Mobile Elevating Work Platforms

PARTICIPANT MANUAL
VERSION 21.1

ENERGY SAFETY CANADA

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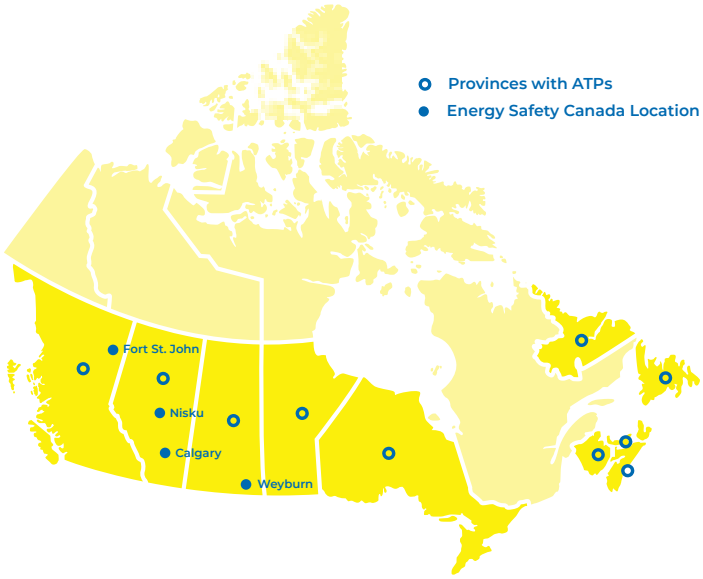

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CHAPTER 1:

Managing Hazards

OUTCOME

Identify hazards and apply control measures to reduce the risk of injury or damage associated with operating Mobile Elevating Work Platforms (MEWPs).

OBJECTIVES

Upon completion of this chapter, you should be able to:

1. Explain MEWP operator responsibilities.
2. Explain what a hazard assessment is and when it is used on a work site.
3. Identify potential worksite MEWP hazards and associated risks.
4. List the controls for the hazards identified.
5. Explain the primary considerations of MEWP rescue planning.
6. Explain what every occupant in the MEWP should know to work safely.

INTRODUCTION

Mobile Elevating Work Platforms are safe to use when operated within their specifications. But incidents can occur despite best intentions and adherence to safety practices. Prior to starting work, it is very important to conduct an assessment of existing and potential hazards on-site to determine the safest way to do a job.

Identifying hazards and putting control measures in place make the use of MEWPs safer. MEWPs can be the cause of serious injury or fatality through:

- **Collision** – by hitting stationary objects, vehicles, pedestrians or power lines
- **Falling** – an operator may fall or be thrown from a platform
- **Entrapment** – an operator may become wedged or crushed between a work platform and a structure
- **Overturning** – a MEWP may overturn on an uneven surface, throwing the operator from the platform or pinning the operator

Understanding the requirements of a job is fundamental to working safely. Once a supervisor determines that a MEWP is required for a job, they must create a work plan that specifies the tasks, locations and conditions of that work. Work can proceed once the site has been assessed and all hazards are identified and mitigated.

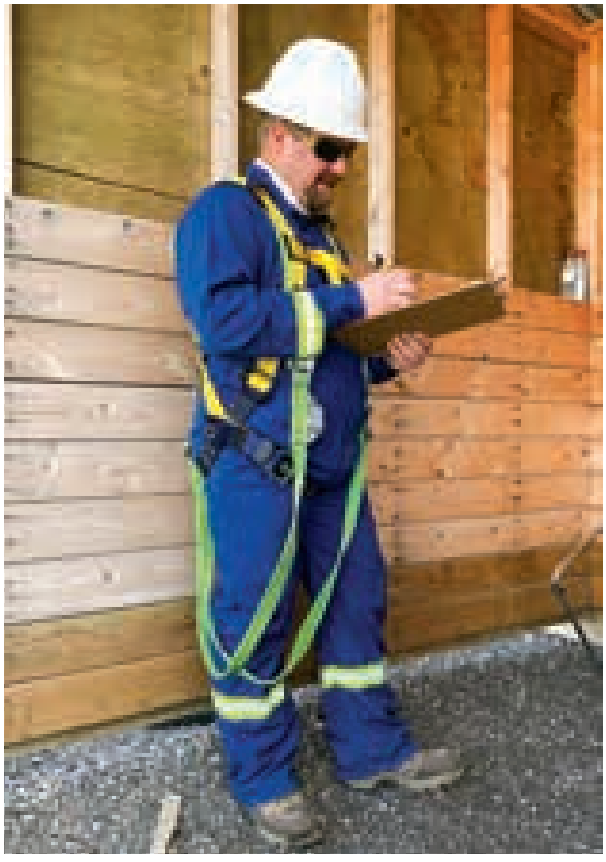


Figure 1-1 Hazard Assessment

OPERATORS AND SUPERVISOR RESPONSIBILITIES

One of the requirements of a hazard assessment is to ensure that only competent, trained and authorized operators are permitted to operate the MEWP. As an operator, you must follow all required Canadian Safety Association (CSA) and provincial Occupational Health and Safety (OHS) standards, company safety policies and safe work processes.

You **must not** operate a MEWP unless you:

1. Are trained to safely operate the equipment.
2. Have demonstrated competency in operating the equipment to a competent worker designated by the employer.
3. Are familiar with the equipment's operating instructions.
4. Are authorized by the employer to operate the equipment.

Supervisors must plan the work to ensure hazards will be controlled. To operate a MEWP, you must be trained and deemed competent by your employer and you must follow safe work practices and procedures consistently to manage the hazards of the workplace.

Note:
A Competent Worker must be adequately qualified, suitably trained and have sufficient experience to safely perform work without supervision or with only a minimal amount of supervision.

Site-Specific Awareness

The first step is to assess the site to identify any specific elements that can affect the use of the MEWP. This involves recognizing how dangerous the work and worksite are at the scene. As part of planning the work, supervisors must assess the specific requirements of the site. Key elements include:

- The type of work
- The location, site layout and path of travel
- Environmental conditions and/or issues
- Other work activities in close proximity
- The height and reach requirements of the job
- Presence of overhead power lines or other potential hazards like building overhang
- Consideration of neighbouring businesses, general public and pedestrian access
- The need for any required approvals or work permits
- The standards and company procedures that must be adhered to

There are many different kinds of MEWPs. Supervisors must familiarize themselves with the types of MEWPs for potential use on a job. The initial work plan and subsequent hazard assessment inform the selection of the specific MEWP to be used (see figure 1-2 examples).

Figure 1-2 MEWP Types

Equipment Familiarity (Obligation to Declare)

Only operators who have been trained in compliance with the standards **and** who have received unit-specific familiarization may operate a MEWP. Given the range of types of MEWPs, each with different manufacturer's operating instructions, both the employer and you as the operator are obliged to confirm that you have sufficient training and familiarity with the MEWP to be used on the applicable job.

Caution:
It is your responsibility to tell your supervisor if you do not have the training, experience or familiarity with the assigned task to operate the MEWP under the specific worksite requirements.

HAZARD ASSESSMENTS

Why are Hazard Assessments Important?

Hazard assessments help to prevent injury, illness, death, and property loss. They help people identify and understand worksite hazards and keep everyone safe. It is your responsibility to take reasonable care to protect your health and safety and the health and safety of others at the worksite.

What is a Hazard?

A hazard is any situation, condition or object that has the potential to cause injury, illness, death or property loss. In other words, a hazard is an accident waiting to happen.

What is a Hazard Assessment?

A hazard assessment is the process used to identify and evaluate hazards in the workplace. Control measures can then be put in place to reduce the risk of exposure to those hazards.

Who is Responsible for Hazard Assessments?

The simple answer is that anyone working on the worksite, whether supervisor or operator, should assess for hazards.

Supervisors, as company representatives, are responsible by legislation for:

- Identifying hazards and explaining how hazards are controlled;
- Ensuring operators have the necessary qualifications to perform their work safely;
- Ensuring workers are using required personal protective equipment (PPE); and
- Investigating injuries, near misses and refusals of unsafe work.

Operators are responsible for:

- Following all job-related operational, health and safety procedures;
- Participating in the site-specific hazard assessment;
- Asking for training if they do not know how to do something safely;
- Using all required personal protective equipment (PPE);
- Immediately reporting unsafe conditions;
- Monitoring and reporting mechanical issues;
- Informing their supervisor if they have a physical, mental or emotional issue that could affect their ability to work safely;
- Refusing work that is unsafe to perform;
- Informing your supervisor if only comfortable at certain heights.

Remember:
By accepting the responsibility to operate a MEWP, you are 100% responsible for its safe operation and activity. As a MEWP operator, you must take every precaution to ensure you do not cause harm to yourself or your coworkers, the equipment and/or the general public.

When is a Hazard Assessment Required?

Hazard assessments are necessary in the following situations:

- Before starting work
- At practicable intervals during work
- When there is a change to the work process or worksite
- When a new work process is introduced

Conducting a Hazard Assessment

Hazard assessments consist of four steps:

1. Identify the hazards.
2. Evaluate the risk of exposure to the hazards.
3. Apply control measures to reduce the risk of exposure.
4. Monitor the effectiveness of the control measures.

Hazard Sources

There are four sources of hazards:

People

People's actions may create a hazard. Their actions may be due to a lack of training, poor communication or other factors.

Equipment

All of the tools, machines and systems that people come into contact with at a worksite. Examples range from hand tools and PPE to mud pumps and flare systems.

Some equipment is inherently hazardous. Other equipment may become hazardous over time due to contamination or inadequate maintenance, storage or disposal.

Materials

All types of cargo or any chemical substance with which you may come into contact.

Environment

The environment you work in may also present hazards due to layout, ventilation, lighting, temperature, walking surfaces and similar concerns. The environment may cause hazardous gases to be released, present dangerous conditions due to severe weather or be infused with biological hazards such as molds and fungi.

CONDUCTING A MEWP HAZARD ASSESSMENT

1. Identify the Hazards

There are several ways to identify hazards while working with a MEWP, including analyzing the tasks and processes involved in the work. However, a physical inspection involving a walk around the workplace with a checklist to identify hazards and control measures is the minimum requirement.

Consider the hazards below when assessing the worksite, the type of MEWP and work activity being undertaken.

Table 1.1 Potential MEWP Hazards

HAZARD CATEGORY	HAZARD
Mechanical	» Crushing » Impact » Cutting or severing » Loss of stability » Failure of energy supply » Entanglement » Friction or abrasion » Ejection of parts » Slip, trip and fall hazards
Electrical	» Electrical contact » External influences on electrical equipment (e.g. power surge or lightning strike) » Electrostatic » Thermal radiation
Environmental	» Noise » Weather » Heat or cold » Fumes » Wind » Unstable, soft and/or uneven ground including steep grades » Excessive mud and/or ice
Ergonomic	» Poor lighting » Constrained postures » Mental overload
Operational	» Overloading caused by sail effect of objects on windy days » Manual force » Starting/moving self-propelled machinery » Uncontrolled movement » Poor site access » Lifting materials or people » Falling objects » Hazardous environment » Poor visibility and/or obstructed vision » Movement from pedestrian-controlled machinery » Simultaneous operations » Rolling over » Loading/overloading » Falls from working at height » Hitting overhead structures » Trapping and/or crushing workers

2. Evaluate the Risk

Once the hazards have been identified, the risks involved in performing the work must be assessed to identify measures and procedures to control them. It may not be possible to eliminate all risk on the worksite.

