

## **Aerial Lift Safety**

Safe Use of Bucket Trucks, Aerial Lifts (OSHA Standard 1910.67, 1926.453)

### **General Use Requirements:**

ANSI/SIA A92.5-1992 (Boom Supported Elevating Work Platforms), including Appendix items, specify the design and construction requirements for aerial lift devices.

Aerial lift devices are used to elevate personnel to job sites above the ground. These include extensible boom platforms, aerial ladders, aerial ladder trucks, articulating boom platforms, vertical towers, and any combination of these devices.

### **Definitions:**

- An aerial device, by definition, includes any vehicle-mounted device, telescoping or articulating, or both, which is used to position personnel.
  - An articulating boom platform is an aerial device with two or more hinged boom sections.
  - An extensible boom platform, by definition, is an aerial device (except ladders) with a telescopic or extensible boom. Telescopic derricks with personnel platform attachments are considered to be extensible boom platforms when used with a personnel platform.
  - A mobile unit is a combination of an aerial device, its vehicle, and related equipment.
  - A platform, or elevated platform, by definition, is any personnel-carrying device (basket or bucket) which is a component of an aerial device.
  - A vehicle, by definition, is any carrier that is not manually propelled.
  - A vertical tower, by definition, is an aerial device designed to elevate a platform in a substantially vertical axis.
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- Aerial lift devices may be constructed of metal, wood, fiberglass, reinforced plastic (RFP), or other materials.
  - Aerial lift devices may be "field modified" for use other than those intended by the manufacturer, provided the modification has been approved, in writing, by the manufacturer or by an equivalent authority, such as a nationally recognized testing laboratory, to be in conformity with ANSI/SIA A92.5-1992 requirements, to be at least as safe as the equipment prior to modification.
  - Aerial lift devices and personnel working near electrical power lines must meet the requirements contained in the OSHA Standard 1910.333 (c) (3), Subpart S-Electrical, Selection and Use of Work Practices (e.g. de-energizing procedures; grounding overhead lines; required work distances relative to overhead electrical power lines; unqualified and qualified employees working in the vicinity of overhead electrical power lines; and vehicular and mechanical equipment in the vicinity of overhead power lines). Consult with New River Light and Power Company officials prior to performing work near energized power lines. See OSHA Standard 1910.333 (c) (3) for details.

**General Aerial Lift Device Use Practices Include:**

- On ladder trucks and tower trucks, secure aerial ladders in the lower traveling position by locking the device on top of the truck cab, and the manually operated device at the base of the ladder prior to moving the truck. Insure outrigger devices (if equipped) are properly stored prior to moving.
- Set the brakes and position the outrigger devices (if equipped) on pads or similar solid surfaces and install the wheel chocks before using aerial lift equipment (especially on inclines).
- Do not move aerial lift trucks with employees located in the elevated work boom position, except for equipment specifically designed or certified as "field modified" for this type of operation.
- Insure that aerial lift devices equipped with working elevated platforms contain both elevated platform (upper) and lower controls. Upper controls are located in or beside the elevated platform, within easy reach of the operator. Lower controls are designed to override the upper controls.
- Check to be sure that controls are plainly marked as to their function.
- Test lift controls each day prior to use to insure safe working conditions.
- Insure loads and distribution on working platforms and platform extensions are in accordance with manufacturer's rated capacity and do not exceed rated load limits. Affix stickers to vehicle that indicate manufacturer's rated load capacity of the working elevated platform and/or elevated platform extensions.
- Insure all personnel in the working elevated platform are wearing appropriate personal protective devices at all times (e.g. hard hats to protect from overhead falling objects, being struck with nearby objects, struck by flying objects; safety shoes/boots; goggles/safety glasses with side shields/hard hat with shield; gloves; other protective clothing).
- Insure that each employee uses an appropriate full body harness and two foot lanyard device attached to the basket to be used to limit workers motion and keep their feet on the work deck.
- Keep feet firmly on the floor of the basket or elevated platform at all times.
- Do not sit, climb or position yourself on the edge of the basket or elevated platform.
- Do not use planks, ladders or other devices as substitute work positions.
- Do not operate lower controls unless permission has been obtained from the employee(s) in the elevated platform, except in case of an emergency.
- Do not position the aerial lift device against another object to steady the elevated platform.
- Do not use aerial lift devices as a crane or other lifting device.
  
