

## Best-in-Class Thoughts

*"Expect the best, prepare for the worst."*

— Muhammad Ali Jinnah

*"Life is less about what you do, and more about how and why you do those things. This is called character."*

— Josh Verseput



Drummac (Training) - San Luis Obispo, CA

## this issue

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## Note from Leanne

In the various industries in which our Family of Companies work, falls from heights are one of the most abundant hazards that our employees face each and every day. And while fall protection is one of the most basic aspects of any safety program (ours included) and even though fall protection has become one of OSHA's most marketed hazard awareness campaigns, falls

from heights still account for approximately 35% of occupational fatalities and 12% of nonfatal occupational injuries in the US construction industry every year.

August's Safety Brief is focused on providing key information in support of protecting our employees from injuries sustained from falls while working at heights; like every issue, the goal is to educate our employees BEFORE an injury occurs. We hope you enjoy reading this month's issue and that you consider how the information and solutions provided on fall protection apply to your day-to-day work environment. Keep it safe!

## Hierarchy of Fall Protection

MER Family of Companies' employees may work at heights during various activities throughout the day. Employees that engage in working-at-heights tasks must consider the hierarchy of fall protection (listed below), as well as a fall protection rescue plan prior to performing work to ensure the fall hazards and risks are appropriately addressed.

### Hierarchy of Fall Protection

1. Eliminate the risk of falling. Reposition the work or the equipment being utilized.
2. Guard the hazard. Consider a physical barrier, such as a guardrail.
3. Protect the worker. Provide a fall arrest or fall restraint system, as well as a rescue plan.

**Fall Restraint System** – Prevents workers from reaching the fall hazard. For example, employees



Fall Restraint



Fall Arrest

performing rooftop abatement work along the roof edge or near skylights/air vents may use a system that prevents them from fully reaching those areas, thus not allowing them to fall.

**Fall Arrest System** – Allows workers to reach the fall hazard and then protects them if they should fall. Generally, these systems are referred to as Personal Fall Arrest Systems (PFAS).

**Rescue** – Prolonged, upright suspension after a fall poses the risk of orthostatic intolerance and suspension trauma. Prompt rescue must be provided; in fact, OSHA requires a comprehensive rescue plan when individuals are working at heights. The rescue plan must be appropriate for the area and can include ladders, aerial lifts, rope rescue systems, etc.

# Personal Fall Arrest System (PFAS)

A Personal Fall Arrest System (PFAS) is comprised of three key components – anchorage connector, body wear (full-body harness), and connecting device. This article places focus on the different types of anchorage connectors and connecting devices typically available to the MER Family of Companies' employees.

## Anchorage Connectors

**Beam Clamp** – Anchor allows tie-off at feet or overhead to an H or I beam flange. Check with manufacturer for specific use.



Beam Clamp

**Concrete Anchor** – Temporary, reusable anchor designed for vertical or overhead applications in cured concrete with a compression strength of at least 3000 psi.



Concrete Anchor

**Cross-Arm Strap** (Shown as "A" in upper right picture) – Wraps around I-beams and other structures and attaches with a smaller D-ring that slips through a larger D-ring to form a secure attachment point for lanyards and other connecting devices.

## Connecting Devices (Bears the greatest fall forces during a fall.)

**Shock-absorbing Lanyard** (Shown as "C" in upper right picture) – Designed with a shock-pack or inner core that expands up to 42" to reduce fall arrest forces.

**Tie-back Lanyards** – All-in-one lanyard with shock absorber and cross-arm anchorage connector. Snap hook has a 5,000 lb. gate load capacity from any angle. (MUST BE DESIGNED FOR TIE-BACK USE.)



Double-legged Shock-absorbing Lanyard



Pull-free Lanyard Ring



Double-legged Tubular Shock-absorbing Lanyard

**Double-legged Lanyards** – Used for 100% tie-off safety.

**Note:** If one leg of a double-legged lanyard is not being used, **the unused leg should not be attached to any permanent fixture on a harness, such as side D-rings.** This inhibits proper operation of shock-absorber design. When using a double-legged lanyard with a shock-absorber pack, connect the unused leg to a harness with a pull-free lanyard ring or other breakaway restraint device that will easily disengage in the event of a fall.

**Tubular shock-absorbing lanyards take into account foreseeable misuse.** If a user unintentionally attaches the unused leg of a double-legged tubular shock-absorbing lanyard to their side D-ring or another permanent fixture on the harness, the unused leg will not have an effect on peak arrest forces.

