USER INSTRUCTION MANUAL

CSA Z259.2.2 Type 1	OSHA

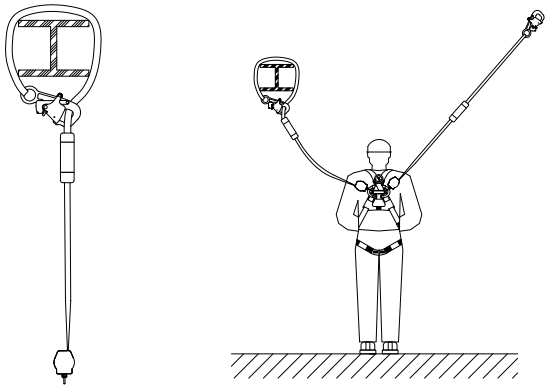
This manual is intended to meet the manufacturer's instructions as required by CSA Z259.2.2 and should be used as part of an employee training program as required by OSHA.

NANO-LOK™ SELF RETRACTING LIFELINES

Model Numbers: *(See Figure 1)*

Fall Protection

Figure 1 – Nano-Lok™ Self Retracting Lifeline Tie-Back Models



Swivel End	Lanyard End	OSHA Model	CSA Model	No Hook	B - 2000112 Steel Carabiner	C - 2000025 Aluminum Carabineer	D - 3100088 Single Leg Interface	E - 3100087 Twin Leg Interface	F - 2000159 Steel Carabiner	A - 9501804 Steel Tie-Back Snap Hook	Hotwork / Arc Flash
Anchorage Connection Models B - 2000112 C - 2000025	A	3101365	3101379			1				1	
		3101367	3101371		1					1	
		3101368	3101372	•						1	
Single SRL Harness Mount Models D - 3100088	A	3101366	3101370				1			1	
		3101322	3101352				1			1	Hotwork
		3101324	3101354	•						1	Hotwork
		3101562	3101566				1			1	Arc Flash
		3101563	3101567	•						1	Arc Flash
Twin SRL Harness Mount Models E - 3100087	A	3101374	3101378					1		2	
		3101326	3101328					1		2	Hotwork
		3101565	3101569					1		2	Arc Flash
Twin Connect for Fixed D-Ring Models F - 2000159	A	3101373	3101377						1	2	
Single SRL Harness Mount Modular Model B - 2000112	A	3100468	------		1					1	

Hot Work SRLs: Fire resistant models for welding, foundry work, etc. where SRL may be exposed to sparks or flames.

Arc Flash SRLs: SRL meets the test requirements of the ASTM F887 standard and is designed for use in environments where an arc flash (electrical explosion) could occur.

FORM NO: 5903610
REV: B

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WARNING: *This product is part of a personal fall arrest, work positioning, or rescue system. The user must follow the manufacturer's instructions for each component of the system. These instructions must be provided to the user of this equipment. The user must read and understand these instructions before using this equipment. Manufacturer's instructions must be followed for proper use and maintenance of this equipment. Alterations or misuse of this product or failure to follow instructions may result in serious injury or death.*

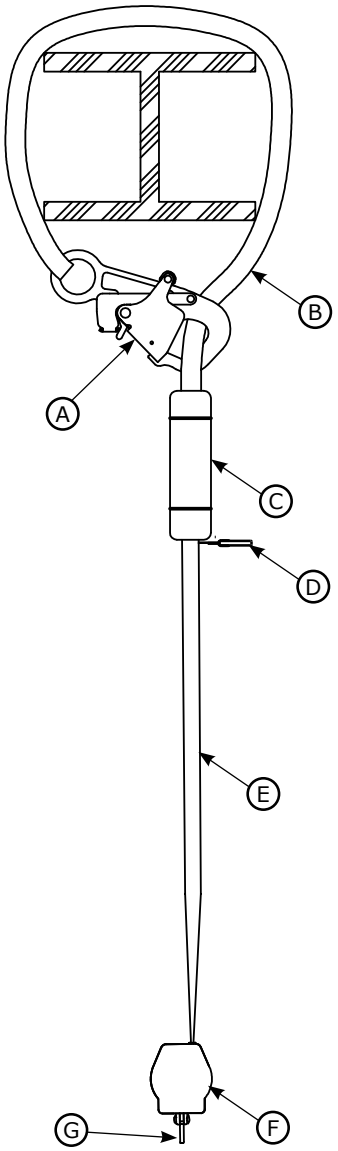
IMPORTANT: *If you have questions on the use, care, or suitability of this equipment for your application, contact Capital Safety.*

IMPORTANT: *Before using this equipment, record the product identification information from the ID label in the inspection and maintenance log of this manual.*

DESCRIPTION:

Figure 2 illustrates key components of the Nano-Lok™ Tie-Back Self Retracting Lifeline (SRL). The Nano-Lok SRLs are 9 ft. (2.7 m) Lanyards, equipped with an in-line Load Indicator, which retract into a Thermoplastic Housing. They are available in multiple model configurations that allow tie-back attachment to an anchorage point and single or dual mounting on a Full Body Harness (see Figure 1). The Nano-Lok SRL automatically locks at the onset of a fall to arrest the fall, but pays out and retracts lifeline during normal movement by the attached user. The Tie-Back hook and Tie-Back portion of lifeline allow this unit to be tied back around structural members that meet anchorage requirements.

Figure 2 – Nano-Lok Self Retracting Lifeline Tie-Back (SRL) Components



A - Tie-Back Snap Hook **B** - Tie-Back Portion of Lifeline (Wear Sleeve) **C** - Load Indicator **D** - i-Safe FRID Tag
E - SRL Lifeline **F** - Nano-Lok Housing **G** - Swivel Eye

1.0 APPLICATIONS

1.1 PURPOSE: Capital Safety Self Retracting Lifelines (SRLs) are designed to be a component in a personal fall arrest system (PFAS). Figure 1 illustrates SRLs covered by this instruction manual and their typical applications. They may be used in most situations where a combination of worker mobility and fall protection is required (i.e. inspection work, general construction, maintenance work, oil production, confined space work, etc.).

1.2 STANDARDS: Your SRL conforms to the national standard(s) identified on the front cover of these instructions. Refer to local, state, and federal (OSHA) requirements governing occupational safety for additional information regarding Personal Fall Arrest Systems.

1.3 TRAINING: This equipment is intended to be used by persons trained in its correct application and use. It is the responsibility of the user to assure they are familiar with these instructions and are trained in the correct care and use of this equipment. Users must also be aware of the operating characteristics, application limits, and the consequences of improper use.

2.0 LIMITATIONS & REQUIREMENTS

Always consider the following limitations and requirements when installing or using this equipment:

2.1 CAPACITY: SRLs are designed for use by one person with a combined weight (person, clothing, tools, etc.) not exceeding 420 lbs (190 kg).

At no time shall more than one person connect to a single SRL for fall arrest applications.

2.2 MAXIMUM ARREST FORCE AND MAXIMUM ARREST DISTANCE: SRLs documented in this instruction meet the following Arrest Force and Arrest Distance maximums:

Average Arresting Force	900 lbs (4.0 kN)
Maximum Arresting Force	1,350 lbs (6.0 kN)
Maximum Arrest Distance	42 in (1.1 m)

2.3 ANCHORAGE: Anchorages selected for fall arrest systems shall have a strength capable of sustaining static loads applied in the directions permitted by the system of at least:

1. 5,000 lbs. (22.2 kN) for non-certified anchorages, or
2. Two times the maximum arresting force for certified anchorages.

When more than one fall arrest system is attached to an anchorage, the strengths set forth in (1) and (2) above shall be multiplied by the number of systems attached to the anchorage. **Any structural member the unit is tied back around must meet these Anchorage requirements**.

2.4 RESCUE PLAN: When using this equipment, the employer must have a rescue plan and the means at hand to implement it and communicate that plan to users, authorized persons, and rescuers.

2.5 INSPECTION FREQUENCY: The SRL shall be inspected by the user before each use and, additionally, by a competent person[1] other than the user at intervals of no more than one year[2]. Inspection procedures are described in the *"Inspection Checklist"* (Table 1). Results of the Competent Person inspection should be recorded in the *"Inspection and Maintenance Log"* on the back pages of these instructions or recorded with the i-Safe™ system (see Section 5).

2.6 LOCKING SPEED: Situations which do not allow for an unobstructed fall path should be avoided. Working in confined or cramped spaces may not allow the body to reach sufficient speed to cause the SRL to lock if a fall occurs. Working on slowly shifting material, such as sand or grain,may not allow enough speed buildup to cause the SRL to lock. A clear path is required to assure positive locking of the SRL.

2.7 NORMAL OPERATIONS: Normal operation will allow the full length of the lifeline to extend and retract with no hesitation when extending and no slack when retracting as the worker moves at normal speeds. If a fall occurs, a speed sensing brake system will activate, stopping the fall and absorbing much of the energy created. For falls which occur near the end of the lifeline travel, a reserve lifeline system or Load Indicator has been incorporated to assure a reduced impact fall arrest. If the SRL has been subjected to fall forces or Arc Flash, remove the SRL from service, mark "UNUSABLE," and dispose of in the recommended manner (see Section 5.5 Disposal). Sudden or quick movements should be avoided during normal work operation, as this may cause the SRL to lock up.

2.8 FREE FALL: <u>Always anchor the SRL overhead whenever possible in order to limit free fall distances.</u> Avoid working where your lifeline may cross or tangle with that of another worker. Avoid working where an object may fall and strike the lifeline resulting in loss of balance or damage to the lifeline. Do not allow the lifeline to pass under arms or between legs. Never clamp, knot, or prevent the lifeline from retracting or being taut. Avoid slack line. **Do not lengthen the SRL by connecting a lanyard or similar component without consulting Capital Safety.**

2.9 FALL CLEARANCE: Figure 3A illustrates Fall Clearance requirements. Ensure adequate clearance exists in the fall path to prevent striking an object during a fall. If the worker will be working at a position that is not directly below the SRL anchorage point, the clearance required and vertical fall distance will be greater.

