use.

(12) A lifting machine shall not be operated excepted by –

- (a) a person **trained and competent** to operate that machine; or
- (b) A person undertraining who is under the direct supervision of a qualified person.

(13) No person below the age of 18 years shall be at work –

- (a) **operating any lifting machine driven by mechanical power**; or
- (b) **giving signals to the operator of any lifting machine.**

(14) It shall be the duty of the occupier of workplace in which any lifting appliance or lifting machine is used to comply with paragraphs (1) to (13). [S 517/2011 wef 10/09/2011]

(15) It shall be the duty of an authorised examiner to –

(a) issue and sign a certificate, in a form determined by the Commissioner, of the result of the examination referred to in paragraph (3);

(b) provide the certificate referred to in sub-paragraph (a) to the occupier or the workplace; [S517/2011 wef 10/09/2011]

(c) inform the Commissioner –

(i) as soon as is reasonably practicable, if the examination shows that the lifting appliance or lifting machine cannot continue to be used safely unless repairs are made; or

(16) It shall be the duty of the owner of a lifting appliance or lifting machine to ensure that it is –

(a) of good mechanical construction, sound material and adequate strength; and

(b) properly maintained.

(17) An inspector may at any time test any lifting appliance or lifting machine and may **prohibit its further use** if he is not satisfied that the lifting appliance or lifting machine is safe for the use to which it is put.

Workplace Safety and Health (Construction) Regulations 2007

Vehicular hazards

28.– (1) Where in a worksite, **any work is performed over, on or in close proximity to a street, public road or any other place where public vehicular traffic may cause danger to any person who carried out the work**, it shall be the duty of –

- (a) the employer of any person who carries out the work in the worksite; or
- (b) the principal under whose direction any person carries out the work in the worksite,

to ensure that –

- (i) the **worksite is barricaded**;
- (ii) suitable **warning signs and warning lights** are set up to direct traffic away from the worksite; and
- (iii) where **necessary, the traffic is specially controlled by designated persons**.

Personal protective equipment

33.– (1) It shall be the duty of –

- (a) the employer of any person who carries out any work in a worksite which requires any protection referred to in paragraph (2); or
- (b) the principal under whose direction any person carries out any work referred to in sub-paragraph (a) in a worksite.

To provide and maintain, as far as is reasonably practicable, the appropriate personal protective equipment to the person.

(2) The protection referred to in paragraph (1) is as follows:

- (a) eye protection;
- (b) fall protection;
- (c) foot protection;
- (d) hand protection;
- (e) head protection
- (f) hearing protection; and
- (g) respiratory protection.

Workplace Safety and Health (Risk Management) Regulations

Risk assessment

3. – (1) In every workplace, the employer, self-employed person and principal **shall conduct a risk assessment in relation to the safety and health risk posed to any person** who may be affected by his underaking in the workplace.

(2) The Commissioner may determine the manner in which the risk assessment referred to in paragraph (1) is to be conducted'

Workplace Safety and Health (Work at Heights) Regulations 2013

- (a) in or on an elevated workplace from which a person could fall;**
- (b) in the vicinity of an opening** through which a person could fall;
- (c) in the vicinity of an edge** over which a person could fall
- (d) on a surface through** which a person could fall; or
- (e) in any other place** (whether above or below ground) from **which a person could fall,**

from one level to another and it is reasonably likely that the person or any other person **would be injured due to the distance** of the fall;

Fall prevention plan

5. – (1) It shall be the duty of the occupier of every workplace specified in the Schedule, and in which work at height is carried out, to establish and implement a fall prevention plan.

(2) The fall prevention plan referred to in paragraph (1) shall be established and implemented in accordance with the requirements of the approved code of practice relating to safe and sound practices for fall prevention.

(3) It shall be the **duty of the occupier of every workplace** specified in the Schedule to ensure that the fall prevention plan referred to in paragraph (1) is made available for inspection upon request by any inspector.

Definitions

“competent person” means a person who has sufficient experience and training to perform the work required to be carried out, and has

passed such courses as the Commissioner may require for that work; “**responsible person**”, in relation to a person who carries out or is carry out any work at height, means –

- (a) his employer; or
- (b) the principal under whose direction he carries out or is to carry out any such work;

Training for persons at work

6. it shall be the **duty of the responsible person** of any person who carried out or is to carry out any work at height to **ensure that the person shall work at height in a workplace only after he has first received adequate safety and health training to familiarise himself with the hazards associated with work at height and the precautions to be observed.**

Supervisor of work at height

7. It shall be the **duty of the responsible person** of any person who carries out or is to carry out any work at height to **ensure that the person shall work at height in a workplace under the immediate supervision of a competent person for that work.**

Fall arrest system

11.– (1) Where a fall arrest system is used in a workplace, it shall be the duty of the responsible person of any person who carries out or is to carry out at that workplace any work at height to ensure that –

- (a) the fall arrest system –
 - (i) is of good construction, sound material and adequate strength;
 - (ii) is free from patent defects; and
 - (iii) **is suitable and safe for the purpose for which it is intended;**

(b) every person using the fall arrest system is **trained in the safe and correct use of the system**; and

(2) Where a fall arrest system using a full-body harness is used in a workplace, it shall be the duty of the responsible person of any person who carries out or is to carry out at that workplace any work at height to ensure that –

- (a) the system incorporates a suitable means of absorbing energy and limiting the forces applied to the user’s body; and
- (b) **in the event of a fall, there is enough fall clearance available to prevent the user from hitting an object, the ground or other surfaces.**

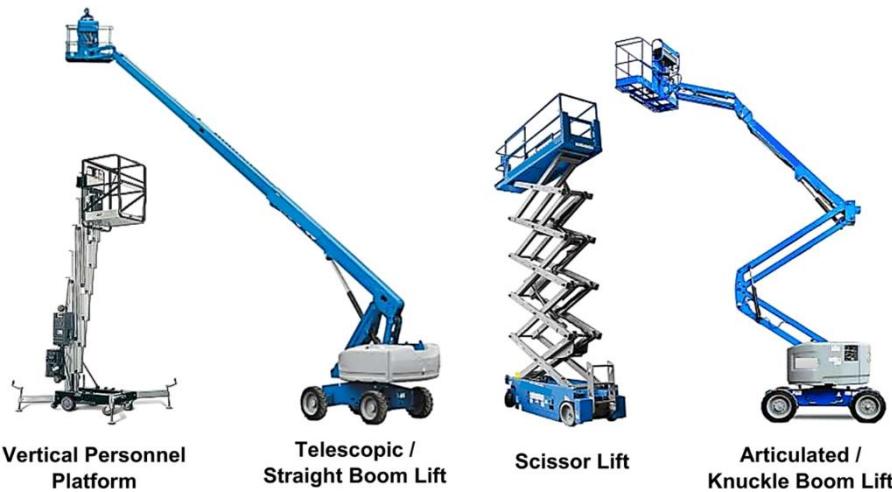
Fall protection in MEWP

Vertical Lifts

It is necessary for personnel working from a vertical lift to wear fall protection equipment.

This includes Vertical Personal Platform, Scissor Lift, Push Around Verticals (PAV) and Mast Climbing Work Platforms (MCWP).

The need for a fall protection system will be the outcome of a job specific risk assessment undertaken prior to work commencing and taking into consideration the manufacturer's operators' manual.



Vertical Personnel Platform

Telescopic / Straight Boom Lift

Scissor Lift

Articulated / Knuckle Boom Lift

Permit-To-Work System For Hazardous work at Height

Implementation of permit-to-work system

20.– (1) Before the carrying out of any hazardous work at height at a factory, it shall be the duty of the occupier of the factory to –

(a) appoint a competent person for the hazardous work at height at the factory to carry out the duties of any authorised manager in accordance with this Part; and

(b) appoint a competent person for the hazardous work at height at the factory to carry out the duties of a work-at-height safety assessor in accordance with this Part.

[S280/2014 wef 01/05/2014]

(2) Before and during the carrying out of any hazardous work at height at a factory, it shall be the duty of the occupier of the factory to ensure that a permit-to-work system in accordance with this Part is implemented for that hazardous work at height. [S 280/2014 wef 01/05/2014]

(3) The permit-to-work system referred to in paragraph (2) shall provide that –

(a) the hazardous work at height is carried out with due regard to the safety and health of persons carrying out the work;

(b) such persons are informed of the hazards associated with the hazardous work at height and the precautions they have to take; and

(c) the necessary safety precautions are taken and enforced with the hazardous work at height is being carried out.

Definitions: “**hazardous work at height**” means work –

(a) in or on an elevated workplace from which a person could fall;

(b) in the vicinity of an opening through which a person could fall;

(c) in the vicinity of an edge over which a person could fall;

(d) on a surface through which a person could fall; or

(e) in any other place (whether above or below ground) from which a person could fall,

a distance of more than 3 metres;

Workplace Safety and Health (Work at Heights) (Amendment) Regulations 2014

A PTW is required for WAH where a person could fall from a height of more than 3 metres, including falling into depts. Such work activities are deemed as hazardous WAH under the Regulations. Under the **WSH (WAH) (Amendment) Regulation 2014**, the **PTW regulatory requirements apply only to workplaces defined as Factories where hazardous WAH is carried out.**

For WAH where the risk of falling more than 3 metres have been mitigated through adequate and effective edge protection, a PTW may not be required, unless the responsible person (employer or the principal) deemed that a PTW should still be implemented.