The supervisor typically quantifies the risk associated with each hazard. This is done to help prioritize the risk and the response to ensure more serious hazards are not overlooked or underestimated. Often a matrix that combines severity (how bad could this be) with probability (how likely is this to occur) is utilized to score and rank hazard risk.

Note:
The International Powered Access Federation (IPAF) publishes MEWP Safety reports. Statistics gathered from 25 different countries outlined in the GLOBAL MEWP SAFETY REPORT (2016-18) identify falls from height, electrocution, entrapment and overturn as the four deadliest events reported when using MEWPs. **How can you avoid these situations?**

3. Apply Control Measures

The closer controls are to the source, the more effective they are. The method of control selected should be based on the following hierarchy:

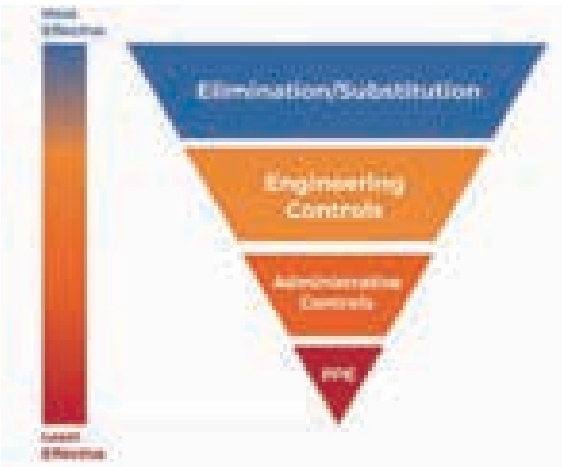


Figure 1-3 Hierarchy of Hazard Controls

- **Elimination or substitution** – eliminate the hazard or substitute with a safer alternative
- **Engineering controls** – control or modify the hazard at its source, usually through equipment design, guards and barriers and limiter sensors
- **Administrative controls** – control the hazard by managing how the work is performed and include company policies, safe work procedures, alarms or signage. Often used in conjunction with other types of controls.
- **Personal protective equipment (PPE)** – the last line of defence because it does not remove the hazard but inserts a barrier between the worker and the hazard, e.g. safety glasses to prevent eye injury.

If a hazard cannot be adequately controlled by a single method, a combination of methods may be required.

4. Monitor Control Measures

It is not enough to confirm that hazards have been identified and controls have been put in place. Anyone working on the worksite must evaluate the effectiveness of the hazard identification process and the control measures implemented. If unanticipated negative consequences have resulted from the control measures, they must also be revealed in an effort of continuous improvement.

Identify Path of Travel

One critical step in performing a MEWP hazard assessment is to determine the MEWP's path of travel, from the start to the end of the job. The path of travel includes the movement of the MEWP from its storage location to the area where the tasks are to be completed, the movement during task completion and the movement during the return to storage. The hazard assessment consists of identifying the existing and potential hazards on the path of travel. The easiest way to determine the safest path of travel is to walk the proposed path of travel and look up, down and around for hazards.

Inspect your planned travel path and general work area to ensure that:

- The ground is stable and strong enough to support the MEWP.
- The area is free from holes, curbs, slopes, drop-offs or other uneven surface features.
- The overhead area is free from obstructions such as power lines, scaffolding, barriers and signage.
- Pedestrian and traffic access is controlled.
- The area is free from exposed electrical hazards.

If your planned travel path does not meet the above conditions, it has potential hazards that may require control measures.

Determine the Need for a Spotter

Blind spots can create a hazard for the MEWP operator and others on the worksite. Thus, another critical step in performing a MEWP hazard assessment is to determine whether the operator needs a spotter. A spotter is required whenever there are any potential blind spots along the MEWP's path of travel and anytime work is performed near power lines or confined areas where vision may be obstructed.

Caution:
When using a spotter, you require a predetermined **safe work practice** in place to ensure effective and safe communication between the operator and spotter as MEWPs are moved about the site. The operator must know the whereabouts of the spotter at all times. If the operator loses site of or communication with the spotter, the operator must cease movement of the MEWP and re-establish sight and/or communication.

CLASS DISCUSSION

1. What methods of risk analysis have you seen in the workplace?
2. How are hazard assessments initiated at your worksite?
3. Describe a MEWP hazard at your worksite and how that hazard is controlled.

Figure 1-4 Spotter Monitoring a MEWP Operator

RESCUE PLANNING

Any planning for work at height in a MEWP must include a rescue plan. The primary consideration for all MEWP operations is the safe return to ground level of the occupants inside the platform as quickly as possible.

Unexpected events may prevent the platform from lowering to the ground, including:

- Lack of training or familiarity with operating or safety systems
- Operator/occupant injured or unconscious and unable to assist with rescue
- Snagged/trapped platform
- Platform overload/tilt alarm system activation
- Mechanical malfunction
- Loss of power
- Equipment shift creating unstable movement

A rescue plan must be specific to the applicable MEWP and designed in accordance with emergency resources available on the worksite. The plan must identify several options to be considered in a logical/escalating order, depending on the seriousness of the situation.

Caution:
Calling emergency services is not an acceptable rescue plan on its own. The employer or a designate of the employer is responsible to initiate rescue operations. Emergency Services may be enlisted to assist employer emergency response persons depending on severity and location of event.

Note:
Only competent people should carry out rescue procedures. Rescue work is conducted under stressful conditions. Thus, all personnel tasked with conducting rescue work must practise scenario-based responses in a safe setting. Rescue skills should be learned and practised prior to experiencing a real emergency.

The order of sequence when carrying out a rescue should be:

1. **Operator (Self-rescue):** Always refer to the manufacturer's instructions for the emergency lowering procedure on the MEWP. Test the emergency lowering system before operating the machine.
2. **Ground operator (Assisted rescue):** Ensure there is someone on the ground who is familiar with the emergency lowering procedure. Ground controls/auxiliary lowering controls must always be accessible. Consider this when positioning the MEWP prior to elevating.
3. **Another MEWP (External rescue):** Using a second MEWP or a qualified rope rescue team may be the safest option to gain access to the platform in exceptional situations.

Communication is key. For each of the different options within the rescue plan, decide who is qualified to perform the rescue procedure and how it will be carried out. Prior to work beginning, review the rescue plan and post in plain view on site where everyone is aware of its location.

Note:
Rescue plans must include support for operators working at height and in isolated areas.

INSTRUCTING OCCUPANTS

An occupant is anyone in the MEWP platform who is not an operator. As an operator, it is your responsibility to ensure every occupant in the platform knows how to work safely on the MEWP, with particular reference to equipment, processes and procedures and roles and responsibilities. (Refer to Table 1.2).

Table 1.2 Sample Occupant Checklist

OCCUPANT INSTRUCTION CHECKLIST

These are general guidelines. You should always check and follow the manufacturer's instructions and company- specific procedures.

Equipment

- ☑ Can the occupant use the required fall protection equipment?
- ☑ Does the occupant know the location of the fall protection anchors?
- ☑ Can the occupant safely use the applicable MEWP accessories?

Processes and Procedures

- ☑ Is the occupant aware of the site-specific work procedures related to the operation of the MEWP?
- ☑ Does the occupant know the location of the MEWP operator's manual?
- ☑ Is the occupant aware of the manufacturer's specific warnings and instructions related to the work activity undertaken?
- ☑ Is the occupant trained at an awareness level in spotter operator communications procedures?

Roles and Responsibilities

- ☑ Does the occupant know their responsibilities when the operator is moving or positioning the MEWP?
- ☑ Is the occupant aware of how their actions and movement could affect the stability of the MEWP?
- ☑ Can the occupant complete an emergency shut down and the lowering procedures in line with the manufacturer's warnings and safety information (if required)?
- ☑ Does the occupant know how to adhere to the hazard assessment plan and avoid site-specific hazards?

If the answer to any of the above questions is No, the occupant is not ready to enter the MEWP platform. The operator should review required knowledge items and/or tasks with the occupant prior to entrance.

Remember:
This instruction does not give the occupant authorization to operate the controls at any time except in an emergency situation. Do not take any occupant up in the MEWP until these details have been thoroughly reviewed and you have confirmed the occupant(s)' understanding and agreement.

COMMUNICATING AND MONITORING THE HAZARDS

Every worksite has different hazards, and these hazards may change from day to day and sometimes hour by hour. The operator of the MEWP is responsible to identify any changing conditions that create a hazard and ensure the risk is manageable before continuing work.

Your supervisor should make you aware of changing or new safety hazards at reasonably practicable intervals and as they are identified. Ultimately as the operator, you must take reasonable care for your own health and safety and for those around you. Monitor the hazards along the MEWP's path of travel or area of work, and immediately alert your supervisor of new hazards (arising from people, equipment, materials or the environment) upon observing them.

ACTIVITY 1.1 MEWP HAZARD ASSESSMENT AND CONTROLS

SCENARIO 1
COILED TUBING (CT)

Working in pairs or small groups, complete the hazard assessment by identifying hazards found in the following scenario. Also list corresponding control measures.

Be prepared to share your results.

On a lease site, a MEWP is required to assist the crew of a coil tubing rig when replacing a flange on the wellhead, allowing for the installation of a Blowout Preventer (BOP). The workers must remove the flange from the pressurized wellhead, 5 m (16.5 ft.) above ground, using pneumatic tools which are connected to the air supply of the CT rig. It has been raining for several days straight.

Hazard assessment and control (Partial template)

TASKS	HAZARDS (CONSIDER PEOPLE, EQUIPMENT, MATERIALS AND THE ENVIRONMENT)	PLANS TO ELIMINATE/CONTROL (LIST THE CONTROLS FOR EACH HAZARD: ELIMINATE, ENGINEERING, ADMINISTRATIVE, PPE)
Attach pneumatic tools and place in the basket	» » »	» » »
Maneuver MEWP into position to access flange	» » »	» » »
Operate pneumatic wrench	» » »	» » »
Replace flange	» » »	» » »

SCENARIO 2
CONSTRUCTION OPERATIONS

Working in pairs or small groups, complete the hazard assessment by identifying hazards found in the following scenario. Also list corresponding control measures.

Be prepared to share your results.

A new building is under construction, including contractors installing steel structural beams with the use of a crane. The steel frame is 12.2 m (40 ft.) above the ground, which consists of loose gravel over clay. A MEWP is required to allow welders access to the steel frame overhead.

Hazard assessment and control (Partial template)

TASKS	HAZARDS (CONSIDER PEOPLE, EQUIPMENT, MATERIALS AND THE ENVIRONMENT)	PLANS TO ELIMINATE/CONTROL (LIST THE CONTROLS FOR EACH HAZARD: ELIMINATE, ENGINEERING, ADMINISTRATIVE, PPE)
Assess work environment and identify lift requirements	» » »	» » »
Maneuver MEWP into position	» » »	» » »
Move welding equipment from welder's truck to work area	» » »	» » »
Position basket to work zone	» » »	» » »
Conduct welding from the basket	» » »	» » »

SCENARIO 3
MAINTENANCE OPERATIONS

Working in pairs or small groups, complete the hazard assessment by identifying hazards found in the following scenario. Also list corresponding control measures.

Be prepared to share your results.

During the night shift on an oil and gas processing facility, workers are replacing failed light bulbs approximately 12.2 m (40-ft.) above the ground. The facility is known to have levels of H_2S present. The closest approach would place the MEWP 12.2 m (40 ft.) from the base of the tower.

