

Aerial Lift Safety Training

Aerial Lift Safety

**29 CFR 1926 453 Aerial Lifts
ANSI A92.2 – 2001 American National Standard Vehicle-
Mounted Elevating and Rotating Aerial Devices.**

Objectives

- Understand the training requirements for operating an aerial lift.
- Understand aerial lift inspection requirements.
- Understand safe work practices for operating and performing work on aerial lifts.
- Demonstrate the ability to safely operate an aerial lift.



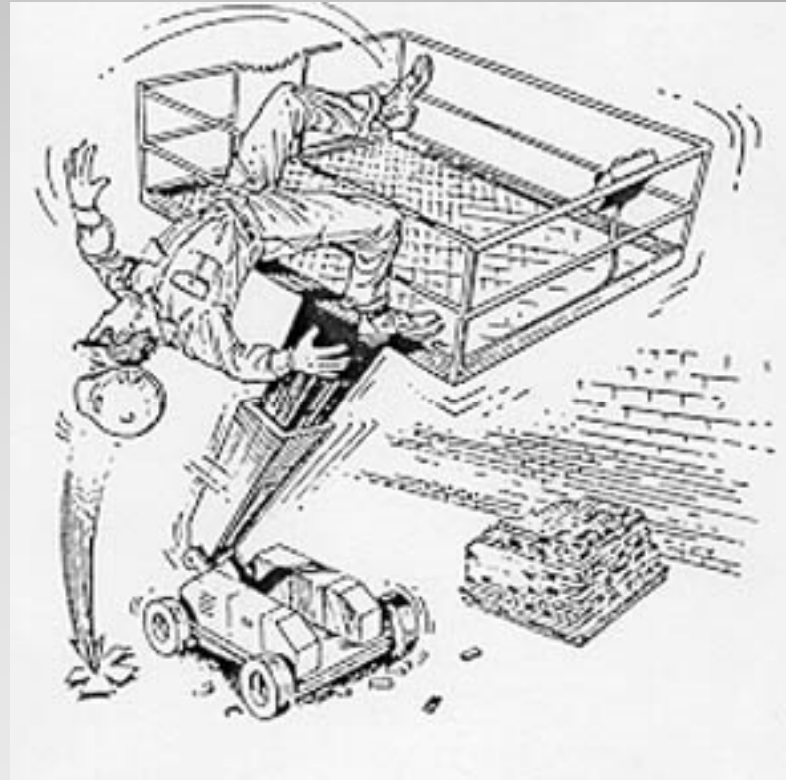
Part I

Aerial Lift Introduction

Aerial Lifts Can Be Hazardous

Employee was operating an aerial lift, with an extendable boom rotating aerial work platform. He was thrown from the basket while moving the machine.

The boom was fully extended and the machine apparently ran over some bricks, causing the boom to flex or spring, throwing the employee from the basket. The fall was about 37 feet to a concrete surface. The employee died from severe head and chest injuries.



Accident Prevention Recommendations

1. Have a competent person conduct frequent regular inspections of the worksite.
2. Permit only those employees qualified by training to operate equipment and machinery.
3. Instruct each employee in the recognition and avoidance of unsafe conditions and the regulations applicable to his or her work environment.
4. Prohibit unauthorized persons from operating aerial lifts.
5. Require the wearing of fall protection at all times.

Accident
Investigation
Report

Aerial Lift Requirements

- Aerial lifts must be compliant with ANSI Standard A92.2-2001.
- Aerial lifts must have the following markings:
 1. Identification
 2. Operational
 3. Instructional



It is the responsibility of management to ensure that all aerial lift devices used are ANSI compliant.

Part II

Aerial Lift Training Requirements

Training Requirements

- Only employees who have received training regarding the inspection, application, and operation of aerial devices, including hazard management, may operate an aerial device.
- The company must keep records of the training.

