3M

PROTECTA

Fall Protection

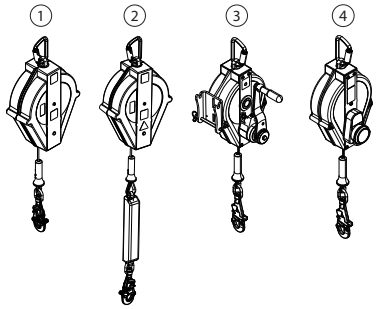
OSHA 29 CFR 1910.140
OSHA 29 CFR 1926.502

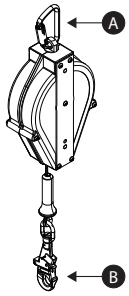
ULTRA-LOK
SELF-RETRACTING DEVICES

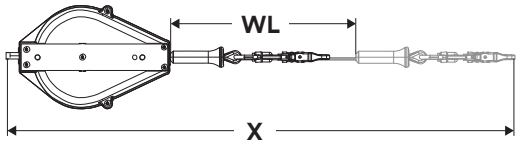
USER INSTRUCTIONS
5908123 Rev. C

☑ *For identification of product codes, refer to Table 1. See "Table 1 - Product Specifications" for more product information.*

Figure 1 - Product Overview







Model		Connectors		Housing Size	Lifeline	Extended Length (X)	Working Length (WL)
		A	B				
3503882	①	---	C2	Size A	SS1	50 ft. (15.2 m)	49 ft. (14.9 m)
3503883	①	---	C3	Size A	SR1	50 ft. (15.2 m)	49 ft. (14.9 m)
3503884	①	---	C2	Size B	SS1	85 ft. (25.9 m)	84 ft. (25.6 m)
3503885	②	---	C3	Size B	GS2	55 ft. (16.8 m)	53 ft. (16.2 m)
3503886	③	C1	C3	Size C	GS1	50 ft. (15.2 m)	49 ft. (14.9 m)
3503887	③	C1	C2	Size C	SS1	50 ft. (15.2 m)	49 ft. (14.9 m)
3503888	④	---	C3	Size D	GS1	50 ft. (15.2 m)	49 ft. (14.9 m)
3503889	④	---	C2	Size D	SS1	50 ft. (15.2 m)	49 ft. (14.9 m)

EN

SAFETY INFORMATION

Please read, understand, and follow all safety information contained in these instructions, prior to the use of this product. FAILURE TO DO SO COULD RESULT IN SERIOUS INJURY OR DEATH.

These instructions must be provided to the user of the equipment. Retain these instructions for future reference.

Intended Use:

This product is used as part of a complete Fall Protection system.

Use in any other application including, but not limited to, material handling, recreational or sports-related activities, or other activities not described in these instructions, is not approved by 3M and could result in serious injury or death.

This product is only to be used by trained users in workplace applications.

⚠ WARNING

This product is used as part of a complete Fall Protection system. All users must be fully trained in the safe installation and operation of their complete Fall Protection system. **Misuse of this product could result in serious injury or death.** For proper selection, operation, installation, maintenance, and service, refer to all instruction manuals and manufacturer recommendations. For more information, see your supervisor or contact 3M Technical Services.

- **To reduce the risks associated with using a Self-Retracting Device which, if not avoided, could result in serious injury or death:**
  - Inspect the product before each use and after any fall event, in accordance with the procedures specified in these instructions.
  - If inspection reveals an unsafe or defective condition, remove the product from service immediately and clearly tag it "DO NOT USE". Destroy or repair the product as required by these instructions.
  - Any product that has been subject to fall arrest or impact force must be immediately removed from service. Destroy or repair the product as required by these instructions.
  - Ensure that Fall Protection systems assembled from components made by different manufacturers are compatible and meet all applicable Fall Protection regulations, standards, or requirements. Always consult a Competent or Qualified Person before using these systems.
  - Ensure the product is kept free from all hazards including, but not limited to: entanglement with users, other workers, moving machinery, other surrounding objects, or impact from overhead objects that could fall onto the product or users.
  - Do not twist, tie, knot, or allow slack in the lifeline.
  - Avoid trip hazards with legs of the lifeline. Attach any unused lifeline legs to the lanyard parking elements on your full body harness, if present.
  - Do not exceed the number of allowable users specified in these instructions.
  - Do not use in applications that have an obstructed fall path. A clear path is required to lock the SRD. Working on slowly shifting materials (e.g. sand or grain), or within confined spaces or limited spaces, may not allow the worker to reach sufficient speed to lock the SRD.
  - Avoid sudden or quick movements during work operation because this may cause the SRD to unintentionally lock.
  - Use caution when installing, using, or moving the product as moving parts may create pinch points.
  - Use appropriate edge protection when the product may contact sharp edges or abrasive surfaces.
  - Ensure the product is configured and installed properly for safe operation as described in these instructions.