Hazard assessment and control (Partial template)

TASKS	HAZARDS (CONSIDER PEOPLE, EQUIPMENT, MATERIALS AND THE ENVIRONMENT)	PLANS TO ELIMINATE/CONTROL (LIST THE CONTROLS FOR EACH HAZARD: ELIMINATE, ENGINEERING, ADMINISTRATIVE, PPE)
Assess work environments and identify lift requirements	» » »	» » »
Maneuver MEWP into position to access lights	» » »	» » »
Position basket to work zone	» » »	» » »
Change light bulbs	» » »	» » »

SCENARIO 4
REPAIRING EQUIPMENT

Working in pairs or small groups, complete the hazard assessment by identifying hazards found in the following scenario. Also list corresponding control measures.

Be prepared to share your results.

Workers are conducting repair and maintenance of a series of ceiling fans and lights in a fabrication shop with a 15.3-m (50-ft.) ceiling. The concrete shop floor is equipped with 30.5-cm (12-in.) drainage grills every 4.3 m (14 ft.), running the entire width of the building. Pipe, pallets, machining equipment and welding stations are set up throughout the building. All lights and fans have been shut down at the breaker, with natural light coming in through windows along the top of two walls.

Hazard assessment and control (Partial template)

TASKS	HAZARDS (CONSIDER PEOPLE, EQUIPMENT, MATERIALS AND THE ENVIRONMENT)	PLANS TO ELIMINATE/CONTROL (LIST THE CONTROLS FOR EACH HAZARD: ELIMINATE, ENGINEERING, ADMINISTRATIVE, PPE)
Assess work environment and identify lift requirements	» » »	» » »
Maneuver MEWP into position to access lights	» » »	» » »
Position basket to work zone	» » »	» » »
Start repairs and preventative maintenance of fans and light fixtures	» » »	» » »

SCENARIO 5
INSTALLING DRYWALL

Working in pairs or small groups, complete the hazard assessment by identifying hazards found in the following scenario. Also list corresponding control measures.

Be prepared to share your results.

Workers are installing drywall on a partition in a warehouse. The warehouse has 12.2-m (40-ft.) ceilings, with an uneven floor against the wall.

Hazard assessment and control (Partial template)

TASKS	HAZARDS (CONSIDER PEOPLE, EQUIPMENT, MATERIALS AND THE ENVIRONMENT)	PLANS TO ELIMINATE/CONTROL (LIST THE CONTROLS FOR EACH HAZARD: ELIMINATE, ENGINEERING, ADMINISTRATIVE, PPE)
Assess work environments and identify lift requirements	» » »	» » »
Maneuver MEWP into position to access lights	» » »	» » »
Install drywall panels	» » »	» » »

SCENARIO 6
PAINTING APPLICATION

Working in pairs or small groups, complete the hazard assessment by identifying hazards found in the following scenario. Also list corresponding control measures.

Be prepared to share your results.

On a remote plant site, new piping approximately 5-6 m (16.4-19.7 ft.) above the ground requires painting and labelling. The owner has requested a polyurethane product which will be applied with a gas-powered airless sprayer. The ground under the piping consists of loose gravel over soft soil.

Hazard assessment and control (Partial template)

TASKS	HAZARDS (CONSIDER PEOPLE, EQUIPMENT, MATERIALS AND THE ENVIRONMENT)	PLANS TO ELIMINATE/CONTROL (LIST THE CONTROLS FOR EACH HAZARD: ELIMINATE, ENGINEERING, ADMINISTRATIVE, PPE)
Assess work environment and identify lift requirements	» » »	» » »
Prep paint, sprayer and lines	» » »	» » »
Maneuver MEWP into position to access lights	» » »	» » »
Paint and label piping with spray guns	» » »	» » »

EXERCISE

1. Explain a MEWP operator's Obligation to Declare.

2. What are the four potential sources of hazards?

3. When does a MEWP operator require a spotter?

4. When is an **occupant** authorized to operate the controls of the MEWP?

5. Explain the order of sequence for carrying out a rescue from a MEWP.

CLASS DISCUSSION

1. How do you ensure every occupant in the platform knows how to work safely on the MEWP at your worksite?

2. Have you been involved in a MEWP rescue? Describe the situation.

NOTES

CHAPTER 2:

Selecting a Mobile Elevating Work Platform

OUTCOME

Determine the requirements for selecting the appropriate Mobile Elevating Work Platform.

OBJECTIVES

Upon completion of this chapter, you should be able to:

1. Describe the function of the MEWP owner's manual.
2. Assess that a MEWP is capable of performing the required task.
3. Determine any additional performance requirements for the MEWP for the required task.

INTRODUCTION

MEWPs come in a variety of designs with performance characteristics that are suited to a wide range of tasks. Understanding the capabilities and limitations of each MEWP is essential for selecting the right MEWP for the job and for operating it safely within site conditions. It is important that you are able to identify conditions that make a platform stable and what causes it to tip over, as this is one of the most dangerous hazards. To do this, you must understand the concept of centre of gravity, tipping point and forces that may shift the centre of gravity.

ENSURING MAXIMUM STABILITY (CENTRE OF GRAVITY AND TIPPING POINT)

MEWPs are safe to use within their specifications. However, overturning and tipping is one of the most dangerous hazards associated with operating a MEWP. To avoid injury or fatality, you must understand what makes a MEWP stable and what causes it to tip over. To do this, you must understand the centre of gravity of a MEWP, tipping point and the forces that may shift the centre of gravity.

Every object has a centre of gravity – the point where the object's weight is evenly distributed or balanced. The centre of gravity is usually located where the mass is mostly concentrated.

Any action that changes the machine's configuration can change the centre of gravity and make it unstable. When a MEWP turns over, it tips on an axis or tipping point.

Each MEWP also has an area of stability, which varies with each MEWP. A MEWP is stable as long as the centre of gravity remains inside the area of stability. For most MEWPs, the area of stability is contained within the 'working envelope' of the drive chassis defined by 'the tipping line' created by the four tires or outriggers.

Figure 2-1 Boom MEWP Stability

Figure 2-2 Scissor Lift Stability

Tipping can be caused by:

- Sudden movement of the MEWP or parts of it when elevated
- Sudden stops while in motion when the MEWP is elevated
- Traveling or operating on a slope or uneven terrain or having a tire drop into a hole
- Changing the weight distribution or centre of gravity through replacement of parts or adding additional equipment not approved by the manufacturer
- Operating the MEWP in windy conditions beyond what the manufacturer recommends
- Uneven or overloaded platform

Newer MEWPs are equipped with a load-sensing device that disables the functions of the machine when overloaded. The maximum load capacity includes the combined weight of the workers, tools and equipment used for the job. The weight of the basket is not included in the maximum load capacity as it is already included in the weight of the MEWP. Maximum load limits vary by the type of MEWP. Boom-type machines are especially sensitive to overloading. Be sure to stay within the operating range for horizontal load and weight capacities specified in the operator's manual or as indicated on the platform's data plate or warning labels.

MEWP CLASSIFICATIONS

MEWP classifications consist of two key distinguishing features: group and type.

MEWP Groups

MEWP groups are determined by where the platform location is in reference to the tipping line.

Group A machines have a design that does not allow the main platform to extend beyond the tipping line or outside the 'working envelope' of the drive chassis. An example would be a scissor lift.

Group B machines have platforms that are designed to extend beyond the tipping line or working envelope of the drive chassis. An example would be an articulating or telescopic boom lift.

Figure 2-3 MEWP Groups

MEWP Types

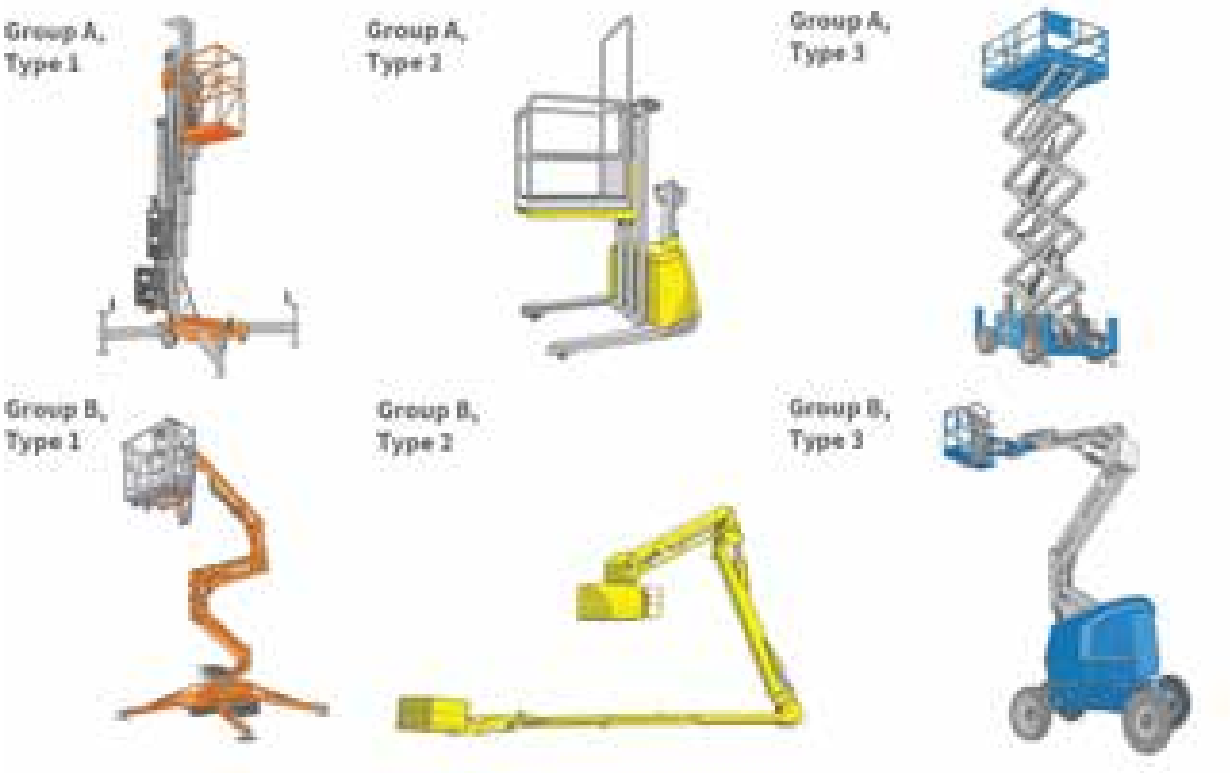


Figure 2-4 MEWP Types

Type 1 – This type of MEWP can only travel while the MEWP is in its stowed position. An example for a Type 1 Group A lift is a manually propelled vertical lift. An example of a Type 1 Group B MEWP is a trailer-mounted boom lift.
Type 2 – This type of MEWP travels with the work platform in the elevated position and is controlled from a point on the chassis. An example of a Type 2 MEWP is an under-bridge inspection machine.

Type 3 – This type of MEWP travels with the work platform in the elevated position and is controlled from a point on the platform. Examples of Type 3 Group A MEWP are certain types of scissor lifts. An example of a Type 3 Group B MEWP is an articulated or telescopic Elevated Platform.

MEWPs themselves have many generic and interchangeable nicknames, such as aerials, aerial work platforms, access equipment or a generic 'Genie® lift.' Understanding the differences in the type of MEWPs available on the market will help you select the right machine to meet your jobsite needs.