Employee Name: _____

Company Name

Aerial Lift Safety Trainee Certificate

Employee Name: _____

Aerial Lift Type(s): _____

***Note to Evaluator:** By signing this document, you are confirming that the trainee has demonstrated the ability to safely perform the task listed, or has the requisite knowledge for the subject.*

***Note to Trainee:** By accepting this signature, you are confirming that you have the ability to safely perform the task listed, or have the requisite knowledge for the subject, and have been given the opportunity to ask any questions.*

Required Courses

Aerial Lift Safety Training		
	Trainer Signature	Date

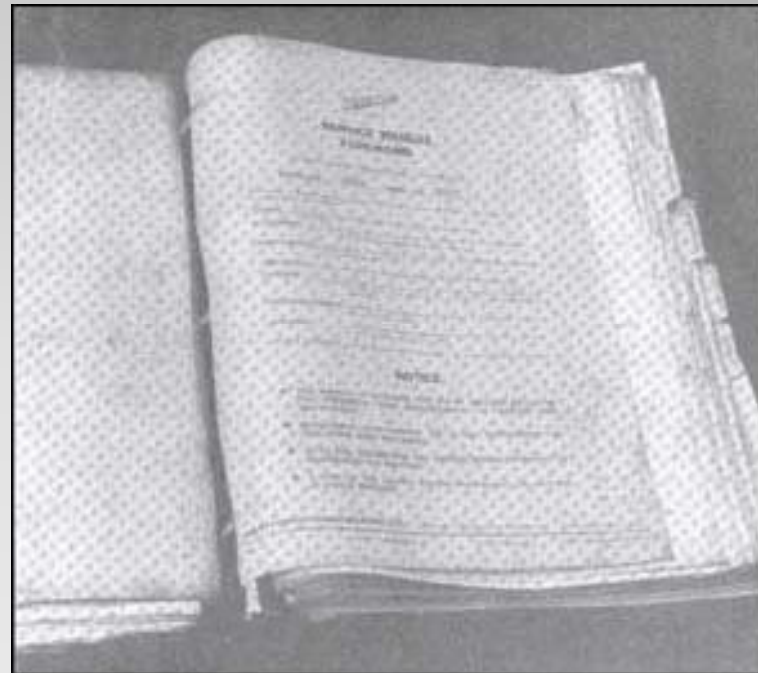
Performance Requirements

Demonstrate understanding of the purpose of the user manuals.		
	Trainer Signature	Date
Demonstrate familiarity with the vehicle user manuals.		
	Trainer Signature	Date
Demonstrate the ability to properly store user manuals on the vehicle when not in use.		
	Trainer Signature	Date
Demonstrate the ability to perform a pre-start inspection.		
	Trainer Signature	Date
Demonstrate understanding of what to do when malfunctions affect the operation of the aerial device.		
	Trainer Signature	Date

Companies should certify that their employees can do these tasks safely.

Training Requirements

- At a minimum, employees must be trained on:
 1. The purpose and use of the manuals.
 2. That operating manuals are an integral part of the aerial device and must be properly stored on the vehicle when not in use.



Training Requirements

3. How to perform a pre-start inspection.
4. Responsibilities associated with problems or malfunctions affecting the operation of the aerial device.
5. Factors affecting stability.

Daily Aerial Lift Inspection Form

Equipment Type: _____ Unit Number: _____
Inspected By: _____ Date: _____

Instructions: This inspection must be performed by the operator once daily, prior to first use. If any items do not pass inspection, they should be marked with a "No" and the reason for failure described in the "comments" section. The equipment must be removed from service until suitable repairs are made.

Inspection Item	Yes	No	N/A
Are the visual and audible safety devices working properly?			
Are the hydraulic and pneumatic systems free from deterioration and leakage?			
Is there any visible damage or deterioration of fiberglass and other insulating components?			
Are all the operational and instructional markings visible and legible?			
Is the electrical system functioning properly?			
Is the electrical system free from signs of excessive deterioration, dirt, and moisture?			
Did the bolts, pins, and other fasteners pass a visual inspection for tightness and deformation?			

