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Aerial Lifts

Introductions...

Learning Outcomes

- **Differentiate types of aerial lifts and individual requirements**
- **OSHA & ANSI operating requirements**
- **Selecting the correct aerial lift based on the task**
- **Types of inspections, responsibilities & documentation**
- **Difference btw. deficiencies & safety hazards**
- **Set-up and use**
- **Working near power lines or other electrical hazards**
- **Fall protection: selection, set up & use**
- **Rescue considerations**

Please Note:

Watching a presentation on aerial lifts does not automatically qualify participants to operate aerial lifts.

Qualification requires demonstration of proficiency

Knowledge Evaluation – *common understanding of expectations*

Skill Assessment – *aptitude, expertise or ability to perform*

(AKA – Competency)

Focus is on Operator Skill & Ability

- ***"Operating"* equipment is more than just pulling levers and pushing button**
  - **Necessary Technical Knowledge & Practical Skills**
- **Compliance Responsibilities**
  - **You are at the Moment of Choice**
  - **You influence Final Outcomes**
- **Learning has not taken place until visible change occurs and different results are achieved**
  - **If You want People to be Safe, then Define what "Safe" is in Observable Actions of the Task**

Aerial Lifts have a High Potential for Accidents, Injuries and Fatalities

Falls, tip over and electrocution ***8 out of 10 fatalities***

Capacities based on like new conditions

Load charts, overloading

Tires, outrigger, stabilizer failures or incorrect use

Inspection and maintenance

Ground conditions unstable, unsupportive

Reckless and irresponsible operation

The two leading causes of aerial lift fatalities are falls and electrocution.

Poll locked. Responses not accepted.

True

False

Total Results: 1

How to Use this Webinar

One component of an effective, defensible Aerial Lift training & qualification strategy

- Define Expectations based on the Task
- OSHA Compliance & ANSI Standards
- Hazard Recognition & Necessary Precautions
- Critical Importance of Manufacturer Guidelines, Manuals, Placards, Signs, Warnings
- Selection, Inspection, Maintenance, Set-up, Use, Required Records, etc…
- Fall Protection
- Rescue Considerations

Develop a Defensible Strategy

- **Training:** ***develop knowledge & competency on a topic***
  - **Webinar, Classroom, Instructor-led, etc…**
  - **Ability to Answer Critical Questions**
  - **Written Knowledge Evaluation?**
- **Manufacturer's Operating Manuals**
  - **Documented?**
- **Skills Assessment**
  - **Measure Ability to Accomplish a Specific Task**
  - **Documented Skills Assessment?**

Read & Follow Manufacturer Operator's Manual

The Operator shall be familiar with the manuals and reference them as need and as required.

The Operator shall ensure the operating and maintenance manuals are stored in the weather resistant storage compartment on the aerial lift.

The manual(s) is considered an integral part of the aerial lift and is vital to communicate necessary safety information to the operator.

Additional Training is Necessary

Skill Assessment

- **OSHA**
  - Demonstrations of the skills and knowledge needed to operate an aerial lift before operating it on the job
- **ANSI**
  - Actual operation of the aerial lift under the direction of a Qualified Person for a sufficient time to demonstrate proficiency

OSHA's Perspective on Training

- **1926.20(b)**
  - **Accident prevention responsibilities.**
- **1926.20(b)(2)**
  - **Such programs shall provide for frequent and regular inspections of the job sites, materials, and equipment to be made by competent persons designated by the employers.**
- **1926.20(b)(3)**
  - **The use of any machinery, tool, material, or equipment which is not in compliance with any applicable requirement of this part is prohibited. Such machine, tool, material, or equipment shall either be identified as unsafe by tagging or locking the controls to render them inoperable or shall be physically removed from its place of operation.**
- **1926.20(b)(4)**
  - **The employer shall permit only those employees qualified by training or experience to operate equipment and machinery.**

OSHA LOI on Equipment Qualification

- **QUESTION (2): Section 1926.20(b)(4) provides that only those who are qualified through training or "experience" are allowed to operate equipment. In this context, what does "experienced" mean? If a worker has operated the equipment a number of times in the past, does that automatically mean they are "experienced" for purposes of this req't?**

- **ANSWER: No. Title 29 CFR 1926.20(b)(4) states: The employer shall permit only those employees qualified by training or experience to operate equipment or machinery. [Emphasis added.] The term "experience" in this provision is used in conjunction with the term "qualified." Where an operator, through prior experience, has acquired the knowledge and skill necessary to safely operate the equipment, the operator may be considered "qualified by...experience" for purposes of this provision. However, *a history of having operated the equipment by itself does not necessarily mean that the operator knows how to safely and competently operate the equipment*.**

The provision requires the operator to be "qualified." If the worker has operated the machinery in the past but has not acquired the knowledge and skills necessary to safely operate the equipment, the experience is not sufficient to make the employee "qualified."

Is your Training Program Objective-based?

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Let's begin...

Compliance & Standards

OSHA – Occupational Safety and Health Administration

ANSI – American National Standards Institute

Compliance Considerations:

- *Incorporation by Reference*
- *Reasonable Standard of Care*
- *Due Diligence*

Ignorance is no excuse for compliance

Compliance Standards

- **OSHA Standards:**
  - 1910.67
  - 1910.269(p)
  - 1910.333(c)(3)
  - 1926.21 *Safety Training*
  - Aerial Lifts
  - Mobile Scaffolds
  - Fall Protection
  - Competent Person
  - Electrical Safety
  - Minimum Approach Distances
- **American National Standards Institute:**
  - A92.2
  - A92.3
  - A92.5
  - A92.6

Please Note:

additional federal and state compliance standards may apply depending on your scope of scope of work, task, conditions, etc…

OSHA standards are the only source of COMPLIANCE information for aerial lift selection, inspection, set-up, use and operator qualifications.

Poll locked. Responses not accepted.