- Do not operate aerial lift devices from trucks, scaffolds, or similar equipment unless approved in writing by the manufacturer.
- Limit travel speeds of aerial lift devices according the conditions of the ground surface, congestion, visibility, slope, location of personnel and other factors that may cause hazards to other nearby personnel.

- Shut down the aerial lift device engine prior to fueling. Fuel engines or charge fuel cylinders in well ventilated areas free of flames, sparks or other hazards which may cause fires or explosions.
- Charge batteries in well ventilated areas free of flames, sparks or other hazards which may cause fires or explosions.
- Be sure to maintain a clear view of the path of travel, maintain a safe distance from other obstacles, debris, drop offs, holes, depressions, slopes and other hazards. Maintain a safe distance from overhead obstacles (including overhead electrical power lines).
- Stunt driving and horseplay are prohibited.
- Do not position booms and elevated platform devices in an attempt to jack the wheels off the ground.
- Do not operate aerial lift devices on grades, side slopes or ramps that exceed the manufacturer's recommendations.
- If elevated platforms or elevated work areas become caught, snagged or otherwise do not operate properly, remove personnel from the platform prior to freeing the elevated platform using ground controls.
- Do not alter the insulated portion of an aerial lift device in any manner that might reduce its insulating effectiveness.
- Insure the area surrounding the elevated platform is clear of personnel and equipment prior to lowering the elevated platform.
- Perform inspections of aerial lift devices per manufacturer's, ANSI/SIA and other regulatory agency schedules. Make repairs immediately.
- Do not operate aerial lift devices with noted, reported deficiencies until repairs are made and equipment is authorized for use.
- Perform electrical system safety tests on aerial lift devices per ANSI/SIA A92.5-1992 requirements.
- Inspect hydraulic and pneumatic system components (Bursting Safety Factor) on aerial lift devices per ANSI/SIA A92.5-1992 requirements.
- Conduct welding operations on aerial lift devices per Automotive Welding Society (AWS) Standards.

**Training - Employees Using Aerial Lift Devices will be trained in:**

- Employees authorized to use aerial lift devices will receive training in accordance with manufacturer's operating instructions and routine maintenance requirements prior to operation.
- Employees authorized to use aerial lift devices will receive hands on training on the actual aerial lift device (or duplicate model) he/she will be expected to operate prior to actual use.
- Training will be under the direction of a qualified, competent individual capable of determining an employee's proficiency in knowledge and actual operation of the aerial lift device.

- Only properly trained and authorized employees are permitted to operate aerial lift devices. Employees will be given and display, when requested, cards, certificates or other form of identification that denotes successful completion and authorization to operate specific aerial lift devices.
- Departments will retain initial employee training records for individuals authorized to operate specific aerial lift devices for a minimum of 3 years. Subsequent refresher and other specialized training records will be maintained for a similar period. Previous employee training records may be replaced with copies of subsequent and other specialized training records.
- Departments will retain written records of initial and subsequent inspections performed on each aerial lift device for a minimum of 3 years. Subsequent inspection records will be maintained for a similar period. Previous inspection records may be replaced with copies of subsequent inspection records.
- Departments will retain written records of repairs performed on each aerial lift device for a minimum of 3 years. Records will include the date of repair, a description of the work accomplished and identification of persons performing the repair. Previous repair records may be replaced with copies of subsequent repair records.
- Departments will retain written records of all paperwork in connection with authorized "field modifications" made with respect to specific aerial lift devices.

"Overhead lines." if work is to be performed near overhead lines, the lines shall be de-energized and grounded, or other protective measures shall be provided before work is started. If the lines are to be de-energized, arrangements shall be made with the person or organization that operates or controls the electric circuits involved to de-energize and ground them. If protective measures, such as guarding, isolating, or insulating, are provided, these precautions shall prevent employees from contacting such lines directly with any part of their body or indirectly through conductive materials, tools, or equipment.

Note: The work practices used by qualified persons installing insulating devices on overhead power transmission or distribution lines are covered by 1910.269 of this Part, not by 1910.332 through 1910.335 of this Part. Under paragraph (c)(2) of this section, unqualified persons are prohibited from performing this type of work.

When an unqualified person is working in an elevated position near overhead lines, the location shall be such that the person and the longest conductive object he or she may contact cannot come closer to any unguarded, energized overhead line than the following distances:

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.

