1

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Statistics

2017 OSHA Violations

1. **Fall Protection = 6,072**
2. Hazard Communication = 4,176
3. Scaffolding = 3,288
4. Respiratory Protection = 3,079
5. Lockout/Tagout = 2,877

9. Fall Protection Training = 1,523 (NEW)

2018 OSHA Violations

1. **Fall Protection = 5,899**
2. Scaffolding = 3,059
3. Hazard Communication = 4,176
4. Ladders = 2,480
5. Lockout/Tagout = 2,384

9. Fall Protection Training = 1,539

2014 OSHA Violations

1. **Fall Protection = 7,515**
2. Hazard Communication = 6,148
3. Scaffolding = 4,968
4. Respiratory Protection = 3,147
5. Powered Indus. Truck = 3,147

2015 OSHA Violations

1. **Fall Protection = 6,721**
2. Hazard Communication = 5,192
3. Scaffolding = 4,295
4. Respiratory Protection = 3,305
5. Lockout/Tagout = 3,002

2016 OSHA Violations

1. **Fall Protection = 6,906**
2. Hazard Communication = 5,665
3. Scaffolding = 3,900
4. Respiratory Protection = 3,573
5. Lockout/Tagout = 3,406

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2022 OSHA Violations

1. **Fall Protection = 5,980**
2. Hazard Communication = 2,682
3. Respiratory Protection = 2,471
4. Ladders= 2,430
5. Scaffolding = 2,285
7. Fall Protection Training = 1,778

2021 OSHA Violations

1. **Fall Protection = 5,295**
2. Respiratory Protection = 2,527
3. Ladders= 2,026
4. Scaffolding = 1,948
5. Hazard Communication = 1,947
7. Fall Protection Training = 1,666

2019 OSHA Violations

1. **Fall Protection = 6,010 (+111)**
2. Hazard Communication = 3,671
3. Scaffolding = 2,813
4. Lockout/Tagout = 2,606
5. Respiratory Protection = 3,079
8. Fall Protection Training=1,773(+234)

2020 OSHA Violations

1. **Fall Protection = 5424**
2. Hazard Communication = 3,199
3. Respiratory Protection = 2,649
4. Scaffolding = 2,129
5. Ladders = 3,079
8. Fall Protection Training = 1,621

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2023 OSHA Violations

1. **Fall Protection = 7,271** **(4,058 More than #2)**
2. Hazard Communication = 3,213
3. Ladders = 2,978
4. Scaffolding = 2,859
5. Powered Industrial Truck = 2,561
6. Lockout/Tagout = 2,554
7. Respiratory Protection = 2,481
8. Fall Protection Training = 2,112
9. PPE – Eye & Face Protection = 2074
10. Machine Guarding = 1,644

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UNDERSTANDING THE CONCERN

How many falls from height are **Reported** in the work place each year?

Year	Fall Injuries	Fall Fatalities
2018	52,510	615
2019	48,040	711
2020	49,250	645
2021	46,005	680
2022	NA	700

Source: U.S. Bureau of Labor Statistics, U.S. Department of Labor

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June 15, 2015 – The Day My Life Changed Forever

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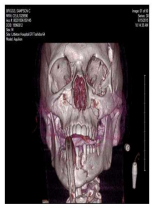

- 12 titanium plates in face & head
- Jaw wired shut
- Feeding tube for 7 weeks: 25 pound weight loss
- Trachea breathing tube for 7 weeks

- Depressed skull fracture
- Severe traumatic brain injury
- Extensive facial fracturing
- Broken mandible, loss of teeth
- Crushed left orbital socket
- Broken hearing bones in right ear
- Fractured support bones in lower spine
- Shattered left patella