Common Mobile Elevating Work Platform Terms

In addition to the classifications mentioned above, MEWPs have many generic and interchangeable nicknames, such as aerials, aerial work platforms, stick booms, straight booms or even elevated platforms. It is important to be familiar with common MEWP terms given to each classification to avoid confusion with industry jargon.

Regardless of what a MEWP is called, the variety of platform positions (access characteristics) achievable using vertical lift MEWPs and telescopic and articulated booms, affects the selection of the most suitable type of MEWP for the applicable work tasks and environment. (Refer to Table 2.1).

Table 2.1 MEWP Selection

Group A Type 1

Trailer Mounted or Compact MEWP

- Mounted on a moveable trailer and can be towed by vehicles meeting tow requirements using a tow ball.
- Have manually adjusted stabilisers to provide stability.
- Working heights up to 26 metres
- Can operate on 120-volt current or batteries.
- Best used when access to the work is limited by congestion (high human exposure potential), but manoeuvrability is required to reach different work areas.

Group A Type 3

Scissor Lift MEWP

- Work platform provides more space than boom-type MEWP.
- Options include platform extension, outriggers/ stabilisers, battery or electric power.
- Can be raised or lowered but has no ability to slew or telescope.
- Most appropriate on firm flat surfaces such as concrete or asphalt.
- Not suitable for steep inclines.

Group A Type 3

4X4 Scissor Lift MEWP

- For use when a scissor lift is required but access to the worksite is limited by 'off-slab' ground condition that may require a rough-terrain-capable MEWP.
- Four-wheel drive.
- More efficient than scaffolding for short-term work tasks.
- Effective in all seasons for construction work.

Group B Type 2

Bucket Truck or Bridge Inspection Platform

- A device for which travelling with the work platform in the elevated position is controlled from a point on the chassis
- A bucket on the end of a boom, mounted from a truck. Used commonly by utility companies and arborists
- Also includes bridge inspection platforms mounted from a truck bed or rail unit
- The ability to operate below the mounting or anchor point is a unique characteristic of the bridge inspection models
- Wide range in reach and capacity

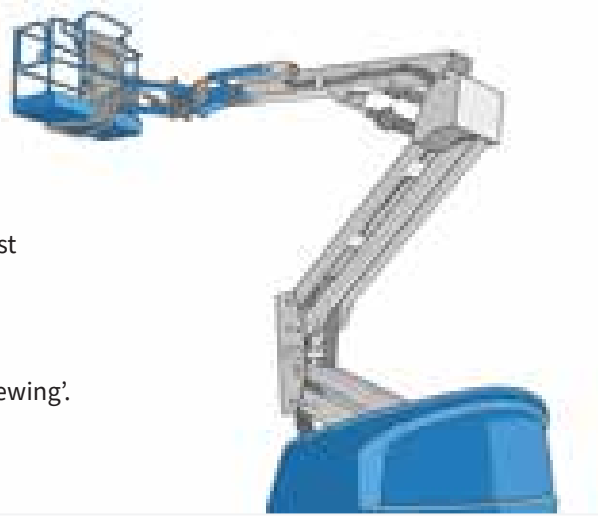
Group B Type 3

Self-Propelled Telescoping Boom MEWP

- Self-propelled for use on flat slabs or firm unsealed areas.
- Two or four-wheel drive.
- Controls at ground level and on the platform.
- Work platform is elevated using a straight extension (telescoping) boom.
- Mounted on a turret which allows rotating or ‘slewing’.
- Best for high-access requirement when the MEWP can’t approach close to the work.
- Efficient to access multiple points without repositioning machine.

Group B Type 3

Self-Propelled Knuckle Boom or Articulating Boom MEWP



- Self-propelled for use on flat slabs or firm unsealed areas.
- Two or four-wheel drive.
- Controls at ground level and on the platform
- Work platform is elevated by a boom with at least two main sections, “hinged” with a knuckle.
- Both boom sections may incorporate a telescoping extension.
- Mounted on a turret which allows rotating or ‘slewing’.
- Most adaptable MEWP to use when specific access is required (e.g. to reach up and over obstacles, under overhangs).

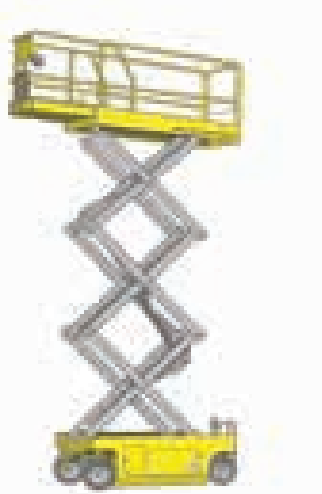
ACTIVITY 2.1 MEWP MATCHING

Match each MEWP to its description. Place a checkmark next to the correct description.

1. Group A Type 1 / 'Trailer Mounted' or 'Compact Articulating' MEWP		
2. Group A Type 3 / 'Scissor Lift' MEWP		
3. Group A Type 3 / "4X4 Scissor Lift" MEWP		
4. Group B Type 3 / Self-Propelled 'Knuckle Boom' or 'Articulating Boom' MEWP		
5. Group B Type 3 / Self-Propelled 'Telescoping Boom' MEWP		

1. Group A Type 1 / 'Trailer Mounted' or 'Compact Articulating' MEWP		
2. Group A Type 3 / 'Scissor Lift' MEWP		
3. Group A Type 3 / "4X4 Scissor Lift" MEWP		
4. Group B Type 3 / Self-Propelled 'Knuckle Boom' or 'Articulating Boom' MEWP		
5. Group B Type 3 / Self-Propelled 'Telescoping Boom' MEWP		

1. Group A Type 1 / 'Trailer Mounted' or 'Compact Articulating' MEWP		
2. Group A Type 3 / 'Scissor Lift' MEWP		
3. Group A Type 3 / "4X4 Scissor Lift" MEWP		
4. Group B Type 3 / Self-Propelled 'Knuckle Boom' or 'Articulating Boom' MEWP		
5. Group B Type 3 / Self-Propelled 'Telescoping Boom' MEWP		

1. Group A Type 1 / 'Trailer Mounted' or 'Compact Articulating' MEWP		
2. Group A Type 3 / 'Scissor Lift' MEWP		
3. Group A Type 3 / "4X4 Scissor Lift" MEWP		
4. Group B Type 3 / Self-Propelled 'Knuckle Boom' or 'Articulating Boom' MEWP		
5. Group B Type 3 / Self-Propelled 'Telescoping Boom' MEWP		

1. Group A Type 1 / 'Trailer Mounted' or 'Compact Articulating' MEWP		
2. Group A Type 3 / 'Scissor Lift' MEWP		
3. Group A Type 3 / "4X4 Scissor Lift" MEWP		
4. Group B Type 3 / Self-Propelled 'Knuckle Boom' or 'Articulating Boom' MEWP		
5. Group B Type 3 / Self-Propelled 'Telescoping Boom' MEWP		

DETERMINE MEWP REQUIREMENTS

You must understand the classifications of MEWPs and the capabilities and limitations of each style of equipment. Knowing this information will keep you safe and minimize your risk of injury, as well as potential damage to the machine or work location.

CSA Standards provide that "the correct machine should be selected for the task to be undertaken, taking into account the constraints of the work site, ground conditions, site access and proximity to the public or other workers."

Use the following criteria to identify the correct MEWP for the task.

Remember:
Consult and consider the initial hazard assessment completed when identifying the correct MEWP for the applicable job.

1. Ground Conditions

Location and ground condition are key factors when choosing the right MEWP for the job. Knowing whether the job site is indoors or outdoors will help to determine the correct MEWP. Location can also include obstructions that a particular MEWP must be able to navigate to accomplish the task or weather factors, such as wind.

For indoor jobs on concrete or pavement, an 'on-slab' model MEWP is often appropriate.

If the jobsite is outdoors, the ground condition is critical, as early stage construction sites, unpaved terrain or even poor weather conditions may require the choice of a rough-terrain-capable MEWP built to handle 'off-slab' terrain.

An important factor of the ground stability is understanding the weight of the MEWP that is being used. A good practice to implement is to walk over the ground to check if there is any soft or uneven ground. Following this walking check, drive the machine over the ground before using the platform.

Figure 2-5 On-Slab MEWP

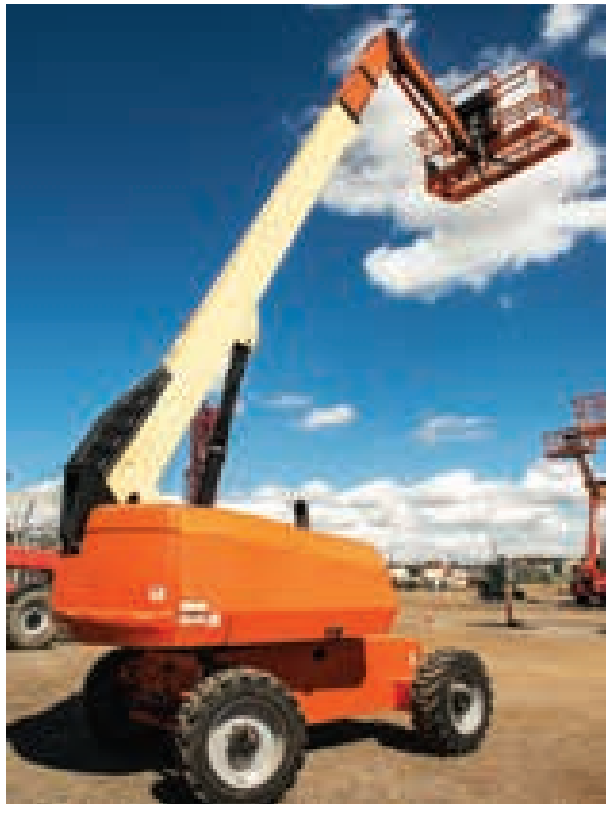


Figure 2-6 Off-Slab MEWP

Other factors to consider in ground conditions are:

- **Poor weather conditions:** weather conditions can result in poor ground conditions such as washout, frost heaving and movement
- **Seasonal conditions:** conditions may vary with the season. The ground may be stable in winter, but if you have heating equipment in the area, it may remove frost.
- **Parking location:** do not park on new utilities or pipelines
- **Trenches:** if work is conducted near trenches, the downward pressure of the MEWP will need to be considered against the outward pressure of the trench
- **Surface:** a surface such as pavement is no guarantee of ground stability
- **Ground disturbances:** ask the site supervisor if there have been any ground disturbances in the last month

Caution:
Small movements at the base are exaggerated at height.

2. Height

A critical criterion when selecting a MEWP is to determine the working height. To do this, the supervisor will look at the machine's working envelope (tipping line) or range of motion. It is essential to select a MEWP that will extend a few vertical feet higher than required. A typical mistake is to extend the platform with ladders or other devices, which creates a hazard.

3. Reach

Another important selection criterion is the reach of the MEWP, which is its horizontal outreach. It is determined by the combination of its vertical height and horizontal reach capabilities. MEWPs come with range of motion and load charts that show safe operating configurations. On MEWPs with booms, stability decreases with the length of the boom and boom angle as the centre of gravity moves in relation to the platform position.

