Aerial Lift and Scissor Lift Safety

Introduction
This program is for employees who use aerial lift and scissor lift devices to perform various work duties. This program will discuss various types of aerial lift devices, scissor lifts, pre-start inspections, proper safety equipment, safety procedures, training and more.

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1. Definitions

a. Aerial device-Any vehicle-mounted device, telescoping or articulating, or both, which is used to position personnel.
b. 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.
c. Scissor lift-A mobile supported scaffold which can be powered or unpowered, is portable and caster or wheel-mounted.

2. OSHA Standards

While aerial lifts and scissor lifts are similar in function and use, there are distinct differences. OSHA recognizes these differences and applies different standards to these machines. This outline will make those distinctions known as appropriate for training purposes. OSHA covers the use of aerial lifts in CFR 1926.453 and CFR 1926.454. OSHA classifies scissor lifts as mobile scaffolds and covers them under CFR 1926.451, 1926.452(w) and 1926.454. The use of fall protection is required when using both lift devices.

3. Types of Aerial Lifts

a. Aerial lifts include the following types of vehicle-mounted aerial devices used to elevate employees to job-sites above ground:
i. Extensible boom platform- Uses a single arm to lift the platform to the desired height, often by hydraulics, or less frequently, pneumatic pressure. The length of the arm limits the reach of the boom lift. Some boom lifts can extend the reach by using telescoping sections within the arm;
ii. Aerial ladder-An aerial device consisting of a single- or multiple-section extensible ladder. Most often used by Fire Departments;

iii. Articulating boom platform- Operates in much the same way as the normal boom lift, except it consists of at least one joint in the arm. This joint allows the arm to be twice as long. Some are capable of rotating on an axis at the base or even on the second arm. The second arm can extend horizontally as well as vertically to reach over crowded and difficult areas. This lift provides great access to difficult areas; and

iv. Vertical towers- An aerial device designed to elevate a platform in a substantially vertical axis.

4. **Scissor Lifts**

Scissor lifts are another common type of aerial working platform. The lift works much like a pair of scissors. The parts that elevate the platform contain crossing, interlocking members. When pressure is applied to the outside of the lowest set of supports through hydraulic, pneumatic or mechanical means, the crossing supports "lengthen" to raise the platform. By releasing the pressure the supports are "shortened" to lower the platform. The work platform is generally never bigger than the base. Scissor lifts usually cannot reach as high as a boom, although some may reach up to forty or fifty feet high.

5. **Training Requirements**

a. OSHA requires training for aerial lifts and scissor lifts, according to CFR 1926.454. Employers should train operators, employees that work on aerial lifts and other personnel, as necessary. Training should include:

i. The nature of any lift hazards, electrical hazards, fall hazards and falling object hazards in the work area;

ii. The correct procedures for dealing with electrical hazards and for erecting, maintaining and disassembling the fall protection systems and falling object protection systems being used;

iii. The correct procedures for moving, operating, repairing, inspecting and maintaining the type of lift in question;

iv. Proper use of the lift and proper handling of materials on the lift;

v. The maximum intended load and the load-carrying capacity of the lift used; and

vi. Any additional requirements set by the manufacturer.

b. Employers must ensure that employees are familiar with the lift they are asked to use. Employees must be provided with an operator's manual and a maintenance manual for the lift being used.

c. All operators must demonstrate that they understand how to use the lift and must be retrained if they do not demonstrate the skill or understanding needed for safe operating procedures. Additionally, employees must be retrained in at least the following situations:

i. Changes in the worksite present a hazard which was not previously known to the employees;

ii. Changes in the type of lift, fall protection, falling object protection or other equipment present a hazard which was not previously known to the employee; and

iii. Where inadequacies in an affected employee's work involving lifts indicate that the employee has not retained the requisite proficiency.

d. Operators of lifts should also be trained in fall protection in addition to operations of the machine.

e. Training records should be maintained for at least four years. Required information includes:

i. Names of employees trained, retrained and familiarized;

ii. Name of the trainer(s);

iii. Training covered;

iv. Date of training; and

v. Written records of all inspections and repairs.

6. Selecting The Right Lift

When selecting a lift there are some important issues that must be considered:

a. The type of work being performed. Some work requires lifts which are equipped with additional features such as electrical outlets, compressed air connectors, piped water supply or securing racks;

b. The terrain in which the lift will be utilized will eliminate some lifts from consideration; and

c. The number of employees and equipment needed affects the type of lift that can be used.

7. Inspections

There are two main inspections that must be done when using an aerial lift device. A pre-start inspection of the lift must be performed before each use and an inspection of the surrounding work site in which the lift will be utilized.

a. Pre-start inspection. The manufacturer provides a list of items that should be inspected before use in the operator's manual. Some items to inspect include:

i. Operating and emergency controls should work properly. Controls should never be forced from one position to another;

ii. Inspect the boom for damage and any signs of weakness. If the lift is insulated, make sure it is dry and free of grease or oil;

iii. Guardrails should be free of damage;

iv. Check hydraulic system for possible leaks and fluid level for proper amount of fluid;

v. Outriggers should work properly and should always be set;

vi. Emergency stop buttons should work correctly;

vii. Tires must be properly inflated and inspected for damage;

viii. All safety guards should be check for malfunctions. Check balance sensors, level sensors/controls, lights, interlock devices, backup alarm and intercom for proper operation; and

ix. Emergency descent system should be checked by raising the platform a couple of feet and then turning the lift off and using the auxiliary power to lower the lift.