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1 ***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.*

2 ***Inspection Frequency:*** *Extreme working conditions (harsh environments, prolonged use, etc.)may require increasing the frequency of competent person inspections.*

2.10 SWING FALLS: Swing falls occur when the anchorage point is not directly above the point where a fall occurs (see Figure 3B). The force of striking an object in a swing fall may cause serious injury. In a swing fall, the total vertical fall distance will be greater than if the user had fallen directly below the anchorage point, thus increasing fall clearance required to safely arrest the user. Use Figure 3A to determine the fall clearance for your application. Minimize swing falls by working as directly below the anchorage point as possible. **Never permit a swing fall if injury could occur.**

2.11 HAZARDS: Use of this equipment in areas where surrounding hazards exist may require additional precautions to reduce the possibility of injury to the user or damage to the equipment. Hazards may include, but are not limited to: high heat, caustic chemicals, corrosive environments, high voltage power lines, explosive or toxic gases, moving machinery, sharp edges, or overhead materials that may fall and contact the user or fall arrest system.

2.12 SHARP EDGES: Avoid working where the lifeline will be in contact with or abrade against unprotected sharp edges. Where contact with a sharp edge is unavoidable, cover the edge with a protective material.

2.13 BODY SUPPORT: A Full Body Harness must be used with the Self Retracting Lifeline. The harness connection point must be above the user's center of gravity. A body belt is not authorized for use with the Self Retracting Lifeline. If a fall occurs when using a body belt it may cause unintentional release and possible suffocation because of improper body support.

2.14 COMPATIBILITY OF COMPONENTS: Unless otherwise noted, Capital Safety equipment is designed for use with Capital Safety approved components and subsystems only. Substitutions or replacements made with non approved components or subsystems may jeopardize compatibility of equipment and may affect safety and reliability of the complete system.

> ***IMPORTANT:*** *Read and follow manufacturer's instructions for associated components and subsystems in your personal fall arrest system.*

2.15 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 Capital Safety if you have any questions about compatibility.

Connectors (hooks, carabiners, and D-rings) must be capable of supporting at least 5,000 lbs. (22.2 kN). 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 (see Figure 4). Connectors must be compatible in size, shape, and strength. Self-locking snap hooks and carabiners are required by ANSI Z359 and OSHA.

2.16 MAKING CONNECTIONS: Snap hooks and carabiners used with this equipment must be self-locking. Ensure all connections are compatible in size, shape and strength. Do not use equipment that is not compatible. Ensure all connectors are fully closed and locked.

Capital Safety connectors (snap hooks and carabiners) are designed to be used only as specified in each product's user's instructions. See Figure 5 for examples of inappropriate connections. Do not connect snap hooks and carabiners:

A. To a D-ring to which another connector is attached.

B. In a manner that would result in a load on the gate.

> ***NOTE:*** *Large throat snap hooks should not be connected to standard size D-rings or similar objects which will result in a load on the gate if the hook or D-ring twists or rotates, unless the snap hook complies with CSA Z259.12 and is equipped with a 3,600 lb (16 kN) gate. Check the marking on your snap hook to verify that it is appropriate for your application.*

C. In a false engagement, where features that protrude from the snap hook or carabiner catch on the anchor, and without visual confirmation seems to be fully engaged to the anchor point.

D. To each other.

E. Directly to webbing or rope lanyard or tie-back (unless the manufacturer's instructions for both the lanyard and connector specifically allows such a connection).

F. To any object which is shaped or dimensioned such that the snap hook or carabiner will not close and lock, or that roll-out could occur.

G. In a manner that does not allow the connector to align properly while under load.

Figure 3 – Fall Clearance and Swing Falls

Figure 3A:
Clearance required in feet (meters) between Working Level and Nearest Obstruction for User with Total Weight indicated in chart.

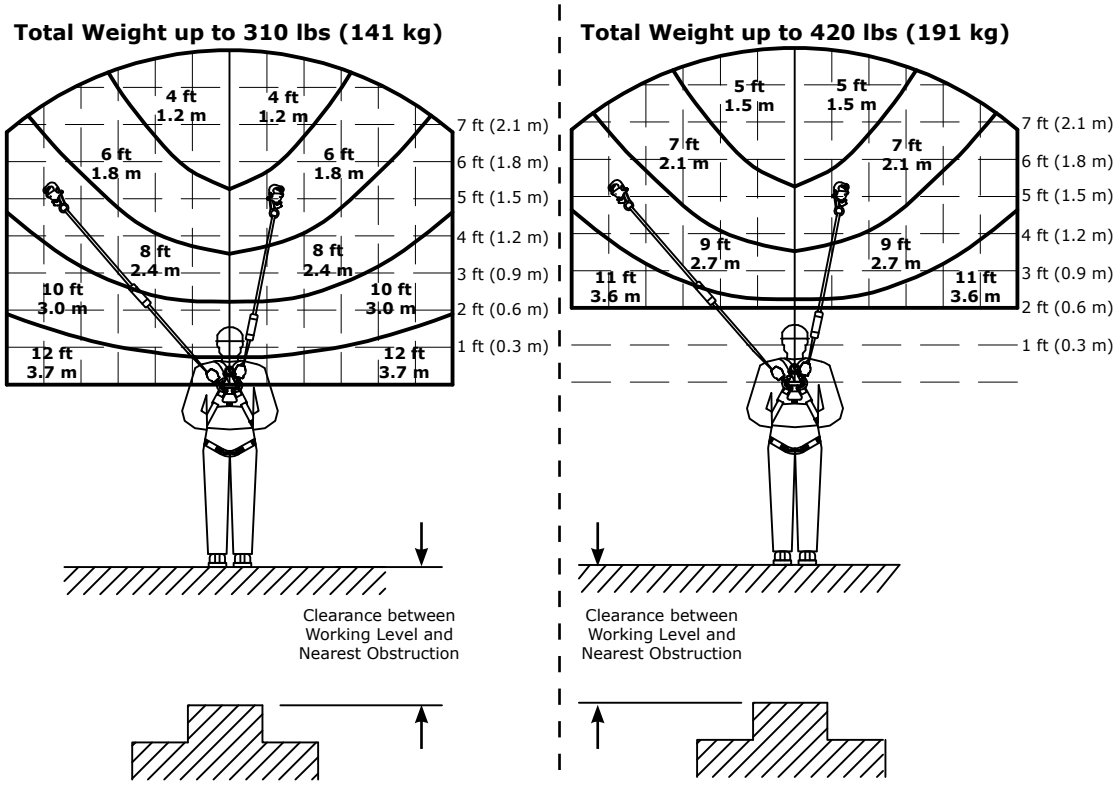


Figure 3B:
Swing Falls

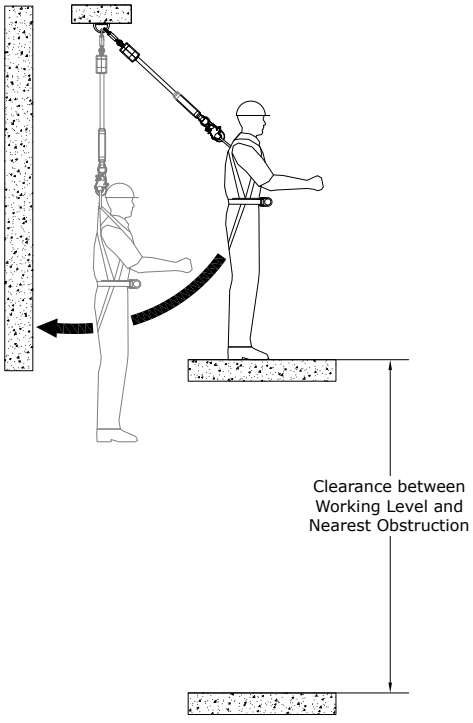
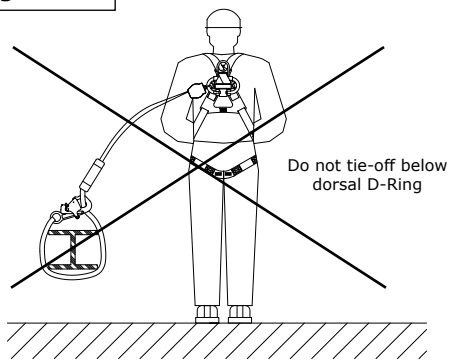


Figure 3C:



To determine the clearance required: Measure the distance from the user's harness dorsal connection to the anchorage for the Nano-Lok SRL. Both horizontal and vertical distances are required. Use Figure 3A above to determine the required clearance. The dotted lines in the figure represent 1 foot (0.3 m) increments from the user's harness dorsal connection to the anchorage. For example, for a total weight up to 310 lbs (141 kg), 8 ft (2.4 m) of clearance is required when the Nano-Lok unit is anchored 3 1/2 ft (1 m) above and 3 1/2 ft (1 m) to the side of the user's harness dorsal connection, 10 ft (3 m) of clearance is required when the Nano-Lok is anchored 1 1/2 ft (0.5 m) above and 4 1/2 ft (1.4 m) to side of the user's dorsal connection.

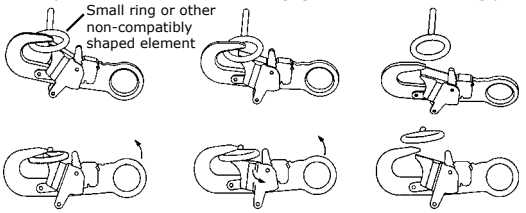
If the SRL is tied back around structural members, the fall clearance may be reduced by 1 ft (0.3 m). For example, if a 310 lb user is tied off to an I-beam that is 3 ft (0.9 m) overhead, the required clearance is reduced from 8 ft (2.4 m) to 7 ft (2.1 m).

NOTE: *The clearances provided above assume the fall occurs from the standing position. If the worker is kneeling or crouching an additional 3 ft (0.9 m) of clearance is needed.*

Warning: *Do not tie-off below the dorsal D-Ring. (Figure 3C)*

Figure 4 – Unintentional Disengagement

If the connecting element to which a snap hook (shown) or carabiner attaches is undersized or irregular in shape, a situation could occur where the connecting element applies a force to the gate of the snap hook or carabiner. This force may cause the gate (of either a self-locking or a non-locking snap hook) to open, allowing the snap hook or carabiner to disengage from the connecting point.

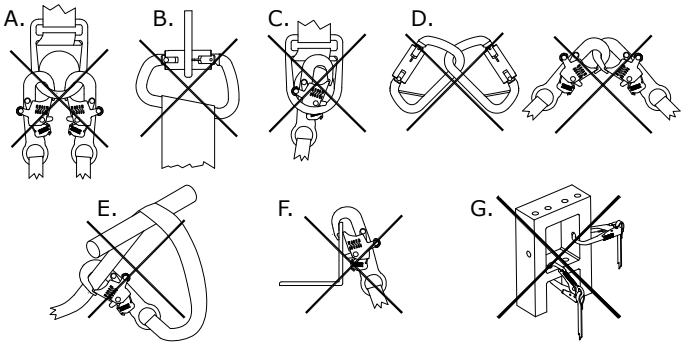


Force is applied to the Snap Hook.

