MEWP - Boom

Note: *It is recommended that you read the Supporting Information page before you read this factsheet.*

Preparation for work *(Preparation)*

- Boom-type mobile elevated work platforms, commonly known as MEWPs or cherry pickers, are elevating platforms that allow persons to access areas both at height and reach and, in some cases, below the level of the MEWP chassis. MEWP booms are commonly used in construction as well in areas such as maintenance activities, engineering etc.
- The rotating upper structure and boom can be mounted on a trailer or vehicle chassis, such as a large van or truck, or on its own self-propelled chassis which is driven from the work platform. Self-propelled types are predominately operated by workers such as electricians or steel erectors, who may infrequently operate a variety of models. Incidents regularly occur with MEWP booms and this factsheet aims to highlight some of those areas where good practice has not been followed.
- Thorough pre-use checks must be undertaken that follow the manufacturer's requirements. This information will be found in the operator's manual as well as on warning or information decals around the machine.
- The operator's manual, which contains vital information, must be kept with the machine, which should not be used unless the manual for that machine is available to the operator.
- As there are a variety of manufacturers with a range of model types, the operator (that is, anyone who is going to operate the MEWP) must first have undertaken familiarisation training. This is in addition to basic training on the class of MEWPs. Familiarisation training is specific to the type being operated, which may differ from previous models used.
- One of the key checks that must be undertaken before the machine is used is the function of the emergency lowering system. If the boom cannot be lowered from the platform's controls, perhaps because of an engine, hydraulic or electrical failure, the boom can be lowered from ground level. It is vital that this function is checked according to the manufacturer's recommendations.
- All types of MEWP boom should be fitted with one or more safety or emergency stop buttons, which should also be checked before work starts. The emergency stop button (or buttons) cuts working power, which in turn isolates or cuts off the operating power to all boom functions and, where applicable, travel functions.
- MEWPS are fitted with a variety of safety systems, such as limit switches, which prevent the boom from exceeding safe limits. Although some of these safety systems are adjustable, they can only be adjusted by trained and qualified maintenance staff and not by the operator.
- After carrying out pre-use checks but before travelling the MEWP, it is important that the turntable lock or brake (where fitted) is applied so that the upper structure, mounted on a turntable, can be locked in the travel position. Failure to do so can cause the upper structure to rotate causing the boom to go out of line.

Stability

- MEWP booms work on the counterbalanced principle in that the weight of the chassis and upper structure overcomes the weight exerted by the boom and the platform plus any contents up to full extension. On many self-propelled types, the upper structure has a counterweight on the opposite side of the platform and is sufficiently weighted to prevent instability in normal and specified operating conditions.
- On vehicle-mounted types, the vehicle's chassis provides the effective counterweight and stabilisers are further added to the chassis to aid stability.
- However, counterweights and stabilisers can only maintain stability in certain parameters and do not prevent MEWPs from overturning and exceeding safe parameters, such as overloading the platform, increases the risk of instability and overturning.

- The MEWP can be unstable in a number of directions, for example, as a forward or rear tip in line with the boom, or as an overturn which is sideways to the boom. MEWP booms are designed to be stable only on firm and level ground and, in most cases, the boom prevented from being raised if the chassis is not level.
- However, travelling on uneven ground with a raised boom means that an un-level chassis can cause a tip or overturn and the higher the platform, the greater the instability on uneven ground.
- Where a MEWP boom has been travelled on uneven ground and between two buildings with the boom raised, the platform has been known to strike one of the structures.
- Where a MEWP boom is working on soil-type ground, conditions such as heavy rain can turn what was firm ground into soft ground. Checks must be made before work starts after heavy rain to ensure that the ground can safely support the MEWP at all operating heights and reaches.
- Where a MEWP boom needs to work near to the edge of a slope or trench, guidance indicates that, in principle, to prevent the slope or trench collapsing, at least twice the depth of the slope should be maintained from the edge of the slope. The minimum distance that needs to be kept should be properly and effectively planned before work starts.

Working safely and with others *(Working safely)*

- The majority of MEWPs used in construction or allied sectors are the self-propelled type in which the driving and steering is controlled from the platform. In many cases, the chassis can be travelled and manoeuvred whilst the platform is at height so the operator needs to be aware of the direction of travel because, for example, when the rear of the chassis is leading the travel controls can be reversed. This is particularly important if the platform is at height as the operator often needs to look down from the platform to check the path of the machine.
- Incidents have shown that operators have leant over the control panel, particularly where the controls on the control panel are exposed, and in doing so inadvertently activated other controls. Before the machine is moved, the turntable or upper structure should be positioned and, where relevant, locked in the correct travel position.
- As previously described, MEWP booms become less stable as the platform reach increases. Therefore, there is a restriction on the weight that can be taken by the working platform and this should be clearly marked within or on the platform. The weight limit includes people, tools and any other equipment such as components that need replacing.
- When calculating the load to be carried in the platform, if a component at height is to be removed and lowered, such as a lighting lamp, the weight must be taken into account before the platform is raised, to avoid overloading at height.
- Although components that need fitting or replacing can be carried within the platform, MEWPs are not lifting machines and loads that need to be suspended externally should not be lifted.
- Care must also be taken when working at height so that tools being used should not be placed on or near to the operating controls as tools, placed on the control panel, have been known to prevent controls operating when needed.
- As MEWP booms can reach height of 40 metres or more, they are exposed to weather conditions that may not be apparent at ground level, such as high wind speeds and changes to wind direction. The operator must know the maximum wind speed that the MEWP can be operated in and shut down operations when the wind speed exceeds the manufacturer's criteria.
- The operator must also take into account gusts of wind or wind funnelling caused, for example, by the MEWP being between two buildings.
- Before the MEWP is used, all hazards that may be encountered must be identified and control measures applied. For example, minimum distances must be kept between the MEWP and overhead power lines. Guidance from the Health and Safety Executive indicates that a distance of at least 9 metres, plus the maximum height of the platform, must be kept from power lines mounted on wooden poles, whilst a distance of 15 metres plus the maximum height of the platform must be kept from power lines mounted on metal pylons.