Such WAH situations where a PTW may not be required, include but are not limited to the following:

1. Working on a flat roof with a perimeter parapet wall of at least 1 metre in height, and no openings or open sides where a person may fall;
2. Working on a mezzanine with safe and proper stair access and effective barricade around the mezzanine perimeter to prevent falls; and
3. **Working within the properly barricaded mobile elevated work platform (with the appropriate PPE anchored to designated anchor points at all times).**

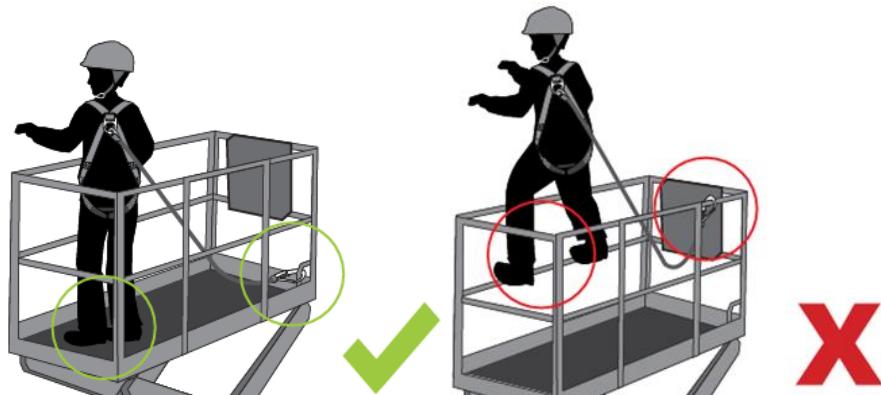
Code of Practice for Working Safely at Heights

MEWP operator competency includes:

- MEWP operator course conducted by a Ministry of Manpower Accredited Training Provider; and
- A familiarization for the model/s of MEWP they are required to operate.

While working at heights in a MEWP, the operator shall ensure that:

- All person on the MEWP use appropriate PPE (for work at heights), including a travel restraint system anchored to the manufacturers' designated anchor point inside the MEWP;
- All persons maintain a firm footing on the MEWP floor – climbing on guard-rails or the use other devices to achieve additional height or reach is prohibited; and
- When other moving equipment or vehicles are present, additional precautions (e.g. barricade, traffic management measures) are in place.



MEWPs are not specifically designed to transfer personnel from one level to another, or for persons to enter/exist the work platform at height; it should only be considered as an option after ensuring that:

- Access/egress at height is not prohibited by the manufacturer;
- There are no other reasonable practicable means to provide the access to the level or the work area;
- A thorough risk assessment is conducted to assess all additional risks (e.g., falling of persons, falling of objects or sudden movement of the MEWP); and
- All persons are able to utilize 100 percent tie-off.

WSH Act & Regulations

Code of Practice on Working Safely at Height

Summary of Code of Practice on Working Safely at Height

Working Safely at Height 15.3.4:

- Should only be used on solid level surface
- Should be clearly marked with Safe Working Load limit (SWL)
- Should not be used in high wind conditions or where there is a risk of lightning

Working Safely at Height 15.3.5:

- Operators of boom lifts should be properly trained and competent for the job
- A risk assessment of the work area must be done by the operator before commencing any work
- A Pre-operation check must be performed by the operator before usage
- There must be no modification or alteration to the MEWP or its safety devices

Working Safely at Height 15.3.5:

- It is recommended that the load pressure at the contact points of the MEWP with the ground be marked near the contact points.
- The operator must be able to recognise conditions such as hazardous terrain.
- Operators working in boom lifts should wear a suitably anchored safety harness.

Working Safely at Height 15.3.6:

- Personnel required to climb out of an elevated boom lift onto an elevated facility structure shall utilize 100 percent tie-off procedures

Working Safely at Height 15.3.7:

- The use of planks, ladders or other devices on work platforms to achieve additional height or reach is strictly prohibited

Working Safely at Height 15.3.8:

- Always refer to the operators or service manual for specific lifting equipment

Offences and Penalties

The Workplace Safety and Health Act states a general maximum penalty for offences.

WSA Regulations 45:

"Any person who contravenes any provision of these Regulations which imposes a duty on him, shall be guilty of an offence and shall be liable on conviction to a fine not exceeding \$20,000 or to imprisonment for a term not exceeding 2 years or to both."

4**Vertical Personnel Platform****Objective:**

At the end of this section, the participant should be able to understand and/or successfully perform the following:

- Main components of vertical personnel platform (*UK 1.5*)
- Safe working load of vertical personnel platform (*UK 1.6*)
- Safety devices, signage, labels and vertical personnel platform controls (*UK 1.7*)

4

Vertical Personnel Platform

Parts of a Vertical Personnel Platform

Vertical Personnel Platform (VPP) consist of a work platform attached to a vertically extending aluminum mast mounted on a steel base. Raising and lowering of the hydraulic mast and platform relies on the battery operated controls.

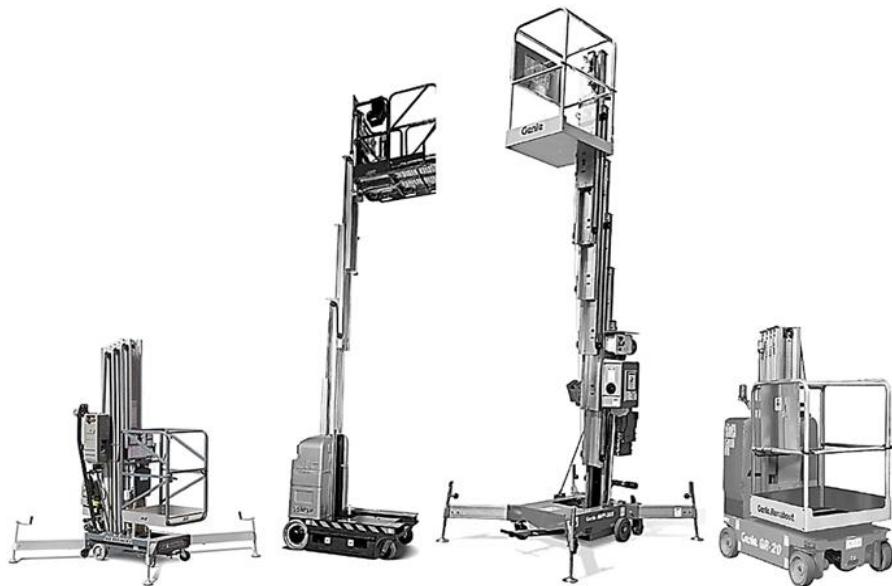
VPPs are compact and efficient. It combines the portability and convenience of a ladder with the stability and safety of a work platform. VPPs are ideal for applications requiring straight vertical access, minimal outreach and excellent portability. Their compact size makes them easy to set up, operate and maneuver around the job site.

VPPs are usually for internal maintenance or warehouse operations, a personnel lift access solution. It is limited in terms of extension and maximum load but ideal for routine maintenance tasks.

Parts of a Vertical Personnel Platform



Feature of a Vertical Personnel Platform



VPPs are mainly for operating on flat solid surfaces, either deploying outriggers or built-in counterweight for stability. They are available in many models but are basically classified into two categories: "manual" machine; and "mobilised", drivable machine.

The "manual" machines can be rolled in their retracted position for portability, and when fully extended reach a remarkable platform heights.

The “mobilised” machines can be driven with or without platform extended at full height.

