OPERATE BOOM LIFT

GMS-COM-1105-1.1-E

Learner's Guide

Version Control Record

Version	Effective Date	Changes	Author
4.0	Nov 2024	WDA/SSG/WSH COUNCIL	EFG Training Services

Prepared By: ***Sivakolunthu Venkatesan*** **Approved By:** ***Rosli Pitchay***

For Enquiries and feedback please email admin@efg.com.sg

Operate Boom Lift

Table of Contents

Course Information

Why this course

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

This is also a mandatory course under the 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 after a risk assessment is conducted and according to the manufacturer's guidelines.
- Operate MEWP safely

Competency Element

1. Prepare to carry out boom lift operations
2. Carry out boom lift operations
3. Conduct post operation of boom lift

Underpinning Knowledge

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

UK 2.1. Safe work practices for boom lift operation
UK 2.2. Modes of manoeuvring

UK 3.1. Standard operating procedures for post-operation of boom lift

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 boom lift operations
PC 1.2. Observe and apply safe work practices when preparing to operate boom lift
PC 1.3. Prepare work area for safe operation of the boom lift
PC 1.4. Use appropriate personal protective equipment in accordance with organisational procedures
PC 1.5. Perform pre-use inspection on boom lift, its associated components and safety devices/signage/labels
PC 1.6. Perform function checks on boom lift
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 boom lift operations
PC 2.2. Manoeuvre boom lift according to operator manual
PC 2.3. Travel the identified route to, from or within the work area
PC 2.4. Operate boom lift in stable position according to operator manual

PC 3.1. Park and Shut down of boom lift
PC 3.2. Carry out routine post-operational boom lift 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 as follow:

	Topic	Duration
Classroom Learning	• **Prepare to carry out boom lift operations *(CE 1)*** 1. What is MEWP? 2. Risk Management 3. MEWP Safety Legislative Requirements 4. Boom Lift 5. Pre-Start Inspections • **Carry out boom lift operations *(CE 2)*** 6. Operation Safety 7. Emergency Response • **Conduct post operation of boom lift *(CE 3)*** 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 regulation 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;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%3A5bbf883a-7b67-409e-9fe7-fe433611edf0%20Depth%3A0%20Status%3Ainforce;rec=0;whole=yes

- Workplace Safety and Health (Risk Management) Regulations

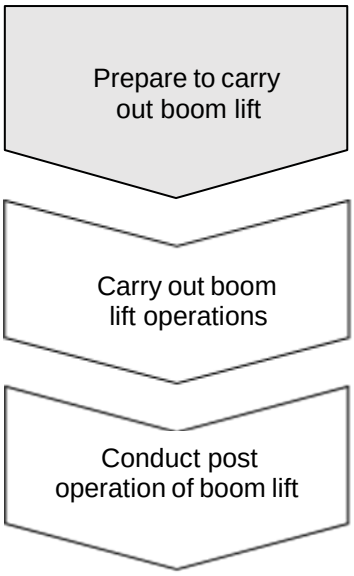
  http://statutes.agc.gov.sg/aol/search/display/view.w3p;ident=424fe219-0674-4888-aa4f-62bef7cd9604;orderBy=numUp;page=0;query=DocId:cd9437b7-419b-40de-99a3-09f2e7b8c90a%20Depth:0%20Status:inforce;rec=0

- 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 boom lift operations

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



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 boom lifts *(UK 1.3)*
- Fundamentals of boom lifts 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.

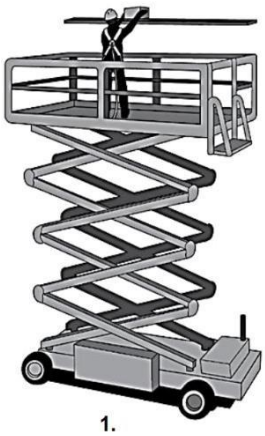
Types of MEWP

Selection of MEWP

WSH CP: 1 Code of Practice for Working Safety at Height 6.5.1:

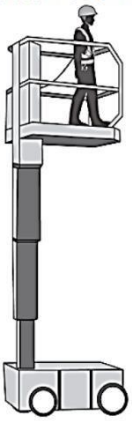
Definition: A Mobile Elevating Work Platform is any telescoping scissor or articulating equipment used to position personnel, materials or equipment at height.

1. Scissor Lift



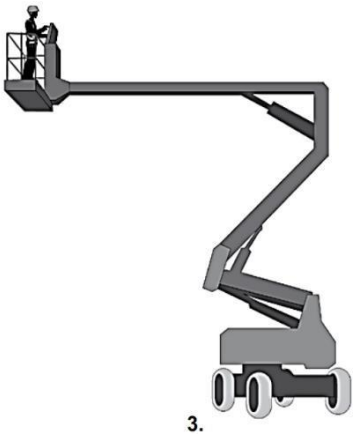
1.

2. Vertical Personnel Platform



2.

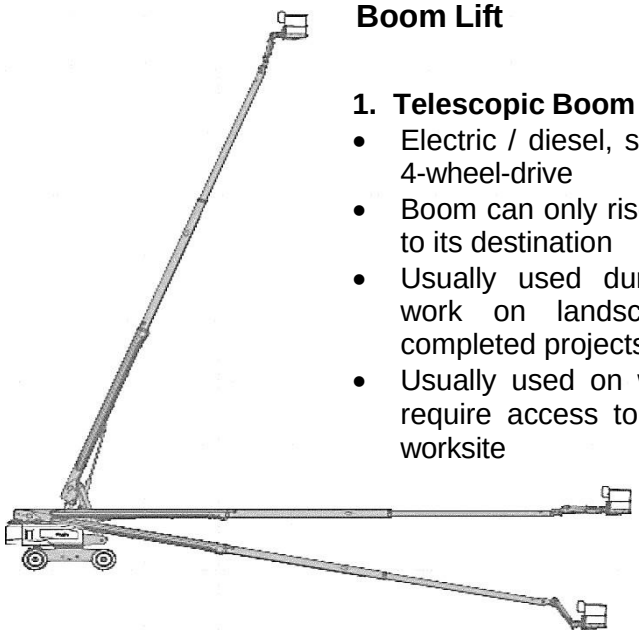
3. Boom Lift



3.

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

Types of MEWP



Boom Lift

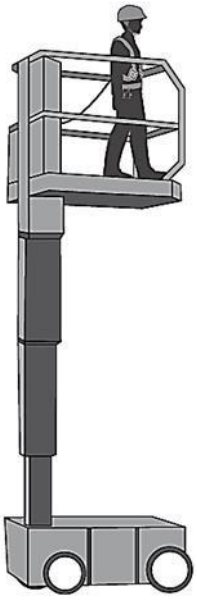
1. Telescopic Boom Lift

- 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

Vertical Personnel Platform (VPP)



- Primary action is up and down
- Usually only a one person operation
- Battery operated
- Can be self-propelled or have manual outriggers

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)

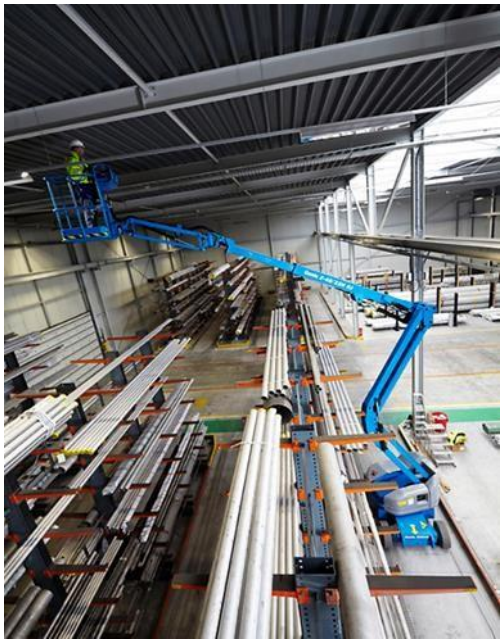
2. Scissor – Rough Terrain

- 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 scissors have a greater SWL
- Can get up to 32m (105ft) lift

Selection of MEWP

Types of MEWP

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 nearing 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

The above considerations must be thought through during the risk assessment and planning for the lifting operation.

