Aerial Lift Safety
Facilitator’s Guide
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Overview

When a work task must be performed in an area which is out of reach, an aerial lift can be a useful tool. If not used correctly, however, aerial lifts can be dangerous. The risks associated with aerial lifts can be greatly reduced if an employee is properly trained in how to use the equipment. The manufacturer’s instructions provide specific information on how to operate the lift, and each person who uses the equipment must be thoroughly familiar with the contents of this written guide. By knowing how to perform an inspection on the lift to determine any potential defects and following proper safe work procedures, an employee can greatly reduce the risk of injury when using an aerial lift. This will not only help to keep the employee safe, but also fellow co-workers within the area.
Getting Started

Training Materials

Collect all of the necessary materials and supplies before training begins. Here are some suggested materials and supplies:

• A training location that is free of distractions, has good lighting, and a comfortable temperature.

• Desks and chairs arranged so that everyone will be able to see the viewing screen, the facilitator, and each other.

• The video, a VCR, and a TV with a remote. Make sure the video is rewound.

• An employee handbook and pen/pencil for each trainee. Each handbook includes a quiz at the back, which can be used to test comprehension and document training.

• Other supplies and equipment you may need - blackboard chalk, paper, handouts, transparencies, overhead projector, markers, notepads, etc.

• Additional information, such as a copy of the regulation or other reference tools.
Preparation

A successful presentation requires preparation and planning. Give yourself several days before the training session to get organized.

• Locate and schedule the training site as soon as possible.

• Notify trainees of the training date and time, the training schedule, and proper dress.

• Obtain all necessary equipment and supplies.

• Make sure you know how to operate the TV, VCR, and other equipment. Check to ensure that it is working properly. Replace or repair any damaged equipment.

• Review all training materials, including the Facilitator’s Guide, handouts, and any other reference materials.

• Prepare your presentation, including a lesson plan or outline of the training. Include the training goals and objectives. Some presentation guidelines are included on the next page. A sample lesson plan has been included on page f of this Facilitator’s Guide.

• A day or so before conducting the training session, you may want to have participants take the quiz as a pre-test. The results of this test can help you to determine weak areas to focus on during the training session.

• Preview the videotape. Note any key points you want to expand upon in your training.
How you present the training course can have a great impact on learning. By following these simple presentation guidelines and keeping your objectives in mind, you can effectively and efficiently get the most out of your training session.

Organize Training Time Efficiently
In today’s busy work climate it can be difficult to find the time needed for training, so it is important to be organized and well-prepared when you do schedule training sessions. Whether you use Summit’s suggested lesson plan or not, it is important to have a lesson plan prepared that you can implement comfortably. This ensures that time spent in training is productive and beneficial for everyone.

Stress the Purpose and Goals of Training
Training needs to be goal-oriented. State the purpose of training in a clear, specific manner - whether it’s to reduce injuries, increase production, improve quality, improve working conditions, etc. Review the goals and objectives of the training so trainees know what is expected of them.

Capture Their Attention
Training needs to be interesting and compelling to hold trainees’ attention. To help motivate learners, give them specific evidence that their effort makes a difference and provide feedback on their progress. Also, remember that the first experience with a new subject usually forms a lasting impression on the learner. By making that experience a positive one, you can help ensure your audience retains the information learned.
Make New Learning Experiences Pleasant

For some adults, past experiences with education were unpleasant and not helpful. Adults learn best when they feel comfortable. By making the learning environment open and friendly, you can help adults to feel secure in their new learning experience. Offer support and feedback as often as possible, and be ready to provide extra attention to those who may require it.

Ask If There are any Questions

When most adults learn new information that conflicts with what they already know, they are less likely to integrate those new ideas. It is very important to make sure participants fully understand the training and do not have any unresolved questions. Provide for a question and answer period so participants can resolve those questions and/or answer questions throughout the training session.
Lesson Plan

As a qualified trainer, your job is to effectively communicate a great deal of information in a well-organized manner. By preparing a lesson plan, you can ensure that each minute of the training session is productive. Summit has provided a suggested lesson plan for your use.