- **To reduce the risks associated with working at height which, if not avoided, could result in serious injury or death:**
  - Your health and physical condition must allow you to safely work at height and to withstand all forces associated with a fall arrest event. Consult your doctor if you have questions regarding your ability to use this equipment.
  - Never exceed allowable capacity of your Fall Protection equipment.
  - Never exceed the maximum free fall distance specified for your Fall Protection equipment.
  - Do not use any Fall Protection equipment that fails inspection, or if you have concerns about the use or suitability of the equipment. Contact 3M Technical Services with any questions.
  - Some subsystem and component combinations may interfere with the operation of this equipment. Only use compatible connections. Contact 3M Technical Services before using this equipment in combination with components or subsystems other than those described in these instructions.
  - Use extra precautions when working around moving machinery, electrical hazards, extreme temperatures, chemical hazards, explosive or toxic gases, sharp edges, abrasive surfaces, or below overhead materials that could fall onto you or your Fall Protection equipment.
  - Ensure use of your product is rated for the hazards present in your work environment.
  - Ensure there is sufficient fall clearance when working at height.
  - Never modify or alter your Fall Protection equipment. Only 3M, or persons authorized in writing by 3M, may make repairs to 3M equipment.
  - Before using Fall Protection equipment, ensure a written rescue plan is in place to provide prompt rescue if a fall incident occurs.
  - If a fall incident occurs, immediately seek medical attention for the fallen worker.
  - Only use a full body harness for Fall Arrest applications. Do not use a body belt.
  - Minimize swing falls by working as directly below the anchorage point as possible.
  - A secondary Fall Protection system must be used when training with this product. Trainees must not be exposed to an unintended fall hazard.
  - Always wear appropriate Personal Protective Equipment when installing, using, or inspecting the product.
  - Never work below a suspended load or worker.
  - Always maintain 100% tie-off.

☑ *Always ensure you are using the latest revision of your 3M instruction manual. Visit www.3m.com/userinstructions or contact 3M Technical Services for updated instruction manuals.*

PRODUCT OVERVIEW:

Figure 1 illustrates the product models covered by this instruction. Self-Retracting Devices (SRDs) are drum-wound lifelines that retract into solid housings.

The following SRD types are covered by this instruction:

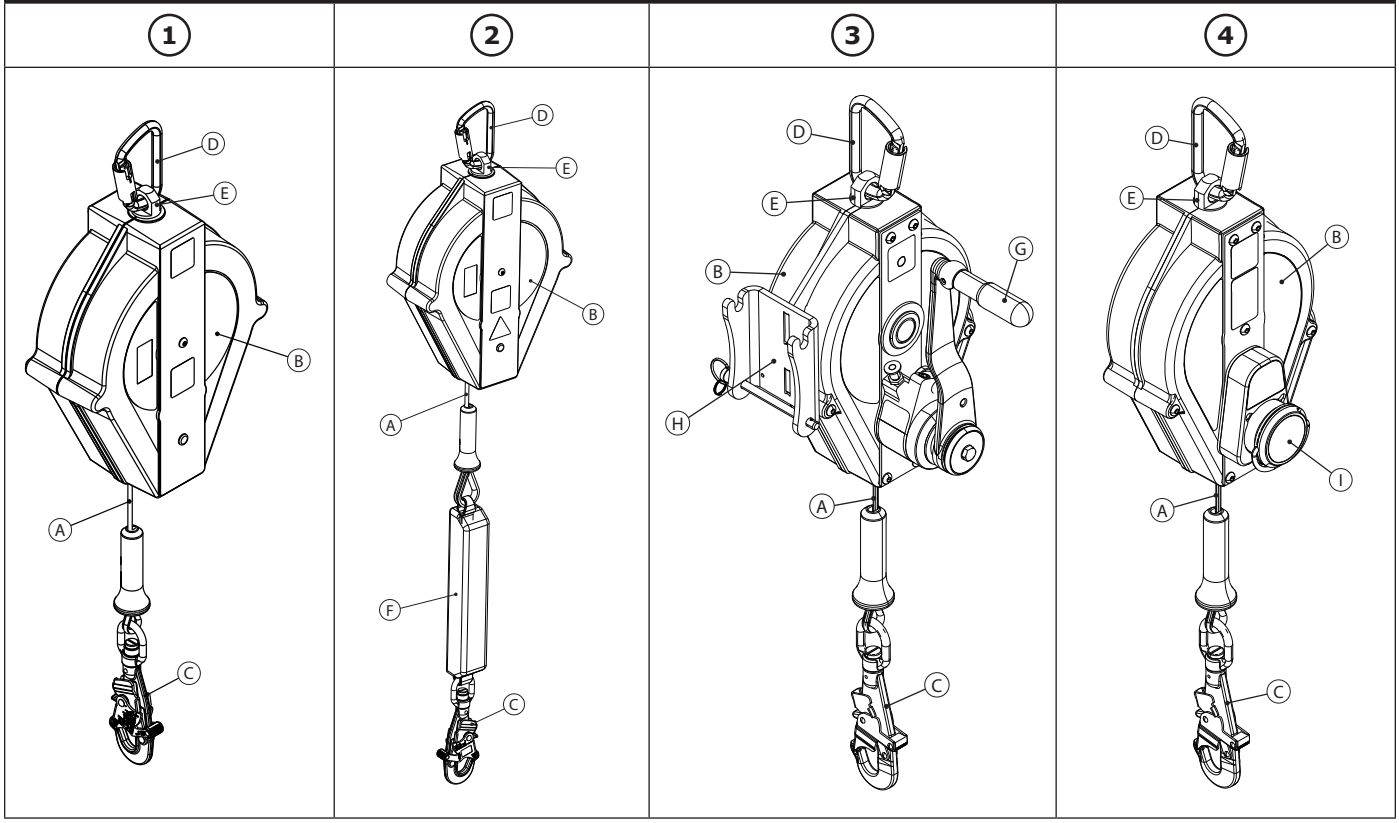
- **Self-Retracting Device (Figures 1.1, 2.1):** Self-Retracting Devices (SRDs) are suitable for applications where the lifeline remains generally vertical during use. This type may be used for Fall Arrest or Restraint applications.
- **Self-Retracting Device with Leading Edge (Figures 1.2, 2.2):** Self-Retracting Devices with Leading Edge (SRD-LEs) are suitable for applications where the lifeline remains generally horizontal during use. SRD-LEs have an integral energy absorber to withstand impact loading of the lifeline over a sharp or abrasive edge during fall arrest and minimize fall arrest forces on the user. This type may be used for Fall Arrest or Restraint applications.
- **Self-Retracting Device with Rescue (Figures 1.3, 1.4, 2.3, 2.4):** Self-Retracting Devices with Rescue (SRD-Rs) include an integral means for assisted rescue by raising or lowering the subject. This type may be used for Fall Arrest, Restraint, or Rescue applications.

Figure 2 identifies key components of the available SRD models. In a standard SRD, the Lifeline (A) extends and retracts from within the Housing (B). The Top Connector (D) mounted on the SRD secures the SRD to the anchorage point and is connected to the SRD by means of the Swivel Eye (E). The Bottom Connector (C) is secured at the end of the Lifeline and attaches to the designated Fall Arrest attachment element of the user's full body harness. Energy Absorbers (F) dissipate kinetic energy and limit deceleration forces during fall arrest.

SRD-R models covered in this instruction include some additional components. The Rotation Handle (G) is used to retrieve the Lifeline (A) after the Bottom Connector (C) has been secured to the harness of the subject of rescue. The Bracket (H) enables the SRD-R to be mounted to a tripod during use. Some SRD-R models include an RSQ™ Descent Knob (I), which allows the user to switch between fall arrest or descent modes.

Each product model has its own particular size and its own combination of components as listed in Figure 1. See Table 1 for more information on Component Specifications.

