

# Working at Heights • Fall Protection



## Introduction

Working at heights is a frequent cause of accidents associated with construction work. Accidental falls from heights are severe and can cause permanent damage, injury, or death. With protective measures, all accidents from falling can be prevented. This booklet briefly summarizes the primary protective measures to avoid accidents from falling from a working height. More detailed information can be found in English on the website of the Occupational Safety and Health Administration (EU-OSHA) or Icelandic Vinnueftirlitsins: [vinnueftirlit.is](http://vinnueftirlit.is)

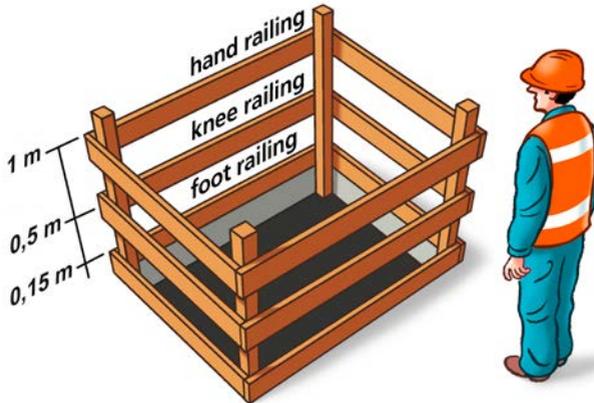
If working at height is inevitable, it is immediately required to design, organize, and prepare the project by deciding on which fall protection plan should be used. There is not just one type of fall protection plan and changes made to the working area and the period of the project will also matter. It is imperative that all employees who work at heights receive specific teaching and training.

### **Before working at height begin with a risk assessment:**

- Is it possible to work in a sensible manner from the ground?
  - Is it possible that pre-work is done on the ground and planned in a way to reduce the time that are worked at height?
  - Is it possible to use a general prevention plan that works for everybody at the construction site, e.g. scaffolds or railings?
  - Is it possible to use equipments or machines that are specifically designed to lift people, e.g. scissor lifts and basket cranes?
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- For smaller projects that take shorter time, is it possible to use lifters or cranes with a man basket?
  - For smaller tasks that take even less time, is it possible to use extension or step ladders?
  - If it is not possible to use any of these other methods safely. Will there be need of a body harness and lifeline?
  - Never should there be only one person working alone at height.

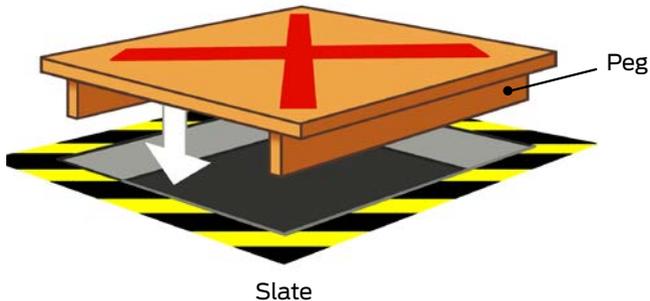
## Guardrails and floor covers

Guard rails are a good thing for fall prevention. It is useful to everyone at the work site. The railings should be sufficiently strong and firm enough to prevent the fall of people and tools. As a rule, the guard rails must have a top handrail of at least one meter from the floor and a knee rail at 0,5 meters from the floor. If there is a risk of items falling there must also be a 0,15-meter high foot rail.



In some cases it may be necessary that the top handrail is higher and stronger than usual. For example, the handrail on a work platform encounters a sloping roof. If the railing is higher it may need another handrail added. In some instances, it may also be necessary that the railings are covered in netting to prevent small items and materials from falling.

All holes in the floor; which poses a risk of people falling, should be barricaded by railings, and covered by a clearly marked floor cover slate. If the hole is covered by a slate it must be pegged down securely or fastened to hold it firmly in place.



