
# Aerial Lift Training

Instructor: _____

# Goals for Today

- **Understand regulatory and company standards regarding aerial lift use**
- **Recognize aerial lift hazards**
- **Understand need for aerial lift training**
- **Demonstrate understanding of fall protection in aerial lifts**
- **Become familiar with specific aerial lift in use at this facility**
- **Demonstrate proficiency with operation of aerial lift equipment**

# Purpose of Standards

- Prevention of accidents
- Prevent personal injuries and property damage to company assets or public

# Chapter 1 – Aerial Lift Safety


Photo from www.safteng.net

**Student Manual pg. 6**

# Accident Causes

- Inattention
- Distractions
- Poor Habits
- Lack of Training
- Improper Procedure
- Excessive Speed

# Aerial Lift Hazards


## STUDENT ACTIVITY

Turn to page 6 of the student manual and create a list of hazards that are specific to aerial lifts.

# Scissor Lifts

- **Falls**
  - 1/5 of deaths involved ejections, after being struck by object
  - Cause of fall unknown in 3/5 of deaths
  - Other causes included removal of chains, standing on or leaning over railings
- **Tipovers**
  - Caused almost 1/3 of scissor lift deaths
  - Mostly while elevated over 15 feet
  - 1/4 of tipovers occurred where lift hit a hole or curb while moving
- **Electrocutions**
  - 1/2 involved overhead power lines

# Aerial Lift Hazard Recognition

- Working on too great a slope
- Not being familiar with the operator manual
- Failing to conduct inspections
- Operating unit with unmarked controls
- Overloaded basket or platform
- Using control panel as tool/material storage
- Working too close to energized electrical
- Other work site hazards

# Electrical Safety

When working near electrical lines or equipment, avoid direct or indirect contact. Direct contact is contact with your body. Indirect contact is when the body touches or is in dangerous proximity to any object in contact with energized systems. Always assume that lines are 'live' and carry high voltage. Electrical lines can only be considered 'dead' when verified by the utility.

# Electrical Safety Continued

- Company operations shall conform to the High Voltage Proximity Act, which applies to electrical systems carrying 600 volts or more and requires employers to:
- For voltages to ground 50kV or below - 10 feet (305 cm). For voltages to ground over 50kV - 10 feet (305 cm) plus 4 inches (10 cm) for every 10kV over 50kV.
- Inform employees of the hazards and precautions of working near high voltage.

# Electrical Hazard Warnings

- Post warning decals on equipment regarding 10-foot minimum clearance.
- Ensure that when an equipment operator is unable to assess clearances a 'spotter' observes for clearance and directs the operator.
- Notify the utility at least 5 working days before any work begins which requires the utility to identify voltages and clearances, or de-energize, insulate or relocate lines.

# Electrical Hazard Clearances

- As voltages increase, minimum clearances increase and potential for arcing increases. Injuries or fatalities may occur even if contact is not made. Weather and contact with conductors such as tools can increase the possibility of arcing. Because only authorized company employees are qualified to determine voltage, the utility should be called to establish voltages and minimum clearances, and to render the work safe. Where prior notification cannot be made, request the utility to respond immediately.

# Electrical Hazard Training

- Annual training shall be conducted, preferably in conjunction with or supplemented by training from local utility companies, and include characteristics, hazards and precautions for high voltage electricity.
- Prior to the start of an operation where contact with energized electrical systems is possible, supervisors shall identify energized lines or equipment, and reference their location. Their location shall be discussed at a pre-work safety meeting of all crewmembers. All new employees shall be similarly informed.

# Regulatory Standards

- OSHA
  - General Duty Clause
  - **29 CFR 1910.67** (Vehicle-mounted elevating and rotating work platforms)
  - **29 CFR 1926.453** (Aerial Lifts)
  - Other regulations as they may apply
    - Fall protection
    - Personal Protective Equipment
    - Electrical Safety
    - Working over water

# Regulatory Standards

- ANSI
  - **A92.2** – Vehicle-mounted elevating and rotating Aerial platforms
  - **A92.3** – Manually propelled elevating aerial platform
  - **A92.5** – Boom supported Elevating Work platforms
  - **A92.6** – Self-propelled elevating work platforms

# Chapter 2 – Aerial Lift Fall Protection

Student Manual pg. 11

Thursday, May 10, 2001

Look at the back D-ring.....