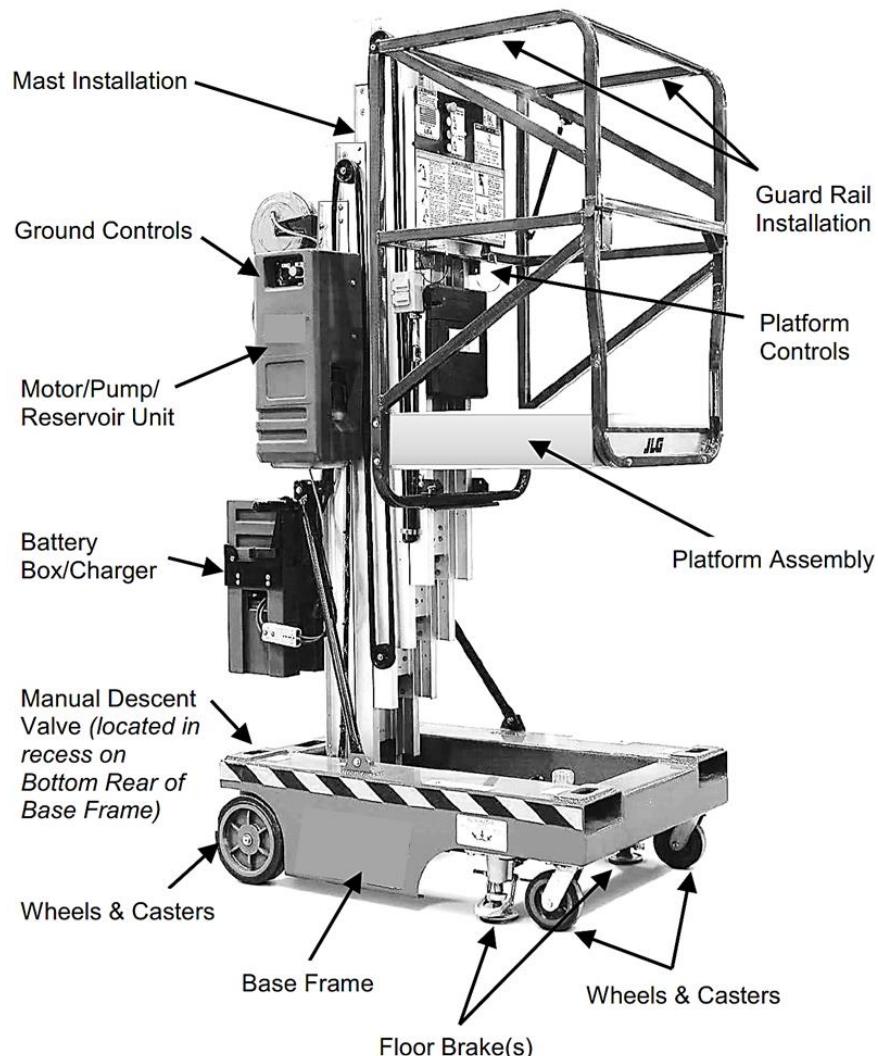


“Mobilised” drivable VPP ↑
“Manual” VPP →



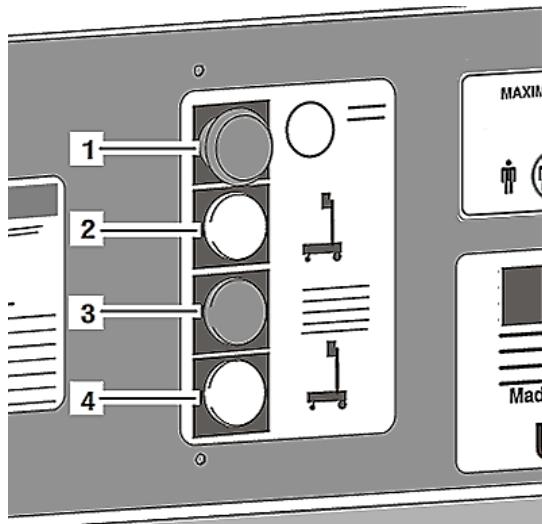
Parts of a Vertical Personnel Platform

A Manual VPP



- The primary operator control station is in the platform, where the operator can raise and lower the platform.
- The ground control station has an Emergency Stop button to lower the platform to the ground in case the operator in the platform is unable to do so or if a power failure should occur.
- The base frame has a manual descent valve which can also be used to lower the platform in an emergency.
- The controls are battery operated.

Emergency Stop System – Platform Control Station



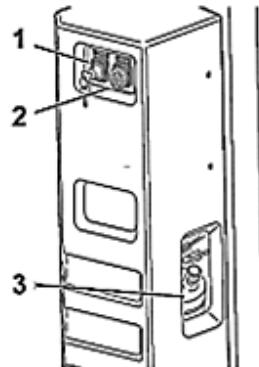
1. **POWER/EMERGENCY STOP** furnishes power to the platform and ground controls when reset (ON) and when pushed in (OFF), power is shut off to the platform and ground controls.
2. **PLATFORM UP** button when pressed in simultaneously with **ENABLE** button raises the platform.
3. **FUNCTION ENABLE** button must be pressed in for machine to operate.
4. **PLATFORM DOWN** button when pressed in simultaneously with **ENABLE** button lowers the platform.

Platform Control of a mobilised VPP

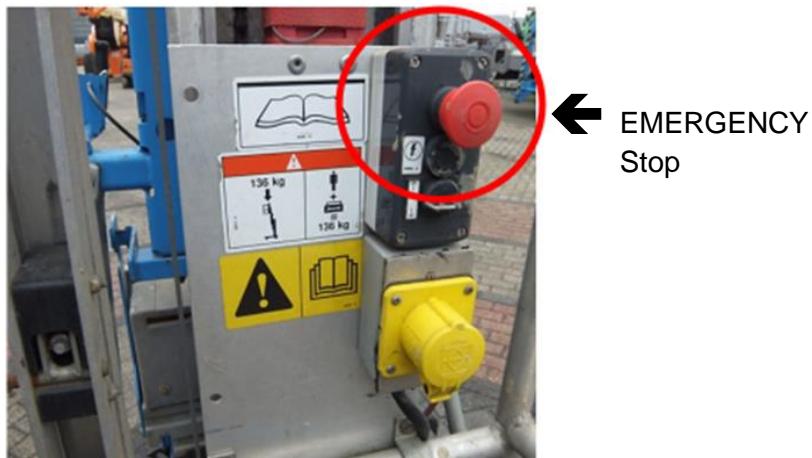


Emergency Stop System – Ground Control Station

1. POWER ON/OFF Key Switch control station controls power to all functions on the machine.
2. POWER/EMERGENCY STOP allows power to the platform and ground controls when reset (ON). When pushed in (OFF), power is shut off to the platform and ground controls
3. HYDRAULIC RESERVOIR / CIRCUIT BREAKER / FUSE is located inside the ground control state housing.

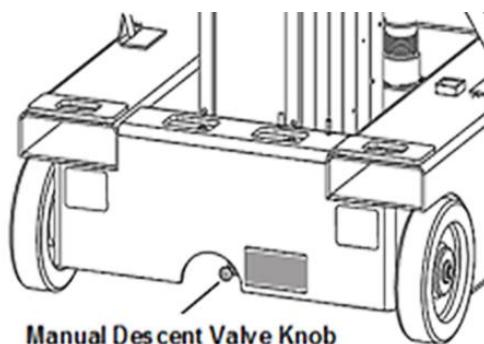


Ground Station of a mobilised VPP



Emergency Stop System – Base Frame

Manual Descent Valve is located at the rear and bottom of the base frame. Pull to release spring loaded return valve (RED knob) to lower the platform in an emergency or power failure.



Refer to Manufacturer's Instructions as different brands and models may have different specifications.

Base Frame of a mobilised VPP

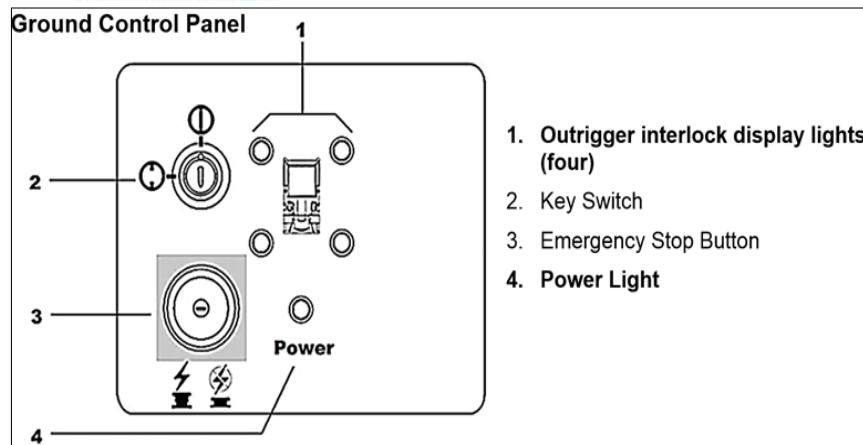


Lights and Beepers

These should all be operational. Lights indicate "power on" and a beeper indicates "motion".



*Machine that is fitted with
outriggers*



Tilt Sensor

Sensor fitted in the MEWP will detect if the base is greater than 0-5 degrees out of level. **Do not exceed rated gradeability.** Warnings may sound and illuminate on the panel and the machine may stop.

Refer to Manufacturer's Instructions for testing instructions as different brands and models have different specifications.

Tyres

The tyres must be in good condition to help support the MEWP on the ground. Refer to Manufacturer's Operating Instructions.

The tyres may be Black (marking), or Grey (non-marking).



Features of a Vertical Personnel Platform

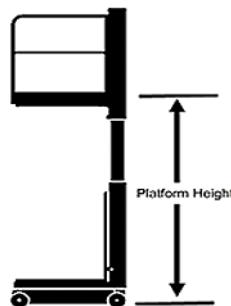
Operating characteristics and limitations

The platform can be raised above the stowed position if:

- The machine is positioned on a smooth, firm surface on which the machine is capable of being levelled.
- Load must be within manufacturer's rate capacity
- All machine systems are functioning properly
- The machine floor brake is set and operating properly

Parts of a Vertical Personnel Platform

Feature of a Vertical Personnel Platform



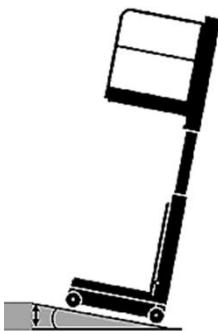
Platform Height

It is the maximum vertical distance from the surface upon which the MEWP is supported to the floor of the platform. This is normally written in metres and feet.



Platform Load Capacity

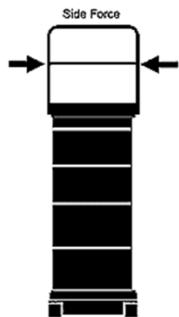
Do not exceed the rated platform load capacity and the occupancy which is usually 1 person.



Gradeability & Side Slope

This usually refers to when platform is stowed only.

Refer to Manufacturer's Instructions as different brands and models may have different specifications.