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.

Risk Assessment

Risk Control Measures

What is a Hazard?

Anything with the potential to cause injury or harm.

What is a Risk?

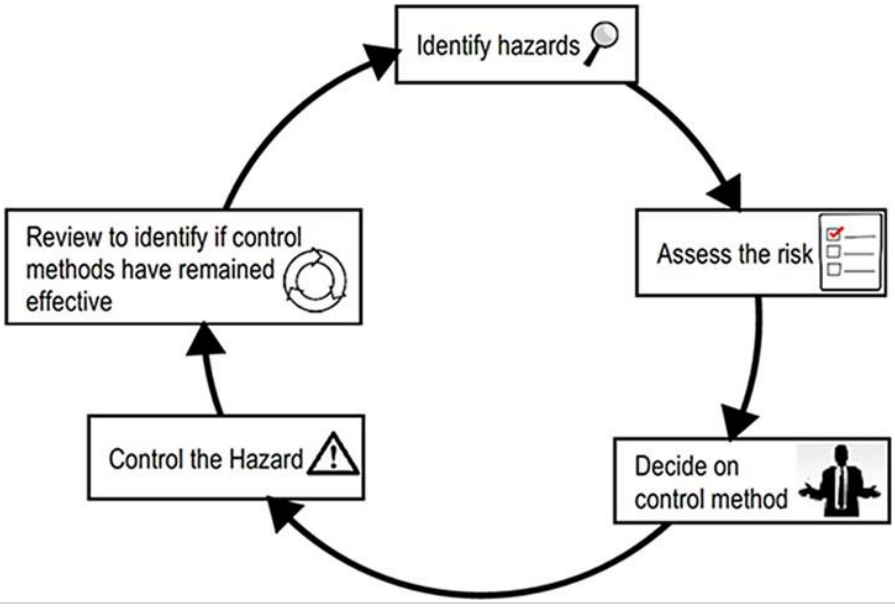
A Risk is the likelihood of a hazard causing injury or harm.

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 6.5.1:

"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 any 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 in time.
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 sink hole and they can be catapulted out.
Collision	The MEWP may hit pedestrians or nearby vehicles or overhead power lines.

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:

Identify Hazards

- Walk around the workplace using a checklist to identify the hazards.
- Look at each task and identify the hazards involved.
- Review and see what caused any accident/incident using investigations of accidents on similar equipment or work.

Assess Hazards

- Decide if the identified hazards are likely to harm someone? If they are, how serious? If someone could be seriously harmed, it is a significant hazard and need to be controlled to stop anyone being seriously hurt.
- All hazards should have effective controls
- Review and see what caused accident/incident using investigations of accidents on similar equipment or work.

Hazard Controls

- First try to eliminate the hazard. If it is not possible, then isolate it. As a last resort, try to reduce the harm that could be caused by a hazard by minimizing it.
- A combination of controls may be needed.

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

Confined overhead working	• 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	• Use the MEWP on firm and level ground where possible. Make sure the MEWP is rated for any slopes it may face. • Trenches, manholes and soft ground conditions can cause MEWP to overturn.
Outriggers	• Set the outriggers correctly before using the MEWP. Use the manufacturer's instructions to set the outriggers before raising the platform. • Use the spreader plates when needed because of the ground conditions. They should be made of material that gives good grip to both the spreader foot and ground. • Do not set up the outriggers' footplates on a slope. If you need to set up MEWP on ramps using outrigger, ensure extreme caution is taken to prevent the MEWP from slipping down the ramp.
Fall prevention	• 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	• 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.
Weather	• Poor weather can affect a MEWP's stability and make it unsafe to use. Only use a MEWP within the manufacturer's specified wind rating. This can be found on the manufacturer's serial plate. • Bad weather and storms can cause damage to a MEWP. Inspect the MEWP before using it again after severe weather. • Do not park or store the MEWP with the platform elevated.

Handling materials	• 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.
Working near or over water	• When working over or near water, assess the hazards and risks to decide what personal protective equipment should be worn and what control measures should be in place. PPE includes life jacket and harness systems. • Take into account the extra hazards working near water can create and have a rescue plan in place.
Nearby hazards	• 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	• The operator must face the direction which the MEWP is travelling in. • Always lower the MEWP when travelling between work areas. • Always lower the boom and point it in line with the direction of travel.
Electrical hazards	• All overhead power lines near the workplace. Treat them as being live, unless the power company that owns the power lines formally advise that the lines are safe. Keep a safe working distance from it. • All trees, structures and work positions that are within close proximity of the power lines. Trees can conduct electricity if they are too close to or touch live power lines. Safety plan must include these hazards and give details of how the hazards are controlled.

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

RISK ASSESSMENT FORM

Department:	EFG	RA Leader:	MD NASSER	Approved by	Reference Number
Process:	OPERATE FORKLIFT TRAINING	RA Member 1:	S GOVIND	ROSLI PITCHAY	
Process/Activity Location:	No. 3/1 Soon Lee Street, #01-16, #01-33	RA Member 2:	DURAI	Signature:	
Original Assessment date:	01/11/2024	RA Member 3:	U. FAROUK	Name: ROSLI PITCHAY	RA 008
Last review date:	02/11/2024	RA Member 4:		Designation: DIRECTOR	
Next review date:	01/11/2027	RA Member 5:		Date: 02/11/2024	

HAZARD IDENTIFICATION (LOOK)				RISK EVALUATION (THINK)				RISK CONTROL (DO)						
Ref	Work Activity / Sub Activity	Hazard	Potential injury/ill-health	Existing risk controls	S	L	RPN	Additional Controls	S	L	RPN	Implementation Person	Due Date	Remarks
1	Disconnect Forklift Power Supply	Electrocution Pinch Point	Burns & electrical shock Fingers and hands injury	• Permit To Work • Turn Off power supply • Proper connectors and wires • Safety shoes, helmets, gloves • Signage put up	Mo	R	Low					Supervisor Worker	14/09	
2	Inspection of Forklift	Slip, trip & fall Pinch Points	Bodily injury and Hands/legs Fingers and hands injury	• Clear access areas • Proper sufficient lightings • Safety shoes, helmets, gloves • Provide Inspection Checklist	Mo	R	Low					Supervisor Worker	14/09	
3	Ascend / Mount Forklift	Slip, trip & fall from height	Bodily injury and fractures	• Maintain 3-point contacts when mounting • Step & Grab handles use • Seat belt use	Mo Ma	R O	Low Me					Supervisor Worker	14/09	
4	Operate Forklift Driving forward & reversing	Accident Person injured	Forklift, structure & Equipment damage Bodily injury and fractures	• No speeding (5km/hr) • Look out for blind spots • No pedestrian access during forklift operation • Warning Lights and buzzers activation • Horns used when required	Ma	O	Me					Supervisor Worker	14/09	
5	Stacking and re-stacking of palletized load	Slip & load fall	Load damage Bodily injury and fractures	• Proper insertion of forks & balance • Don't overload • No workman near forklift operation	Mo	R	Low					Supervisor Worker	14/09	

Notes:

RISK ASSESSMENT FORM

Process:	FORKLIFT OPERATION TRAINING	RA Member 1:	S GOVIND	ROSLI PITCHAY	
Process/Activity Location:	No. 3/1 Soon Lee Street, #01-16, #01-33	RA Member 2:	DURAI	Signature:	
Original Assessment date:	01/11/2024	RA Member 3:	U. FAROUK	Name: ROSLI PITCHAY	RA 008
Last review date:	02/11/2024	RA Member 4:		Designation: DIRECTOR	
Next review date:	01/11/2027	RA Member 5:		Date: 02/11/2024	

