About 26 construction workers die each year from using aerial lifts. More than half of the deaths involve boom-supported lifts, such as bucket trucks and cherry pickers; most of the other deaths involve scissor lifts. Electrocutions, falls, and tipovers cause most of the deaths. Other causes include being caught between the lift bucket or guardrail and object (such as steel beams or joists) and being struck by falling objects. (A worker can also be catapulted out of a bucket, if the boom or bucket is struck by something.) Most of the workers killed are electrical workers, laborers, painters, ironworkers, or carpenters.
The major causes of Aerial Lift Injuries, accident and fatalities, are falls, electrocutions or tip-over’s. Safe work practices for Aerial Lift ensures that workers are properly trained and tested. Aerial devices such as cherry pickers, boom supported aerial platforms, or bucket trucks must have properly trained users in order to maintain safety.

Safety guidelines will be outlined during this session, as well as statistics for accidents.

Types of Aerial Lifts
OSHA, INOSHA, and ANSI

- OSHA Standard 29CFR 1926.453 (Aerial Lifts)
- ANSI A92.3 “Manually Propelled Elevating Aerial Platforms” 2006 edition
- ANSI A92.5 “Boom Supported Elevating work Platforms” 2006 edition

Manufacturers Operating Instructions and Safety Rules

Sometimes Overlooked or under stated in Training.

Must be provided and maintained on Site

Operators Must Read and Understand Prior to Operation of Equipment
Tip-over’s

Caused almost 1/3 of scissor lift deaths

Mostly while elevated over 15 feet

1/4 of tip-over’s occurred where lift hit a hole or curb while moving

Collapses/tip-over’s

2/5 of deaths involved collapse of boom

Almost one-third were due to tip-over’s.

1/4 involved collapses of bucket

1/2 of fatal falls involved ejection from the bucket after worker or lift s was struck by vehicles, cranes or objects.

1/6 occurred while transferring to or from the bucket at a height.

Rated Work Load or Load Capacity Rating

LOAD CAPACITY — is a specific load carried at a specific distance from the fulcrum wheels and spread evenly over the operator platform.

UNRESTRICTED LOAD CAPACITY — is the maximum allowable weight load allowed in and spread evenly, over the operator platform.

Maximum allowable weight load includes personnel, their tools and their materials.

As long as you are (1) within the unrestricted load capacity limits, (2) are operating on level ground that will support the units weight and (3) you employ any necessary safety devices you can operate the lift at any height safely.

Unrestricted rated work load capacity decals will always be located at each entrance into the platform and at the operator control stations. You should always verify these decals are in place during your pre-shift inspection.
Center of Gravity

The center of gravity of an object is the point about which all forces of gravity are equal. As the boomlift is operated, the center of gravity on a boomlift changes position. Changes occur when the platform is moved in or out, up or down, forwards or backwards, and rotating left or right. Any inclined (sloping or graded) surface also affects the combined center of gravity.

Fulcrum Point

The Boom lift works on the simple principle of loads balanced over a set of two wheels, the fulcrum. Depending on which set of tires the operator platform is set over, they become the fulcrum. The fulcrum point changes as the platform is elevating and swinging into position.
STABILITY REMINDERS

- 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

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, girder’s, etc.
Fatalities

- Employee fell 35 feet when a **gust of wind** pushed the employee and a window he was installing off the platform of a forklift.
- Employee was performing tree trimming operations. Either the employee or his equipment **contacted live power lines**. They were unable to revive him at the scene.
- Two employees were using an aerial work platform while painting the exterior of a building. The employees were repositioning the lift while elevated 15 feet when the **rear tire fell into a waste water grate** causing the lift to tip over injuring both employees. The deceased, a 34 year old painter, received serious head injuries and later died. The second employee was treated for a broken arm and released.

Training

- **ONLY TRAINED AND AUTHORIZED PERSONS ARE ALLOWED TO OPERATE AN AERIAL LIFT.**
- **TRAINING SHALL INCLUDE:**
  - **EXPLANATION OF ELECTRICAL, FALL AND FALLING OBJECT STANDARDS**
  - **PROCEDURE FOR DEALING WITH HAZARDS**
  - **RECOGNIZING AND AVOIDING UNSAFE CONDITIONS IN THE WORK SETTING**
  - **INSTRUCTIONS FOR CORRECT OPERATION OF THE LIFT (INCLUDING MAXIMUM INTENDED LOAD AND LOAD CAPACITY).**
TRAINING CONTINUED

- DEMONSTRATION OF THE SKILL AND KNOWLEDGE NEEDED TO OPERATE AN AERIAL LIFT BEFORE OPERATING IT ON THE JOB

- WHEN AND HOW TO PERFORM INSPECTIONS

- MANUFACTURER’S REQUIREMENTS

TRAINING CONTINUED

Such instruction and training shall include the following:

(a) Instruction by a qualified person in the intended purpose and function of each of the controls.

(b) Training by a qualified person or reading and understanding the manufacturer’s or owner’s operating instructions and safety rules.

