

# SELF-PROPELLED AERIAL PLATFORM



## OPERATOR SAFETY TRAINING



**HARD HAT** TRAINING SERIES

AERIAL PLATFORM

Welcome students to the class and see that each one has a student manual and a pencil.

- Emphasize the three main reasons for this training:
  1. Training reduces the risk of accidents and injuries to you and those you work with.
  2. Training reduces operating costs.
  3. OSHA requires it.

## ACCIDENT PROFILE



**Scottsdale, Ariz.**— A garbage truck sideswiped a boom lift aerial work platform while a worker was repairing a traffic signal. The collision threw the man from the personnel basket and killed him. When the operator fell from the basket, he hit his head on the bottom of the platform several times. According to reports, orange cones were in place around the intersection where the accident occurred.



**HARD HAT** TRAINING SERIES

AERIAL PLATFORM

**Scottsdale, Ariz.**— A garbage truck sideswiped a boom lift aerial work platform while a worker was repairing a traffic signal. The collision threw the man from the personnel basket and killed him. When the operator fell from the basket, he hit his head on the bottom of the platform several times. According to reports, orange cones were in place around the intersection where the accident occurred.

This accident was indeed a tragedy. It appears that all safety precautions had been taken and personal protective equipment was being used. What caused the fatality was the long lanyard being used and tying off either to the railing or a connection point near the top railing. Using a shorter lanyard or tying off to an approved connection point lower down in the platform might have prevented this death.

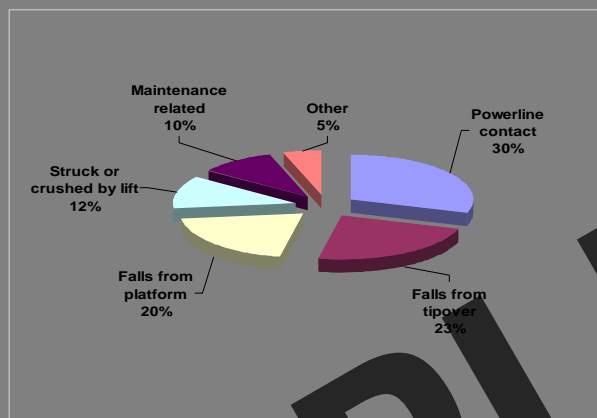
During operation of a boom-supported aerial platform, the impact of another vehicle against it can cause the boom to flex and eject the operator. Take every precaution to prevent this from occurring.

**WARNING:** The railing is NOT approved as a connection point for your lanyard. Always use an approved connection point.

**Review some of the other accidents in the Student Manual or from the Accident Profile file. Pick those that might be closest to the types of machines and work your company is involved with.**

## HAZARDS OF AERIAL LIFT OPERATION

In a random study of 100 OSHA investigated aerial lift accidents the causes of the injuries or death were broken down into the following categories:



**HARD HAT** TRAINING SERIES

AERIAL PLATFORM

SAMPLE

## POWERLINE CONTACT

An employee had been assigned to paint a metal utility pole with a spray gun. He was working from an aerial lift and had painted one side of the pole. As he was rotating the bucket of the aerial lift so that he could paint the other side of the pole, he leaned back in the bucket, and the back of his neck contacted a 7960-volt overhead power line. The employee received an electric shock, which knocked him out of the bucket and into the bed of the aerial lift truck. Two coworkers broke his fall and administered cardio-pulmonary resuscitation. Unfortunately, the injured employee had no heartbeat and was not breathing when the emergency medical team arrived. He had been electrocuted.



**HARD HAT** TRAINING SERIES

AERIAL PLATFORM

SAMPLE

## FALLS FROM TIPOVER

At approximately 2:30 p.m. on May 8, 1996, Employee #1 and #2, roofers, were using a JLG telescopic boom lift, model 80HX, from a height of approximately 60 ft to place ridge caps atop a section of roof on a breezeway connection. The vehicle toppled over and Employees #1 and #2 fell to ground with a 30-degree slope, for a total fall of approximately 80 ft. Employee #1 sustained a broken right wrist, fractured ribs, and a fractured leg. Employee #2 sustained severe facial and head injuries, internal injuries, and fractured ribs. The extendable axes were not extended while the lift was being operated; this was in violation of the manufacturer's recommendations and cautions.



**HARD HAT** TRAINING SERIES

AERIAL PLATFORM

SAMPLE

## FALLS FROM PLATFORM

Employee #1 and a coworker were at the intersection of two streets to repair a signal light. They could not locate the problem from the ground, so they moved the Verdalift into the intersection for Employee #1 to work out of the elevated basket. The bucket was being lowered and was at a height of approximately 15 ft when a semi-truck struck it. Employee #1, who was not wearing a safety belt, was thrown out. He was taken to Port Huron Hospital, where he was pronounced dead. The employer was cited for violations of no accident prevention program; providing no hard hats; not providing and maintaining signal-signs-barricades; no traffic control devices; and, no safety belt use in manlift.



**HARD HAT** TRAINING SERIES

AERIAL PLATFORM

SAMPLE

## STRUCK OR CRUSHED BY LIFT

At 1:30 p.m. on August 22, 1996, Employee #1 was operating an Ivy Hi-Lift to install insulation brackets in the ceiling of an Amway warehouse. He had the boom of the lift turned to the backside of the base platform, a position in which the operating controls are reversed. Employee #1 was elevated to the roof and was snug against a rafter. He apparently wanted to move away from the rafter and pushed forward on the control lever to move forward. With the controls reversed, he was actually pushing against the rafter instead. Employee #1's body was pressed against the control lever and he became caught between the lift basket and the rafter. He was unable to free himself and he died of asphyxia.



**HARD HAT** TRAINING SERIES

AERIAL PLATFORM

SAMPLE

## MAINTENANCE RELATED

Employee #1 was a foreman for a tree trimming service. He was approximately 30 ft above the ground when the aerial boom he was operating fell from the truck on which it was mounted. He suffered head, leg, and internal injuries, and was transported by ambulance to Mercy Medical Center in Redding, CA. Subsequent investigation revealed that the bolts that secured the base of the boom to the truck mounting had sheared off. Nine of the bolts were rusty, indicating old breaks; 16 of the bolts showed fresh metal without rust. From the front of the truck, the nine rusty bolts were located on the backside of the boom drive gear.



**HARD HAT** TRAINING SERIES

AERIAL PLATFORM

SAMPLE

## OTHER

Employee #1, a truck driver, was delivering two scissor lifts to a construction site. He was backing the second lift from a Lowboy transporter when he ran off the Lowboy's ramp and the lift fell, landing on its side. Employee #1 was thrown to the ground, fracturing his upper left arm and several ribs. The scissor lift could have been driven off the ramp remotely, using a cable-connected controller. Other drivers had used these controllers routinely, and the employer has directed all drivers to use the remote system in the future, and not to ride the units.



**HARD HAT** TRAINING SERIES

AERIAL PLATFORM

SAMPLE

## TRAINING OUTLINE



- Responsibility of Training
- Responsibility of Inspections
- Different Types of Aerial Lifts
- Basic Components
- Inspecting Your Machine
- Safe Operation Guidelines
- Refueling
- Battery Care
- Final Exam
- Operator Evaluation



**HARD HAT** TRAINING SERIES

AERIAL PLATFORM

This is a good time to tell the class what they will be doing for the next few hours. Some of this training can take place at a different time. If this is a refresher course, then you may condense parts of the training as needed.

## TRAINING REQUIREMENTS

Only trained and authorized personnel must be permitted to operate the work platform. Before using the work platform, the operator must:

- (a) Read and understand the manufacturer's operating instructions and safety rules and be trained by a qualified person on the contents of the manufacturer's instructions and safety rules.
- (b) Read and understand all decals, warnings, and instructions on the work platform.
- (c) On a daily basis, before the work platform is used, it must be given a thorough inspection.



**HARD HAT** TRAINING SERIES

AERIAL PLATFORM

Know all federal, state and local rules which apply to your machine and jobsite. If you are not sure, ask your supervisor or safety coordinator.

29 CFR 1910.67

(c) (2) (ii) Only trained persons shall operate an aerial lift.

**ANSI/SIA A92 – 1990**

**6.10 Operator Training.** An owner who directs or authorizes an individual to operate an aerial platform shall ensure that the individual has been trained in accordance with the manufacturer's operating manual and requirements listed in Section 8 of this standard before operating the aerial platform.

## INSPECTIONS

**Annual Inspection:** The owner of an aerial platform shall cause an annual inspection to be performed on the aerial platform no later than thirteen (13) months from the date of the prior annual inspection.

**Frequent Inspection:** The owner of an aerial platform shall cause a frequent inspection to be performed on the aerial platform:  
a) That has been in service for three (3) months or 150 hours, whichever comes first. b) Before putting into service a machine that has been out of service for a period longer than three months of time.

**Daily Inspection:** Prior to putting a machine to work each day an inspection shall be made. This shall be a visual as well as a functional inspection.



**HARD HAT** TRAINING SERIES

AERIAL PLATFORM

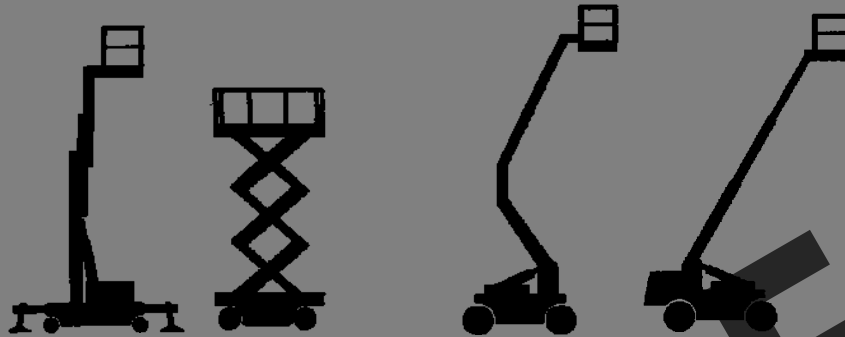
ANSI/SIA A92.5 – 1992 6.5 Annual Inspections

ANSI/SIA A92.5 – 1992 6.6 Frequent Inspections

ANSI/SIA A92.5 – 1992 7.3.3 Pre-Start Inspections



## TYPES OF AERIAL PLATFORMS



Vertical Aerial Platforms

Boom-Supported Aerial Platforms

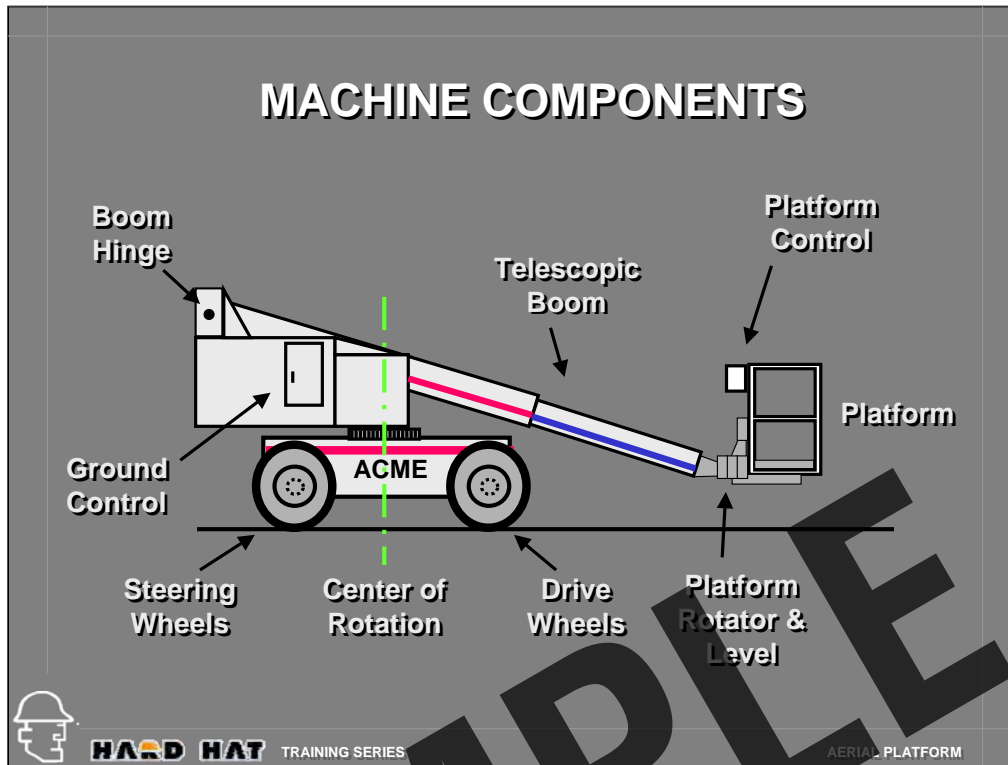


**HARD HAT** TRAINING SERIES

AERIAL PLATFORM

There are numerous types of self-propelled aerial platforms. These shown are just a representation of the most common ones.