Ground Control Station Operational Check	Yes	No	N/A
Can the platform/boom be raised and lowered properly?			
Can the platform/boom be raised and lowered with auxiliary power?			
Can the platform/boom be raised and lowered with manually bleed valves?			
Can the platform/boom be telescoped out and in?			
Can the platform/boom be moved right and left?			

Platform Control Station Operational Check	Yes	No	N/A
Can the platform/boom be raised and lowered properly?			
Can the platform/boom be raised and lowered with auxiliary power?			
Can the platform/boom be telescoped out and in?			
Can the platform/boom be moved right and left?			

All inspections must meet these minimum requirements. The manufacturer may have additional requirements that must be adhered to.

Comments: _____

A good pre-start inspection is critical for employee safety.

Training Requirements

6. The purpose of placards and decals.
7. How to perform a workplace inspection.
8. Applicable safety rules and regulations, such as the National Electric Safety Code.

A workplace inspection is different than the equipment inspection. The employee must survey the work area and check for hazards that may affect lift operation.

Overhead power lines, uneven surfaces, ditches, and possible electrical contacts are all things that an operator must check for.

Training Requirements

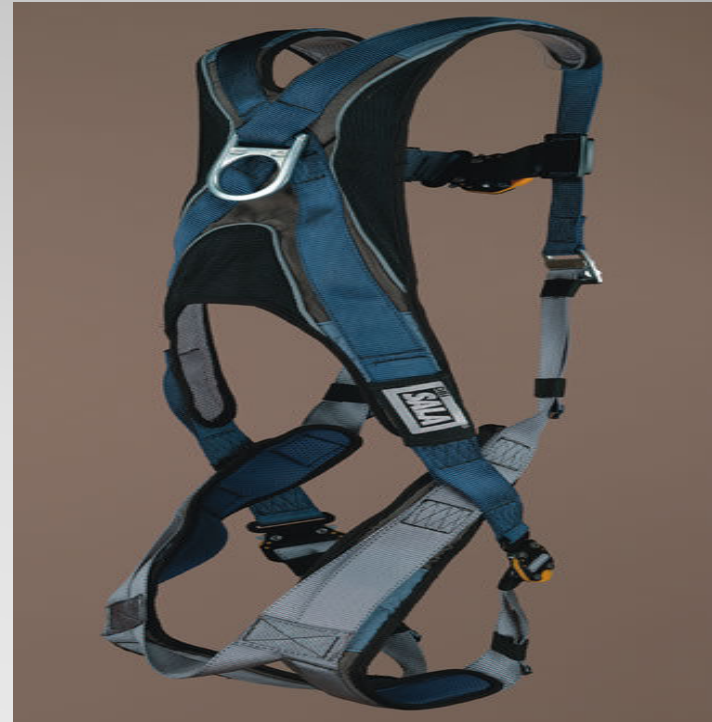
9. The required authorization to operate.
10. All operator warnings and instructions.
11. The actual operation of the aerial device.
 - Under the direction of a qualified person, the trainee shall operate the aerial device for a sufficient period of time to demonstrate proficiency.



Trainees should be closely supervised by a qualified person.

Training Requirements

12. The proper use of fall protection equipment.
- The operator must be retrained when they demonstrate improper operation, or when their ability to safely operate is in question.



Employees should be trained on the proper use of fall protection.

Operating Different Devices

- When a trained operator is to operate a device which they are not familiar with, they must be trained on:
 1. The location of the manuals.
 2. The purpose and function of all controls.
 3. Safety devices and operating characteristics specific to the aerial device.

