Use of aerial lifts

Aerial lifts are widely used throughout industry and are extremely valuable. However, aerial lifts pose numerous hazards when they are not maintained or used properly, or when they are operated by inadequately trained individuals.

Introduction

An aerial lift is any vehicle-mounted device, telescoping or articulating, or both, which is used to position personnel.

Most commonly, this includes articulating boom lifts and scissor lifts.

OSHA regulations

OSHA regulates aerial lifts in a regulation entitled "Vehicle-mounted elevating and rotating work platforms" (29 CFR 1910.67).

In summary, the regulation establishes requirements pertaining to ANSI approval of aerial lifts, fall protection, modification of aerial lifts, employee training, safe operating practices, inspections, etc.

Hazards of aerial lifts

According to NIOSH, between 1992 and 2003, 306 workers died from aerial lift incidents. Most work-related deaths from aerial lifts involve scissor lifts and boom-supported lifts. In 2000, falls surpassed workplace homicide to become the second-leading cause of work-related death.

The primary hazard of aerial lifts is falls. Serious or fatal falls may occur when employees fall from the work platform, but more commonly, workers are injured or killed when the aerial lift "upsets" (tips over) when it is operated on surfaces that are uneven, broken, soft, etc. Examples include driving the aerial lift into depressions in the ground such as potholes, soft soil, over curbs, etc.

Aerial lifts also pose a crush hazard. Bodies or body parts may be crushed in moving parts of the aerial lift (e.g., scissor mechanisms), or between moving parts of the aerial lift and adjacent fixed objects.

Employees may also be killed or injured by contact with exposed energized electrical parts, such as overhead power lines, electrical wiring, or fixtures. This may occur when the employee in the work basket is injured by direct contact. However, if employees on the ground are making simultaneous contact with the aerial lift and the ground when an energized conductor is contacted, they too may be killed or injured.

ANSI approval and modifications

In general, all aerial lifts acquired on or after July 1, 1975, must be designed and constructed in conformance with the applicable requirements of the American National Standard for "Vehicle

Mounted Elevating and Rotating Work Platforms," ANSI A92.2 - 1969, including appendix.

Aerial lifts acquired for use before July 1, 1975 which do not meet the requirements of ANSI A92.2 - 1969, may not be used after July 1, 1976, unless they have been modified so as to conform with the applicable design and construction requirements of ANSI A92.2 - 1969.

Aerial lifts *may* be "field modified" for uses other than those intended by the manufacturer, provided the modification has been certified in writing by the manufacturer or by any other equivalent entity, such as a nationally recognized testing laboratory, to be in conformity with all applicable provisions of ANSI A92.2 - 1969 and this section, and to be at least as safe as the equipment was before modification.

Manufacturer's warnings, instruction, ratings, etc.

All aerial lifts must be maintained, serviced, and used only as permitted by the manufacturer.

All manufacturer-provided warning labels, instructions, etc. must be maintained in a legible condition.

Rated capacities may not be exceeded.

Inspection

Aerial lifts must be inspected prior to each day's use. In nearly all cases, the manufacturer can provide checklists for inspections. At a minimum, inspections must include the following:

- Checking tire condition.
- Hydraulic hoses and connections.
- Controls and instrumentation.
- Visual inspection of welds.
- Fall protection equipment, including anchorage points.
- Railings, flooring, gate, and gate latches.
- Unusual noise, odor, behavior, movement.
- Electrically insulating equipment/materials.

Preventing falls from the work basket

Without question, fall protection is the most important component of aerial lift safety.

Fall protection requirements will vary based on the type of aerial lift in question. Most importantly, employees in the work basket of an articulating aerial lift (i.e., a unit in which the boom extends, telescopes, or articulates horizontally away from the base) must wear a full-body harness and lanyard attached to the work basket or other safe anchorage point on the aerial lift. Fall protection requirements are much more important in this type of unit because they are more prone to "catapult" type movements, which can eject the employees from the basket.

Employees may never attach lanyards to fixed points or objects outside/adjacent to the basket, such as building components, poles, etc.

Employees in the work basket must always have both feet firmly in contact with the floor of the workbasket. They may not sit, stand, or climb on railings, or use any type of object, such as a ladder or box, to elevate themselves from the workbasket.

Weather

Weather conditions have the potential to negatively affect the safe operation of aerial lifts.

- Snow, ice, or rain may cause poor traction between the vehicles and the driving surface, or may cause slick footing for employees on the working platform.
- Rain may cause puddles and soft ground, leading to instability and rollovers.
- Use of aerial lifts when lightning is present may cause electrocution from lightning strikes.
- High winds may cause the aerial lift to topple.
- Heat and direct sun may cause employees to develop heat-related illness.

Always consult and follow manufacturer's recommendations on safe conditions for operation.

Tip-over incidents

Falls are also common when the entire aerial lift tips over.

If provided, outriggers must always be used as directed by the manufacturer. If operating surfaces are overly soft or unstable, pads must be used in conjunction with outriggers.

Many of these incidents also result from operating aerial lifts on unsafe surfaces. This includes ground surfaces that are overly soft, unstable, or uneven (potholes, curbs, etc.). The travel path must be inspected prior to travelling over it.

Aerial lifts may not be used on excessive inclines or declines. Consult the manufacturer on limits.

Electrical safety

Aerial lifts may not be used near exposed energized conductors or parts, such as overhead power lines, except by employees who are qualified for such work.

Clearance distances outlined in 29 CFR 1910.333(c) must be maintained at all times.

Training

OSHA requires that aerial lifts be operated only by trained individuals, but the regulation provides no guidance whatsoever on training content, frequency, documentation, etc.

Training must be provided prior to allowing employees to operate an aerial lift, and annual refresher training is strongly recommended.

Suggested training content includes:

- Types of hazards presented by aerial lifts and the work at hand.
- A review of the specific aerial lift to be used including its controls, instrumentation, limitations, warnings/instructions, the types of environments for which it's approved including surface conditions, etc.
- Fall protection.
- Electrical safety hazards.
- Required Personal Protective Equipment.

The Office of Occupational Health and Safety and the Department of Environmental Health and Safety may be able to help with training.

Fact sheets and tool box talks on a variety of health and safety issues can be found here:

http:/www.ohs.umn.edu/factsheets/home.html

Questions

If you have questions on this topic, please contact the Office of Occupational Health and Safety at (612) 626-5008 or uohs@umn.edu, or see the website at http://www.ohs.umn.edu.