HAZARD IDENTIFICATION (LOOK)				RISK EVALUATION (THINK)				RISK CONTROL (DO)						
Ref	Work Activity / Sub Activity	Hazard	Potential injury/ill-health	Existing risk controls	S	L	RPN	Additional Controls	S	L	RPN	Implementation Person	Due Date	Remarks
6	Parking of forklift after operation	Hit against	Bodily injury and fractures	• Park at designated parking area • Off ignition switch	Mo	R	Low					Supervisor Worker	14/09	
7	Descend / dismount Forklift	Slip, trip & fall from height	Bodily injury and fractures	• Seat belt remove • Maintain 3-point contacts when dismounting • Step & Grab handles use	Mo Ma	R O	Low Me					Supervisor Worker	14/09	
8	Connect Forklift Power Supply	Electrocution Pinch Point	Burns & electrical shock Fingers and hands injury	• Turn ON power supply • Proper connectors and wires • Safety shoes, helmets, gloves • Signage put up	Mo	R	Low					Supervisor Worker	14/09	

Notes:

Recommended Risk Matrix with numeric rating

Likelihood / Severity	Rare (1)	Remote(2)	Occasional(3)	Frequent(4)	Almost Certain(5)
Catastrophic (5)	5	10	15	20	25
Major (4)	4	8	12	16	20
Moderate (3)	3	6	9	12	15
Minor (2)	2	4	6	8	10
Negligible (1)	1	2	3	4	5

Risk level	Risk Acceptability	Recommended Actions
Low	Acceptable	▪ No additional risk control measures may be needed. ▪ Frequent review and monitoring of hazards are required to ensure that the risk level assigned is accurate and does not increase over time.
Medium	Tolerable	▪ A careful evaluation of the hazards should be carried out to ensure that the risk level is reduced to As Low As Reasonably Practicable (ALARP) within a defined period. ▪ Interim risk control measures, such as administrative controls or PPE, may be implemented while longer term measures are being established. ▪ Management attention is required.
High	Not acceptable	▪ High Risk level must be reduced to at least Medium Risk before work starts. ▪ There should not be any interim risk control measures. Risk control measures should not be overly dependent on PPE. ▪ If practicable, the hazard should be eliminated before work starts. ▪ Management review is required before work starts.

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 boom lift 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).

WSH Act & Regulations

Code of Practice on Working Safely at Height

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.

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 store, 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

23. 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)

10. (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

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

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

(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.**

(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

7- (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

(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 –

(b) 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;

(c) that **the machinery, equipment** or hazardous substance **is safe, and without risk to health, when properly used;**

(d) **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

(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

(1) For the purposes of subsection (2), where a building comprises **one or more workplaces, any common properly 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.

"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 an 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

(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

11. – (1) In every workplace, the employer, self-employed person and principal **shall conduct a risk assesment 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

(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

5. 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

6. It shall be the **duty of the responsible person** of any person who carries out or is to carry out any work at eight 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

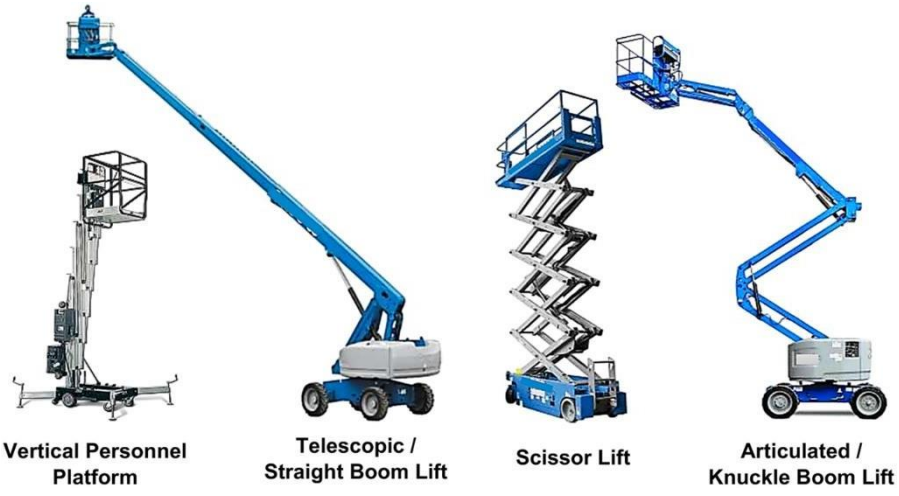
Boom Type Platforms
When working from a boom type MEWP, it is strongly recommended that a full body harness with an adjustable lanyard be used to provide work restraint, the lanyard should be adjusted to be as short as possible and may contain an energy absorbing device.

This includes Telescopic or Straight Boom and Articulated or Knuckle Boom.

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.



Permit-To-Work System for Hazardous Work at Height

Implementation of permit-to-work system

19.– (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 factor 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 (Frequent Asked Questions)

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 o n 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

WSH Act & Regulations

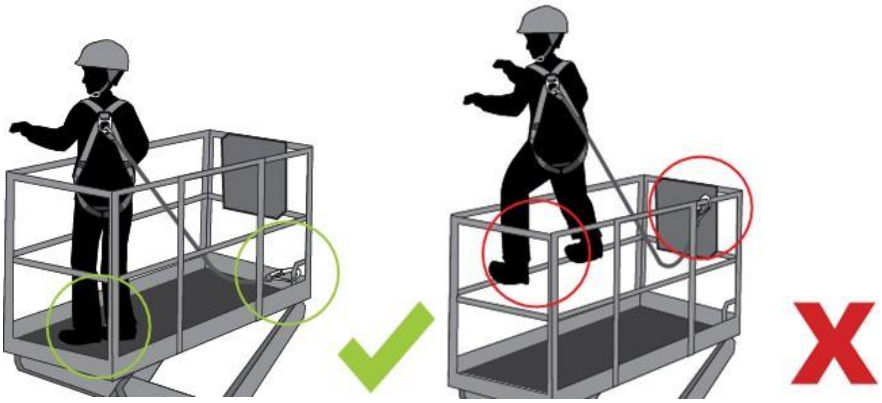
Code of Practice on Working Safely at Height

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.

Summary of Code of Practice on Working Safely at Height

Working Safely at Height 6.5.1:
- 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 3.4.3:
- 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 6.5.2:
- 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 6.5.7:
- 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 6.5.7:
- The use of planks, ladders or other devices on work platforms to achieve additional height or reach is strictly prohibited

Working Safely at Height:
- 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 Boom Lift

Objective:

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

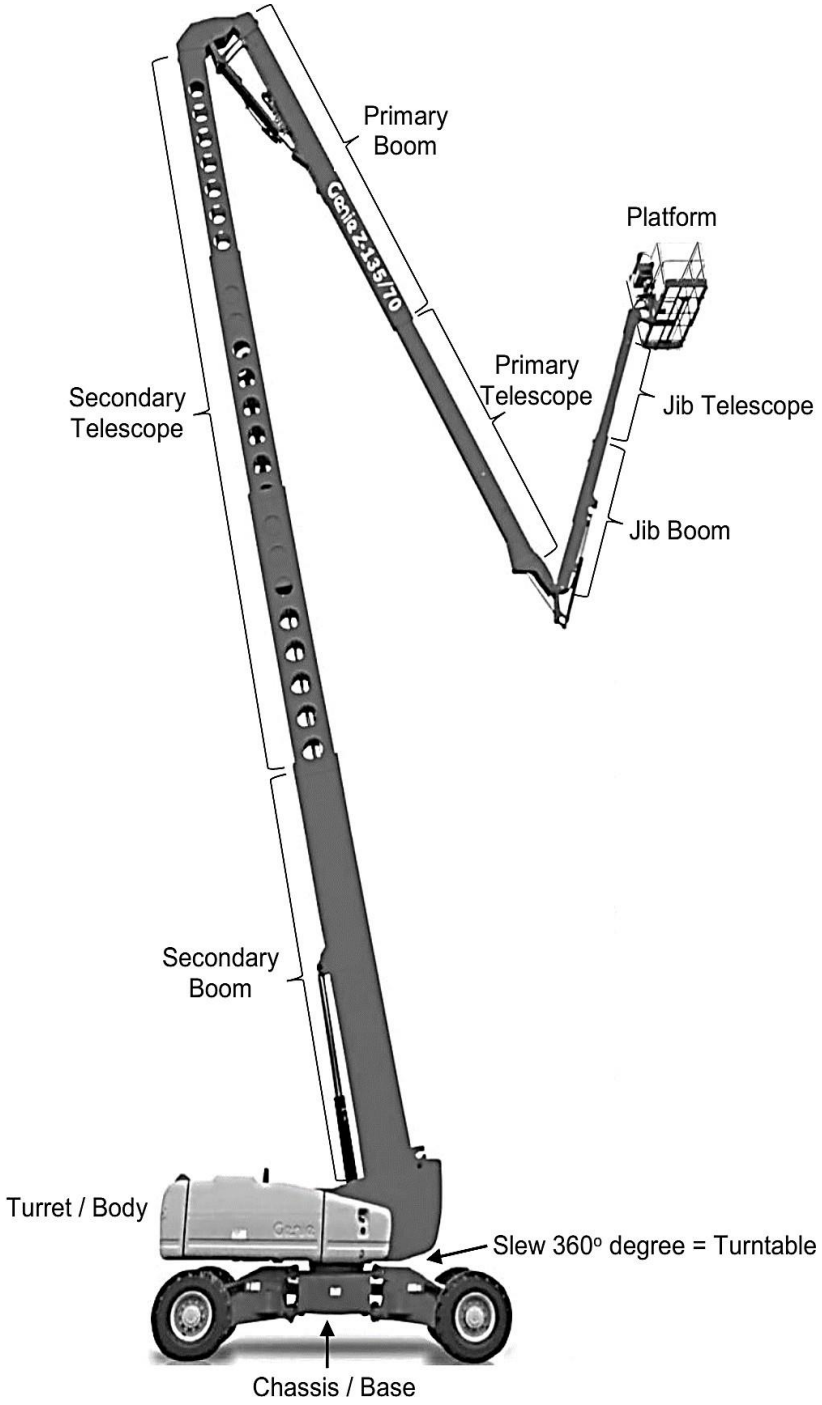
- Main components of boom lift *(UK 1.5)*
- Safe working load of boom lift *(UK 1.6)*
- Safety devices, signage, labels and boom lift controls *(UK 1.7)*