Part III

Aerial Lift Inspection and Maintenance Requirements

Inspection Requirements

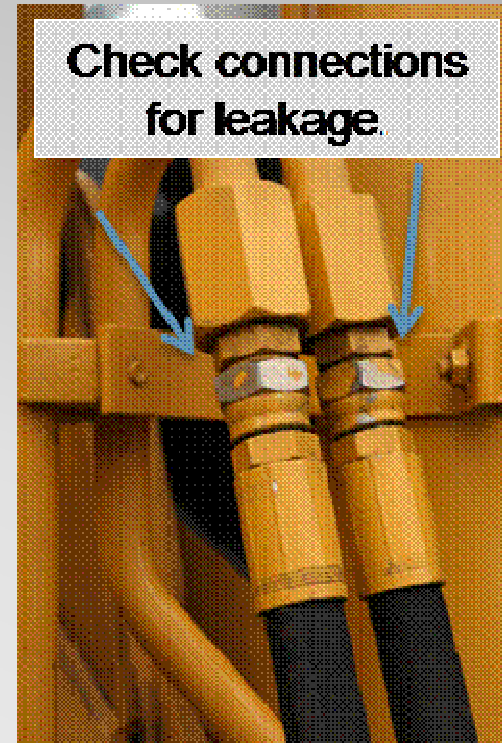
- There are two types of inspections required for aerial lifts.
- “Frequent” inspections must be performed daily by the operator before the device is used.
- “Periodic” inspections should occur between one and twelve month intervals, as determined by the company and manufacturers recommendations.



Inspections are important for maintaining equipment safety.

Frequent Inspection Requirements

1. Check operating controls and associated mechanisms for conditions interfering with proper operation.
2. Check visual and audible safety devices for malfunctions.
3. Check hydraulic or pneumatic systems for observable deterioration or excessive leakage.



Check the hoses for seepage and deterioration.

Frequent Inspection Requirements

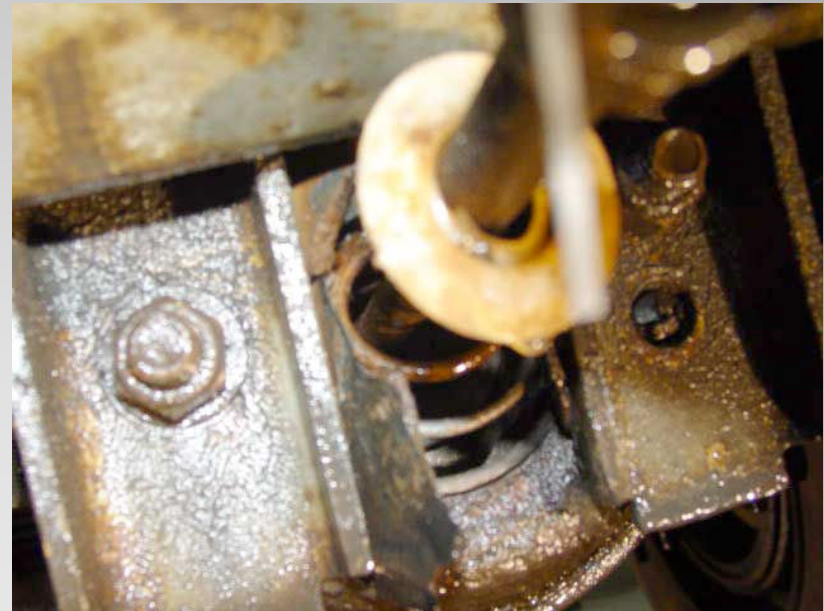
4. Check fiberglass and other insulating components for visible damage or contamination.
5. Check for missing or illegible operational and instructional markings.
6. Check electrical systems for malfunction, signs of excessive deterioration, dirt and moisture accumulation.



All instructional and warning labels must be legible.

Frequent Inspection Requirements

7. Perform a visual inspection of all bolts, pins, fasteners, and locking devices for looseness or deformation.
- Any suspected items should be examined and tested, and a determination must be made by a qualified person if they are a safety hazard.
 - All unsafe items must be replaced or repaired before the aerial lift is used.



Rusted and broken fasteners can cause serious equipment malfunction.

Frequent Inspections Records

- Records are not required for frequent inspections.
- If a safety violation is found during a frequent inspection, it must be reported in writing.
- That report and the record of the corrective action must be kept for at least five years.