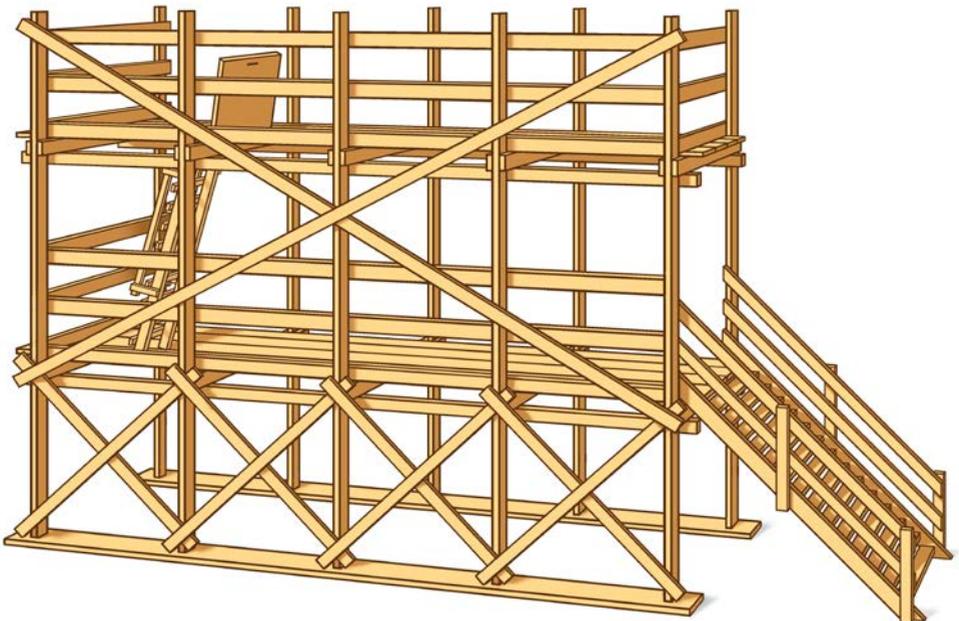
## Pipe Scaffolds and Wood Scaffolds

A well-installed scaffold is a basis for proper fall prevention. Scaffolds are appropriate when a project requires extensive work. Pipe scaffolds are the most common, but wood scaffolds are also widely used. Only those who have received education and training may assemble a pipe or wood scaffold, dismantle, or make any changes to them.

The manufacturer, sales representative, or rental agent of a pipe scaffold must include with the structure all the necessary installation, maintenance and other information regarding the proper use and instructions in Icelandic. It is essential that the scaffold foundation is solid. If the base is not totally firm, then the weight must be leveled, e.g., with base plates that prevent sinking into porous soil. Pipe scaffolds can also be used on wheels.



- There should be rails on all scaffolds regardless of their height. They must be sufficiently strong and firmly in place to prevent people and tools from falling off the platforms.
- The rails should be on the sides facing away from the building and opposite the interior.
- The distance between the wall and the inner edge of the scaffold must be as little as possible. If the range is more than 0,3 meters, there must be rails on the inside.
- Ensure a safe and secure way to the first platform.
- Steps between platform floors inside the scaffold must have hatched openings, but not on the outside of the framework.
- Closing the end of the scaffold is critical.
- It is prohibited to move a scaffold while men are on it.
- Portable scaffolds should be fastened down so that they cannot move on their own.
- When a scaffold is not ready for use, e.g., during set-up, dismantling, or other changes are being made. It must be marked with general warning signs.



# Lifting personnel Using Heavy Equipment

All lift equipment intended for lifting personnel must be labelled with a CE certificate. (Man baskets that are attached to forklifts or suspended from crane hooks are not labelled with a CE rating and should only be used for simple tasks for short periods of time.) All man baskets and heavy equipment intended for lifting personnel must be registered and inspected by the Administration of Occupational Safety and Health. The Administration of Occupational Safety and Health inspects heavy equipment and man baskets to ensure their safety. The owner of the equipment is responsible for ensuring that it undergoes an annual inspection. Owners must follow manufacturer's instructions regarding routine maintenance. All equipment intended for elevating personnel must always be in perfect working order and have a valid inspection certificate from the Administration of Occupational Safety and Health.



Registration Plaque for Heavy Equipment

## All heavy equipment and man baskets must be labelled with Icelandic instructions on their safe usage



Man baskets and work platforms must be clearly labelled with their maximum weight capacity and the number of personnel they can contain at one time. All heavy equipment must be labelled with information regarding its lifting capacity and reach. All heavy equipment specifically intended for lifting personnel must have an emergency lowering mechanism which is operable in case of machine malfunctions. (Forklifts do not have such emergency lowering mechanisms, which is why a strategy must be in place for how to help workers descend from the man basket in case of malfunctions.)

The Administration of Occupational Safety and Health recommends the use of harnesses and safety lines when using man baskets or lifting equipment. If a worker needs to exit the basket, a safety line must be attached to the equipment or the relevant structure before leaving the basket. All tasks must be undertaken while standing on the basket's floor. Never stand on the basket's railing in order to reach higher.

It's important that the ground beneath the lifting equipment or machinery is level, horizontal and sufficiently stable. If the ground is uneven, a specific machine must be used that is intended for such conditions.

# Registration plaque for heavy equipment

When using heavy equipment outdoors to elevate personnel, always take weather and conditions into account. Lifting equipment may not be used if wind levels exceed those specified by the manufacturer. Personnel should not be elevated using heavy equipment during thunder storms, in icy weather, snow, sleet or other weather conditions that can affect the safety of the equipment.