Figure 2 - Components



☑ *Before using this equipment, record the product identification information from the ID label in the 'Inspection and Maintenance Log' at the back of this manual.*

Table 1 – Product Specifications

System Specifications:

Anchorage:

Anchorage structure requirements vary with the system application and whether it is a certified anchorage or non-certified anchorage. The anchorage structure must sustain static loads applied in the directions permitted by the anchorage connector.

System Application	Certified Anchorage	Non-Certified Anchorage	Defined by
Fall Arrest	2 times maximum arresting force	5,000 lbf (22.2 kN)	ANSI Z359 OSHA 29 CFR 1910.140, 1926.502
Restraint	2 times foreseeable force	1,000 lbf (4.4 kN)	ANSI Z359
		5,000 lbf (22.2 kN)	OSHA 29 CFR 1910.140, 1926.502
Work Positioning	2 times foreseeable force	3,000 lbf (13.3 kN)	ANSI Z359 OSHA 29 CFR 1910.140, 1926.502
Rescue	5 times applied load	3,000 lbf (13.3 kN)	ANSI Z359

When more than one system is attached to an anchorage, the strengths stated above must be multiplied by the number of systems attached to the anchorage. See ANSI/ASSP Z359.2 for more information.

☑ *Anchorage must be approved by a Qualified Person.*

Standards:

Each product model is certified to, or conforms with, the applicable standards and regulations listed within Figure 1. If none are specified, then all standards and regulations listed on the cover apply.

Capacity:

See the performance tables for product capacity. The listed capacities apply to use of the product in all compatible applications, unless otherwise stated. This product is for use by one user with a combined weight (including clothing, tools, etc.) within the applicable capacity range.

Component Specifications:

Figure 2 Reference	Component	Materials
Ⓐ	Lifeline	(see Lifeline Specifications)
Ⓑ	Housing	Thermoplastic polyurethane or cast aluminum alloy
Ⓒ	Bottom Connector	(see Connector Specifications)
Ⓓ	Top Connector	(see Connector Specifications)
Ⓔ	Swivel Eye	Stainless steel or zinc-plated steel
Ⓕ	Energy Absorber	Polyester fabric and polyurethane cover with polyester tear web
Ⓖ	Rotation Handle	Stainless steel arm with rubber handle
Ⓗ	Bracket	Zinc-plated steel or aluminum
Ⓘ	RSQ™ Descent Knob	Aluminum

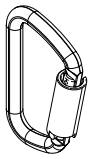
☑ ***Internal Components:*** *Internal SRD components are made from a combination of Stainless Steel, Steel, and Aluminum.*

Table 1 – Product Specifications

Connector Specifications:

Figure 1 Reference	Model Number	Description	Material	Gate Opening	Gate Strength
C1	2000112	Carabiner	Steel	11/16 in. (17 mm)	3,600 lbf (16 kN)
C2	2100044	Swiveling snap hook	Stainless steel	3/4-in. (19 mm)	3,600 lbf (16 kN)
C3	9502194	Swiveling snap hook	Zinc-plated steel	3/4-in. (19 mm)	3,600 lbf (16 kN)

☑ ***Tensile Strength:*** *The tensile strength of each of the connectors listed above is 22.2 kN (5,000 lbf).*

C1	C2	C3
		

Lifeline Specifications:

Figure 1 Reference	Description
GS1	3/16-in. (5 mm) galvanized steel wire rope
GS2	7/32-in. (5.5 mm) galvanized steel wire rope
SR1	1/4-in. (6 mm) Vectran rope
SS1	3/16-in. (5 mm) stainless steel wire rope

Table 1 – Product Specifications

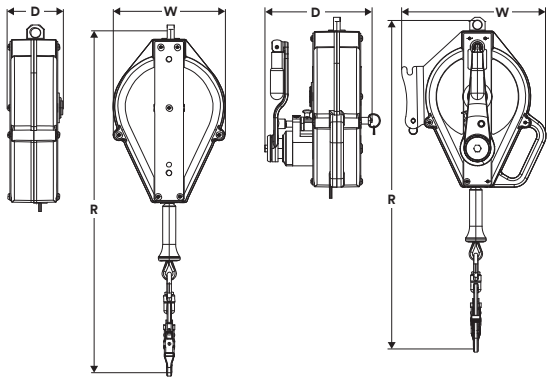
Performance - SRDs	OSHA 29 CFR 1910.140, 1926.502
Capacity Range:	130 lb. - 310 lb. (59 kg - 140 kg)
Maximum Arresting Force:	1,350 lbf (6 kN) [1,800 lbf (8 kN) for 3503884]
Average Arresting Force:	900 lbf (4 kN) [1,350 lbf (6 kN) for 3503884]
Maximum Arrest Distance: **Assumes the SRD is mounted directly above the user.*	42 in (1.1 m)
Maximum Deceleration Distance: **Assumes the SRD is mounted directly above the user.*	42 in (1.1 m)
Minimum Fall Clearance Required: **Assumes the SRD is mounted directly above the user.*	6 ft (1.8 m)
Maximum Free Fall: **SRD must be mounted above user's D-ring.*	2 ft (0.6 m)