4. Capacity

It is also critical to estimate the weight of the load to be lifted in order not to exceed the lift capacity of the MEWP. The total weight must also include the weight of the workers and their tools and materials and safety equipment. MEWPs that are overloaded or loaded unevenly can become unstable and fail, particularly boom-type MEWPs.

5. Power/Fuel Source

MEWPs may be electric, hybrid (a combination of diesel and electric) or internal combustion. The type of power/fuel that runs the MEWP is important in the selection process, primarily for safety reasons. Diesel fuelled MEWPs must not be used indoors unless they have scrubbers. Gasoline fuelled MEWPs are mainly used for outdoors and have unique considerations that must be addressed, such as whether a gas such as propane is handled correctly. If they are to be used indoors then there must be adequate ventilation. If the MEWP is being operated in an atmosphere where flammable or explosive gases may be present, always check the hazard assessment and confirm with your supervisor to ensure the MEWP is designed for use in the space prior to starting work.

6. Platform Size

It is important to know the number of people who need to work on the platform at the same time. Know what tools and material will also have to be on the platform. This information helps to determine the platform size and the MEWP required.

7. Accessibility

Determine how confined the space for which the MEWP will be working. Be mindful of narrow hallways, doorways or stairs that could interfere with required mobility or accessibility to accomplish the task. Consider these factors when making rescue plans.

8. Proximity

Determine the proximity to electrical lines, structures, suspended plant/industrial lines (chemical, gas, water, waste, etc.) and other equipment when identifying the correct MEWP for the applicable task.

VERIFY MEWP COMPONENTS

Review Operator's Manual

Manuals and handbooks containing the manufacturer's information necessary for the operation and maintenance of the MEWP must be readily available to the operator. This information includes any applicable standards, regulations, placards or decals. It is important to maintain the manual in a weather-resistant storage compartment on the MEWP when not in use.

Your supervisor should make you aware of its location. You should familiarize yourself with the manual and all applicable operating information **before operating a MEWP for the first time**, even if you have been trained to operate that class of MEWP. Your supervisor or other authorized person must ensure you have read and understand the manual and can explain it to you if you do not understand any part of it.

Figure 2-8 MEWP Operator Manual

Figure 2-9 MEWP Rated Capacity

Familiarization

Before being authorized to operate a particular MEWP make or model, the operator shall receive familiarization by a supervisor or other qualified person in the control functions and operating characteristics specific to the particular MEWP. You must have general knowledge of the function of its controls, features and devices as well as the emergency controls.

It is important to be able to visually recognize and explain how the basic components of a MEWP function. As an operator, you will be asked to inspect the equipment or perform function tests before operating the MEWP.

Knowledge of the MEWP's components is an operator's responsibility. The photos below show the basic components on a Scissor Lift and an Articulating Lift.

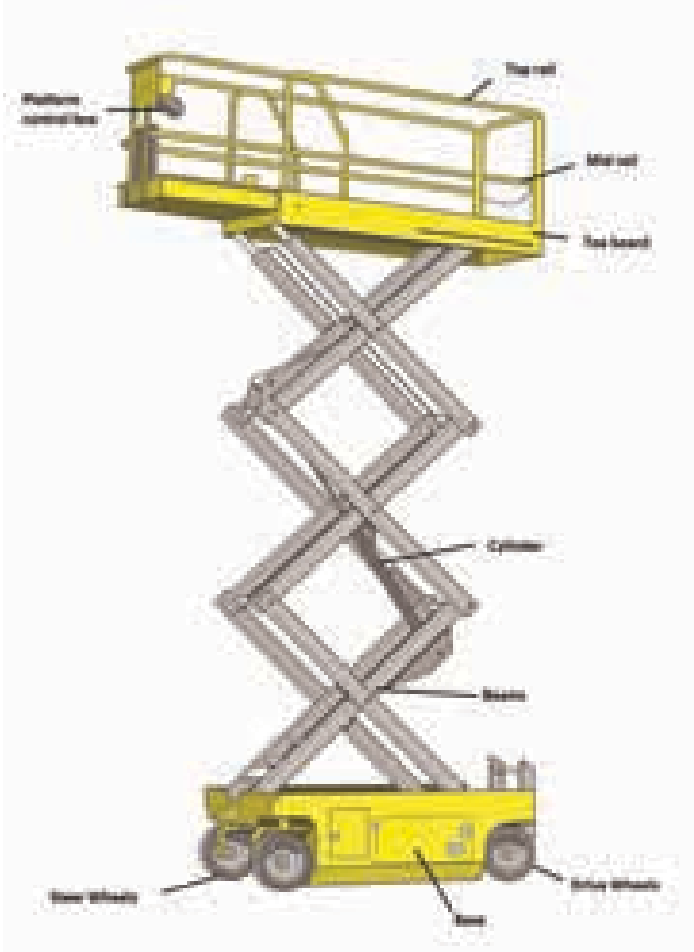


Figure 2-10 Scissor Lift Components

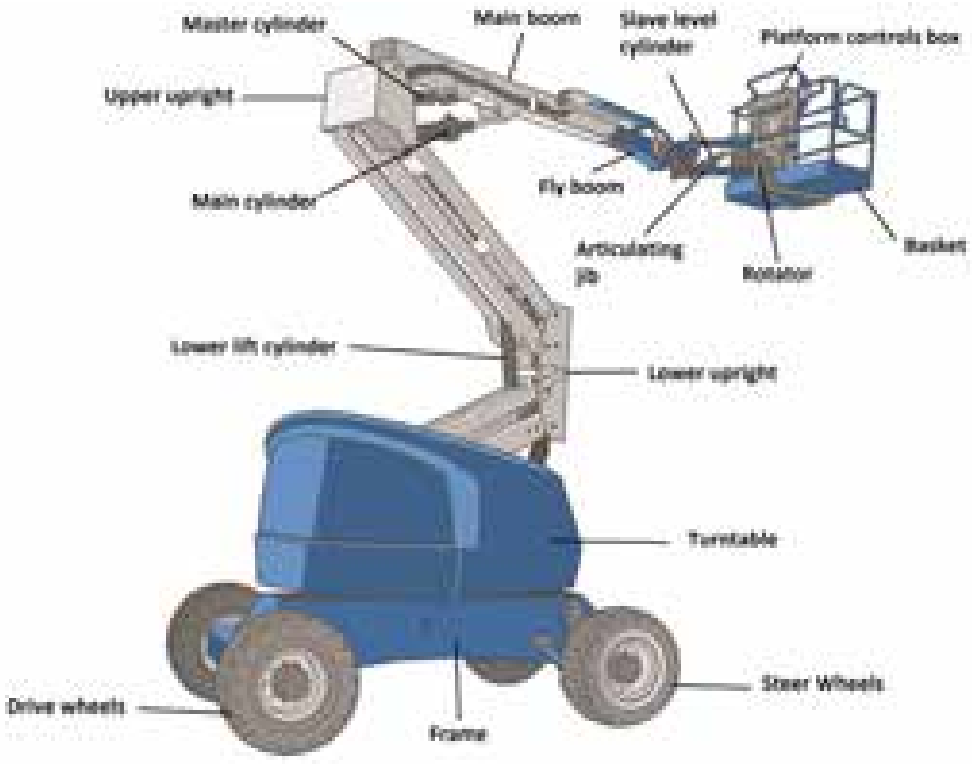


Figure 2-11 Articulating Lift Components

Additional Equipment

Part of the selection process for a MEWP is to identify and assess any additional equipment that may be necessary to complete the task. This does not include homemade attachments that are inconsistent with the designed purpose of the MEWP but rather additional equipment that has been designed and authorized for use by the manufacturer or specifically engineered and attached to the MEWP. Selection of a generator and a compressor would potentially introduce new hazards such as carbon monoxide exposure, which should be included in the hazard assessment. This includes but is not limited to the following items:

Generator

Depending on the availability of a power source, it may be necessary to add a generator to provide power to electrical tools.

Compressor

If the task requires air tools or the completion of a pneumatic test, then a compressor will be required.

Cradle (Glass or Pipe)

Pipe, panel or glass carriers all reduce the risk of injury and fatigue by providing operators with a safe and secure way to lift pipes, panels or plate glass.

Note:
Adding additional items to the MEWP results in increased weight on it, potentially resulting in a shift in the MEWP's centre of gravity or tipping line.

Welding

If welding is required, it may be necessary to include a welding machine. Make sure to account for the weight of the welding machine as you plan your work.

OPERATING ADDITIONAL EQUIPMENT

Review Operation

As with the MEWP itself, an operator must be trained in the use of any additional equipment. Your supervisor must determine the necessity and fitness of the additional equipment in selecting the MEWP.

Mounting Configuration

Anything screwed, bolted or welded to a MEWP must be professionally engineered for the unit so that the integrity of the steel and the rest of the unit is not compromised. Positioning of additional equipment must also be taken into account as to not affect the centre of gravity of the MEWP or its capacity.

Capacity Reductions

Any additional equipment will add weight to the MEWP and may reduce its capacity so its use must be accounted for and assessed in the selection process.

WIND LIMITATIONS

All MEWPs have a maximum rated wind speed at which they may be operated. Refer to the manufacturer's specifications as wind speeds are specific to each machine. Have an operational means of measuring wind speed for the current elevation in which the MEWP is operated. It is important to realize that wind speed increases with height.

Buildings may create funnelling effects which may increase wind speeds. MEWPs are not transportation devices for materials. Materials such as panels or sheet materials may act as a 'sail' and further impact the stability of the MEWP under windy conditions. The only exceptions are if there are specific supports being used for transporting materials (such as supports for hauling pipe).

How do you know when it is too windy to operate the MEWP?

Refer to the wind rating in the operator's manual to determine safe operating limits. The potential for inclement weather should be identified in the Hazard Assessment before work begins. If conditions change or you are in any doubt about operating a MEWP in windy conditions , you should stop work and reassess the hazards with your supervisor. If wind gusts are nearing the wind rating of the MEWP, do not operate it.

CLASS DISCUSSION

1. What factors must you consider when preparing for a task that involves the use of a MEWP?

ACTIVITY 2.2 MEWP SELECTION

SCENARIO 1
COILED TUBING (CT)

Referencing the hazard assessment completed in Chapter 1 for your assigned scenario and the information in this chapter, select the appropriate MEWP for the job. Details should include MEWP group and type, size and power source. Factors to consider: ground conditions, height, reach, capacity, power/fuel source, platform size, accessibility and proximity. Describe what influenced your selection.

Be prepared to share your results.

On a lease site, a MEWP is required to assist the crew of a coil tubing rig when replacing a flange on the wellhead, allowing for the installation of a Blowout Preventer (BOP). The workers must remove the flange from the pressurized wellhead, 5 m (16.5 ft.) above ground, using pneumatic tools which are connected to the air supply of the CT rig. It has been raining for several days straight.

MEWP GROUP AND TYPE	SELECTION COMMENTS

SCENARIO 2
CONSTRUCTION OPERATIONS

Referencing the hazard assessment completed in Chapter 1 for your assigned scenario and the information in this chapter, select the appropriate MEWP for the job. Details should include MEWP group and type, size and power source. Factors to consider: ground conditions, height, reach, capacity, power/fuel source, platform size, accessibility and proximity. Describe what influenced your selection.

Be prepared to share your results.

A new building is under construction, including contractors installing steel structural beams with the use of a crane. The steel frame is 12.2 m (40 ft.) above the ground, which consists of loose gravel over clay. A MEWP is required to allow welders access to the steel frame overhead.