A Heavy Equipment Operator License is required for operating most types of heavy equipment and machinery. Heavy equipment operators must ascertain whether they have the right qualifications. You must be at least 17 years old and possess a driver's license to apply for a heavy equipment operator license. Aside from crane operator licenses, all licenses are valid up until the age of seventy.

Category **A**, **B**, **D** and **P** crane operator licenses must be renewed every 10 years. To renew your crane operator license, you must submit a medical certificate similar to that which is required for a commercial driver's license. After the age of seventy, a medical certificate must be submitted every three years to renew your heavy equipment operator license.

Front

HEAVY EQUIPMENT OPERATOR LICENSE		NO: 090827
1. Full Name <b>Magnús Jónsson</b>		
2. Personal ID Number <b>010165-0009</b>		
3. Issued in <b>Reykjavík – 6.6.2015</b>		
4. Initial date of issue <b>6.6.1995</b>	5. Valid until <b>See back</b>	
6. Driver's license no. <b>99000123</b>	7. Issued in <b>ICELAND</b>	
Comments Dates on back signify expiration dates and indicate registered qualifications. Capital letters refer to first letter in the registration number of the relevant heavy equipment. Thus, an A certificate is valid for operating heavy equipment with the registration number AB-XXXX, J for operating equipment with a JL-XXXX registration number, etc.		
The holder of the heavy equipment operator license must always have the license at hand when operating heavy equipment and be ready to present it along with identification if asked to do so.		

Back

ADMINISTRATION OF OCCUPATIONAL SAFETY AND HEALTH		Teaching qualification
This license validates your qualifications for operating the types of heavy equipment marked below.		
A Fixed crane / tower crane		
B Mobile crane > 18 tm		
C Bridge crane		
D Crane ≤ 18 tm	6.6.2025	6.6.2025
E Excavator > 4000 kg		
F Wheel dozer		
G Bulldozer		
H Road grader		
I Tractor and tilling equipment	6.6.2035	
J Forklift ≤ 10 t capacity	6.6.2035	6.6.2035
K Lyftarar > 10 t lyftigetá		
L Roller	*	
M Paver	*	
P Loading cranes ≤ 18 tm	6.6.2025	

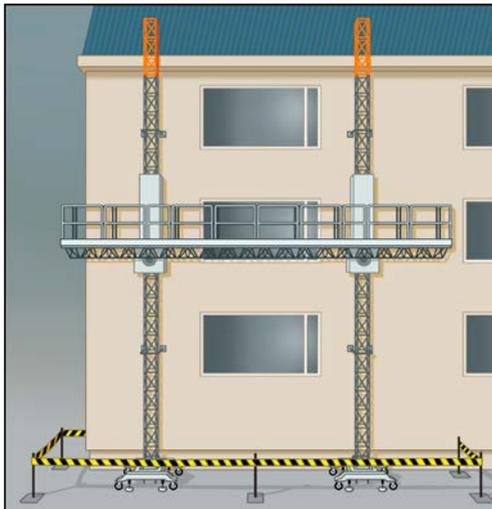
Before operating any heavy equipment for the first time, heavy equipment operators are required to sufficiently familiarize themselves with the equipment's instruction manual. Heavy equipment operators must perform a daily inspection of their equipment before beginning work.

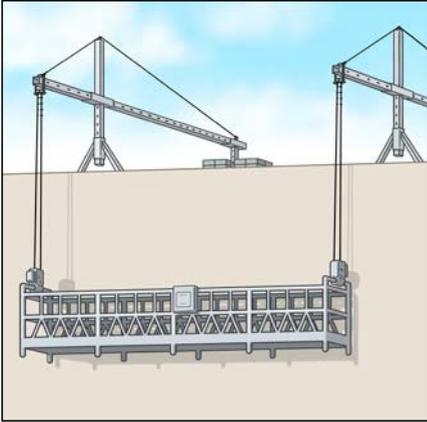
## Platform Lifts: Mast Platforms *Capacity > 150 kg.*

A Mast Platform is a work platform that climbs a vertical mast that is attached to a structure. More than one mast may be used by fastening platforms together. If two or more platforms are attached to one another, their control systems must be interconnected so that the raising of the platforms is synchronized. Mast platforms fall under registration category VL and must be registered and inspected by the Administration of Occupational Safety and Health.

You need to have undergone special training to install a mast platform. The installment must comply with the manufacturer's instructions. A mast platform may not be put into action until the Association of Occupational Safety and Health has verified that it has been correctly installed.

- All mast platforms must be clearly labelled with their total capacity.
- Operating panels and emergency lowering mechanisms must be clearly labelled.
- Mast Platforms must be used in accordance with manufacturer's instructions.
- It should not be possible to move the platform unless all its exit gates are locked.
- It should only be possible to operate a mast platform while onboard the platform.
- The platform should make an audible alarm sound when it is being lowered.