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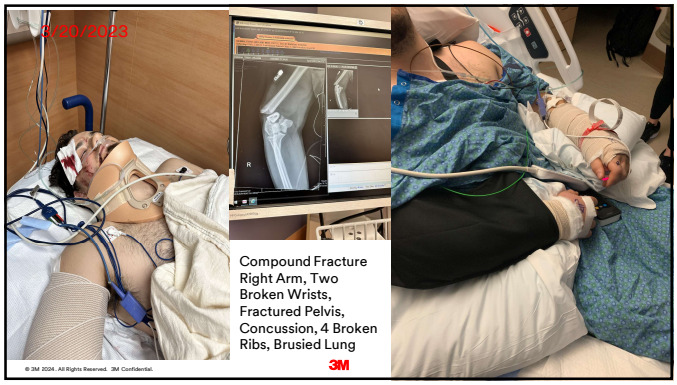
4/20/2023
Compound Fracture Right Arm, Two Broken Wrists, Fractured Pelvis, Concussion, 4 Broken Ribs, Brusied Lung
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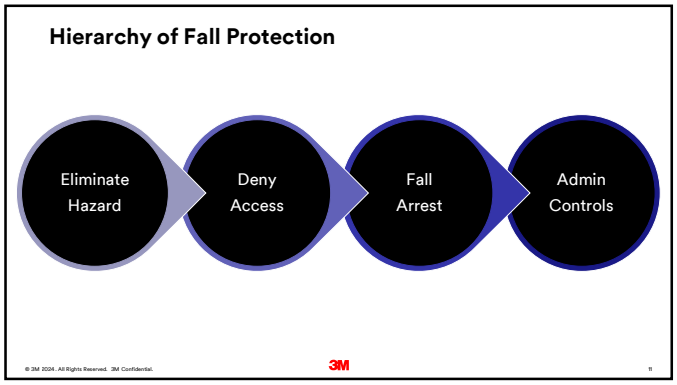
Hierarchy of Fall Protection
Eliminate Hazard
Deny Access
Fall Arrest
Admin Controls
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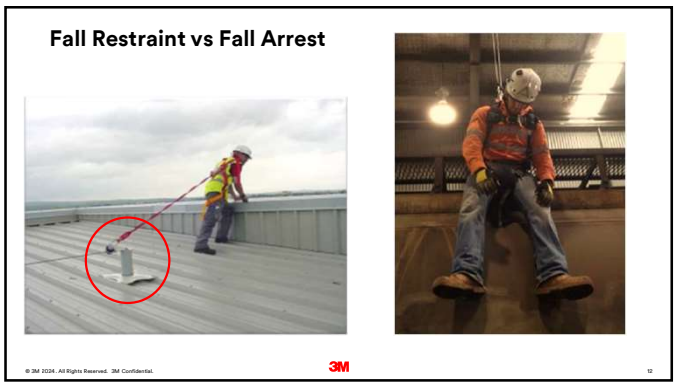
Fall Restraint vs Fall Arrest
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Challenge Question

Based on your own impressions, approximately how far and how fast do you think you would free fall in two seconds?

Distance

- 20 ft
- 30 ft
- 50 ft
- 65 ft
- 15 mph
- 26 mph
- 35 mph
- 44 mph

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29 CFR 1910 General Industry WWSR

29 CFR 1910 General Industry

On November 17, 2016, OSHA published its final rule on Walking and Working Surfaces.

The 513 page copy from the *Federal Register* can be downloaded at: https://www.federalregister.gov/documents/2016/11/18/2016-24557/walking-working-surfaces-and-personal-protective-equipment-fall-protection-systems

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Training

OSHA 1910.30(a)(2):
"The employer must ensure that each employee is trained by a **qualified person**."

OSHA 1926.503(a)(2):
"The employer shall ensure that each employee has been trained, as necessary, by a **competent person**"

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OSHA Definitions

Authorized Person

A person approved or assigned by the employer to perform a specific type of duty or duties or to be at a specific location or locations at the jobsite.

Competent Person

One who is capable of identifying existing and predictable hazards in the surroundings or working conditions which are unsanitary, hazardous, or dangerous to employees, and who has authorization to take prompt corrective measures to eliminate them.

Qualified Person

One who, by possession of a recognized degree, certificate, or professional standing, or who by extensive knowledge, training and experience, has successfully demonstrated his ability to solve or resolve problems relating to the subject matter, the work, or the project.

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What does "Qualified" Mean?

In Construction:

OSHA 29 CFR 1926.32(m) states: "Qualified" means one who, by possession of a recognized degree, certificate, or professional standing, or **who by extensive knowledge, training and experience, has successfully demonstrated his ability to solve or resolve problems relating to the subject matter, the work, or the project.**

In General Industry:

OSHA 1910.140(b) states: *Qualified* describes a person who, by possession of a recognized degree, certificate, or professional standing, **or who by extensive knowledge, training, and experience has successfully demonstrated the ability to solve or resolve problems relating to the subject matter, the work, or the project.**

OSHA uses the word **"OR"** when defining the credentials of a Qualified Person -

"… a recognized degree, certificate, **OR** professional standing,

OR… extensive knowledge, training, and experience…".