Side Force

This refers to platform fully extended with maximum load.

Refer to Manufacturer's Instructions as different brands and models may have different specifications.

5**Pre-Start Inspection****Objective:**

At the end of this section, the participant should be able to understand and/or successfully perform the following:

- Main components of vertical personnel platform (*UK 1.5*)
- Safe working load of vertical personnel platform (*UK 1.6*)
- Safety devices, signage, labels and vertical personnel platform controls (*UK 1.7*)

5**Pre-Start Inspection**

All VPPs must be inspected at the beginning of each shift, before use.

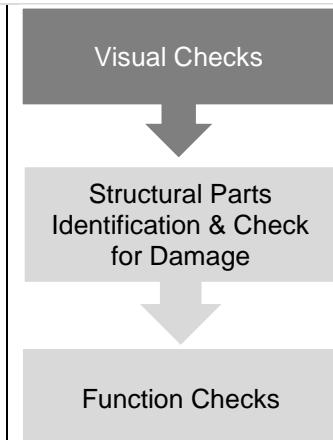
The purpose of a pre-start inspection is to identify faults or damage that may have occurred during previous work shift or during transportation.

Check the Operator Safety Check record for recent history such as:

- Recorded faults (must be rectified before it can be used)
- Maintenance issues (must be rectified before it can be used)
- 6 monthly Inspection in date (must not be expired)

The Operator Safety Check record must be provided by the owner and filled in by the operator. These pre-use inspection records are to be kept by user/occupier for not less than 5 years from the date of the record made.

Start with a visual inspection of the VPP and follow with functional test.

**Visual Checks**

The following Pre-Start Inspection should include the following:

Cleanliness of the machine	All surfaces for leakage (oil, fuel, or batter fluid) or foreign objects. Report any leakage to the proper maintenance personnel.
Decals and Placards	They must be legible and none of the decals and placards are missing. Make sure all illegible decals and placards are cleaned or replaced.
Operators and Safety Manuals	A copy of the Operator and Safety Manual is enclosed in the weather resistant storage container.
Battery	Charge as required
Fuel	(Combustion Engine Powered Machines Only) Add the proper fuel as necessary.
Hydraulic Oil	Check the hydraulic oil level. Ensure hydraulic oil is added as required.

Six-Monthly Inspection

Under the WSH Regulation, the MEWP has to go through a 6-monthly mandatory inspection by an authorised person. After passing the inspection criteria, a Ministry of Manpower Inspection sticker will be given to be displayed on the MEWP. The operator must look out for this sticker as the evidence of the 6-monthly inspection being done.

On the sticker, the operator must check the "Cert. Expiry Date" to make sure that the expiry date is not overdue.

If the "Cert. Expiry Date" is overdue, the MEWP should not be used. The operator has to report the status to his supervisor, employer or MEWP owner.

WSH Regulation 19.3:

"Every hoist or lift used in a factory shall be thoroughly examined by an authorise examiner at least once every 6 months or at such other intervals as the Commissioner may determine"

MINISTRY OF MANPOWER OCCUPATIONAL SAFETY & HEALTH DIVISION

C.I.F. REGISTRATION NO:	_____
SERIAL NO:	_____
TEST LOAD:	_____
TEST DATE:	_____
SWL:	_____
APPROVAL DATE:	_____
CERT EXPIRY DATE:	_____
INSPECTOR NO:	_____
EMAIL:	_____

Data Plate

Every VPP will be fitted with a Data Sheet. The Data Sheet identifies the operating capabilities of the MEWP. The operator must be aware of the operating capabilities of the MEWP before use.

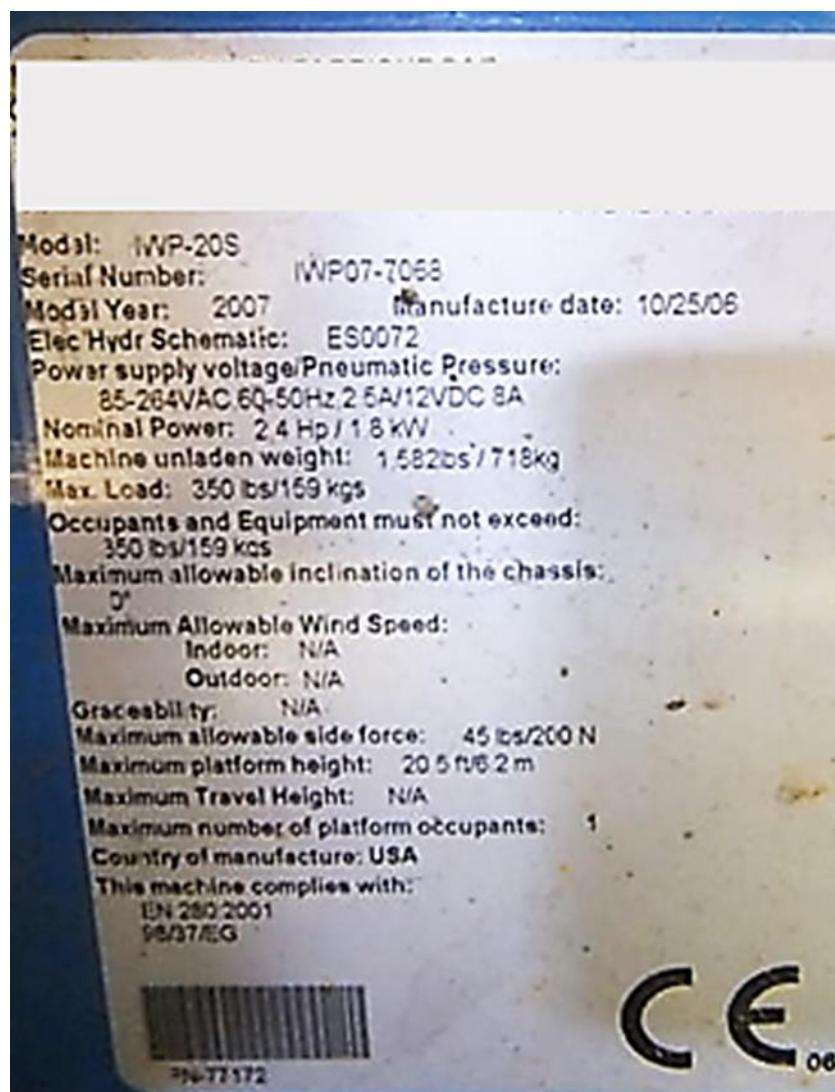
This is done during the Pre-use inspection.

Data sheet will generally include the following information:

- Model
- Manufacture Date
- Platform Height
- Platform Load Capacity
- Gradeability
- Side Force
- Wind Rating

DO NOT USE THE MEWP if the Data plate is missing or illegible. Information on the Data plate is required as a guideline to determine if the MEWP is suitable for the task.

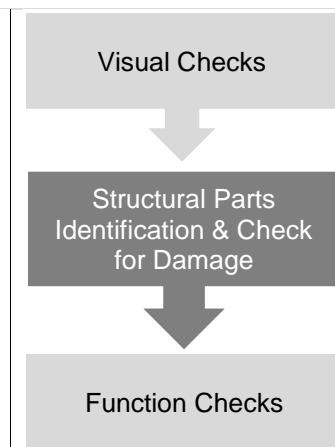
Sample of a VPP Data Plate



Structural Parts Identification and Check for Damage

Walk around the MEWP to inspect structural parts for any damages. Open all access covers and identify mechanical components and check for damage.

1. Wheels and Caster	Check for any visible damage. They should be properly secured and able to turn freely and are lubricated.
2. Floor Brake	Must be properly secured to the base frame with no visible damage (cracks, distortion, etc) and is functioning properly.
3. Base Frame	<ul style="list-style-type: none"> • No visible damage - components properly secured. • No loose wires dangling below base • Bubble level in place and functioning properly.
4. Manual Descent Control Valve	No visible damage, properly secured with no loose or missing parts.
5. Battery Box/Charger Installation	<ul style="list-style-type: none"> • Proper battery electrolyte level. • Cables are secure, no damage or corrosion.
6. Motor/Pump/Reservoir Unit	<ul style="list-style-type: none"> • All properly secured, without visible damage or evidence of hydraulic leaks. • Check that hydraulic reservoir fluid level is filled to the "Fill to Line" mark on the side of the reservoir.
7. Ground Controls	<ul style="list-style-type: none"> • Key switch is operable. No visible damage. • Placards are secured and legible. • Emergency stop switch does not have any visible damage and is properly set for operation.
8. Mast Installation	<ul style="list-style-type: none"> • Mast sections properly secured without visible damage to mast sections, lose or missing parts. • Slide pads are properly secured. Mast chains and cables properly secured, lubricated and undamaged. • Sequencing cables properly secured and undamaged. • Sheaves and pins are properly secured without visible damage, lose or missing parts and are



	<p>lubricated.</p>	
9. Platform Controls	<ul style="list-style-type: none">• Up/Down and Function Enable buttons are properly secured with no loose or missing parts or any visible damage.• Placards are secure and legible, emergency shut-off button set for operation.• Control markings legible.• Operator manual enclosed in manual storage tube.	
10. Guard Rail	<ul style="list-style-type: none">• All railings are securely attached with no visible damage or missing parts.• Sliding entry bar is in proper working order.• Platform gate/slide bar is working properly without visible sign of damage (if equipped).	
11. Platform Assembly	<ul style="list-style-type: none">• Secure to mast without loose or missing parts and visible damage.• Control and power cables do not have any visible damage.• Cables are properly tensioned and seated in control cable sheaves.• Control cable sheaves are not damaged and rotate freely.• Mast chains and cables properly secured, lubricated and undamaged.• Sequencing cables properly secured and undamaged.	