This training is for general purposes and in no way replaces instructions in the aerial platform operator's manual.



## Know your equipment

Know your aerial platform. Be familiar with the different components and purpose of all the controls, gauges, and dials. Know the rated work load, speed range, braking and steering characteristics, turning radius, and operating clearances.

Since there are so many makes and models and types of aerial lifts, it would be impossible to give an adequate description of all components of every machine.

Set up a time to take the class out to the machine to do a walk-around. Demonstrate how to do a pre-shift inspection. Pay particular attention to safety devices, lockouts, interlocks, stabilizers, etc. that may be different from similar aerial platforms.

### 7.7 Before operation (ANSI/SIA A92.5 – 1992)

Before authorizing an operator to operate an aerial platform, the user shall ensure that the operator has:

- a) Been instructed by a qualified person in the intended purpose and function of each control.
- b) Read and understood the manufacturer's operating instruction(s) and users safety rules, or been trained by a qualified person on the contents of the manufacturer's operating instruction(s) and users safety rules.
- d) Determine that the purpose for which the aerial platform is to be used is within the scope of the intended applications defined by the manufacturer.

# PRE-OPERATION INSPECTION

INSPECT THE FOLLOWING COMPONENTS PRIOR TO OPERATION



- ▣ Decals legible and in place
- ▣ Engine fluids at correct levels
- ▣ Electrical components & wiring
- ▣ Hydraulic hoses, fitting, cylinders
- ▣ Fuel & hydraulic tanks
- ▣ Drive & turntable motors & drives
- ▣ Boom extension cables & wear pads
- ▣ Boom damage & dents
- ▣ Tires & wheels
- ▣ Engine & related components
- ▣ Limit switches, alarms, horns, beacons
- ▣ Nuts, bolts, & other fasteners
- ▣ Platform rail & entry gate
- ▣ Cracks in welds & structural components
- ▣ Compartment covers in place & latched
- ▣ Platform & ground control operations
- ▣ Auxiliary power function

Perform any additional tests as prescribed by the manufacturer.



**HARD HAT** TRAINING SERIES

AERIAL PLATFORM

**PURPOSE:** Help students understand that inspections are important for safe aerial lift operations.

- Emphasize that the aerial lift is to be inspected before each day's use or at the start of each shift. A record of the inspection is recommended.
- The above checklist is for discussion purposes. The manufacturer typically can provide a more definitive checklist for a particular aerial platform.

**ALSO:**

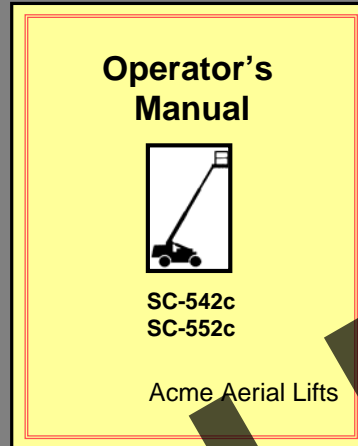
**ANSI/SIA A92.5-1992 7.8 states: Work place inspection**

Before the aerial platform is used and during use, the user shall check the area in which the aerial platform is to be used for possible hazards such as but not limited to:

- a) Drop-offs or holes
- b) Bumps and floor obstructions
- c) Debris.
- d) Overhead obstructions and high voltage conductors
- e) Hazardous locations
- f) Inadequate surface and support to withstand all load forces imposed by the aerial platform in all operating configurations
- g) Wind and weather conditions
- h) Presence of unauthorized persons
- i) Other possible unsafe conditions

# OPERATOR'S MANUAL

The manual is considered an integral part of the aerial platform and is vital to communicate necessary safety information to users and operators.



**HARD HAT** TRAINING SERIES

AERIAL PLATFORM

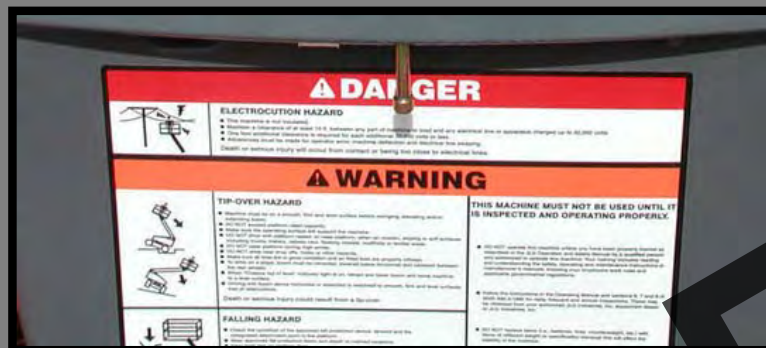
**Maintenance and operating manuals requirement:** An operating and maintenance manual(s) must be provided with each work platform and must contain:

- (a) Descriptions, specifications, and ratings of the work platform.
- (b) The maximum hydraulic and pneumatic system pressure and the maximum voltage of the electrical systems which are part of the work platform.
- (c) Instructions regarding operation and maintenance.
- (d) Replacement part(s) information.

Manual should be on the machine at all times.

**ANSI/SIA A92.5 – 1992 7.2 Manuals.** Users shall keep and maintain a copy(ies) of the operating and maintenance manual(s) required in 4.16.1 of this standard. The operating manual(s) shall be provided with each rental, lease or sale delivery and shall be stored in the weather resistant storage compartment require by 4.16.2 of this standard. **The manual is considered an integral part of the aerial platform and is vital to communicate necessary safety information to users and operators.** In addition, parts and maintenance manuals shall be provided with each sale delivery.

## DECALS AND WARNING LABELS



**HARD HAT** TRAINING SERIES

AERIAL PLATFORM

The following information must be displayed on all aerial platforms in as permanent and as visible a manner as practical:

- Warnings, cautions, or restrictions for safe operation
- Make, model, serial number, and manufacturer's name and address
- Rated workload
- Maximum platform height
- Nominal voltage rating of batteries or rated voltage of AC line
- Statement concerning the need of the operator's familiarity with the work platform before it is used
- A statement of whether or not the aerial platform is electrically insulated

**The user shall verify that all nameplates and markings are in place and are maintained in a legible condition.**

**(COPY OF ANSI/SIA A92.6 – 1990 REGARDING DECALS AND WARNING LABELS REQUIRED TO BE ON THE MACHINE IS ON THE NEXT PAGE)**

# DECALS AND WARNING LABELS

## ANSI/SIA A92.6 - 1990

**Note:** This section of the standard is almost identical to the one for Boom-Supported Elevating Work Platforms found in A92.5.4.18-1992. Although this information is intended for manufacturers, it helps owners to see what information must be maintained on the machine or replaced if damaged or illegible.

### 4.13 Instructions and Markings (for Self-Propelled Elevating Work Platforms)

4.13.1 **Manufacturer information.** The following information shall be displayed on all aerial platforms in a clearly visible, accessible area and in a durable manner

- (1) Warnings, cautions, or restrictions for safe operation and maintenance in accordance with ANSIZ35.1-1972;
  - (2) The make, model, serial number, and manufacturer's name and address.
  - (3) The rated work load, including rated number of occupants;
  - (4) The maximum platform height;
  - (5) The maximum travel height, if not equal to the maximum platform height;
  - (6) The nominal voltage ratings of the batteries if battery powered;
  - (7) A notice to study the Operating Manual before using the equipment;
  - (8) A notice of the inspections required by Section 6 of this standard.
  - (9) An alternative configuration statement. If an aerial platform may have several alternative configurations, the manufacturer shall clearly describe these alternatives, including the rated capacity in each situation. If the rated work load of the aerial platform is the same in all configurations, these additional descriptions are not necessary.
  - (10) If the multiple ratings are used, the following conditions shall be compiled with:
    - (a) When the rated workload varies according to multiple configurations of the aerial platform, the manufacturer shall clearly describe these configurations, including the rated workload of each, in the manual and on the platform. Examples of alternated configurations are, but shall not be limited to, the following:
      - (i) Outriggers or stabilizers extended to firm footing versus not extended;
      - (ii) Platform and extensions(s) extended versus retracted;
      - (iii) Platform attachment(s) attached versus unattached;
      - (iv) Elevating assembly elevated versus lowered;
      - (v) Extendable axles extended versus retracted.
    - (b) When the rated workload of the alternate configuration depends on the location of the platform in relation to the base, the manufacturer shall display the appropriate rated workload of the control station(s).
    - (c) Unrestricted rated workload shall be displayed at each access to the platform and operator control station(s).
  - (11) A statement of whether or not the platform or any portion thereof is electrically insulated. If equipped with an insulated platform, the level of protection and applicable test standard shall be stated, in accordance with ANSI/SJA A92.2-1990.
  - (12) Warnings against replacing, without manufacturer's consent, components critical to machine stability, i.e. batteries or ballasted tires, with lighter weight components. The minimum weights of such components shall be specified.
- A statement of compliance with section 4 of this standard.

## RATED LOAD



**HARD HAT** TRAINING SERIES

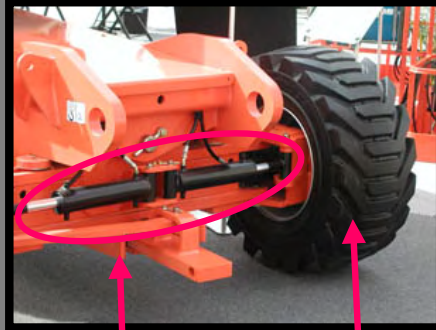
AERIAL PLATFORM

The rated load must be visible to the user. The difference between a 2 person and a 3 person platform can be critical for the stability of the machine. This load rating includes the weight of all occupants, their tools, and all materials.

Before raising the platform, disperse the load evenly, making sure that nothing is interfering with any of the controls. Do not carry materials on railings unless railings are approved for that purpose. Do not, at any time, add a load that exceeds the rated capacity of the machine. Do not carry overhanging loads unless approved by the manufacturer.

**ANSI/SIA A92.5 – 1992 8.10.7 Capacity Limitations.** Rated capacities shall not be exceeded when loads are transferred to the platform at any height.