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1910.30 Training requirements.

Fall hazards. (1) Before any employee is exposed to a fall hazard, the employer must provide training for each employee who uses personal fall protection systems or who is required to be trained as specified elsewhere in this subpart. Employers must ensure employees are trained in the requirements of this paragraph on or before May 17, 2017.

(2) The employer must ensure that each employee is trained by a qualified person.

(3) The employer must train each employee in at least the following topics: (i) The nature of the fall hazards in the work area and how to recognize them; (ii) The procedures to be followed to minimize those hazards; (iii) The correct procedures for installing, inspecting, operating, maintaining, and disassembling the personal fall protection systems that the employee uses; and (iv) The correct use of personal fall protection systems and equipment specified in paragraph (a)(1) of this section, including, but not limited to, proper hook-up, anchoring, and tie-off techniques, and methods of equipment inspection and storage, as specified by the manufacturer

62-588 Rev. C

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(b) Equipment hazards. (1) The employer must train each employee on or before May 17, 2017 in the proper care, inspection, storage, and use of equipment covered by this subpart before an employee uses the equipment.

(2) The employer must train each employee who uses a dockboard to properly place and secure it to prevent unintentional movement.

(3) The employer must train each employee who uses a rope descent system in proper rigging and use of the equipment in accordance with §1910.27. (4) The employer must train each employee who uses a designated area in the proper setup and use of the area. (c) Retraining. The employer must retrain an employee when the employer has reason to believe the employee does not have the understanding and skill required by paragraphs (a) and (b) of this section. Situations requiring retraining include, but are not limited to, the following:

(1) When changes in the workplace render previous training obsolete or inadequate; (2) When changes in the types of fall protection systems or equipment to be used render previous training obsolete or inadequate; or (3) When inadequacies in an affected employee's knowledge or use of fall protection systems or equipment indicate that the employee no longer has the requisite understanding or skill necessary to use equipment or perform the job safely. (d) Training must be understandable. The employer must provide information and training to each employee in a manner that the employee understands.

62-588 Rev. C

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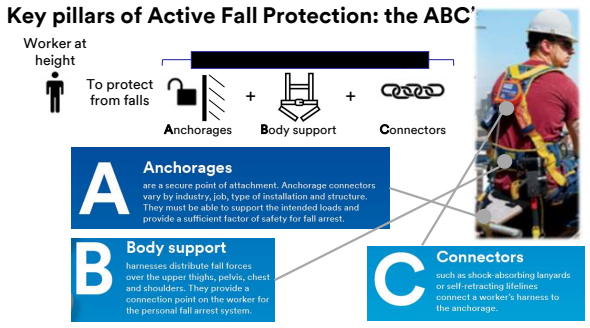
Key pillars of Active Fall Protection: the ABC'



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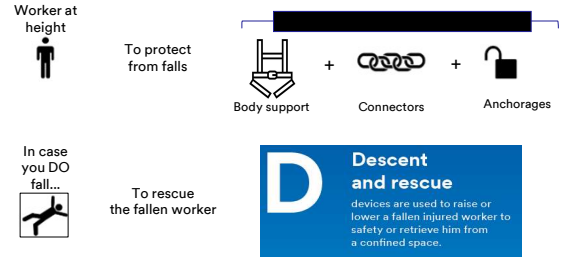
But don't forget about D



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Anchors

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Anchors: "A secure point of attachment for lifelines, lanyards or deceleration devices." – OSHA

Your choice of anchor depends on the type of work being done.

Anchors must be inspected by a Qualified or Competent Person!

