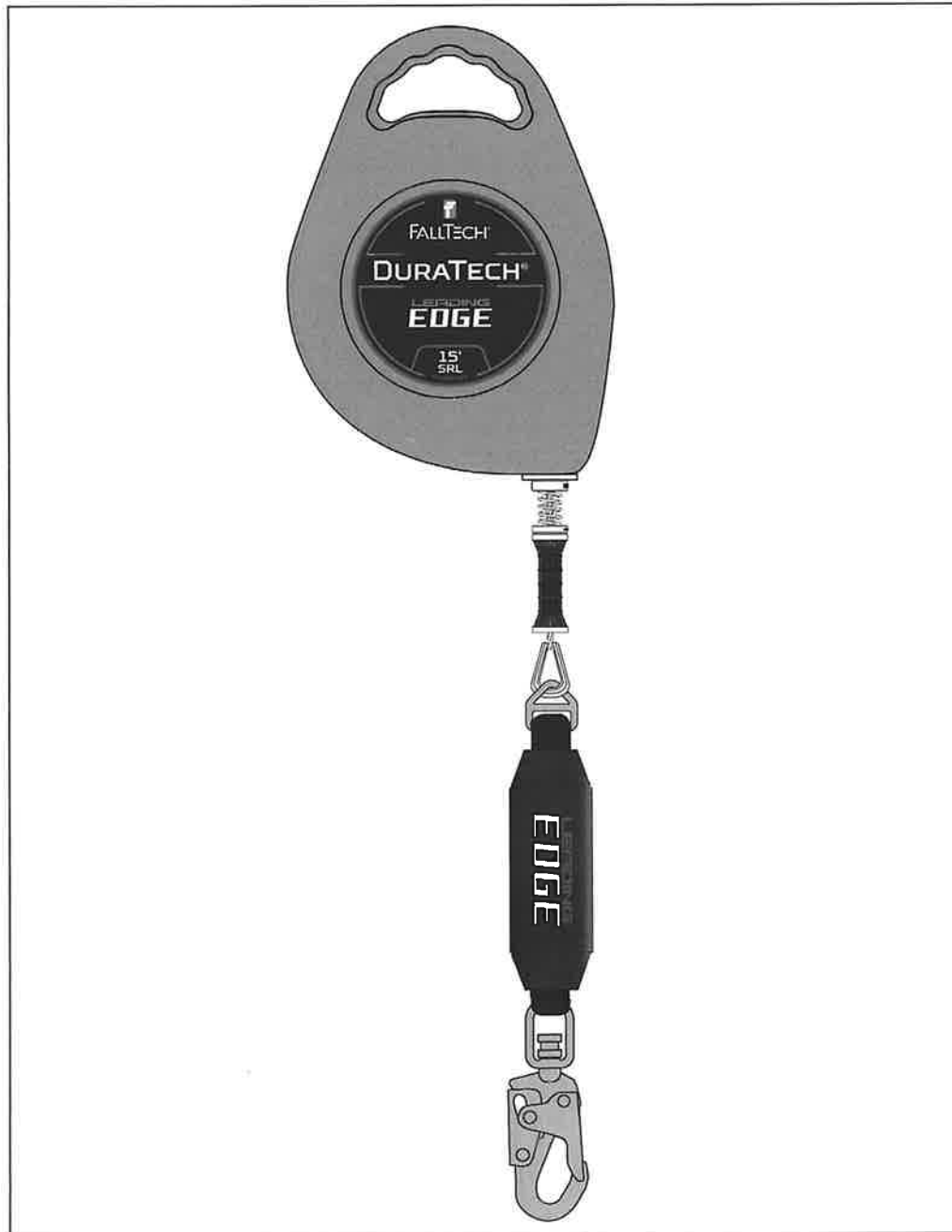


## **DuraTech Leading Edge SRL-LE**

### **User Instruction Manual**



This manual is intended to meet the Manufacturer's Instructions as required by the American National Standards Institute (ANSI) Z359 and should be used as part of an employee training program as required by the Occupational Safety and Health Administration (OSHA).

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For purposes of this manual, the DuraTech Leading Edge SRL-LE in all iterations may be referred to collectively as the SRL-LE , the SRD-Leading Edge (SRD-LE), the self-retracting device, the equipment, the device, the product, or the unit.

Throughout this manual, ANSI Z359.0-2012 fall protection words, phrases and terms are used. These terms are all formally defined in Section 9 of this manual.

## 1.0 Warnings and Important Information



### WARNING

- Avoid moving machinery, thermal, electrical and/or chemical hazards as contact may cause serious injury or death.
- Avoid swing falls.
- Follow the weight restrictions and recommendations in this manual.
- Remove from service any equipment subjected to fall arrest forces.
- Remove from service any equipment that fails inspection.
- Do not alter or intentionally misuse this equipment.
- Consult FallTech when using this equipment in combination with components or subsystems other than those described in this manual.
- Do not connect rebar hooks, large carabiners, or large snap hooks to the FBH dorsal D-rings as this may cause a roll-out condition and/or unintentional disengagement.
- Avoid sharp and/or abrasive surfaces and edges.
- Use caution when performing arc welding. Arc flash from arc welding operations, including accidental arcs from electrical equipment, can damage equipment and are potentially fatal.
- Examine the work area. Be aware of the surroundings and workplace hazards that may impact safety, security, and the functioning of fall arrest systems and components.
- Hazards may include but not be limited to cable or debris tripping hazards, equipment failures, personnel mistakes, moving equipment such as carts, barrows, fork lifts, cranes, or dollies. Do not allow materials, tools or equipment in transit to contact any part of the fall arrest system.
- Do not work under suspended loads.



### IMPORTANT

This product is part of a personal fall arrest, restraint, work positioning, suspension, or rescue system. A Personal Fall Arrest System (PFAS) is typically composed of an anchorage and a Full Body Harness (FBH), with a connecting device, i.e., a Shock Absorbing Lanyard (SAL), or a Self-Retracting Device (SRD), attached to the dorsal D-ring of the FBH.

These instructions must be provided to the worker using this equipment. The worker must read and understand the manufacturer's instructions for each component or part of the complete system. Manufacturer's instructions must be followed for proper use, care, and maintenance of this product. These instructions must be retained and be kept available for the worker's reference at all times. Alterations or misuse of this product, or failure to follow instructions, may result in serious injury or death.

A Fall Protection Plan must be on file and available for review by all workers. It is the responsibility of the worker and the purchaser of this equipment to assure that users of this equipment are properly trained in its use, maintenance, and storage. Training must be repeated at regular intervals. Training must not subject the trainee to fall hazards.

Consult a doctor if there is reason to doubt your fitness to safely absorb the shock of a fall event. Age and fitness seriously affect a worker's ability to withstand falls. Pregnant women or minors must not use this equipment.

ANSI limits the weight of fall protection equipment users to a maximum of 310 lbs. Products in this manual may have a rated capacity exceeding ANSI capacity limits. Heavy users experience more risk of serious injury or death due to falls because of increased fall arrest forces placed on the user's body. In addition, the onset of suspension trauma after a fall even may be accelerated for heavy users.

The user of the equipment discussed in this manual must read and understand the entire manual before beginning work.

NOTE: For more information consult the ANSI Z359 body of standards.

## 2.0 Description

The FallTech® DuraTech Leading Edge SRL-LE is a self-retracting device for those working at height and when may be subject to Leading Edge fall hazards, see Figure 10 for typical extreme sharp edges. For purposes of this manual, the DuraTech Leading Edge SRL-LE in all iterations may be referred to collectively as the SRL-LE , the self-retracting device, the equipment, the device, the product, or the unit.

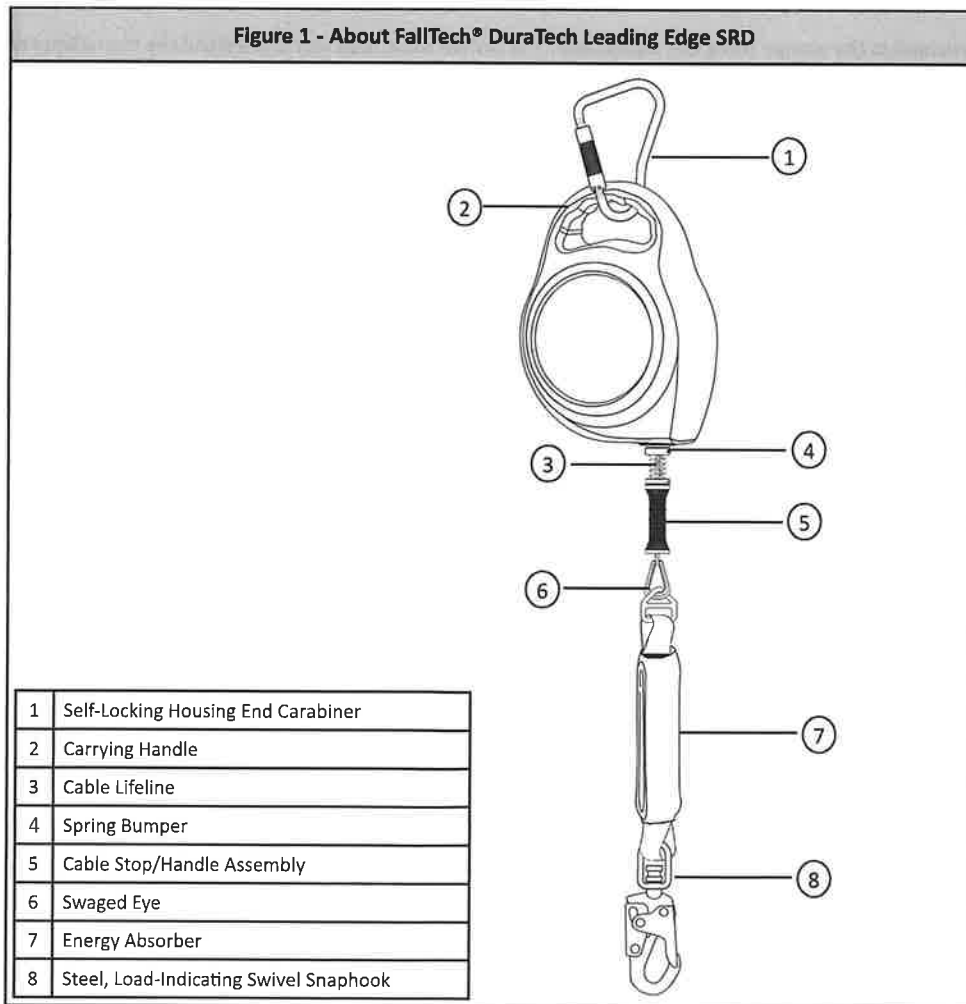
This manual contains one Appendix that contains figures and tables specific to the DuraTech Leading Edge SRL-LE discussed in this manual.