## TIRES, WHEELS, STEERING



Steer linkages



Check for leaks

Wear & proper inflation



**HARD HAT** TRAINING SERIES

AERIAL PLATFORM

Check tires once a day. Check for:

- Correct pressure
- Cuts or bulges
- Nails or spikes
- Uneven or excessive wear
- Missing valve caps

Check wheels for:

- Damaged rims
- Missing or loose wheel nuts, bolts, or bearing caps
- Proper torque
- Misalignment

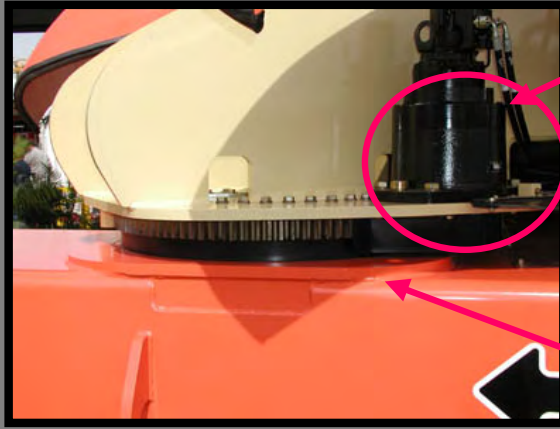
Have cuts or punctures repaired by authorized personnel before adding air.

**WARNING:** An over-inflated tire can explode and cause injury or death. An under-inflated tire will reduce the stability of the machine.

**WARNING:** Tires are to be repaired only by an authorized person using the proper procedures and safety equipment

**WARNING:** Do not substitute pneumatic tire for foam-filled or solid tires. When liquid filling is required, check liquid level. Be sure to replace tire ballast or sealing compound. Check manufacturer's specifications.

## CHASSIS & TURNTABLE



Check swing motor for loose bolts, damaged gears.

Check turntable base and chassis for objects left there.



**HARD HAT** TRAINING SERIES

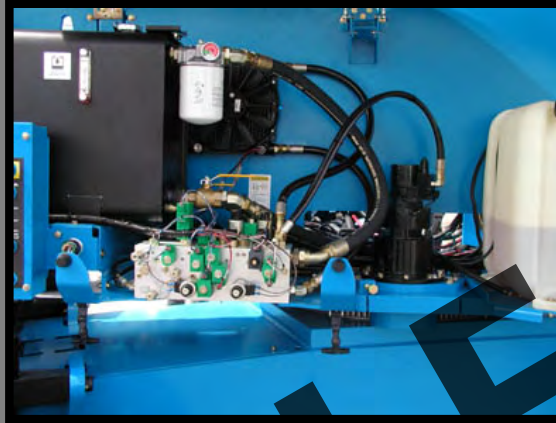
AERIAL PLATFORM

The swing motor and bearing need to be checked for wear.  
All parts need to be lubricated often.  
Worn bearings or pinion gears can cause sloppy handling.

SAMPLE

## ELECTRICAL COMPONENTS

Check for damaged or loose electrical wiring and components.



**HARD HAT** TRAINING SERIES

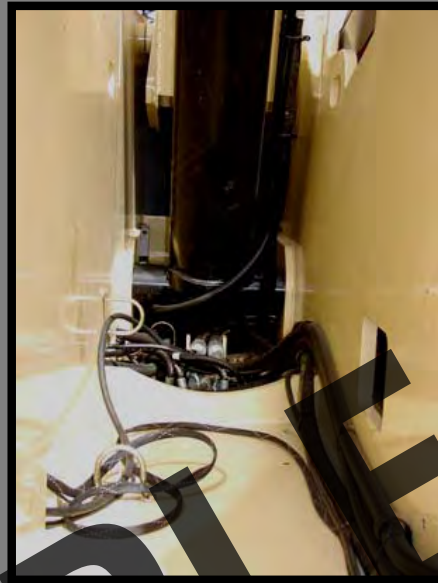
AERIAL PLATFORM

Any damaged or loose electrical wiring or components should be repaired immediately. Keep such components free from dirt and grease.

SAMPLE

## BOOM LIFT CYLINDER

Check the boom lift cylinders for hydraulic leaks and other damage.



**HARD HAT** TRAINING SERIES

AERIAL PLATFORM

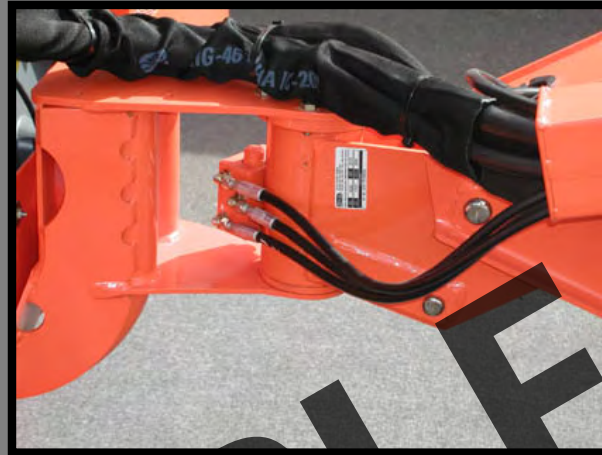
Hydraulic lines are under tremendous pressure. Suspected leaks should be checked with a piece of cardboard. Never use a bare hand. Goggles are recommended.

A thin film of fluid on a lift cylinder rod is not a cause for concern. This can be caused by a worn wiper seal. If it turns into a drip, then it should be investigated more thoroughly.

## PLATFORM HINGES

Check hinge for smooth operation.

Check hoses for chafing and other damage.



**HARD HAT** TRAINING SERIES

AERIAL PLATFORM

Any hoses that go over a sharp edge should be covered with chafing gear or softeners.

Check hinge pins and bushings for looseness and/or wear.

SAMPLE

## PLATFORM CONTROLS



**HARD HAT** TRAINING SERIES

AERIAL PLATFORM

All directional controls must be marked for the direction they control and must be of the type which automatically returns to the “off” or neutral position when released.

Controls must be protected against inadvertent operation.

## PLATFORM STRUCTURE

Check for broken welds, damaged rails and frame, loose or missing bolts.



**HARD HAT** TRAINING SERIES

AERIAL PLATFORM

The load rating should be clearly visible to anyone who enters the platform.  
There should be an anchorage point for a lanyard that is clearly marked so the operator knows not to tie off to the railing.

## INSPECT THE BOOM



Inspect for dents and other damage



**HARD HAT** TRAINING SERIES

AERIAL PLATFORM

The boom is like a tin can, very strong until it gets a dent on the side. Any dents should be checked with the specifications from the manufacturer and repaired if needed.

You must assume your machine is NOT electrically insulated unless it is specifically indicated on the machine rating plate.

Electrically insulated booms must be dielectrically tested often. Many factors can contribute to a failure of this test including a dirty machine, contaminated hydraulic oil or cracks in the boom finish.

Always keep your machine clean and free of excessive dirt and grease.

On the boom, look for leaks that may indicate leaky hydraulic cylinders.

Check slide pads for wear and adjust them when needed.

## LOCKOUT - TAGOUT

*Machines which have deficiencies need to have all controls tagged and the machine taken out of service.*



**HARD HAT** TRAINING SERIES

AERIAL PLATFORM

If your aerial platform becomes disabled or unsafe to operate, attach a warning tag to both the upper control station and lower control station (if so equipped).

If the machine should not be started, take necessary steps to prevent unauthorized starting, in accordance with the manufacturer's recommendations.

Do any maintenance or repair work, only with permission.

Read the manufacturer's service manuals for maintenance instructions.

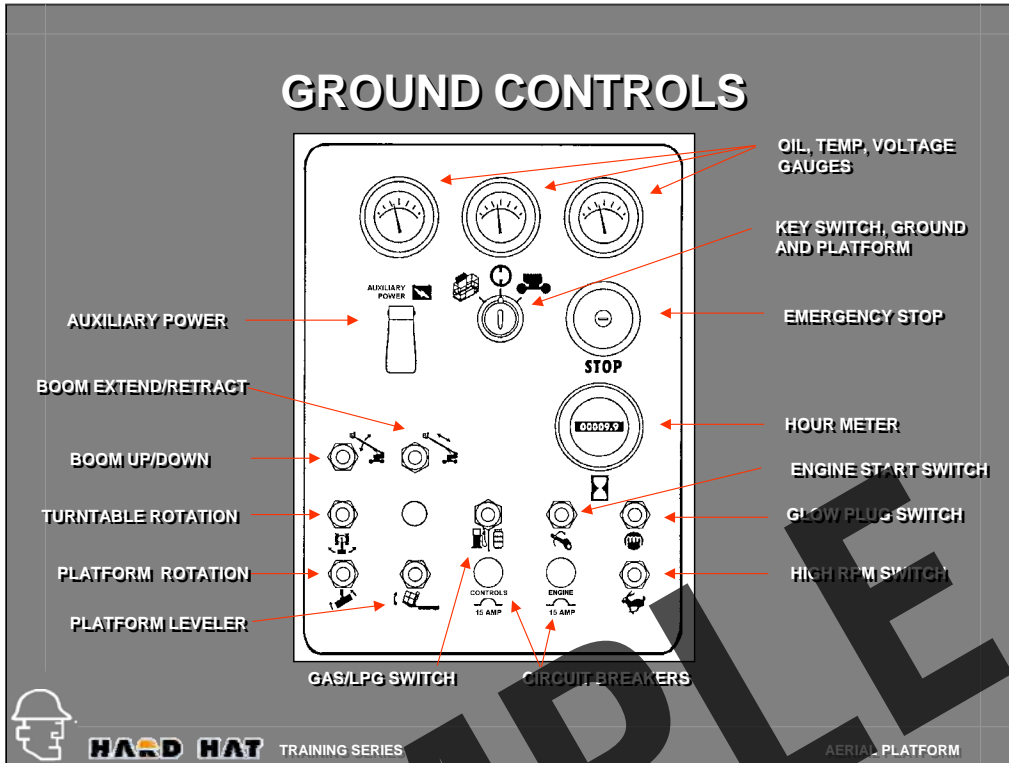
# GROUND CONTROLS



**HARD HAT** TRAINING SERIES

AERIAL PLATFORM

SAMPLE

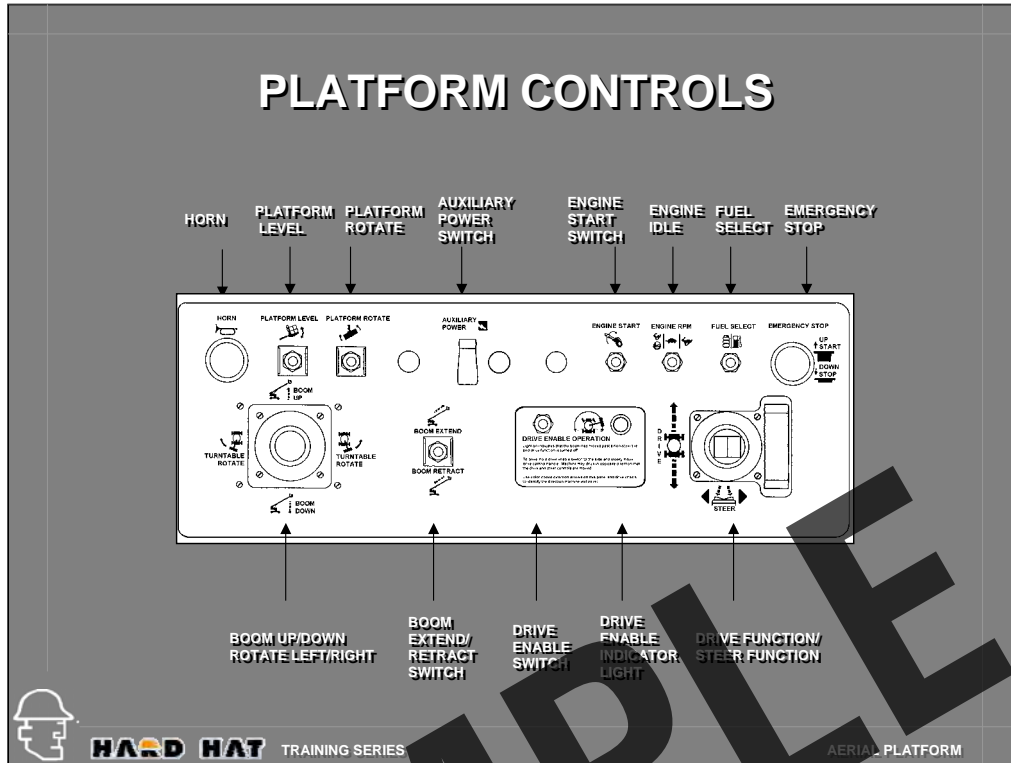


Know your equipment.