True

False

Total Results: 1

OSHA's Definitions

- ***Aerial Device*** **- Any vehicle-mounted device, telescoping or articulating, or both, which is used to position personnel.**
  - **Vehicle = any carrier that is not manually propelled**
- ***Aerial Lift*** **- Any aerial device used to elevate personnel to job sites above ground including extensible boom platforms, aerial ladders, articulating boom platforms and vertical towers.**
- ***Scissor Lift*** **- A mobile supported scaffold which can be powered or unpowered, is portable and caster or wheel-mounted.**
- ***Extensible Boom Platform*** **- Uses a single arm to lift the platform to the desired height and some have telescoping sections**
- ***Articulating Boom Platform*** **– an aerial device with 2 or more hinged boom sections.**
- ***Vertical Tower*** **– an aerial device designed to vertically elevate a platform**

ANSI

- **Vehicle Mounted** *(actual auto or truck)*
  - **Elevating or rotating, telescoping or articulating, or both for positioning or elevating personnel**
- **Manually Propelled**
  - **Does not move under its own power** *(push/pull)*
- **Self Propelled**
  - **Produces own power –** *gas, electric, LP, Diesel*
  - **Scissors, Articulating Booms, Vertical Work Platforms**
- **Boom Supported**
  - **Single arm fixed or telescoping**

Combining Compliance

- **Common understanding of actions for OSHA & ANSI**
- ***"Aerial Lift"* is used generically throughout webinar**
  - **Great deal of overlap for compliance**
  - **Exclude "trade terms" to avoid any confusion**
- **Specific requirements for equipment type will be explicit, when necessary:**
  - **Vehicle Mounted**
  - **Manually Propelled or Self Propelled**
  - **Boom Supported –** *Telescope or Articulating*
  - **Scissors Lift**

Which of the following is not considered an aerial lift?

Poll locked. Responses not accepted.

- Vehicle mounted (bucket truck) aerial lifts
- Manually propelled aerial lifts
- Hydraulic aerial lifts
- Boom supported aerial lifts
- Scissors lifts

Total Results: 1

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Operator Training

What do you want me to KNOW?

What do you want me to DO?

Operator Training must be Equipment-specific

Receiving training on one type of AL *does not* qualify an operator to operate all types of AL

1. **Equipment training** *(knowledge)*
2. **Demonstrate proficiency in actual operation** *(skill)*

Qualified Person is defined by **OSHA** as:

> *"by possession of a recognized degree, certificate, or professional standing, or who by extensive knowledge, training and experience,* ***has successfully demonstrated his/her ability*** *to solve or resolve problems relating to the subject matter, the work, or the project."*

Equipment-specific Training

No specific training is required to operate an aerial lift.

Poll locked. Responses not accepted.

True

False

Total Results: 1

Operator Training

- **Employees must be provided with:**
  1. **Manufacturer Operator's Manual**
  2. **Method of written reporting for deficiencies or safety hazards for repair or replacement**

- **All operators must:**
  1. **Demonstrate understanding of how to use the lift**
     - **Knowledge and Skill Assessment**
  2. **Be retrained if they do not demonstrate the skill or understanding needed for safe operation of an aerial lift**

Training Records

Undocumented Training Never Happened!

- **Names of employees trained, retrained, familiarized**
- **Name of the trainer(s)**
- **Date of training**
- **Type of aerial lift(s)**
- **Objectives of the training**
- **Any knowledge tests and/or skill assessments**

Good rule of thumb:
keep training records for a minimum of 5 years

Being trained to operate one type of aerial lift means that you are qualified to operate all types of aerial lifts.

Poll locked. Responses not accepted.

True

False

Total Results: 1

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Correct Equipment for the Task

Before any Work, Verify the Correct Equipment is Available

- **Are Employees Qualified to Operate the Aerial Lift?**
- **Verify Height and Width for Aisles and Doorways**
- **Elevation, Reach, Position***…can you get there?*
- **Indoors or Outdoors**
- **Site Conditions or Terrain***…are outriggers necessary?*
- **Number of Occupants and Fall Protection Considerations**
- **Types of Tools, Equipment, Materials**
- **Lift Capabilities, Load Charts**
- **Engine Type and Hazardous Locations**

Understanding Hazardous Locations

- **Hazard class determines which engine type can or cannot be in the environment**
  - **Class 1 – Flammable Gases or Vapors**
  - **Class 2 – Combustible Dust**
  - **Class 3 – Ignitable Fibers of Flyings**

"It shall be the responsibility of the operator to understand the hazard classification of the intended location of the operation according to ANSI/NFPA 505-1996"

Engine Types

Carbon Monoxide or other Concerns?

Gasoline

- **Type G – no explosion protection**
- **Type GS – all available explosion protection**

LP-gas

- **Type LP – no explosion protection**
- **Type LPS – all available explosion protection**

Diesel

- **Type D – no explosion protection**
- **Type DS – add'l explosion pro.**
- **Type DY – all available explosion protection**

Electric

- **Type E – no explosion protection**
- **Type ES – add'l explosion pro.**
- **Type EE – add'l explosion protection over ES**
- **Type EX – all available explosion protection**

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Inspections

Inspection Objectives

OSHA

- **The use of any machinery, tool, material or equipment which is not in compliance with this part is prohibited**
  - General Health and Safety Provision – 1926.20(b)(2) & (3)

ANSI

- **Any suspected items shall be carefully examined and a determination made by a qualified person as to whether they constitute a safety hazard.**

Qualified Person is defined by **OSHA** as:

> *"by possession of a recognized degree, certificate, or professional standing, or who by extensive knowledge, training and experience, **has successfully demonstrated his/her ability** to solve or resolve problems relating to the subject matter, the work, or the project."*

Aerial lift inspections are optional as long as your supervisor says everything is ok.

Poll locked. Responses not accepted.

True

False

Total Results: 1

Classification of Inspections

- **Initial** – prior to initial use, by a qualified person
- **Frequent**
  - **Vehicle Mounted** = daily to monthly, by a qualified person
  - **Boom, Self-propelled, Manually Propelled** = every 3 months or 150 hours, whichever comes first, or unit is out of service > 3 months
- **Periodic** – 1 to 12 months, by a qualified person
  - **Vehicle Mounted** = daily to monthly, by a qualified person
  - **Boom, Self-propelled, Manually Propelled** = at intervals no greater than 13 months by a qualified mechanic
- **Post-Event** – following any event with suspected stress or excessive loading to structural members

Inspection Records

OSHA/ANSI do not require documented daily inspections

- Undocumented Inspections Never Happened!

Vehicle Mounted Aerial Lifts

- Frequent – all unsafe conditions shall have a record of correction kept for minimum 5 years
- Periodic – dated/signed record kept for minimum 5 years
- Modification – written approval from manufacturer kept for entire duration of equipment own/lease/use

Boom Supported, Manually Propelled, Self-propelled

- Frequent & Periodic – written record containing deficiencies, corrective action and person performing repairs
- Maintain records for a minimum of 4 years

Inspection Reporting

- **All identified safety hazards must be reported in writing**
  - **Record of the correction shall be maintained for a minimum of 5 years**
- **Documented daily inspections support consistent, reliable, efficient inspections**
  - **Inspection document becomes a written record used to report a safety hazard**
  - **Proves due diligence**

Operator Inspection Responsibilities

1. **Prestart Inspection**
2. **Workplace Inspection**

How many inspections must be performed before operating an aerial lift?