MEWP GROUP AND TYPE	SELECTION COMMENTS

SCENARIO 3
MAINTENANCE OPERATIONS

Referencing the hazard assessment completed in Chapter 1 for your assigned scenario and the information in this chapter, select the appropriate MEWP for the job. Details should include MEWP group and type, size and power source. Factors to consider: ground conditions, height, reach, capacity, power/fuel source, platform size, accessibility and proximity. Describe what influenced your selection.

Be prepared to share your results.

During the night shift on an oil and gas processing facility, workers are replacing failed light bulbs approximately 12.2 m (40-ft.) above the ground. The facility is known to have levels of H_2S present. The closest approach would place the MEWP 12.2 m (40 ft.) from the base of the tower.

MEWP GROUP AND TYPE	SELECTION COMMENTS

SCENARIO 4
REPAIRING EQUIPMENT

Referencing the hazard assessment completed in Chapter 1 for your assigned scenario and the information in this chapter, select the appropriate MEWP for the job. Details should include MEWP group and type, size and power source. Factors to consider: ground conditions, height, reach, capacity, power/fuel source, platform size, accessibility and proximity. Describe what influenced your selection.

Be prepared to share your results.

Workers are conducting repair and maintenance of a series of ceiling fans and lights in a fabrication shop with a 15.3-m (50-ft.) ceiling. The concrete shop floor is equipped with 30.5-cm (12-in.) drainage grills every 4.3 m (14 ft.), running the entire width of the building. Pipe, pallets, machining equipment and welding stations are set up throughout the building. All lights and fans have been shut down at the breaker, with natural light coming in through windows along the top of two walls.

MEWP GROUP AND TYPE	SELECTION COMMENTS

SCENARIO 5
INSTALLING DRYWALL

Referencing the hazard assessment completed in Chapter 1 for your assigned scenario and the information in this chapter, select the appropriate MEWP for the job. Details should include MEWP group and type, size and power source. Factors to consider: ground conditions, height, reach, capacity, power/fuel source, platform size, accessibility and proximity. Describe what influenced your selection.

Be prepared to share your results.

Workers are installing drywall on a partition in a warehouse. The warehouse has 12.2-m (40-ft.) ceilings, with an uneven floor against the wall.

MEWP GROUP AND TYPE	SELECTION COMMENTS

SCENARIO 6
PAINTING APPLICATION

Referencing the hazard assessment completed in Chapter 1 for your assigned scenario and the information in this chapter, select the appropriate MEWP for the job. Details should include MEWP group and type, size and power source. Factors to consider: ground conditions, height, reach, capacity, power/fuel source, platform size, accessibility and proximity. Describe what influenced your selection.

Be prepared to share your results.

On a remote plant site, new piping approximately 5-6 m (16.4-19.7 ft.) above the ground requires painting and labelling. The owner has requested a polyurethane product which will be applied with a gas-powered airless sprayer. The ground under the piping consists of loose gravel over soft soil.

MEWP GROUP AND TYPE	SELECTION COMMENTS

Remember:
When selecting a MEWP to use, consider the type of work to be performed and the environment in which it will be used. This ensures the job tasks can be carried out efficiently, effectively and most important, safely.

Start the job properly by committing the appropriate resources for the required tasks.

EXERCISES

1. Where should the operator's manual be stored when the MEWP is not is use? What information is found in the manual?

2. List five criteria that should be considered when assessing the correct MEWP for the task. (There is a total of eight.)

   1) _____

   2) _____

   3) _____

   4) _____

   5) _____

3. What additional equipment may you need to add to a MEWP? Why?

CLASS DISCUSSION

1. What should you do if you do not understand any part of the MEWP operator's manual?

2. Why is it important to be familiar with common terms given to each MEWP classification?

NOTES

CHAPTER 3:

Performing a MEWP Pre-Use Inspection

OUTCOME

Perform a pre-use inspection of a MEWP.

OBJECTIVES

Upon completion of this chapter, you should be able to:

1. Demonstrate a visual inspection.
2. Demonstrate an engine inspection.
3. Demonstrate a function inspection.
4. Complete a daily inspection checklist.

INTRODUCTION

Prior to beginning any work with a MEWP, you must perform a pre-use inspection. This step is critical for your safety and the safety of others.

WHY PERFORM A PRE-USE INSPECTION?

Operators must complete a pre-use inspection of every MEWP to ensure it is not faulty or unsafe and does not have the potential to cause injury to the operator or others. The frequency of inspections is determined by the environment and intensity of use.

As per company and manufacturer's guidelines, the operator should conduct the pre-use MEWP inspection in a quick, efficient and thorough manner at the beginning of each shift on the MEWP. This applies even if the MEWP was pre-inspected prior to your shift by another operator.

Remember:
If you take care of your machine,
it will take care of you.

What if the MEWP is Faulty?

Do not operate a faulty, defective or unsafe MEWP. If you find a defect on the MEWP, report the defect immediately to your supervisor. Not all defects require the MEWP to be taken out of service. An example of this could be a low battery or slow operation of the MEWP.

Examples of faults or defects requiring the MEWP to be taken out of service or 'tagged out' are leaking hydraulic lines, non-functioning base controls or a flat or damaged tire. Always refer to the manual and your company policy to determine what faults or defects require a tag-out of the MEWP and the tag-out procedure.

If the fault is serious enough to prevent the MEWP from being operated, perform a tag-out procedure as follows:

» Tag the MEWP by putting your name, position and other relevant information, the date and time of tagging and the reasons for the MEWP's removal from service

» Attach a copy of the inspection form if there is more than one defect

Repairs to the MEWP may only be completed by a qualified service technician and according to the manufacturer's specifications. After repairs are completed, you must perform a pre-use inspection again. After completing your inspection, ensure all panels are in place and secure for travel and covers are latched properly.

PERFORM A VISUAL INSPECTION OR 'WALK AROUND'

Because MEWPs come in a wide range of designs, inspections vary slightly depending on the machine. Take time to familiarize yourself with the operating characteristics of the MEWP you are inspecting by reviewing the operator's manual—even if you are familiar with it.

Before starting the pre-use inspection, review any prior inspections or the inspection log, if present, and further investigate any previously identified issues. Once these are addressed, you can start the pre-use inspection.

The first part of the pre-use inspection involves a walk around or 'motor-off' inspection. This includes looking under the machine's chassis to check for conditions, such as loose or missing parts, leaking fluids, frayed or damaged wires or debris/excessive dust buildup, which may cause extensive machine damage during operation. If the MEWP, or any parts of the MEWP, are defective to the point where it is not safe for use, then it must be locked/tagged out via an information tag. Use manufacturer and company guidelines to conduct the lock-out/tag-out to process effectively and safely.

The pre-use inspection includes but is not limited to the following points (be sure to record your observations on the inspection form). Check that/for:

» Operator's manual is present and readable (kept in a weather-resistant storage compartment)

» Structural components are not damaged, with no loose or broken parts and/or cracks in welds

» Cleanliness and general signs of damage (MEWP is free of excessive mud, grease, etc.)

» Structural components of stabilizers and extending structures are in good shape

» Beams, booms and platform are in good condition (no obvious bends, twists or cracks visible)

- Tires have proper pressure and wheels are not loose or missing lug nuts
- Tracks, rollers, frame, welds, bolts and drive system are in good condition
- Decals, warning signs, instructions, control markings are clean and readable – many are vital to the operation of the machine and protection of workers
- Cables, wiring harnesses and safety devices are in place
- Air, hydraulic cylinders, fuel system and hoses do not have leaks or are showing excessive wear
- Tank mounting bracket and locking pin are in good condition
- Steps are free of debris, damage and obstructions
- Pins and securing devices are on the platform
- Platform, including guardrail, floor, anchorage and mounting are in good condition
- Beacon and warning lights are operational and lenses are not damaged or missing
- Yearly structural inspection/certification tag is readable and up to date for the current year
- Fall protection anchors and equipment tie-offs are in place to prevent dropped objects
- Doors, gates and latches are in place and secure
- Record hours from the hour indicator display
- Movement alarms

PERFORM ENGINE INSPECTION

The next part of the pre-use inspection involves checking the engine powertrain – combustion or electric. Improper fluid levels can result in engine problems. There should be enough fuel in the tank to complete the job. Proper battery condition is essential to good engine performance and operational safety.

Engine checks should be based on the MEWP's manual and include but are not limited to:

- Checking fluid levels including engine oil, engine coolant and hydraulic oil
- Ensuring the MEWP is not leaking and there are no leaks beneath the MEWP
- Checking for fluid leaks around the engine and radiator
- Confirming the fuel level is okay, free of leaks and the fuel cap is on and secure
- Ensuring the engine oil level is at the full mark on the dipstick and the filler cap is secure
- Ensuring the propane hose and connecting nut are in good condition
- Inspecting the condition of the tank mounting bracket and locking pin
- Checking the battery for any damage, including corrosion, heat from the battery, inappropriate fluid level or smell
- Ensuring the battery is charging as required, battery connections are tight and vent caps are not clogged
- Conducting a function test of positive air shut-off or an emergency shut-down procedure
- Checking the hour indicator and noting the hours as necessary

Figure 3-1 MEWP Engine

PERFORM FUNCTION TEST

Operators must perform a function test prior to using the MEWP before starting each shift. These function tests should be performed in an area free of overhead and ground-level obstructions. Function tests are designed to uncover any faults not found by the visual inspections before the machine is put into service. Examine any accessories or attachments before operating the machine.

Remember:
Do not use a faulty machine. Shut the machine down and alert your supervisor upon discovering any damage or defects.

1. Start the MEWP

Each make and type of MEWP has different starting sequences. Use the manual to confirm the sequence.

The first step of the Perform Function, or 'Motor On' inspection, involves turning on the MEWP to ensure the engine runs smoothly and quietly, without leaks or sparks from the exhaust.

2. Full Range of Motion

This step involves testing the operation and function of all controls to ensure they are working properly. It involves but is not limited to:

- Starting, stopping and driving (forward, reverse) the MEWP
- Extending the booms, outriggers and stabilizers
- Checking emergency controls
- Checking foot controls
- Ensuring drive systems, brakes, steering and speed controls are smooth and responsive
- Checking that motion alarms work
- Testing the horn

3. Ground Controls Function Test

All functions for ground controls must be tested, including but not limited to controls for emergency operation, for speed(s) smoothness and limits of motion.

Ground controls' function tests include but are not limited to:

- Test emergency stop
- Check that the boom and platform rise and lower smoothly
- Test any overriding of work platform controls
- Check manual lowering device
- Verify the active beacon

Remember:
Ground controls are for emergency response to lower an injured worker.

Figure 3-2 Ground Controls Function Test

4. Platform Function Test

Check all the controls on the platform. On some MEWPs, the platform can be extended, tilted or swivelled. All platform functions should be operated through a full cycle and should smoothly move up, down and in any required direction. If functioning properly, the platform or unit will move in the direction of the control. Each control will automatically return to its neutral position when released. All control levers must be labelled. All switches when tested must be returned to neutral.

Function tests include but are not limited to:

- Platform foot pedal works properly
- Control levers are labelled, not loose or binding, and return to neutral
- Hydraulic and pneumatic systems
- Lights
- Alarms
- Cut out systems and safety systems

Figure 3-3 Platform Function Test

Caution:
Consult the operator's manual when completing a function test.