**Self-retracting Lifeline (SRL)** – SRLs require less than 2 feet to arrest falls as opposed to traditional six-foot shock-absorbing lanyards, which allow up to 6 feet of free-fall distance and another 3-1/2 feet of deceleration distance. With shorter activation distance and shorter overall arresting distance, SRLs reduce the risk of hitting the ground or any obstructions at a lower level. Additionally, they allow for easier rescue in the event of a fall.

[www.millerfallprotection.com/smart-solutions/guide-to-fall-protection/personal-fall-arrest-system](http://www.millerfallprotection.com/smart-solutions/guide-to-fall-protection/personal-fall-arrest-system)

## Body Wear

**Body Wear:** This personal protective equipment worn by the worker (Ex: full-body harness)

## Connecting Device

**Connecting Device:** The critical link which joins the body wear to the anchorage/anchorage connector (Ex: shock-absorbing lanyard (shown), or retractable lifeline)

Individually, these components will not provide protection from a fall. However, when used properly and in conjunction with each other, they form a Personal Fall Arrest System that becomes vitally important for safety on the jobsite.



Tie-back Lanyard



Tie-back Lanyard with Connection Ring



Self-retracting Lifeline

## There's an App for that!

Miller Fall Clearance Calculator



When working at heights, it is important to know your fall clearance and swing fall, whether using a shock-absorbing lanyard or self-retracting lifeline. Calculating your fall clearance and swing fall is critical to your safety. The Miller Fall Clearance Calculator App gives workers at height the ability to quickly calculate the required fall clearance for Shock Absorbing Lanyards and Self-Retracting Lifelines, including swing fall.



## Suspension Trauma

Suspension trauma (also known as or orthostatic intolerance) is the natural human body response to being held motionless in a vertical position for a period of time resulting in presyncopal symptoms (i.e. faintness, nausea, sweating, paleness, narrowing of vision) or loss of consciousness. Depending on the susceptibility of the individual, unconsciousness, renal failure or even death can occur in less than 30 minutes. The rate at which suspension trauma develops varies in each individual, but there are factors that influence the potential for suspension trauma and speed of onset, which include:

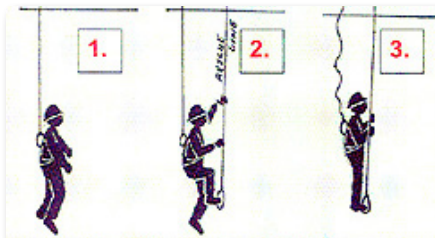
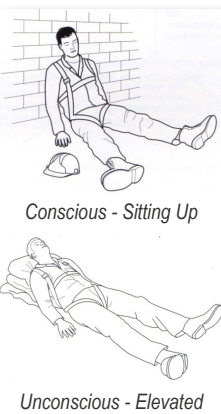
- ◆ Harness fit and adjustment – impacts the degree of inclination when a fall is arrested. (Affects the amount of pressure placed on certain parts of the body, such as the femoral artery.)
- ◆ Personal medical conditions, such as a preexisting respiratory or cardiac condition, or physical conditions, such as being dehydrated or fatigued.
- ◆ Anxiety or stress – causes increased heart rate and hormone release.
- ◆ Consciousness and ability to move legs to assist circulation while suspended.

### Before Rescue Action

If able to do so, the suspended worker should be encouraged to do the following:

- ◆ If the suspended person is uninjured and fully conscious, they should mobilize all 4 limbs, i.e. flexing the leg muscles with bicycling motions or leg pulls, to help maintain circulation.

- ◆ Frequent pumping of the legs against a firm surface will also activate muscles and improve blood circulation.
- ◆ If possible, a rope can also be lowered down for the person to step into to relieve the pressure on the legs.



### Post Rescue Action

- ◆ If the person is **fully conscious and mobile**, they are best managed in the seated position.
- ◆ If the person is **unconscious**, or cannot maintain a seated position, they are best managed in an inclined position (approx 20 degrees) with the head at the highest point of the body. Ensure the airway remains open.
- ◆ Keep in **recovery position for at least 30 minutes!**
- ◆ **NEVER lay flat in horizontal position** after suspension.
- ◆ Seek medical treatment immediately.

### Steps in Suspension Trauma

1. Fall arrested by harness
2. Legs suspended, blood flow is impeded by leg straps and gravity
3. Blood collects in large leg muscles
4. Blood-return to heart declines
5. Danger and pain cause heart rate increase and hormone release
6. Heart pumping action reduced because of decreased blood return
7. More blood collects in legs
8. Body reflex reduces heart rate and blood pressure
9. Blood flow to brain falls
10. Victim loses consciousness
11. Blood flow to brain continues to fall
12. Brain damage
13. Eventual death



### Wellness Tip

#### 6 Hydration Tips

1. Start each day with a glass of water (no ice).
2. Eat 2-3 servings of fruits & vegetables at every meal.
3. Establish regular water breaks.
4. Substitute sparkling water & low-sodium vegetable juice for soda & fruit juice.
5. Install water filters at home and use a pitcher-type filter at the office. Get a reusable bottle for on-the-go.
6. Cook with high-quality sea salt instead of table salt.