1. Program Objective
This guide reviews *Aerial Lift Safety*. In it, we will cover:

- The Equipment
- Pre-start Inspections
- Safe Use

2. Show the Video: “Aerial Lift Safety”

3. Discussion and Demonstration
To help relate the training to your site, you may wish to incorporate your own discussion topics and exercises. Key issues you might consider include:

- What are the procedures to be followed regarding transferring from a lift to an elevated work area?
- What penalties could be involved if proper safety procedures are not followed when using an aerial lift?
- What procedures should be followed in the event an operator becomes incapacitated while elevated on the lift?
4. Use Handbooks to Reinforce Training
The handbooks increase comprehension and reinforce the information learned in the video program by explaining the main points and expanding on the original material. For increased employee information retention, go over one section at a time and stop to answer questions. The quiz at the back of the Facilitator’s Guide is provided to document employee training. Answers to the quiz are provided on a separate page.

5. Questions and Answers
Provide for a Q&A session to answer any questions. It may be necessary to review some of the material when providing answers. The employee handbook, equipment manuals, and other reference tools may be helpful.
Frequently Asked Questions

What type of fall protection equipment should be used with my aerial lift?
The type of fall protection equipment you will need depends on the type of aerial lift you will be using. When using a scissor lift, guardrails are an acceptable form of fall protection as long as the operator stays within the boundaries of the guardrail. When working with bucket trucks and boom lifts, a personal fall arrest system is required. This would consist of a harness and a short lanyard (2 feet in length) without any sort of “tear-away” shock absorber. This type of protection is intended to keep the operator inside the bucket instead of free falling.

How do I know the lift I’m using is the correct one for the task?
There are a few important things to consider when trying to determine whether an aerial lift is appropriate for a task. One thing to consider is weight capacity. You must be sure the total amount of weight for the personnel, tools, equipment, and materials are within this weight limit before proceeding. Another thing to consider is, the grade of the ground you’ll be working on. A level surface would be ideal, but if it does slope check to see what the limits are for the lift as set by the manufacturer.
In a landscape like this it’s easy to believe you’re free of danger... but looks can be deceiving. When danger appears it pays to be prepared. That’s true whether your job takes you to the depths of the ocean... or high above a factory floor.

When working from a height, aerial lifts – such as boom, reach, and scissor lifts – are generally safer to use than ladders. They provide an easy means to reach work sites far above the ground, while supplying a level platform to stand on. But, unfortunately, aerial lifts are not accident-proof. According to the United States Bureau of Labor Statistics, in the construction industry alone, 26 workers die each year from using aerial lifts. Most serious and fatal accidents occur due to electrocutions, falls and tipovers. The best way to eliminate these risks is to be aware of them, and follow safe work practices every time you use an aerial lift.

In this handbook, we will discuss:

- The Equipment
- Pre-start Inspections
- Safe Use

Before a worker is authorized to use a lift, they must receive training from a qualified person. Because aerial lift designs are varied and ever-changing, this training covers the operation, safety features and limitations of the specific model the worker will be using. The primary reference for the safe operation of a lift is the operating manual supplied by the manufacturer – this manual should stay with the lift at all times, and any worker who uses that lift must have a thorough understanding of the manual’s contents. In addition to this, your employer may have other safety guidelines that take into account the work environment, the nature of the tasks, and company policy. Despite these numerous variables in equipment and work situations, however, there are some safety principles common to all aerial lifts.
Every aerial lift requires the use of fall protection – the type you will need depends on the lift you are using. For scissor lifts, a guardrail is considered adequate fall protection, as long as the worker stays within the boundaries of the guardrail. Even when this is the case, some workers prefer, and some facilities require, the added protection of a safety belt or harness attached to a lanyard. When using most other types of aerial lift – such as bucket trucks and boom lifts – a personal fall restraint system is required. This consists of a body belt or harness and a 2 foot lanyard. The lanyard secures the worker to an anchorage point on the bucket – never attach the lanyard to a pole, beam or any other structure outside the lift. The length of the lanyard is important: fall restraint systems have a short lanyard without any sort of “tear-away” shock absorber – this short tether is intended to prevent a fall from occurring by keeping the person inside the bucket.