## Suspended Platform

A Suspended Platform is a work platform that is suspended by cables from gallows attached to the structure. It can also be attached to a track, in which case it can be moved from side to side. Suspended platforms fall under registration category **VP** and must be registered and inspected by the Administration of Occupational Safety and Health. You need to have undergone special training to install a suspended platform. The installment must comply with the manufacturer's instructions. A suspended platform may not be put into action until the Association of Occupational Safety and Health has verified that it has been correctly installed.

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- All suspended platforms must be clearly labelled with their total capacity.
- Operating panels and emergency lowering mechanisms must be clearly labelled.
- Suspended Platforms must be used in accordance with manufacturer's instructions.
- It should only be possible to operate a suspended platform while onboard the platform.

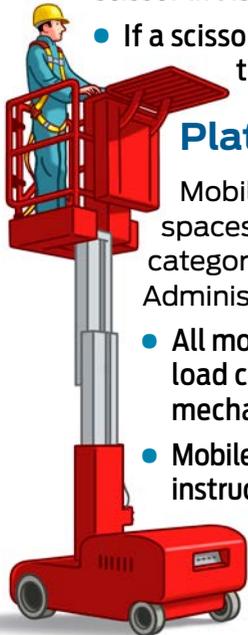
## Platform Lifts: Scissor Lift *Capacity > 150 Kg.*

A scissor lift is a mobile lift platform that may be designed for indoor or outdoor use or be applicable to both. It may be designed to be used on either level ground or uneven terrain—with or without stabilizers. Most outdoor scissor lifts have stabilizers to increase their stability and to level them on uneven terrain. Scissor lifts fall under registration category **VL** and must be registered and inspected by the Administration of Occupational Safety and Health.

- All scissor lift platforms must be clearly labelled with their total capacity and intended number of occupants, as well as maximum wind levels.



- Operating panels and emergency lowering mechanisms must also be clearly labelled.
- Scissor lifts must be used in accordance with manufacturer's instructions.
- Always ensure the stability of the ground below the scissor lift and use stabilizers and outrigger pads to distribute the lift's weight on uneven terrain.
- If there is a risk of people or vehicles entering the site where the scissor lift is being used, the site must be cordoned off.
- If a scissor lift is being used on a road, specific precautions must be taken to guard against collisions.



### Platform Lifts: Order Picker *Capacity $\leq 150$ kg.*

Mobile mast lift intended for level ground. Suitable for tight spaces; e.g. in shops. Order pickers fall under registration category **VB** and must be registered and inspected by the Administration of Occupational Safety and Health.

- All mobile mast lifts must be clearly labelled with their total load capacity. Operating panels and emergency lowering mechanisms must be clearly labelled.
- Mobile mast lifts must be used in accordance with manufacturer's instructions.
- It should not be possible to operate the lifting mechanism unless the platform's gate is locked.

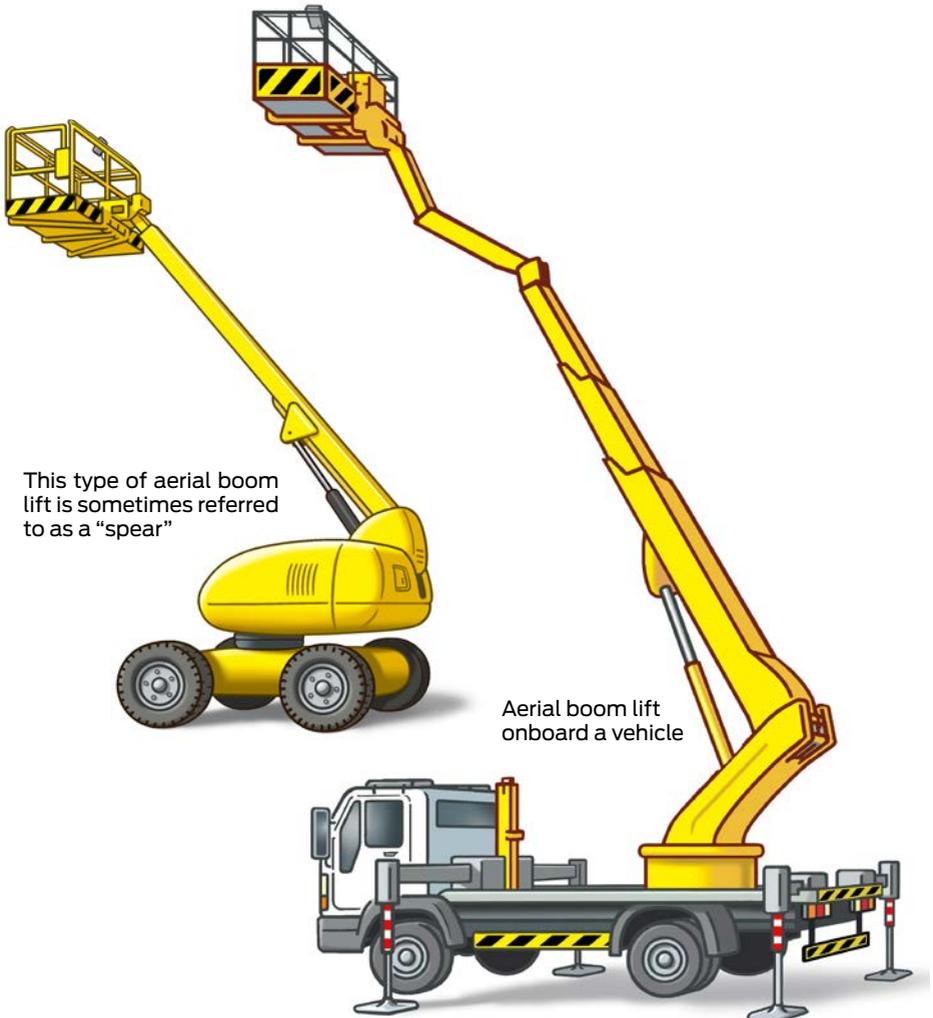
### Aerial Boom Lift *Capacity $>150$ kg.*

