Michigan Safety Conference 2024
ANSI Z359.14-2021 Update
April 17, 2024

Michigan Safety Conference

Definitions: ANSI/ASSP Z359.14-2021

- SRD: " Self retracting devices (SRDs) make use of a drum wound line that not only automatically locks to arrest the user at the onset of a fall but also pays out from and automatically retracts the wearer onto the drum".

  SRL: Self Retracting Lanyard, "These mechanical fall arresters feature a locking mechanism and energy management system. In addition to arresting the fall of the user, this design limits the forces imparted onto the user".

SRD's/SRL'S

Definitions: ANSI/ASSP Z359.14-2021

- SRL-P: Self Retracting Lanyard, Personal "is worn by the user on a full-body harness to be used as a fall arrest connector".

  SRL-R: Self Retracting Lanyard, "includes an integral means for assisted rescue via raising or lowering the rescue subject".

- SRL-LE: Self Retracting Lanyard, "with leading edge capability".

SRL-P

SRL-R

SRL-LE

ANSI/ASSP Z359 History

- First introduced in May 1992.

- ANSI Z359.1 was upheld in 1999

- In January 2012 ANSI Z359.14 was published with specific language for SRD's becoming effective in, August 20, 2012.

- This is when leading edge classification were established with A and B SRL's.

- September 17, 2014, ANSI Z359.14-2012 was revised and published in February 2015 for safety requirements for SRL and additional information was added regarding leading edge.

- June 17, 2021, the most recent revision was published.

ANSI/ASSP Z359.14-21

- ANSI approve the update to Ansi Z359.14 on June 17th, 2021.

- Original Effective date was issued of August 1, 2022.

- New standard has been postponed until February 1, 2023. In effect as of August 1st, 2023.

- After August 1, 2023, manufactures would have to comply.

Changes between 2014-2021 revision

- *(New)*Test mass was updated from 282lbs to 310 lbs.

- *(Updated)* Classification for SRD's
  - Class 1 use to be Class A
  - Class 2 use to be class B

Changes between 2014-2021 revision

ANSI Z359.14-2014 (Old)	ANSI Z359.14-2021 (New)
Class A -Tested overhead with 282 lb. weight -Must arrest fall within 24" -Average force less than 1,350 lbs.	**Class 1** -Tested overhead with 310 lb. weight -Max arresting distance 42" -Average force less than 1,350 lbs. -Max force 1,800 lbs.
Class B -Tested overhead with 282 lb. weight -Must arrest fall within 54" -Average force less than 900 lbs.	**Class 2** -Meets Class 1 standards -Tested at foot level with 310 lb. weight -Max force 1,800 lbs -Max Arresting Distance 42" -Average arresting force 1,350 lbs.