4 Boom Lift

Parts of a Boom Lift

Parts of a Boom Lift

Feature of a Boom Lift



Emergency Lowering Systems

There are **3 main types** of emergency descent systems which are fitted to a Boom Lift.

1. Battery back-up power (auxiliary)
2. Bleed valves
3. Hand operated jack

Battery Back-up

Auxiliary switches are located on the platform and ground controls.

When the platform needs to be lowered in an emergency, the **auxiliary switch and the normal operating controls** are **pressed simultaneously** to lower the platform.

Example of Platform Controls


Example of Ground Controls


Bleed Valves

Bleed valves are usually located externally on the MEWP, however, on larger MEWPs, they may be found under the engine covers.

To activate a bleed valve, simply pull the cable or push the button, depending on which type is fitted.

Be aware, the more a valve is opened, the faster the platform will descend.

Hand Operated Jack

A hand operated jack allows someone to manually apply hydraulic pressure to the required control. It is usually found under the engine covers.

To operate, use one hand to press the desired function on the valve body and with the other, pump the jack up and down to lower the platform.

Directional Arrows

Directional arrows are strategically placed on the base to assist the operator determine the drive direction of the machine. The operator must check to ensure the arrow on the machine base is in line with the arrow on the dashboard. If the operator has slew the machine, the controls may have to be operated in the reverse mode.

Lights and Beepers

These should all be operational. Lights indicted “power on” and a beeper indicates “motion”.

Refer to Operator’s Manual for instructions as each MEWP may have different procedures.

Tilt Sensor

Sensor fitted in the MEWP will detect if the base is greater than 0-5 degrees out of level. As a result, warnings may sound and illuminate on the panel and the machine may stop.

Refer to Manufacturer’s Instructions.

Tyres

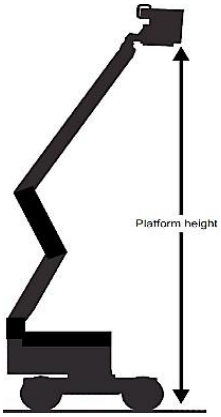
The tyres must be in good condition to help support the MEWP on the ground. Refer to Manufacturer’s Operating Instructions.

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

Good Condition Tyres on Boom Lifts

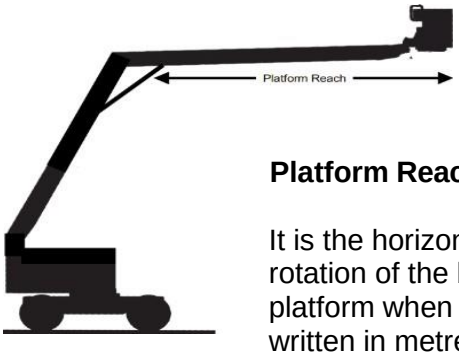
MEWPs with Damaged Tyres

Features of a Boom Lift



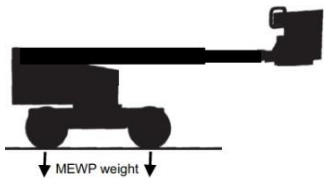
Platform Height

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 Reach

It is the horizontal distance from the axis of rotation of the boom to the out edge of the platform when fully extended. This is normally written in metre and feet.



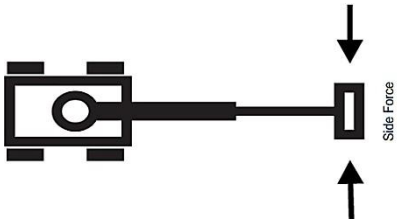
Weight

This is the weight of the MEWP. It does not include any person or equipment inside the platform unless otherwise stated. This is usually stated in kilograms.

Be sure to add the weight of foam tires if applicable.

Safe Working Load (SWL)

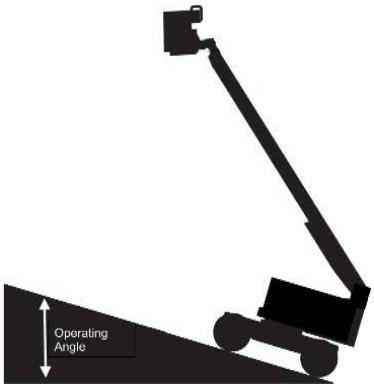
This indicates the total weight that can be raised in the platform. Total weigh of operators, tools and equipment must not to exceed the SWL. It also states the maximum number of people allowed in the platform. SWL is stated in kilograms.



Side Force

It is the maximum allowable sideways force (push or pull) which can be applied to the platform. Side force is stated in Newton.

Different brands and models have different specifications, please refer to manufacturer's manual for guidance.



Operating Angle
(chassis inclination/slope sensor alarm/operating incline maximum)

The maximum safe ground angle the MEWP is designed to be elevated on as specified by the manufacturer.

Different brands and models have different specifications, please refer to manufacturer's manual for guidance.

Gradeability

The maximum gradient for travel (hill climbing ability of the MEWP) when the boom is lowered and retracted.

Different brands and models have different specifications, please refer to manufacturer's manual for guidance.

Wind Speed Rating

The MEWP must be wind rated before it can be used outdoors

Follow the wind rating as specified by the manufacturer.

How to gauge the Wind Speed?

The MEWP operator may use an anemometer to measure both wind direction and wind speed.

3-Cups Anemometer

Digital Anemometer

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 boom lift *(UK 1.5)*
- Safe working load of boom lift *(UK 1.6)*
- Safety devices, signage, labels and boom lift controls *(UK 1.7)*

5 Pre-Start Inspection

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

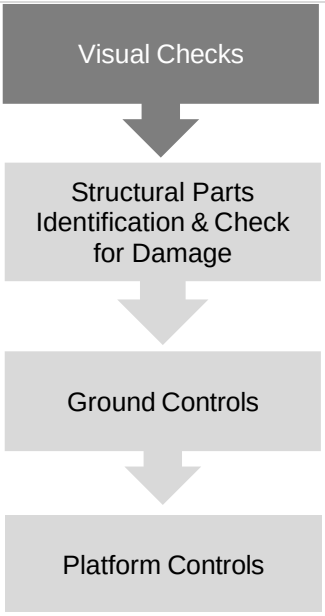
The purpose of a pre-start inspection is to identify faults or damage that may have occurred during previous work shift or during transportation.

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 MEWP and follow with functional test.



Visual Checks

The following should not be missing, damaged or contaminated.