The SRD discussed in this manual may be attached to an overhead anchorage, i.e., from directly over the user's head, to as low as the level of the user's FBH dorsal D-ring. The SRD may also be attached to a non-overhead anchorage, i.e., level with the user's FBH dorsal D-ring, down to foot-level, to a maximum of 5' below the user's FBH dorsal D-ring.

Leading edge means the unprotected side and edge of a floor, roof, or formwork for a floor or other walking/working surface (such as deck) which changes location as additional floor, roof, decking or formwork sections are placed, formed or constructed. The shape and texture of a leading edge may vary, see Figure 10.

As shown in Figure 1 below, the SRD has an aluminum housing with an integrated handle that contains a lifeline composed of 7/32" diameter galvanized steel wire rope, wound onto a spring tensioned drum. The SRD's lifeline is equipped with a cable stop/handle assembly with a spring bumper, integrated tearaway Energy Absorber (EA), and a steel, load-indicating swivel snaphook. When the user is attached, the lifeline extends and retracts with user movement, automatically maintaining a taut lifeline. If a fall occurs, a centrifugal pawl system engages, stopping the lifeline payout. The tearaway EA deploys, gradually slowing and arresting the fall.

See Table 1A in Appendix A for product and materials specifications.



**2.1 American National Standards Institute (ANSI) and Occupational Safety and Health Administration (OSHA):** The SRD discussed in this manual meets the standards of ANSI Z359.14-2014, ANSI A10.32-2012, and Occupational Safety and Health Administration (OSHA) regulations 1926.502. ANSI requires SRDs be classified according to their tested overhead dynamic performance, and are classified either Class A or Class B, based on those test results. Dynamic performance means that the SRD is installed in a testing drop tower. A test weight is attached to the SRD and then dropped. Test results are recorded.

Parameters recorded are:

- Arrest Distance (AD)
- Average Arrest Force (AAF)
- Maximum Arrest Force (MPAF)

The Arrest Distance is the total vertical distance required to arrest a fall. The Arrest Distance includes the deceleration distance and the activation distance. The Average Arrest Force is the average of the forces applied to the body and the anchorage by the fall protection system. The Maximum Arrest Force is the maximum amount of force that may be applied to the body and the anchorage by the fall protection system. In addition to the above tests conducted in ambient conditions, the units must be retested for average and peak forces under certain environmental conditions, where the units are cooled, then tested, heated, then tested, and saturated in water and tested again. Separate units may be used for each test. All test results are recorded.

This test data is then used to establish the basis for fall clearance guidelines published in the user instruction manual.

**SRD Class A and B:** To be declared a Class A device, ANSI requires an SRD to have an Arrest Distance of less than 24", an Average Arrest Force of less than 1350 lbs, (1575 lbs conditioned) and a Maximum Peak Arresting Force of 1800 lbs, for both ambient and conditioned testing. To be declared a Class B device, the SRD must have an Arrest Distance of less than 54", an Average Arrest Force of less than 900 lbs, (1125 lbs conditioned) and a Maximum Peak Arresting Force of 1800 lbs, for both ambient and conditioned testing.

When dynamically tested in accordance with requirements of ANSI Z359.14-2014, FallTech Class A Self-Retracting Devices have an AAF of 1350 lbs and an AD of less than 24".

When dynamically tested in accordance with requirements of ANSI Z359.14-2014, FallTech Class B Self-Retracting Devices standard have an AAF of 900 lbs and an AD of less than 54".

**The arrest distances described by Class A and Class B apply to overhead anchorage applications only. For non-overhead anchorage applications, please see Section 5 of this user instruction manual for how to calculate your Minimum Required Fall Clearance (MRFC).**

Classification information found on product labels is based on test results. Table 1B provides test performance results for the SRD discussed in this manual. NOTE: Arrest distance is one of several parts of the Minimum Required Fall Clearance (MRFC). MRFC is discussed in detail in Section 5.

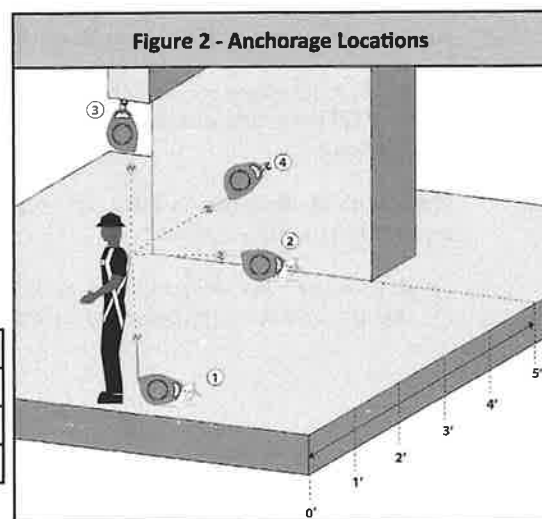
OSHA requires an SRD limit the free fall to 2 feet or less. If the maximum free fall distance must be exceeded, the employer must document, based on test data, that the maximum arresting force will not be exceeded, and the personal fall arrest system will function properly. The SRD discussed in this manual was successfully tested for horizontal use and falls over a steel edge without burrs, as found on steel shapes and metal sheeting, and may be used in situations where a fall may occur over similar edges, such as found on steel shapes or metal sheeting.

## 3.0 Application

**3.1 Purpose:** The FallTech DuraTech Leading Edge SRL-LE is designed to be used as a component in a Personal Fall Arrest System (PFAS), to provide a combination of worker mobility and fall protection as required for inspection work, general construction, maintenance work, oil production, confined space work, etc. The SRL-LE is intended for fall protection in Leading Edge applications where falls may occur over edges.

**3.2 Personal Fall Arrest System:** A PFAS is an assembly of components and subsystems used to arrest a person during a fall event. A PFAS typically consists of an anchorage, a deceleration device such as a Shock Absorbing Lanyard (SAL), a Self-Retracting Device (SRD), or a Fall Arrestor Connecting Subsystem (FACSS), and a properly fitted Full Body Harness (FBH). Maximum permissible free fall in a typical PFAS is 6'. The SRD discussed in this manual may be used in non-overhead anchorage situations. Clearance calculators provided in this manual offer methods for calculating MRFC for non-overhead anchorage locations when the SRD is set back from 0' to 4' and non-overhead anchorage locations that are set back 5' or greater, see Figure 2.

1	Anchorage of SRD at Foot Level with 0' Setback from Leading Edge
2	Anchorage of SRD at Foot Level with 5' Setback from Leading Edge
3	Overhead Anchorage of SRD Above Dorsal D-Ring
4	Anchorage of SRD Above Dorsal D-Ring with 5' Setback from Leading Edge



- 3.3 Horizontal Lifeline (HLL) and Rail Systems:** The SRD may be attached to rigid and flexible anchors provided that all HLL or rail system applications, installation, and uses are under the supervision of a qualified person.
- 3.4 Rescue:** Ensure a written rescue plan, method and system is in place and readily available for rapid response. Rescues may require specialized equipment or measures. Rescue operations are beyond the scope of this manual. See ANSI Z359.4-2013 and Z359.2-2017.
- 3.5 Application Limits:** The SRD discussed in this manual is designed for Leading Edge applications. However, take caution to avoid very sharp edges such as sheared metals, metals cut with an abrasive disk, or flame-cut metals. Also take caution around very abrasive surfaces and edges, such as concrete or stone, as these edges and surfaces may abrade the lifeline or the energy absorber during a fall event.

## 4.0 System Requirements

- 4.1 Capacity:** The SRD is designed for use by a single user with a combined weight of user, tools, clothing, etc., of 130 – 310 lbs.
- 4.2 Compatibility of Connectors:** Connectors are considered to be compatible with connecting elements when they have been designed to work together in such a way that their sizes and shapes do not cause their gate mechanisms to inadvertently open regardless of how they become oriented. Contact FallTech if you have any questions about compatibility. Connectors must be compatible with the anchorage or other system components. Do not use equipment that is not compatible. Non-compatible connectors may unintentionally disengage. Connectors must be compatible in size, shape, and strength. Self-closing, self-locking connectors are required by ANSI and OSHA.
- 4.3 Compatibility of Components:** Equipment is designed for use with approved components and subsystems only. Substitutions or replacements made with non-approved components or subsystems may jeopardize compatibility of equipment and may affect the safety and reliability of the complete system.
- 4.4 Making Connections:** Only use self-locking connectors with this equipment. Only use connectors that are suitable to each application. Ensure all connections are compatible in size, shape, and strength. Do not use equipment that is not compatible. Visually ensure all connectors are fully closed and locked. Connectors are designed to be used only as specified in each product's user's instructions.
- 4.5 Personal Fall Arrest System:** A PFAS is an assembly of components and subsystems used to arrest a person during a fall event. A PFAS is typically composed of an anchorage and a FBH, with an energy absorbing connecting device, i.e., an SAL, an SRD, or a Fall Arrestor Connecting Subsystem (FACSS), connected to the dorsal D-ring of the FBH. PFAS components used in conjunction with this SRD should comply with ANSI Z359 requirements and applicable OSHA regulations.
- 4.6 Average Arrest Force and Arrest Distance:** Table 1B provides test data on typical performance attributes of the three principal parameters, Arrest Distance, Average Arrest Force and Maximum Arrest Force, listed by model number and class. Testing is conducted under various environmental conditions; at ambient temperature, plus hot, cold, and in wet conditions. In manufacturer's tests, typical performance attributes of the SRD, connected at foot-level in a Leading Edge application with five feet of setback, or with zero setback, are:

	5' Setback	0' Setback
Longest Arrest Distance	110"	145"
Largest Average Arrest Force	1,032 lbs	1,002 lbs
Largest Maximum Arrest Force	1,711 lbs	1,570 lbs

The competent person may find this data useful with planning anchorage location and calculating fall arrest loads and distances from the walking/working level to the nearest obstruction or lower level. See Section 5.

**NOTE:** Arrest distance is one part of the Minimum Required Fall Clearance (MRFC). The MRFC is determined by consideration of multiple factors in fall protection. Attachment below the level of the FBH D-ring will require additional fall clearance. MRFC is discussed in detail in Section 5.

- 4.7 PFAS Anchorage Strength:** An anchorage selected for PFAS must have a strength able to sustain a static load applied in the direction permitted by the PFAS of at least:

- Two times the maximum arrest force permitted when certification exists, or
- 5,000 lbs. (22.2 kN) in the absence of certification.