Class 1 versus Class 2
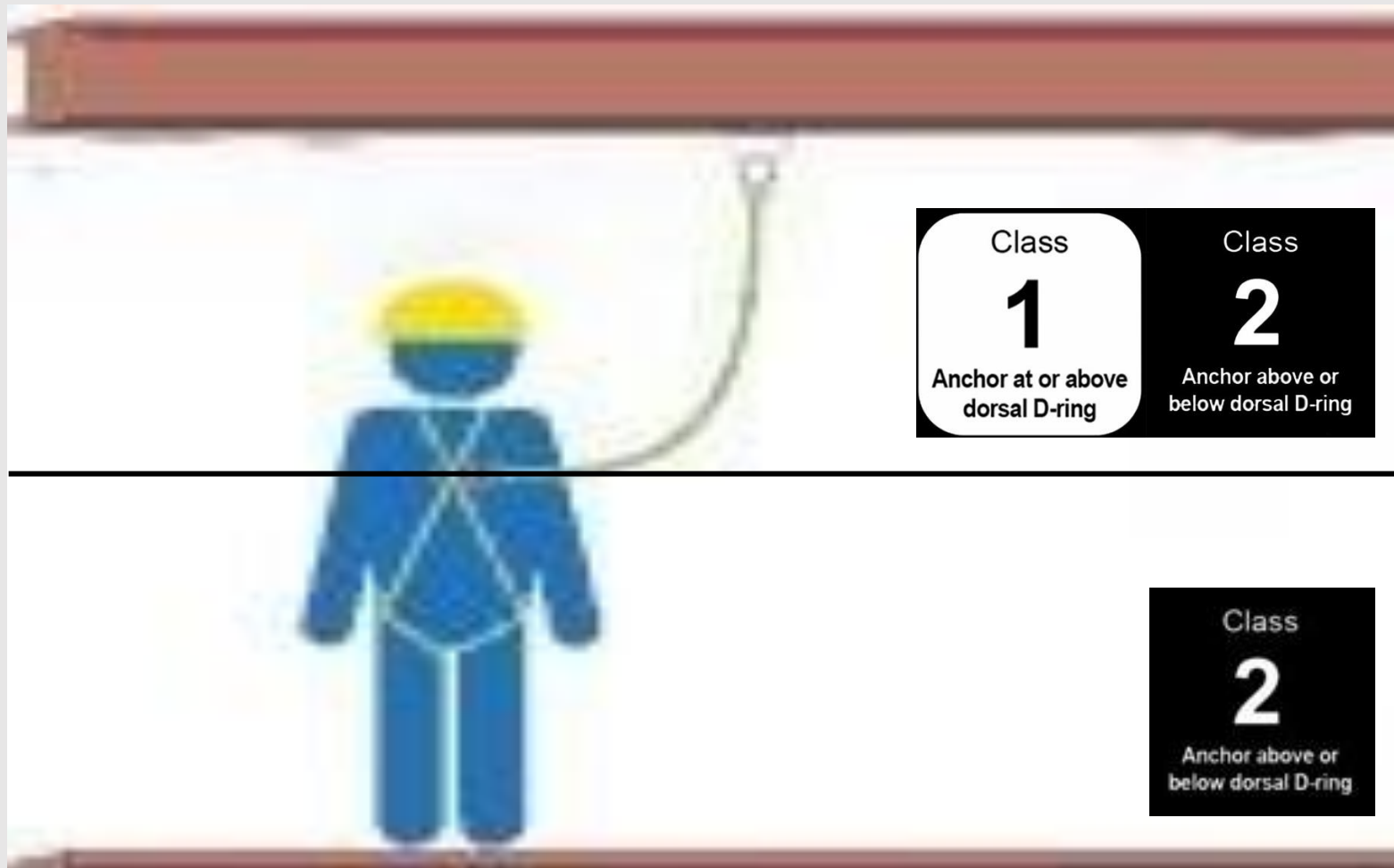
Changes between 2014-2021 revision

- Required an integral energy absorber on the lifeline.

- *(New)* Class 2 SRD must pass a dynamic test over an edge with a 310 lb. test weight and the Average Arresting Force must not exceed 1,350 lbs. and maximum arresting force not to exceed 1800 lbs. in ambient and average arresting force 1,575 pounds in conditioned.

- *(Updated)* SRL-P and Class devices can only have up to 48 inches of line outside the SRL housing when fully retracted. Previous 60 inches.

Changes between 2014-2021 revision

- *(Updated)* Categories changed to
- **SRL**
- **SRL-P**
- **SRL-R**
- **Removed:** Type SRL-LE. Now a type SRL—defining Leading Edge – is covered in the new classes of SRL-P.

Changes between 2014-2021 revision

- *(New)* SRL-P devices with twin or dual legs must hold a 3,600 lb. load applied from leg to leg.

- *(New)* SRL-P devices designed to tie back to itself or a around a beam must hold a load 3,600 lbs. This needs to be applied after completion of 2,500 cycles of abrasion testing with the lifeline wrapped around a I beam fixture.

- *(New)* SRL-P and Class 2 devices DO NOT need to retract after the overhead dynamic performance tests.

- *(New)* Class 2 SRL-P devices shall include a clearance requirement label.

