



A DIVISION OF WESCO DISTRIBUTION, INC.

Fall Protection Ready Reference

1. The Law

A. ANSI Standards

- Scaffolding A10.8
- Personnel and Debris Nets for Construction and Operations A10.11-1989
- Construction and Demolition Operations A10.32-2004
- Ladder Safety Devices A14.3-08
- Confined Space Z117.1
- Safety Requirements for Personal Fall Arrest Systems, Subsystems and Components Z359.2007
- Z359 Fall Protection Requirements

B. OSHA 1910.21-30, Subpart D

-This is the fall protection standard for General Industry.

C. OSHA 1926.500-503, Subpart M

- This is the fall protection standard for Construction.

D. Trigger Heights for OSHA Standards

- 1910.28 (Duty to have fall protection and falling object protection – G. I.).....4'
- 1926.500 (Fall Protection: Subpart M – Construction).....6'
- 1926.450 (Scaffolding: Subpart L – Construction).....10'

- 1926.750 (Steel Erection: Subpart R – Construction) 15' - for most workers; 30' for connectors

- 1910.23 (Fixed Ladders: Subpart D – General Industry) 24' - fixed ladders that extend more than 24' above a lower level if installed prior to 11-19-2018 must have a safety system, cage, or well. If installed on or after 11-19-2018, must have a personal fall arrest or ladder safety system. Portable ladders do not require fall protection.

- 1926.1053 (Ladders: Subpart X – Construction) 24' - above this height you need a cage or ladder safety device on fixed ladders; portable

ladders do not require fall protection

E. Regulatory Aspects of Fall Protection Equipment

- When wearing fall protection equipment, users are not allowed to free-fall greater than 6' unless foot level tie off is the only feasible option. Foot level tie off equipment must be designed specifically for that purpose.
- Work positioning devices cannot allow a free fall more than 2 feet.
- Anchors used for positioning must be rated for no less than 3,000lbs.
- Anchorage points must be designed to maintain a safety factor of two (3,600lbs.), or be capable of supporting at least 5,000lbs.
- Maximum arresting force for full body harnesses cannot exceed 1,800lbs.
- Maximum deceleration distance is 3.5 feet
- Protection of a worker can generally be provided through the use of guardrail systems, safety nets, or personal fall arrest systems.

2. FAQ's

A. What Are the ABC's of a Personal Fall Arrest System?

Individually, these three components will not provide protection from a fall. When used properly in conjunction with each other, however, they form a Personal Fall Arrest System.

Anchor

- Anchors must be rated for a minimum of 5,000lbs. and are either engineered into a system or are improvised. Examples of improvised anchors included: cross-arm straps, beam anchors, and concrete anchors.
- If installed under the supervision of a qualified person, an anchor can be installed that maintains a safety factor of two. If the maximum arresting force is 1,800lbs. (1,800lbs. x safety factor of 2 = 3,600lbs. minimum anchor point rating. Engineer approval is recommended.
- An anchorage point or tie-off point is the structure that supports the entire weight of the system. Common anchorage points include joists, girders, and columns.
- Anchorage points must be high enough for a worker to avoid contact with a lower level should a fall occur.

Body Wear

- Body wear is the harness worn by the worker.
- Sizing differs by manufacturer, so be sure to consult an MFG sizing chart before ordering.

Connecting Devices

- Connecting devices are the critical link which join the harness to the anchor.
- Connective devices include shock-absorbing lanyards, fall limiters, self-retracting lifelines, rope grabs, etc.

B. What Are the Main Criteria When Selecting Body Wear?

Buckle Options

- **Mating Buckle** is the most common buckle style used by workers who **do not share** their harness. Once adjusted, the smaller buckle simply locks over the larger buckle for a secure fit.
- **Tongue Buckle** is similar to a standard belt buckle. This type of buckle is **ideal for those who share** their harness. Material is generally a little thicker and stiffer in the tongue buckle area.
- **Friction Buckle or Parachute Buckle** is **easy to adjust between various workers**. Simply step into the leg holes and pull the straps tight. These buckles are commonly used to adjust torso length.

- **Specialty Buckles** are a newer style that is considered a quick connect/release and is very **easy to adjust**.

D-Ring Locations

- **Back D-Rings** are found on every harness and are the only connective point allowed for fall arrest scenarios.
- **Side D-Rings** are commonly used for positioning applications when workers need their hands free during certain work functions.
- **Chest D-Rings** are used for positioning work, such as ladder climbing application.
- **Shoulder D-Rings** are commonly used for lowering workers into tight confined spaces.

Harness Materials

- **Nylon** – A significant number of harness styles are made of nylon webbing for excellent strength and comfort.
- **Polyester** – A significant number of harnesses are made of polyester webbing for excellent chemical resistance in harsh environments.
- **Nomex/Kevlar** – This is the material of choice for a flame-retardant fabric and is commonly used in hot work or arc rated situations.
- **Teflon Coating** – Miller® sprays a Teflon HT coating on many of their harnesses. This invisible finish provides superior water/oil repellency and protection against spills and stains. This coating is designed to produce up to 25% longer service life without changing the breathability, feel, or color of the webbing.