All aerial lifts have a load capacity rating that indicates the amount of weight the lift can safely carry. Before work begins, you must know the rating of the boom and basket you will be using, and make sure that the combined weight of all personnel, tools, equipment and materials carried on the lift does not exceed this rating.
Aerial lifts are also rated for the grade they can safely operate on – in other words, some lifts can only be used on surfaces that are level, while others are designed to be used on surfaces that are somewhat sloping. Never operate a lift on a grade that exceeds the manufacturer’s rating – this destabilizes the machine, often resulting in a tip-over. If the lift has outriggers, use them as required by the manufacturer. Make sure the outrigger floats are placed on a surface that has enough strength to support them – to disperse the pressure over a larger surface area, blocks can be used underneath the floats. To prevent the lift from moving accidentally, set the brake and use wheel chocks – this is especially important when the ground you are parked on is sloped.

Except for high voltage work, government regulations do not specify how many workers the operation of an aerial lift requires. A good safety practice, however, is to have a person stationed on the ground who is able to give aid in the event of an emergency. Aerial lifts have two sets of controls – an upper and lower set. The upper controls are attached to the bucket and within easy reach of the person who is riding in the lift. The lower controls are positioned at ground level – these controls are designed to override the upper controls in case of a malfunction or other safety hazard, but they must never be operated without the permission of the worker in the basket – the exception to this is if the worker becomes incapacitated by injury or illness.
The operator of the lift is responsible for inspecting the equipment before each day’s use. This pre-start inspection includes both a visual assessment and an operational check of the entire unit.

The manual provided by the manufacturer gives detailed information on how to inspect the lift you will be using. In general, check that there are no loose or missing parts on the unit; and make sure the welds on the boom are free of cracks. Check that all warning signs and decals on the lift are readable – these display such critical information as the make and model of the lift, the rated workload capacity, the maximum platform height, and maximum operating pressure of the hydraulic system. Inspect for leaks in the air, hydraulic fluid, and fuel systems, and make sure hydraulic hoses are free of kinks and pinch points. Be sure that tires are at the correct air pressure and look for punctures, cracks, and tread wear. Check fiberglass and other insulating components for damage or wear.
Inspect that safety devices are sound – such as outriggers, stabilizers and guardrails. If you will be using personal fall protection, check harnesses, belts and lanyards according to the manufacturer’s directions. Finally, test the lift’s operating and emergency controls. Using the lower controls, extend the boom with the basket unmanned, and look for signs of damage or malfunction.

During this pre-start inspection, if a problem is discovered that affects the safe operation of the lift, tag-out the machine and report this to your supervisor immediately. The lift must be taken out of service until it has been repaired by a person authorized to perform maintenance.
Besides this daily inspection, more detailed inspections must be performed regularly by a qualified person. If the aerial lift you will be using is a rental unit, the dealer should be able to provide records of the lift’s inspection and maintenance history. This is important, because a unit that is well-maintained is far safer on the job. You don’t want to discover when you are high up in the air that the equipment you’ve rented has not been serviced properly.

Hazards in the environment are every bit as dangerous as faulty equipment; so it is also important to inspect the area where you will be working. Avoid tipovers by carefully surveying the ground for holes, debris, ditches, and soft spots in the earth due to mud or untamped earthfills. To provide a safe base, the surface that the lift will sit on must be able to adequately support the combined weight of the equipment, the workers and any other tools or materials. Whenever possible, it is also safer to operate the equipment on a level surface – if the ground or floor does slope it must not exceed the limits set by the lift’s manufacturer.
During this inspection, check overhead for possible obstructions – when working outside, tree branches can cause injury or tangle the lift, but the most serious danger is power lines. Many people assume the black coating on overhead power lines is an insulator that provides protection against electric shock, but this isn’t true – the coating’s only function is to protect the lines from harsh weather. Touching the line is no different than touching a bare wire.