Performance - SRD-LEs	OSHA 29 CFR 1910.140, 1926.502
Capacity Range:	130 lb. - 310 lb. (59 kg - 140 kg)
Maximum Arresting Force:	1,800 lbf (8 kN)
Average Arresting Force:	1,350 lbf (6 kN)
Maximum Arrest Distance: **Assumes the SRD is mounted directly above the user.*	42 in (1.1 m)
Maximum Deceleration Distance: **Assumes the SRD is mounted directly above the user.*	42 in (1.1 m)
Minimum Fall Clearance Required:	Vertical: 6 ft. (1.8 m) Horizontal: 15 ft. (4.5 m)
Maximum Free Fall: **SRD must be mounted above user's D-ring.*	2 ft (0.6 m)
Maximum Free Fall - LE: **Measured from user's D-ring to working surface.*	5 ft (1.5 m)

Performance - SRD-Rs	OSHA 29 CFR 1910.140, 1926.502
Capacity Range:	130 lb. - 310 lb. (59 kg - 140 kg)
Maximum Arresting Force:	1,350 lbf (6 kN)
Average Arresting Force:	900 lbf (4 kN)
Maximum Arrest Distance: **Assumes the SRD is mounted directly above the user.*	42 in (1.1 m)
Maximum Deceleration Distance: **Assumes the SRD is mounted directly above the user.*	42 in (1.1 m)
Minimum Fall Clearance Required: **Assumes the SRD is mounted directly above the user.*	6 ft (1.8 m)
Maximum Free Fall: **SRD must be mounted above user's D-ring.*	2 ft (0.6 m)
Maximum Lifting Load:	310 lb. (140 kg)

Dimensions:

Figure 1 Reference	D	W	R
Size A	3.4 in. (8.64 cm)	7.9 in. (20.0 cm)	11.6 in. (29.47 cm)
Size B	4.3 in. (10.92 cm)	10.6 in (26.9 cm)	13.3 in. (33.8 cm)
Size C	7.2 in. (18.3 cm)	10.5 in. (26.7 cm)	11.5 in. (29.2 cm)
Size D	5.9 in. (15.1 cm)	9.1 in. (23.2 cm)	11.6 in. (29.47 cm)



1.0 PRODUCT APPLICATION

1.1 **PURPOSE:** 3M Self-Retracting Devices (SRDs) are designed for use as a connecting subsystem in a Fall Protection system. Once anchored, the lifeline extends and retracts automatically as the worker moves. If a fall occurs, a sensing mechanism activates the device and arrests the fall. For more information on system applications, refer to the "Product Overview" and Table 1.

1.2 **SUPERVISION:** Use of this equipment must be supervised by a Competent Person.

1.3 **STANDARDS:** Your product conforms to the national or regional standards identified on the front cover of these instructions. If this product is resold outside the original country of destination, the re-seller must provide these instructions in the language of the country in which the product will be used.

> ☑ *For more information on certification or conformance requirements, refer to the applicable standards and regulations listed for your product (e.g. the ANSI/ASSP Z359 Fall Protection codes).*

1.4 **TRAINING:** This equipment must be installed and used by persons trained in its correct application. These instructions are to be used as part of an employee training program as required by national, regional, or local standards. It is the responsibility of the users and installers of this equipment to ensure they are familiar with these instructions, trained in the correct care and use of this equipment, and are aware of the operating characteristics, application limitations, and consequences of improper use of this equipment.

1.5 **RESCUE PLAN:** When using this equipment and connecting subsystems, the employer must have a written rescue plan and the means to implement and communicate that plan to users, authorized persons, and rescuers. A trained, on-site rescue team is recommended. Team members should be provided with the equipment and techniques necessary to perform a successful rescue. Training should be provided on a periodic basis to ensure rescuer proficiency. Rescuers should be provided with these instructions. There should be visual contact or means of communication with the person being rescued at all times during the rescue process.