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Anchorage vs Anchorage Connector

Anchorage

Anchorage Connector

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Slide 23

A50 Should clarify this page. You are talking about anchors (the structure), then reference by circling an anchorage connector.
Author, 8/14/2019

A61 done
Author, 8/20/2019

Anchorage Classes

Non-Certified

Requires **5000 lbs**

Certified (Engineered)

2 to 1 safety factor
2 X the MAF (Except HLL)

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Important Considerations

Swing Fall

Obstructions

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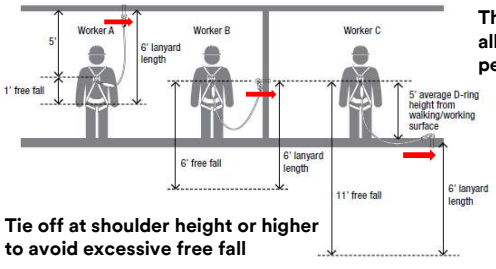
Important point to remember: Limit Free Fall



The maximum allowable free fall per OSHA is 6 ft.
OSHA: 1910.140(d)(2)(ii)

Tie off at shoulder height or higher to avoid excessive free fall

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Body Support Then vs Now



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Body Support: Harness

The main purpose of a harness is to safely:
- distribute forces
- support the worker

Desirable Traits:
- Fast and simple adjustments
- Comfortable
- Properly sized

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Full-Body Harnesses

Required for fall arrest

Must have a back D-ring

Must distribute the force throughout the body

Must be inspected before each use and at a minimum of once a year by a competent person

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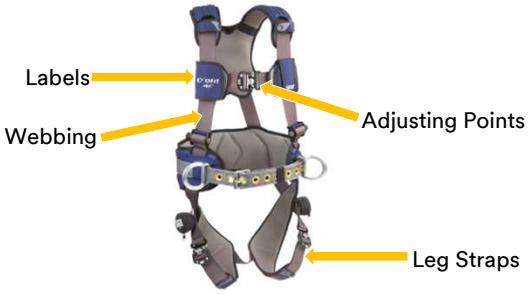
Key Harness Components



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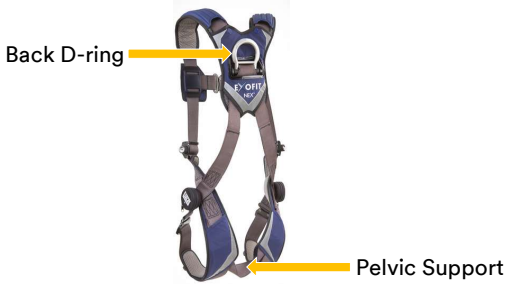
Key Harness Components



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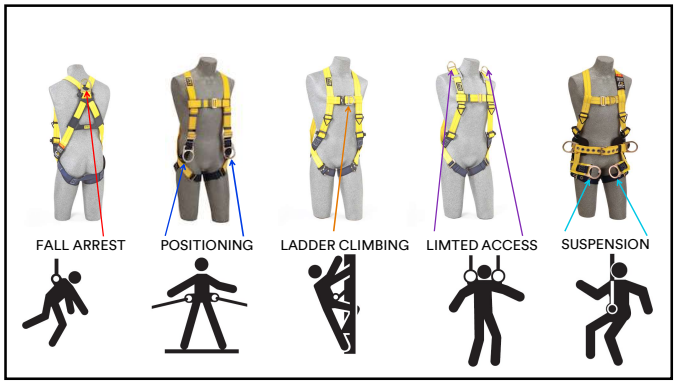

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Donning the harness: untangle, drape on, connect adjust

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Connectors

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Connectors

Lanyards

Self-retracting Devices (SRDs)

Hooks

Carabiners

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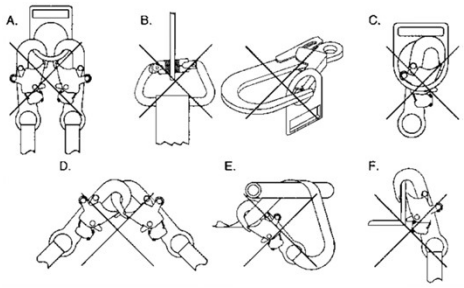
Connector incompatibilities



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Improving Safety Connections

Each Connecting Device will have a connector to attach to the harness and anchorage connector

ANSI Z359.12-2019 – Transverse Loading (3M - MARKING)

Snaphooks and carabiners with gate opening larger than 1 in. (25mm), shall be capable of withstanding a transverse body (dynamic) drop test. Permanent deformation shall be acceptable, provided that the deformation is not sufficient to release the gate from the nose by more than 0.125 in. (3.1mm).