For this reason, government regulations mandate that workers remain at least 10 feet away from power lines that are 50,000 volts or less. When voltage is higher than this, the rule is ten feet plus an additional 4 inches for every 10,000 volts over 50,000. When working near power lines, continually check your position to make certain you maintain a safe distance and be aware that trees and overcast days can make spotting power lines and judging distances that much more difficult. Also, remember that trees themselves can become excellent conductors of electricity if their limbs come in contact with a power line.
When checking an area for hazards, it is important to consider traffic flow. Being struck by a second vehicle is a major risk factor that can cause the lift to tip over or throw the operator from the bucket. As much as possible, avoid setting up where other vehicles or construction equipment could cross your path. When you must work near other traffic, be sure to secure your work zone by posting barricades, clearly marked signs and flashing warning lights.

Finally, if you’ll be using a lift outside, weather conditions can also create a dangerous environment – lightening is an obvious hazard, but rain, hail or snow can decrease visibility and cause surfaces to become slippery, while windy conditions can cause the lift to tip.
Before mounting or dismounting from a lift, make sure that the platform is in the lowered position. Any climbing should be done using the 3 points-of-contact method – that means that both hands and one foot, or both feet and one hand should be in contact with the equipment at all times.

Once inside the lift, remember to secure the entry door or chains before raising the equipment. When operating the controls use a slow, easy touch so that the platform’s movement is smooth rather than jerky. While extending the lift, always make sure that you stay within the vertical and horizontal reach limits established by the manufacturer. If at any time the equipment appears to be malfunctioning, stop work immediately and report the problem to your supervisor. Do not use the equipment again until the problem has been checked out and repaired by a qualified person.

Prior to using a lift, warn people in the area, and use barricades such as cones or caution tape to keep pedestrians at a safe distance.
While working from an aerial lift, keep your feet firmly on the floor. Do not climb or sit on the edge of the basket, platform or guardrail, and do not use planks, ladders, scaffolds, boxes or any other such device to increase your working height.

Avoid using the lift in ways that increase the risk of tipping over. For example, do not subject the lift to side loads by leaving a ladder leaned against the lift, or by using the boom to push the lift along the ground. Unless the manufacturer has approved this procedure, do not use the lift as a crane – that is, do not attempt to lift loads by having them slung below the basket. Another risky behavior is to attach wires, cables or similar lines to the platform as these could possibly tangle or catch on something when the equipment moves. And, increasing the surface area of a platform or load is dangerous because it creates a “sail” when exposed to the wind, resulting in less stability.
When using a lift, there are a couple activities that may or may not be allowed depending on your circumstances. Government regulations do not prohibit a worker from leaving an elevated bucket to gain access to an off-the-ground work site, but it may be prohibited by your employer. If it is allowed, and it becomes necessary to complete a task, check with your employer on the exact procedure for that facility and equipment. Obviously, if not done carefully, this can be a very dangerous activity – never make the transfer off the lift, unless you are protected 100 percent of the time by effective fall protection equipment.
Another potentially dangerous procedure is moving a lift while the worker is elevated in the basket – this is only allowed if the lift is designed for that purpose and if your facility does not prohibit this type of operation. If it is an authorized procedure, know the manufacturer’s exact guidelines before proceeding. The route to be traveled must be surveyed immediately before the move, with a check for traffic, holes or uneven surfaces, and obstructions overhead. While the lift is in motion keep your focus on the direction you are traveling and maintain a safe distance from potential hazards. Keep the speed within the limits set by the manufacturer – usually 3 miles per hour or less. This slower speed reduces the possibility of “bouncing” the platform, and of momentum carrying the vehicle farther than intended.

Once a task is completed, check that the area is clear of workers and obstructions before lowering the platform. If you need to add fuel to a lift, shut off the engine first. When fueling engines or charging batteries, choose a well ventilated area away from flames, sparks, fumes, or other fire and explosion hazards. Before leaving an aerial lift unattended, secure it by setting the parking brake and removing the key – this prevents an unauthorized person from attempting to use the lift, and putting themselves and others at risk.
Aerial lifts provide a solid, comfortable base to stand on when working above ground level – but a clear understanding of potential hazards is essential. Whenever you use an aerial lift, follow these guidelines:

- Operate the equipment within the manufacturer’s specifications.
- Use the appropriate fall protection.
- Inspect the lift prior to use.
- Check the work site for potential hazards.
- Avoid activities that could destabilize the machine and cause a tipover.
- And, finally, only travel in or transfer off of an elevated lift if authorized by the manufacturer and your employer.