Company Name Daily Aerial Lift Inspection Form

Equipment Type: _____ Unit Number: _____
 Inspected By: _____ Date: _____

Instructions: This inspection must be performed by the operator once daily, prior to first use. If any items do not pass inspection, they should be marked with a "No" and the reason for failure described in the "comments" section. The equipment must be removed from service until suitable repairs are made.

Inspection Item	Yes	No	N/A
Are the visual and audible safety devices working properly?			
Are the hydraulic and pneumatic systems free from deterioration and leakage?			
Is there any visible damage or deterioration of structure and other supporting components?			
Are all the operational and instructional markings visible and legible?			
Is the electrical system functioning properly?			
Is the electrical system free from signs of excessive deterioration, dirt, and moisture?			
Did the bolts, pins, and other fasteners pass a visual inspection for alignment and deformation?			

Ground Control Station Operational Check	Yes	No	N/A
Can the platform boom be raised and lowered properly?			
Can the platform boom be raised and lowered with auxiliary power?			
Can the platform boom be raised and lowered with manually bleed valves?			
Can the platform boom be telescoped out and in?			
Can the platform boom be moved right and left?			

Platform Control Station Operational Check	Yes	No	N/A
Can the platform boom be raised and lowered properly?			
Can the platform boom be raised and lowered with auxiliary power?			
Can the platform boom be telescoped out and in?			
Can the platform boom be moved right and left?			

Comments: _____

Signature of Person Completing Inspection: _____
 Signature of Person Completing Repair: _____ Date Required: _____

Periodic Inspection Requirements

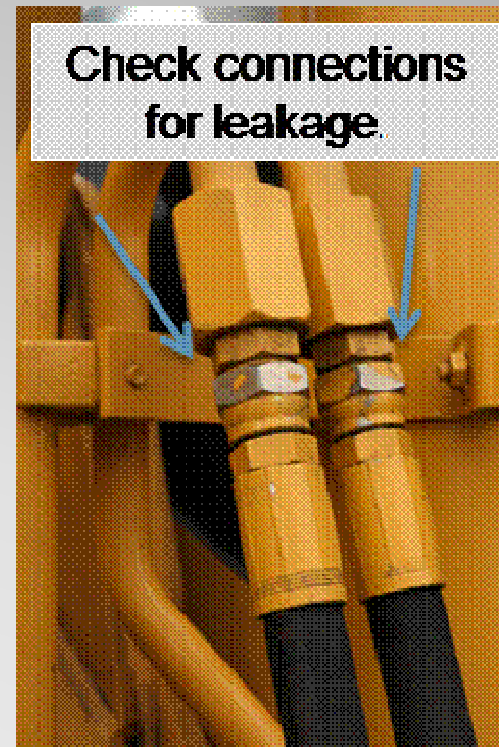
1. Check structural members for deformation, cracks, and corrosion.
2. Check parts, such as pins, bearings, shafts, gears, rollers, locking devices, chains, chain sprockets, wire and synthetic ropes, and sheaves for wear, cracks, or distortion.
3. Check hydraulic and pneumatic relief valve settings.



Small parts, such as locking pins, need to be inspected.

Periodic Inspection Requirements

4. Check hydraulic system for proper oil level.
5. Check hydraulic and pneumatic fittings, hoses and tubing for evidence of leakage, abnormal deformation or excessive abrasion.
6. Check hydraulic and pneumatic valves for malfunction and visible cracks in the external valve housing, leaks, and sticking spools.



Check connections for leakage.

Check the hoses for seepage and deterioration.

Periodic Inspection Requirements

7. Check compressors, pumps, motors, and generators for loose fasteners, leaks, unusual noises or vibrations, loss of operating speed, and excessive heating.
8. Visually inspect any vacuum prevention systems and verify their function.
9. Check hydraulic and pneumatic cylinders and holding valves for malfunction and visible damage.