b. It is necessary to inspect the work site also. Items to inspect include:

i. The ground on which the lift will be used needs to be solid and as level as possible;

ii. Hazards that may create dangerous driving conditions such as overhead power lines, holes, drop-offs, bumps, lumber, tools and debris must be identified and procedures to avoid any hazards made known to all employees. OSHA requires employees maintain a ten foot clearance of all power lines with less than 50 kilovolts. Electricians have different guidelines and should consult with their

employers concerning this issue; and

iii. Weather conditions must be considered before using any lift.

c. Additional inspections are required by the manufacturer to be done every three months or 150 hours, whichever comes first. This inspection should only be done by a licensed professional.

8. Safety Procedures for Aerial and Scissor Lifts

a. Most lifts are equipped with various safety features. Never remove or use these features for any reason other than specified by the manufacturer. Lifts should never be modified without written permission from the manufacturer or other equivalent entity. If modified, the lift must be at least as safe as before it was modified. Employers should also be aware of local and state regulations and ensure compliance with those laws.

b. Only authorized persons should operate an aerial lift.

c. Belting off to an adjacent pole, structure or equipment while working from a lift is not permitted.

d. Employees should always stand firmly on the floor of the lift. They should not sit or climb on the basket or guardrails or use planks, ladders or other items to attain a higher work position. If additional height is needed, then the lift should be extended or, if necessary, use a different lift that is more appropriate for the job.

e. The operator should know the total load of the lift including tools, supplies and other employees. The weight of the load should be within the manufacturer's suggested maximum safe working load. Make sure the load is balanced.

f. Lifts should never be used as a crane unless the manufacture has designed it to lift loads in such a manner.

g. Hard hats should be worn by employees at all times.

h. Before moving the lift, all employees should be made aware of the move.

i. The operator should always refer to the lift's operating manual for any other safety procedures specific to the lift.

9. Specific Safety Procedures for Aerial

a. Brakes must be set and if the lift has outriggers they must be positioned on pads or a solid surface. Wheel chocks must be installed before using an aerial lift on an incline provided they can be installed safely.

b. An aerial truck should not be moved when the boom is elevated in a working position with men in the basket, unless the lift is specifically designed for such an operation.

c. Aerial work platforms must have both platform and lower controls. Platform controls must be in or beside the platform within easy reach of the operator. Lower controls should be able to override the platform controls but should not be used unless permission has been obtained from the employees in the lift or in case of emergency.

d. Before moving an aerial lift for travel, the boom(s) must be properly cradled and outriggers must be in stowed position.

e. Another employee on the ground should guide the operator when transporting the lift from one area to another on the work site. The operator must make sure that the boom is never over an employee that is working on the ground.

10. Specific Safety Procedures for Scissor Lifts

a. Never raise the platform while the lift is on a truck or other vehicle.

b. Employees should never ride on a scissor lift unless the following conditions exist:

i. The surface on which the lift is being moved is within 3 degrees of level and free of pits, holes and obstructions;
ii. The height to base width ratio of the lift during movement is two to one or less unless the lift is designed and manufactured to meet or exceed recognized stability test requirements such as ANSI/SIA A92.5 and A92.6;
iii. The lift does not travel more than 1 foot per second; and
iv. No employee is on any part of the lift which extends outward beyond the wheels.

11. Fall Protection

Fall protection is required for all employees who perform work on a lift. If the lift is used according to manufacturer's guidelines and all safety precautions are being followed, the chance of any fall is minimal.

a. All scissor lifts require fall protection. Guardrails that are properly designed, maintained and meet OSHA guardrail requirements are sufficient fall protection. If the guardrail does not meet OSHA standards, or if an employee leaves the safety of the work platform, then a personal fall arrest system utilizing a body harness is required.
b. All aerial lifts require fall protection. Guardrails and buckets provide some fall protection but due to the "catapulting" characteristics of lifts it is necessary to have additional fall protection. A full body harness should be worn and a lanyard attached to the boom or basket when working from an aerial lift. The length of the lanyard must conform to the lift manufacturer's guidelines.
c. Most lifts contain a restraining point which is designed to attach to a personal fall arrest system or restraining device. If no anchor point is available, it is up to the competent trainer to determine the best point to tie-off. Tie-off to an adjacent structure is not allowed due to the possibility of being pulled out when the lift is moved.
d. Your employer and the manufacturer of the lift in use will provide more precise fall protection rules and guidelines. Manufacturer's guidelines must always be followed.

12. Shutdown Procedure

a. The first step is to ensure that the lift is lowered and safely resting on its supports. If the lift is not on its supports, damage may occur to the lift as well as create a risk for tipping over while being transported.
b. When necessary, secure the lift to its supports to ensure that it does not move while transporting it.
c. Raise the outriggers, if the lift has them.
d. Shut off the power supply to the lift and outriggers.
e. Remove pads used for outriggers and wheel chocks.
f. Remove the key from the ignition to prevent any unauthorized use of the lift.
g. Check the operator's manual for any additional procedures.

13. Conclusion