Gate Strength

ANSI & OSHA - **3,600lbs**

Must be stamped on the gate

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Shock Absorbing Lanyards

Single Leg

Twin Leg

Tieback Lanyard

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Fall Clearance Calculations for Shock Absorbing Lanyards

Free Fall

Deceleration

Worker Height

Safety Factor

General Rule from your anchor:

"You need 17.5 ft of clearance with a 6 ft lanyard"

6.0 ft for Free Fall
3.5 ft for Deceleration (4' ANSI)
6.0 ft for Worker Height
2.0 ft for Safety Factor

17.5 ft clearance required

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SELF RETRACTING DEVICES - SRD

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Non Leading Edge Web Based SRL

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Non Leading Edge Cable Based SRL

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Leading Edge Cable Based SRL

What is the Design Difference for Leading Edge?

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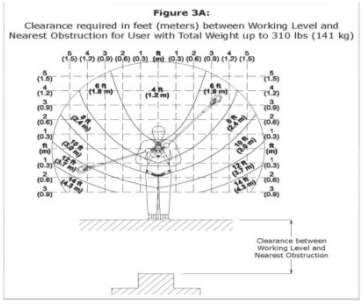
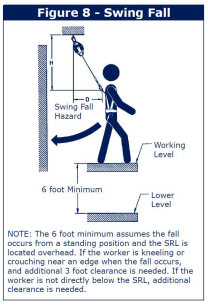
Self Retracting Lifeline Fall Clearance - OLD





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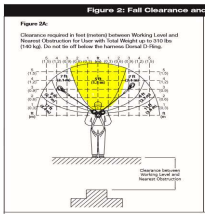
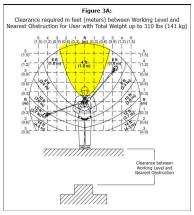
Miss understanding ON CLASS “A” & CLASS “B”

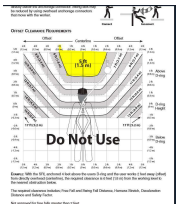
READ THE INSTRUCTION MANUALS TO FIND THE RIGHT FIT FOR YOU



Class A



Class B



Class A

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ANSI Update Z359.14-2021 Self-Retracting Devices

SRD Categories

Previous Z359.14-2014		*New* Z359.14-2021 (effective August 2023)	
SRL		*SRL*	
SRL-LE		*SRL-P*	
SRL-R		*SRL-R*	

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ANSI Update Z359.14-2021 Self-Retracting Devices **SRD Categories**

New Z359.14-2021 (effective February 1, 2023)

Self-retracting lifelines that has the housing secured to the anchor point.	***SRL***	
Self-retracting lifelines that has the unit secured to the user's harness.	***SRL-P***	
Self-retracting lifelines that includes an integral means for rescue.	***SRL-R***	

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Self Retracting **Device Classifications**

•Class 1

•For use with anchorages **AT or ABOVE** the dorsal D-ring.

•Maximum allowable freefall not to exceed 2 feet

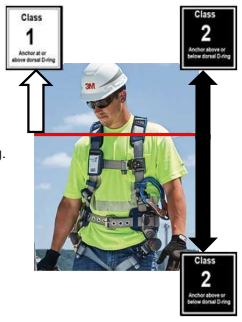
•Class 2

•For use with anchorages **ABOVE or BELOW** the dorsal D-ring.

•Maximum allowable freefall not to exceed 6 feet (1.8m)

•Leading Edge Devices will be identified within this classification.

•SRL-LE will no longer be used as an SRL class designation.



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ANSI Update Z359.14-2021 Self-Retracting Devices **SRD Categories**

All categories of units will also be classified as either a class 1 or class 2 SRD.

Class 1

- For use with anchorages at or above the dorsal D-ring
- Maximum allowable free fall not to exceed 2 feet

Class 2

- For use with anchorages above or below the dorsal D-ring
- Maximum allowable free fall not to exceed 6 feet

Class 1	Class 2
Anchor at or above dorsal D-ring	Anchor above or below dorsal D-ring

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ANSI Update Z359.14-2021 Self-Retracting Devices

SRD Categories

- Always carefully review the labels and written instructions for any self-retracting device to understand that working specifications for that particular device.