The Gate presses against the Connecting Ring.

The Gate opens allowing the Snap Hook to slip off.

Figure 5 – Inappropriate Connections



3.0 INSTALLATION

3.1 PLANNING: Plan your fall protection system before starting your work. Account for all factors that may affect your safety before, during, and after a fall. Consider all requirements and limitations defined in Section 2.

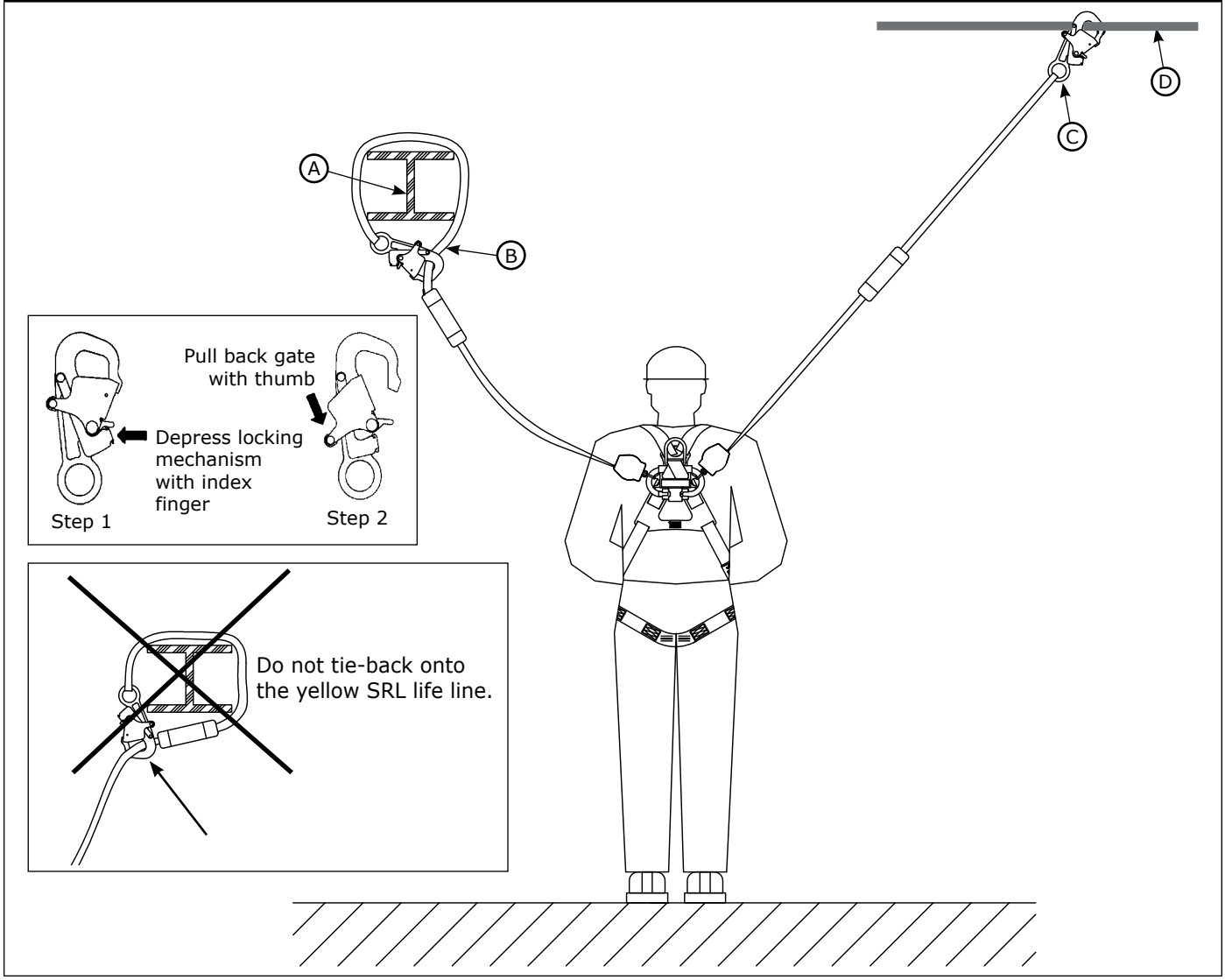
> ***IMPORTANT:*** *In most applications, the Nano-Lok SRL can be connected to the anchorage or the harness Dorsal location. Either orientation is allowed; except as noted in Section 4.7.*

3.2 ANCHORAGE: Figure 6 illustrates a twin SRL anchorage with tie-back (A, B) and snap hook (C, D) connections. Select an anchorage location with minimal free fall and swing fall hazards (see Section 2). Select a rigid anchorage point for each connection that is capable of sustaining the static loads defined in Section 2.2. Where anchoring overhead is not feasible, Nano-Lok SRLs may be secured at D-Ring level for 310 lb (141 kg) users. 420 lb (191 kg) users must anchor at least 2 ft (0.6 m) above the dorsal D-Ring.

3.3 TIE-BACK ATTACHMENT: See Figure 6. Snap hooks and WrapBax hooks operate in the same manner. Grip the hook handle in one hand. With your index finger, depress the locking mechanism in. With your thumb, pull back the gate latch. As the gate latch is pulled back, the gate will open. Release your grip and the gate will close.

Wrap the tie-back portion of the lifeline (B) around an appropriate anchor (A), then open the gate of the Tie-back snap hook and pass the lifeline through the hook. The lifeline may only be passed through the Tie-back hook once. Make sure the Tie-back portion of the lifeline is captured and the gate closes completely.

Figure 6 – Anchorage Connections

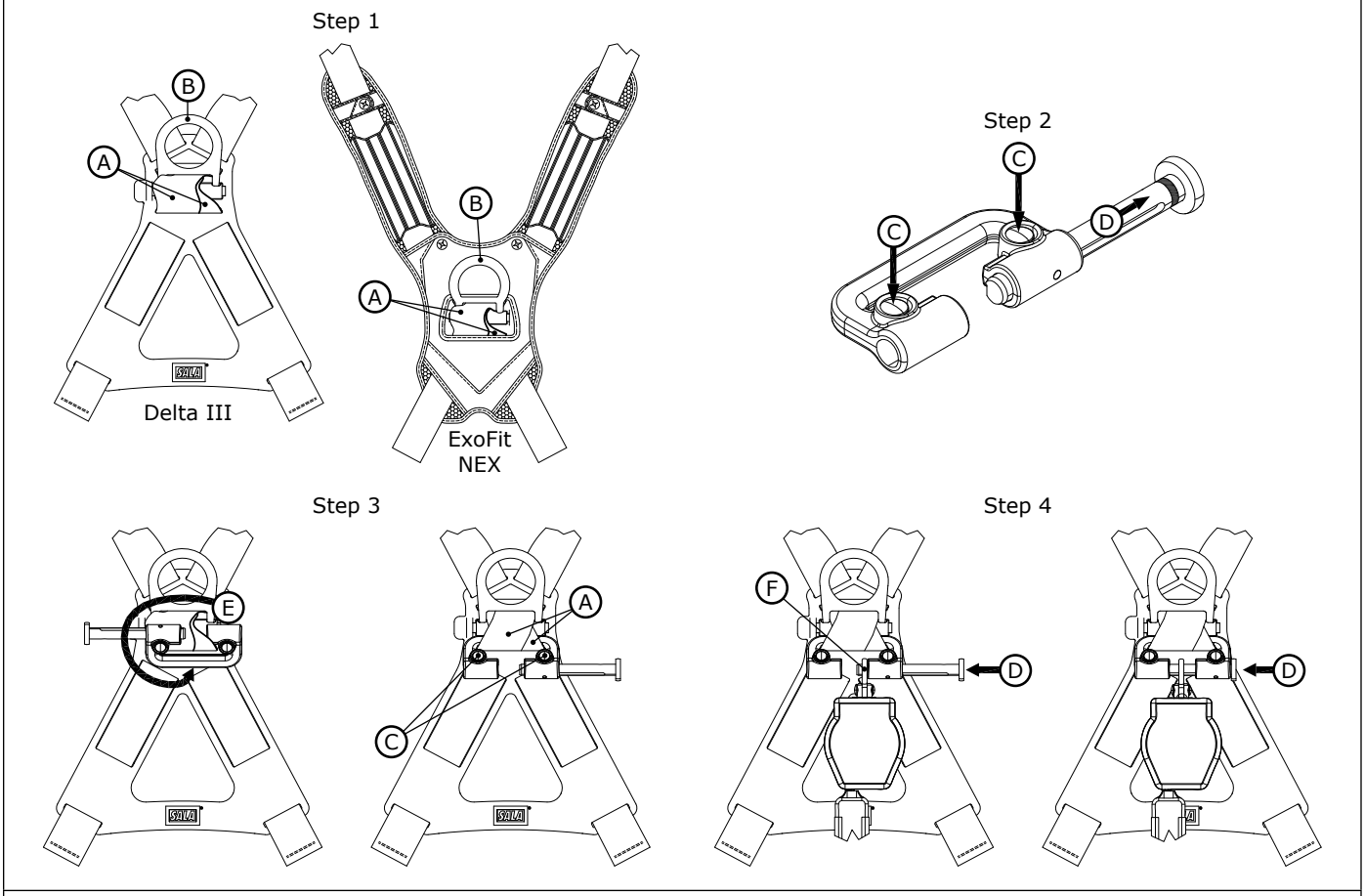


> ***WARNING:*** *Only the WrapBax hook may be used to snap back directly onto the blue Tie-Back SRL Lifeline. When installed, the Tie-Back hook must contact the blue wear sleeve (Tie-Back portion of the lifeline). If the anchor structure is so large that the Tie-Back hook contacts the lifeline webbing material, a different anchor structure must be used.* ***Never tie-back onto the shock pack or onto the yellow SRL life line.***

WARNING: *Never connect the WrapBax snap hook of one SRL to the lifeline of another SRL or lanyard.*