Know the purpose of all ground controls. Make sure you know what to do if the operator on the platform cannot get himself down.

Make sure all control labels are in place and legible.

Make sure that all controls do what they are labeled to do.



Perform an operational test prior to operating the machine to make sure that all the controls do what they are supposed to.  
 Be certain that the controls do not stick.  
 Know the purpose of all the controls, gauges and dials.

# FUNCTIONAL TEST

PRIOR TO PUTTING THE MACHINE INTO SERVICE,  
ENSURE ALL THE FUNCTIONS ARE PROPERLY WORKING.



## Ground controls:

- Activate Emergency Stop
- Activate each boom function
- Test auxiliary controls

## Platform controls:

- Activate Emergency Stop
- Test horn
- Test foot switch
- Test boom and platform functions
- Test steering functions
- Test the drive and braking
- Test the drive enable system
- Test drive speed limits
- Test auxiliary controls

Perform any additional tests as prescribed by the manufacturer.



**HARD HAT** TRAINING SERIES

AERIAL PLATFORM

After starting, recheck all gauges and lights. Check the audible and/or visual alarms (if provided). Make sure everything is functioning correctly. Check all control functions, including the emergency stop mechanism at the upper and lower control stations. If the aerial controls do not respond properly when operated, do not use the machine until it is fixed.

Move slowly until you are certain everything is operating properly. Recheck the steering for right and left control. Be certain you have full travel and automatic brake control. Be certain you can lower an elevated platform.

## REPAIRS AND MAINTENANCE

Aerial platforms that are not in safe operating condition must be removed from service until repaired.

Repairs must be made by a qualified person in compliance with the manufacturer's operation and maintenance manuals.

Modifications or alterations of aerial platforms must be made only with written permission of the manufacturer or an other equivalent entity.



**HARD HAT** TRAINING SERIES

AERIAL PLATFORM

### ANSI/SIA A92.6-1990

**6.7 Maintenance Safety Precautions.** Before adjustments and repairs are started on an aerial platform, the following precautions shall be taken as applicable:

- (1) Power plant stopped and starting means rendered inoperative
- (2) All controls in the "off" position and all operating systems secured from inadvertent motion by brakes, blocks, or other means.
- (3) Elevating assembly and platform lowered to the full down position, if possible, or otherwise secured by blocking or cribbing to prevent dropping
- (4) Hydraulic oil pressure relieved from all hydraulic circuits before loosening or removing hydraulic components.
- (5) Safety props or latches installed where applicable as prescribed by the manufacturer.

**6.8 Replacement Parts.** When parts or components are replaced, they shall be identical or equivalent to original aerial platform parts or components.

**6.9 Maintenance Training.** The owners shall train their maintenance personnel in inspection and maintenance of the aerial platform in accordance with 6.3, 6.4, 6.5, 6.6, 6.7, 6.8 and 6.10 of this standard, and with the manufacturer's recommendations.

**6.14 Modifications.** Modification or alteration of an aerial platform shall be made only with prior written permission of the manufacturer.

# REPAIRS AND MAINTENANCE

Follow manufacturer schedule for maintenance and service.

MAINTENANCE SCHEDULE		
DAILY MAINTENANCE (OPERATOR'S INSPECTION)	OPERATOR'S INSPECTION SERVICE REQUIRED	RECOMMENDED CERTIFICANT OR FURTHER INSTRUCTIONS
Emergency Stop System	Check operation	
Air Filter	Check Condition	
Engine Oil	Check Oil Level	
Engine Coolant	Check Coolant Level	
Fuel Level	Visually Inspect (Leaks, Connections, etc.)	
Fuel Tank Cap	Visually Inspect (Operation)	
Engine Fuel Level	Check Fuel Gauge	
Belt and Pulleys	Visually Inspect (Tension/Slack)	
Hydraulic Pressure	Visually Inspect (Operation)	
Structural Damage & Welds	Visually Inspect (Structural Integrity, Rust)	
Tires and Wheels	Visually Inspect (Condition, Check Inflation)	
Battery Fluid Level	Check Fluid Level	
Battery Terminals	Visually Inspect (Connections)	
Charging System	Visually Inspect (Belt, Gauge)	
Control Switches	Visually Inspect (Operation)	
Wiring Harnesses	Visually Inspect (Insulation, Condition)	
Hydraulic Leaks	Visually Inspect (Leaks, Pools)	
Hydraulic Oil	Check Fluid Level	
<b>30 DAY OR 50 HOUR MAINTENANCE (QUALIFIED SERVICE TECHNICIAN)</b>		
Fuel System Maintenance	Visual Inspection, Complete Form	Retain Copy of Checklist
Hydraulic & Electric Inspection	Visual Inspection, Complete Form	Retain Copy of Checklist
Chassis		
Steering & Brakes Inspection	Visual Inspection, Complete Form	Retain Copy of Checklist
Clutch		
Drive Shafts & Latches	Lubricate	SAE 90W Oil in Spray Lubricator
Roller Bearings	Lubricate	Below 90 Degrees, Molykote EP 40
Roller Bearings (Swirl & Pinion)	Lubricate	Above 90 Degrees, Molykote EP 40
Ta Hubs	Lubricate	Control Super Lube
Power Windows	Check Fluid Level	EP #2200 Molykote HD
Swing Drive		SAE 90W Oil (or equivalent)
<b>6 MONTH OR 250 HOURS MAINTENANCE (QUALIFIED SERVICE TECHNICIAN)</b>		
Hydraulic Pressure	Check Pressure	Check OIL IN 20% (2)
Hydraulic Connections	Check Connections	
Fuel Filter	Check Fuel Filter	See Engine Manual
Engine Oil	Check Oil Level, Condition & Quantity	Change Oil Regularly
Roller Bearings (Swirl & Pinion)	Lubricate	EP Heavy Duty Lubricant
Engine Oil Filter	Check Engine Oil Filter	See Engine Manufacturer
Engine Coolant	Check Engine Coolant	See Engine Manufacturer
Engine Oil/Fuel	Check Fuel/Fuel Filter	See Engine Manufacturer
<b>YEARLY OR 500 HOURS MAINTENANCE (QUALIFIED SERVICE TECHNICIAN)</b>		
Hydraulic Oil Reservoir	Check and Refill	Check OIL IN 20% (2)
Hydraulic Return Filter	Replace	After 1st 50 Hours, Replace or Recommended Interval
Hydraulic Reservoir Suction Filter	Clean and Replace	After 1st 50 Hours, Replace or Recommended Interval
Power Windows	Repair Fluid	EP #2200 Molykote HD
Swing Drive	Repair Fluid	SAE 90W Oil (or equivalent)
Front Main Bearings	Check Front	Control Super Lube (or equivalent)



**HARD HAT** TRAINING SERIES

AERIAL PLATFORM

**WARNING:** Failure to perform Preventive Maintenance at the intervals outlined in the manufacturer's maintenance manual may result in a unit being operated with a defect. This could result in the injury or death of the operator.

**ANSI A92.5 – 1992 8.4 Problems or Malfunctions.** Any problems or malfunctions that affect the safety of operations shall be repaired prior to the use of the aerial platform.

# SAFETY DEVICES

Use all Available Protective and Safety Devices



Your platform may be equipped with:

- Chain, gate or bar closures
- Safety bars or mechanical locks
- Stabilizers or outriggers
- Extending axles
- Turntable lock
- Emergency controls
- Interlock devices
- Continuously activated control
- Ground controls
- Control lever lock
- Audible and visual alarms



**HARD HAT** TRAINING SERIES

AERIAL PLATFORM

Keep all protective and safety device in place and in proper working order. Make certain all guards, railings, covers and safety signs are installed on the aerial platform as required by the manufacturer.

Know which devices are required on your machine.

Be familiar with how they work.

Never remove or modify any of them.

**WARNING:** All operators must be trained and have received proper instructions before operating aerial platforms. For your safety, warning notices are placed on the platform and in the manufacturer's manual. Failure to obey warnings can cause injury or death.

## DRIVING THE LIFT

- Always look in the direction travel.
- Assure the path of travel is firm and level.
- Maintain safe distance from obstacles, debris, drop-offs, holes, depressions ramps or other hazards to safe elevated travel.
- Maintain a safe distance from overhead obstacles.
- Limit speed according to conditions.
- Use caution when operating near slope, personnel, or other vehicles that could create a collision.



**HARD HAT** TRAINING SERIES

AERIAL PLATFORM

Here are some of the principles that must be taught.

- Use good common sense.
- Know the capacity and operating characteristics of your machine. Do not overload the platform.
- Inspect your machine before each use as specified by the manufacturer.
- Check the work area for hazards that might cause a tip over.
- Check your path of travel– above, below and all around– for hazards.
- Maintain specified distances from electric power lines and apparatus.
- Keep others away from your work area.
- Wear a safety harness (if required for your type of machine).
- Never modify or remove any part of the equipment unless authorized by the manufacturer.
- If machine is to be unattended, lower the platform, shut off engine, engage parking brake and remove key.

## DRIVING THE LIFT

- Never participate in stunt driving or horseplay.
- Operator should maintain a firm footing on the platform.
- Steering is not self-centering and must be manually returned to center line.
- Travel only with boom in stowed position with the platform behind the drive wheels.
- Do not raise, lower, extend or rotate boom when traveling.



**HARD HAT** TRAINING SERIES

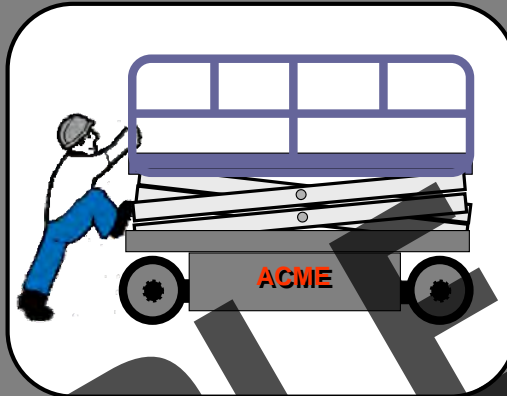
AERIAL PLATFORM

SAMPLE

## SAFE OPERATION

### MOUNTING THE MACHINE

- Always use “three point contact”
- Wear clean shoes
- Never use controls as handles
- Never climb onto a moving machine
- Never climb an elevated machine
- Secure gates & chains before moving a machine



**HARD HAT** TRAINING SERIES

AERIAL PLATFORM

When mounting the machine always use the “three point contact” method. Face the machine when you enter or leave it.

Clean your shoes and wipe your hands before mounting. Use handrails, ladders or steps (as provided) when mounting the platform.

Never use control levers as a handhold when climbing on or off.