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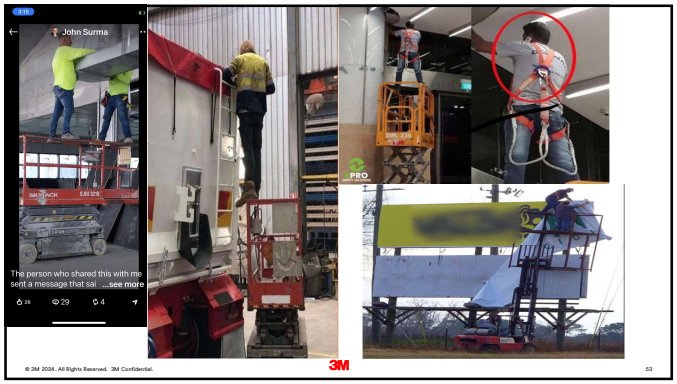

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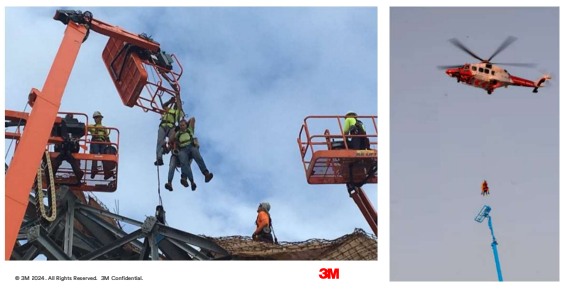

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There have been recent communications distributed by select fall protection manufacturers that instruct and authorize a potential misuse of ANSI/ASSP Z359.14-2021 Class 1 devices. These authorizations instruct that it is appropriate to connect a Class 1 device up to five feet (5 ft.) below the operator's dorsal D-ring. This application and direction is in direct conflict with the published ANSI/ASSP 359.14-2021 standard.

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The SRL discussed in this manual may be attached to an overhead anchorage, i.e., from directly over the user's head, or to an anchorage at a maximum of 5' below the user's FBH dorsal D-ring. Below D-ring tie-off is outside the scope of ANSI Z359 and is only allowed when no edge hazards are present. At no point during a fall shall the lifeline be loaded over any edge.

The non-leading edge below D-ring condition minimum required fall clearance (MRFC) is calculated using five metrics, measured from the walking-working surface: SRD Deceleration Distance, D-Ring Shift and Harness Stretch [1 ft (0.3m)], Safety Factor [1.5 ft (0.5m)], Dorsal D-ring Height [5 ft (1.5m)], and Swing Fall. Dorsal D-ring height is added to account for the below D-ring tie-off compared to the overhead condition. The diagram in Figure 8 is calculated using the performance data of the SRD and includes all five metrics listed previously to determine the MRFC. Below D-ring tie-off is outside the scope of ANSI Z359 and is only allowed when no edge hazards are present. At no point during a fall shall the lifeline be loaded over any edge.

Installation and Use

- **WARNING! SRL must NEVER be used in Leading Edge (LE) applications.**
- **No free fall is allowed.**
- **Always avoid lifeline contact with sharp edges and surfaces, both during use and in the event of a fall.**

Mobile Elevated Work Platform (MEWP) Applications:

When used in Travel Restraint applications only, an ANSI/ASSP Z359.14-2021 qualified Class 1 or 2 Personal Self-Retracting Lanyard (SRL-P) may be utilized as part of a Fall Protection system within the confines of a MEWP enclosure provided there is no risk of the user falling out of the enclosure or off the platform. The application, SRL-P, and compatibility with the MEWP and other equipment must be assessed and approved by a Competent Person prior to use to ensure that all Fall Arrest hazards are not possible by considering potential travel of the user within the MEWP enclosure and other factors including but not limited to, the strength and location of available certified anchorages. Applications that expose the user to a Fall Arrest hazard must utilize the appropriate Class 1 or 2 Self-Retracting Device (SRD) as determined by the Competent Person.

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Experimental evaluation of cable D-ring extension concept

Experimental Cable D-Ring Extender
Evaluated Sept 2018

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ANSI/ASSP Z359.7 (2019)

Qualification and Verification Testing of Fall Protection Products

Key Points:

2. Test Equipment:

- Provides testing laboratories with specifics for drop test structure, test weight, test torso, test lanyard, instrumentation, test data analysis etc.