# Anything Wrong in This Photo?

# Fall Protection

- OSHA regulates aerial lifts as scaffolds
  - 1926.453 Aerial Lifts only applies to bucket trucks
  - Fall protection is required (full body harness with lanyard or body belt with 2-foot lanyard as restraint device)
  - OSHA does not require harnesses and lanyards on other boom lifts and scissor lifts if there are guardrails
- Fall arrest systems (harness plus lanyard to stop a fall)
  - Can tip over some boom lifts and scissor lifts due to fall stopping force
- Fall restraint systems intended to prevent falls are preferred
  - e.g. Full body harness plus lanyard designed for size of lift platform
- Always close entrance chains or doors
- Stand on floor of bucket or lift platform
  - Do not climb on or lean over guardrails

# What is wrong with this picture?

# Fall Restraint Systems

Limits worker fall to 2 feet maximum

# Fall Arrest System Equipment

**Anchorage & Connectors**

**Lanyards**

# Equipment Inspection & Maintenance

- Inspect before AND after each use-
- What to look for:
  - Cuts, tears, abrasions, stitches coming out
  - Cracks, burrs
  - Parts move freely
  - No alterations
  - Appropriate labels
  - Record inspection in a log

# Chapter 3 – Elevating Work Platforms


**Student Manual pg. 15**


What is an Aerial Lift ? A piece of equipment, extendible and/or articulating, designed to position personnel and/or materials in elevated locations.

# General Safety Instructions

- Aerial Lift Operators must inspect equipment prior to each shift and maintain a record of these inspections.
- Do not operate an Aerial Lift if it is not in proper working condition or it has been tagged with a “DO NOT OPERATE” tag.
- Only authorized/trained persons can operate an aerial lift

# General Safety Instructions

- Only devices approved for lifting personnel shall be used as aerial lifts. Loaders, forklifts, or other material lift devices shall not be used to transport employees to elevated locations nor as work platforms unless used properly and in compliance with all regulations and company policies.
- Modification shall not be made to any aerial lift device without written approval of the company and manufacturer.

# Aerial Lift Design/Engineering

- Know the load limits of the Aerial Lift.

# Before Operating Aerial Lifts

- Check safety devices and **operating controls** before each use
- Check area in which aerial lift will be used for:
  - Level surface (Do not exceed manufacturer slope recommendations)
  - Holes, drop-offs, bumps, debris, etc.
  - Overhead obstructions and overhead power lines
  - Stable surface
  - Other hazards
- Set outriggers, brakes, wheel chocks if installed

# Aerial Lift Inspections

- Frequent
- Annual
- Pre-Use


# Operator Training Requirements

- Purpose and use of manuals
- Operator manuals are integral part of aerial lift operations
- Pre-start inspections
- Responsibilities with regards to malfunctions or problems
- Factors affecting stability of aerial lift platform
- Purpose of placards and decals
- Workplace inspections
- Safety rules and regulations
- Persons authorized to operate lifts
- Operator warnings and instructions
- Actual operation of aerial lift platform under the direction of a qualified employee/trainer with sufficient time to demonstrate proficiency in actual operation of aerial lift

# Operator Warnings & Instructions

- Page 17 of the student manual has a thorough list of operator warnings. Take time to become familiar with the list and items that apply in your work center and to your aerial lift.

# Aerial Lift Incident #1

An employee was performing building exterior painting from an Aerial Lift. The lift overturned while the platform was at minimum telescopic extension, and in a nearly vertical position. As the equipment began to move forward, it flipped backwards.

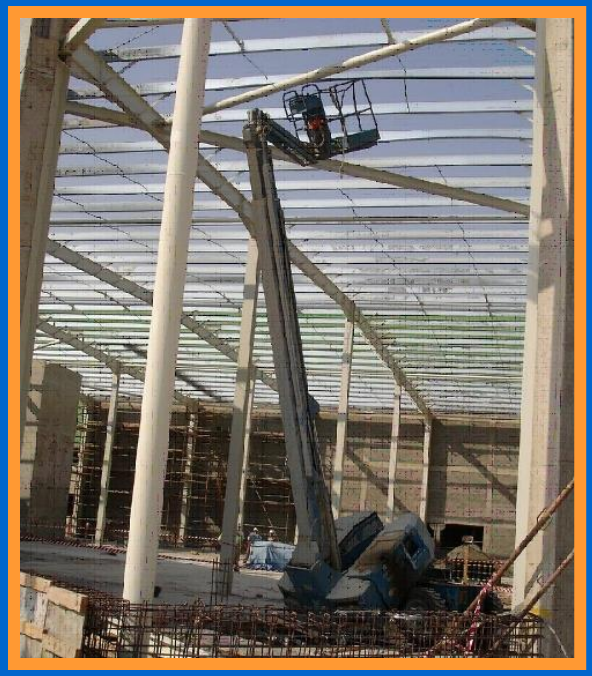
Results: A Fatality

# Aerial Lift Incident #2

Improper rigging while lifting aerial lift.