Function Checks

Once the “Walk-Around” inspection is complete, perform a function check of all systems in an area free of overhead and ground level obstructions.

Function check of all systems should be performed in an area free overhead and ground level obstructions perform a function check as follows:



Visual Checks

Structural Parts Identification & Check for Damage

Function Checks

Platform Control

Set up machine for operation, install outriggers (if there are), level machine, and make sure the wheels are off the ground.

Enter platform, raise and lower platform about half a metre to one metre (2-3 feet) several times. Check for smooth elevation and lowering of platform. Check all functions with power on:

- i. **Check warning devices** – make sure that the audible warning devices, flashing lights, gauges, warning lights batter charge indicator, horn etc are in working condition.
- ii. **Deadman Control** – check the deadman control trigger/foot pedal operation. Do not test switch whilst driving, test by releasing when operating.
- iii. **Travel/Steering/Brakes (Mobilised VPP)** – travel and steer forward and reverse to test function.

Caution: Some electric MEWPs have extremely responsive steering.

Use brakes forward and reverse direct to test function.

Caution: Some MEWPs momentarily over-run before stopping.

Allow ample braking distance.

Ground Control

Check all functions with engine or power ON.

Pull the emergency stops out and select ground controls to turn the MEWP on and check:

1. Battery charge level.
2. Warning devices – audible and flashing light gauges are working
3. All functions – lift and lower
4. Emergency Lowering device – Bleed Down Valve

Check as per manufacturer's specifications or operator's manual.

With platform completely lowered, check hydraulic oil level in reservoir at ground control station maintain an oil level to the "Fill to Line" indicator on the side of the reservoir.

DO NOT USE HYDRAULIC BRAKE FLUID.

Base Frame

Check **Manual Descent Valve** function which is located at the rear and bottom of the base frame. Pull to release spring loaded return valve (RED knob) to lower the platform in an emergency or power failure.



If

both ground and platform controls inspections and the **Manual Descent Valve** function are cleared with all other functions working in good and safe order sign the **Operator Safety Checklist Record** book.

If a fault is detected report to an authorised person and record the details in the **Faults / Problems / Action Taken** section of Operator Safety Checklist Record book.)

DO NOT USE THE MEWP if the Operator Safety Checklist Record shows:

A recorded fault that has not been rectified and signed off.
The MEWP has not been serviced within 90 days of the current date.

Sample of MEWP Pre-Use Inspection Checklist (Operator Safety Checklist)

Source: IPAF

MEWP Pre-Use Inspection Checklist

Machine: _____ Week Commencing: _____

All checks should be conducted in accordance with the manufacturer's manual

VISUAL CHECKS		Mon	Tue	Wed	Thurs	Fri	Sat	Sun					
Documentation	1 Current thorough examination certificate (within last six months) 2 Manufacturer's operator manual 3 Rescue plan												
Wheels/tyres	4 Wheel security (nuts, retainers: loose, damaged, missing) 5 Tyre pressure (pneumatic, foam filled or solid) 6 Cuts, splits, exposed braiding, damaged rims												
Engine/power source	7 Fluid levels (engine oil, coolant, fuel) 8 Fluid leakage on ground and around engine 9 Battery (electrolyte, security and charging plug condition)												
Hydraulics	10 Hydraulic fluid level 11 Leaks (hoses, pipe connections, rams, cylinders)												
Hose and cables	12 Security and condition (cuts, chaffing, bulges) 13 Power track cable trays (free from damage and debris)												
Outriggers, stabilisers	14 General condition, pins/retainers, footplate 15 Spreader plates (present, condition, secure for travel) 16 Interlocks (functioning, engaged)												
Chassis, boom and scissor pack	17 General condition (damaged, misalignment, corrosion) 18 Cracks in weld 19 Pin, retainers and chains (security, signs of wear) 20 Canopies, guards, engine covers (security and condition)												
Platform or cage	21 Steps for access/egress (secure, undamaged, clear) 22 Entrance gate, guard rails and retaining pins 23 Harness anchor points 24 Clear of rubbish, debris and obstructions												
Decals and signage	25 ID plate, safety, warning and information decals (legible) 26 Controls (identification decals, directional arrows) 27 Platform loads (SWL, max wind speed, max number of persons)												
FUNCTION CHECKS		G	P	G	P	G	P	G	P	G	P	G	P
Using ground (G) and Platform (P) controls	28 Security device (power isolator, keypad, smart card) 29 Function enable (ignition key, foot switch, hold to run device) 30 Emergency stops and emergency lowering system 31 All switches, function controls (move freely, do not stick) 32 Lifting functions (raise, lower, slew, tele-out, tele-in) 33 Travel functions (forward, reverse, steer, brakes) 34 Elevated drive speed (reduced or prevented) 35 Lights, beacons, warning devices 36 Alarms (tilt, descent and travel) 37 Limit switches (e.g. descent, load, outreach, rotation) 38 Pothole protection device (fully deploys and retracts) 39 Oscillating axle locks, extending axles 40 Accessories, power to platform, extending decks 41 Jacks-legs, stabilisers, outriggers, levelling devices												
ALL FAULTS AND DEFECTS TO BE REPORTED IMMEDIATELY TO YOUR SUPERVISOR		Initial:											
Only persons who are trained and authorised by their employer should operate this equipment.													

OPERATOR NAME (S) AND LICENSE NUMBERS:

CE 2

Carry out vertical personnel platform operations

6. Operation Safety

7. Emergency Response

Prepare to carry out vertical personnel platform operations

Carry out vertical personnel platform operations

Conduct post operation of vertical personnel platform

6**Operation Safety****Objective:**

At the end of this section, the participant should be able to understand and/or successfully perform the following:

- Types of Personal Protective Equipment (PPE) (*UK 1.9*)
- Operational procedures relating to vertical personnel platform operations (*UK 1.10*)
- *Safe work practices* for vertical personnel platform operation (*UK 2.1*)
- *Modes of manoeuvring* (*UK 2.1*)

6

Operation Safety

The machine operator should inspect the workplace before work starts as this will help the operator to determine if the work place is suitable for safe machine operation.

This should be done by the operator before moving the machine to the work place.

The operator must remember the work place hazards, then watch for and avoid them when moving, setting up and operating the machine.

VPP can only be operated safely on level surface, look out for these other following and take safety precautions to prevent any occurrence:

1. Ground Level

- Uneven or wet ground
- Ramps, bumps or sloping ground
- Obstructions and limited space/work area
- Site traffic
- Other machinery and debris
- Inadequate surface and support to withstand all load forces imposed by the MEWP
- Poor lighting/ visibility

Ensure ground is stable/ compacted before elevating. If not sure, relocate the MEWP.

2. Overhead

- Overhead obstructions and other machinery
- People working above
- Overhead services/power lines or pipes

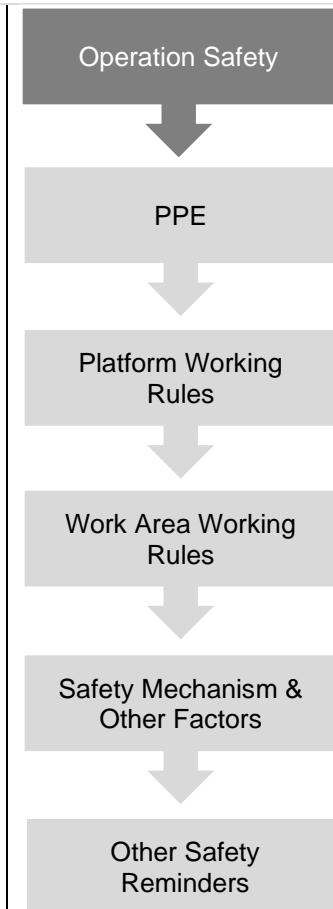
3. Dangerous Materials

- Chemical
- Flammable material
- Fume

Wear the appropriate Personnel Protective Equipment (PPE) when handling these materials.

Always have copy of the Material Safety Data Sheet (MSDS), Safety Data Sheet (SDS), or Product Safety Data Sheet (PSDS) of the dangerous material which you are handling in hand.

These data sheet is an important component of the product stewardship and occupational safety and health. It is intended to



provide workers and emergency personnel with the procedures for handling or working with that substance in a safe manner. It has information such as physical data (melting point, boiling point, flash point etc), toxicity, health effects, first aid, reactivity, storage, disposal, protective equipment, and spill-handling procedures.