When an unqualified person is working on the ground in the vicinity of overhead lines, the person may not bring any conductive object closer to unguarded, energized overhead lines than the distances given in paragraph (c)(3)(i)(A) of this section.

Note: For voltages normally encountered with overhead power line, objects which do not have an insulating rating for the voltage involved are considered to be conductive.

"Qualified persons." When a qualified person is working in the vicinity of overhead lines, whether in an elevated position or on the ground, the person may not approach or take any conductive object without an approved insulating handle closer to exposed energized parts than shown in Table S-5 unless:

The person is insulated from the energized part (gloves, with sleeves if necessary, rated for the voltage involved are considered to be insulation of the person from the energized part on which work is performed), or

The energized part is insulated both from all other conductive objects at a different potential and from the person, or

The person is insulated from all conductive objects at a potential different from that of the energized part.

#### TABLE S-5 - APPROACH DISTANCES FOR QUALIFIED EMPLOYEES - ALTERNATING CURRENT

Voltage range (phase to phase) | Minimum approach distance

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300V and less .....	Avoid Contact
Over 300V, not over 750V .....	1 ft. 0 in. (30.5 cm).
Over 750V, not over 2kV .....	1 ft. 6 in. (46 cm).
Over 2kV, not over 15kV .....	2 ft. 0 in. (61 cm).
Over 15kV, not over 37kV .....	3 ft. 0 in. (91 cm).
Over 37kV, not over 87.5kV .....	3 ft. 6 in. (107 cm).
Over 87.5kV, not over 121kV ...	4 ft. 0 in. (122 cm).
Over 121kV, not over 140kV .....	4 ft. 6 in. (137 cm).

Any vehicle or mechanical equipment capable of having parts of its structure elevated near energized overhead lines shall be operated so that a clearance of 10 ft. (305 cm) is maintained. If the voltage is higher than 50kV, the clearance shall be increased 4 in. (10 cm) for every 10kV over that voltage. However, under any of the following conditions, the clearance may be reduced:

If the vehicle is in transit with its structure lowered, the clearance may be reduced to 4 ft. (122 cm). If the voltage is higher than 50kV, the clearance shall be increased 4 in. (10 cm) for every 10 kV over that voltage.

If insulating barriers are installed to prevent contact with the lines, and if the barriers are rated for the voltage of the line being guarded and are not a part of or an attachment to the vehicle or its raised structure, the clearance may be reduced to a distance within the designed working dimensions of the insulating barrier.

If the equipment is an aerial lift insulated for the voltage involved, and if the work is performed by a qualified person, the clearance (between the uninsulated portion of the aerial lift and the power line) may be reduced to the distance given in Table S-5.

Employees standing on the ground may not contact the vehicle or mechanical equipment or any of its attachments, unless:

The employee is using protective equipment rated for the voltage; or

The equipment is located so that no uninsulated part of its structure (that portion of the structure that provides a conductive path to employees on the ground) can come closer to the line than permitted in paragraph (c)(3)(iii) of this section.

If any vehicle or mechanical equipment capable of having parts of its structure elevated near energized overhead lines is intentionally grounded, employees working on the ground near the point of grounding may not stand at the grounding location whenever there is a possibility of overhead line contact. Additional precautions, such as the use of barricades or insulation, shall be taken to protect employees from hazardous ground potentials, depending on earth resistivity and fault currents, which can develop within the first few feet or more outward from the grounding point.

Name: \_\_\_\_\_ Date: \_\_\_\_\_ Score: \_\_\_\_\_

### **Aerial Lift Test**

1. The major causes of death from aerial lift include:
  - a. Electrocutions
  - b. Falls
  - c. Collapses/tipovers
  - d. All of the above
  
2. The major cause of electrocutions in boom-supported lifts is due to contact with overhead power lines.
  - a. True
  - b. False
  
3. Non-electrical workers must stay at least \_\_\_\_\_ feet away from overhead power lines.
  - a. 2
  - b. 5
  - c. 10
  - d. 50
  
4. Aerial lift operators are required to have motion-limiting devices which are a full body harness with a 2-foot lanyard attached to the cage rail which acts as a restraint device to keep the operator in the platform area.
  - a. True
  - b. False
  
5. Aerial lift operator training should include:
  - a. Nature of hazards involved in operating lift
  - b. Precautions for dealing with hazards
  - c. Rate load capacity for the lift
  - d. All of the above