If you have any questions about the proper use of aerial lifts at your facility, ask your supervisor. Whether your job takes you under the sea or high off the ground – the environment you work in determines many of the hazards you’ll face while on the job. But you can prevent accidents and injuries from occurring with a thorough knowledge of the equipment you’re using and a strong commitment to safety.
To review your knowledge of *Aerial Lift Safety*, answer the questions below.

**Your Name**

**Date**

1. Which of the following would be authorized to use an aerial lift? Select all that apply.
   a. A qualified person
   b. An employee with no training, but has worked around lifts before
   c. An employee who has received training from a qualified person
   d. Anyone can operate a lift without prior training

2. All aerial lifts require fall protection to be used.
   a. True      b. False

3. What do you need to consider when determining how much weight your lift will need to be able to safely carry? Select all that apply.
   a. The weight of each person on the lift
   b. The weight of the tools to be used
   c. The weight of equipment and materials
   d. Aerial lifts do not have a weight limit

4. Any type of aerial lift can be used in an area where the ground slopes.
   a. True      b. False

5. What can be done to prevent the load from accidentally moving? Select all that apply.
   a. Park it on a sloped surface
   b. Park it on an uneven surface
   c. Set the brake
   d. Use wheel chocks
6. When should the lower controls on the lift be used to operate the lift? Select all that apply.
   a. The lower controls should always be used when operating the lift
   b. When the upper controls malfunction
   c. When the operator in the basket has given a person permission
   d. When the operator on the lift becomes incapacitated by injury
   e. All of the above

7. The operator of the lift is responsible for a visual assessment and an operational check of the entire unit before each day’s use.
   a. True       b. False

8. When inspecting a lift, which of the following should you be sure to look for?
   a. Loose or missing parts
   b. Warning signs and decals on lift are readable
   c. Check for leaks in hoses
   d. The guardrails, outriggers, and stabilizers are in good condition
   e. All of the above

9. If you notice a problem during the pre-start inspection, you may continue using the lift and then tag it for repair once you are finished.
   a. True       b. False

10. According to government regulations, how far away must a worker remain from power lines that are 50,000 volts or less?
    a. 5 feet
    b. 10 feet
    c. 10 feet plus 4 inches
    d. 20 feet
11. When climbing onto the equipment you must use the 3 points-of-contact method to help ensure your safety.
   a. True  
   b. False

12. It is safe to use any lift as a crane to lift materials up to the work area by placing them below the basket.
   a. True  
   b. False

13. Government regulations do not prohibit a worker from leaving an elevated bucket to gain access to an off-the-ground work site, but your employer might.
   a. True  
   b. False

14. If a lift must be moved while a worker is elevated in the basket, how fast is the worker allowed to travel in the lift?
   a. Assuming this procedure is allowed, the operator must stay within the speed limit set by the manufacturer
   b. The lift must never be moved with someone elevated in the basket.
   c. The regular posted speed limit for normal traffic in the area
   d. At least 25 miles per hour or more

15. Before leaving an aerial lift unattended, you should secure it by setting the parking brake and removing the key.
   a. True  
   b. False
Quiz Answers

1. a A qualified person  
   c An employee who has received training from a qualified person
2. a True
3. a The weight of each person on the lift  
   b The weight of the tools to be used  
   c The weight of equipment and materials
4. b False
5. c Set the brake  
   d Use wheel chocks
6. b When the upper controls malfunction  
   c When the operator in the basket has given a person permission  
   d When the operator on the lift becomes incapacitated by injury
7. a True
8. e All of the above
9. b False
10. b 10 feet
11. a True
12. b False
13. a True
14. a Assuming this procedure is allowed, the operator must stay within the speed limit set by the manufacturer
15. a True