4. Pedestrians

- Co-workers
- Other personnel

5. Enclosed Areas

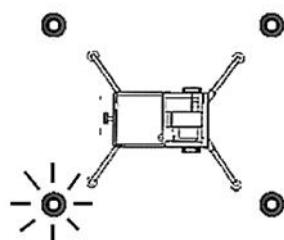
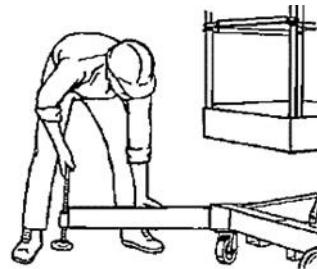
- Exhaust fumes
- Poor visibility
- Poor lighting

6. Outriggers/Stabilisers

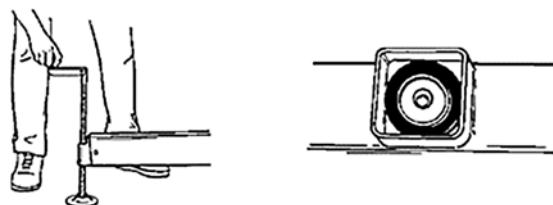
Some VPPs are fitted with outriggers at the base frame. These outrigger jacks are designed to increase the support area ("foot print") at the base and stabilise the VPP during operation. They must be set out before the operator enters the platform.

During set-up, select an outrigger and slide it into a base socket until the outrigger lock pin snaps into place. Adjust the outrigger to level the machine and raise the base casters slightly off the ground. Level the machine using only the outriggers. Do not use chock blocks or shims to level the machine.

Check the interlock display lights at the ground controls. Confirm that the corresponding light is on. Repeat the procedure for each of the remaining outriggers.



Use the bubble level at the base frame to adjust the levelling jacks until the machine base is level.

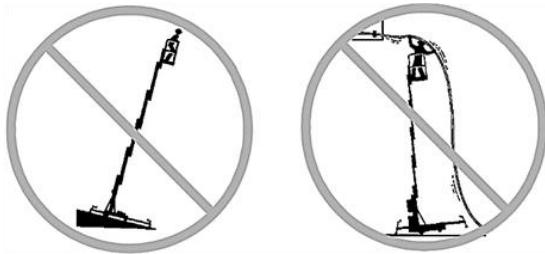


Set up manual VPP directly below the desired work area

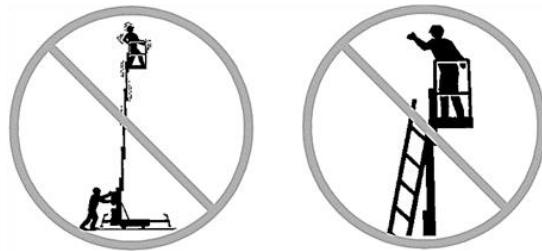
Safety Operation for VPP

Tipping Hazards

- Do not raise the platform unless the machine or the base is level.
- Do not move the machine while the platform is raised.



- Do not place ladders or scaffolds in the platform or against any part of this machine.
- Do not cause a horizontal force or side load to the machine by raising or lowering a fixed or overhanging load.



- Do not push off or pull toward any object outside the platform.
- Do not operate indoor machine in outdoor environment with windy condition.



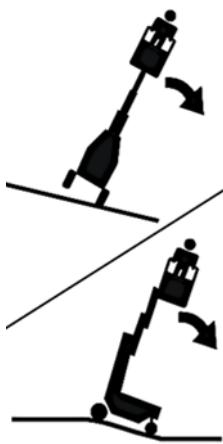
- Do not operate outdoor machine in strong or gusty winds, always refer to manufacturer's manual for guidance.
- Do not increase the surface area of the platform or the load. Increasing the area exposed to the wind will decrease machine stability.
- Do not place or attach overhanging loads to any part of the machine or exceed the rated platform load capacity and occupancy.

- Ensure the loads are evenly distributed on the platform floor.
- Do not alter or disable machine components that in any way affect safety and stability.
- Do not replace items critical to stability with items of different weight or specification. Use only manufacturer's authorised replacement parts.

Addition Precautions

Mobilised VPP

The operator must be familiar with the workplace surface before driving the VPP. Do not exceed the allowable sideslope and grade while driving.



Do not elevate platform or drive with platform elevated while on a slope or on uneven or soft surface.

Before driving on floor, bridges, trucks and other surfaces, check allowable capacity of the surfaces.

Keep the chassis of the machine a minimum of 2 ft / 0.6 metres from holes, bums, drop-offs, obstructions, debris concealed holes and other potential hazards at the ground level.

If mast assembly or platform is caught with one or more wheels off the ground, the operator must be removed before attempting to free the machine.

Always lookout when driving especially in areas where vision is obstructed.

Be aware of stopping distances in all drive speeds.

Limit travel speed according to conditions of ground surface, congestion, visibility slope, location of personnel and other factors causing hazards of collision or injury to personnel.

Manual VPP

Do not set the machine up on surface that cannot be leveled using only the levelling jacks. Never use chocks, blocks or shims of any kind to level the machine.

If the machine is fixed with outriggers, ensure all outriggers are properly installed and the levelling jacks firmly contact the floor.

Do not adjust or remove the outriggers while the platform is occupied or raised.

Do not operate near drop-offs, holes, bumps, debris, unstable or slippery surfaces or other possible hazardous conditions.

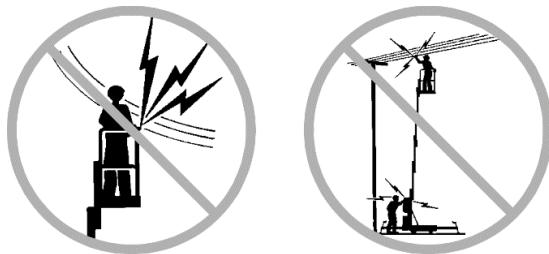
Fall Hazards

- Do not sit, stand or climb on the platform guard rails. Maintain a firm footing on the platform floor at all times.
- Do not exit the platform while raised. If a power failure occurs, have ground personnel activated the manual lowering valve first to lower the platform to exit.
- Keep the platform floor clear of debris.
- Lower the platform entry mid-rail or gate before operating.

**Electrocution Hazards**

- Do not assume that the machine is electrically insulated, even if it has a fiberglass platform. It will not provide protection from contact with or proximity to electrical current.
- Maintain safe distances from electrical power lines. Allow some safe distance for platform movement, electrical line sway or sag and movement due to strong or gusty winds.

- Stay away from the machine if it contacts energised power lines or becomes electrically charged. Personnel on the ground or in the platform must not touch or operate the machine until energised power lines are shut off.



Collision Hazards

- Check the work area for overhead obstructions or other possible hazards such as crushing when grasping the platform guard rail.
- Warn personnel not to work stand or walk under a raised platform. Position barricades on floor.



Explosion Hazards

Batteries emit explosive gas. Lead acid batteries may generate explosive hydrogen gas during normal operation. Keep sparks, flames and lighted tobacco away from the battery.

When charging the battery, ensure that the area is well-ventilated. Do not disconnect charge DC output wires for the battery when the charger is on.



Personal Protective Equipment



Operation Safety

PPE

Platform Working
Rules

Work Area Working
Rules

Safety Mechanism &
Other Factors

Other Safety
Reminders

What PPE to use?

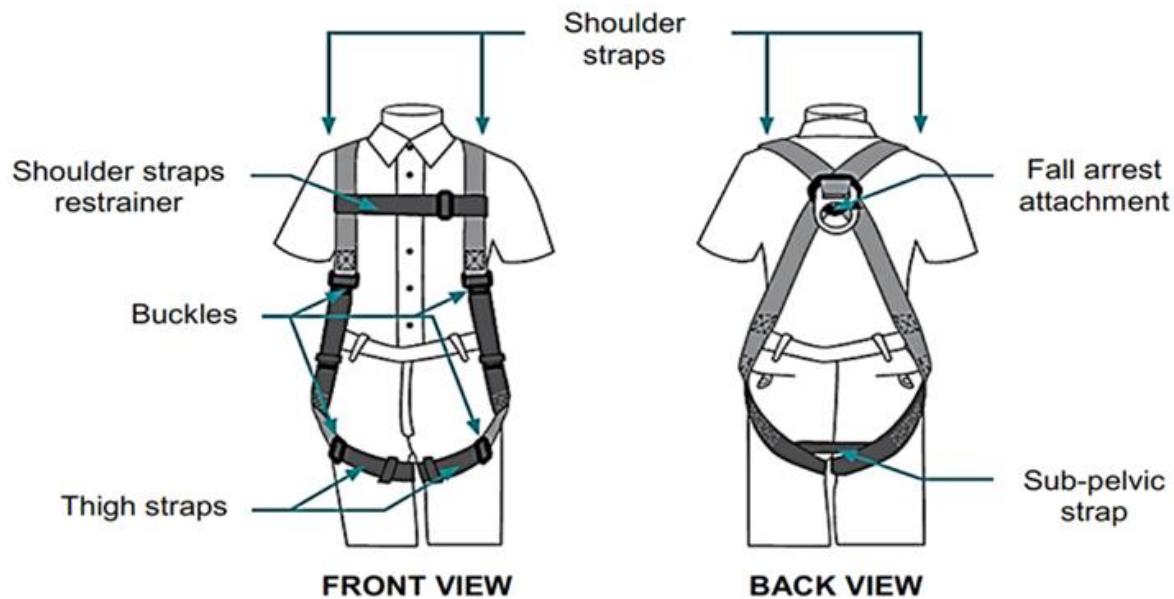
Full fall body harness with leg and shoulder straps together with an energy absorbing lanyard is strongly recommended in all boom type MEWPs.