- Operating and emergency controls
- Safety devices
- Personal protective devices
- Air, hydraulic and fuel system (leaks)
- Cable and wirings
- Loose or missing parts
- Tires and wheels
- Placards, warnings, control markings, **Data plate** and operating manual(s)
- Outriggers, stablisers and other structures
- Guardrail system
- Other items specified by manufacturer
- If outdoors, a functioning anemometer is attached to the platform.

Do not use any **MEWP** that are not in proper operating condition. The MEWP must be removed from service until the problems have been corrected by an authorised and trained maintenance technician.

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, stablisers	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 (damager, 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	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, stablisers, outriggers, levelling devices														
ALL FAULTS AND DEFECTS TO BE REPORTED IMMEDIATELY TO YOUR SUPERVISOR Only persons who are trained and authorised by their employer should operate this equipment.			Initial:		Initial:		Initial:		Initial:		Initial:		Initial:		Initial:	

OPERATOR NAME (S) AND LICENSE NUMBERS:

_____

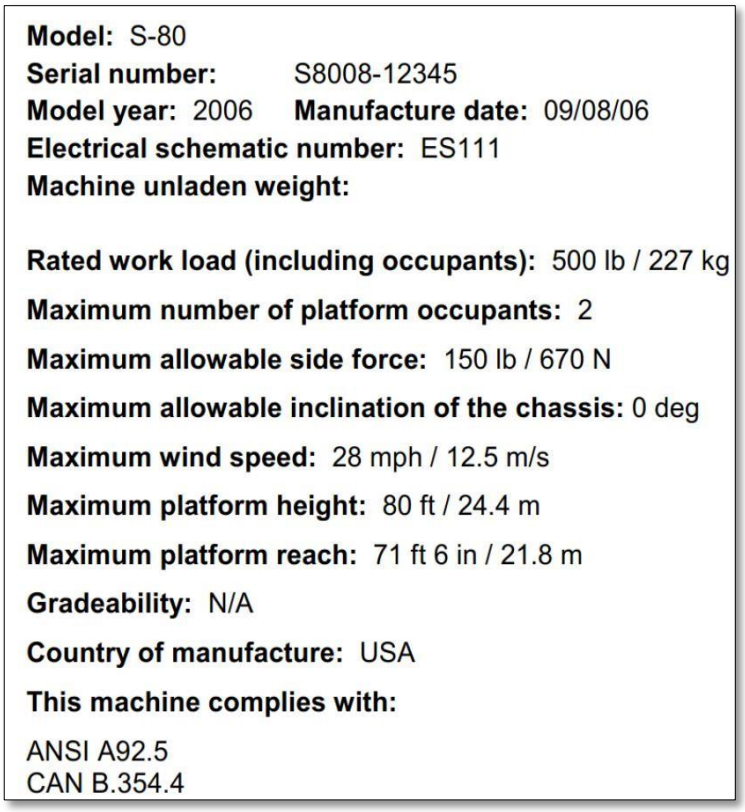
Data Plate

Every MEWP will be fitted with a Data plate. The Data plate 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.

The Data plate will generally include the following information:

- Model
- Manufacture Date
- Platform Height
- Weight
- SWL
- Operating Angle
- Gradeability
- Side Force
- Wind Rating

Sample of a Data Plate

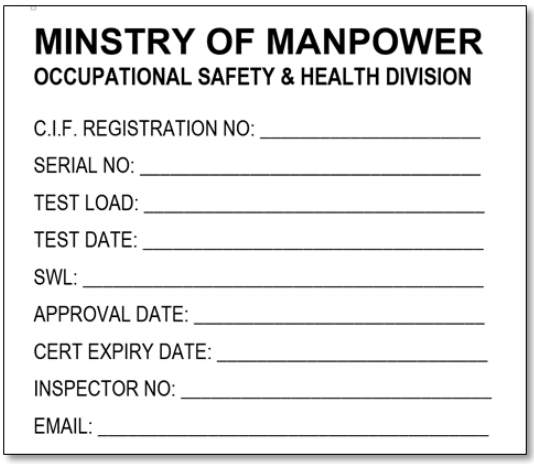


DO NOT USE THE MEWP if the Data plate is missing or illegible.

Information on the Data plate is required as a guideline to determine if the MEWP is suitable for the task.

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.


MINSTRY 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: _____

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”

Decals

All decals, including lifting and towing points must be legible and in good condition.

Manufacturer's Operating Instructions

Each MEWP is supplied with an Instruction/Operator's Manual. This manual is written in English and should be kept on the MEWP at all times for reference during operations.

Fluid Levels

Check the fluid levels. This may vary between machines. Refer to the MEWP Operation Manual.


✓ **Fuel:** petrol/diesel/gas


✓ **Radiator Coolant** Check expansion bottle (visual) or only when radiator is cool


✓ **Engine Oil**


✓ **Hydraulic Oil**


✓ **Steering Fluid**


✓ **Brake Fluid**


✓ **Batteries** (use PPE)

Structural Parts Identification and Check for Damage

Visual Checks
Structural Parts Identification & Check for Damage
Ground Controls
Platform Controls

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, wheel nuts, tires

- Check tires and identify if they are solid, foam filled or air filled tires so that appropriate care can be given.
- Check wheel nuts are in place and tire pressure is correct.
- **Check that the MEWP is not freewheeled and that the brakes are applied.**

2. Steering components

Check steering rams for:
- damage
- oil leaks
- linkages for damage.

3. Hydraulic rams, lines, hoses

Check hydraulic hoses for:
- chaffing
- bulges
- leaks

4. Drivability

Check if the MEWP is self-propelled or push around? If self-propelled, can it be driven at height?

5. Slew mechanism (if fitted)

- Check the slew gear and pinion teeth are lubricated and no teeth missing.
- Check the slew motor and turntable mounting bolts are in place.
- Check the slew lock pin is removed ready for operating.

6. Oil leaks

Check under covers and under MEWP for oil leaks.

7. Boom Components

- Look out for dents, creases or crack on the hollow sections of the boom.
- Check the fiberglass insulated booms for cracks and damage to bonding.
- Check the pivot pins to ensure that they are not worn or broken and pin retainers are in place.
- Check for frays, wear or slack (if applicable) on the chains and cables.

8. Hand rails, platform, supports

Check the following are in safe working order:

- platform controls (not damaged)
- handrail
- platform (free of oil and debris)
- basket door (self-closing and locking action)

9. Electrical cables

Check any electrical for:

- chaffing, shorts or burns,
- ELCB / RCD / safety switch is serviceable.

Ground Controls

Visual Checks
Structural Parts Identification & Check for Damage
Ground Controls
Platform Controls

As a safety measure, start the check with **POWER OFF** if it is an electrical boom lift. Unplug and ensure that it is not connected to any power supply before operating the MEWP.

A. Check all controls with engine or power OFF

1. Check that switches or levers are centered when released
2. Check key switch and emergency stop

B. Check all functions with engine or power ON

Pull the emergency stops out and select ground controls to turn the MEWP on.
If it is a diesel consuming engine, pre-heat the engine for 5 seconds before starting the engine.

1. Warning devices and gauges (alarms/flashing lights)
2. Slew left and right
3. Boom telescopes
4. Extra jib raise / lower, rotate left / right
5. Basket rotation
6. Basket level
7. **Emergency Lowering device**
    i. Bleed Down Valve
    ii. Other manufacturers specifications as in the operator manual

Platform Controls

As a safety measure:

- Start the check with **POWER OFF** if it is an electrical boom lift. Unplug and ensure that it is not connected to any power supply before operating the MEWP.
- Put on the **safety harness** before entering the platform.
- Switch selector to platform controls, enter the platform and check all the controls return to centre.