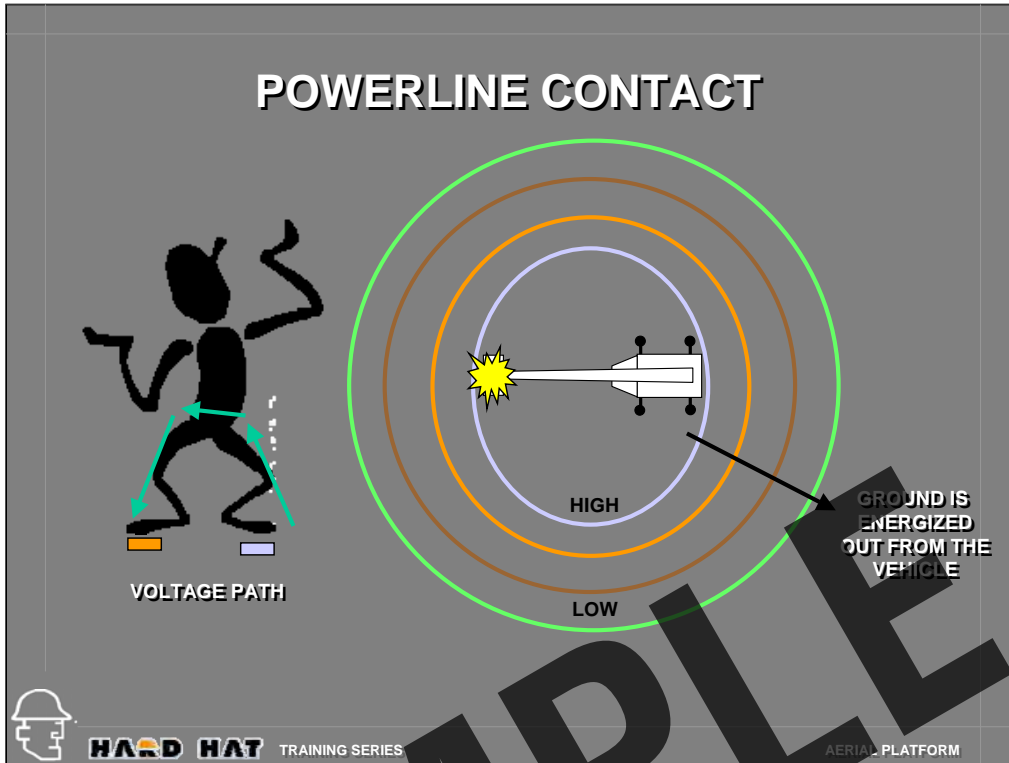
Never step on foot controls when mounting or climbing off.

Never attempt to mount or dismount a moving machine.

Never walk or climb an elevated assembly to gain access to it. (nor do so to leave a platform).

Make certain that all handrails, toe boards, gates and entry chains are in place and secured before raising the platform.

Enter and exit the platform from the ground only.



If you make contact with a power line and you are aware of it, then there is good news and bad news. The good news is you are still alive. The bad news is, of course, you are touching a live electrical wire which could be fatal to you and anyone nearby.

If your hands are still on the controls, then use the controls to back off the line.

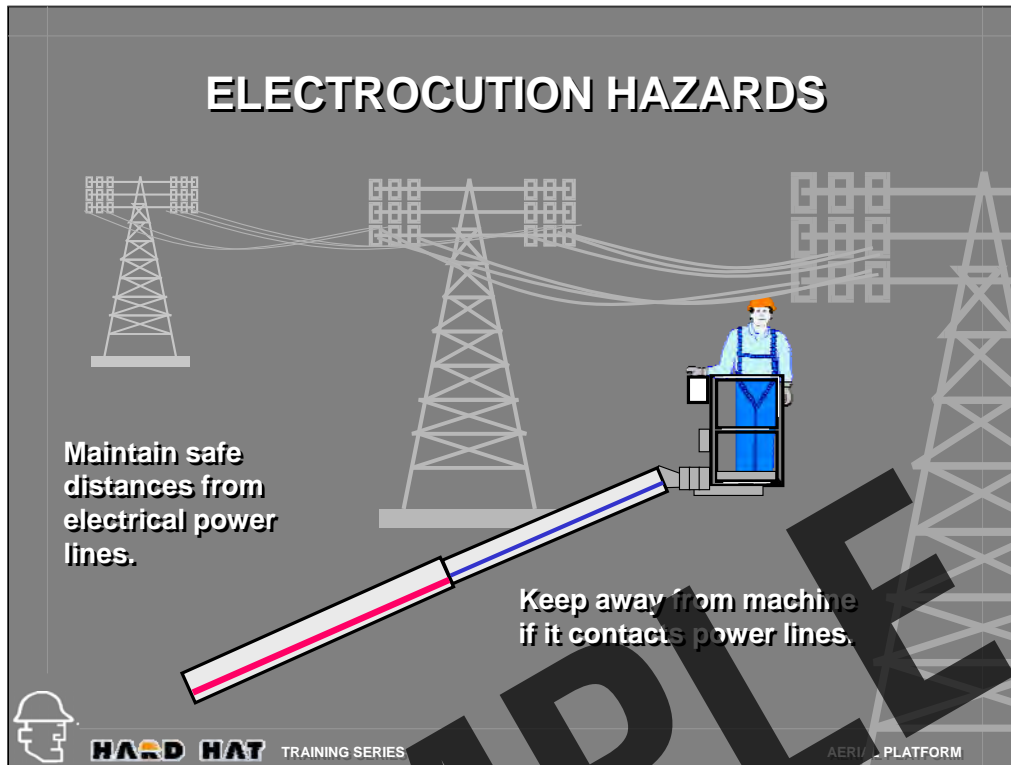
If you let go of the controls, **do not touch them.** They could be energized. Call for help and warn everyone to stay away from the ground surrounding the lift.

**Do not** allow anyone to try to work the ground controls to free you. Not only could the ground around the machine be energized, but anyone touching the machine could be electrocuted.

Stay on the machine if possible, until help arrives and the lines are turned off.

Do not assume that your boom is insulated.

If you see someone in an aerial lift that has contacted an electrical line and is unconscious, do not try and be a hero by trying to save them before the electric lines are shut off! Many that have tried become a victim also.



The number one cause of injuries or fatalities involving aerial platforms is contact with electrical wires.

Stay away from live power lines.

If you must work near live power lines, make sure they are de-energized.

Insulated booms are not a fail-safe measure from electrocution.

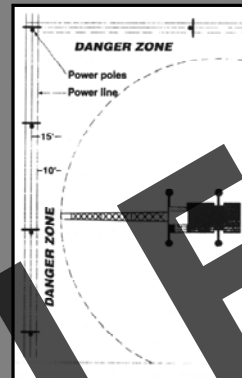
Booms that are insulated must be dielectric tested often. Note: Dirty booms or contaminated hydraulic fluid can be a conductor of electricity.

# POWERLINE CONTACT



## Required Clearances

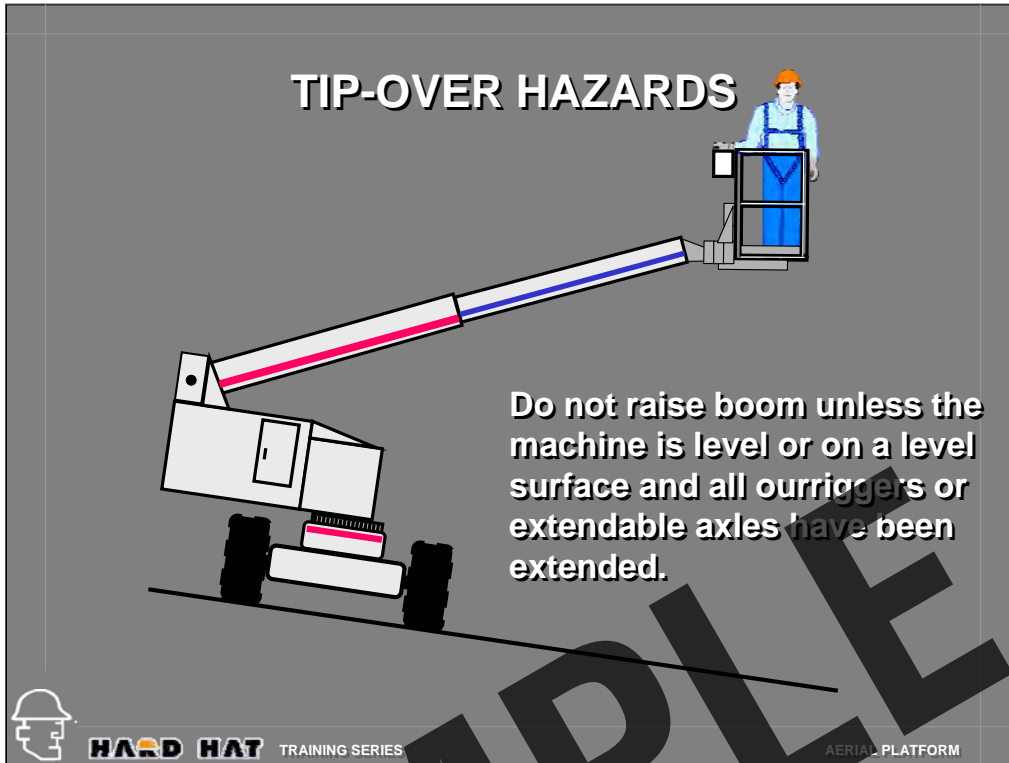
50kV	10 ft
50 to 200kV	15 ft
200 to 350kV	20 ft



**HARD HAT** TRAINING SERIES

AERIAL PLATFORM

Never operate an aerial lift if there are power lines nearby. If you must do so, and any part of your boom could come into contact with a live line, then you must use a spotter to warn you if you get near one.

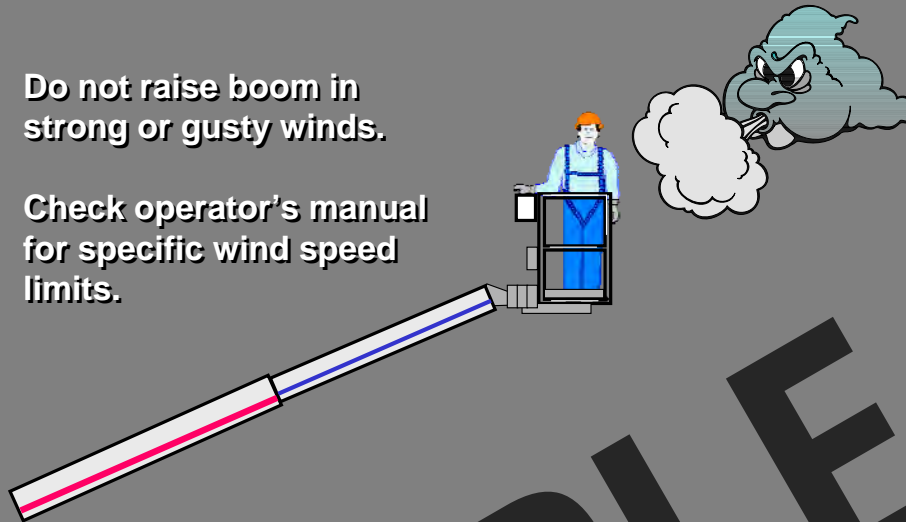


**8.10.19 Driving on Slopes.** The aerial platform shall not be driven on grades, side slopes or ramps exceeding those for which the aerial platform is rated by the manufacturer.

## TIP-OVER HAZARDS

Do not raise boom in strong or gusty winds.

