



Aerial Lift Fall Protection

Technical Brief



WE KNOW WHAT'S AT STAKE.



Definitions

An “aerial lift” is a device used to elevate personnel to their work surface.

- **OSHA Subpart F: 1910.67** — “Powered Platforms, Manlifts, and Vehicle-Mounted Work Platforms”
- **OSHA Subpart L: 1926.453** — “Scaffolding”



Aerial Lift Types & Regulations

- ■ **Vehicle-Mounted Boom** ANSI A92.2
- ■ **Extensible Boom Platform** ANSI A92.5
- ■ **Articulating Boom Platform** ANSI A92.5

Both the General Industry and Construction regulations **require fall protection** when working in such a device.

• General Industry

“A personal fall arrest or travel restraint system that meets the requirements in subpart I of this part shall be worn and attached to the boom or basket when working from an aerial lift.”

— 1910.67(c)(2)(v)

• Construction

“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).” —1926.453(b)(2)(v)

OSHA rules and current industry best practice in fall protection for aerial lift devices call for the operator of the lift to **remain behind the guard rails** with both feet on the floor of the platform at all times. Additional protection is provided by the use of a **personal restraint** and/or **fall arrest system**.

Vehicle-Mounted Boom
ANSI A92.2



Extensible Boom Platform
ANSI A92.5



Articulating Boom Platform
ANSI A92.5



What about Scissor Lifts



The **scissor lift** is a motorized device that operates much like an aerial lift—it is motorized and contains a basket from which workers can perform their jobs. However, the platform only goes up and down and cannot be articulated from side to side on a turntable. Per OSHA, this difference is significant enough that a scissor lift is *not* considered an aerial lift but, instead, a form of scaffolding. Since a scissor lift platform is completely guardrailed without gaps, a worker can work inside the basket without the added protection of a PFAS (Personal Fall Arrest System).

Despite this, many employers treat scissor lifts like aerial lifts, requiring a PFAS to be worn. Accordingly, a number of manufacturers now build scissor lifts fitted with connection points. It should be noted that in cases where manufacturers recommend connection, OSHA often will hold the user responsible for following this recommendation. Therefore, in older lifts without a connection, retrofit kits can be installed if a company requires a PFAS.



#1

Fall Protection Option No. 1:

Personal Restraint: Restraint Lanyard



V-SERIES® Restrain Lanyard

Fall restraint should always be considered first. Restraint means that workers simply tie themselves to the basket with a short leash. This option can prevent a worker from being ejected from the elevated work platform, which is especially important when repositioning the lift.¹ However, while personal restraint may prevent a fall, its use also presents several problems:

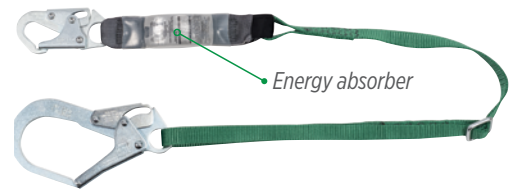
1. **Not True Restraint** — The lanyard may be *too long*, allowing the worker's center of gravity (CoG) to pass over the edge.
2. **Lack of Deceleration** — *Without energy absorption*, forces on the body could easily skyrocket above the allowed 1,800 pounds and approach those that could be fatal.
3. **Limited Mobility** — If true restraint is achieved, the worker likely will not be able to move around in the basket due to the short connection.
4. The worker may consider *disconnecting their lanyard* for a period of time, which is a major violation of OSHA rules.

¹Most aerial lift manufacturers advise against using lifts for access to a work location that requires a worker to exit the lift—the transition into and out of an aerial lift platform is especially hazardous. Lift manufacturers also caution strongly against the practice of stepping onto the guard rails when working on an elevated work platform.

#2

Fall Protection Option No. 2:

Personal Fall Arrest System: Energy-Absorbing Lanyard



V-SERIES® Energy-Absorbing Lanyard

Using an energy-absorbing lanyard eliminates some of the problems associated with restraint lanyards by providing an attached deceleration device which will deploy should the worker go over the edge. However, issues can still arise:

1. **Needed Clearance** — *At least 18 ½ feet* is needed between the anchor point and the ground, but work often takes place in an aerial lift at heights much lower than 18 ½ feet. If this is the case, a worker wearing a 6-ft. energy-absorbing lanyard does not have the required amount of open space below. It is possible that the combination of *stretch* in the lanyard, *flex* in the basket arm of the aerial lift, and *proximity* to the ground will allow the worker to strike the surface below in a fall.
2. **Limited Mobility** — Manufacturers require attachment once in the basket *before any movement*—horizontal or vertical—takes place. This requirement exists because the long lift arm connected to the vehicle has a considerable amount of flex and can bounce during movement in even mildly rough terrain, potentially throwing the worker free of the basket. Because of this restriction, using either an energy-absorbing or restraint lanyard limits the ability of the worker to change positions when the vehicle is moving and once the lift is raised.

What is the Tie-Off Point



In all lifts manufactured today—as well as in many older models—the worker is directed to connect the lanyard system to a particular location, typically on the floor or on the vertical railing below the operator's control box. This spot is called the **tie-off point** and usually consists of a small ring or welded bar near the base of the basket.



#3

Fall Protection Option No. 3:

Personal Fall Arrest System: Leading Edge Personal Fall Limiter (PFL)

If restraint won't work, the general recommendation for a connecting device in an aerial lift is a small retractable device such as MSA's V-SHOCK or V-EDGE Leading Edge PFL units shown here. With one of these PFLs, the worker:

1. Is connected,
2. Is permitted mobility,
3. Has fall arrest capabilities should they go over the basket edge, and
4. Will come to a stop more quickly than if using an energy-absorbing lanyard.