"Aerial boom lifts" refers to all aerial work platforms with a basket that is suspended from a boom. Such lifts may be attached to a vehicle or trailer or they can be capable of being moved from place to place by their own volition. The basket can extend beyond the ground area that the lift occupies.

Most aerial boom lifts have stabilizers. Aerial boom lifts fall under registration category **DK** and must be registered and inspected by the Administration of Occupational Safety and Health.

- The lift's basket must be clearly labelled with its total load capacity and intended number of occupants at any one time.

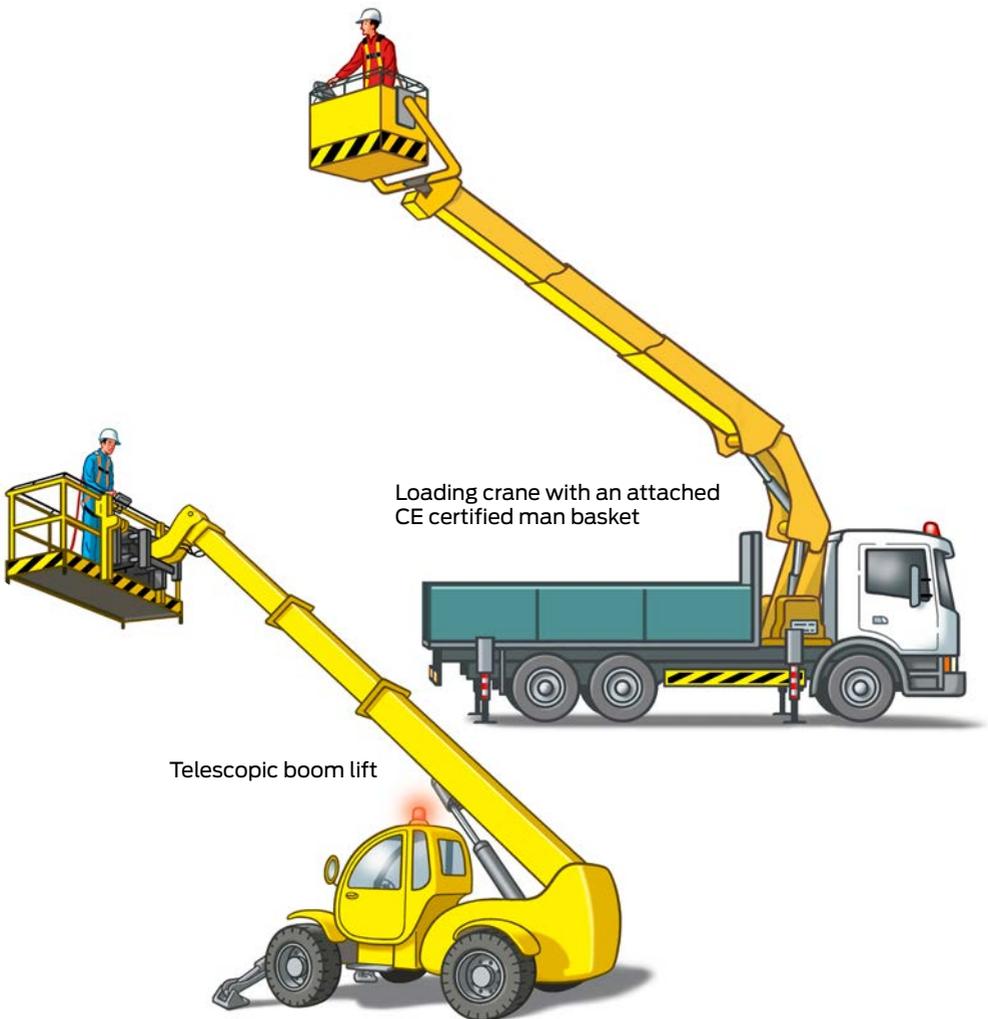
- Aerial boom lifts must be levelled and used in accordance with manufacturer's instructions.
- Operating panels and emergency lowering mechanisms must be clearly labelled.
- When working on uneven terrain, always use stabilizers and outrigger pads to distribute the lift's weight.
- If there is a risk of people or vehicles entering the site where the aerial boom lift is being used, the site must be cordoned off.
- If an aerial boom lift is being used on a road, specific precautions must be taken to guard against collisions.