Poll locked. Responses not accepted.

1

2

3

Total Results: 1

#1 - Prestart Inspection – 2 parts

Visual Inspection and Functional Testing shall be performed before use and at the beginning of each shift to include, but not limited to:

- ***Items specified by manufacturer***
  - Not going to see these items on a generic aerial lift inspection form
- Operating and emergency controls
- Safety devices and interlocks
- Personal protective devices
- Air, hydraulic, fuel system leaks
- Cables and wiring harnesses
- Loose or missing parts
- Tires and wheels
- Placards, warnings, control markings, operating manuals
- Outriggers, stabilizers, other structures
- Guardrail systems, fall protection devices

Always Read and Follow the Manufacturer's Operating Manual(s) for Equipment-specific Inspection Standards

Read & Follow Manufacturer Operator's Manual

The Operator shall be familiar with the manuals and reference them as need and as required.

The Operator shall ensure the operating and maintenance manuals are stored in the weather resistant storage compartment on the aerial lift.

The manual(s) is considered an integral part of the aerial lift and is vital to communicate necessary safety information to the operator.

Operational Aid vs. Safety Device

Operational Aid

Examples: *boom angle indicator or radius indicator*

- **Allows for alternative aid/device/measure use to continue with normal operations**
- **Repair is needed but can use "manual" alternative**

Safety Device

Examples: *angle stop, interlock, horn, backup alarm, data plate*

- **Alternate aid/device/measure shall not be used and equipment is out of service until repaired**

Safety Device Examples

- **Emergency Stop**
- **Tilt Alarm warning device**
- **Function Enable**
- **Detent on Joystick or other Controls Limit Switch:**
- **Guard Rails**
- **Anchorages**
- **Placards -** *safety or instructional decals, stickers or labels*
- **Pot Hole Protection**
- **Scissor Arm Prop**
- **Emergency Lowering Controls or Auxiliary Power/Lowering**
- **Audible Warning Devices**
- **Warning Indicator Lights**
- **Drive Orientation Override or Drive Enable**
- **Flashing Beacons or Strobes**

Out of Service Until Repaired or Replaced

Tires

- **Primary or secondary source of equipment stability**
- **Manufacturer-specific make/model/manufacturer**
  - **Included in Counterweight Design**
  - **Check for mismatched tires, different make or model**
- **Fill agents:**
  - **Pneumatic – maintain specific compressed air pressure**
  - **Nitrogen – will not react with other elements and therefore will not contribute to oxidation** (rusting) **or support combustion**
  - **Liquid-filled - Commonly referred to as ballast or hydrofill, these tires are filled with a liquid compound** (calcium chloride and water) **weighing approx. 3 ½ times more than water and will not freeze**
  - **Foam-Filled – foam is available in various weights and densities**
  - **Urethane-Filled – solid tires may be filled with urethane** (rubber-like)

Tires are Critical for Stability

Beware of Mismatched Tires

Aerial lift tires can be of any make, model and/or manufacturer.

Poll locked. Responses not accepted.

True

False

Total Results: 1

Data Plate

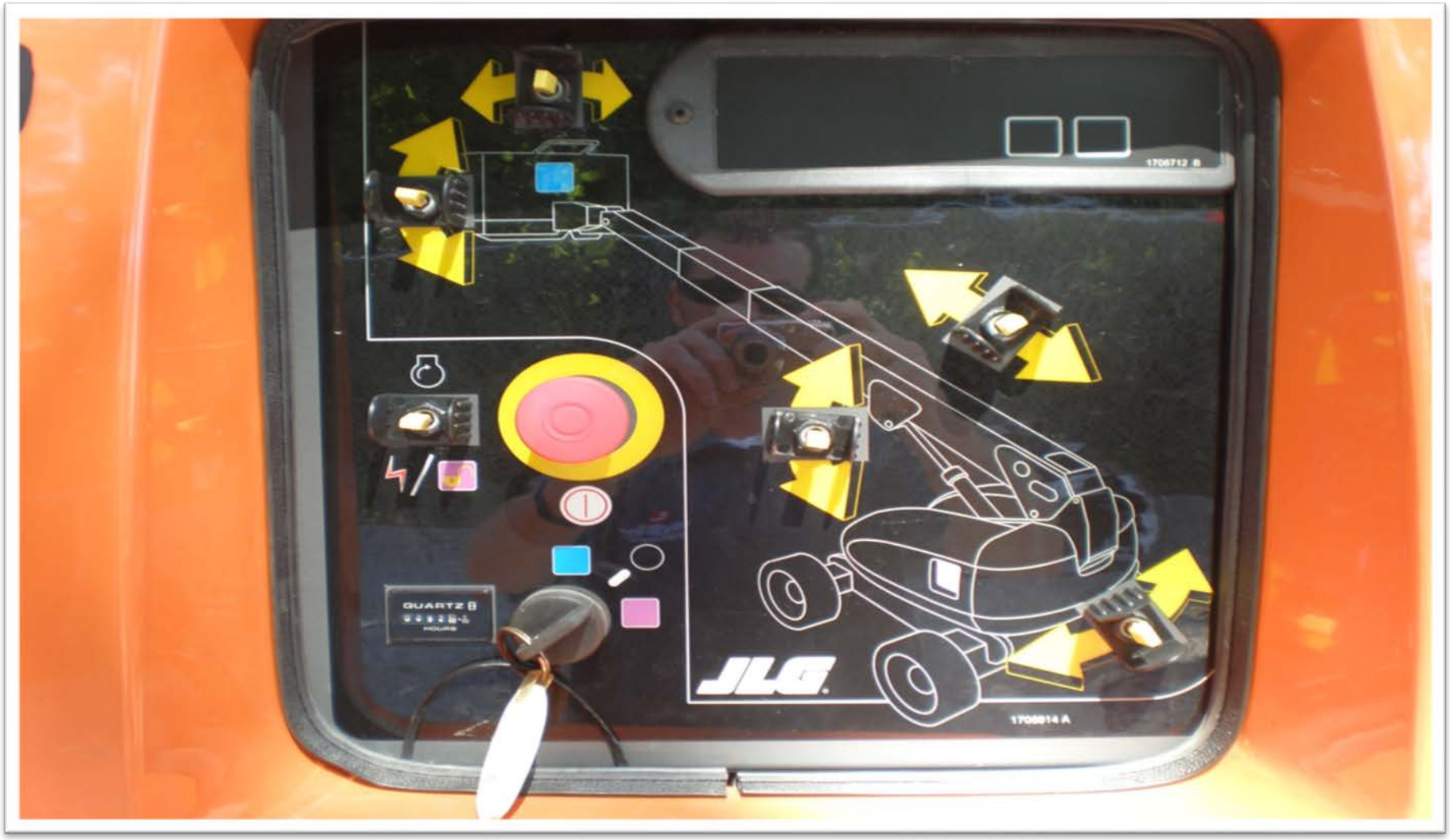
Must Be Legible!