Small PFLs work so fast that if the basket bounces, the rapid pull of line from the unit will cause it to lock off in a matter of inches, often before the worker even leaves the basket. However, if the worker does go over the rail in a fall, this type of connector keeps the energy absorber on the worker's back so that it can properly activate.



MSA V-SHOCK® and V-EDGE® Leading Edge PFLs are approved for use in aerial lifts provided the hazards described below are considered. In addition, the user is advised to perform an evaluation by a Competent Person for other fall related hazards unique to the application.

- Avoid exposing the lifeline to working over an exposed sharp edge. Sharp edges may cut the line. However, the rounded bars of a guard rail are acceptable for the line to pass over provided the energy-absorbing end of the device is worn at the user's back.
- A fall out of the platform can result in a swing-fall hazard, with the potential for the worker to strike the boom of the aerial lift device or other objects in the path of the fall.
- When a V-SHOCK or V-EDGE Leading Edge PFL is used in a boom lift with the boom extended horizontally, the forces of a fall can cause the extended boom to flex. This oscillating movement can cause a "ratcheting effect" in the locking mechanism of the V-SHOCK or V-EDGE Leading Edge PFL which may lead to greater fall distances.
- The V-SHOCK or V-EDGE Leading Edge PFL must be attached to a certified anchor point within the platform of the lift.

Device	Orientation of Use	User Weight Capacity Limit	Clearance Below Platform
V-SHOCK Leading Edge PFL	Device housing on harness	130–310 lbs. (60–141 kg)	Refer to user manual
V-EDGE Leading Edge PFL	Device housing on harness	130–310 lbs. (60–141 kg)	Refer to user manual

#4

Fall Protection Option No. 4:

Personal Safety Harness:

Full-Body Harness

Whether using a lanyard or a PFL, the aerial lift occupant will need a safety harness. The **MSA V-FORM+™ Safety Harness** is an option that can accommodate both lanyard options or a PFL. With the V-FORM+, three important safety harness considerations are met.

When choosing a harness option, things to consider include:

1. **Comfort**—Comfort and worker adherence to wearing safety gear can go hand in hand. If a worker is donning a harness that makes them uncomfortable while trying to work, the worker may consider disengaging critical safety features, such as buckles, or improperly wearing the harness. Doing so could leave the worker more susceptible to serious injury or fatality if a fall were to occur. The V-FORM+ harness utilizes shoulder padding to eliminate pressure points and is designed to contour to the body to improve upper torso movement.
2. **Adjustability**—The harness's adjustability is an important factor in finding a comfortable and safe fit. Everyone's fitting needs differ, so the ability to customize the fit can help the wearer ensure a proper fit. The V-FORM+ is designed with pull-down adjustment straps to meet the wearer's fitting needs.
3. **Sizing Options**—Finding the correct size harness is important to the wearer's safety. An ill-fitting harness may not provide proper protection in a fall, putting the wearer at risk of serious injury or worse. When choosing a safety harness, careful consideration should be given to the harness size. The V-FORM+ safety harnesses are available in four sizes and feature adjustment straps.
4. **Fall Arrest Connectivity**—It is important to consider the compatibility of the fall arrest device to be used and the selected safety harness. The V-FORM+ will work with any of the fall arrest devices mentioned and includes a dedicated PFL attachment point that doesn't utilize the back D-Ring. This allows the D-Ring to remain free and useable for other purposes. It also has four lanyard keeper points, including two at the waist to reduce underarm chaffing by keeping the lanyards away from the underarms.



#5

Fall Protection Option No. 5:

**Head Protection:
Safety Helmet**

Proper head protection is a crucial part of any comprehensive fall protection strategy. Careful consideration should be given to key features and accessories, in addition to the type of impact that could occur in the event of a fall. Some considerations to think about include the following:

1. **Safety Helmet Type:** Safety helmets are classified as either Type I or Type II. A Type I helmet is designed to protect from impacts to the top of the head only, while a Type II is designed to protect from impacts to the front, side, back, and top of the head.
2. **Chinstraps:** Chinstraps can help secure a helmet to the user's head and prevent it from falling off while the worker is working at height or in the event of an impact during a fall.
3. **Comfort Features:** A safety helmet is only effective if it is being worn properly. A helmet with features to enhance the comfort of the fit and options to help with cooling during hot weather can help enhance comfort.
4. **Accessories:** Depending on the type of work being done and the worksite hazards, additional protective measures may be needed. A safety helmet with additional safety attachments can help ensure workers utilize the necessary safety gear on the site without compromising the helmet's fit.

An option that meets all of these considerations is the **MSA V-Gard H2™ Safety Helmet**. It is a Type II safety helmet with chinstraps to secure the helmet to the user's head. The ratchet suspension system makes the helmet adjustable, and optional vents can improve airflow under the helmet. The safety helmet also offers a suite of attachable safety accessories, including options for face and hearing protection.



**V-Gard® H2 Safety Helmet,
non-vented**



**Further
Information**

For more information about safe, effective powered access worldwide, visit the IPAF website:
<https://www.ipaf.org/en-us>

Note: This Bulletin contains only a general description of the products shown. While product uses and performance capabilities are generally described, the products shall not, under any circumstances, be used by untrained or unqualified individuals. The products shall not be used until the product instructions/user manual, which contains detailed information concerning the proper use and care of the products, including any warnings or cautions, have been thoroughly read and understood. Specifications are subject to change without prior notice. MSA is a registered trademark of MSA Technology, LLC in the US, Europe, and other Countries. For all other trademarks visit <https://us.msasafety.com/Trademarks>.

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