- For SRL-P Devices which attach to the user dorsal D ring no energy absorber is required

ANSI/ASSP Z359.14-2021 (SRLs)

SRL

SRL-P

SRL-R

Class 1 — Anchor at or above dorsal D-ring
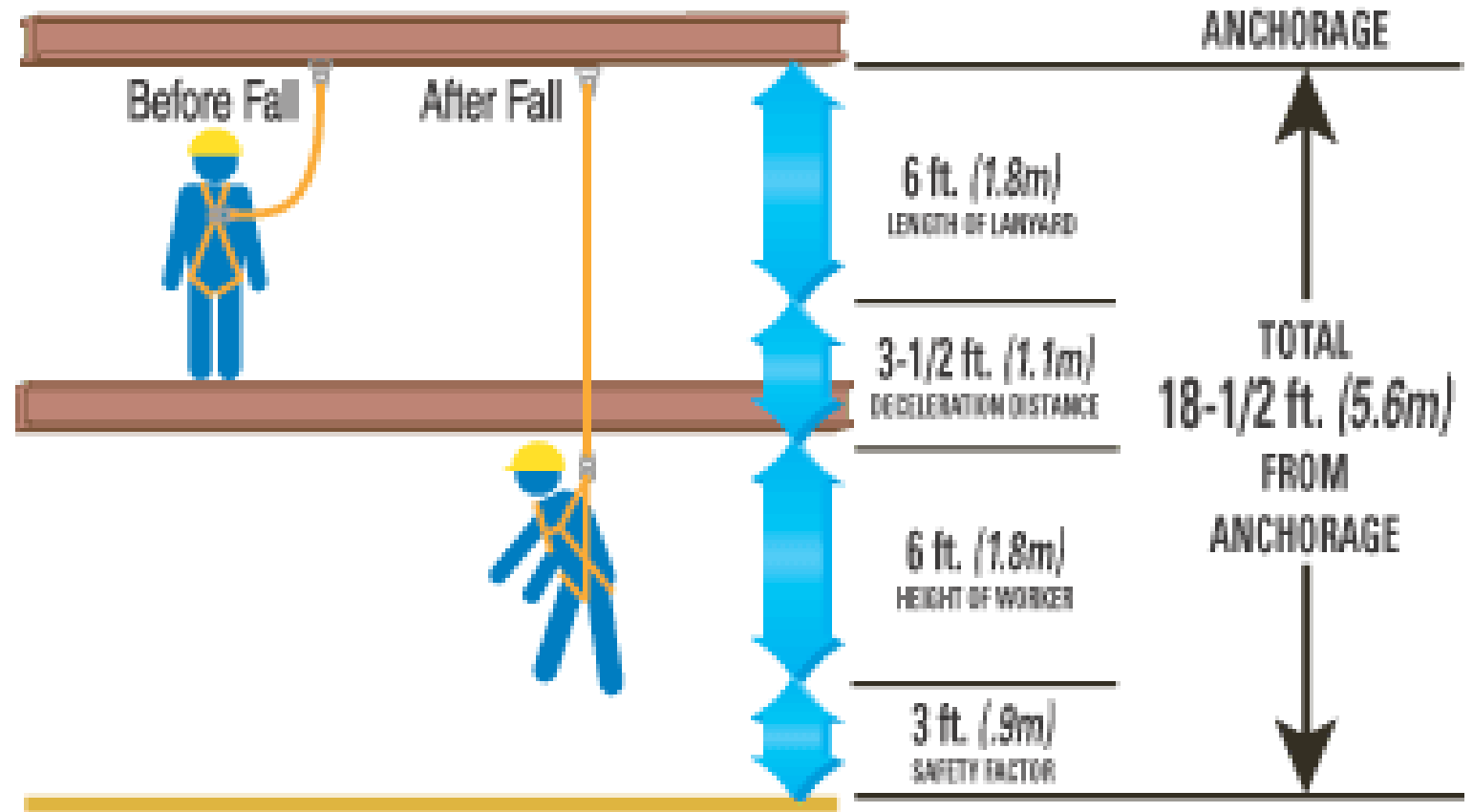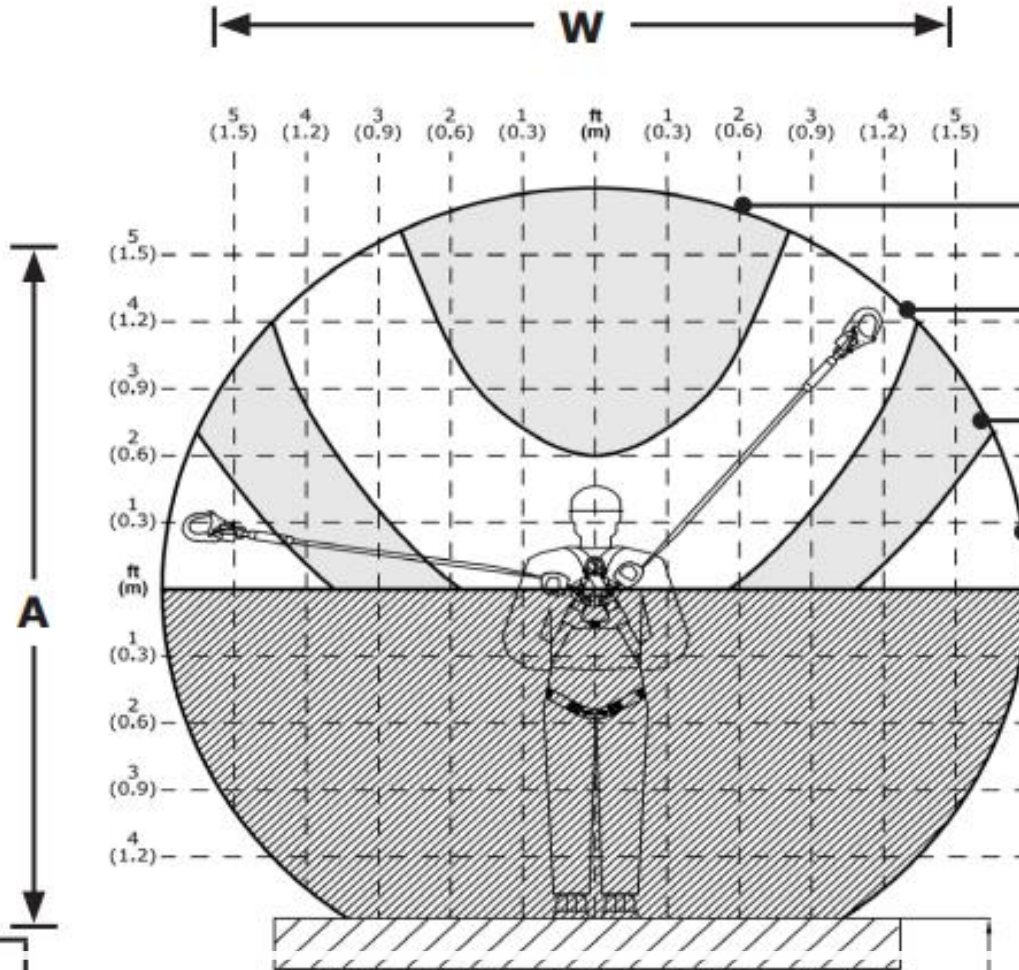
Class 2 — Anchor above or below dorsal D-ring
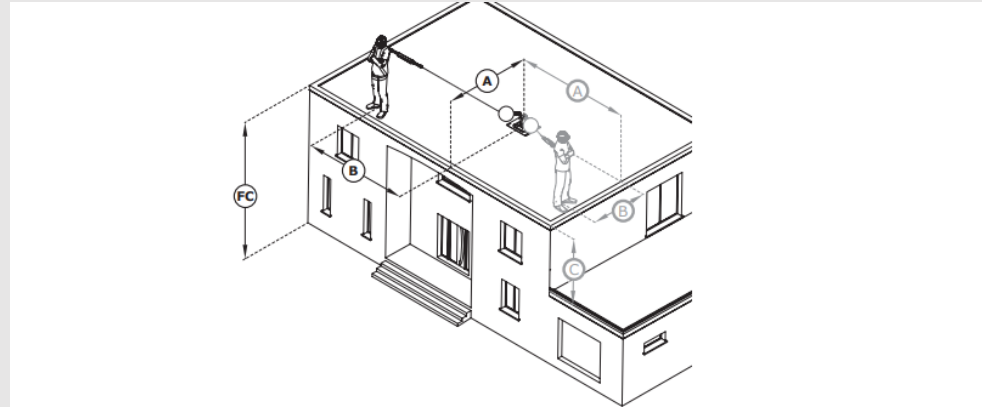
Fall Clearance Calculation- Then