A. Check all controls with engine or power OFF.

1. Check that switches or levers are centered when released
2. Check key switch / emergency stop

B. Check all functions with engine or power ON

1. Raise and lower boom sections
2. Slew left and right
3. Boom extensions
4. Extra jib raise / lower, rotate left / right
5. Basket rotation, basket level
6. Warning devices, flashing lights, gauges, battery charge indicator (warning lights) and horn
7. Deadman control trigger/foot pedal (test by releasing when operating but **do not test switch while driving**)
8. Test steering and brakes by traveling, steering and braking in forward and reverse direction. Caution: some MEWPs momentarily over-run before stopping. Allow ample braking distance.
9. Battery back-up for Emergency Lowering Device from the platform (if applicable)

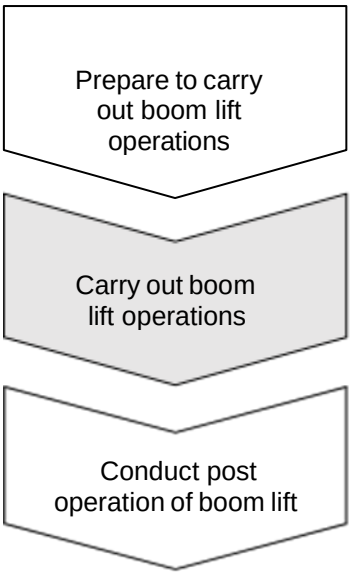
Visual Checks
Structural Parts Identification & Check for Damage
Ground Controls
Platform Controls

If both ground and platform controls inspections are cleared with all functions working in good and safe order sign the **Operator Safety Check Record** section in the log book. If a fault is detected report to an authorised person and record the details in the **Faults / Problems / Action Taken** section of the log book.	

CE 2 Carry out boom lift operations

6. **Operation Safety**

7. **Emergency Response**



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 boom lift operations *(UK 1.10)*
- *Safe work practices* for boom lift operation *(UK 2.1)*
- *Modes of* manoeuvring *(UK 2.1)*

6 Operation Safety

1. **Workplace Inspection**
   Before any MEWP is used, the operator shall visually check the workplace areas where the EWP is to be used. This is to identify any potential hazards such as:

2. **Below Ground**
   - Underground services, pipes, drains, man holes, cables
   - Backfill, recent excavation
   - Basements or car parks
   - Inadequate surface and support to withstand all load forces imposed by the MEWP

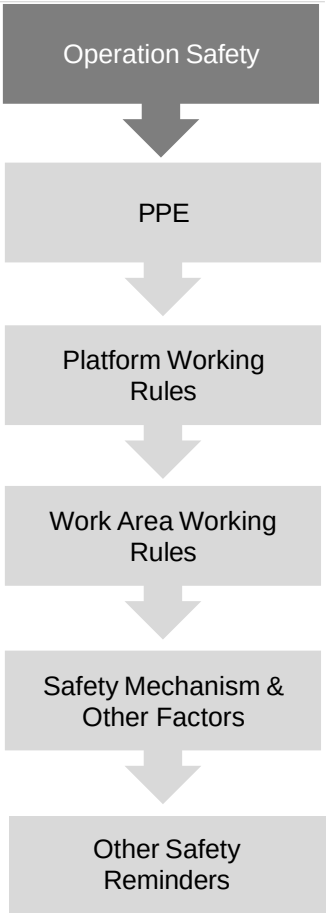
3. **Ground Level**
   - Rough, soft, uneven, wet or unstable ground
   - Ramps or sloping ground
   - Trenches
   - Buildings or obstructions
   - Site traffic
   - Other machinery
   - Debris
   - Other tradesmen & pedestrians
   - Poor lighting

4. **Overhead**
   - Power lines, minimum distances and the use of spotters
   - People or machinery working above
   - Overhead services/power lines or pipes
   - Bridges
   - Weather – wind, rain, lightning, sun

5. **Dangerous Materials***
   - Chemicals
   - Flammable material
   - Fumes
   - Over spray

6. **Pedestrians**
   - Public
   - Other trade personnel

7. **Enclosed Areas**
   - Exhaust fumes
   - Poor visibility
   - Poor lighting



8. Outriggers/Stabilisers

Some MEWPs are fitted with outriggers or stabilisers. They may be hydraulic powered or manual screw jacks.

These outriggers/stabilisers are designed to increase the support area ("foot print") at the base and stabilise the MEWP that may need to work over uneven or unstable ground. Besides supporting and/or levelling the complete MEWP, in some MEWPs, they are used to extend the structure.

Hydraulic outriggers

Manual screw jacks

Hydraulic stabilizer legs

It is strongly recommended that suitable spreader plates should always be used under the outrigger "feet" regardless of the apparent ground conditions as the small areas of the "feet" to the outrigger/stabiliser generates high pressure on the ground.

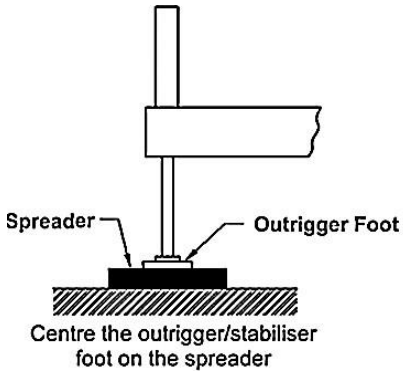
For very poor ground conditions, advance preparation of additional foundations such as steel plates, concrete pads, timber mats are necessary.

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

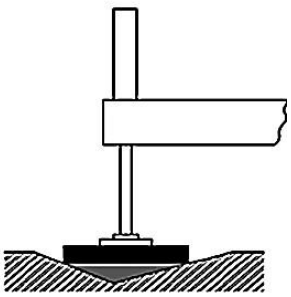
9. Ways to distribute the Load

The MEWP should be on a firm surface and leveled to within the limits set by the manufacturer.

Load plates/mats should always be used to spread the load and reduce the risk of sinking.

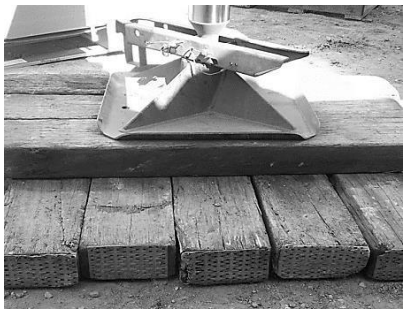


Centre the outrigger/stabiliser foot on the spreader



Fill in the hollow before placing spreader

Types of spreaders for packing the ground:

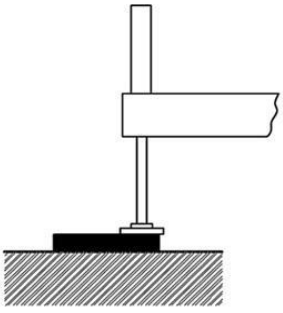


Pig-Sty Packing

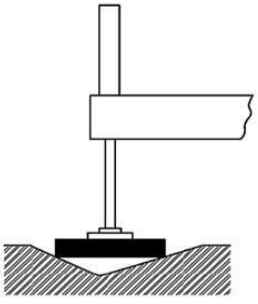
Steel Plates

Load mats/plates

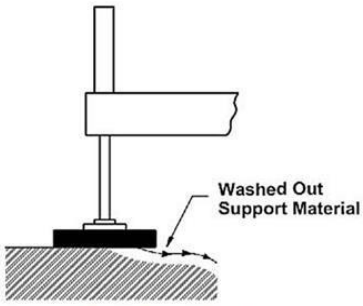
Incorrect ways of packing the spreader for outriggers/stabilisers



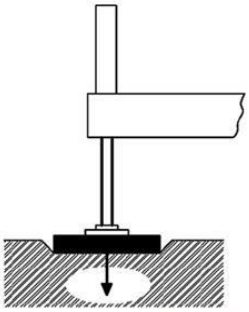
Foot not centred on spreader



Spreader over hollow

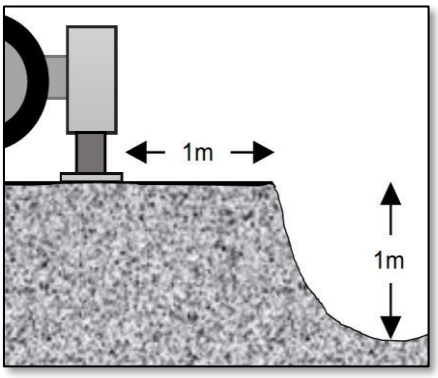


Loose material washed out by rain



Outrigger positioned over void

10. Working near Trenches or Excavations



MEWPs must not be positioned near the edge of trenches or excavations as it will increase the ground pressure in the area, causing the sides of the trench or excavation to collapse without warning and the MEWP to overturn.