Select an anchorage location carefully. Consider structural strength, obstructions in the fall path, and swing fall hazards. In certain situations, the qualified person can determine that a given structure is able to withstand the applied MAF of the PFAS with a safety factor of at least two, as required by OSHA.

## 5.0 Installation and Use

### WARNING

Do not alter or intentionally misuse this equipment. Consult FallTech when using this equipment in combination with components or subsystems other than those described in this manual. All components or subsystems used with the SRD discussed in this manual must be in compliance with ANSI Z359 and OSHA.

Do not use rebar hooks, large carabiners or large snap hooks to connect to the FBH dorsal D-rings or to any small diameter non-compatible anchor point as this may cause a roll-out condition and/or unintentional disengagement.

Do not insert extra connectors between the SRD lifeline connector and the FBH dorsal D-ring, except an approved D-ring extender.

Use caution. Take action to avoid sharp and/or abrasive surfaces and edges when possible.

- 5.1. Install the SRD:** Examine the work area for possible hazards. Take caution to avoid overhead hazards such as cranes, poles, overhead power cables, and walking/working surface hazards such as power cables, welding leads, air and fluid hoses, including obstruction hazards such as vertical columns and stacks of materials on the lower level. Eliminate hazards where possible.

Ensure the anchorage provides the Minimum Required Fall Clearance (MRFC) in the fall path below the walking/working surface to prevent striking the lower level or an obstruction during a fall event. Take action to avoid swing falls, which occur when the anchorage is not directly above the point where the fall occurs.

Fall clearance and swing falls are subject to variable conditions. Anchor height, lateral movement, and setback distance all affect anchor location with regard to fall clearance and swing fall.

The SRD may be attached to an overhead anchor, i.e. above the user's FBH dorsal D-ring, or a non-overhead anchor, i.e., below the user's FBH dorsal D-ring. A non-overhead anchor may be as low as foot level, but no more than a maximum of 5' below the user's FBH dorsal D-ring. Non-overhead anchor locations result in greater contact between the lifeline and the edge and present greater abrasion risk hazards.

Use of a foot-level anchorage should be as a last resort, when no other anchor option exists.

Performance testing has shown that a fall event over a leading edge will alter SRD performance characteristics and fall clearance requirements. When anchored below the FBH back D-ring fall events will result in greater fall clearances. Reduced setback distances will also increase clearance requirements. Non-overhead anchorage when the SRD is set back less than 5' will result in the greatest MRFC and the least amount of worker mobility due to swing fall. Greater set back distances of 5' or more will reduce the overall MRFC and allow for more lateral movement of the worker when attached to a non-overhead anchorage.

If job site geometry allows it, a setback distance of 5' is recommended to take full advantage of the SRD performance. In addition, the Angle of Redirection of the lifeline, i.e., the angle of the lifeline as it passes over the edge, must be at 90 degrees or more, never less, see Section 5.3.

Do not attach the SRD in a manner that places the edge higher than the SRD.

## 5.2 Calculating SRL-LE MRFC

### 5.2.1 SRL-LE in Overhead, Non-Leading Edge Anchorage Application

The Leading Edge SRD may be used as a standard SRD in an overhead condition, in which the SRD is installed anywhere in the allowable attachment area, which ranges from directly above the user to level with the FBH D-ring, as shown in Figure 3. The overhead condition MRFC has six metrics, labeled A – F, measured from the walking/working surface.

A = SRD Deceleration Distance

B = D-Ring Shift and Harness Stretch

C = Safety Factor

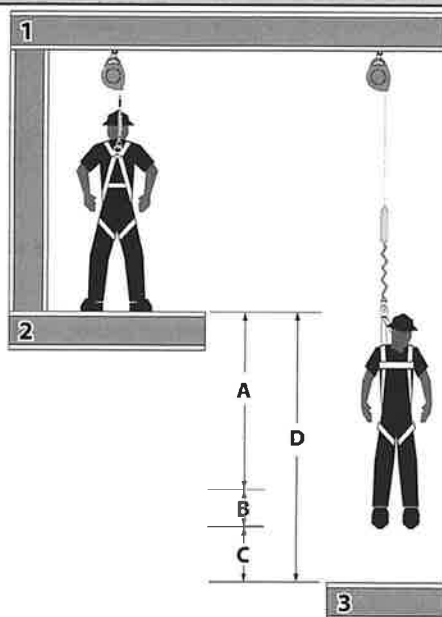
D = Sub Total- Minimum Required Fall Clearance

E = \*Additional Fall Clearance Calculation Due To Swing Fall

F = Total Required Fall Clearance

The MRFC for an overhead anchorage, with no swing fall condition, is calculated as  $A+B+C=D$ . The user must be aware that if a swing fall hazard exists, as shown in Figure 4, additional steps are required. Use Chart 1 on the following page to determine the amount of swing fall, and place that value in E. Add the E value to the D value to determine the total MRFC.

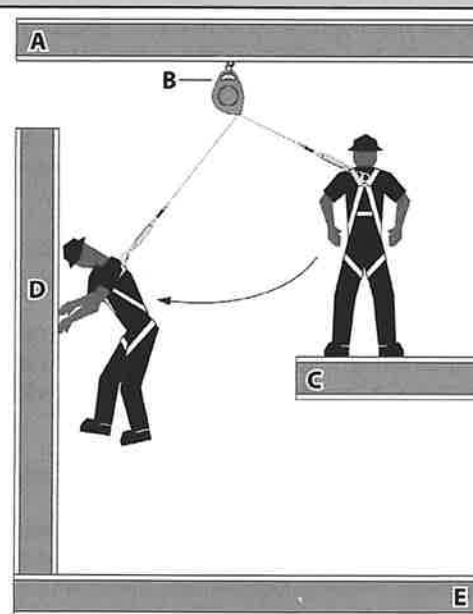
**Figure 3 - MRFC Overhead Anchorage**



A	4½ ft	<b>Deceleration Distance</b> Maximum allowable length of cable or web that may payout from the SRD once deceleration of the user has begun and after a fall event occurs. For work in low clearance areas, see Table 1B for Typical Performance
B	1 ft	<b>Dorsal D-Ring Shift and FBH Stretch</b> Combined amount of Dorsal D-ring up-shift and harness webbing elongation during entire fall event
C	1½ ft	<b>Safety Factor</b> Added length to account for other factors such as an improperly adjusted harness, actual worker height or worker weight
D	7 ft	<b>Sub Total- Minimum Required Fall Clearance</b> for direct overhead use of SRD with No Swing Fall; sum of A, B and C only
E	— ft	<b>*Additional Fall Clearance Calculation</b> due to Swing Fall (using Chart 1)
F	— ft	<b>Total Required Fall Clearance</b> Including sub-total D and Swing Fall E (from Chart 1)

1. Overhead Anchorage 2. Walking/Working Surface  
3. Nearest Lower Level or Obstruction

**Figure 4 - Swing Fall Hazards: Overhead, Non-Leading Edge**



A	Anchorage
B	Self-Retracting Lifeline
C	Walking/Working Surface
D	Swing Fall Impact after fall event
E	Next Lower Level or Obstruction



Y-Axis: SRD Anchorage Height Above Dorsal D-Ring of FBH

**Chart 1: Additional Fall Clearance Due to Swing Fall (feet) Overhead, Non-Leading Edge Condition**

50	0	0	0	0	1	1	1	2	2	3	4	5	5	6	7	8	9	10	12
45	0	0	0	0	1	1	2	2	3	3	4	5	6	7	8	9	10	11	13
40	0	0	0	0	1	1	2	2	3	4	5	6	7	8	9	10	11	12	14
35	0	0	0	1	1	1	2	3	3	4	5	6	7	9	10	11	12	14	15
30	0	0	0	1	1	2	2	3	4	5	6	7	8	10	11	12	14	15	17
25	0	0	0	1	1	2	3	4	5	6	7	8	10	11	13	14	16	17	19
20	0	0	0	1	2	2	3	4	6	7	8	10	11	13	14	16	18	19	21
15	0	0	1	1	2	3	4	6	7	8	10	12	13	15	17	19	20	22	24
10	0	0	1	2	3	4	6	7	9	11	12	14	16	18	20	22	24	25	27
5	0	0	1	3	4	6	8	10	12	14	16	18	20	21	23	25	27	29	31
0	Dorsal D-Ring	2	4	6	8	10	12	14	16	18	20	22	24	26	28	30	32	34	36
Feet	0	2	4	6	8	10	12	14	16	18	20	22	24	26	28	30	32	34	36

X- Axis: Lateral Work Zone Radius (ft) → →

### Using Chart 1 to Find Additional Fall Clearance: Overhead, Non-Leading Edge

2 foot increments along the X-Axis represent the distance the user is working away from being directly under the SRD

5 foot increments up the Y-Axis represent the SRD Anchorage height above the user's Dorsal D-Ring

To find the additional Fall Clearance needed to compensate for potential Swing Fall, note the starting location on Chart 1 titled **Dorsal D-Ring**

#### Example:

If the user needs to work 18' away from directly under the SRD, the SRD needs to be anchored at least 35' above the user's Dorsal D-Ring therefore, 4 feet of additional fall clearance should be added to the Sub-total calculation in **Figure 3**.

#### Example:

If the only suitable overhead Anchorage for the SRD is 50 feet above the user's Dorsal D-Ring, the maximum allowable work zone is 20 feet away from directly overhead therefore, 4 feet of additional fall clearance should be added to the sub-total calculation in **Figure 3**.