The full body harness is an important component of the personal fall arrest system. It keeps the wearer suspended upright in the event of a fall, supporting him while he waits for rescue. The full body harness can also be used in fall restraint systems which prevents the wearer from reaching points where fall can occur.

During a fall, a full body harness distributes the fall forces throughout the body and the shock-absorbing lanyard decreases the total fall arresting forces. This reduces the chances of injury.

A safety helmet and protective footwear are highly recommended as they will protect the operator's head and feet from fall tools and debris. Wearing an eye protection will protect the wearer from glare and eye injury.

These correct PPEs should always be worn – safety helmet with chin strap, high visibility clothing, protective (steel toe cap) footwear, safety harness and eye protection.



Platform Working Rules

1. Enter the platform with “3 points of contact”
2. Attach harness on to the anchorage point
3. Close platform door to prevent falling out

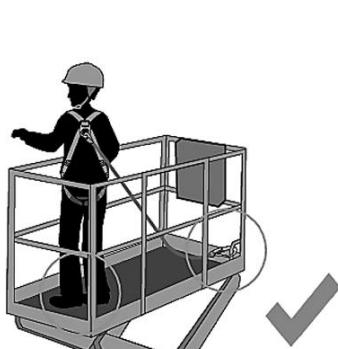


2 Feet 1 Hand or 2 Hands 1 Foot

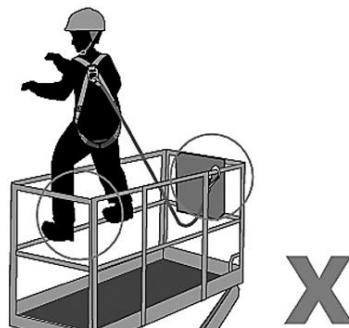
The Operator shall ensure that:

1. All persons on the MEWP use appropriate PPE for work at heights and has a travel restraint system anchored to the manufacturer's designated anchor point inside the MEWP.
2. All persons maintain a firm footing on the MEWP floor.
3. Climbing on guard-rails or the use of other devices to achieve additional height or reach is prohibited.
4. Additional precautions such as barricade and traffic management measures are in place when there are other moving equipment or vehicles present

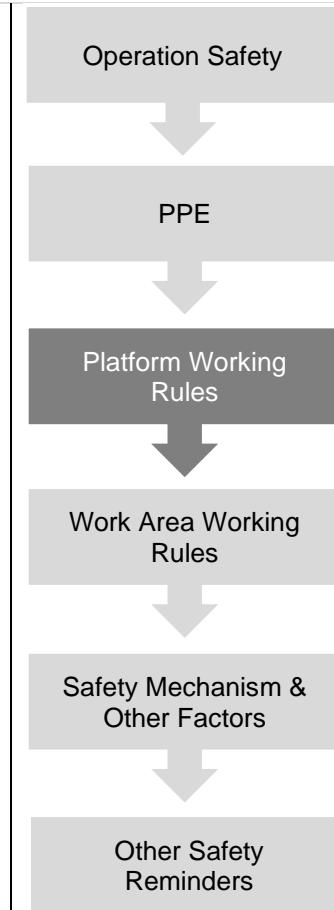
Do not use MEWPs to transfer personnel from one level to another or enter/exit the work platform at height under normal circumstances as they are not specifically designed to do so.



Correct way of working



Unsafe way of working



Work Area Rules

A. Prepare the work area

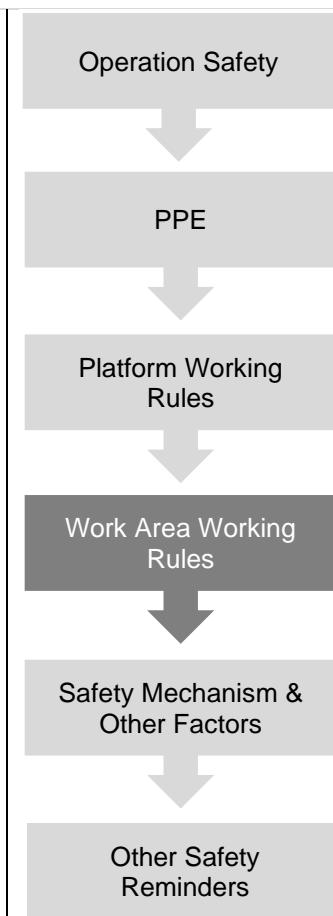
- When using the MEWP in an area used by other vehicles or pedestrians, the operator must consider his safety and the safety of anyone who could be affected by his work.
- Always walk the intended route to inspect and familiarise before commencement of work.
- The entire working area around the MEWP must be barricaded, using cones, warning signs and flashing lights.
- If necessary, provide overhead protection for personnel on the ground or isolate the area from personnel.
- Ensure an alternative access and exit for personnel.
- Use lanyard on your tools if necessary.

B. Working on Suspended Surfaces

If driving or operating a MEWP on a suspended surface, ensure the slab/floor can support the weight of the MEWP and the load.

Examples of suspended surface are:

- Multi-level car park
- Mezzanine floor



Safety Mechanism & Other Factors

A. Safe working load

The safe working load (SWL) that is specified by the machine manufacturer must never be exceeded. It is the maximum load that the MEWP can safely carry. This includes personnel, tools, equipment and anything else that is pace in the cage or platform.

Do not maximize the load as an allowance must be made for any additional loads that may have to be carried by the MEWP during the task.

Always ensure that the safe working load of the machine is sufficient for the job.

B. Operating Angle

It is important not to setup the MEWP on a slope surface greater than what the manufacturer's specifies as this would cause the MEWP to topple over.

MEWP's maximum Operating angle can be found in the Operator's manual.

Note: Larger MEWPs will generally have a greater operating angle than smaller ones due to their weight.

C. Side force

MEWPs are designed to withstand a certain amount of side force. This can be found in the Operator's manual.

Do not apply too much force (Push or Pull) to the side of any MEWP. This can make the MEWP unstable and topples over. It will also put stress on the hydraulic system and cause damage.

D. Guardrails of the platform

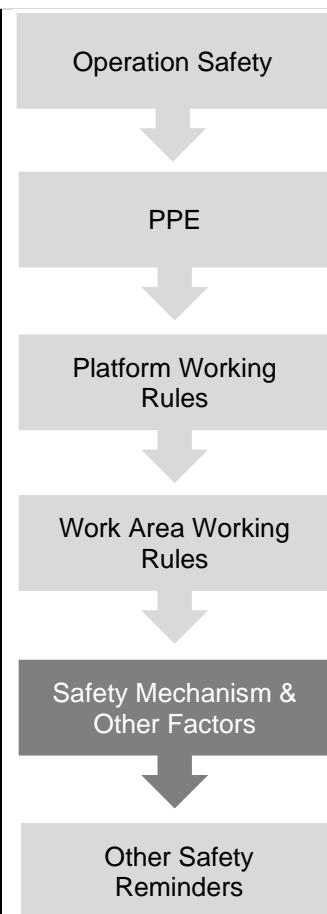
Do not use the guardrails of the platform to pull or push or load.

The guardrails of a MEWP are designed to prevent the operator falling out of the platform.

The load can cause instability, overturn MEWP, damage the platform door, over load the hydraulic system.

E. Uneven distribution of load

This will reduce stability and may cause MEWP to topple, resulting with damages, injuries and/or fatalities.



F. Sudden impact

Sudden impact can cause damages to the working and safety mechanism of the MEWP.

G. Do not use MEWPs as crane or jack or prop.

MEWPs are not designed to be used as a crane or jack or prop. Do not compromise the safety of the personnel at work and the structure of the MEWP.



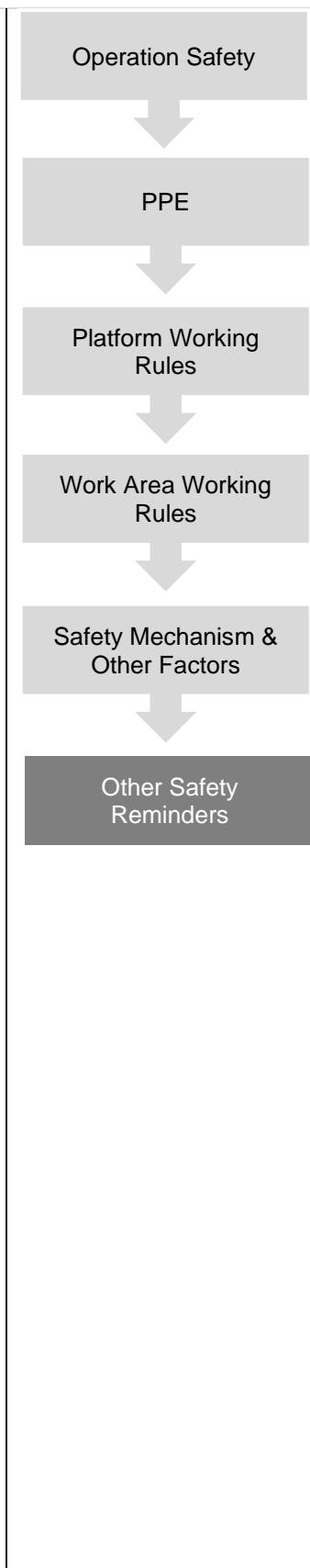
Emergency procedures in the event of contact with electric power cables

- Do not attempt to exit the cage or platform.
- Inform all personnel of the situation and advise them not to touch any part of the machine.
- Get someone to raise the alarm and inform site management of the situation. If possible get someone at ground level to stand guard and keep all persons away from the machine.
- If it is possible, try with extreme caution to gently move the MEWP away from the hazard.
- If it is not possible to move the MEWP away from the power cable, you must remain inside the cage or platform.
- Inform the local power supply company immediately. Do nothing more until it has been made safe i.e. the power has been switched off, this must be confirmed.