- **Primary source of basic information for Aerial Lift planning, capabilities and limitations**
- **Manufacturer's equipment specification, information, data**
  - **Load Rating, Lift Capacity, Number of Personnel**
  - **Max Height, Radius, Reach**
  - **Weight restrictions and load distribution**
  - **Engine Type, Tire Description**
  - **Slope or Grade Restrictions**

Pothole Protection

- Apparatus providing additional support in the event that a wheel is driven into a hole

Lower Controls



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Verify all Decals are Legible

When Necessary, Order New Decal Kits

Placards, Markings, Decals

- **Death or serious injury WILL occur if all necessary precautions are not followed**

- **Death or serious injury MAY occur if all necessary precautions are not followed**

Where a safety hazard is identified, the deficiency shall be reported in writing to a person and a record of the correction shall be maintained for a minimum of 5 years.

Poll locked. Responses not accepted.

True

False

Total Results: 1

#2 - Workplace Inspection

Before and during use, the Operator shall check the area of operation for possible hazards such as, but not limited to:

- Drop offs, slope(s) or holes – concealed by ice, water, mud, debris, etc.
- Excavations, trenching, potholes
- Bumps, penetrations, floor obstructions
- Debris or garbage
- Overhead obstructions and
- Electrical conductors or energized parts
- Hazardous locations and atmospheres
- Surface conditions and ability to support a load
- Wind and weather conditions
- Presence of unauthorized persons or pedestrians

Factors Affecting Stability

Slopes, Uneven Ground & Surface Load Capabilities

Slopes & Grades

- **Aerial lifts should not be driven on grades or slopes exceeding those specified:**
  - Data Plate
  - Caution Placards
  - Listed in the Operations Manual
- **Often listed in:**
  - Maximum %-grade
  - Slope angle

Which of the following is not considered a required aerial lift inspection?

Poll locked. Responses not accepted.

- Level 1 operator inspection
- Prestart inspection
- Workplace inspection

Total Results: 1

Overhead Lines and other Electrical Hazards

Minimum Approach Distances

Unknown Voltages

Energized Parts

Electrical Precautions

Table A – ANSI A92.2 appendix-F

- Up to 50kV = 10-feet
- Above 50kV = 10-ft plus 4-inches for every add'l 10kV

OSHA 1926.1408 Table A

TABLE A—MINIMUM CLEARANCE DISTANCES

Voltage (nominal, kV, alternating current)	Minimum clearance distance (feet)
up to 50	10
over 50 to 200	15
over 200 to 350	20
over 350 to 500	25
over 500 to 750	35
over 750 to 1,000	45
over 1,000	(as established by the utility owner/operator or registered professional engineer who is a qualified person with respect to electrical power transmission and distribution).

Note: The value that follows "to" is up to and includes that value. For example, over 50 to 200 means up to and including 200kV.

Unknown Voltages?

Always go with the most stringent standard

Precautions are defined by task or application

TABLE A—MINIMUM CLEARANCE DISTANCES

Voltage (nominal, kV, alternating current)	Minimum clearance distance (feet)
up to 50	10
over 50 to 200	15
over 200 to 350	20
over 350 to 500	25
over 500 to 750	35
over 750 to 1,000	45
over 1,000	(as established by the utility owner/operator or registered professional engineer who is a qualified person with respect to electrical power transmission and distribution).

Note: The value that follows "to" is up to and includes that value. For example, over 50 to 200 means up to and including 200kV.

2-day Response Requirement

1926.1407(e) *Voltage information.*
Where Option (3) of this section is used, the utility owner/operator of the power lines must provide the requested voltage information within two working days of the employer's request.

October 13, 2011

Charles Kelly, Director
Industry Human Resource Issues
Edison Electric Institute
701 Pennsylvania Avenue, N.W.
Washington, D.C. 20004

Dear Mr. Kelly:

On October 6, 2010, Edison Electric Institute (EEI) filed a Petition of Review in *EEI vs. the Occupational Safety and Health Administration and Secretary of Labor (OSHA), No. 10-1311 (D.C. Circuit)*challenging various aspects of OSHA's final rule, Cranes and Derricks in Construction (Subpart CC). EEI and OSHA entered a settlement agreement, dated August 22, 2011, in which OSHA agreed to clarify the two Subpart CC requirements below in a letter of interpretation. This letter fulfills that obligation.

(1) 29 CFR §1926.1407(e) states:

> *Voltage information. Where Option (3) of this section is used, the utility owner/operator of the power lines must provide the requested voltage information within two working days of the employer's request.*

Thus, §1926.1407(e) allows a utility owner/operator two working days to provide the requested information. For the purposes of this provision, working days include all calendar days except weekends and holidays. See *75 Fed. Reg. 47951* (Aug. 9, 2010). For example, if an electric utility receives a request for voltage information on one of its distribution lines on a Friday, it will have until the end of the business day on the following Tuesday to provide the necessary information (assuming there are no holidays in between).

(2) The provisions of §1926.1408 (Power Line Safety) allow deenergization as one option for employee protection from electrical hazards of power lines. Employers choosing this option must not proceed with this option if the electric utility does not de-energize the power line, but Subpart CC does not require utility companies to deenergize power lines.

Minimum Approach Distances (MAD) for electrical hazards like overhead lines and energized parts do not apply to aerial lifts.

Poll locked. Responses not accepted.