- Where MEWP booms are being used near or next to areas involving vehicle movements, the first course of action is to segregate the MEWPS working area from any moving vehicles and be of sufficient size to include the radius of the boom.
- No part of the boom or platform must extend into the path of a moving vehicle, particularly when working on or alongside the public highway. Collisions between moving vehicles and the boom of a MEWP have occurred with serious consequences.
- MEWPs are designed to allow people to access a structure or machine at height or reach. They are not designed to allow people to leave the platform at height and this should not be attempted except in emergency situations.
- Likewise, they should not be used to pick up people at height unless again there is an emergency, for which procedures should be properly planned. As MEWPs are used to access intricate areas within a structure, if ground-based controls are used to lower the platform to ground level in an emergency, all obstructions need to be taken into account before the platform is lowered.

Working at height and in restricted areas *(Working at height)*

- Before any type of MEWP is specified during the planning of the work, the first consideration should be whether the work can be carried out at ground level, so that work at height is not necessary.
- If any work is to be undertaken at height, a procedure needs to be put into place so that the operator of the MEWP can summon assistance in an emergency, particularly if they are working in a segregated area away from other work.
- Furthermore, the operating key needs to be located in the ground level control panel, so that the ground controls can be operated in an emergency.
- In the majority of cases of where people in the platform are working at height, the use of fall arrest or fall restraint equipment will be required by all those in the platform and a suitable type should be established during the work planning stage.
- The MEWP manufacturer's data must be checked first to determine whether fall arrest equipment can be used with that particular type of machine. When the fall arrest equipment is specified, the operating height of the platform needs to be taken into account, as fall arrest equipment only works effectively above a certain height.
- For MEWP boom operations, a short-restraint type of fall arrest harness is usually specified, which minimises the shock loading to the machine from the momentum of a fall. A retrieval procedure must also be planned before work starts, determining the recovery time needed if there is a fall from the platform.
- Fall arrest equipment must only be secured to the approved securing points in the platform, and not on any other part of the platform or machine as the momentum of a fall could cause component failure. Fall arrest equipment must not be secured to a structure external to the platform.
- The trapping of operators between the platform and parts of a structure has occurred causing both injury and death. In some cases, the operator has become trapped and crushed between the control panel and the structure, causing other controls to be inadvertently operated and the operator or other passengers have been unable to return the control to the neutral position.
- Amongst the various requirements for minimising these incidents is that the path which the platform needs to take is established before work starts so that sufficient clearance between a structure and the platform is maintained.
- Good lighting up to and within the working area can further reduce trapping incidents. If the platform needs to work in a restricted or tight area, machines equipped with a shielded control panel should be specified at the planning stage.
- The sequence of positioning a platform at height, particularly in a restricted area is important to maintain sufficient stability. In this order, the platform must be firstly elevated, then slewed into position, and finally telescoping the boom out to the accessing point using fine control.

Sample questions

The following questions are based on the text within this factsheet and indicate how the questions and answers are structured. Based on the factsheet, there is only one correct answer. The correct answer to each question is indicated at the end of this factsheet.

Q1. If working at height on a construction site, which is stopped because of heavy rain, what should be checked before starting work again?

That visibility is clear at height

That all steering controls function correctly

That the ground where the machine is located is still firm

That the key platform is clear of rainwater

Q2. It is becoming common for operators and/or personnel to be trapped between a structure and the platform. What action can reduce the risk?

Establishing the amount of chassis manoeuvring that is required

Limit the working height of the platform before work starts

Establishing the path that the platform needs to take before works starts

Specifying a smaller size of MEWP

Study checklist

This checklist aims to act as a study aid to ensure that the reader has identified and understood the relevant parts of this factsheet.

Do you know?

1. Where the information for carrying out pre-use checks in found.
2. Why familiarisation training is different to basic training.
3. The reasons why the emergency lowering system must be checked before use.
4. What happens to the MEWP when the emergency stop button is depressed or activated.
5. What can cause a MEWP to overturn or become unstable.
6. What the purpose is of the counterweight of the MEWP.
7. What distance must the MEWP be kept from the edge of a slope or trench.
8. Why the travel route of the MEWP must be checked before travelling.
9. What factors determine the weight limit of the machines platform and the effects of an overloaded platform.
10. Why tools and equipment must be kept clear of the operating controls.
11. The effect that wind can have on the machine.
12. What the dangers are of using a MEWP in close proximity to other moving plant and vehicles.
13. When people are allowed to enter and exit the platform at height.
14. Why a minimum distance must be kept from overhead power lines.
15. What emergency procedures should be in place when working at height.
16. What the procedures are if the use of fall arrest or harnesses is required.
17. What the causes and effects are of a MEWP operator being trapped between a structure and the control panel.
18. Why good lighting is important when operating the platform at height.

Answers to sample questions: Q1: C and Q2: C