

Safely Connecting A Personal Fall Arrest System



Image from Guardian Fall Protection's - The ABCs of Fall Protection video

- A** is for Anchorage Point
- C** is for Connecting Device
- B** is for Body Harness
- D** is for Descent & Rescue

C is for Connecting Device

This is the third installment of our four-part series on “The ABCD’s of Fall Arrest.”

While workers performing tasks in elevated areas may not be working close together as they did in the pre-COVID world, their need to be properly connected is more important than ever. Connectors complement a Personal Fall Arrest System (PFAS) by linking safe anchorage with the worker’s full-body harness.

There are two main types of connecting devices that commonly comply with OSHA standards for fall protection. Workers must be instructed to know how to distinguish the differences in their uses. One style of connector (such as rope grabs) enables workers to position themselves safely for specific short drop exposures. The second style of connector is designed to be an integral part of a PFAS.

Types of PFAS Connectors

Lanyards designed for PFAS’s are defined as a flexible line securing a full-body harness to an anchorage point. The standard lanyard length for PFAS connectors is 6 feet. But workers should select the lengths as short as possible to minimize free fall distance without hindering your movement.

There are two main styles of PFAS connecting devices – energy-absorbing lanyards and self-retracting lifelines.

Energy-Absorbing Lanyards

Energy absorbing lanyards are fixed-length devices designed to reduce the energy transmitted to the user’s body in a fall. Shock absorbing lanyards also provide deceleration distance during a fall. OSHA and ANSI specify that these devices must reduce the fall-arresting forces on the worker by approximately 60-80 percent below the threshold of injury.

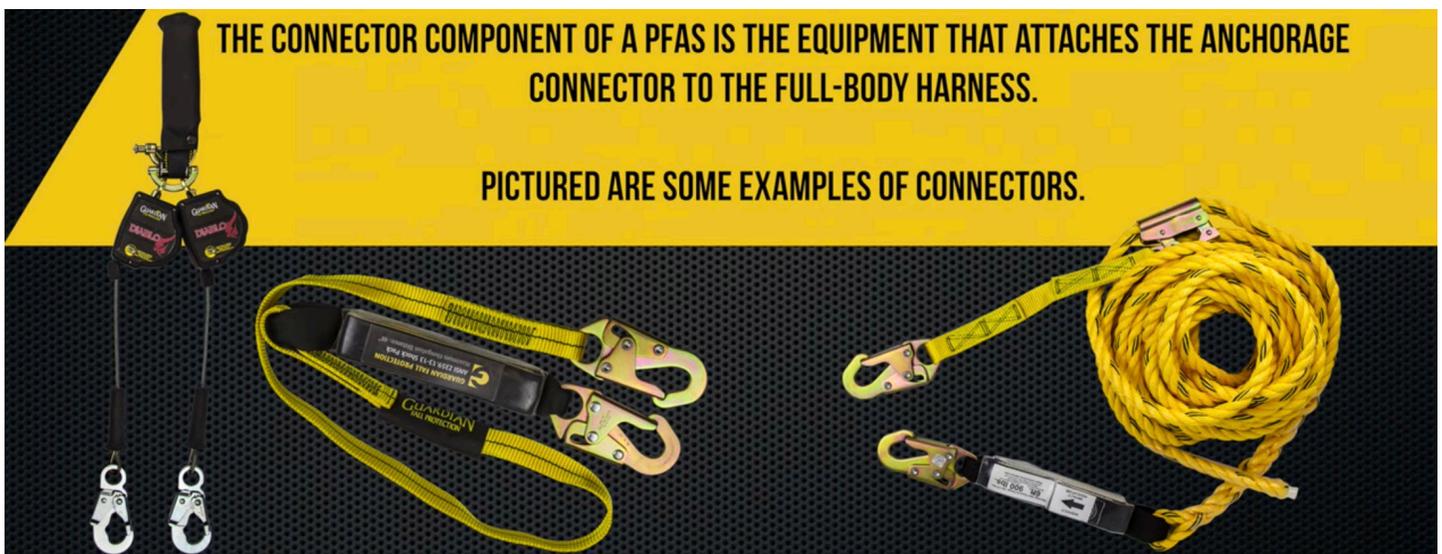


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Energy absorbing lanyards use one of two mechanisms to reduce the energy transfer:

- **Shock packs**
- **Internal shock absorbing material**

These types of lanyards are often selected when the worker must use anchorage below their shoulders or even with the feet. In these cases, manufacturers provide free fall lanyards that feature stronger energy absorbers to reduce the potential of greater impact forces from a fall.

A shock absorber pack uses a specially woven inner core that expands to reduce the impact associated with the arrest of a fall. The pack can be incorporated into the lanyard's design or added as a device between the lanyard and anchorage.

Lanyards with an internal shock absorbing material have a built-in woven inner core. These devices smoothly expand from a wearing length up to 3-1/2 ft to the 6-ft final length drop distance prescribed by OSHA. When a fall event occurs, the lanyard's inner core restraint strength is enhanced by the outer polyester jacket webbing strength to meet OSHA's energy absorption requirements.