Key to Work Zone Areas:



= Allowable Use Area



= Cautionary Use Area



= Not Allowed Use Area

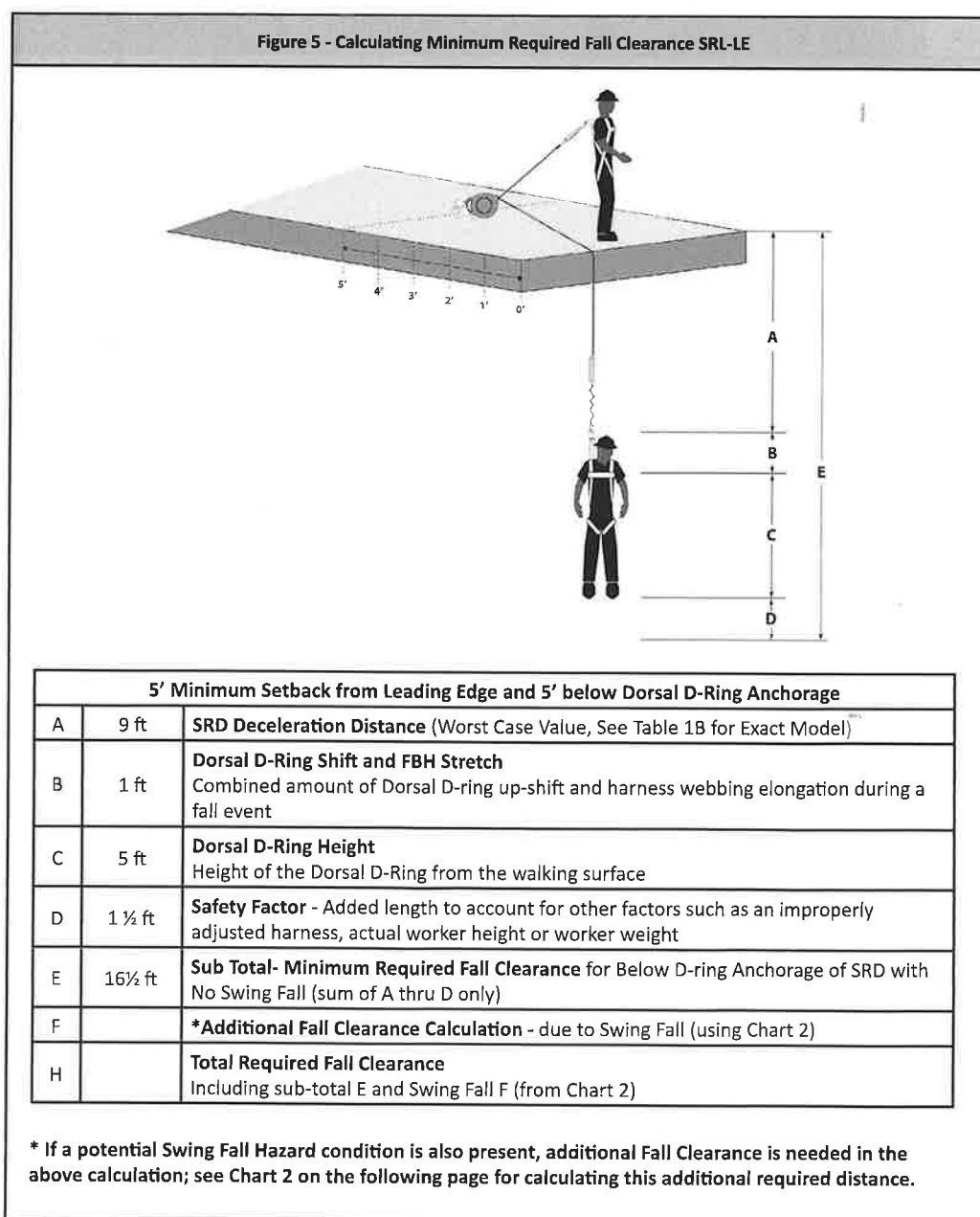
## 5.2.2 5' Setback From Leading Edge and 5' Below the Dorsal D-Ring Anchorage

With the anchor set back and below the D-ring, as shown in Figure 5, there are seven variables to consider when calculating the MRFC. These seven are labeled A, B, C, D, E, F, and G. H is the MRFC.

These variables are:

- A = Free Fall Distance due to Below D-ring Anchorage
- B = SRL-LE Deceleration Distance (Typical Overhead Distance)
- C = Additional Deceleration Distance (Due to Below D-Ring Anchorage)
- D = Dorsal D-Ring Shift and FBH Stretch
- E = Safety Factor
- F = Sub Total-Minimum Required Fall Clearance
- G = Additional Fall Clearance Calculation for Swing Fall – 4' Maximum
- H = Minimum Required Fall Clearance

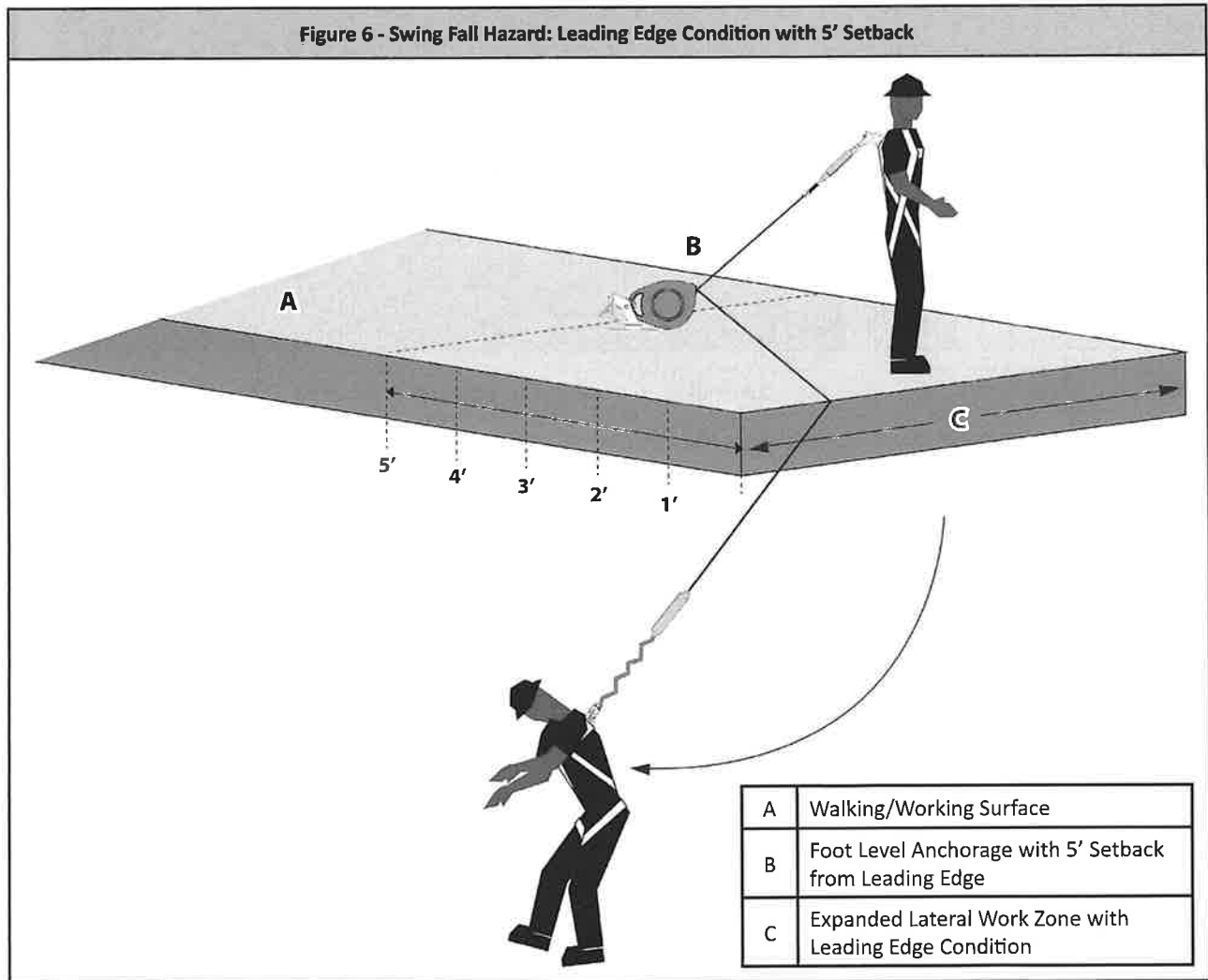
Use Figure 5 as a worksheet. The MRFC for this anchorage geometry is calculated as  $A+B+C+D+E=F$ . F is the Sub Total-MRFC. This total does NOT account for swing fall. If a swing fall condition exists, use Chart 2 to determine "G", the additional fall clearance needed.  $G+F=H$  is the total fall clearance required.



**Swing Fall with 5' Setback:** A swing fall condition is created when the user travels laterally from directly in front of or below the anchorage, as shown in Figure 6. For each foot of work zone expansion, the risk of severe injury or death from a swing fall increases. This increased risk requires additional MRFC distance, up to a maximum of 4' of added clearance.

If the user exceeds maximum lateral travel, the swing force of a fall event would cause the lifeline to swing and abrade on the edge, with increased risk of damage to or otherwise compromising the lifeline, resulting in serious injury or death to the user. Limit potential swing fall abrasion risk by limiting lateral travel.

See Chart 2 for instructions on how to determine a safe lateral travel distance.



**Chart 2: Additional Fall Clearance Locator due to Swing Fall (feet) with Leading Edge Conditions  
for 5' Setback from Leading Edge with Foot Level Anchorage**

Y-Axis: SRD Anchorage Height Above Dorsal D-Ring of FBH Feet	50	0	0	0	0	1	1	1	2	2	3	4	5	5	6	7	8	9	10	12
	45	0	0	0	0	1	1	2	2	3	3	4	5	6	7	8	9	10	11	13
	40	0	0	0	0	1	1	2	2	3	4	5	6	7	8	9	10	11	12	14
	35	0	0	0	1	1	1	2	3	3	4	5	6	7	9	10	11	12	14	15
	30	0	0	0	1	1	2	2	3	4	5	6	7	8	10	11	12	14	15	17
	25	0	0	0	1	1	2	3	4	5	6	7	8	10	11	12	14	15	17	19
	20	0	0	0	1	1	2	3	4	5	7	8	10	11	13	14	16	17	19	21
	15	0	0	1	1	2	3	4	5	7	8	10	11	13	15	16	18	20	22	24
	10	0	0	1	2	3	4	5	7	8	10	12	13	15	17	19	21	23	25	27
	5	0	0	1	2	4	5	7	9	10	12	14	16	18	20	22	24	26	28	30
	0	Dorsal D-Ring	0	1	3	4	6	8	10	12	14	16	18	20	21	23	25	27	29	31
	-5	0	0	1	3	4	6	8	10	12	14	16	18	20	21	23	25	27	29	31
		0	2	4	6	8	10	12	14	16	18	20	22	24	26	28	30	32	34	36

X- Axis: Lateral Work Zone Radius (ft) → →

### Using Chart 2 to Find Additional Fall Clearance: Leading Edge Conditions

2 foot increments along the X-Axis represent the distance the user is working away from the SRD Anchorage.