Body Wear Requirements/Weight Concerns

- Body belts can only be used for fall arrest. They can only be used for positioning.
- All full body harnesses are minimally rated to 310 lbs. (includes weight of worker, clothes, and tools).
- Many harnesses are rated for 400 lbs or more.

C. What Are the Main Criteria When Selecting a Connecting Device?

Connecting devices attach to the harness on one side and the anchor point on the other. This can be one device, such as a lanyard, or a combination of devices, such as lanyards, lifelines, rope grabs, fall limiters/self-retracting lifelines, and carabiners.

Lanyards

- Used to restrain workers in position and to arrest falls.
- When used as a restraining device you need to keep length short so that worker cannot fall more than 2'.
- Restraining lanyards can include steel cable, rebar chain assemblies, and nylon webbing or rope.
- Fall protection lanyards can be made of steel, nylon rope, or nylon webbing.
- Height of tie-off point must ensure that worker does not free fall greater than 6' before shock absorber is activated.
- Longer shock-absorbing lanyards can be special ordered if the tie-off point is higher.

Lifelines ([Fall Distance](#))

- Add versatility to a fall arrest system as workers can move along the lifeline when used with a rope grab. The rope grab will arrest a fall instantly.
- Manual Rope Grab – Worker must manually pinch the device to adjust where it is placed on the lifeline; commonly used in roofing applications.
- Trailing Rope Grab – Commonly used in vertical work applications where employee wants the grab to trail them up or down a ladder. If a worker falls, the unit will lock and keep them from free falling more than 6'.

Retractable Lifelines ([Fall Distance](#))

- Also called Fall Limiters

- Units will pay out either cable or webbing, then retract automatically as the worker gets closer to the device. This prevents excessive free fall distances and decreases the chances of injury during a fall.
- When choosing a Retractable Lifeline/Fall Limiter, you must address the following:
 - Length of line needed
 - Material of lifeline – Steel cable, wide nylon webbing, or narrow nylon webbing
 - Type of connection – Snap lock, carabiner, larger rebar carabiner
 - Swivel options – Some swivel at the top of the unit, some swivel at the connection to your harness, some don't swivel, and some mount directly to a user's harness.

D. What Are the Four Categories of Fall Protection?

- **Fall Arrest** – A fall arrest system is required if the risk of falling from an elevated level exists. It is designed to be passive and activates only if a fall occurs. A maximum free-fall of 6' allowed before the shock-absorber activates.
- **Positioning** – A positioning system allows workers to hold themselves in place, keeping their hands free to accomplish a task. Whenever a worker leans back, the system is activated, making this an active system.
- **Retrieval** – A personal retrieval system is mostly used in confined space operations. This system is primarily used where workers enter tanks, manholes, etc. and may require retrieval from above if an emergency occurs.
- **Suspension** – The fourth and least common fall protection category is the personal suspension system. This system is used widely in the window washing and painting industries, and is designed to lower and support a worker while allowing a hands-free work environment.

E. What Are the Elements of a Fall Protection Program?

- Try to eliminate fall hazards.
- Train workers to understand the nature of their work and the hazards involved.
- Perform a hazard analysis of the workplace and document the need for fall protection.
- Evaluate the effect of friction, momentum, and gravity on potential falls for each job task. Document this information in the hazard assessment.
- Develop written procedures on administrative and engineering controls for fall protection.
- Develop a rescue plan. 1910.140(c)(21). The employer must provide for prompt rescue of each employee in the event of a fall.

F. What Are the Elements of a Fall Rescue Plan?

A rescue plan is a critical component of a fall protection program. When fall protection requires the use of a fall arrest system by workers, a procedure must be in place to provide for the quick rescue of any fallen worker and the safety of the rescuers. A prompt rescue is necessary because of the dangers of suspension trauma and stagnant hypoxia.

Hierarchy of Fall Protection Rescue

- **Self-Rescue** by the worker who has fallen.
- **Assisted Rescue** by co-workers using their hands or a tripod/winch assembly, etc.
- **Professional Rescue** by firemen or qualified high-rescue team.

Suspension Trauma (or Orthostatic Intolerance):

- Refers to the potential health hazards that can occur by workers who are suspended upright after a fall. Blood can pool in your legs due to the weight of your body acting like a tourniquet around your legs, restricting circulation back to the heart. The more you are able to move your legs around and keep your circulation moving while awaiting rescue, the longer you can avoid this condition which can cause unconsciousness or death.
- In order to prolong the effects of suspension trauma, Suspension Trauma Straps are available and can be integrated into any manufacturer's harness. They work by allowing a conscious victim to transfer weight off of the harness's leg straps.

G. Inspection

Conscientious inspection of all fall protection equipment is essential to ensuring product performance and the safety of the user. The following links provide information on inspection requirements and techniques.

[Inspection DBI Link](#)

[Inspection Miller Link](#)

[Back to Top of Page](#)