# Lifting personnel using a telescopic boom lift or loading crane with attached, CE certified man basket

Overall, telescopic boom lifts and loading cranes are not suitable for lifting personnel, but some such machines are specifically designed in such a way that a **CE** certified man basket may be attached to them.

In such cases, the **CE** certified man basket's controls override the telescopic boom lift or loading crane's operating panel, so that the device can only be operated from within the basket. These devices belong to registration categories **JF**, **KL**, **BH** and **PH**.



**CE** certified man baskets fall under registration category **VH** and must be registered and inspected by the Administration of Occupational Safety and Health. The basket's operator must have a heavy equipment operator license in the relevant registration category.

- The lift or crane used to lift the basket must be levelled and used in accordance with manufacturer's instructions.
- When working on uneven terrain, always use stabilizers and outrigger pads to distribute the lift or crane's weight.
- Operating panels and emergency lowering mechanisms must be clearly labelled.
- If there is a risk of people or vehicles entering the site where the lift or crane is being used, the site must be cordoned off.
- If the lift or crane is being used on a road, specific precautions must be taken to guard against collisions.
- It is strictly forbidden to attach a man basket to a telescopic boom lift's forks.

## Lifting personnel using a forklift

This passage covers how to elevate personnel using a category **JL** and **KG** forklift.

Overall, forklifts are not suitable for lifting personnel, but exceptions can be made for short periods of time as long as a specialized man basket is being used. These baskets fall under registration category **VH** and must be registered and inspected by the Administration of Occupational Safety and Health.

The total weight of a forklift's man basket must never exceed 500 kg. The basket can only contain a maximum of 2 people at one time, and its reach must not extend beyond 5 meters. The forklift's lifting capacity chart must be consulted to ensure that its lifting capacity is always at least 4 times beyond that of the basket's total weight in a fully extended reach. The basket must have guard railings at feet, knee and hand level. The side of the basket facing the forklift's lifting mechanism must be at least 1,9 m in height and be covered with a wire mesh.



- The forklift's operator must have a category **J** or **K** heavy equipment operator license.
- The basket's total weight when empty must be clearly labelled, along with its total load capacity and the total weight and number of occupants allowed onboard at any one time.

Manufacturer: Litfir lyftarar ehf
Manufacture no: 1412 Model: 2015
Maximum load: 150 kg.
Basket weight: 200 kg.
Total weight capacity: 350 kg.
Maximum occupancy: 1 man

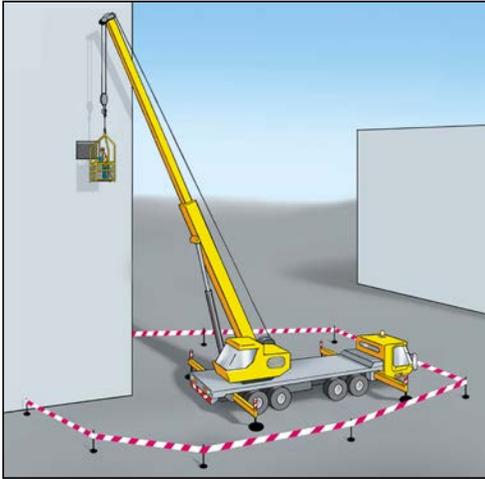
- The forklift's forks must be inserted into the slots beneath the basket.
- The basket should be attached to the forks using two independent fastenings.
- The basket may not be attached to a forklift whose lifting mechanism has a pivoting feature.
- Once a basket containing personnel has been elevated above 1 meter, the forklift's operator is not allowed to leave the forklift.
- Once a basket containing personnel has been elevated above 1 meter, it is forbidden to drive the forklift.
- If there is a risk of people or vehicles entering the site where the forklift is being used, the site must be cordoned off.
- If a forklift with an attached man basket is being used on a road, specific precautions must be taken to guard against collisions.
- **It is strictly forbidden to attach man baskets intended for forklifts to a telescopic boom lift.**