5 foot increments up the Y-Axis represent the SRD Anchorage height above or below the user's Dorsal D-Ring

At no time shall the expanded Work Zone exceed 16' (8' on each side of center)

To find the additional Fall Clearance needed to compensate for potential Swing Fall, note the starting location on Chart 2 titled **Dorsal D-Ring**

#### Example:

The starting point shown is where the SRD is anchored at Foot Level (5' below the Dorsal D-ring) and has 5' of Setback distance from the Leading Edge. From here, the user may expand the lateral work zone up to 8' along the X-axis and still remain inside the allowable and cautionary areas. This expanded work zone indicates that 4' of additional fall clearance should be added to the Sub-total calculation in **Figure 5**

Should the user need to expand the work zone to 12', the SRD must be anchored 15' above the Dorsal D-ring to remain in the allowed and cautionary areas. This change also indicates 4' of additional fall clearance to be added to **Figure 5**

If the user cannot anchor the SRD above the Dorsal D-ring but still must expand the work zone, the SRD will need to be anchored with more than 5' of setback distance from the leading edge.

**Key to Work Zone Areas:**  = Allowable Use Area  = Cautionary Use Area  = Not Allowed Use Area

### 5.2.3 0' Setback From Leading Edge and 5' Below the Dorsal D-Ring Anchorage

With the anchor installed at zero set back and below the D-ring, as shown in Figure 7, there are eight metrics to consider when calculating the MRFC. These eight metrics are labeled A, B, C, D, E, F, G and H. These metrics are:

A = Free Fall Distance due to Below D-ring Anchorage

B = SRL-LE Deceleration Distance

C = Additional Deceleration Distance - Note the added deceleration distance for 0' setback.

D = Dorsal D-Ring Shift and FBH Stretch

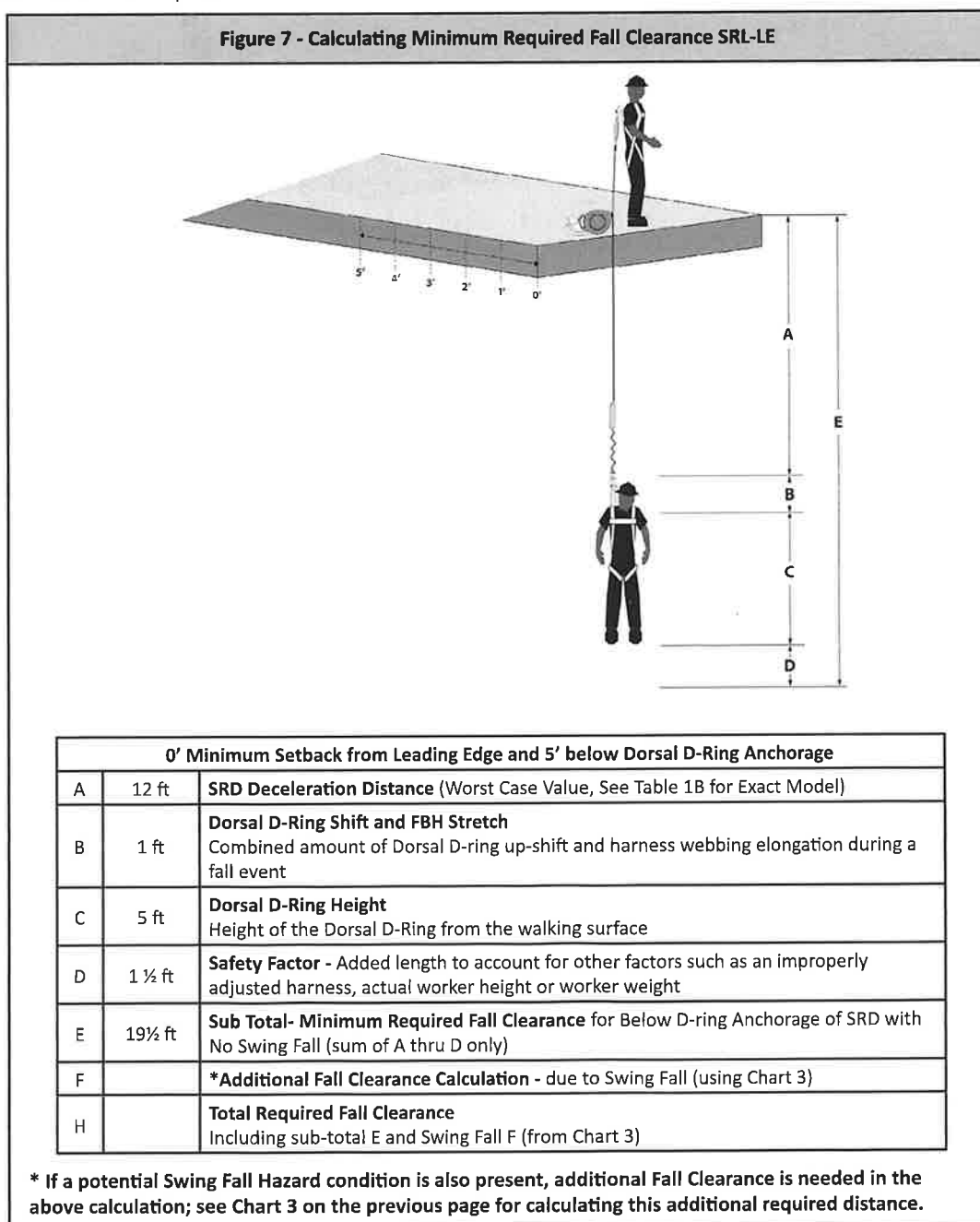
E = Safety Factor

F = Sub Total- Minimum Required Fall Clearance

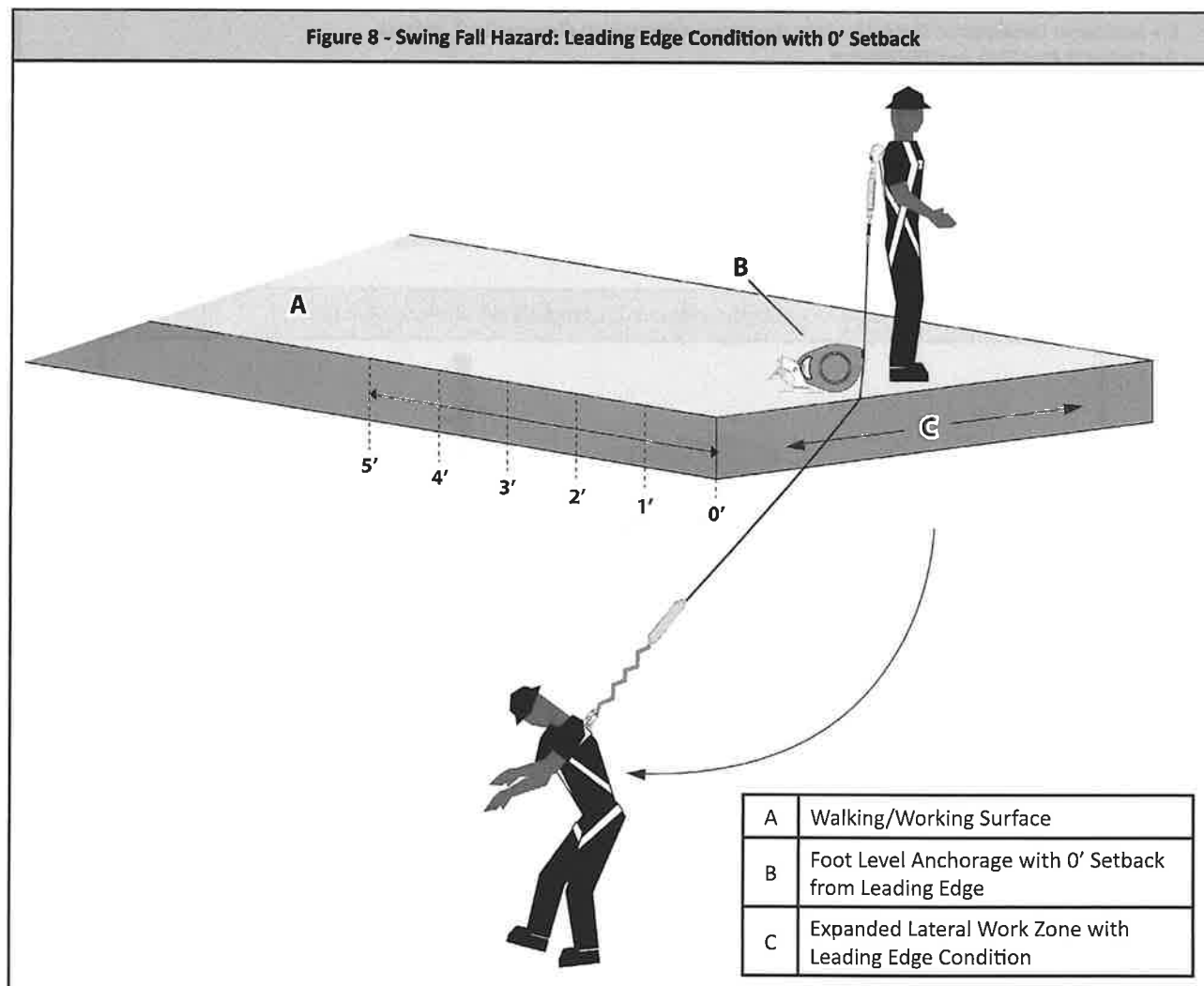
G = Additional Fall Clearance Calculation for Swing Fall – 4' maximum

H = Total Required Fall Clearance

Use Figure 7 as a worksheet. The MRFC for this anchorage geometry is calculated as  $A+B+C+D+E=F$ . F is the Sub Total-MRFC. This total does NOT account for swing fall. If a swing fall condition exists, use Chart 3 to determine "G", the additional fall clearance needed.  $G+F=H$  is the total fall clearance required.



**Swing Fall with 0' Setback:** A swing fall condition with 0' setback in Figure 8. For each foot of work zone expansion, the risk of severe injury or death from a swing fall increases. This increased risk requires additional MRFC distance, up to a maximum of 4' of added clearance. See Chart 3 for instructions on how to determine a safe lateral travel distance. A swing fall, combined with the user at the maximum allowable lateral travel, will cause the lifeline to abrade along and across the edge. This may cause severe lifeline or energy absorber damage over a rough, sharp, or abrasive edge. Limit lateral travel to avoid swing falls.