3.4 HARNESS MOUNTING: Some Nano-Lok SRL models include a Single Leg or Twin SRL Harness Interface for mounting the SRL(s) on a Full Body Harness just below the Dorsal D-Ring (see Figure 7 and Figure 8):

Figure 7 – Single SRL Harness Interface



A - Web Straps **B** - Dorsal D-Ring **C** - Locking Buttons **D** - Locking Pin **E** - Harness Interface **F** - SRL Swivel Eye

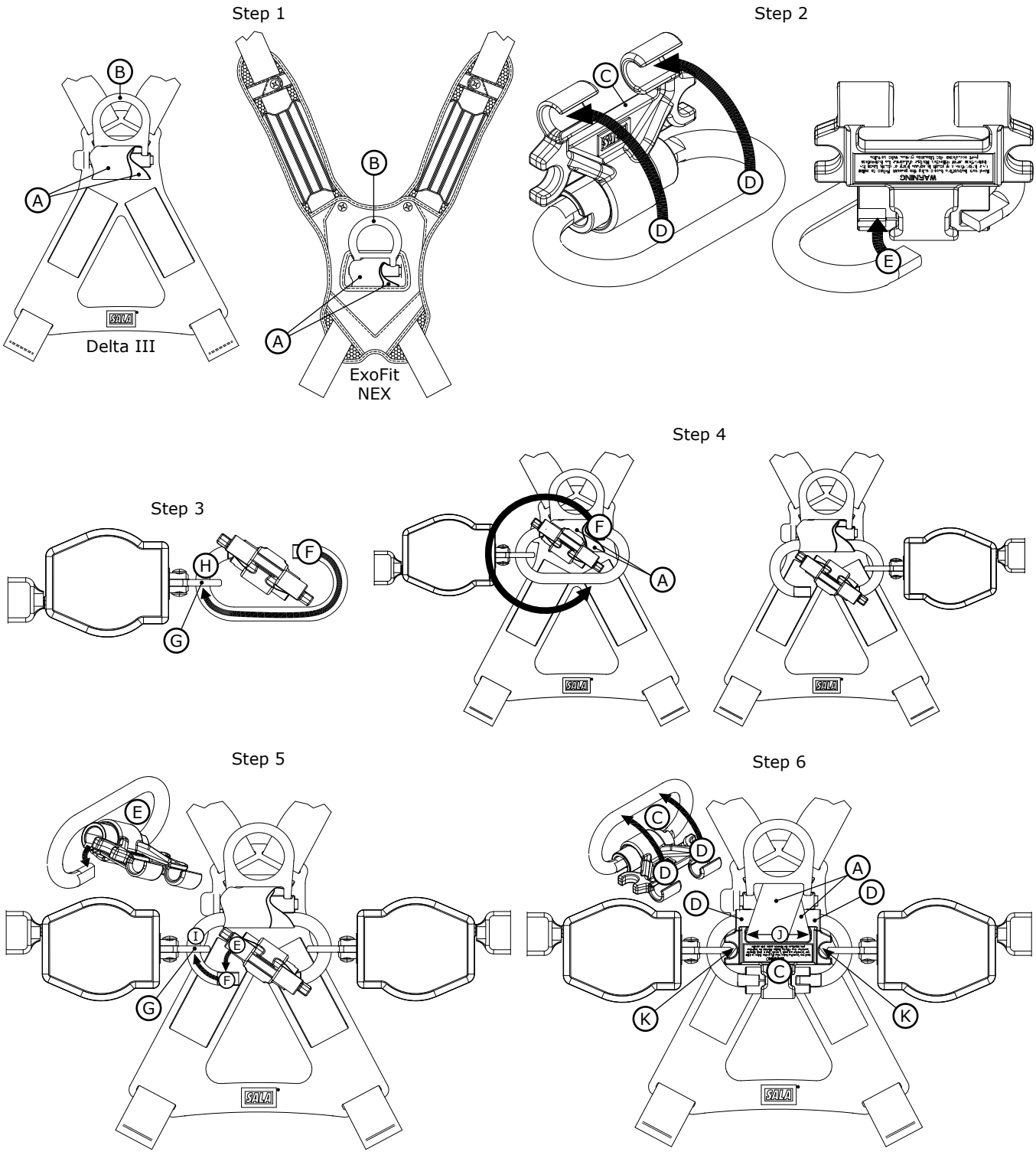
- **Single SRL Harness Interface:** Where worker mobility is critical, a Single SRL Harness Interface can be used to mount the Nano-Lok SRL on the back of a Full Body Harness just below the Dorsal D-Ring (see Figure 8). The worker can then connect to varied anchorage points located throughout the site with the Lanyard End of the SRL without repeatedly re-installing the SRL. To mount the Nano-Lok SRL on a Full Body Harness with the Single SRL Harness Interface:

  1. **Loosen the Harness Webbing:** Pull out on the Web Straps (A) where they pass through the bottom of the Dorsal D-Ring (B) until there is sufficient space to slide the Single Leg Interface between the Web Straps and Back Pad.
  2. **Open the Harness Interface:** Push down on the Locking Buttons (C) simultaneously and slide the Locking Pin (D) out.
  3. **Position the Harness Interface around the Web Straps:** With the Locking Buttons (C) facing out and Gate facing up, insert the Nose End of the Harness Interface (E) behind the Web Straps (A). Rotate the Harness Interface behind the Web Straps until the Harness Interface surrounds the the Web Straps. Pull the Web Straps back through the Dorsal D-Ring and Back Pad to secure the Harness Interface.
  4. **Attach the Nano-Lok SRL to the Harness Interface:** Slide the Swivel Eye on the SRL (F) over the Harness Interface's Locking Pin (D) and then push in the Locking Pin until it locks into place in the opposite end of the Harness Interface.

  WARNING: *The Red Band on the knob end of the Harness Interface Locking Pin will be exposed if the Harness Interface is unlocked. To avoid accidental release of the connection, always make sure the Harness Interface is locked before using the Harness and attached Nano-Lok SRL. Failure to do so could result in injury or death.*

NOTE: *It is also acceptable to connect the Nano-Lok SRL to the Harness Dorsal D-Ring with a Carabiner or Snaphook.*

Figure 8 – Twin SRL Harness Interface



A - Web Straps **B** - Dorsal D-Ring **C** - Connector Insert **D** - Clamps, Connector Insert **E** - Gate, Connector **F** - Nose, Connector
G - Swivel Eye, SRL **H** - Gate End, Connector **I** - Nose End, Connector **J** - Webbing Slot, Connector Insert
K - Swivel Eye Recesses, Connector Insert

- **Twin SRL Harness Interface:** In climbing applications where 100% tie-off is required, the Twin SRL Harness Interface can be used to mount two Nano-Lok SRLs side-by-side on the back of a Full Body Harness just below the Dorsal D-Ring (see Figure 9). To mount two Nano-Lok SRLs on a Full Body Harness with the Twin SRL Harness Interface:

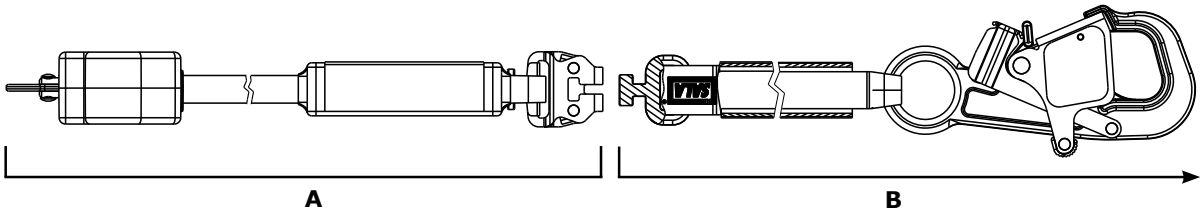
  1. **Loosen the Harness Webbing:** Pull out on the Web Straps (A) where they pass through the bottom of the Dorsal D-Ring (B) until there is sufficient space to slide the Twin Leg Interface between the Web Straps and D-Ring Pad.

2. **Open the Harness Interface:** Push up on the Connector Insert (C) to unsnap the Clamps (D) from the Connector and then swing the Connector Insert up to unlock the Gate. Push the Gate (E) inward to open the Connector.
3. **Thread the first Nano-Lok SRL onto the Harness Interface:** Insert the Nose of the Connector (F) through the Swivel Eye (G) on the SRL and then rotate the SRL around to the Gate End of the Connector (H). The Gate can be rotated toward the Nose to allow clearance for the Swivel Eye between the Gate and Spine of the Connector.
4. **Position the Harness Interface around the Web Straps:** With the Gate facing up, insert the Nose of the Connector (F) behind the Web Straps (A). Rotate the Connector behind the Web Straps until the Connector surrounds the the Web Straps.
5. **Add the second Nano-Lok SRL on the Harness Interface:** Slide the SRL's Swivel Eye (G) over the Nose of the Connector (F) and position the SRL Swivel Eye in the Nose End of the Connector (I). Swing the Gate (E) closed.
6. **Close the Harness Interface:** Rotate the Connector Insert (C) forward so the Clamps (D) secure on the Connector. When properly closed, the Web Straps should pass through the Webbing Slot (J) at the top of the Connector Insert and the SRL Swivel Eyes should be secured in the Recesses (K) on either side of the Connector Insert. Once the Harness Interface is closed, pull the Web Straps (A) back through the Dorsal D-Ring and D-Ring Pad to eliminate slack in the webbing and secure the Connector between the Web Straps and D-Ring Pad.

NOTE: *Older ExoFit harnesses may require a different Twin SRL Harness Interface. See Appendix A.*

3.5 NANO-LOK SRL MODULAR COMPONENTS ASSEMBLY: Nano-Lok SRL Modular system components must be properly assembled. The system consists of the SRL (**A**) and a single lanyard (**B**) (See Figure 9).

Figure 9 – Modular Nano-Lok Components



WARNING: *modular SRL 3100468 is only to be used with modular Tie-Back lanyard 3100470. If the lanyard 3100470 fails inspection, the lanyard may be replaced with a new version of 3100470 lanyard.*

TO ASSEMBLE SRL MODULAR COMPONENTS:

Step 1: Figure 10: Orient the SRL female connector and the lanyard male connector as shown.

Step 2: Figure 11: Press the female connector locks (**C**) on each side of the connector to unlock the device. Insert the male connector and slide to the bottom of the female connector. Release both locks to capture the male connector. The female connector locks must return to their fully extended position.