True

False

Total Results: 0

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Fall Protection

Clarify Common Misunderstandings

Fall Protection Training

Subpart M – Fall Protection

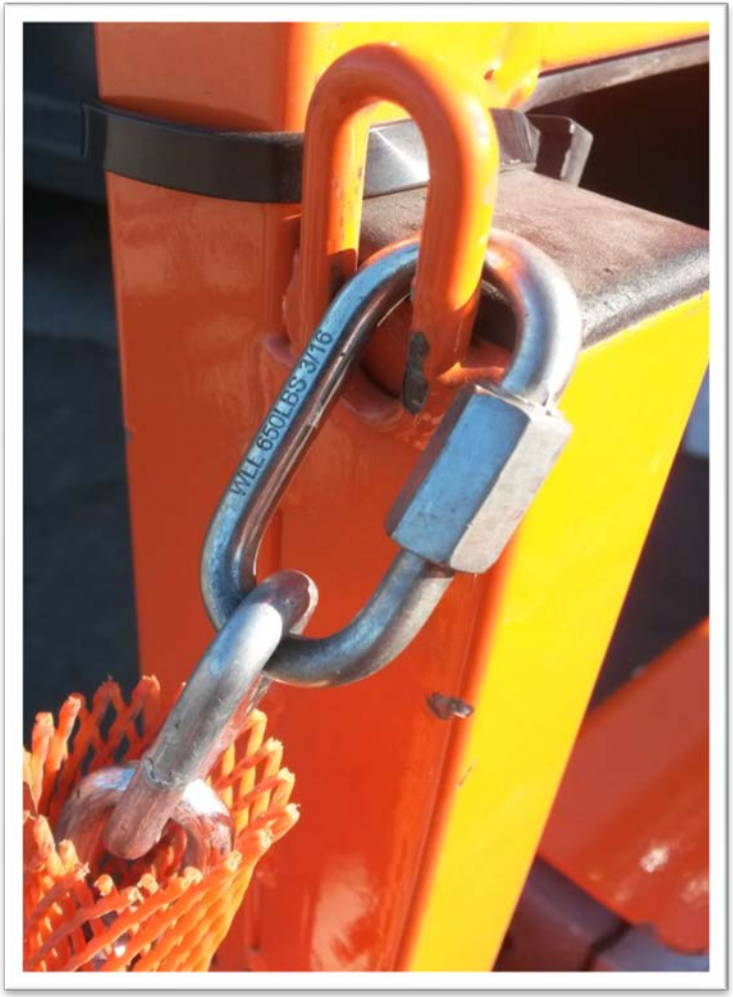
1926.503(a) – The employer shall provide a training program for each employee who might be exposed to fall hazards. The program shall enable each employee to recognize the hazards of falling and shall train each employee in the procedures to be followed in order to minimize these hazards.

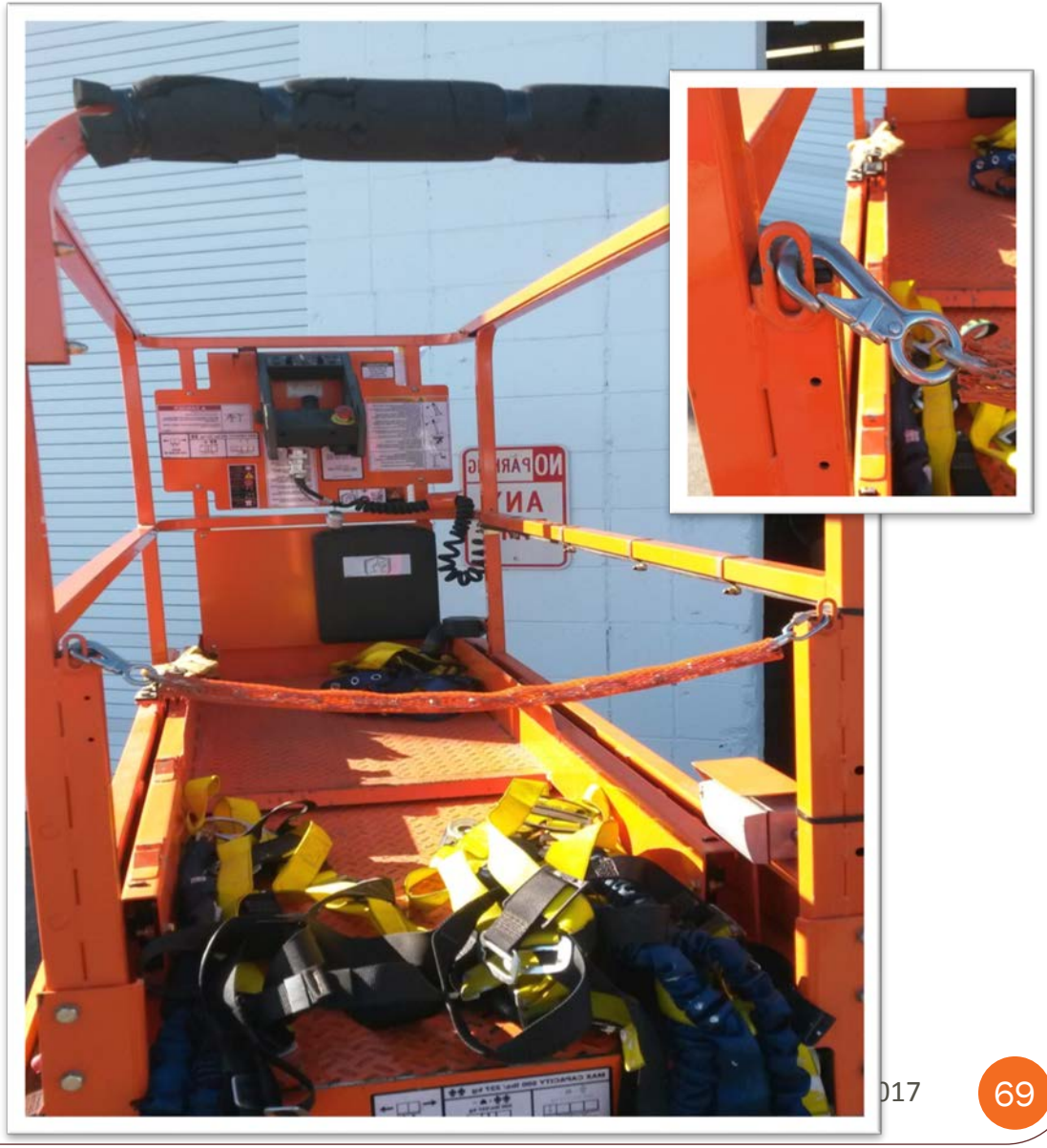
Common Concerns w/o Training

Scissor Lifts & Fall Protection

- **Scissor lifts are regulated as mobile scaffolds and not as aerial lifts**
  - **Scissor Lifts Fall Protection Regulations - 1926.451**
  - **Personal Fall Arrest System is not required**
- **Personal fall arrests systems can be used or guardrail systems** (with closing gate or latch chain) **that meet the requirements of 1926.451 must be installed on all open sides and ends of platforms.**

Chain is Part of Fall Protection





Using guard rails as a primary means of fall protection on a scissors lift is not OSHA and ANSI compliant.