3. **Test Specimens:**

- Requirements for manufacturing of test specimens
  - "4.3.3 When performing qualification testing on a new product, a minimum of **three specimens** shall be tested. The specimens shall be configured as defined by the applicable test method"
  - "4.3.4 When performing verification testing on an existing product, a minimum of **one specimen** of each compliant product shall be inspected, tested and evaluated to the requirements specified in the respective ANSI/ASSP Z359 standard"
  - "4.3.5 Any variance within product models that affects the product's performance, design and/or function with regard to the respective ANSI/ASSP Z359 standard shall constitute a different product model."

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LE D-Ring Extension Testing Summary

10 Units Tested / 2 Catastrophic Failures

Primary Issues Observed

- D-ring extenders expose the SRL shock pack to greater probability of contacting the leading edge during a fall event
- Connectors and hardware may contact leading edge during a fall event – creating high loading scenarios

Due to potential for catastrophic failure D-ring extensions NOT to be used for LE

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INSPECTION AND FREQUENCY

1910.140 Personal fall protection systems.

(18) Personal fall protection systems must be inspected before initial use during each workshift for mildew, wear, damage, and other deterioration, and defective components must be removed from service.

OSHA 1926.502 (d) (21):

Personal fall arrest systems shall be inspected prior to each use for wear, damage and other deterioration, and defective components shall be removed from service.

ANSI Z359.1-2007 (General Industry), requires:

- Inspection Prior to use;
- Inspection of equipment each year by a competent person;
- Comply with manufacturer's instructions

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READ THE MANUFACTURE INSTRUCTIONS

A least every 12 months, a Competent Person other than the user must inspect . Competent Person inspections MUST be recorded in inspection log in instruction manual and on equipment inspection grid label.

Service. recommends a five year maximum service life on its soft-goods fall protection products from the documented date that the product is placed into service by the end-user. Soft-goods fall protection products include harnesses, lanyards, and lifelines made of nylon, polyester, or other synthetic fibers.. fall protection products are to be inspected on a daily basis by the user and inspected, with documentation, on a semi-annual basis by a competent person.* Ultraviolet rays, abrasion, corrosive atmospheres, and severe service are among the factors that may affect and terminate a product's life prior to the five year maximum service life.

Formal Inspection requires that all harnesses be inspected by a competent person other than the user at intervals of no more than six months per applicable standard or as specified by a formal fall protection program. Record formal inspections in the provided Inspection Log. Punch or indelibly mark the inspection grid attached to the harness. Do not use a harness with a formal inspection date older than six (6) months unless under provision of formal inspection program. recommends that harnesses with formal inspection dates older than six (6) months be tagged "UNUSABLE"

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Descent & Rescue

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Rescue: Essential to your Fall Protection Program

Standards:

OSHA 1910.66 and 1926.502:

"The employer shall provide for prompt rescue…
or shall assure that employees are able to rescue themselves."

ANSI/ASSE Z359.2-2007:

"Employers shall develop
and maintain written fall protection and rescue procedures
for every location where an active fall protection system
is used to control a fall hazard."

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What is Prompt Rescue?

OSHA 1910.151 – Medical Aid

Recommended "contact" time 4 minutes
(OSHA Letter of interpretation 2004) https://www.osha.gov/laws-regs/standardinterpretations/2004-04-27

Definition of "prompt rescue" dependent on situation

Suspension Trauma

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The purpose of a fall arrest system is to arrest the fall of a falling worker and disperse arrest forces throughout the body, reducing the chance of injury. It is not designed for prolonged suspension.

Possible symptoms

- Nausea
- Dizziness
- Sweating
- Paleness
- Altered level of consciousness

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Avoiding Suspension Trauma

- Elevate the legs on a nearby structure if safe to do so
- Periodically clutch and hold knees up to the chest
- Move the legs to help maintain circulation
- Use suspension trauma straps, or another means of support under the feet (recommended as most effective method)

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Rescue Plan

Procedures

Equipment

Personnel needed

- Requires training

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Characteristics of a good rescue system

Simple, Safe, Planned and Practiced:

- Never Cut
- Never Improvise
- Keep it Simple
- Document and Update as situations change
- Be Prepared and…..
- Practice, Practice, Practice

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Rescue Devices

Self-Rescue

Ultra-Lok RSQ

R550

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Thank you

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