Step 3: Figure 12: Pull the SRL and lanyard in opposite directions to fully seat the male connector. The male connector must be securely locked in the position shown.

Figure 10 – Connector Orientation

Figure 11 – Press Female Connector Locks, Insert Male Connector

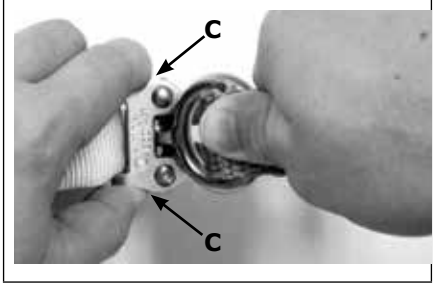
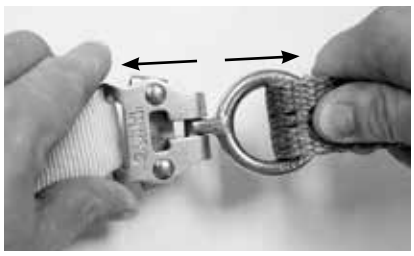


Figure 12 – Fully Connected



WARNING: *Do not use the modular assembly if the locks do not return to the fully extended position after following Steps 1, 2 and 3 in Section 3.3.*

An example of a failed connection is shown in Figure 13. The male connector is not fully inserted and locked within the female connector. This is an unsafe condition and the modular components must not not be used.

Refer to Section 4.0 Inspection in this instruction for procedures to determine unsafe or defective component conditions.

Figure 13 – Failed Connection

TO DISASSEMBLE SRL MODULAR COMPONENTS:

Step 1: Figure 14: Press the female connector locks (**C**) on each side of the connector to unlock the device.

Step 2: Figure 15: While pressing the female connector locks, push the SRL and lanyard connectors toward each other.

Step 3: Figure 16: Pull the male connector out of the female connector to separate the components.

Figure 14 – Press Female Connector Locks

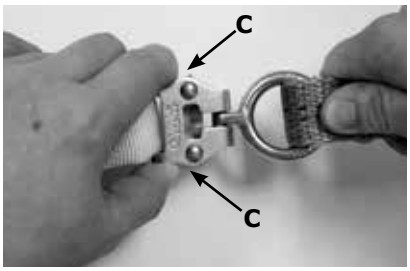


Figure 15 – Push Connectors Together

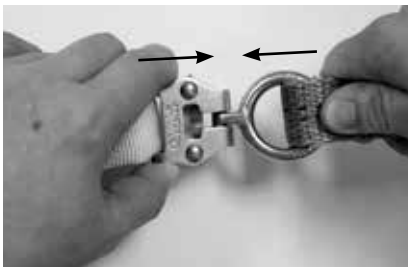
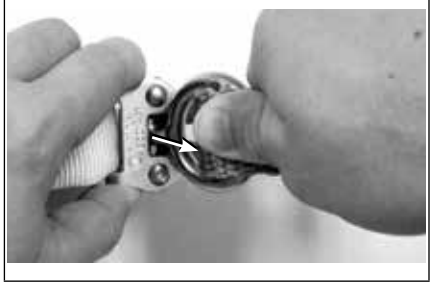


Figure 16 – Separate Components



4.0 USE

WARNING: *Do not alter or intentionally misuse this equipment. Consult Capital Safety when using this equipment in combination with components or subsystems other than those described in this manual. Some subsystem and component combinations may interfere with the operation of this equipment. Use caution when using this equipment around moving machinery, electrical hazards, chemical hazards, sharp edges, or overhead materials that may fall onto the lifeline. Do not loop the lifeline around small structural members. Failure to heed this warning may result in equipment malfunction, serious injury, or death.*

WARNING: *Consult your doctor if there is reason to doubt your fitness to safely absorb the shock from a fall arrest. Age and fitness seriously affect a worker's ability to withstand falls. Pregnant women or minors must not use DBI-SALA self retracting lifelines.*

4.1 BEFORE EACH USE: Before each use of this fall protection equipment carefully inspect it to assure it is in good working condition. Check for worn or damaged parts. Ensure all bolts are present and secure. Check that the lifeline is retracting properly by pulling out the line and allowing it to slowly retract. If there is any hesitation in retraction the unit should be removed from service and destroyed. Inspect the lifeline for cuts, frays, burns, crushing and corrosion. Check locking action by pulling sharply on the line. See Section 5 for inspection details. Do not use if inspection reveals an unsafe condition.

4.2 AFTER A FALL: Any equipment which has been subjected to the forces of arresting a fall or exhibits damage consistent with the effect of fall arrest forces as described in Section 5, must be removed from service immediately and destroyed.

4.3 BODY SUPPORT: A full body harness must be worn when using Nano-Lok SRLs. For general fall protection use, connect to the back (dorsal) D-ring.

IMPORTANT: *Do not use a body belt for free fall applications. See OSHA 1926.502 for guidelines.*

4.4 MAKING CONNECTIONS: When using a hook to make a connection, ensure roll-out cannot occur (see Figure 4). Do not use hooks or connectors that will not completely close over the attachment object. Do not use non-locking snap hooks. The anchorage must meet the anchorage strength requirements stated in section 2.2. Follow the manufacturer's instructions supplied with each system component.

4.5 OPERATION: Prior to use, inspect the SRL as described in section 5.0. Connect the Nano-Lok SRL to a suitable anchorage or mount the SRL on the back of a Full Body Harness per the instruction in Section 3. On anchorage connected SRLs, connect the Hook (D) or Carabiner on the Load Indicator to the Dorsal D-Ring (A) on the Full Body Harness. On harness mounted SRLs, connect the Hook (D) or Carabiner to a suitable anchorage. Ensure connections are compatible in size, shape, and strength. Ensure hooks are fully closed and locked. Once attached, the worker is free to move about within the recommended working area at normal speeds. If a fall occurs the SRL will lock and arrest the fall. Upon rescue, remove the SRL from use. When working with an SRL, always allow the lifeline to recoil back into the device under control.

> ***WARNING:*** *Do not tie or knot the lifeline. Avoid lifeline contact with sharp or abrasive surfaces. Inspect the lifeline frequently for cuts, fraying, burns, or signs of chemical damage. Dirt, contaminants, and water can lower dielectric properties of the lifeline. Use caution near power lines.*

4.6 TWIN LEG INTERFACE 100% TIE-OFF: When two Nano-Lok SRLs are mounted side-by-side on the back of a Full Body Harness, the SRL Fall Arrest System can be used for continuous fall protection (100 % tie-off) while ascending, descending, or moving laterally (see Figure 17). With the Lanyard Leg of one SRL attached to an anchorage point, the worker can move to a new location, attach the unused Lanyard Leg of the other SRL to another anchorage point, and then disconnect from the original anchorage point. The sequence is repeated until the worker reaches the desired location. Considerations for twin leg 100% tie-off applications include the following:

- Connection of each Lanyard Leg to a separate anchorage point is acceptable (Figure 17).
- Never connect more than one person at a time to the Twin-Leg system (Figure 18).
- Do not allow the Lanyards to become tangled or twisted together as this may prevent them from retracting.
- Do not allow any lanyard to pass under arms or between legs during use.

Figure 17 – 100% Tie-Off

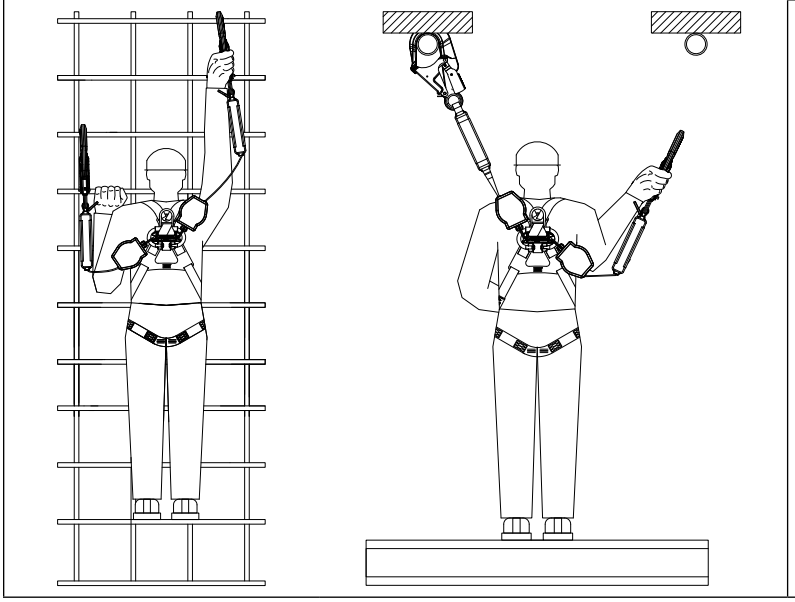
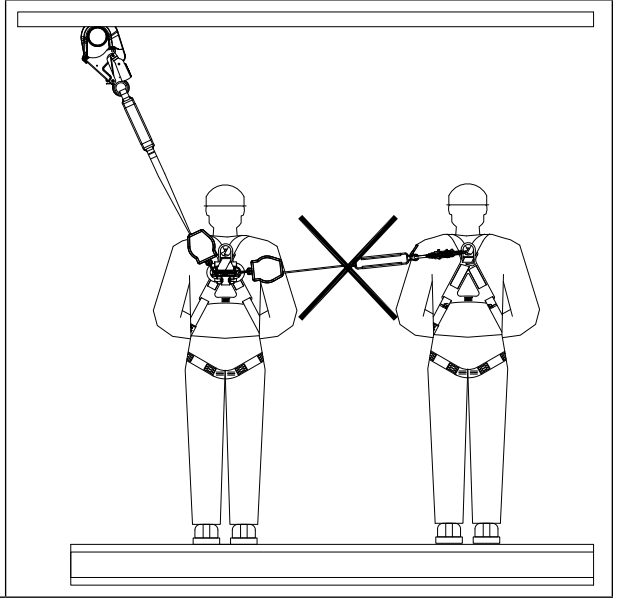


Figure 18 – Incorrect Attachment

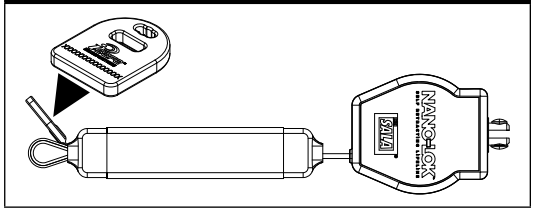


4.7 HORIZONTAL SYSTEMS: In applications where the Nano-Lok SRL is used in conjunction with a horizontal system (i.e. Horizontal Lifeline, Horizontal I-Beams Trolley), the SRL and horizontal system components must be compatible. Horizontal systems must be designed and installed under the supervision of a qualified engineer. Consult the horizontal system equipment manufacturer's instructions for details.