Poll locked. Responses not accepted.

True

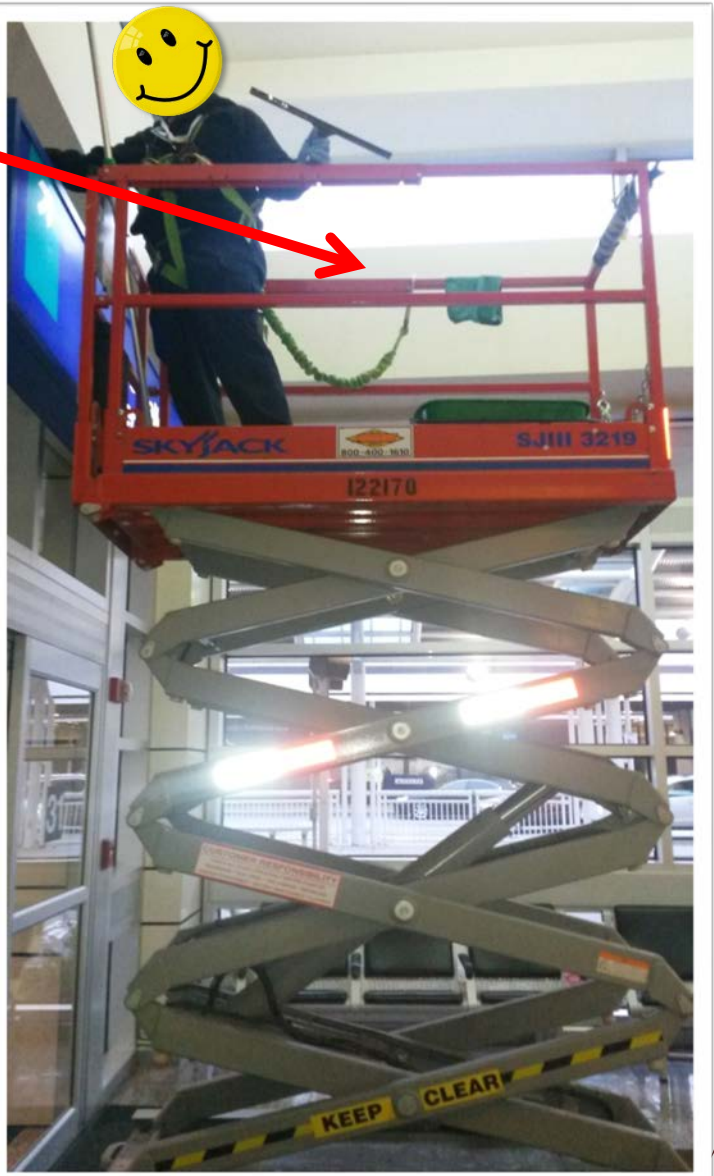
False

Total Results: 1

Employer Requires Fall Protection

- **Employer policy requires personal fall protection to be worn**
  - Example: Wearing Fall Protection in a Scissors Lift
- **Solutions:**
  - **Rent, Lease, Purchase Equipment with Rated Attachment Point(s)**
  - **Qualified Mechanic installs Manufacturer Approved, Rated Attachment Point(s) to Existing Equipment**

Is this a Rated Attachment Point?



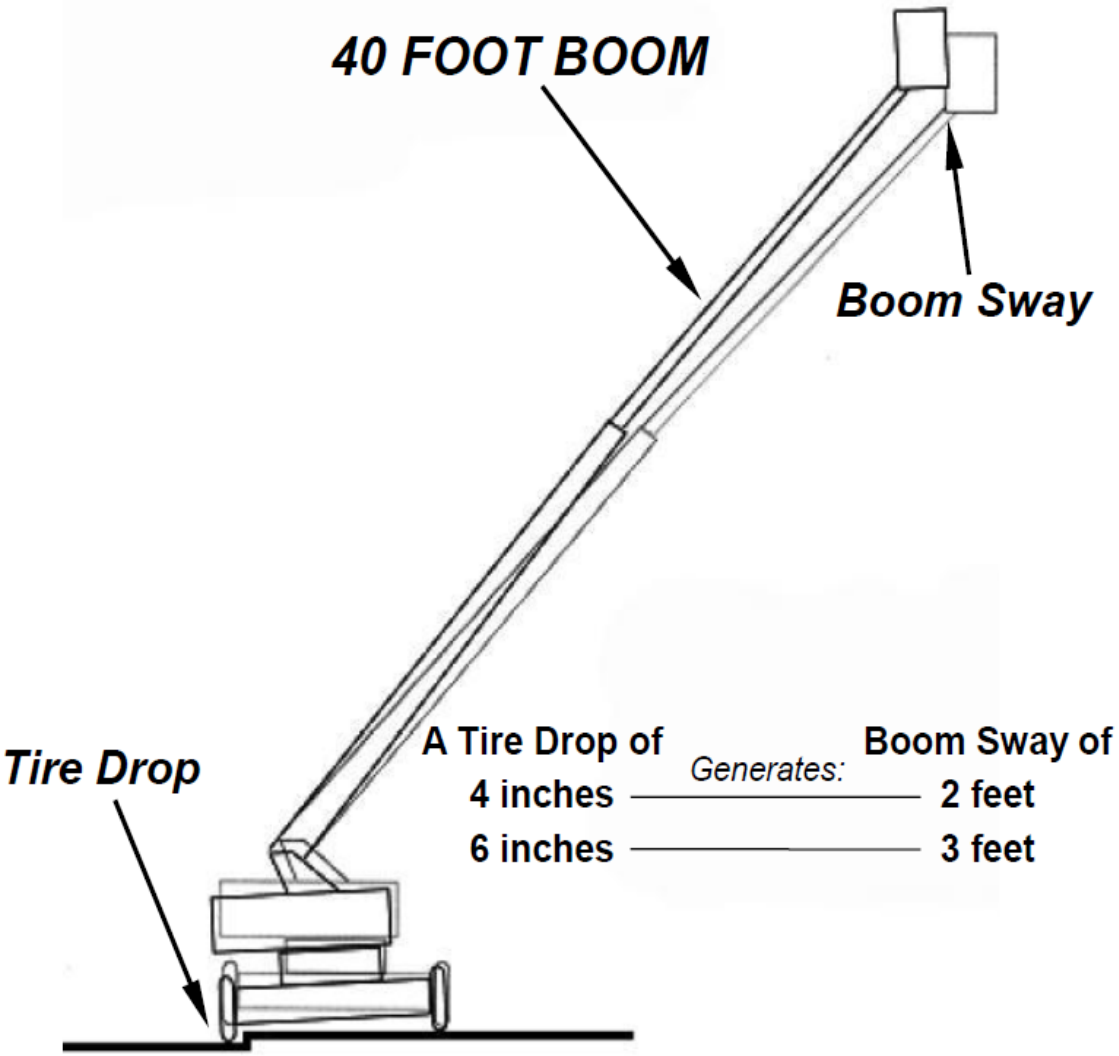
Fall Arrest Anchorages shall be capable of supporting at least 5,000 pounds per employee