Periodic Inspection Requirements

10. Check hydraulic and pneumatic filters for cleanliness and the presence of foreign material in the system.
11. Check electrical systems and components for deterioration or wear.
12. Conduct a performance test of all boom movements.



Check all filter elements for foreign objects. Metal in the filters can be a sign of serious damage.

Periodic Inspection Requirements

13. Check the condition and tightness of bolts and other fasteners.
14. Check welds as specified by the manufacturer.
15. Check for legible and proper identification, operational, and instructional markings.



All instructional and warning labels must be legible.

Periodic Inspection Records

- Written, dated and signed reports must be kept of each periodic inspection test.
- Records must be retained for at least five years, or as required by applicable regulations.

Company Name Periodic Aerial Lift Inspection Form

Equipment Type: _____ Unit Number: _____

Inspected By: _____ Date: _____

Instructions: Periodic inspections must occur at time intervals determined by the manufacturer and the conditions of vehicle use. All periodic inspections must include these inspection requirements AND the inspection requirements of a frequent inspection. Written periodic inspection records must be kept for a minimum of five years.

Inspection Item	Yes	No	N/A
Structural members are free from deformation, cracks and corrosion.			
Parts such as pins, bushings, shafts, gears rollers, locking devices, chains, chain sprockets, wire and synthetic ropes are free from wear, cracks or distortion.			
Hydraulic and pneumatic relief valves are set correctly.			
Hydraulic system has the proper oil level.			
Hydraulic and pneumatic fittings, hoses, and tubing are free from leakage, abnormal deformation, and excessive abrasion.			
Compressors, pumps, motors and generators do not have loose fasteners, leaks, unusual noise or vibration, loss of operating speed, or excessive heating.			
Hydraulic and pneumatic valves are functioning properly and are free from cracks.			
Vacuum protection systems are functioning properly.			
Hydraulic and pneumatic cylinders and holding valves work properly and do not have visible damage.			
All electrical system components are free from deterioration and wear.			
All boom movements pass a performance test.			
All bolts and fasteners are the appropriate tightness.			
Welds have been checked as specified by the manufacturer.			
All identification, operational and instructional markings are present and legible.			
Electrically insulated aerial devices pass the appropriate electrical checks.			

Comment: _____

¹Signature of Person Completing Inspection: _____

Signature of Person Completing Repair: _____ Date Repaired: _____

² All inspections must meet these requirements at a minimum. The manufacturer may have additional inspection requirements that must be adhered to.

Maintenance Requirements

- Type and frequency of maintenance will be determined by the owner in accordance with the manufacturers recommendations.
- The owner must train employees on inspection and maintenance of the aerial device in accordance with the manufacturers recommendations.



All maintenance must be done in accordance with manufacturers recommendations.

Aerial Lift Modifications

- No modifications or additions that affect vehicle stability, mechanical, hydraulic, or electrical integrity, or safe operation may be made without prior written permission from the manufacturer.
- If these changes are made, the instructional markings must be changed accordingly.

Part IV

Aerial Lift Operations

Pre-Start Inspection

- Aerial devices must be inspected prior to each days operation.
- The operator must perform the inspection in accordance with the "frequent" inspection requirements.
- All unsafe items must be replaced or repaired before use.

Company Name Daily Aerial Lift Inspection Form

Equipment Type: _____ Unit Number: _____

Inspected By: _____ Date: _____

Instruction: This inspection must be performed by the operator once daily, prior to first use. If any items do not pass inspection, they should be marked with a "No" and the reason for failure described in the "comments" section. The equipment must be removed from service until suitable repairs are made.

Inspection Item	Yes	No	N/A
Are the visual and audible safety devices working properly?			
Are the hydraulic and pneumatic systems free from deterioration and leakage?			
Is there any visible damage or deterioration of floorplate and other insulating components?			
Are all the operational and instructional markings visible and legible?			
Is the electrical system functioning properly?			
Is the electrical system free from signs of excessive deterioration, dirt, and moisture?			
Did the belt, pin, and other fasteners pass a visual inspection for alignment and deformation?			