5.0 INSPECTION

5.1 i-Safe™ RFID TAG: The Nano-Lok SRL includes an i-Safe™ Radio Frequency Identification (RFID) tag (Figure 19). The RFID tag can be used in conjunction with the i-Safe handheld reading device to simplify inspection and inventory control and provide records for your fall protection equipment. If you are a first-time user, contact a Capital Safety Customer Service representative (see back cover); or if you have already registered, go to *isafe.capitalsafety.com*. Follow the instructions provided with your i-Safe handheld reader or software to transfer your data to your database.

Figure 19 – i-Safe RFID Tag



5.2 INSPECTION FREQUENCY: The Nano-Lok SRL must be inspected at the intervals defined in *"Section 2.5 - Inspection Frequency"*. Inspection procedures are described in the *"Inspection Checklist"* (Table 1).

5.3 UNSAFE OR DEFECTIVE CONDITIONS: If inspection reveals an unsafe or defective condition, remove the Nano-Lok SRL from service immediately and discard (see *"Section 5.5 - Disposal"*).

5.4 PRODUCT LIFE: The functional life of Nano-Lok SRLs is determined by work conditions and maintenance. As long as the SRL passes inspection criteria, it may remain in service.

5.5 DISPOSAL: Dispose of the Nano-Lok SRL if it has been subjected to fall force, Arc Flash, or inspection reveals an unsafe or defective condition. Before disposing of the SRL, cut the Load Indicator off of the Web Lanyard or otherwise disable the SRL to eliminate the possibility of inadvertent reuse.

6.0 MAINTENANCE, SERVICING, AND STORAGE

6.1 CLEANING: Cleaning procedures for the Nano-Lok SRL are as follows:

- Periodically clean the exterior of the SRL using water and a mild soap solution. Position the SRL so excess water can drain out. Clean labels as required.
- Clean the Web Lifeline with water and mild soap solution. Rinse and thoroughly air dry. Do not force dry with heat. The lifeline should be dry before allowing it to retract into the housing. An excessive buildup of dirt, paint, etc. may prevent the lifeline from fully retracting back into the housing causing a potential free fall hazard.

> ***IMPORTANT:*** *If the lifeline contacts acids or other caustic chemicals, remove the SRL from service and wash with water and a mild soap solution. Inspect the SRL per Table 1 before returning to service.*

6.2 SERVICE: Nano-Lok SRLs are not repairable. If the SRL has been subjected to fall force or inspection reveals an unsafe or defective condition, remove the SRL from service and discard (see *"Section 5.5 - Disposal"*).

6.3 STORAGE: Store Nano-Lok SRLs in a cool, dry, clean environment out of direct sunlight. Avoid areas where chemical vapors may exist. Thoroughly inspect the SRL after any period of extended storage.

7.0 SPECIFICATIONS

7.1 PERFORMANCE: Your Nano-Lok SRL has been tested and certified to the performance requirements of the standard(s) identified on the cover of this instruction manual. See *"Section 2.0 - Limitations & Requirements"* for performance specifications.

7.2 MATERIALS: Material specifications for the Nano-Lok SRL are as follows:

<table>
<tr><td>Housing:</td><td>Nylon, UV Resistant</td><td rowspan="2">End Connectors:</td><td rowspan="2">See Figure 15 for End Connector options and their respective material specifications.</td></tr>
<tr><td>Drum:</td><td>Nylon, Type 6/6</td></tr>
<tr><td rowspan="2">Fasteners:</td><td rowspan="2">Zinc Plated Steel Screws;
Stainless Steel Rivets</td><td rowspan="2">Lifeline:</td><td>Dynema Polyester Web</td></tr>
<tr><td>Hot Work
Arc Flash Kevlar Nomex Web</td></tr>
<tr><td>Locking Pawls:</td><td>Stainless Steel</td><td rowspan="2">Tie-Back Portion of Life Line:</td><td>Blue Nylon Web</td></tr>
<tr><td>Main Shaft:</td><td>Stainless Steel</td><td>Hot Work
Arc Flash Black Kevlar Nomex Web</td></tr>
<tr><td>Motor Spring:</td><td>Stainless Steel</td><td rowspan="2">Load Indicator:</td><td>Cover: Denier Textured blue Web Nylon
Stitching: Polyester or Nylon Thread
Web: Polyester</td></tr>
<tr><td>Swivel:</td><td>Zinc Plated Steel</td><td>Hot Work
Arc Flash Cover: Kevlar Nomex
Stitching: Nomex
Web: Kevlar Nomex</td></tr>
</table>

7.3 DIMENSIONS: Figure 15 lists Nano-Lok SRL dimensions. Average working range for the Nano-Lok SRL is 6 ft. (1.8 m), but will vary slightly with length differences in the various End Connector options. Retracted and Extended length values in Figure 15 are approximations based on the total length of the fully retracted/ extended SRL and the applicable End Connectors.

7.4 LABELING: Figure 16 illustrates Nano-Lok SRL labeling. All labels on the SRL must be present and fully legible.

Table 1 – Inspection Checklist			
Component:	**Inspection:**	**Pass**	**Fail**
SRL (Figure 20)	Inspect for loose fasteners and bent or damaged parts.	☐	☐
	Inspect the Housing (A) for distortion, cracks, or other damage.	☐	☐
	Inspect the Swivel (B) and Swivel Eye (C) or Integral Connector (D) for distortion, cracks, or other damage. The Swivel should be attached securely to the SRL, but should pivot freely. The Swivel Eye or Integral Connector should rotate freely in the Swivel.	☐	☐
	The Web Lifeline (E) should pull out and retract fully without hesitation or creating a slack line condition.	☐	☐
	Ensure the SRL locks up when the Lifeline is jerked sharply. Lockup should be positive with no slipping.	☐	☐
	Ensure the SRL locks up when the Lifeline is jerked sharply. Lockup should be positive with no slipping.	☐	☐
	All labels must be present and fully legible (see Figure 16).	☐	☐
	Inspect the entire SRL for signs of corrosion.	☐	☐
Web Lifeline (Figures 20 and 21)	Inspect the Web Lifeline (E) and Tie-back Lifeline (F) for concentrated wear, frayed strands, broken yarn, burns, cuts, and abrasions. The lifeline must be free of knots throughout its length. Inspect for excessive soiling, paint build-up, and rust staining. Inspect for chemical or heat damage indicated by brown, discolored, or brittle areas. Inspect for ultraviolet damage indicated by discoloration and the presence of splinters and slivers on the lifeline surface.	☐	☐
Modular Lanyard Hardware	Inspect modular lanyard connection components for proper operation. Using the procedures in Section 3.5 of this instruction, confirm that female connector locks move freely when depressed and that they securely capture male connectors when the male and female components are assembled.	☐	☐
Load Indicator (Figure 22)	Inspect the Load Indicator to determine if it has been activated. There should be no evidence of elongation and the cover should be secure and free of tears or other damage.	☐	☐
End Connectors (Figure 23)	Figure 1 identifies the End Connectors that should be included on your Nano-Lok SRL model. Inspect all Snap Hooks, Carabiners, Rebar Hooks, Interfaces, etc. for signs of damage, corrosion, and proper working condition. Where present: Swivels (A) should rotate freely, Gates (B) should open, close, lock, and unlock properly, and Locking Buttons (C) and Locking Pins (D) should function correctly.	☐	☐