(c) Understanding by reading or by having a qualified person explain, all decals, warnings, and instructions displayed on the aerial work platform.
TRAINING CONTINUED

(d) Reading and understanding the provisions of this subrule and subrules (1) to (9) of this rule or be trained by a qualified person on their content.

(2) An employer shall provide the operator of an aerial work platform with an aerial work platform permit.

(3) The requirements of subrule (1)(a), (b), (c), and (d) of this rule shall be met before an employee is issued a permit.

RETRAINING

- AN ACCIDENT OCCURS DURING AERIAL LIFT USE
- WORKPLACE HAZARDS INVOLVING AN AERIAL LIFT ARE DISCOVERED
- A DIFFERENT TYPE OF AERIAL LIFT IS USED
FALL PROTECTION

The employer shall provide a safety harness that has a lanyard and which is affixed to an attachment points provided and approved by the manufacturer.

Any occupant of an aerial work platform described shall use a safety harness.

A fall arrest system shall only be used where the aerial lift is designed to withstand the vertical and lateral loads caused by an arrested fall.

(2) An employee may use a body belt with a restraint device with the lanyard and the anchor arranged so that the employee is not exposed to any fall distance. An employee is required to use a restraint device where the aerial lift cannot withstand the vertical and lateral loads imposed by an arrested fall.
An employer shall not allow employees to exit an elevated aerial work platform, except where elevated work areas are inaccessible or hazardous to reach. Employees may exit the platform with the knowledge and consent of the employer. When employees exit to unguarded work areas, fall protection shall be provided and used as prescribed in construction safety standard.

**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
### Cause of Death

<table>
<thead>
<tr>
<th>Cause</th>
<th>Boom-supported Lift</th>
<th>Scissor Lifts</th>
<th>Unknown Type of Lift</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Electrocutions</td>
<td>62</td>
<td>6</td>
<td>-</td>
<td>69</td>
</tr>
<tr>
<td><strong>Falls</strong></td>
<td>35</td>
<td>23</td>
<td>6</td>
<td>64</td>
</tr>
<tr>
<td>Collapses or tipovers</td>
<td>23</td>
<td>23</td>
<td>-</td>
<td>46</td>
</tr>
<tr>
<td>Caught in/between</td>
<td>11</td>
<td>-</td>
<td>-</td>
<td>14</td>
</tr>
<tr>
<td>Struck by/against</td>
<td>6</td>
<td>-</td>
<td>-</td>
<td>9</td>
</tr>
<tr>
<td>Other causes</td>
<td>5</td>
<td>-</td>
<td>-</td>
<td>5</td>
</tr>
<tr>
<td><strong>Total deaths</strong></td>
<td>142</td>
<td>55</td>
<td>30</td>
<td>207</td>
</tr>
</tbody>
</table>

### WORKSITE INSPECTION

**Electrocutions: 1/2 involved overhead power line**

**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**
Preventing Electrocutions

Non-electrical workers must stay at least 10 feet away from overhead power lines.

Electrical workers must de-energize/insulate power lines or use proper PPE/equipment.

Use insulated buckets near overhead power lines

Regularly check insulation on buckets

OPERATING PROCEDURES

- Before Operating Aerial Lifts Check safety devices, operating controls before each use
- Check area in which aerial lift will be used for:
  - Level surface (Do not exceed manufacturer slope recommendations) Typically 6° (degrees)
  - Holes, drop-offs, bumps, debris, etc.
  - Overhead obstructions and overhead power lines
  - Stable surface
  - Other hazards: Do not modify aerial lift without written permission
  - Set outriggers, brakes, wheel chocks
Lower (Emergency) Controls

- The lower (emergency) controls must be accessible from the ground level. It is located on or near the base frame of the unit.
- Review the operator's manual to identify the exact location. All of these controls will be of the type that automatically returns to the "off" or "neutral" position when released if they are used to control any movement of the lift. **IMPORTANT NOTE: Lower controls can override the upper controls.**

The Lower controls should only be used during the following conditions:

- During pre-shift checkout of functions from the lower controls.
- To override the upper controls to gain access in the event of an emergency. (upper controls will not work)
- Only after you have been given permission to operate a function by the operator.
- To override the upper controls to gain access in the event of an emergency. (upper controls will not work)
- By a qualified mechanic during the process of performing necessary repairs and/or maintenance on the boom lift.
CONCLUSION
When operating a man lift or bucket truck, follow these safety practices:

> Use the equipment ONLY for its intended purpose.
> Operate the equipment in tight quarters ONLY as per the manufacturer’s recommendations.
> When operating equipment from the bucket or platform, always wear a safety harness and safety line.
> Always look in the direction of movement and exercise caution in close areas.
> Use low speed function when in restricted or close quarters.
> Use caution when working near energized power lines.
> Fully stabilize the man lift or bucket truck before use.
> Become fully acquainted with the equipment and get adequate training on its safe operation BEFORE beginning the task.
THANK YOU

ROYAL ARC
23851 Vreeland
Flat Rock, MI.
48134
734-789-9099