**Chart 3: Additional Fall Clearance Locator due to Swing Fall (feet) with Leading Edge Conditions**

**for 0' Setback from Leading Edge with Foot Level Anchorage**

Y-Axis: SRD Anchorage Height Above Dorsal D-Ring of FBH Feet	50	0	0	0	0	1	1	1	2	2	3	4	5	5	6	7	8	9	10	12
	45	0	0	0	0	1	1	2	2	3	3	4	5	6	7	8	9	10	11	13
	40	0	0	0	0	1	1	2	2	3	4	5	6	7	8	9	10	11	12	14
	35	0	0	0	1	1	1	2	3	3	4	5	6	7	9	10	11	12	14	15
	30	0	0	0	1	1	2	2	3	4	5	6	7	8	10	11	12	14	15	17
	25	0	0	0	1	1	2	3	4	5	6	7	8	10	11	13	14	16	17	19
	20	0	0	0	1	2	2	3	4	6	7	8	10	11	13	14	16	18	19	21
	15	0	0	1	1	2	3	4	6	7	8	10	12	13	15	17	19	20	22	24
	10	0	0	1	2	3	4	6	7	9	11	12	14	16	18	20	22	24	25	27
	5	0	0	1	3	4	6	8	10	12	14	16	18	20	21	23	25	27	29	31
	0	Dorsal D-Ring	2	4	6	8	10	12	14	16	18	20	22	24	26	28	30	32	34	36
	-5	0	2	4	6	8	10	12	14	16	18	20	22	24	26	28	30	32	34	36
		0	2	4	6	8	10	12	14	16	18	20	22	24	26	28	30	32	34	36

X- Axis: Lateral Work Zone Radius (ft) → →

### Using Chart 3 to Find Additional Fall Clearance: Leading Edge Conditions

2 foot increments along the X-Axis represent the distance the user is working away from the SRD Anchorage.

5 foot increments up the Y-Axis represent the SRD Anchorage height above or below the user's Dorsal D-Ring

At no time shall the expanded Work Zone exceed 8' (4' on each side of center)

To find the additional Fall Clearance needed to compensate for potential Swing Fall, note the starting location on Chart 3 titled **Dorsal D-Ring**

#### Example:

The starting point shown is where the SRD is anchored at Foot Level (5' below the Dorsal D-ring) and has 0' of Setback distance from the Leading Edge. From here, the user may expand the lateral work zone up to 4' along the X-axis and still remain inside the allowable and cautionary areas. This expanded work zone indicates that 4' of additional fall clearance should be added to the Sub-total calculation in **Figure 7**.

Should the user need to expand the work zone to 10', the SRD must be anchored 10' above the Dorsal D-ring to remain in the allowed and cautionary areas. This change also indicates 4' of additional fall clearance to be added to **Figure 7**.

If the user cannot anchor the SRD above the Dorsal D-ring but still must expand the work zone, the SRD will need to be anchored with more than 0' of setback distance from the leading edge.

Key to Work Zone Areas:



= Allowable Use Area



= Cautionary Use Area



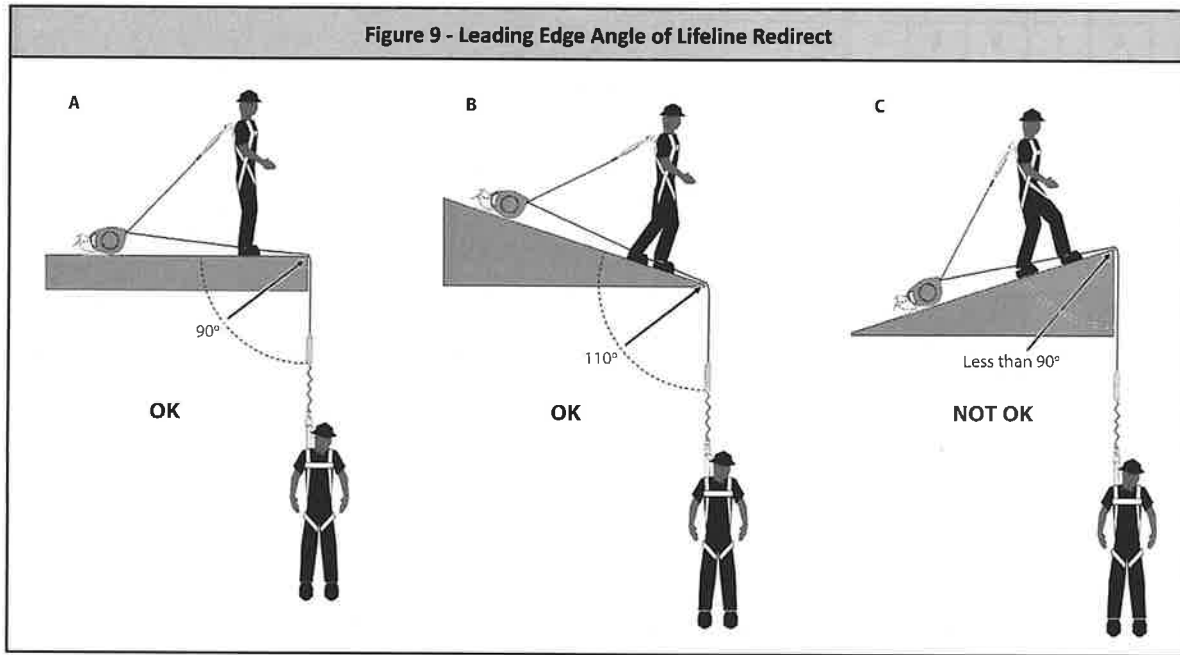
= Not Allowed Use Area

## ⚠ WARNING

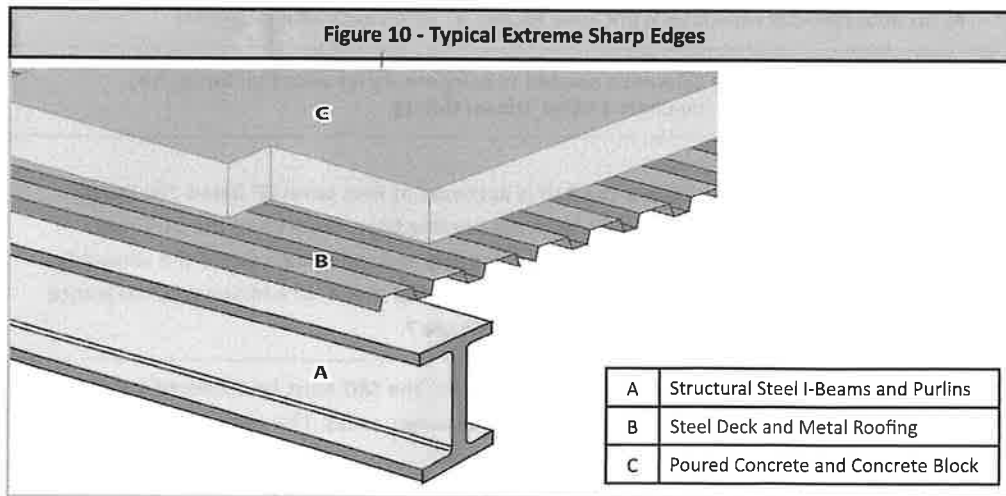
An expanded work zone combined with an SRD attached at or near foot level will have a high risk of serious injury or death.

- 5.3 Angle of Redirection:** The angle of redirection is the angle of the lifeline over an edge during a fall event. Install the SRD so that the angle of the two parts of the lifeline are at least 90°, or more, but never less, as shown in Figure 9. The lifeline must never rise up to the edge as it may bend the lifeline in too small a radius and/or severely abrade, or otherwise compromise, the lifeline.

**Do not** work with the leading edge above the anchorage.



- 5.4 Edge Conditions:** Leading Edge conditions vary, and may be composed of steel, I-beams with purlins, steel deck, metal roofing, or poured concrete or cinder block as shown in Figure 10.



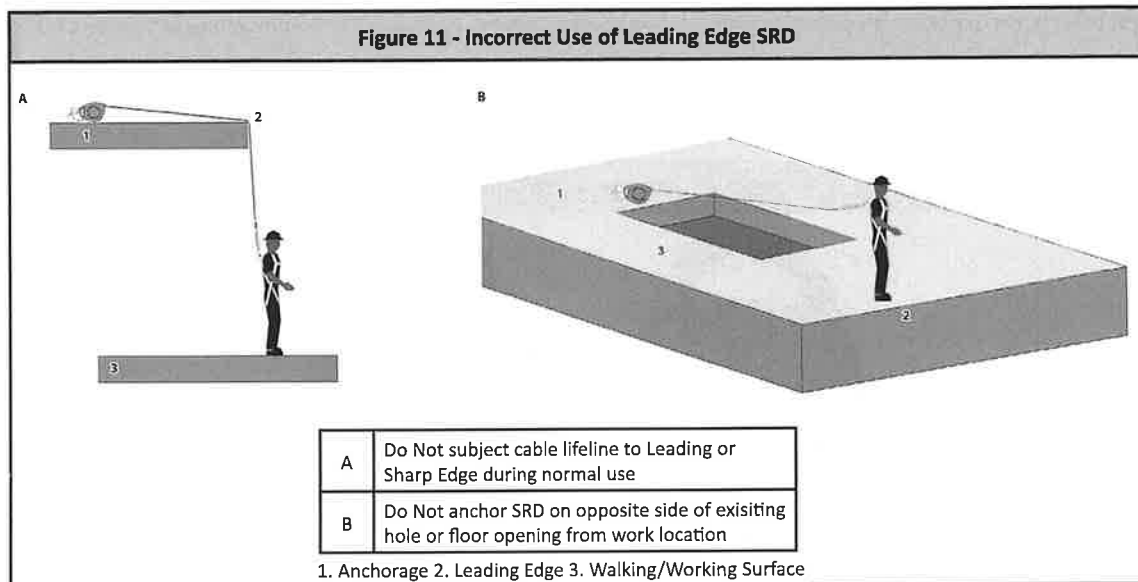
**Examples not intended to depict the full extent of all hazardous sharp edges found on jobsites for the user to identify and avoid.**



**5.5 Incorrect Use:** Additional factors to avoid, shown in Figure 11:

**Do not** allow the lifeline to drape over and edge during normal work as this may abrade, damage, or otherwise compromise the lifeline.

**Do not** attach the anchor on one side of an opening and work on the other side, as this creates multiple possible leading edges and potential swing fall hazards.