Fall Restraint or Positioning Devices shall be secured to an anchorage capable of supporting at least 3,000 pounds or 2x the potential impact load of an employee's fall or, whichever is greater

Must Use a Rated Attachment Point

Boom Sway

- **Dynamic forces are forces generated by movement or change of movement.**
- **Sudden stops while raising or lowering the platform can also cause instability.**
- **Traveling the platform over rough or uneven ground can also cause instability.**



“Catapulting” Hazard

- **Boom supported aerial lifts require a personal fall protection system**
- **Guardrails and buckets provide some fall protection but due to “catapulting” characteristics it is necessary to have additional fall protection**
- **Lanyard length must conform to manufacturer guidelines**

Lives are Saved when Used Correctly…

When using a fall protection harness and lanyard, using either a manufacturer approved, rated anchorage point or a heavy gauge steel guardrail is an approved method for tying off.

Poll locked. Responses not accepted.

True

False

Total Results: 0

October 23, 2002

Frances Youney
C.Y. Concepts, INC.
440 Stone Road
Rochester, N.Y. 14616

Question: can I stand on the aerial or scissor lift guardrails if I am wearing fall protection?

Re: Whether workers may stand on scaffold guardrails; anchor points; §§1926.450, 1926.502(d).

Dear Mr. Youney,

This is in response to your August 6, 2002, letter to the Occupational Safety and Health Administration (OSHA). We apologize for the delay in answering your inquiry.

Question: *Is it permissible to allow workers to stand on boom lift[1] guardrails or scissor lift guardrails in order to perform work if they use a personal fall arrest system?*

Answer

Aerial lifts

The answer is no for aerial lifts. Section 1926.453(b)(2)(iv) states that *"employees shall always stand firmly on the floor of the basket, and shall not sit or climb on the edge of the basket or use planks, ladders, or other devices for a work position."*

Scissor lifts

The requirements of 29 CFR Part 1926 Subpart L (Scaffolds) applies to scissor lifts. There is no single provision in the scaffold standard that states that this practice is prohibited. However, as a practical matter, it is unlikely that all the requirements of the scaffold standard could be met while engaging in this practice.

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Rough Terrain Forklifts & Personnel Platforms

Manufacturer Requirements

- **Personnel platforms are prohibited, unless the forklift manufacturer** *(operator's manual)* **specifically approves such use**
- **If forklift operator's manual is silent on whether the equipment may be used to elevate personnel:**
  - **Employer must Determine if Forklift was Designed for such Use**
  - **The Standard places the Obligation on the Employer to ensure that a Forklift is used to Elevate Personnel only when the Manufacturer has Designed/Approved the Equipment to do so.**
  - **Employer could Either:**

    A. Request Written Permission/Approval from the Manufacturer, or

    B. Where Manufacturer Information is Unavailable, Obtain a Certification by a Registered Professional Engineer (PE)

Common Understanding

- **Subpart L – Scaffolds**
  - **Platform = *work surface elevated above a lower level***
  - **1926.451 thru 1926.454 and Appndx. A-E**
  - **Capacity, Construction, Access, Use, Fall Protection, Employee Training, Forklift Operator**
- **Guardrails, Access & Openings**
- **Fall Restraint Anchorage Points**
  - **Personal Fall Restraint System**

Compliance Considerations

- **Forklift shall not be moved horizontally while the platform is occupied**
- **Entire platform must be securely attached to the forks**
- **ANSI B56.6-1992 Safety Standards for Rough Terrain Forklift Trucks**
  - **Platform Width Must Not exceed 10-inches beyond the Width of the Forklift**
  - **If the manufacturer designed it without this 10-inch limitation, then it be a violation of §1926.451(a)(6) to exceed it.**

Forklifts and Personnel Platforms

Safe, efficient alternative to working from ladders or other types of scaffolding……when used correctly!

Is this a Compliant Setup?

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Setup and Use

Read & Follow Manufacturer Operator's Manual

The Operator shall be familiar with the manuals and reference them as need and as required.

The Operator shall ensure the operating and maintenance manuals are stored in the weather resistant storage compartment on the aerial lift.

The manual(s) is considered an integral part of the aerial lift and is vital to communicate necessary safety information to the operator.

Before Moving an Aerial Lift…

- **Boom(s) must be properly cradled and outriggers must be in stowed position**

Personnel Footing

- **Personnel shall maintain firm footing on the platform floor at all times**
  - **Climbing or Standing on a Mid-rail or Top Rail is Prohibited**
  - **Planks, Ladders or any other Device on the Platform for achieving additional Height or Reach is Prohibited**

Load Charts

Always Review Operator's Manual

- **Rated capacities shall not be exceeded**
- **Loads shall be evenly distributed according to the manufacturer's rated capacity**

Lateral Force and Tip Overs

Read & Understand Operator's Manual

- **How much lateral force is allowed by the manufacturer?**
  - **Elevated Structures Amplify Movements and Forces**
  - **Force needed to Tip Over your Equipment may be Surprisingly Low**

Loading or Overloading?

It is the responsibility of the operator to know the total load including tools, supplies and other employees. The weight of the load should be within the manufacturer's suggested maximum safe working load.

Modifications to Equipment

Modification or alteration of an aerial lift or the fabrication and attaching of frameworks, or mounting of attachments for holding tools or materials onto the platform or the guardrail system shall only be accomplished with the prior written permission of the manufacturer.