Self-Retracting Lifelines

OSHA defines a self-retracting lifeline (SRL) as:

“a deceleration device containing a drum-wound line that can be slowly extracted from, or retracted onto, the drum under slight tension during normal employee movement, and which, after onset of a fall, automatically locks the drum and arrests the fall.”

OSHA standard 1910.140

OSHA also provided basic performance requirements for SRL's by limiting the maximum arresting force on a worker to 1,800 pounds and the maximum deceleration distance to 3.5 ft.

OSHA's standard also states that a PFAS using SRL's must be able to support a worker in a fall event without contacting the wearer's neck and chin area. To comply, SRL's are designed to be anchored above the workers head. When engaged during a fall, an inertial breaking mechanism locks into place limiting the downward movement to a few inches.

An SRL's connecting line can be either webbing, wire

rope, or cable. Its drum device must always exert enough retraction tension to prevent any slack in the line between body harness and anchor. The length of the connecting line varies between SRL models, allowing a larger working radius, as compared to energy absorbing lanyards.

Leading-Edge SRLs

There can be occasions where workers have a horizontal anchor position when using SRLs. These exposures can occur during the construction of floors, roofs, and decks. OSHA describes these areas as leading edge (LE), meaning:

“the unprotected side and edge of a floor, roof, or formwork for a floor or other walking/working surface (such as a deck).”

Should a fall happen, this exposure leaves workers suspended above them in a potentially precarious position.

For leading edge applications workers must select appropriate SRLs, often identified by the “LE” in their model number, that indicate they are designed for leading edge work or are edge-rated. These devices comply to a specific ANSI standard that require stronger cabling, more wear-resistant components, and an upgraded energy absorbing technology.

Proper Hooks

OSHA requires that all lanyard hardware, including hooks and D-Rings be constructed from drop forged or pressed steel, and cadmium plated in accordance with type 1, Class B plating. All surfaces must be smooth and free of sharp edges.

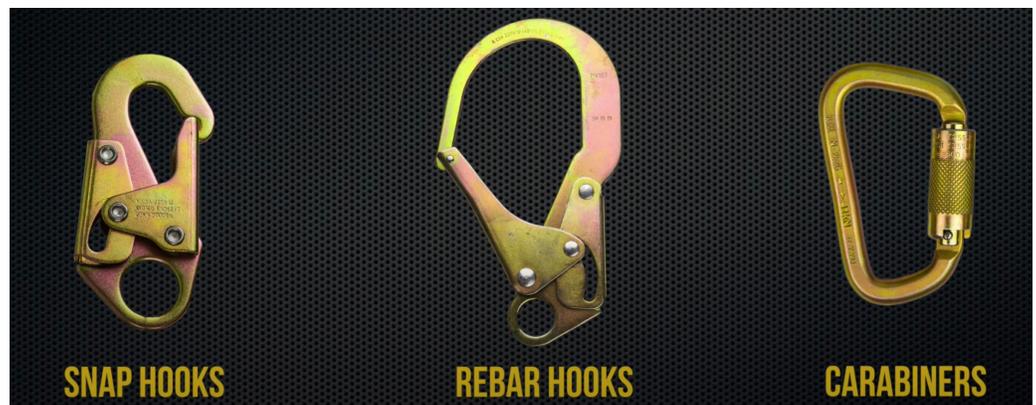


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OSHA further mandates that all connecting devices be equipped with double-action, self-closing, self-locking snap hooks to reduce the possibility of a roll-out (when the hook slides apart from its anchor). On most PFAS hooks, locking occurs after a lever on the back of the hook is depressed so workers can position the main gate properly, allowing the hook to accept the anchor.

Precheck Is Important

As with all PFAS components, workers must perform a thorough pre-check of all connecting devices. Start by ensuring all components are compatible (especially when combining items from multiple manufacturers). Occasionally, incompatible or non-interchangeable components can affect the PFAS's performance.

While performing this visual inspection, check for any damages or deformations to the equipment. For self-retracting lifelines look for cracks in the casing, corrosion or loose wires on the webbing or wire rope, severe pollution on the wire, deformations of the carabiner, and so forth.

Many SRL manufacturers recommend an annual inspection of the drum and tensioning devices.

Check webbing and cables for excessive exposure to UV light, chemicals, physical damage, and/or improper storage.

Finally check all hooks and their anchorage. Hooks must not be attached directly to webbing, connecting lines or other lanyards. There should be only one connector to each D-Ring. Make sure the hook size is compatible to the anchor, looking for undersized openings or irregular applications. And don't connect two or more snap hooks

to each other. Don't get "creative" with your PFAS! Make sure to follow all manufacturer recommendations for ensure maximum safety.

[DOWNLOAD INSPECTION FORM](#)

Following A Fall Experience

OSHA mandates that any lanyard subjected to in-service loading ...

"... shall be immediately removed from service and shall not be used again for employee safeguarding."

PFAS connectors are equipped with Impact Indicators, that enable workers to check if the device has been involved in a fall.

Snap hooks are also equipped with fall indicators. On many hooks, the fall indicator is a colored part at the attachment point. When it's not activated, a green color is showing to point out it's safe to use the equipment. After a fall has been arrested and the indicator is activated by the forces, a red colored piece is visible.

To view the online article go to:

<https://news.whitecap.com/safely-connecting-a-pfas/>