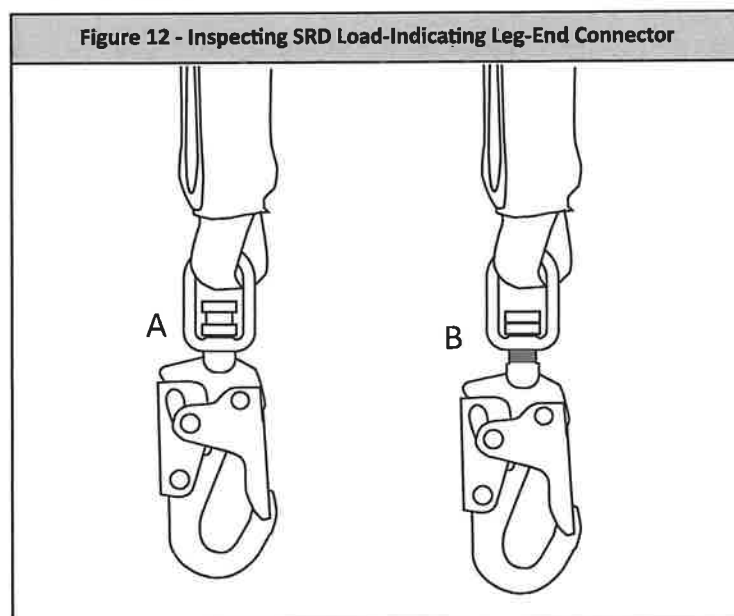


**5.6 Operation of the SRD:** Before each use, inspect the SRD, see Section 7 for inspection instructions.

**5.6.1 Locking Mechanism:** The SRD utilizes an acceleration based locking mechanism. The locking function requires a certain payout rate during a fall event to function correctly. Certain situations, confined or cramped spaces, shifting footing such as sand, gravel, grain, or a sloped surface may not allow the lifeline to reach sufficient speed to activate the lock mechanism. A clear path is required to assure positive locking of the SRD. Ensure the lock is functioning properly. Pull the lifeline out a short distance and give it a sharp tug. The lifeline must lock. If it fails to lock, remove it from service immediately. Ensure the work zone remains within stated parameters. Beware of Leading Edge hazards.

**DO NOT** attach an additional shock absorbing lanyard or similar device between the SRD housing and the anchorage.

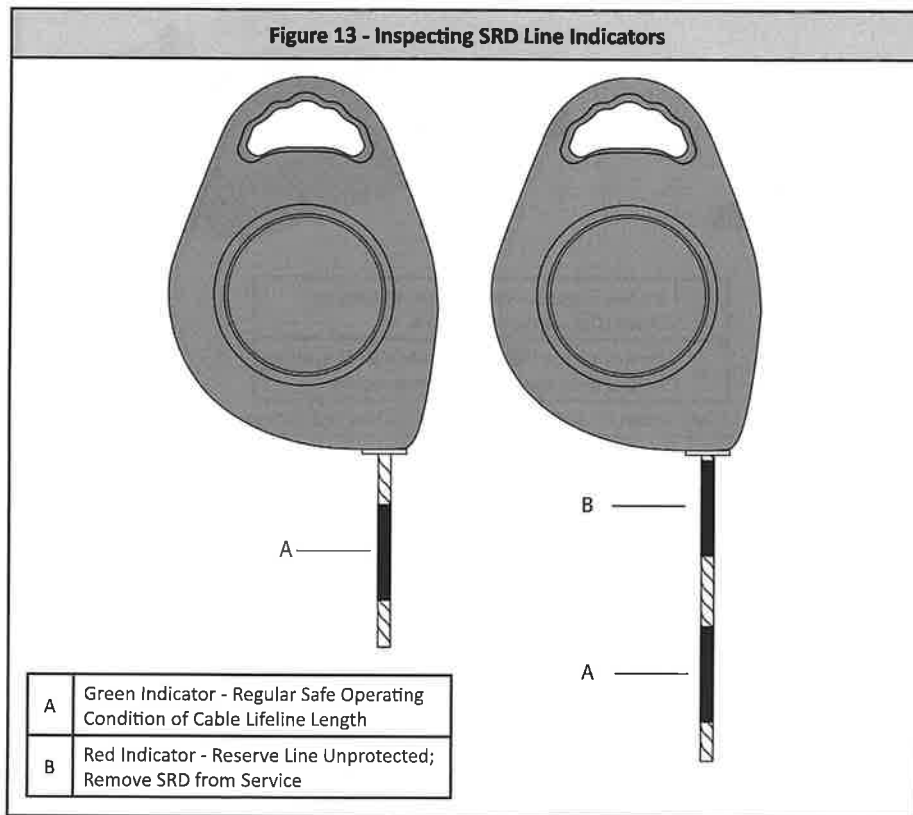
**5.6.2 Fall Arrest Impact Indicator:** The primary fall arrest impact indicator is the load-indicating leg-end connector. The connector will display a red band if it has been subjected to fall arrest, or equal, forces, as shown in Figure 12, Image B. The auxiliary Energy Absorber (EA) installed immediately above the leg end carabiner is the secondary indicator. If the EA shows any sign of damage, torn or ripped cover, frayed thread, burns or trauma of any kind, remove the unit from service.



**5.6.3 Lifeline Operational Limit and Reserve Indicators:** The SRD is equipped with two lifeline length indicators as shown in Figure 13; a green marker to indicate the end of the lifeline's working length, and a red marker, to indicate the reserve cable in the housing has been breached. When the SRD lifeline is extended to its operational limit, the lifeline will stop paying out. A green marker will be visible, as shown in Figure 13. The green marker, and a small portion of the lifeline past it, may become visible due to manufacturing variables during normal use, but the user will know when the operational end is reached. Do not attempt to pull out more lifeline. Extracting additional lifeline will compromise SRD functionality, and may result in serious injury or death.

If additional lifeline is accidentally pulled from the SRD without a fall event, remove the SRD from service and contact FallTech for options.

A red band is further up the lifeline. The red band, also shown in Figure 13, indicates the reserve portion of the lifeline has been breached. The SRD is no longer safe to use. Remove the SRD from service immediately, tag it as "UNUSABLE".



**5.6.4 Inspect the Cable:** The SRD lifeline is steel cable, and subject to certain hazards. Inspect the lifeline before each use for the conditions as described in Section 7.

**5.7 Using the SRD:** Do not use the SRD if inspection shows damage or any malfunction. Don the FBH in accordance with the FBH manufacturer's instructions. Follow the instructions contained in this manual and on the labels. Failure to follow instructions may result in serious injury or death. Connect the leg end carabiner to the dorsal D-ring on the FBH. Ensure the carabiner closes and locks. Attach the housing carabiner to the chosen anchorage and ensure the carabiner closes and locks. Ensure all connections are compatible. Normal operation will allow the working length of the lifeline to extend and retract as the worker moves about. A certain amount of tension must remain on the cable at all times to ensure proper operation of the internal brake. Do not allow the lifeline to become slack. If the lifeline becomes slack, remove the SRD from service for inspection. See Section 7.

Avoid sudden or quick movements during the normal work operation, as this may cause the SRD brake to engage and possibly cause loss of balance and injury or death.

If a fall occurs, the brake will engage and lock the lifeline. The EA will deploy to arrest the fall and limit arrest forces on the user.

- DO NOT extend the lifeline past the operational limit.
- DO NOT allow one SRD lifeline to become tangled or twisted with another SRD lifeline during use.
- DO NOT allow any lifeline to pass under arms or between legs during use.
- DO NOT clamp, knot, or prevent the lifeline from retracting or being taut.
- DO NOT lengthen the SRD by connecting a lifeline or similar component.
- DO NOT allow the lifeline to remain outside the housing when not in use.
- DO NOT allow the lifeline to freewheel back into the housing. Use a tag line to maintain tension and rewind the lifeline during periods of inactivity. Use the tag line to retrieve the leg end connector for the next use.
- DO NOT leave the tag line connected to the leg end connector when using the SRD for fall protection.

- 5.8 After A Fall:** A fall event over an edge may require special rescue equipment and measures. Ensure a written rescue plan, method and system is in place and readily available to all users for rapid response. Ensure all users are trained in rescue procedures. If a fall event occurs, remove it from service, and store it separately. Remove from service any unit that has been subjected to fall arrest forces or that exhibits damage consistent with such forces. For questions, contact FallTech.

## 6.0 Maintenance, Service and Storage

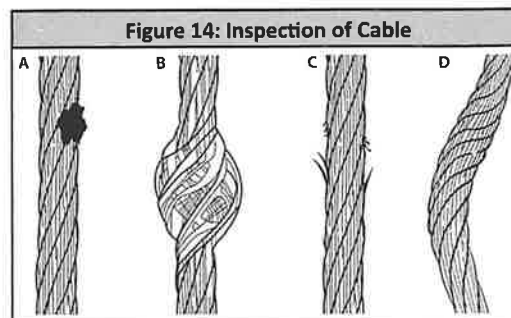
- 6.1 Maintenance:** Ensure the SRD is kept free of excess paint, grease, dirt or other contaminants as this may cause to cable or retracting mechanism to malfunction. Ensure no debris enters the housing through the cable access port. Clean the exterior of the unit as required with a detergent/water solution. Avoid water other corrosion causing elements to enter the housing. After cleaning, pull the lifeline all the way out, allow the unit to air dry, then retract the lifeline into the unit. Do not allow the lifeline to freewheel back into the housing. Clean labels as required.
- DO NOT** use heat to dry.  
**DO NOT** attempt to disassemble the SRD.
- 6.2 Service:** If service is required for any reason; inspection failure, impact loaded, any type of malfunction, tag the unit as "UNUSABLE", store separately, and contact FallTech at 323-752-0066 to receive a Return Authorization number or to locate the nearest FallTech Service Center. The SRD is not user repairable. Only the manufacturer, or a repair facility authorized in writing, may make repairs to the SRD. This SRD is designed to be used installed in an anchor cradle or attached overhead. While it may be used horizontally on a flat surface, the user may encounter a situation where the lifeline will not retract all the way due to misalignment and bunching up on the drum. If this happens, hang the SRD from a height sufficient to allow the full working length of the lifeline to be pulled off the drum, then allow the SRD to retract the lifeline completely. Maintain tension on the lifeline. Use a tag line if necessary.
- 6.3 Storage:** Hang the SRD in a cool, dry, clean environment out of direct sunlight. Position the SRD so excess water can drain out. Avoid exposure to chemical or caustic vapors. Thoroughly inspect the SRD after any period of extended storage.

## 7.0 Inspection

- 7.1 Pre-Use User Inspection:** Perform an inspection before each use in accordance with the recommendations in Table 1 below.