5. Tilt Alarm/Sensor

Just as many new MEWPs are equipped with a load sensing device that disables the functions of the machine when overloaded, MEWPs are required to have a 'cut-out' function that disables the machine when the MEWP is on a slope greater than what the manufacturer recommends. Tilt tolerances vary among MEWPs, but most typically cut out at a five-degree slope. (Group B MEWPs often have a greater tilt tolerance.)

PATH OF TRAVEL

The terrain of a construction area, including its gradient and localized ground features such as trenches and non-compacted backfill, can change significantly over time, resulting in a change in ground bearing capacity and slope. Even operating the MEWP on a precast or cast in-situ concrete slab may create a hazard if the concrete is not sufficiently cured or undermined and cannot bear the maximum weight of the MEWP.

It's important to check and re-check the MEWP's path of travel at the start of every shift, looking up, down and around for potential hazards. Clearly mark off your work area to ensure it is safe to complete the job. Be vigilant and continuously assess the work area for obstructions, including debris, power lines, building or structure overhang and the potential for other vehicles and pedestrians in the path of travel.

EXERCISES

1. Name three things to be aware of during a visual inspection/walk around of a MEWP.

   1) _____

   _____

   _____

   2) _____

   _____

   _____

   3) _____

   _____

   _____

2. During a MEWP engine inspection, which fluid levels should be checked?

   _____

   _____

   _____

   _____

   _____

   _____

3. What is the first step of a function test?

   _____

   _____

   _____

   _____

   _____

4. Why should you check your path of travel?

   _____

   _____

   _____

   _____

   _____

   _____

CLASS DISCUSSION

1. What policies exist in your workplace to tag out or lock out equipment?

2. Do you know where a MEWP inspection log is at your workplace?

NOTES

CHAPTER 4:

Moving, Operating and Stowing Elevating Work Platforms

OUTCOME

Perform the main duties required to operate a MEWP safely and incident-free. Conduct shut-down procedures and safely stow a MEWP.

OBJECTIVES

Upon completion of this chapter, you should be able to:

1. Complete the necessary sequence of steps to move a MEWP into location.
2. Complete the required order of steps to operate a MEWP at location.
3. Demonstrate the necessary sequence of steps to implement a shutdown procedure.
4. Demonstrate the steps required to secure a MEWP to prevent unauthorized use.

INTRODUCTION

Once you have inspected the site, identified its hazards, determined that the worksite is suitable, and completed your pre-operational checks on the MEWP, it is time to move the MEWP into position and sequence the boom before starting work. Ensure the right MEWP is selected for the height of the work and the tasks outlined in the work plan. Checking these factors prior to starting work can save a lot of time and effort.

As the operator of the MEWP, you have sole responsibility for the machine you operate. It is your responsibility to carry out tasks safely and efficiently. Your employer and other employees are counting on your commitment to safe operations and skills to complete tasks. Establishing good habits early and maintaining a consistent focused approach to safe operations of the MEWP is critical.

ENSURING MAXIMUM STABILITY (CENTRE OF GRAVITY AND TIPPING POINTS)

Remember:
Ensuring maximum stability of the MEWP means that the centre of gravity, tipping points and any forces that may shift the centre of gravity are considered. Factors such as sudden stops, traveling over rough or uneven ground or excessive horizontal load may knock the MEWP off-balance and cause it to tip over on its tipping axis. Max load limits vary by the type of MEWP and the combined weight of workers, tools, and equipment used for the job. Be sure to stay within the operating range for horizontal load and weight capacities specified in the operator's manual or as indicated on the platform's data plate or warning labels.

Caution:
Do not use a boom-supported platform as a crane, as it will impact the machine's stability.

MOVING THE MEWP TO LOCATION

Keep the following factors in mind when moving the MEWP:

» **Check all the gauges**, emergency stop controls, lights and switches to ensure they are functioning correctly. Make sure that all controls are clearly labelled with action and direction.

» **Check the ground controls:** Raise the machine slightly. Then allow it to lower again. This will ensure you know where the ground controls are located and that they work properly. Always check to see that the lowering path is clear of obstructions before attempting to lower the platform.

» **Use three-point contact** and proper climbing techniques when mounting or dismounting from the machine. Always face in towards the machine. Do not use any control surfaces or levers as handholds. Mount and dismount only when the equipment is stopped. Local regulations and policies of the site owner, prime or your employer may require fall protection equipment to be used even when not required by the manufacturer.

» **Always close lift-gates:** Do not sit, stand or climb on the platform guardrails. Do not remove guardrails while the platform is raised.

» **Lower the platform before moving:** When traveling between work areas, retract the boom section(s) of the machine and lower the platform to increase stability. Slight dips and drops are amplified when the platform is raised and can cause the machine to overturn. Only move the machine with the platform raised if all of the following conditions are met:

- The machine is designed to move with platform raised
- The ground surface is even and level
- Workers are protected by using and wearing an adequate means of fall protection

» **Be aware of platform orientation:** Face the direction of travel. Make sure the boom section is in line with the chassis and the platform is behind the drive wheels to ensure the controls function in the correct way.

» **Drive slowly:** Maintain a safe travel speed. Make all of your steering movements smoothly. If the route is narrow or unfamiliar, consider walking the route before moving the MEWP to ensure safe passage.

» **Controls:** Operate all controls (direction, lift, rotation, and throttle) smoothly and at a safe speed. Cold weather and fluids will affect machine performance.

» **Accidental contact:** Make sure the path you are going to travel is clear of pedestrians or obstructions that might hinder a smooth passage. Stay aware of surroundings. Whenever necessary, use a spotter on the ground to guide you when the path of travel isn't clear or access is tight.

» **Avoid obstacles:** Look up and around. Watch for overhead obstacles. Maintain a safe distance from holes, ramps, drop-offs and any other features that could cause the platform to overturn. Do NOT operate a MEWP while distracted, e.g. using a mobile phone.

» **Reversing:** In order to protect the other employees in the area, do not reverse the lift unless each of the following is true:

- Make sure that all warning devices are operating
- The driver has a clear rear view
- The lift has a back-up alarm
- Another employee serves as a spotter

SEQUENCE THE BOOM

Sequencing the boom involves elevation of the platform, telescoping of the boom and slewing of the boom.

All boom-type elevating work platforms are capable of slewing (or angular movement in a horizontal plane) the upper structure independently to the lower structure in varying degrees, e.g. 360˚ continuous and 360˚ non-continuous.

Your supervisor will take you through each of these stages, in accordance with the plan of work that you have previously completed. Keep in mind that most machines will only move in creep mode after a predetermined height has been reached. The speed of lifting, lowering, slewing and telescoping are set by a speed controller on the dash panel.

Remember, moving the platform and/or boom of the MEWP during operation may introduce or create new hazards such as proximity to overhead obstructions, roof beams, cranes or lighter than air atmospheres. Working near overhead wires can result in electrocution.

Monitor the MEWP carefully to ensure that its platform and boom are travelling in the direction intended. A spotter is required whenever there are any potential blind spots along the MEWP's path of travel and anytime work is being performed near power lines.

Caution:
Electricity can arc between live wires and a MEWP without actual contact.

Keep the following things in mind as you sequence the boom.

» **Elevating the platform:** Elevate the MEWP to the full extension required to complete the task, or as informed by the manufacturer's requirements, and provided it is safe to do so. Commence the elevation by shifting the control lever. Do not operate the lift at a high speed, especially if you are in a confined area.

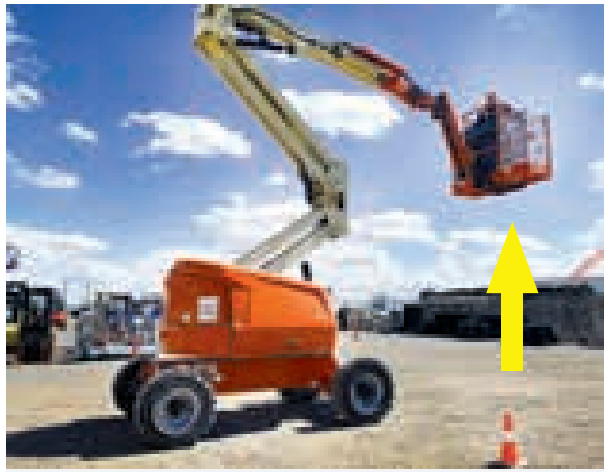


Figure 4-1 Elevating the Platform

» **Telescope the boom** out to the range required for the tasks to be undertaken and back again. Don't try to push or move the MEWP by telescoping the boom.

Figure 4-2 Telescope the Boom

» **Slew the boom** where fitted, to make sure that this function operates smoothly. Slew the boom to the left and right, making sure there are no potential hazards in performing this function. If the boom cannot be slewed, check that the slew-locking pin has been removed.

Figure 4-3 Slew the Boom

When you release a control lever, there will be a momentary delay before the relevant function stops. This is called the 'ramp', and it allows the function to slow down to a stop rather than jerk to a halt. This is most obvious during slewing operations, when jerking the machine to a halt could make it unstable.

EMERGENCY PROCEDURES

If you are working at height and the motor of the machine stops and cannot be restarted, call someone at ground level to lower you down. If this is not possible, you would have determined during your pre-inspection how to lower the machine to the folded position at a controlled speed (see Chapter 3, Perform Pre-Use Inspections).

If there is an emergency of any kind, e.g. loss of stability or machine malfunction, engage the emergency stop to immediately disable the MEWP. Continued use of the controls may cause the MEWP to fail completely or cause it to react in an abrupt or unpredictable manner. Loss of control of the MEWP could result in damage to property, potentially resulting in serious injury or death.

Stay calm, assess the situation and surroundings, assess the risk of the next actions. Once you establish it is safe to lower the machine, have someone on the ground engage the ground controls and lower you using the emergency descent system.

OPERATING THE MEWP AT LOCATION

Upon arrival to the worksite, make sure all relevant site personnel have been consulted and are familiar with your plan of work. If it has been some time since you carried out your site inspection, perform a final 'dry run' of the worksite before you start operating the machine. This will ensure there have been no changes since your first inspection.

Conduct a final assessment of the tasks' requirements: the job to be done, the operating radius of the boom and any workplace hazards that need to be considered, referring to any previously completed Hazard Assessments. Once you have moved into position, you must engage the emergency stop to disable the MEWP to test machine safety functions before you begin work.

Establishing Work Priorities

If your job involves a number of tasks, it is important to establish the order in which they will be undertaken. Often the nature of the work determines the priority of the tasks.

Your work plan should clearly identify the order for completing the required work. For example, you may need to complete tasks at the greatest height first and then complete other tasks at progressively lower elevations. Your supervisor will take you through all tasks and the order for carrying them out, in accordance with the plan of work that you previously completed.

Note:
Some manufacturers may allow transfer at height between equipment and equipment or structure.

Some of the most significant dangers surrounding operation of a MEWP arise from the following common hazards:

» **Failure to maintain exclusion zone(s):** Check for proximity to power lines. MEWPs have been struck by other construction equipment or oncoming traffic when the work area is not properly marked or cordoned off. Place all the required traffic control displays and warning devices to keep traffic clear of swinging booms.

» **Falling from the platform:** The preferred option to prevent falling or ejection from the platform is to use fall protection that is attached to a certified anchor point on the MEWP platform.

Protect yourself against a fall when working at height.

» **Overriding safety features:** Do not disarm safety features such as the tilt or level warning or the foot switch. These features are there to let you know when you are in a dangerous situation. Also, let your supervisor know immediately if the safety features are malfunctioning.