## Lifting personnel using a crane

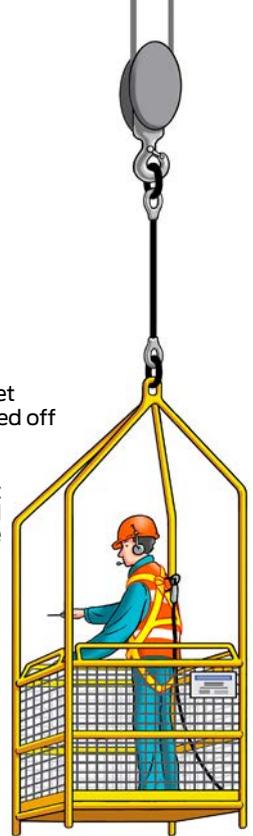
This passage covers how to elevate personnel using a crane by attaching a man basket to the crane's hook.

Cranes are not specifically intended for lifting personnel but a man basket may be suspended from a crane's hook for work on minor tasks for short periods of time. Such man baskets fall under registration category **VH** and must be registered and inspected by the Administration of Occupational Safety and Health.

The suspension mechanism that is attached to a crane's hook should be firmly bolted to the basket and be considered a part of it. The use of any other type of suspension mechanism is forbidden. The total weight of a crane's man basket must never exceed 1000 kg.



Crane with man basket that has been cordoned off



A man basket suspended from a crane

The crane's lifting capacity chart must be consulted to ensure that its total lifting capacity at its furthest reach is always at least 2 times that of the total weight of the basket. Baskets may not be attached to cranes that have a free release function.

- The crane operator must have a category **A, B, D or P** heavy equipment operator license.
- The basket's total weight when empty must be clearly labelled, along with its total load capacity and the total weight and number of occupants allowed onboard at any one time.
- The ground beneath the crane must be level, horizontal and sufficiently stable. Stabilizers must be used.
- The crane operator must at all times have a clear visual of the personnel manning the man basket and also be able to communicate with them audibly.
- It is forbidden to elevate personnel in a man basket suspended from a crane if wind levels are above 7 meters per second,.
- It is forbidden to drive the crane while there are personnel onboard the man basket.
- The crane must have an emergency lowering feature.
- If there is a risk of people or vehicles entering the site where the crane is being operated, the site must be cordoned off.
- If a crane with a man basket is being used on a road, specific precautions must be taken to guard against collisions.

## Ladders and Step ladders

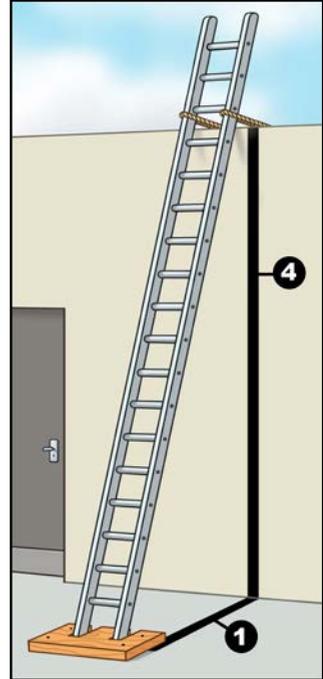
Extension ladders and step ladders are fall protection equipment. It is only authorized to use ladders for temporary work details when there is no requirement to use additional safety devices because of the lower risk of falling.

**Always choose either extension ladders or step ladders in accordance with the task that needs to be done.**

The set up of extension ladders must be done in a way that there is no danger of tipping or sliding.

All ladders must be used in a way that employees are stable and have secure hand grips. It is particularly important for an employee to have secure hand grips on a ladder if they also must hold something.

- Extension ladders and step ladders must be designed for industrial use according to the standard EN 131 (or equivalent).
- Ladder strength must be based on at least 150 kg of load-bearing capacity.
- Ladders must be stabilized and balanced so that they cannot slide to one side or collapse during use.
- It is essential to make sure that the ladder angle is approx. 75°.
- Ladders must reach at least 1 meter over the parapet if used as an access route.
- Projects that require a lot of physical movement may not be done on ladders.