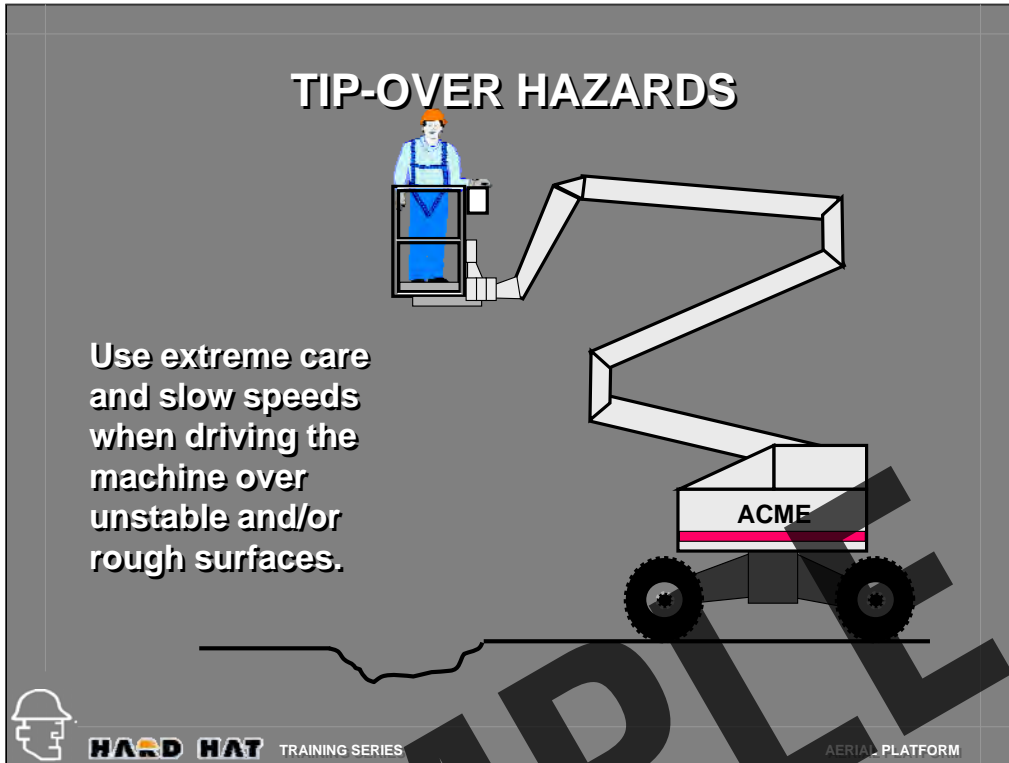
Check operator's manual for specific wind speed limits.



**HARD HAT** TRAINING SERIES

AERIAL PLATFORM

SAMPLE



**7.11.14 Elevated Driving Requirements.** Before and during driving while the platform is elevated, the operator shall:

- (1) Maintain a clear view of the path of travel
- (2) Maintain a safe distance from obstacles, debris, drop-offs, holes, depressions, ramps, and other hazards to ensure safe elevated travel
- (3) Maintain a safe distance from overhead obstacles.

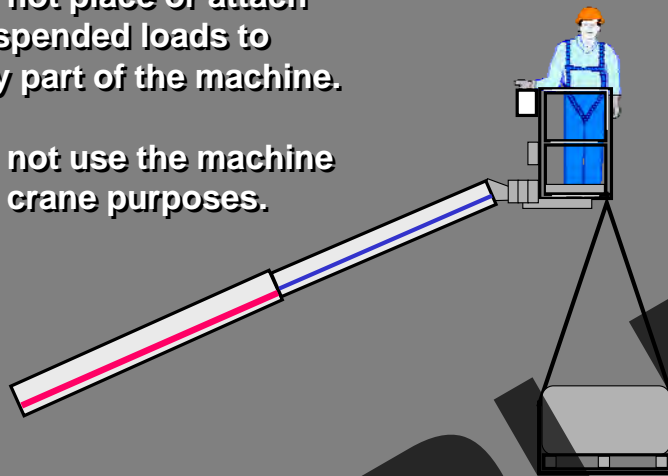
**8.10.14 Travel speed**

Under all travel conditions, the operator shall limit travel speed according to conditions of ground surface, congestions, visibility, slope, location of personnel, and other factors causing hazards of collision or injury to personnel.

## TIP-OVER HAZARDS

Do not place or attach suspended loads to any part of the machine.

Do not use the machine for crane purposes.



**HARD HAT** TRAINING SERIES

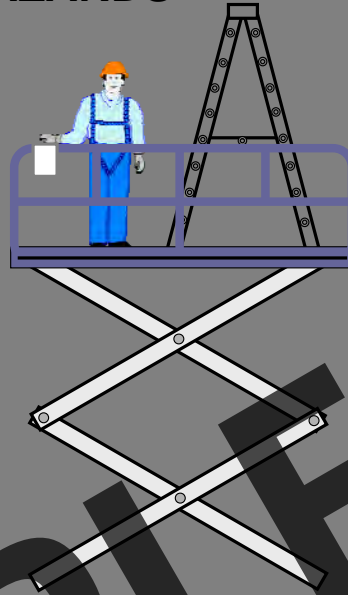
AERIAL PLATFORM

**7.11.11 Misuse as a Crane.** The aerial platform shall not be used as a crane.

SAMPLE

## TIP-OVER HAZARDS

Do not place ladders or scaffolds in platform or against any part of the machine.



**HARD HAT** TRAINING SERIES

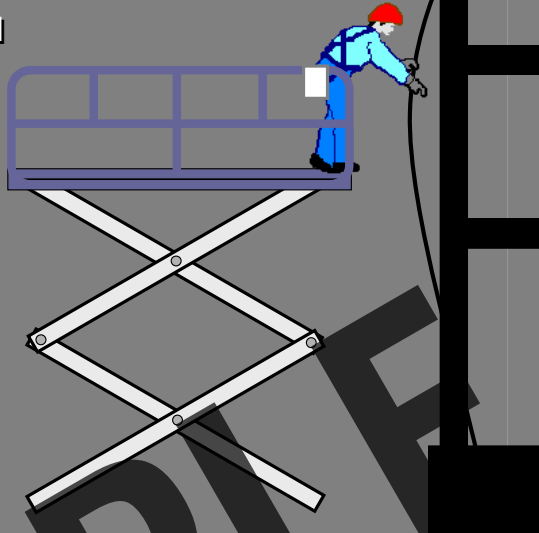
AERIAL PLATFORM

SAMPLE

## TIP-OVER HAZARDS

While elevated in an aerial platform, do not push or pull any object outside of the platform.

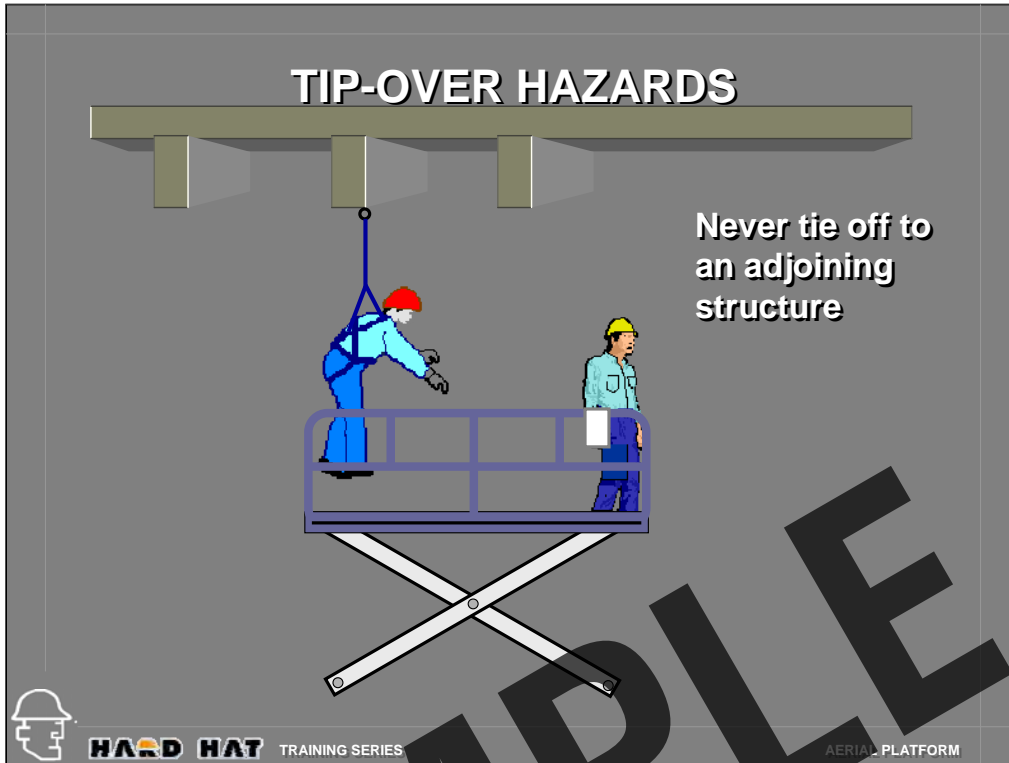
Check the operator's manual for maximum side forces.



**HARD HAT** TRAINING SERIES

AERIAL PLATFORM

SAMPLE



1910.67(c)(2)(iii)

Belting off\* to an adjacent pole, structure, or equipment while working from an aerial lift shall not be permitted.

\*See note on following page.



The number one cause of occupants being thrown from the machine is being hit by another vehicle. For this reason, you must always wear a harness and lanyard and be connected so that if you are thrown out, your free fall will not exceed 4 feet.

Never tie off to an adjacent structure when working from an aerial platform.

Never use ladders, planks, steps or other devices to provide additional reach or gain greater height.

Do not lean over, sit or climb on the platform railing. Always keep both feet on the platform floor.

[1926.453\(b\)\(2\)\(v\)](#) \*see note below

A body belt shall be worn and a lanyard attached to the boom or basket when working from an aerial lift.

\*Note to paragraph (b)(2)(v): As of January 1, 1998, subpart M of this part (1926.502(d)) provides that body belts are not acceptable as part of a personal fall arrest system. The use of a body belt in a tethering system or in a restraint system is acceptable and is regulated under 1926.502(e).

## PROTECT YOURSELF

Wear all the protective clothing and personal safety devices issued to you or called for by job conditions.



You and other workers may need:

- Safety harnesses and lanyards connected to an anchorage point
- Hard hats
- Safety shoes
- Safety glasses, goggles, or face shield
- Heavy gloves
- Hearing protection
- Wet weather gear
- Respirator or filter mask



**HARD HAT** TRAINING SERIES

AERIAL PLATFORM

Be sure you (and any others on the platform) are wearing your personal fall-protection device (if required) and it is properly attached to the appropriate lanyard attachment point.

Never attach a lanyard to the railing unless it is specifically designed as an attachment point.

Attach your lanyard so that if you fall, your free fall will be limited to a maximum of 4 feet.

If your attachment point will not allow this, then use a shorter lanyard.

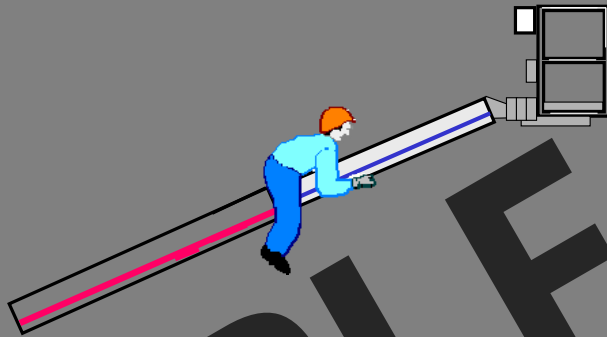
**NEVER** attach your lanyard to an adjacent structure!

Never rest against an adjacent structure to stabilize the platform

Wear all other personal protective equipment (PPE) required for the job.

## FALL HAZARDS

Do not climb down the boom from a raised platform.