Ground Control Station Operational Check	Yes	No	N/A
Can the platform boom be raised and lowered properly?			
Can the platform boom be raised and lowered with auxiliary power?			
Can the platform boom be raised and lowered with manually bleed valves?			
Can the platform boom be telescoped out and in?			
Can the platform boom be moved right and left?			

Platform Control Station Operational Check	Yes	No	N/A
Can the platform boom be raised and lowered properly?			
Can the platform boom be raised and lowered with auxiliary power?			
Can the platform boom be telescoped out and in?			
Can the platform boom be moved right and left?			

Comments: _____

Signature of Person Completing Inspection: _____

Signature of Person Completing Repair: _____ Date Required: _____

Weather Conditions

- Before using aerial lifts outdoors, weather conditions should be checked.
- Lifts should not be used when there are:
 - Storms
 - High winds
 - The possibility of lightning.



Work Area Hazard Survey

- Before an aerial device is used, the work area must be surveyed for hazards such as:
 - Untamped earth fills
 - Ditches
 - Drop offs and floor obstructions
 - Debris
 - Overhead obstructions
 - Possible electrical contacts
 - Presence of unauthorized persons
- Aerial lifts may not be used unless these hazards are managed or eliminated.



Pot holes and ditches are hazardous and should be avoided.

Protection from Falling Objects

- Employees must wear hard hats.
- If there is a danger of falling objects from the platform, the area below must be barricaded and employees prevented from entering.
- If employees need to access the areas beneath the platform, toe boards, screens and canopies must be used to protect employees from the falling object hazards.



What work behaviors lead to falling object hazards?
How can they be avoided?

Moving Aerial Lifts

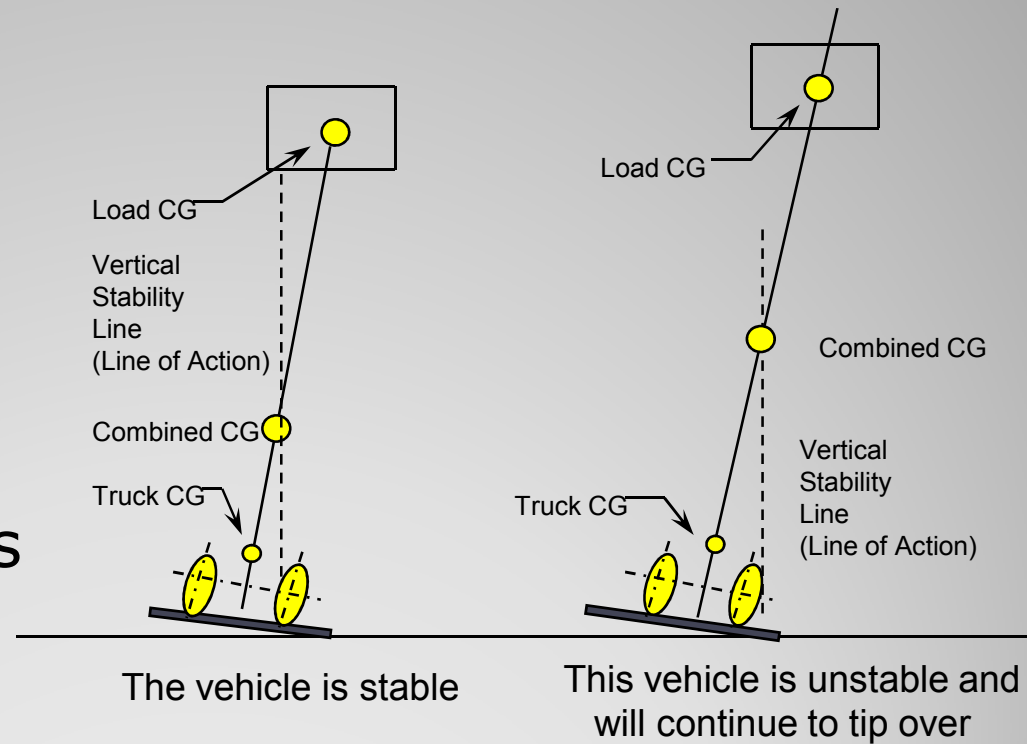
- While driving an aerial lift, the driver must:
 - Avoid any surface that affects vehicle stability.
 - Maintain a safe distance from obstacles and overhead lines.
 - Maintain communications between the driver and operator.
 - Limit speed to a rate that is safe for the conditions of the surface.