Table 1 - Guidelines for Cable SRD Inspection		
Inspection	Pass	Fail
The cable lifeline should extract and retract completely and without faltering and should remain taut under tension without sagging.		
Extract the cable lifeline several inches and apply a firm pull to confirm the SRD locks. The locking should be certain and without skidding. Repeat this lockup at additional places along the lifeline length to confirm the SRD is operating correctly.		
Examine the load indicator on the swiveling carabiner to be certain that it has not been loaded, impacted or activated. (see Figure 12 if needed)		
Inspect the entire length of the constituent line up to the Green Maximum Working Length Visual Indicator shown in Figure 13. Review the cable lifeline closely for broken strand wires, welding spatter burns, welding slag, birdcaging, kinks and bent strands. Also examine for rust, dirt, paint, grease or oil. Check for damage caused by chemical corrosion or excessive heat as evident with discoloration. See Figure 6 for examples. If any of these conditions exist, remove the SRD from service.		
If during your line inspection defined above, you extract the line past the Green Indicator and ultimately expose a secondary Red Indicator on the line, you must remove the SRD from service immediately. This Secondary Red Visual Indicator signals the SRD unit's Reserve Line has been deployed or the SRD has experienced a fall event and is no longer in working order.		
Check for any missing or loose screws or nuts and any deformed or damaged components.		
Examine the external housing for cracks, breaks or warping.		
Check the external Connector Eye and the Anchorage Carabiner for damage and deformation. The Anchorage Carabiner Gate should open and snap shut easily and smoothly.		
Examine the overall SRD unit for any indications of deterioration or damage.		
All labels must be intact and totally legible (see Section 8).		

Extract all of the cable and check the entire working length for damage caused by chemical corrosion or excessive heat as evident by discoloration (A), birdcaging (B), broken wire strands (C), kinks and bent strands (D), see Figure 14. The cable should retract completely without faltering and should remain taut under tension without sagging.



- 7.2 Inspection Frequency:** Inspection by a competent person at regular intervals is required. The competent person will use the information in Table 2: SRD Inspection Recommendations, to determine the inspection frequency. Use Table 2 to determine the inspection frequency. Inspection by a factory authorized inspection entity at regular intervals is also required.

Table 2 - ANSI Z359.14-2014 SRD Inspection Frequency Recommendations			
Type of Use	Application Examples	Conditions of Use	Inspection Frequency Competent Person
Infrequent to Light Use	Rescue and Confined Space, Factory Maintenance	Good Storage Conditions, Indoor or Infrequent Outdoor use, Room Temperature, Clean Environments	Annually
Moderate to Heavy Use	Transportation, Residential Construction, Utilities, Warehouse	Fair Storage Conditions, Indoor and extended outdoor use, All temperatures, Clean or dusty environments	Semi-annually to Annually
Severe to Continuous Use	Commercial Construction, Oil and Gas, Mining	Harsh Storage Conditions, Prolonged or Continuous outdoor Use, all temperatures, Dirty environments	Quarterly to Semi-annually

- 7.3 Inspection Checklist:** Use Table 1: Guidelines for Cable SRD Inspection to inspect the SRD. See Figure 14 for examples of cable damage.
- 7.4 Inspection Results:** If an inspection reveals defects in or damage to the equipment, inadequate maintenance or activated fall indicators, remove the equipment from service.

**7.5 Inspection Document:** Record inspection results on the Inspection Record provided below or on a similar document.

[illegible]

## 8.0 Labels

The labels must be present and legible.



## 9.0 Definitions

The following are general definitions of fall protection terms as defined by ANSI Z359.0-2012.

**Anchorage** - A secure connecting point or a terminating component of a fall protection system or rescue system capable of safely supporting the impact forces applied by a fall protection system or anchorage subsystem.

**Anchorage Connector** - A component or subsystem that functions as an interface between the anchorage and a fall protection, work positioning, rope access or rescue system for the purpose of coupling the system to the anchorage.

**Arrest Distance** - The total vertical distance required to arrest a fall. The arrest distance includes the deceleration distance and activation distance.

**Authorized Person** - A person assigned by the employer to perform duties at a location where the person will be exposed to a fall hazard.

**Available Clearance** - The distance from a reference point, such as the working platform, to the nearest obstruction that an authorized person might contact during a fall which, if struck, could cause injury.

**Capacity** - The maximum weight that a component, system or subsystem is designed to hold.

**Certification** - The act of attesting in writing that the criteria established by these standards or some other designated standard have been met.

**Certified Anchorage** - An anchorage for fall arrest, positioning, restraint or rescue systems that a qualified person certifies to be capable of supporting the potential fall forces that could be encountered during a fall.

**Clearance** - The distance from a specified reference point, such as the working platform or anchorage of a fall arrest system, to the lower level that a worker might encounter during a fall.

**Clearance Requirement** - The distance below an authorized person that must remain clear of obstructions in order to ensure that the authorized person does not make contact with any objects that would cause injury in the event of a fall.

**Competent Person** - An individual designated by the employer to be responsible for the immediate supervision, implementation and monitoring of the employer's managed fall protection program who, through training and knowledge, is capable of identifying, evaluating and addressing existing and potential fall hazards, and who has the employer's authority to take prompt corrective action with regard to such hazards.

**Component** - An element or integral assembly of interconnected elements intended to perform one function in the system.

**Connecting Subsystem** - An assembly, including the necessary connectors, comprised of all components, subsystems, or both, between the anchorage or anchorage connector and the harness attachment point.

**Connector** - A component or element that is used to couple parts of the system together.

**Deceleration Distance** - The vertical distance between the user's fall arrest attachment at the onset of fall arrest forces during a fall, and after the fall arrest attachment comes to a complete stop.

**Energy (Shock) Absorber** - A component whose primary function is to dissipate energy and limit deceleration forces which the system imposes on the body during fall arrest.

**Fall Arrest** - The action or event of stopping a free fall or the instant where the downward free fall has been stopped.

**Fall Hazard** - Any location where a person is exposed to a potential free fall.

**Free Fall** - The act of falling before a fall protection system begins to apply forces to arrest the fall.

**Free Fall Distance** - The vertical distance traveled during a fall, measured from the onset of a fall from a walking working surface to the point at which the fall protection system begins to arrest the fall.

**Harness, Full Body** - A body support designed to contain the torso and distribute the fall arrest forces over at least the upper thighs, pelvis, chest and shoulders.

**Horizontal Lifeline** - A component of a horizontal lifeline subsystem, consisting of a flexible line with connectors or other coupling means at both ends for securing it horizontally between two anchorages or anchorage connectors.

**Horizontal Lifeline Subsystem** - An assembly, including the necessary connectors, comprised of a horizontal lifeline component and, optionally, of: a) An energy absorbing component or, b) A lifeline tensioner component, or both. This subsystem is normally attached at each end to an anchorage or anchorage connector. The end anchorages have the same elevation.

**Horizontal Lifeline** – A component of a horizontal lifeline subsystem, consisting of a flexible line with connectors or other coupling means at both ends for securing it horizontally between two anchorages or anchorage connectors.

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a) An energy absorbing component or, b) A lifeline tensioner component, or both. This subsystem is normally attached at each end to an anchorage or anchorage connector. The end anchorages have the same elevation.

**Lanyard** - A component consisting of a flexible rope, wire rope or strap, which typically has a connector at each end for connecting to the body support and to a fall arrester, energy absorber, anchorage connector or anchorage.

**Lanyard Connecting Subsystem** - An assembly, including the necessary connectors, comprised of a lanyard only, or a lanyard and energy absorber.

**Personal Fall Arrest System (PFAS)** - An assembly of components and subsystems used to arrest a person in a free fall.

**Positioning** - The act of supporting the body with a positioning system for the purpose of working with hands free.

**Positioning Lanyard** - A lanyard used to transfer forces from a body support to an anchorage or anchorage connector in a positioning system.

**Qualified Person** - A person with a recognized degree or professional certificate and with extensive knowledge, training and experience in the fall protection and rescue field who is capable of designing, analyzing, evaluating and specifying fall protection and rescue systems.

**Self-Retracting Device (SRD)** - A device that contains a drum wound line that automatically locks at the onset of a fall to arrest the user, but that pays out from and automatically retracts onto the drum during normal movement of the person to whom the line is attached.

**Snaphook** - A connector comprised of a hook-shaped body with a normally closed gate or similar arrangement that may be opened to permit the hook to receive an object and, when released, automatically closes to retain the object.

**Swing Fall** - A pendulum-like motion that occurs during and/or after a vertical fall. A swing fall results when an authorized person begins a fall from a position that is located horizontally away from a fixed anchorage.



## APPENDIX A


Table 1A: Specifications for DuraTech Leading Edge SRL-LE					
Model #	Lifeline Material	Working Length, Weight, and Housing Size	Materials and Specifications	Capacity and Standards	SRL-LE
7226CLE	7/32" Diameter 7X19 Galvanized Steel Cable	15 ft	Housing: Cast Aluminum  Anchorage Carabiner: 5,000 lbs with 3,600 lbs Gate Strength  Load-Indicating Swivel Snap Hook: 5,000 lbs with 3,600 lbs Gate Strength	Single User Capacity: 130 to 310 lbs.  ANSI Z359.14-2014 See Table 1B for Class A/B Designation	
		14.0 lbs			
		10" X 7"			
7227CLE		20 ft			
7232CLE		30 ft			
		17.0 lbs			
		12" X 8.5"			
7232XLE		30ft			
7265CLE		60 ft			
		24.5 lbs			
		13.5" X 10"			

Table 1B: FallTech Leading Edge SRL-LE Performance Attributes								
Part #s and Conditions			Typical FallTech Performance			ANSI Performance Requirements		
Part #	Anchorage Condition	SRD Class	Arrest Distance	Average Arrest Force	Maximum Arrest Force	Maximum Arrest Distance	Average Arrest Force *Conditioned	Maximum Arrest Force
7226CLE 15' Leading Edge SRL-LE	Overhead Non-Leading Edge	A	24"	1,032 lbs	1,495 lbs	24"	1,575 lbs	1,800 lbs
	Leading Edge Condition, Foot-Level with 5' Setback	N/A	87"	914 lbs	1,549 lbs	N/A	N/A	
	Leading Edge Condition, Foot-Level with 0' Setback	N/A	87"	956 lbs	1,421 lbs	N/A	N/A	
7227CLE 20' Leading Edge SRL-LE	Overhead Non-Leading Edge	B	33"	959 lbs	1,322 lbs	54"	1,125 lbs	1,800 lbs
	Leading Edge Condition, Foot-Level with 5' Setback	N/A	96"	922 lbs	1,657 lbs	N/A	N/A	
	Leading Edge Condition, Foot-Level with 0' Setback	N/A	145"	990 lbs	1,370 lbs	N/A	N/A	
7232XLE 30' Leading Edge SRL-LE	Overhead Non-Leading Edge	B	51"	1,078 lbs	1,458 lbs	54"	1,125 lbs	1,800 lbs
	Leading Edge Condition, Foot-Level with 5' Setback	N/A	110"	916 lbs	1,337 lbs	N/A	N/A	
	Leading Edge Condition, Foot-Level with 0' Setback	N/A	127"	1,002 lbs	1,570 lbs	N/A	N/A	