Several Factors affect Stability

- **Unit Configuration**
- **Weight Distribution**
- **Motion or Speed**
- **% Grade or Incline**
- **Center of Gravity**
  - **The more sudden, severe or abrupt the action is, the more adverse an effect on stability**
    - *Stopping, Turning, Moving Forward or Reverse*
  - **If for any reason the CG is forced outside this defined area, the machine will tip over.**

Outriggers & Stability

- **Outriggers, stabilizers, extendable axles, axle locks, or other means shall be deployed and locked into place, as required by the manufacturer**

Using outriggers is optional when there at least 3/16" inch thread depth on each tire

Poll locked. Responses not accepted.

True

False

Total Results: 1

Outrigger Mats

To be Effective, Outrigger Mats must be at least 3-times the Surface Area of the Outrigger Pad

Transferring from Lift Platform to an Adjacent Structure

This is in response to your letter of July 26, 2000, requesting interpretations on the use of aerial lifts to transport workers to and from elevated workstations and the applicability of §1926.453 (b)(2)(iii) to scissor lifts. We apologize for the lateness of this response.

Question 1: Do the OSHA standards permit employers to use aerial lifts to transport workers to and from elevated work stations where the basket is either set down on an elevated surface or placed at the edge of a structure?

Answer: OSHA standards do not prohibit employees from exiting or entering an aerial lift basket that rests on or adjacent to an elevated surface. Section 1926.453(b)(2)(v) requires that employees working from aerial lifts be tied-off. On the other hand, when employees move from the basket to the elevated surface, the requirements in 29 CFR Part 1926 Subpart M apply. In particular, §1926.501(b)(1) requires fall protection at 6 feet above a lower level. A worker may enter or exit an aerial lift (at heights above 6 feet) provided that fall protection such as guardrails or a fall arrest system is used while the worker moves between the lift and the working surface. A fall arrest system and its components must meet the criteria in §1926.502(d). During entry to and egress from the lift, a worker may tie-off to the lift (**if** the lift is designed to withstand the vertical and lateral loads imposed by the employee's movement itself or by an arrested fall) or to an appropriate nearby structure.

Transfer from Platform to Other Structure

- **100% tie off is required**
  - **Two Lanyards are Required to Perform the Transfer**
  - **One must be Anchored to the Platform and the other to the Structure before Transferring**
- **Platform must be within one foot of the structure**
- **Another employee on the ground should guide the operator when transporting the lift from one area to another on the work site**
- **Operator must ensure the boom is never over an employee that is working on the ground**

In order to be effective, the minimum size of outrigger matts should be:

Poll locked. Responses not accepted.

- 3 times the tire height.
- At least the size of the outrigger pad.
- 2 times the length and width of the outrigger pad.
- 3 times the surface area of the outrigger pad.

Total Results: 1

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Rescue Considerations

Options for Rescue

Ground Controls – ensure that other personnel have been trained and familiarized to operate the ground controls and a key is left in the ground controls during operation.

Second AWP – if possible, include a second AWP along with a method to transfer personnel in a way that prevents falling.

Portable Lift – certain situations will allow for a portable lift to be used to aid in the rescue of incapacitated workers at height by providing the portability of a ladder but the benefit of an aerial work platform.

Pre-installed Self-rescue System – allow the operator to self-rescue by leaving the basket, use a secondary means to safely lower themselves to a safe level.

Self Rescue Equipment – provides an aerial work platform operator a tool or device to allow them to lower themselves from the machine in the event of an emergency. This equipment requires extensive training and machine manufacturer approval prior to use.

Rescuing a Suspended Worker

- **Call 911 Immediately**
- **If self-rescue is impossible, or if rescue cannot be performed promptly, the worker should be trained to "pump" his/her legs frequently to activate the muscles and reduce the risk of venous pooling.**
  - **Footholds can be used to alleviate pressure, delay symptoms, and provide support for "muscle pumping."**
- **Continuously monitor the suspended worker for signs and symptoms of orthostatic intolerance (caused by venous pooling of blood) and suspension trauma.**

Suspension Trauma

- **Rescue death** (or reflow syndrome) **is a fatal condition that can occur after blood pools in a part of the body for a prolonged period such as during suspension trauma and the body goes into shock.**
  - **Some authorities recommend that the patient be transported with the upper body raised.**
- **After rescue, ensure that the worker is evaluated by a healthcare professional.**
  - **Possible delayed effects, such as kidney failure, which is not unusual in these cases, are difficult to assess on the scene.**

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Hoisting & Suspending Loads

Manufacturer Approved?

Vehicle Mounted Aerial Lifts

Only aerial lifts specifically designed to suspend or hoist a load

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Parking & Shut Down

Standard Procedures

- **Whenever possible, park on firm, level ground**
- **Retract and lower all boom/platform sections**
- **Shutdown the main power source (engine/battery)**
- **Remove key(s) to secure the equipment**
- **Lock all access panels/filler caps**
- **Chock the wheels**
- **Switch/lock main power source to off position**
- **Check operator's manual for any additional shutdown procedures**

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Refueling or Recharging

Refueling Precautions

- **Safe fueling generally comes down to observing three necessary precautions:**
  1. **Shutdown and secure unit before refueling**
  2. **Wear the required PPE**
  3. **Read and understand the manufacturer's instructions regarding safe fueling procedures, including the type and grade of fuel used and the location of the fuel filler spout**
- **Handling certain fuels** *(e.g. Propane)* **may require specific training and certification beyond the scope of this training program**
  - **Contact your supervisor about any refueling questions**

Recharging Batteries

- **Risk = Hydrogen Gas Ignition/Explosion**
  - **oxygen and hydrogen are released after a cell has achieved approximately 95 % of its charge**
  - **Boost charging or overcharging increases the risk and concentration of hydrogen gas release**
- **Batteries shall charge in a well-ventilated area free of flame, sparks or other hazards that may cause fire or explosion**

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In Closing...

Aerial Lifts have a High Potential for Accidents, Injuries and Fatalities

Falls, tip over and electrocution ***8 out of 10 fatalities***

Top Compliance Concerns

- **Lack of Fall Protection**
  - **Improper Use or Not in Use**
- **Improper Operation & Loading/Overloading**
- **Lack of Overhead Protection**
- **Lack of Electrocution Protection or Minimum Approach Distances not Achieved**
- **Lack of Stability, Improper Positioning or Setup on Unstable Ground**

Read the Manufacturer Operator's Manual

The Operator shall be familiar with the manuals and reference them as need and as required.

The Operator shall ensure the operating and maintenance manuals are stored in the weather resistant storage compartment on the aerial lift.

The manual(s) is considered an integral part of the aerial lift and is vital to communicate necessary safety information to the operator.

Thank You!

Chad Stuart

Safety & Risk Specialist

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