Figure 20 – SRL Inspection

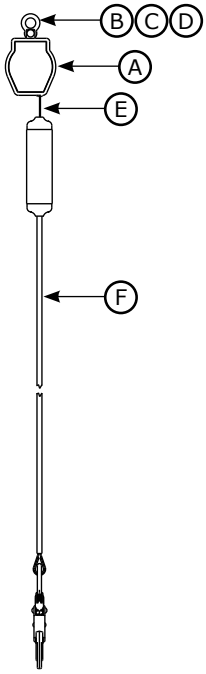


Figure 21 – Web Lifeline

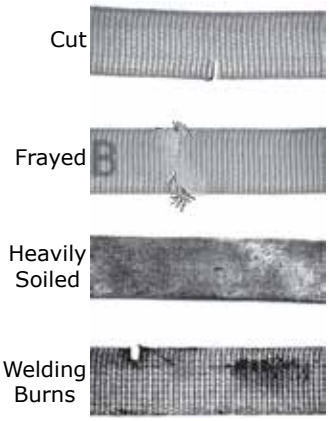


Figure 22 – Load Indicator

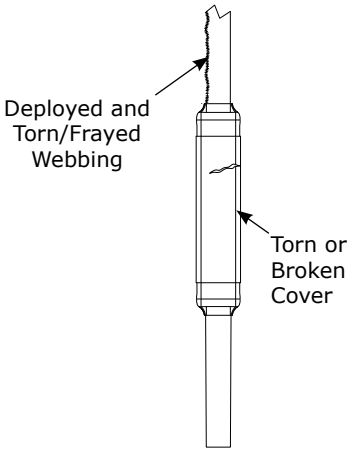
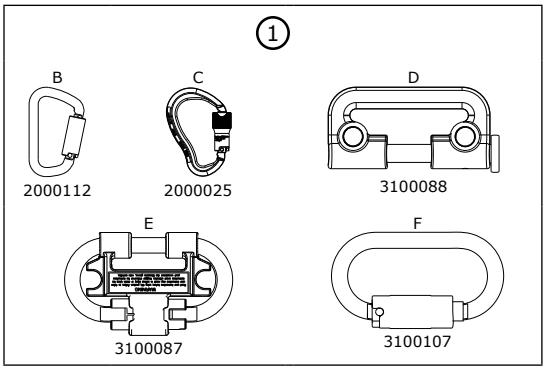
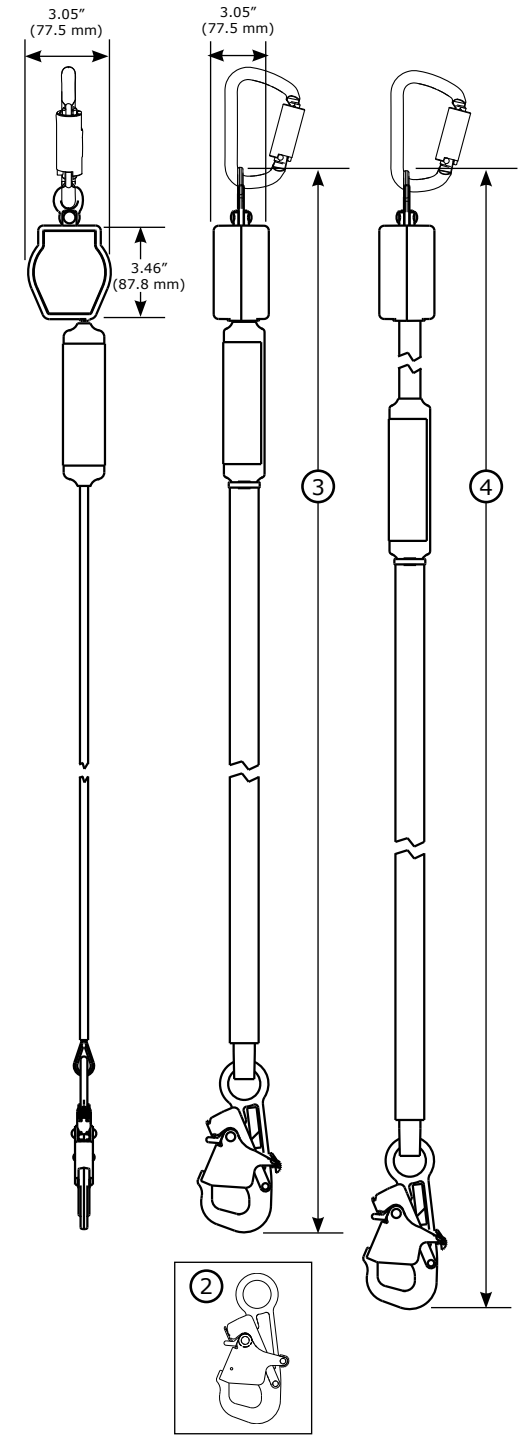


Figure 23 – Dimensions & End Connector Specifications

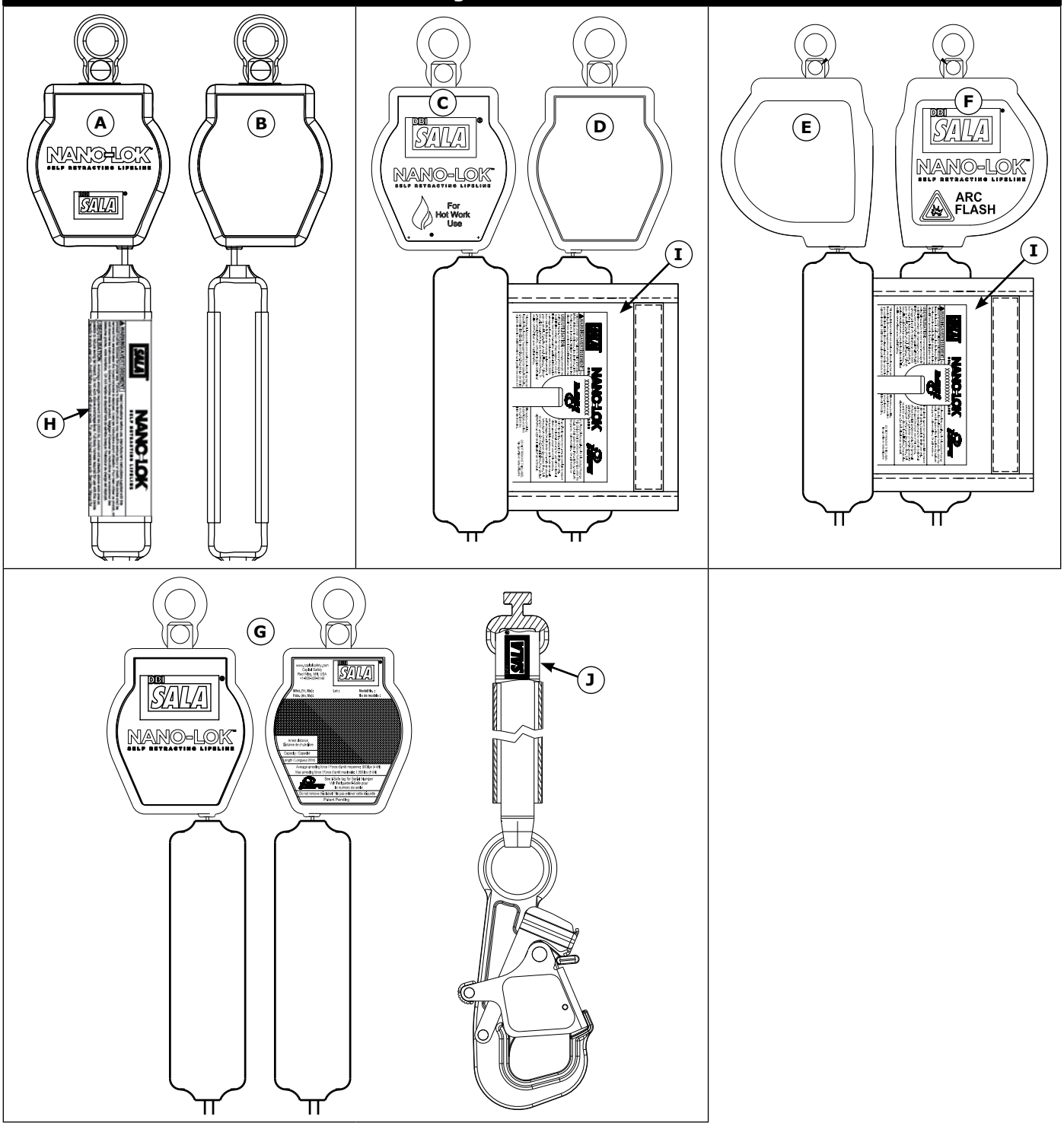




	End Connector		Length (Retracted)		Length (Extended)		Weight	
Model	① Swivel	② Lanyard	③ ft.	③ m	④ ft.	④ m	lbs.	kg
3100468	B	A	4.33	1.32	9.00	2.74	3.30	1.49
3101322	D	A	4.33	1.32	9.25	2.82	2.95	1.39
3101324	None	A	4.22	1.29	9.00	2.74	2.90	1.32
3101326	D	A	4.33	1.32	9.25	2.82	2.95	1.39
3101328	D	A	4.33	1.32	9.25	2.82	2.95	1.39
3101352	D	A	4.33	1.32	9.25	2.82	2.95	1.39
3101354	None	A	4.22	1.29	9.00	2.74	2.90	1.32
3101365	C	A	4.96	1.51	9.33	2.84	2.76	1.25
3101366	D	A	4.71	1.44	9.08	2.77	2.86	1.30
3101367	B	A	4.92	1.50	9.29	2.83	3.03	1.37
3101368	None	A	4.63	1.41	9.00	2.74	2.47	1.12
3101369	C	A	4.96	1.51	9.33	2.84	2.76	1.25
3101370	D	A	4.71	1.44	9.08	2.77	2.86	1.30
3101371	B	A	4.92	1.5	9.29	2.83	3.03	1.37
3101372	None	A	4.63	1.41	9.00	2.74	2.47	1.12
3101373	F	A	4.69	1.43	9.06	2.76	5.41	2.45
3101374	E	A	4.69	1.43	9.06	2.76	5.47	2.48
3101377	F	A	4.69	1.43	9.06	2.76	5.41	2.45
3101378	E	A	4.69	1.43	9.06	2.76	5.47	2.48
3101562	D	A	4.54	1.38	10.67	3.25	3.49	1.58
3101563	None	A	4.44	1.35	10.57	3.22	3.11	1.41
3101565	E	A	4.54	1.38	10.67	3.25	3.63	1.65
3101566	D	A	4.54	1.38	10.67	3.25	3.49	1.59
3101567	None	A	4.44	1.35	10.57	3.22	3.11	1.41
3101569	E	A	4.54	1.38	10.67	3.25	3.63	1.65

①② Connector:	Type:	Material:	Gate Opening	Gate Strength
A	Tie-Back Snap Hook	Steel	3/4 in. (19 mm)	5,000 lb (22.2 kN)
B	Carabiner	Steel	1-3/16 in. (30 mm)	5,000 lb (22.2 kN)
C	Carabiner	Aluminum	3/4 in. (19 mm)	5,000 lb (22.2 kN)
D	Single Leg Interface	Steel	7/8 in. (22 mm)	5,000 lb (22.2 kN)
E	Twin SRL Interface	Steel w/Nylon Insert	3/4 in. (19 mm)	5,000 lb (22.2 kN)
F	Twin SRL Interface (ExoFit Fixed D-Ring)	Steel	3/4 in. (19 mm)	5,000 lb (22.2 kN)

Figure 24 – Labels

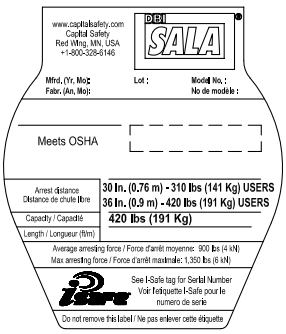


A

Models	
3101365	3101372
3101367	3101373
3101368	3101374
3101366	3101377
3101370	3101378
3101371	3101379

B

ANSI Models
3101365
3101366
3101367
3101368
3101373
3101374



CSA Models
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3101372
3101377
3101378
3101379

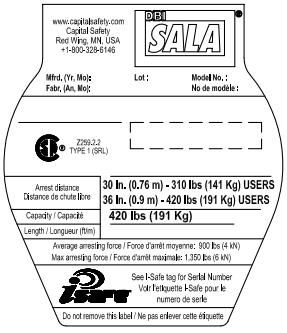

Figure 24 – Labels

C

Models
3101322
3101324
3101326
3101328
3101352
3101354

D

ANSI Models
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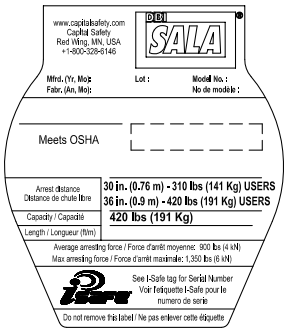
3101324
3101326