Other Safety Reminders

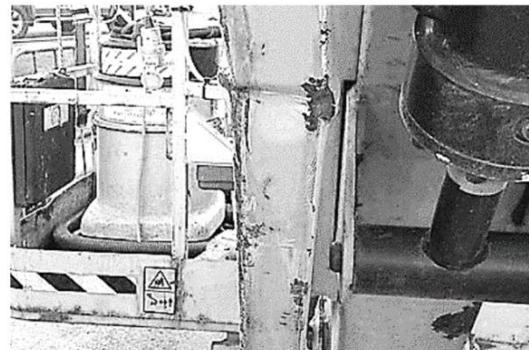
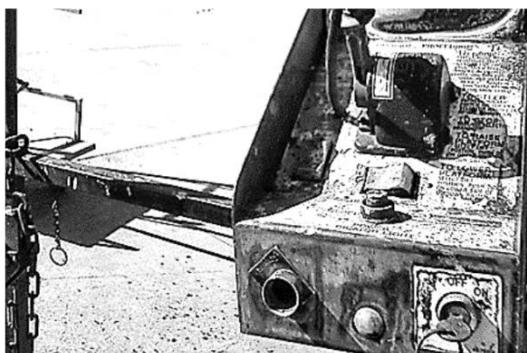
DOs

1. Enter and exist facing the platform using all steps and handrails provided with "3 points of contact" at all times.
2. Ensure the Telescopic function is the **last** function used when **going up or out**.
3. Ensure the Telescopic function is the **first** function used when **coming down or in**.
(Using this method you will reduce boom flex and will not be reliant on outreach limit switches.)
4. Know where the emergency lowering controls are, how they work and what they are actually designed to do.
5. Use the control functions smoothly.
6. Have a rescue plan in place, i.e. a responsible person at the ground who know how to lower the MEWP if an emergency situation should arise.
7. Be alert what is going on around you. This is a key part of safe operation.
8. Be aware of overhead hazards such as building projections, cables, windows (open out) etc.
9. Keep all your body parts inside the cage to reduce the risk of crush injuries.
10. Ensure that no objects fall from the platform.

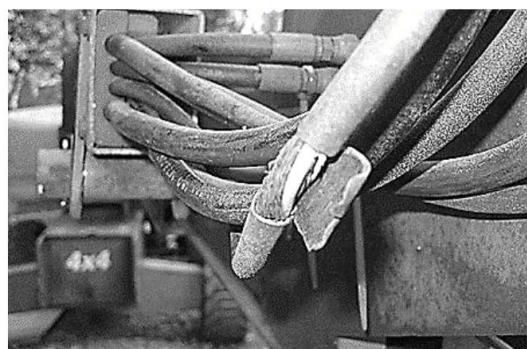


DO NOTs

1. Exit the machine at height unless there is no other possible safe way.
2. Allow an untrained or unauthorised person to operate the MEWP. Operation of the MEWP is the operator's responsibility.
3. Misuse, abuse or override any safety systems. They are provided to protect both the operator, the MEWP and those around you.
4. Use steps, ladders or stand on guardrails to gain additional height. Use a larger MEWP if you need additional height.
5. Use MEWP as a jack or prop. Hoisting loads under the cage is not permitted unless the machine is designed to do so by the manufacturer.
6. Attempt to exit the cage by climbing down the MEWP stack.

Check the working conditions of the MEWP before work shift:*Missing beacon light**Damaged boom (result of impact)**Check Emergency control panel**Illegible Decals**Water in electrics**Check hydraulics for oil leaks*

Source: <http://www.mewpsafety.co.uk/guidance/mewp-images-of-poor-practice/>

Check the working conditions of the MEWP before work shift:*Control panel covered with paint splatter**Damaged anchor hook**Near excavation / void**Damaged wiring**Check for damage, cracks & corrosions**Check for oil leaks*

Source: <http://www.mewpsafety.co.uk/guidance/mewp-images-of-poor-practice/>

7**Emergency Response****Objective:**

At the end of this section, the participant should be able to understand and/or successfully perform the following:

- Legislations and industry guidelines relating to boom lift operations (*UK 1.8*)

7

Emergency Response

Normal and auxiliary control systems in a MEWP allow the operator to bring the platform safely to ground level under controlled conditions.

Often rescue operations are carried out under extreme stress. An emergency response plan must be established and working personnel on the lifting operations must be aware of these procedures in case of an emergency. Those exposed to the risk of working at height ad those supervising and managing the same work at height must be aware of the rescue plan.

The following is a guideline on **Emergency Rescue Plan:**

Emergency Planning & Response

Reporting Incidents

Emergency situation	Proposed action
Failure of upper control functions while platform is raised.	When the normal upper control functions fail, the operator will use the upper auxiliary controls to lower the platform safely.
Failure of the operator to be able to operate the MEWP functions while he in the raised platform due to one of the following reasons: Operator incapacitated Auxiliary functions fail to operate from upper control stations.	Where the operator is incapable of lowering the raised platform using the upper controls, an appointed person familiar with the use of Ground or Emergency Lowering controls to lower the platform safely using the normal ground controls.
Failure of normal ground controls.	Where the normal ground controls fail, an appointed person who is familiar with the use of the "ground" controls will use the ground auxiliary controls to safely lower the platform.
Contact with electric power cables	<ul style="list-style-type: none"> • Do not attempt to exit the cage or platform. • Inform all personnel of the situation and advise them not to touch any part of the machine. • Get someone to raise the alarm and inform site management of the situation. If possible get someone at ground level to stand guard and keep all persons away from the machine. • If it is possible, try with extreme caution to gently move the MEWP away from the hazard. • If it is not possible to move the MEWP away from the power cable, you must remain inside the cage or platform. <p>Inform the local power supply company immediately. Do nothing more until it has been made safe i.e. the power has been switched off, this must be confirmed.</p>
Failure of all normal and auxiliary lowering functions	<p>Where all normal and auxiliary functions have failed, a competent and authorised service engineer should be contacted.</p> <p>Name:</p>

	Contact: Name: Contact: Name: Contact: Others (SCDF); Ambulance etc:
	<i>Name(s) of nominated ground personnel on site who are familiar and authorised to lower the platform in case of emergency or machine malfunction.</i>

Reporting Incidents

All accidents, near misses or dangerous occurrences must be reported to the supervisor and/or employer immediately according to the company and site procedure on reporting methods.

Report any cases of severe machine shock loading to the supervisor and/or employer so that the machine can be inspected to ensure its safety.

Dangerous occurrences: relating to this type of equipment collapse or overturn, failure of any load bearing part of any lift, hoist, crane, derrick or mobile work platform.

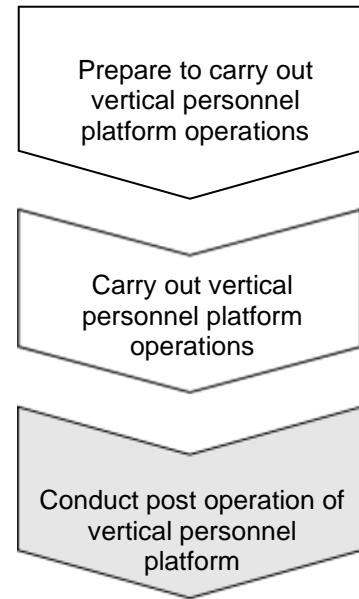
Emergency Planning & Response

Reporting Incidents

CE 3

Conduct post operation of vertical personnel platform

8. End of MEWP Operation



8**End of MEWP Operation****Objective:**

At the end of this section, the participant should be able to understand and/or successfully perform the following:

- *Standard operating procedures* for post-operation of vertical personnel platform (*UK 3.1*)
- Routine post-operation checks (*UK 3.2*)
- Reporting *procedures* for damage and defects (*UK 3.3*)

8**End of MEWP Operation**

At the end of a job, the MEWP should be parked in location away from:

End of MEWP
Operation

- doorways
 - access way
 - walkways
 - firefighting equipment
 - slope
 - unstable ground
- Select a safe storage location that is firm, level surface, weather protected, clear of obstruction and traffic.
 - Chock the wheels to prevent the machine from rolling.
 - Shut down engine.
 - Ensure all stop buttons are in and remove the key to secure from unauthorised use.
 - Remove all working tools and gears from the platform/basket.
 - Before leaving the MEWP at the end of a job always top up the fuel tank. If the machine is powered by batteries, plug it in to a suitable power supply to recharge the batteries.
 - Carry out a post operation check of the MEWP and report any defects.
 - Shut off fuel valve (if fitted).
 - Close and lock control panel/engine covers.
 - If the platform must be raise to prevent unauthorised usage or tampering, make sure there are no present hazards (e.g. power lines) and/or forecast hazards (e.g. strong wind, lightning).

Reference

Workplace Safety and Health Act
Workplace Safety and Health Council
Ministry of Manpower, Singapore
MEWPSafety.co.uk