[www.care2.com/greenliving/6-tips-for-staying-hydrated.html/3](http://www.care2.com/greenliving/6-tips-for-staying-hydrated.html/3)

### Fitness Challenge

#### 4-Week Bigger Stronger Back Workout

##### WEEKLY PROGRESS TEST

Exercise	Set	Reps
Inverted Row	1	As many as you can in 30 seconds.

##### WORKOUT 1 (week 1)

Exercise	Set	Rep	Rest
Dead-lift	3	3	60 seconds
Pull-up	3	6-8	0 seconds
Back Raise	3	6-8	60 seconds

##### WORKOUT 2 (week 2)

Exercise	Set	Rep	Rest
Dead-lift	3	3-5	60 seconds
Inverted Row	3	10	0 seconds
Lat Pull-down	3	10-12	60 seconds

##### WORKOUT 3 (week 3)

Exercise	Set	Rep	Rest
Scapula Pull-down	4	10	0 seconds
Barbell Shrug	4	12	0 seconds
Back Raise	4	12	90 seconds

##### WORKOUT 4 (week 4)

Exercise	Set	Rep	Rest
Face Pull	3	6-10	0 seconds
Lat Pull-down	3	8-15	0 seconds
Back Raise	3	10-15	90 seconds

[www.menshealth.com/fitness/back-exercises/](http://www.menshealth.com/fitness/back-exercises/)

MER

## Values

Professionalism

Integrity

Mutual Respect

Discipline

Whether it's rooftop abatement work, operating an aerial lift or climbing on large-scale industrial equipment, employees throughout the MER Family of Companies often find themselves working on elevated surfaces. Performing a Job Hazard Analysis to identify hazards and corrective actions along with the technical knowledge to select the appropriate fall protection equipment are critical to staying safe. Below are some examples of MER employees getting the job done safe!

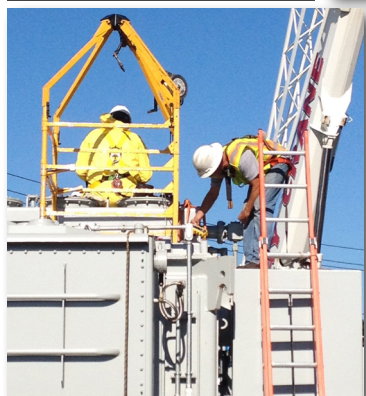


*Upper left picture:* Eric Silvia on an asbestos abatement project in Pawtucket, RI. Prior to using the boom lift, Eric connected his shock-absorbing lanyard to the identified connection point on the lift. This job also required the use of several roof anchors to provide safe anchorage points for the team of MER employees.

*Lower left picture:* Shawn Doherty conducting atmospheric monitoring for a confined space entry project in Boston, MA. A secured extension ladder was used to access the top of the transformer. Climbing on and around the top of the transformer posed challenges due to layout, but

the team was able to use self-retracting lifelines and double-leg lanyards attached to secured anchorage points to complete the project safely.

*Picture to right:* Kyle Sheehan using a double leg lanyard with pelican hooks to climb onto a GapVax Truck in Randolph, MA. A double-leg lanyard for this application is key to maintaining 100% fall protection. In this case, the lanyard allowed him to connect to an appropriate anchor point before leaving the ladder and move freely from one anchor point to the next without compromising the protection offered by his personal fall arrest system.



## Employee Development

Forgetting happens. Even highly motivated learners can only retain a certain amount of information over time; people's retention can be directly related to the type of learning material used. Because of this, MER utilizes several different training methods throughout the MER Family of Companies, such as performing webinars, distributing reading materials (i.e. this Brief) or instructor-led classroom training. One of the most effective methods of training, however, is on-the-job (OTJ) training. OTJ training includes formal reviews of processes, such as showing a new employee how to properly remove gloves or reviewing confined space procedures, but it can also include simple tasks like asking for input from employees while completing a Job Hazard Analysis or having an employee lead a daily tailgate meeting.

The table to the right displays what adults tends to remember after two weeks based upon how they interacted with the information. Keep this in mind when you're performing OTJ training with your employees.

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## Safety Brief

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