If the machines needs to be used close to a trench or excavation, the distance away from the edge should be at least the same as the depth of the trench **(ratio of 1:1)**, assuming hard compact earth.

In situations where the ground is of loose soil, fresh back fill, sand or crushed rock, the distance from the trench or excavation must be at least 2 times the depth of the excavation.

Note: Distance to depth ratios greater than 1:1 are safer than those that are less than 1:1

Personal Protective Equipment

What PPE to use?

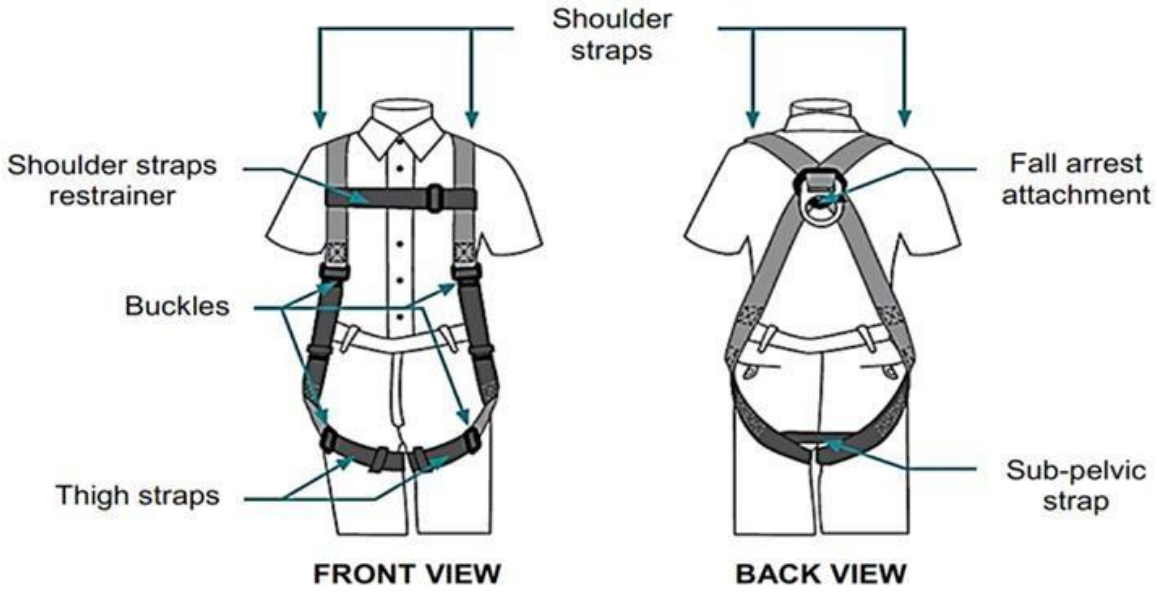
Full fall body harness with has leg and shoulder straps together with an energy absorbing lanyard is strongly recommended in all boom type MEWPs.

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.


Shoulder straps
Shoulder straps restrainer
Buckles
Thigh straps
FRONT VIEW
Fall arrest attachment
Sub-pelvic strap
BACK VIEW

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:

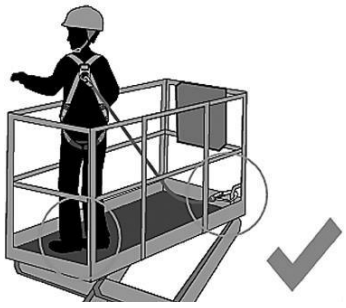
1. All persons on the MEWP use appropriate PPE for work at heights and has a travel restraint system anchored to the manufacturer’s designated anchor point inside the MEWP.

2. All persons maintain a firm footing on the MEWP floor.

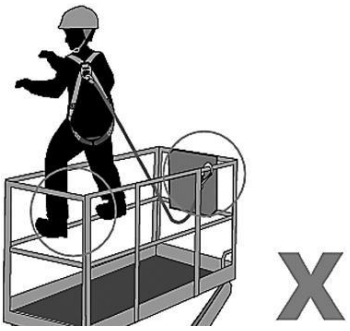
3. Climbing on guard-rails or the use of other devices to achieve additional height or reach is prohibited.

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

Operation Safety
PPE
Platform Working Rules
Work Area Working Rules
Safety Mechanism & Other Factors
Other Safety Reminders

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.
- Uneven ground surface needs to be levelled with travel for the MEWP to travel. Jolting caused by uneven surface will significantly exaggerate at the end of the boom.
- 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. Travel on the public highway

The operator must know the clearance dimension of any road legal MEWP he is going to use, i.e. height, width etc which should be marked in the cab of the MEWP.

Before travel, ensure all outriggers, extendable axles etc are fully retracted ad locked in place. If a slew block is fitted, make sure that it is engaged.

Transport vehicles used for the transportation of MEWP must be suitable for the purpose and used in accordance with the manufacturer's instructions manual. Correct and safe procedures must be carried out without causing damage to the equipment.

C. Travel to work area

The MEWP must be suitable for travelling over the ground conditions found on site.

It is critical that a thorough ground inspection is completed and the weight of the MEWP is not going to crush or collapse any underground services. If you are unsure seek advice from a competent person.

Consider the following points before travel, positioning or set-up of any MEWP:

- Machine type and weight

- Always walk the intended route to familiarise
- Ground conditions
- Storm water drains, phone lines sewers, water services, power lines, gas lines, septic tanks or anything that may give way under the MEWP's weight
- Overhead obstructions, power cables, building projections etc
- Slopes or ramps
- Ensure the machine is leveled within manufacturer's specification
- Correct machine positioning
- Area barricade and signs put up

D. Travelling with operation in elevated platform

- Always walk the intended route to inspect and familiarise before commencement of work.
- Uneven ground surface needs to be levelled with travel for the MEWP to travel. Jolting caused by uneven surface will significantly exaggerate at the end of the boom. This could be a danger to the occupants in the cage or platform. It could also cause the machine to become unstable.
- Do not travel any MEWP up or down on a slope with the platform raised.
- Lower the platform if necessary.
- Watch out for personnel below and make sure that there is a clear travel path.
- It is good practice to use a signalman or responsible person at ground level to give directions.
- Ease the travel controller, do not push too quickly

E. Working on the public highway

- Barricade the whole of the working area by using cones, warning signs, flashing beacons etc.
- Under no circumstances should any part of a MEWP obstruct or swing into a lane of live traffic.
- Arrangements may have to be made to control or divert traffic using temporary traffic lights, signs and cones. Site manager or supervisors are legally responsible for this.
- Advice from the police may have to be sought if there is a need to direct traffic on the public highway.
- Operations carried out during the hours of darkness in areas where the public have access require the use of suitable barriers signage and lighting.

F. 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
- Wharf
- Bridge
- Mezzanine floor

Safety Mechanism & Other Factors

Operation Safety
PPE
Platform Working Rules
Work Area Working Rules
Safety Mechanism & Other Factors
Other Safety Reminders

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.

H. Working in close proximity to overhead power cables

Operators must always be aware of the dangers (electrocution) of overhead power cables.

- Do not travel under any power cable with any part of a MEWP raised or extended.
- Working near power lines can only be done with an insulated MEWP. Be sure to keep a safe distance away so that no part or the MEWP or its operator can come into contact with the power lines.
- The safe recommended set up distance from wooden poles carrying power cable is 9 metres and steel pylons is 15 metres (both with fully extended boom). Remember high winds can also cause cable to sway which thus reduces the safe distances.
- A permit is needed to be issued by the relevant authority when working near or on power lines.

Emergency procedures in the event of contact with electric power cables

- Do not attempt to exist 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.

I. Wind and weather

MEWPs that are designed for outdoors will have a manufacturer's recommended wind tolerance.

Always check the MEWP's recommended Wind Speed Rating which can be found in the Operator's manual or Data Plate. Never exceed the manufacturer's specifications.

Remember that the wind speed can increase by as much as 50 percent at 20 metres above ground level. Funnel effect between buildings where wind speed will be greater through the narrow section can also affect the stability of a MEWP.