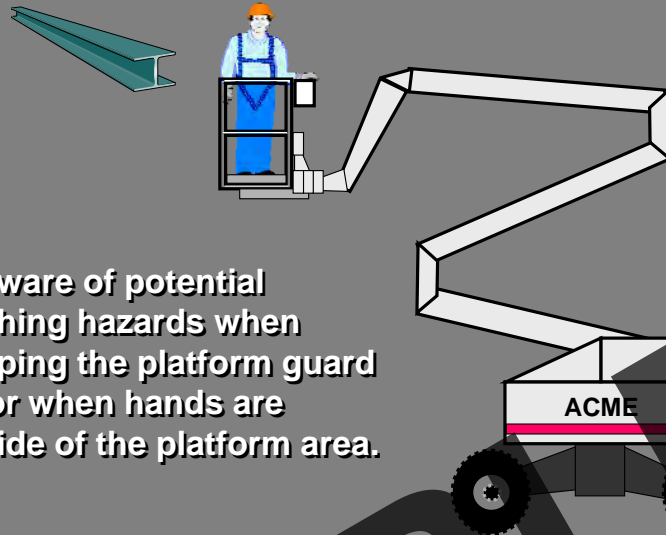


**HARD HAT** TRAINING SERIES

AERIAL PLATFORM

SAMPLE

## COLLISION HAZARDS



Be aware of potential crushing hazards when grasping the platform guard rail or when hands are outside of the platform area.

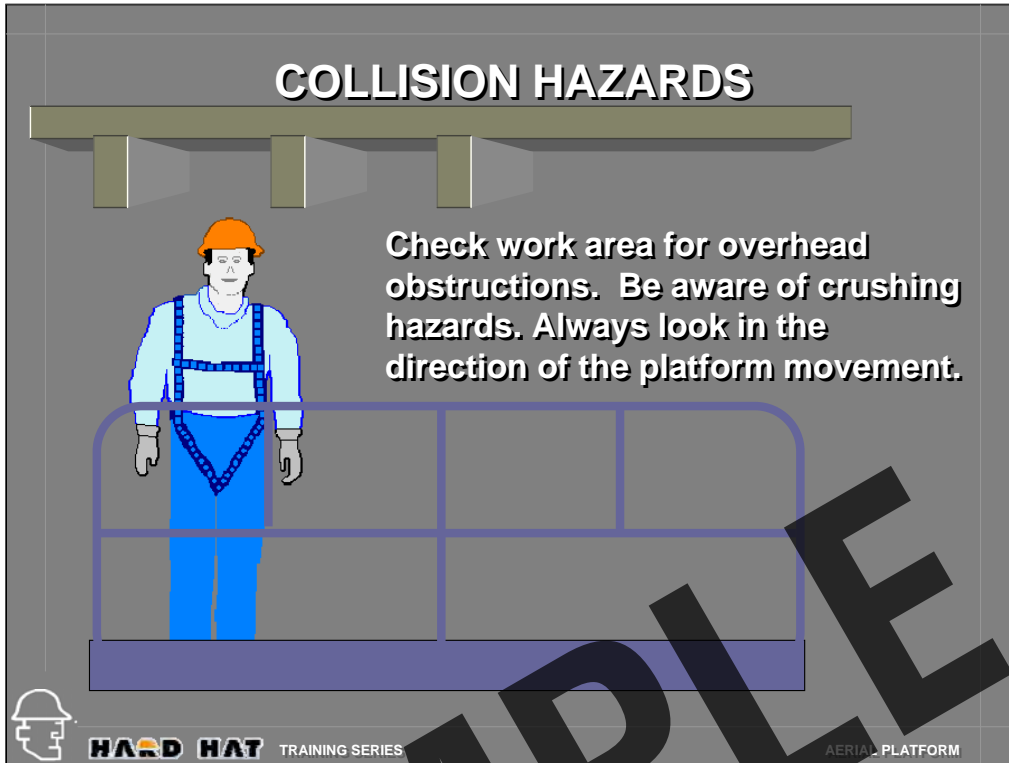


**HARD HAT** TRAINING SERIES

AERIAL PLATFORM

**7.11.14 Elevated Driving Requirements.** Before and during driving while the platform is elevated, the operator shall:

- (1) Maintain a clear view of the path of travel
- (2) Maintain a safe distance from obstacles, debris, drop-offs, holes, depressions, ramps, and other hazards to ensure safe elevated travel
- (3) Maintain a safe distance from overhead obstacles.



**WARNING:** Always check clearances above, below and on all sides before raising, lowering or rotating the platform. If applicable, also check turntable and counterweight clearances. Failure to do so could cause severe injury or death to yourself and/or others.

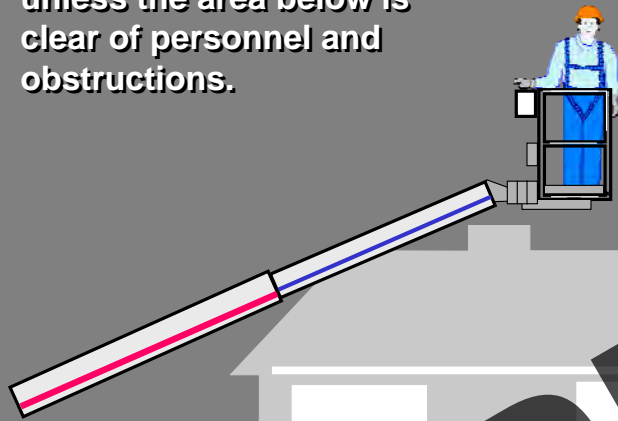
On a boom type machine, do not use the drive to maneuver in close to an obstacle. Place your machine and then use the swing and boom functions to get in close. Never drive the base or platform into an stationary object.

**7.11.14 Elevated Driving Requirements.** Before and during driving while the platform is elevated, the operator shall:

- (1) Maintain a clear view of the path of travel
- (2) Maintain a safe distance from obstacles, debris, drop-offs, holes, depressions, ramps, and other hazards to ensure safe elevated travel
- (3) **Maintain a safe distance from overhead obstacles.**

## COLLISION HAZARDS

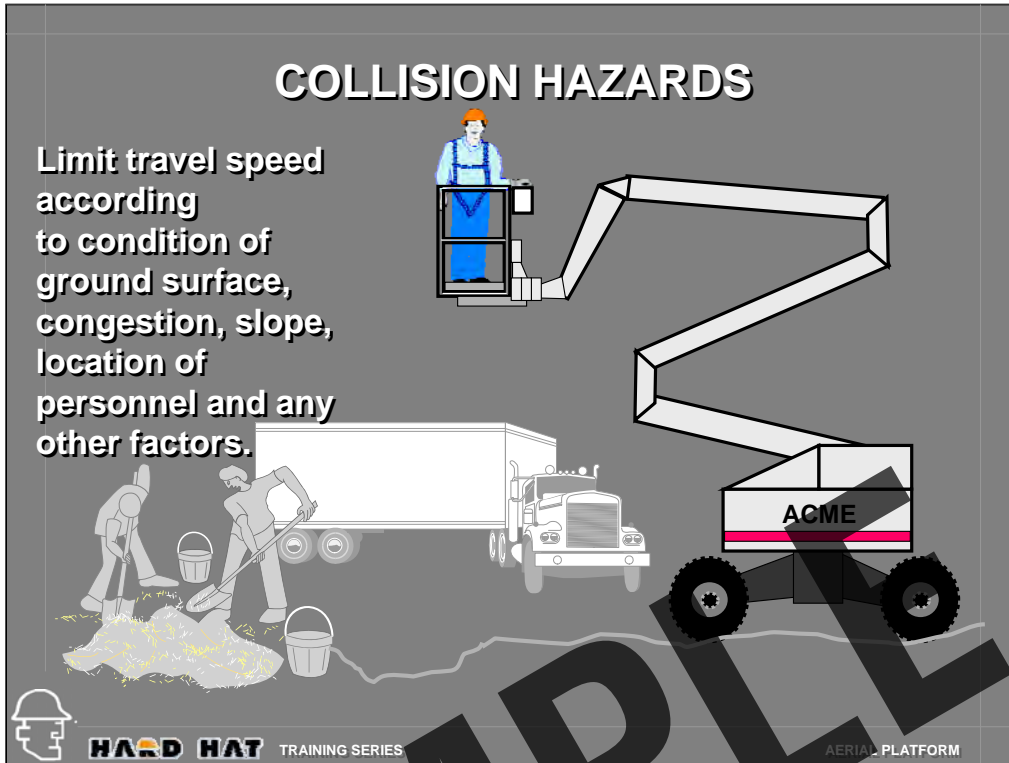
Do not lower the boom unless the area below is clear of personnel and obstructions.



**HARD HAT** TRAINING SERIES

AERIAL PLATFORM

SAMPLE



**7.11.2 Other Moving Equipment.** When other moving equipment and vehicles are present, special precautions shall be taken to comply with local ordinances or safety standards established for the workplace. Warnings such as, but not limited to, flags, roped-off areas, flashing lights, and barricades shall be used.

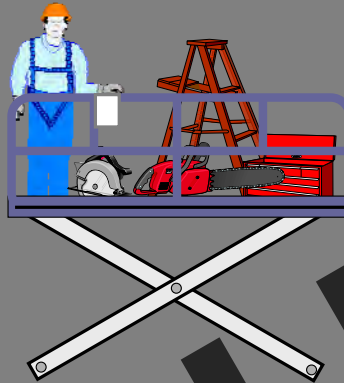
**7.11.14 Elevated Driving Requirements.** Before and during driving while the platform is elevated, the operator shall:

- (1) Maintain a clear view of the path of travel
- (2) Maintain a safe distance from obstacles, debris, drop-offs, holes, depressions, ramps, and other hazards to ensure safe elevated travel
- (3) Maintain a safe distance from overhead obstacles.

## SAFE OPERATION

### DON'T EXCEED THE MACHINE'S CAPACITY

- Know the rated load of the machine
- Maximum load includes:
  - Personnel
  - Materials
  - Tools
- Distribute the load evenly



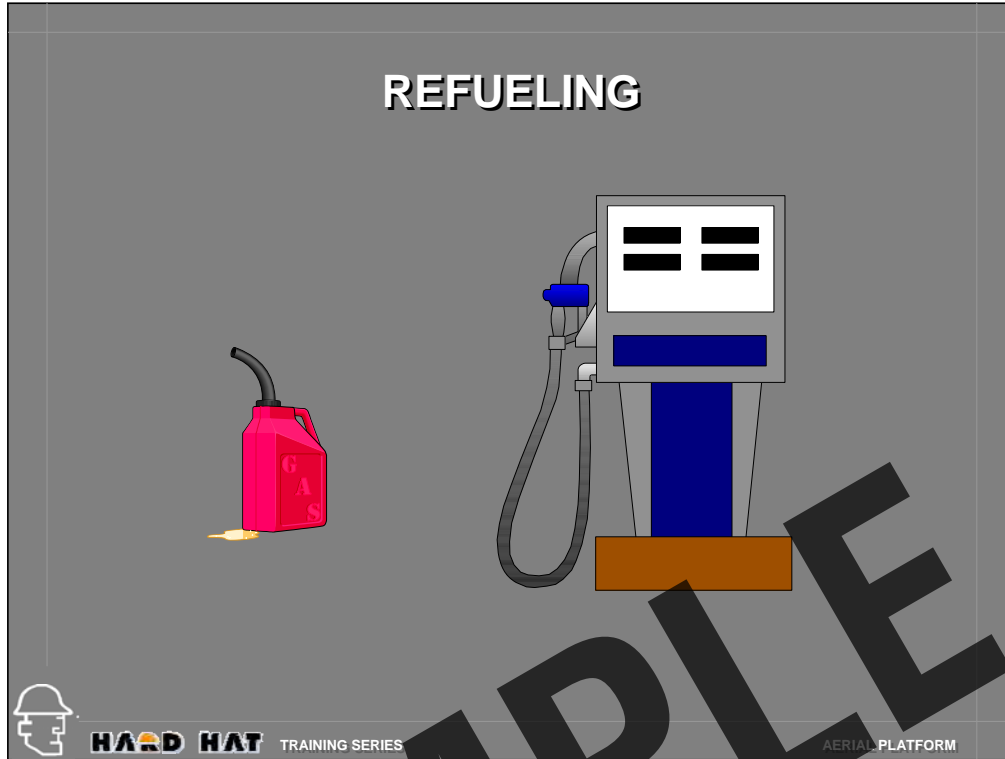
**HARD HAT** TRAINING SERIES

AERIAL PLATFORM

**8.10.7 Capacity Limitations.** Rated capacities shall not be exceeded when loads are transferred to the platform at any height.