Vehicles should always be driven slowly and carefully.

Vehicle Stability

- Longitudinal stability is the vehicles resistance to turning over forward or rearward.
- Lateral stability is the vehicles resistance to overturning sideways.



Notice how the load center on the right is outside the stability triangle, which will cause the vehicle to tip over.

Working Requirements

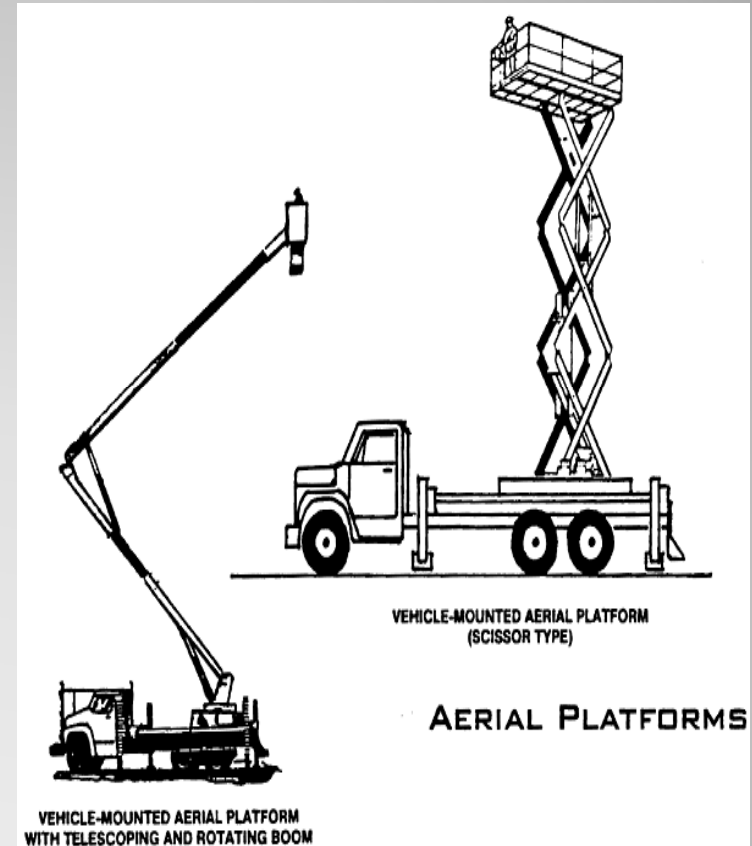
- Employees must stand on the floor of the basket, and cannot sit or climb on the edges, or use other devices to establish work positions.
- A harness attached to the boom or basket must be worn.
- Harnesses should be connected to a lift structural member anchor point.
- Guardrails must be installed.
- Never exceed the load capacity of the aerial lift.



Do you know what your aerial lift load capacity is?

Working Requirements

- The parking brake must be set while the boom is elevated.
- Wheel chocks must be installed before using an aerial lift on an incline.
- Aerial lift trucks should not be moved when the boom is elevated and workers are in the basket.



Part V

Conclusion

Summary

- All aerial lifts must be compliant with ANSI regulations.
- All operators must be trained and certified prior to operating an aerial lift.
- “Frequent” inspections must be performed daily prior to use.
- “Periodic” inspections are in detail inspections that must be performed and recorded in accordance with the manufacturers recommendations.
- Work on aerial lifts should not be performed during lightning conditions or heavy weather.
- The work area must be checked for hazards prior to using aerial lifts.

Questions?