If the weather changes during operation, re-evaluate and if unsafe, cease operation.

J. Other hazards involving weather conditions

- Sun can cause glare, sunburn and tarmac to melt.
- Rain can cause flooding and hide other hazards. It can cause the surface to become slippery, soft and unstable.
- Always ensure suitable PPE is used.
- Do not use a MEWP if lightning is imminent.

Other Safety Reminders

Operation Safety
PPE
Platform Working Rules
Work Area Working Rules
Safety Mechanism & Other Factors
Other Safety Reminders

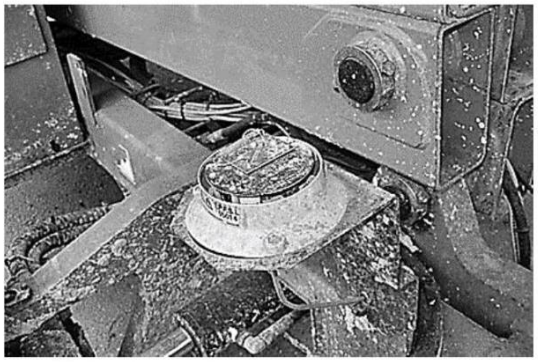
DOs

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.

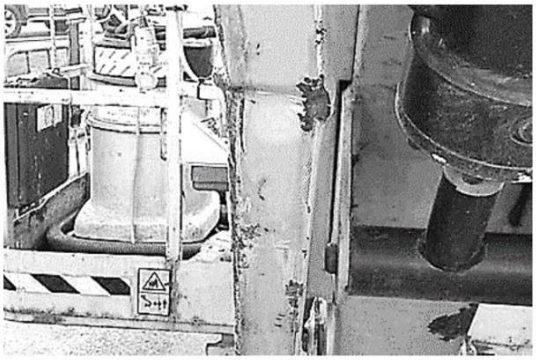
DO NOTs

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 provide 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 boom or scissor stack.

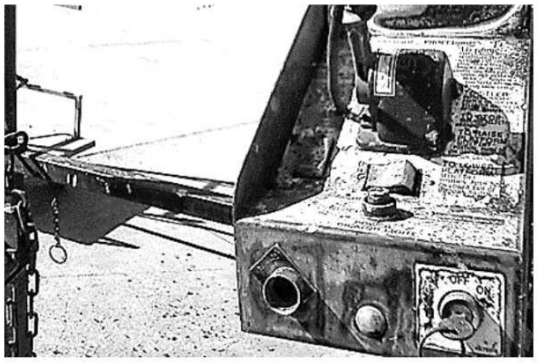
Check the working conditions of the MEWP before work shift:



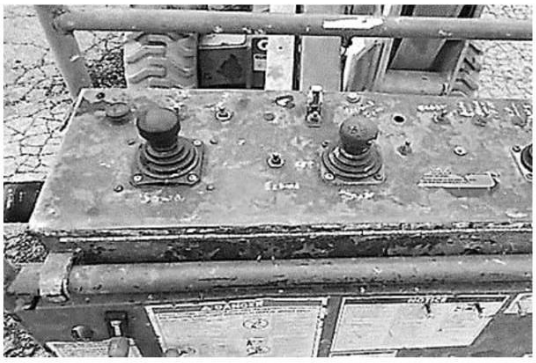
Missing beacon light



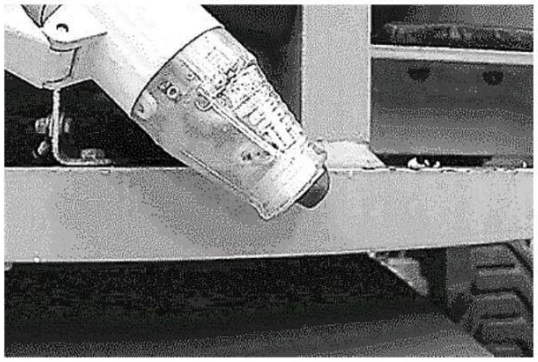
Damaged boom (result of impact)



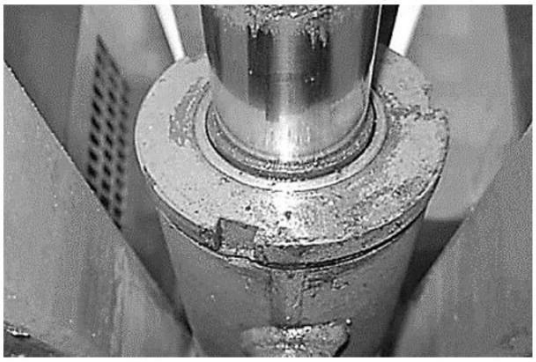
Check Emergency control panel



Illegible Decals



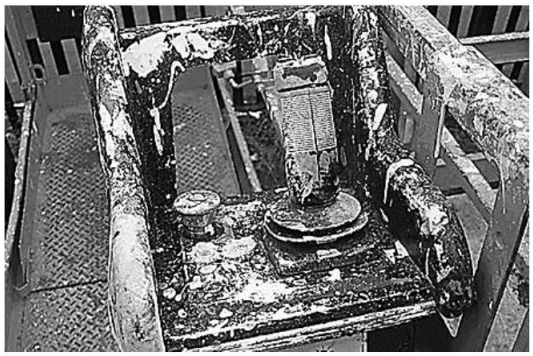
Water in electrics



Check hydraulics for oil leaks

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

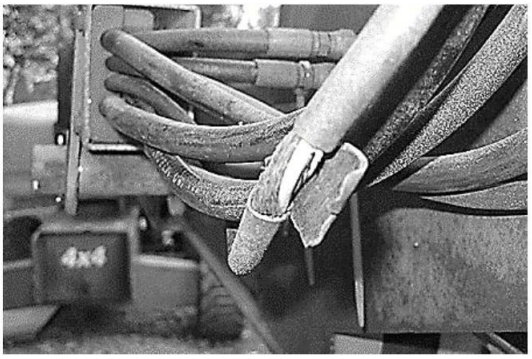
Check the working conditions of the MEWP before work shift:



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/

Unsafe MEWP Operations

Standing on platform rails

Outrigger standing over sewer

Dangerous make shift equipment to add height

Unsuitable make shift stabiliser

Cordon MEWP from public & co-workers

Platform sticking out to on-coming traffic

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

Off balance due to muddy and uneven ground

Close proximity of other vehicles

Don't add anything that can act as a sail

Cut and soiled lanyard

Safety harness not correctly worn

Scaffold hook and lanyard are very worn out

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 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	• Do not attempt to exist 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.**
Failure of all normal and auxiliary lowering functions	Where all normal and auxiliary functions have failed, a competent and authorised service engineer should be contacted. Name:

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

Reporting Incidents

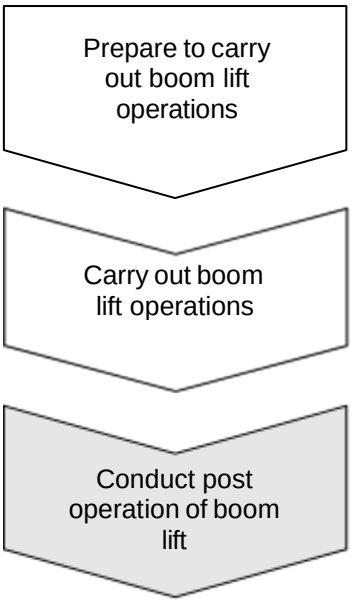
All accidents, near misses or dangerous occurrences must be reported to the supervisor and/or employer immediately according to the company and site procedure on reporting methods.

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.

CE 3 Conduct post operation of boom lift

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 boom lift *(UK 3.1)*
- Routine post-operation checks *(UK 3.2)*
- Reporting *procedures* for damage and defects *(UK 3.3)*

8 End of MEWP Operation

End of MEWP Operation

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

- doorways
- access way
- walkways
- firefighting equipment
- slope
- unstable ground

- Shut down engine.
- Ensure the MEWP is stowed correctly and is safe and secure.
- 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.
- Isolate against unauthorised use by ensuring all stop buttons are in and all keys are removed.
- 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