Obtain authorization before overriding or disabling safety controls.

» **Falling/dropped objects:** Make sure all tools and gear required for the job are placed in the tool tray of the platform and will not hinder the opening of the platform gate, which becomes the primary escape route in case of emergency. Do not carry loads on the handrails. Keep the platform floor clear of debris. All equipment should be ideally kept below the height of the toe-board, with smaller tools and parts kept in suitable containers or tool bags. Ensure that the MEWP has toe-boards and safety netting (protective screens) around the perimeter of the interior to prevent work materials and tools from falling or deflecting outside of the platform. Cordon off the area around the base of the platform so that falling tools or objects do not strike people below. An inventory count must be conducted following completion of the work to ensure no equipment is left behind at height.

Keep yourself and others out of the line of fire.

» **Makeshift extensions:** When the machine can't reach the working height desired, don't compensate by using scaffold planks, ladders, blocks of wood or other makeshift arrangements. Doing so can destabilize the MEWP and lead to falls. Ladders are not to be used from within a MEWP.

» **Entrapment:** Loose or torn clothing, fingers and hands can get caught in scissor mechanisms (pinch points). Remain entirely inside the platform during raising, lowering and positioning to avoid pinching between guardrails and the structure. Position the platform so that work takes place above guardrail height.

» **Lighting:** Poor lighting of darkened areas and fading daylight can make it difficult for you to notice obstructions. If this happens, stop work and get sufficient portable lighting over the whole working area.

» **Watch out for changing weather conditions:** Especially wind, storms and lightning. Take extra care in wet, snowy or icy weather. High winds can tilt platforms and make MEWPs unstable. Do not place the boom or platform against or on top of any structure to steady either the platform or the structure. Storms and snowfalls can also exacerbate conditions, such as mud and soft ground, or can damage platforms and labels. Inspect the platform before use after severe weather. Examine ground conditions for mud, soft spots or dangers hidden in standing water/snow.

STOWING THE MEWP

Once work is completed, it is your responsibility to make sure that the MEWP cannot be used by unauthorized persons and that it is left in good working condition. Never leave the MEWP unattended without locking it or otherwise preventing unauthorized use. Always refer to the manual to determine the best procedure for isolating machines and preventing unauthorized use.

Lowering the Platform

Never leave a MEWP in a raised position unless allowed to do so by the manufacturer, prime contractor or site owner. Before you lower the platform, you should look around and under the platform to make sure the area is clear of people, obstructions and any other hazards.

If people are present, sound the horn to get their attention. Indicate to them that the MEWP will be lowering. Lower the boom slowly and carefully.

Secure the Site

The platform should be lowered to its parked position. Once the platform is fully lowered, drive the MEWP to its designated parking area, place it in a safe position and turn everything off. Wherever possible, keep MEWPs in a secure compound or in a designated area and in a way that can be easily accessed when needed. Park on flat level ground. If it has to be parked on a slope, the wheels should be chocked.

Remove your harness and stow in a safe, dry place. Dismount from the machine, remove your tools and equipment from the platform and lock control panel doors.

Report any faults or damage to your supervisor or employer immediately. Make sure they are noted in the log for corrective action and where necessary, tagged out of service.

Note:
Some manufacturers and some sites allow for the machine to be stored at height.

Isolate the Fuel Supply

Turn the machine off and push the kill switch to keep controls from being pushed accidently. Isolate the energy, and, if needed, place the machine on charge. Any stored energy, e.g. hydraulic or pneumatic power, should be dissipated before the work starts. Reference your manufacturer guidelines before dissapating any stored energy.

Recharging electrically powered MEWPs should be carried out in an area that is protected from the elements. Leave the oil and coolant checks until the following day to prevent oil burns or water scalding.

EXERCISES

1. List five factors (there are a total of eleven) to keep in mind when moving a MEWP.

   1) _____

   _____

   _____

   _____

   2) _____

   _____

   _____

   _____

   3) _____

   _____

   _____

   _____

4) _____

5) _____

2. What should you do if you are working at height and the motor of the MEWP stops and cannot be restarted?

3. What should you do prior to lowering the platform of a MEWP?

4. Explain the process for securing the site when stowing a MEWP.

CLASS DISCUSSION

1. What emergency procedures exist at your worksite for operating a MEWP?

2. What are some things to consider when establishing work priorities when operating a MEWP?

NOTES

APPENDICES

APPENDIX A

Sample Only

General Hazard Assessment and Inspection Form:

Location/Project #: **Date/Time:**

Areas to discuss and review for Hazards

Conducted by:	(Name)	(Position)

Here are some common areas that should be reviewed on any work site. This sample is to be used as an aid. All possible hazards must be assessed for each individual project.

Sample concerns include Fall Protection, Ladders, Egress/Access, Housekeeping, Equipment, Guards, PPE, Overhead Obstructions, Material Storage, Weather Condition, WHMIS, Signage, Electrical, Scaffolds, Worker Competence, Material Handling, Musculoskeletal Injuries, Public, Working Alone, Other Trades etc.

Item #	Priority	Identified Hazards	Specific Location of Hazard
1			
2			
3			
4			
5			
6			
7			
8			

Corrective Action:

Item #	Recommended Action:	Name:	Date:

Copies to:	(For Action)	(For Information)
Superintendent Signature:		Date:

Hazard Priority (Status): 1 – Imminent Danger 2 – Serious 3 – Minor 4 – Ok 5 – Not Applicable

APPENDIX B

Mobile Elevating Work Platform Pre-use Inspection Sheet

Date:	**Model:**
Make:	**Hours:**
Inspector:	**S/N:**

Check all applicable items per your model.

Number	Item	OK	N/R	N/A
	Visual Inspection			
1	Operator manual			
2	Structural components			
3	Cleanliness and general signs of damage			
4	Structural components of stabilizers and extending structures			
5	Beams, booms and platform			
6	Tires and wheels			
7	Tracks, rollers, frame, welds, bolts and drive system			
8	Decals, warning signs, instructions, control markings			
9	Cable, wiring harnesses and safety devices in place			
10	Air, hydraulic cylinders, fuel system and hoses			
11	Tank mounting bracket and locking pin			
12	Ladder and steps			
13	Pins and securing devices			
14	Platform, including guardrail, floor, anchorage and mounting			
15	Beacon and warning lights			
16	Yearly structural inspection/certification tag			
17	Fall protection anchors and equipment tie-offs in place			
18	Doors, gates and latches secure			
19	Record hours from indicator display			
	Engine Inspection			
20	Fluid levels (hydraulic, engine, oil, coolant)			
21	Fuel, LP tank,/Fuel Cap/Fuel Lines			
22	Propane hose and connecting nuts			
23	Tank mounting bracket and locking pin			
24	Battery (cables, water level, charge)			
25	Battery charger (proper operation)			
26	Positive shut-off/emergency shut-down procedure			
27	Hour indicator			
	Function Test			
28	Engine runs smoothly and quietly with no leaks or sparks from the exhaust			
29	Horn			
30	Lights (head, tail and warning)			
31	Ground controls			
32	Lift, lower, extend and retract boom			
33	Platform up and down			
34	Control levers labelled, not loose or binding and freely return to neutral			
35	Platform pedal			
36	Steering is smooth and responsive, free of excessive play			
37	Brakes			
38	Back up alarm (if equipped)			
39	Outrigger/stabilizers			
40	Platform controls			

Definitions: OK, checked and found in good order, N/R Needs repair or adjustment, N/A Not applicable

Name:	**Signature:**

APPENDIX C

MEWP Practical Skills Demonstration

Checklist

1. Pre-use Inspection

- ☐ Conduct pre-use walk-around inspection and report deficiencies
- ☐ Locate and review the operator's manual for the specific machine manufacturer's recommended pre-operational tests
- ☐ Find and check the machine-rated capacities
- ☐ Identify functions and purpose of Envelope Management Systems if present
- ☐ Explain how additional height is affected by various ground conditions

2. Pre-operational Check

- ☐ Complete required pre-operational check and report deficiencies
- ☐ Emergency descent ground and platform demonstration by instructor
- ☐ Safety Device inspection including but not limited to tilt sensor alarms, pothole protection systems, etc.

3. Path of Travel Inspection

- ☐ Participate in the path of travel inspection

4. Proper Operational Control

- ☐ Connect fall protection to appropriate anchor points (where applicable)
- ☐ Demonstrate proper operation and function of:
    - o Use of extendable axles (where applicable)
    - o Telescope each boom section in/out
    - o Platform rotation in both directions
    - o Operation of riser or tower
    - o Operation of jib (where applicable)
    - o Platform levelling (where applicable)
    - o Swing
    - o Steer left/right
    - o Drive through a 45-degree S-curve
- ☐ Identification of hazards in the path of travel during operation

LIFE SAVING RULES

CONFINED SPACE

Obtain authorization before entering a confined space

- I confirm energy sources are isolated
- I confirm the atmosphere has been tested and is monitored
- I check and use my breathing apparatus when required
- I confirm there is an attendant standing by
- I confirm a rescue plan is in place
- I obtain authorization to enter

WORKING AT HEIGHT

Protect yourself against a fall when working at height

- I inspect my fall protection equipment before use
- I secure tools and work materials to prevent dropped objects
- I tie off 100% to approved anchor points while outside a protected area

WORK AUTHORIZATION

Work with a valid permit when required

- I have confirmed if a permit is required
- I am authorized to perform the work
- I understand the permit
- I have confirmed that hazards are controlled and it is safe to start
- I stop and reassess if conditions change

ENERGY ISOLATION

Verify isolation and zero energy before work begins

- I have identified all energy sources
- I confirm that hazardous energy sources have been isolated, locked, and tagged
- I have checked there is zero energy and tested for residual or stored energy

LINE OF FIRE

Keep yourself and others out of the line of fire

- I position myself to avoid:
  - Moving objects
  - Vehicles
  - Pressure releases
  - Dropped objects
- I establish and obey barriers and exclusion zones
- I take action to secure loose objects and report potential dropped objects

BYPASSING SAFETY CONTROLS

Obtain authorization before overriding or disabling safety controls

- I understand and use safety-critical equipment and procedures which apply to my task
- I obtain authorization before:
  - Disabling or overriding safety equipment
  - Deviating from procedures
  - Crossing a barrier

DRIVING

Follow safe driving rules

- I always wear a seatbelt
- I do not exceed the speed limit, and reduce my speed for road conditions
- I do not use phones or operate devices while driving
- I am fit, rested and fully alert while driving
- I follow journey management requirements

HOT WORK

Control flammables and ignition sources

- I identify and control ignition sources
- Before starting any hot work:
  - I confirm flammable material has been removed or isolated
  - I obtain authorization
- Before starting hot work in a hazardous area I confirm:
  - A gas test has been completed
  - Gas will be monitored continually

SAFE MECHANICAL LIFTING

Plan lifting operations and control the area

- I confirm that the equipment and load have been inspected and are fit for purpose
- I only operate equipment that I am qualified to use
- I establish and obey barriers and exclusion zones
- I never walk under a suspended load

FIT FOR DUTY

Be in a state to perform work safely

- I will be physically and mentally in a state to perform my assigned duties
- I commit to not being under the influence of alcohol or drugs
- I will inform a supervisor immediately if I or a co-worker may be unfit for work

ENERGY SAFETY CANADA

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