CSA Models
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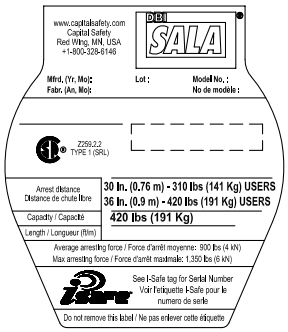
3101354



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Models
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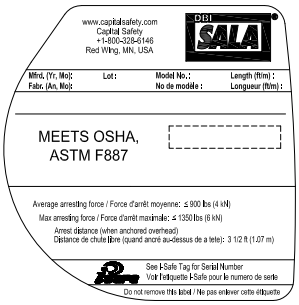
3101565



Models
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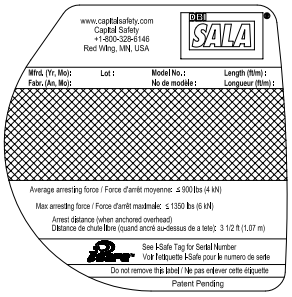
3101569



F

Models
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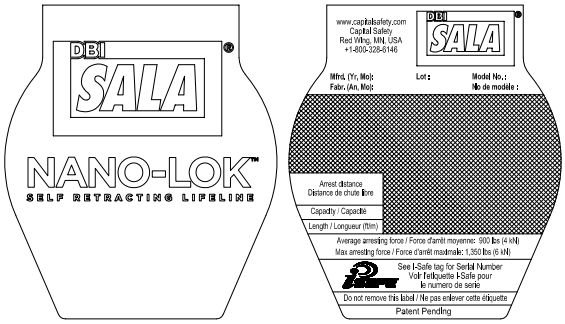
3101563
3101565
3101566
3101567
3101569

G

Model
3100468



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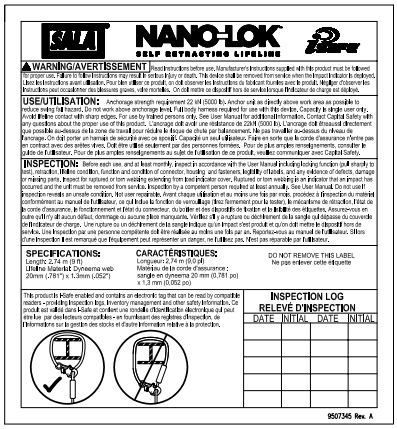

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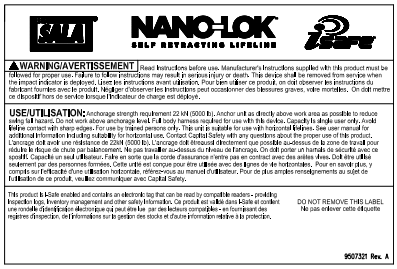

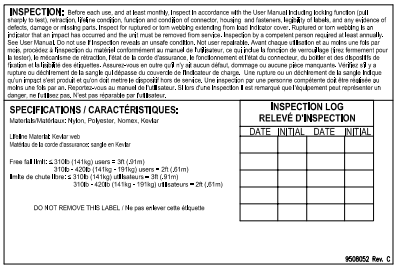

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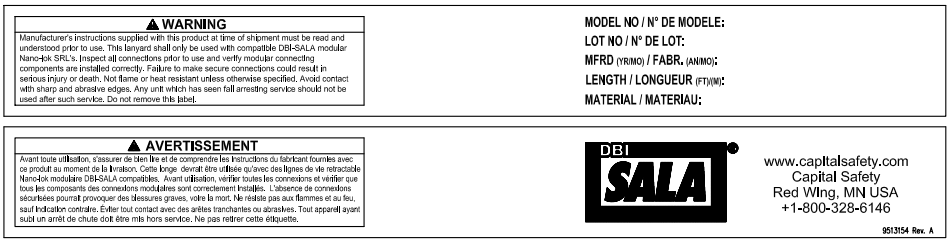

INSPECTION AND MAINTENANCE LOG

SERIAL NUMBER:	
MODEL NUMBER:	
DATE PURCHASED:	**DATE OF FIRST USE:**

INSPECTION DATE	INSPECTION ITEMS NOTED	CORRECTIVE ACTION	MAINTENANCE PERFORMED
Approved By:			
Approved By:			
Approved By:			
Approved By:			
Approved By:			
Approved By:			
Approved By:			
Approved By:			
Approved By:			
Approved By:			
Approved By:			
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Approved By:			
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Approved By:			
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Approved By:			
Approved By:			

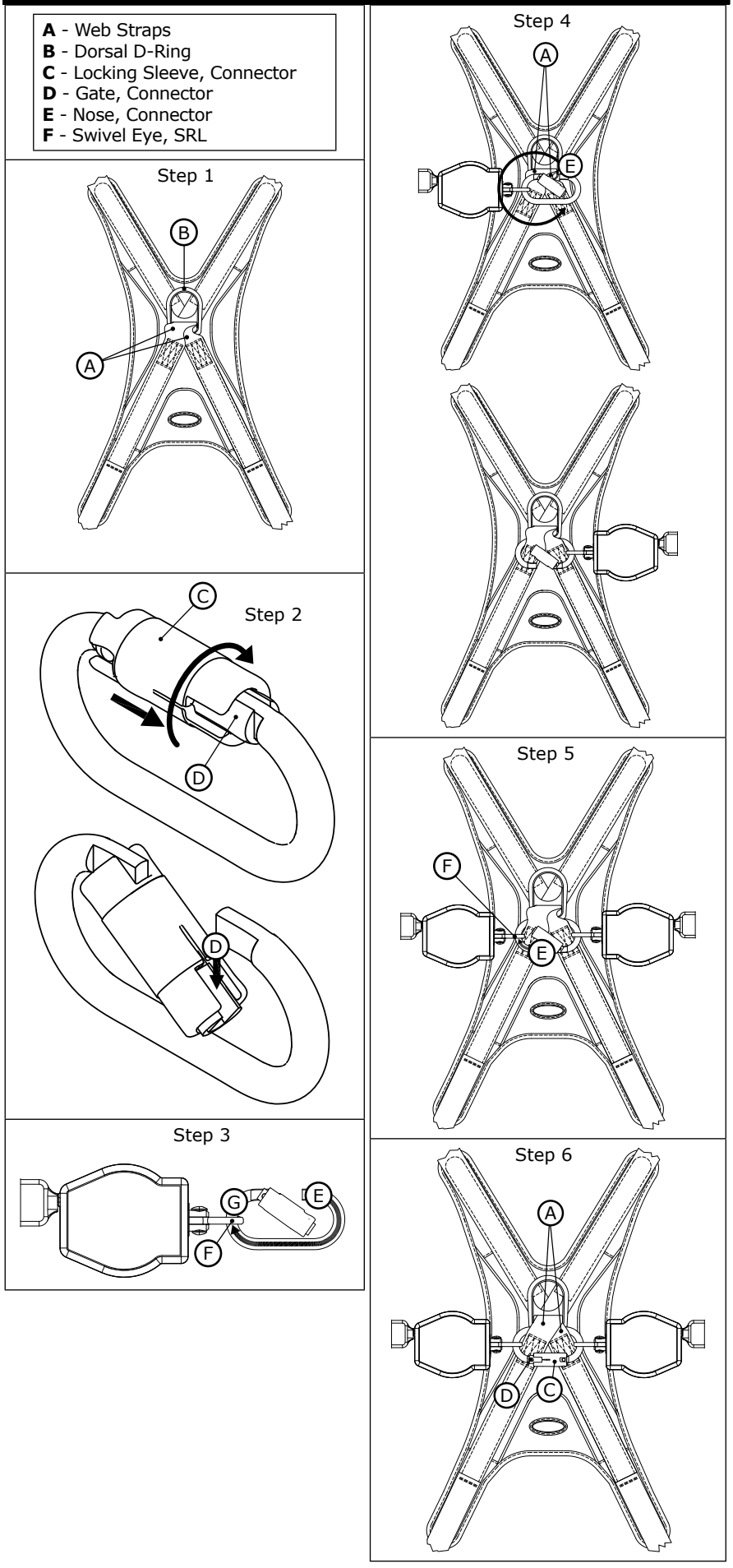
APPENDIX A - TWIN SRL FIXED D-RING HARNESS INTERFACE

Older ExoFit Full Body Harnesses with a Fixed D-Ring require a special Twin SRL Harness Interface to mount two Nano-Lok SRLs on the back of the harness just below the Dorsal D-Ring. Specific Twin Leg Nano-Lok SRL models are available for installation on ExoFit Fixed D-Ring harnesses. See the fixed D-Ring models in Figure 1.

1.0 HARNESS MOUNTING: To mount two Nano-Lok SRLs on an ExoFit Full Body Harness with the Twin SRL Fixed D-Ring Harness Interface (Figure 17):

1. **Loosen the Harness Webbing:** Pull out on the Web Straps (A) where they pass through the bottom of the Dorsal D-Ring (B) until there is sufficient space to insert the Twin Leg Interface between the Web Straps and Back Pad.
2. **Open the Harness Interface:** With the Twin Leg Interface orientated as illustrated in Figure 17 - Step 2, push the Locking Sleeve (C) to the right and then turn clockwise to unlock the Gate (D). Swing the Gate (D) down to open.
3. **Thread the first Nano-Lok SRL onto the Harness Interface:** Insert the Nose of the Connector (E) through the Swivel Eye (F) on the SRL and then rotate the SRL around to the Gate End of the Connector (G). The Gate can be closed to allow clearance for the Swivel Eye between the Gate and Spine of the Connector.
4. **Position the Harness Interface around the Web Straps:** Insert the Nose of the Connector (E) behind the Web Straps (A). Rotate the Connector behind the Web Straps until the Connector surrounds the Web Straps.
5. **Add the second Nano-Lok SRL on the Harness Interface:** Slide the SRL's Swivel Eye (F) over the Nose of the Connector (E) and position the SRL Swivel Eye in the Nose End of the Connector.
6. **Close the Harness Interface**: Allow the Gate (D) to swing closed and the Locking Sleeve (C) to rotate back to locked position. Once the Harness Interface is closed, pull the Web Straps (A) back through the Dorsal D-Ring to eliminate slack in the webbing and secure the Harness Interface between the Web Straps and Back Pad.

Figure 17 – Twin Leg Exofit Harness Interface



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www.EngineeredFallProtection.com

Tel: (314) 492-4422

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