# Body Belts and Lifelines

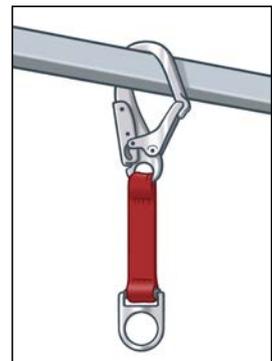
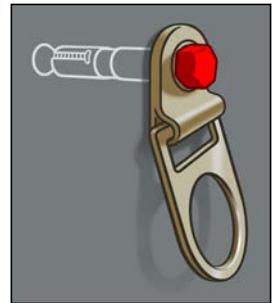
If it is not possible to ensure the safety of employees that work at heights with general fall protection, e.g., guardrails, scaffolds, or basket cranes. It is required to use body belts/harnesses and lifelines. Body belts and lifelines can be very problematic equipment that nobody should use unless they have received instruction and training.

There are various types of belts and lines. Here we will discuss full body belts/harnesses and shock absorbent lanyards/lifelines and full body belts/harnesses and restraining lines.

## Anchor Points

It is important to choose a solid anchor point to attach a line. Anchor points can be of two types:

1. Anchor points that are manufactured to connect to construction work sites and that meet EN standards.
2. Anchor points that are found at construction sites e.g. steel beams or other structures. Anchor points must be very durable and withstand at least 10 kN or 1000 kg. A good rule of thumb is: "Do not use an anchor point unless you can trust it to hold up a jeep."



## Coupling Equipment/Carabiners

It is important to connect the lanyard/lifeline and the anchor point securely. It is also, for example, possible to bind with special cords and steel loops. Coupling equipment must comply with EN Standards.

## Harness and Fall Restraint System

A fall restraint system should prevent a person from falling, e.g., on a flat roof or over unprotected slabs. A harness/ body belt attached to a restraining line that does not stretch should prevent a person from coming too close to the edge by, e.g., 0,5 meters.

The system is not at all a fall arrest system. The length of the restraining line may be at the most 4 meters.

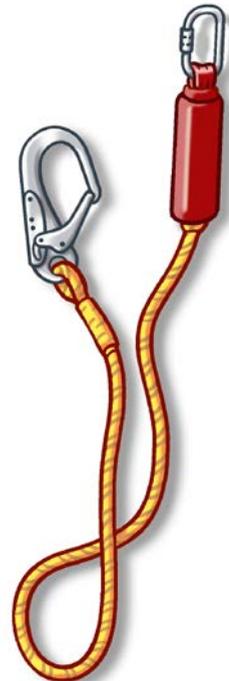
## Harness and Fall Arrest System

Does not prevent a fall but grips/arrests a person who is falling so they are not injured.

- Full body harness must be in accordance with EN 361.
- The shock absorbent lines must be in accordance with EN 355.
- Instructions on the use, care, and inspection of harnesses, lanyards and lines be readily available.
- The full body harness must be a one size fits all, it may never be too big.
- The lanyard/line must be clean, free of knots and imperfections. It is important to prevent the lanyard/line from touching any sharp edges.
- Fall arrest system lanyards/lines are identified by a special color, they may never be confused with other lines and ropes.
- Visually inspect all fall arrest system equipment before each use. If there are any doubts, the equipment must be discarded.
- Never should anybody be alone in harness and line work.



Harness and Fall Restraint Lifeline



Shock Absorbent Lanyard/Line

- Never make changes to the fall protection equipment than what is specified in the instructions.
- Fall protection equipment should be inspected regularly by authorized persons following the manufacturer's instructions.
- Equipment that had been attempted to use or had been claimed as damaged may not be used and must be discarded.
- Follow the manufacturer's instructions for cleaning, inspection, maintenance, and durability of fall protection equipment.
- Fall protection equipment must be stored at room temperature in a clean and dry place away from sunlight.



Harness and Fall Arrest Shock Absorbent Lanyard/Lifeline

## Emergency Plan

Working with safety belt and lines is unauthorized unless there is a rescue plan in place. This plan must explain exactly how to react if a person has fallen and is hanging by the safetybelt and line. The rescue time must be immediate. It is important that the emergency plan is simple and clear.

# Working at Heights • Fall Protection

## Questions to Keep in Mind

1. Is it possible to move the work detail down?
2. Are the bases of the platforms, devices, or ladder steps
3. Is the scaffold correctly installed?
4. Are there handrails, knee rails and foot rails on the scaffold?
5. Does the person assembling the scaffold have the knowledge and experience to do it?
6. Does the person who is controlling the basket crane/boom lift have a machine operator license registered in category D?
7. Is the man basket registered and has it received a valid inspection from Vinnueftirlit?
8. Is the ladder labeled EN 131 and assembled to handle at least 150kg?
9. Is the ladder attached securely and can reach 1 meter over the edge?
10. Are approved EN labeled Fall protection equipment being used?
11. Have the workers that are using a harness and a lifeline completed instruction and training to use such equipment?
12. Have all personnel who employ a harness and safety line received instructions and training in such equipment?



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