# Aerial Lift Incident #3

A fatal accident occurred in the Middle East (02/2006), involving a self propelled boom lift, in which the bolts connecting the slew ring to the chassis, failed, causing the superstructure to topple off and the boom to rise up and hit the overhead steel work throwing the operator to his death.



# Preventing Tip-Over

- Do not exceed manufacturer rated load capacity limits
- Do not travel to job location with lift in elevated position.
- Set up proper work zone protection when working near traffic
- Positioning of lifts
  - Do not drive near drop-offs or holes.
  - Do not raise platform on uneven or soft surfaces.
  - Do not drive onto uneven or soft surfaces when elevated.
  - Do not raise platform on slope or drive onto slope when elevated.
  - Do not raise platform in windy or gusty conditions.
- Avoid excessive horizontal forces when working on elevated scissor lifts

# STUDENT ACTIVITY

Following your instructors guidance conduct a full pre-use inspection and then operate the aerial lift in accordance with the skills block assessment form and your instructors directions until the instructor determines you have sufficiently passed the evaluation.

# Chapter 4 – Vehicle Mounted Aerial Devices


**Student Manual pg. 20**

# Types of Boom Lifts

- Articulated Boom Aerial Devices, insulated or non-insulated

- Extendible (telescopic) Boom Aerial Devices, insulated or non-insulated

# Boom-Supported Lifts Accidents

**Electrocutions** – almost all due to overhead power lines

- 1/2 of electrocutions involved body contact with overhead power lines
- One-third involved overhead power lines contacting lift booms or buckets

**Falls**

- 1/2 of fatal falls involved ejection from the bucket after worker or lifts was struck by vehicles, cranes or objects.
- 1/6 occurred while transferring to or fro

**Collapses/tip-overs**

- 2/5 of deaths involved collapse of boom
- Almost one-third were due to tipovers.
- 1/4 involved collapses of bucket

# Boom-Supported Lifts (Cont.)

**Caught in /between**

- Most involved the worker getting caught between the bucket edge and a roof joist or beam.

**Struck by/against**

- Mostly involved workers being struck by collapsing materials, girders, etc.

# Pre-Operation Inspection

- Outriggers and booms
- Control handles for free operation
- Booms at pivot points
- Fiberglass boom for damage and cleanliness
- Bolts and nuts
- Hydraulic cylinders and attachment points
- Platform attachment points
- Fall protection devices
- Wheel chocks and outrigger pads
- Door latch operation
- Safety chains
- Welds
- Electrical equipment
- All safety devices

# Operating Procedures

Lift equipment shall be inspected and controls tested daily before use. On boom devices, one crew member qualified in the operation of the ground controls shall remain readily available on the ground at all times while the lift is operating.

Only properly trained employees shall operate the lift.

Ground controls shall not be operated without the permission of the employee(s) 'in the air', except in emergencies.

# Boom Lift Operations

- Before extending the boom or raising the platform, outriggers (if the vehicle is so equipped) shall be positioned properly and the truck leveled.
- Outriggers shall be placed on pads, blocking, or other solid surface, and shall not be used to level the vehicle. The parking brake (and micro brake if so equipped) shall be set and wheel chocks in place. Sufficient overhead clearance shall be checked before raising any aerial lift.

# Boom Lift Fall Protection

- Employees shall keep both feet on the bucket floor while the bucket is moving, or work is being performed. Employees shall not attach themselves to an adjacent pole, structure or tree while working from the bucket, but shall remain connected by full body harness and lanyard to the boom, boom eyelet, or boom strap and 'D' ring.

# STUDENT ACTIVITY

Following your instructors guidance conduct a full pre-use inspection and then operate the boom lift in accordance with the skills block assessment form and your instructors directions until the instructor determines you have sufficiently passed the evaluation.

# Chapter 5 – Mobile Scaffolds


Student Manual pg. 25

# Mobile Scaffolds

Scaffolds shall be braced by cross, horizontal, or diagonal braces, or combination thereof, to prevent racking or collapse of the scaffold and to secure vertical members together laterally so as to automatically square and align the vertical members. Scaffolds shall be plumb, level, and squared. All brace connections shall be secured.

# Mobile Scaffolds Continued

- Scaffold casters and wheels shall be locked with positive wheel and/or wheel and swivel locks, or equivalent means, to prevent movement of the scaffold while the scaffold is used in a stationary manner.
- Manual force used to move the scaffold shall be applied as close to the base as practicable, but not more than 5 feet (1.5 m) above the supporting surface.