**8.10.6 Entanglement.** Care shall be taken to prevent rope, electric cords, and hoses, etc., from becoming entangled in the aerial platform.

## REFUELING



ANSI/SIA A92.5 -- 1992

### 7.11.8 Fueling

The engine shall be shut down while fuel tanks are being filled. Fueling shall be done in a well-ventilated area free of flame, sparks, or other hazards which may cause fire or explosion.

## REFUELING GASOLINE, DIESEL & LIQUID PROPANE AERIAL PLATFORMS

- Refuel when engine is cool
- Start shift with a full tank
- Designated areas only
- No smoking, flames or sparks



**HARD HAT** TRAINING SERIES

AERIAL PLATFORM

**PURPOSE:** Understand the general rules for refueling the aerial platform.

- Review each item and discuss how it makes refueling safer.
- Emphasize that starting the work shift with a full tank could avoid an unsafe situation when the aerial platform is in a precarious position.

## REFUELING GASOLINE & DIESEL AERIAL PLATFORMS

- Fire extinguishers in area
- Shut off engine
- Use correct type fuel
- Clean up spills
- Do not completely fill container



**HARD HAT** TRAINING SERIES

AERIAL PLATFORM

**PURPOSE:** Review the special safety precautions regarding gasoline and diesel aerial platforms.

- A fire extinguisher to be in the refueling area.
- Avoid topping off the tank, which could result in a spill and the creation of a fire hazard.

## CHARACTERISTICS OF LP FUEL

- Heavier than air
- Extremely flammable
- Extremely cold
- Odorless in its natural state



**HARD HAT** TRAINING SERIES

AERIAL PLATFORM

**PURPOSE:** Review the characteristics of LP fuel.

- The primary characteristic of LP fuel is that it is heavier than air and therefore will settle into confined spaces. A spark could then ignite the fuel.
- LP fuel can cause frostbite if it comes in contact with the skin.

## LP GUIDELINES

- **No refueling or parking LP machine in:**
  - Confined areas
  - Near high heat sources or open flame
  - Near stairways, exits, safe egress
- **Turn off service valve when:**
  - Machine is parked for extended periods
  - Empty LP tanks
- **Don't drop, roll or strike LP tank**



**HARD HAT** TRAINING SERIES

AERIAL PLATFORM

**PURPOSE:** Review the general guidelines for LP fueled aerial platforms.

- Discuss why it is important not to park or refuel in confined spaces, near heat sources, or exits.

Explanation for not refueling in exit area: others attempting to escape a fire could have their only means of escape blocked.

- Care needs to be used when handling the LP tank to avoid damage.

## REPLACING LP TANKS

- Trained and authorized
- Wear protective clothing
- Designated areas
- “Attended parking” mode
- Turn off service valve
- Run fuel line out
- Try to restart engine
- Disconnected fuel line & remove LP tank



**HARD HAT** TRAINING SERIES

AERIAL PLATFORM

**PURPOSE:** Review the guideline for replacing LP tanks.

- Wear protective clothing. Eye and face protection are important to avoid injury from any escaping fuel.
- The service valve needs to be turned off prior to removing the tank. *Explain that running the engine with the service valve closed will empty the fuel line and therefor eliminate the possibility of gas escaping when the fuel line is disconnected.*

## REPLACING LP TANKS

- Check new tank for damage
- Tank must be compatible and fits within profile of machine
- Place LP tank in proper position
- Secure tank with bracket restraints
- Open service valve *slowly*
- Check for leaks



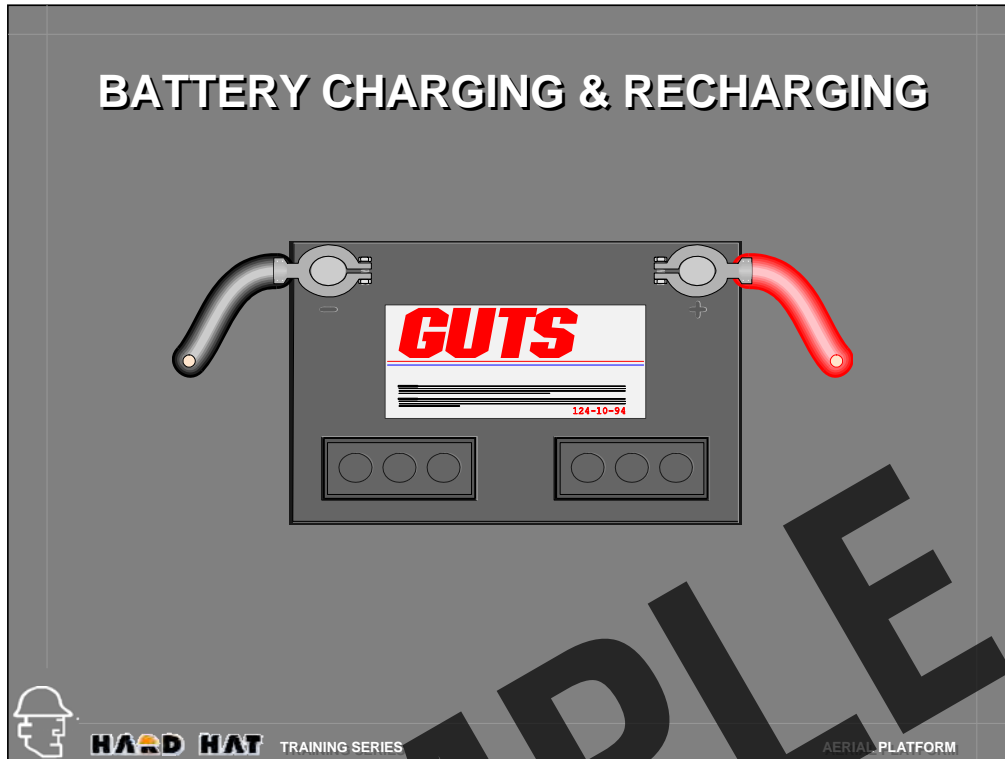
**HARD HAT** TRAINING SERIES

AERIAL PLATFORM

Continuation from previous slide.

- The service valve needs to be opened slowly to avoid the back pressure check valve from shutting off the fuel flow. If this occurs, shut the valve off, wait five seconds and slowly open the valve.
- Use a soapy solution to check for propane leaks.

## BATTERY CHARGING & RECHARGING



ANSI/SIA A92.5 -- 1992

### 7.11.9 Battery charging

Batteries shall be charged in a well-ventilated area free of flame, sparks, or other hazards which may cause fire or explosion.

## BATTERY CONFIGURATION

- Primary voltage in North America
  - 24, 36 and 48 volts
- Battery size affects
  - Vehicle lifting capacity
  - Vehicle stability
  - Charge life
  - Work cycle duration



**HARD HAT** TRAINING SERIES

AERIAL PLATFORM

**PURPOSE:** Review general characteristics of industrial batteries.

- Industrial batteries typically consist of six or more cells connected in series.
- Since the battery is one of the principal offsetting weights, its size affects the lifting capacity of the vehicle.

## WHAT IS AN INDUSTRIAL BATTERY?

- Six or more cells connected in series
- Cell consists of positive & negative plates
- Plates are submerged in electrolyte
- Each cell equals 2.2 volts
- Number of cells times two = battery voltage



**HARD HAT** TRAINING SERIES

AERIAL PLATFORM

**PURPOSE:** Review the general characteristics of an industrial battery.

- Briefly discuss each item.

## BATTERY HAZARDS

- **Battery weight**
- **Battery acid**
- **Explosive fumes**
- **Electrical shorts**



**HARD HAT** TRAINING SERIES

AERIAL PLATFORM

**PURPOSE:** Extra attention to safety is required when working with industrial batteries.

- Batteries can weigh 2,000 pounds or more. Always use proper lifting equipment when changing them.
- Batteries contain sulfuric acid, which is highly corrosive. Always wear proper protective clothing when working around a battery.
- Toward the end of the battery charging process, batteries give off highly explosive hydrogen fumes. The charging area must be properly ventilated.
- When working around batteries, remove all conductive jewelry. Contact with electrical cells can cause an electrical short and severe injury.

## GENERAL SAFETY RULES

- **Follow company policies**
- **Observe all safety rules**
- *Use trained and authorized personnel*



**HARD HAT** TRAINING SERIES

AERIAL PLATFORM

**PURPOSE:** Review the general rules for working with batteries.

**SAMPLE**

## CHANGING & CHARGING BATTERIES

- Use proper equipment
  - Insulated battery beam
  - Plywood cover *if terminals exposed*
  - Hoist with enough lifting capacity
  - Personal protective equipment
    - Face shield & glasses
    - Rubber apron
    - Rubber gloves



**HARD HAT** TRAINING SERIES

AERIAL PLATFORM

**PURPOSE:** Review the use of proper equipment when working with batteries.

- When changing a battery, make sure an adequate lifting device is used.
- The proper personal protective equipment must be worn when working around batteries.

## CHANGING & CHARGING BATTERIES

- Work in designated areas only
- Use “Unattended parking” mode
- Clear removal route
- Fully expose battery
- Connect battery plug to compatible charger
- Check cables & plug
- When disconnecting, *turn charger off first*



**HARD HAT** TRAINING SERIES

AERIAL PLATFORM

**PURPOSE:** Review the precautions to be used when changing and charging batteries.

- Batteries need to be fully exposed when charging to allow the hydrogen to escape.
- When disconnecting the charger, be sure to turn it off first. If the cables are disconnected before the charger is turned off, a spark could be created, which in turn could ignite the hydrogen gas.

## WATERING BATTERIES

- Always add water *after* charge
- Use distilled or approved tap water
- Add water before charging only if separator plates are exposed
  - Then, add just enough to cover plate
- Never attempt to add acid



**HARD HAT** TRAINING SERIES

AERIAL PLATFORM

**PURPOSE:** Review the process for adding water to a battery.

- Adding water prior to charging could cause a boil over. Water should only be added before charging when the separator plates are exposed.
- It should never be necessary to add additional acid to a battery. Doing so causes a hazardous situation.

## INSURING MAXIMUM BATTERY LIFE

- Discharge battery to recommended levels
- Battery life = 1,500 to 2,000 cycles
- Avoid quick or opportunity charges
- Follow 8 - 8 - 8 rule
- Do not overcharge battery
- Do not undercharge battery
- Clean battery periodically



**HARD HAT** TRAINING SERIES

AERIAL PLATFORM

**PURPOSE:** Discuss the ways for insuring maximum battery life.

- The typical recommended discharge for an industrial battery is 80%.
- Quick charges can actually shorten a battery's life.
- Over-charging creates high battery temperatures and can cause a boil over.
- Under-charging a battery can cause the plates to become dry and brittle (sulfation) and will shorten the battery's life.
- Clean batteries with neutralizing detergent and water.