Before Fall   After Fall

ANCHORAGE

6 ft. (1.8m)
LENGTH OF LANYARD

3-1/2 ft. (1.1m)
DECELERATION DISTANCE

6 ft. (1.8m)
HEIGHT OF WORKER

3 ft. (.9m)
SAFETY FACTOR

TOTAL
18-1/2 ft. (5.6m)
FROM
ANCHORAGE

Fall Clearance(FC)

	ANSI / OSHA	OSHA
	130-310 lb. (59-140 kg)	311-420 lb. (141-190 kg)
	4.0 ft. (1.2 m)	4.5 ft. (1.4 m)
	5.9 ft. (1.8 m)	6.5 ft. (2.0 m)
	6.4 ft. (2.0 m)	7.6 ft. (2.3 m)
	8.5 ft. (2.6 m)	9.9 ft. (3.0 m)
	✕	✕

☑ Do not connect Where chart shows cross hatching or crossed-out cells.

A	Anchorage Height
W	Maximum Work Radius

FC	Required Fall Clearance

W

A

ft (m)

5 (1.5) 4 (1.2) 3 (0.9) 2 (0.6) 1 (0.3) ft (m) 1 (0.3) 2 (0.6) 3 (0.9) 4 (1.2) 5 (1.5)

5 (1.5)
4 (1.2)
3 (0.9)
2 (0.6)
1 (0.3)
ft (m)
1 (0.3)
2 (0.6)
3 (0.9)
4 (1.2)

Fall Clearance Calculation-Now

Fall Clearance Requirements-Now

Double Leg

Changes between 2014-2021 revision

- *(Updated)* During ambient dynamic performance testing when using a 310 lb. test torso

- The Average Arresting Force increased from 900 lbs. to 1,350lbs.

- The Average Arrest distance is shortened to 42 inches from 54 inches.

- For conditioning tests, the Average Arresting Force stay at 1,575lbs but the Average Arrest Distance is no 42 inches.

Changes between 2014-2021 revision

- *(New)* SRL-R function tests are the same but static testing when in retrieval mode is now 3,600 lbs.

- *(New)* SRLs with internal brakes must pass a test with the lifeline shortened to 42 inches, then have 36 inches +/- 1" clipped out, then have a 310lb weight free falling 2ft and must maintain a 1,800 lb. lor less.

- *(New)* SRD's that don't have an internal braking system now must hold a minimum 1,800 lb. static load while the brake pawls of other brake activation system is engaged and locked with at least 75% of the lifeline remaining on the drum.

Changes between 2014-2021 revision

- *(New)* Warning card is required to be provided as a separate card insert with each SRD.

- ***WARNING: This Class 2 self-retracting device, when attached to a foot-level anchorage, poses significant risk of injury. The user, the competent person and/or qualified person should all acknowledge that normal use of this device MAY NOT PREVENT A SERIOUS INJURY. Failure to follow all manufacturer's instructions and warnings may result in serious injury or death.***

Changes between 2014-2021 revision

- As stated Previously, all SRD products manufactured after February 1, 2023, and claiming compliance to ANSI/ASPP Z359.14 will be required to conform to the most current revision of the document.

- Products manufactured to the previous revision of the ANSI Z359.14 standard may continue to be used as long as the product continues to meet the inspection requirements as defined by the manufacturer, conducted at the recommendation intervals by a Competent Person.

Sources/References:

- https://blog.ansi.org/ansi-assp-z359-14-2021-self-retracting-devices/
- https://www.wernerco.com/us/products/fall-protection/retractables/R4100Series/R410020#resources
- https://www.falltech.com/Product/7268c/
- https://msa.webdamdb.com/bp/#/folder/2340558/
- https://msa.webdamdb.com/bp/#/folder/5991852/
- https://www.falltech.com/Product/84711sc1/
- https://www.wernerco.com/us/products/fall-protection/retractables/R4300Series/R430006

Sources/References:

- https://www.amazon.com/3M-Sealed-Blok-3400991-Retracting-Carabiner/dp/B00HQOET7S
- https://www.amazon.com/MSA-Self-Retracting-Resettable-Retracting-Emergency/dp/B016MQ1OV4
- https://www.wernerco.com/us/products/fall-protection/confined-space/TSeries/T410060
- https://www.amazon.com/DBI-SALA-Nano-Lok-Twin-Leg-Retracting-3500276/dp/B0CGT6TL5T?th=1
- https://www.amazon.com/Honeywell-RLS30G-Z7LE-30FT-Mightylite-Retracting/dp/B017DC29AQ

Sources/References:

- https://www.amazon.com/Werner-R410030LE-Self-Retracting-Lifeline-Capability/dp/B07MMSVRS1