2.0 SYSTEM REQUIREMENTS

2.1 **ANCHORAGE:** Anchorage requirements vary with the Fall Protection application. The mounting structure on which the equipment is placed must meet the Anchorage specifications defined in Table 1.

2.2 **CAPACITY:** The user capacity of a complete Fall Protection system is limited by its lowest rated maximum capacity component. For example, if your connecting subsystem has a capacity that is less than your harness, you must comply with the capacity requirements of your connecting subsystem. See the manufacturer instructions for each component of your system for capacity requirements.

2.3 **ENVIRONMENTAL HAZARDS:** Use of this equipment in areas with environmental hazards may require additional precautions to prevent injury to the user or damage to the equipment. Hazards may include, but are not limited to: high heat, 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 equipment. Contact 3M Technical Services for further clarification.

2.4 **LIFELINE HAZARDS:** Ensure the lifeline is kept free from all hazards including, but not limited to: entanglement with users, other workers, moving machinery, other surrounding objects, or impact from overhead objects that could fall onto the lifeline or users.

2.5 **FALL PATH AND SRD LOCKING SPEED:** Do not use in applications that have an obstructed fall path. A clear path is required to lock the SRD. Working on slowly shifting materials (e.g. sand or grain), or within limited spaces, may not allow the worker to reach sufficient speed to lock the SRD.

2.6 **COMPONENT COMPATIBILITY:** 3M equipment is designed for use with 3M equipment. Use with non-3M equipment must be approved by a Competent Person. Substitutions made with non-approved equipment may jeopardize equipment compatibility and may affect the safety and reliability of your Fall Protection system. Read and follow all instructions and warnings for all equipment prior to use.

2.7 **CONNECTOR COMPATIBILITY:** Connectors are compatible with connecting elements when the size and shape of either component does not cause the connector to inadvertently open, regardless of orientation. Connectors must comply with applicable standards. Connectors must be fully closed and locked during use.

3M Connectors (snap hooks and carabiners) are designed to be used only as specified in each instruction manual. Ensure connectors are compatible with the system components to which they are connected. Do not use equipment that is non-compatible. Use of non-compatible components may cause the connector to unintentionally disengage (see Figure 3). If the connecting element to which a connector attaches is undersized or irregular in shape, a situation could occur where the connecting element applies a force to the gate of the connector (A). This force could then cause the gate to open (B), disengaging the connector from the connecting element (C).

2.8 MAKING CONNECTIONS: All connections must be compatible in size, shape, and strength. See Figure 4 for examples of inappropriate connections. Do not attach connectors:

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

B. In a manner that would result in a load on the gate. Large-throat snap hooks should not be connected to D-Rings or other connecting elements, unless the snap hook has a gate strength of 16 kN (3,600 lbf) or greater.

C. In a false engagement, where size or shape of the connector or connecting element is not compatible and, without visual confirmation, would seem to be fully engaged.

D. To each other.

E. Directly to harness webbing, lanyard leg material, or tie-back material unless such a connection is explicitly allowed for by the manufacturer instructions.

F. To any object whose size or shape does not allow the connector to fully close and lock, or that could cause connector roll-out.

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

Figure 3 - Connector Compatibility

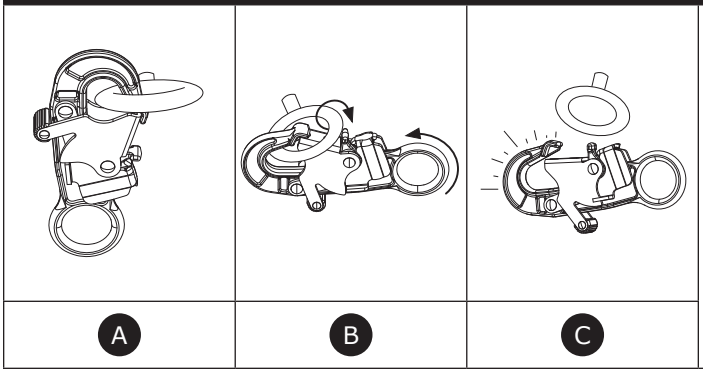
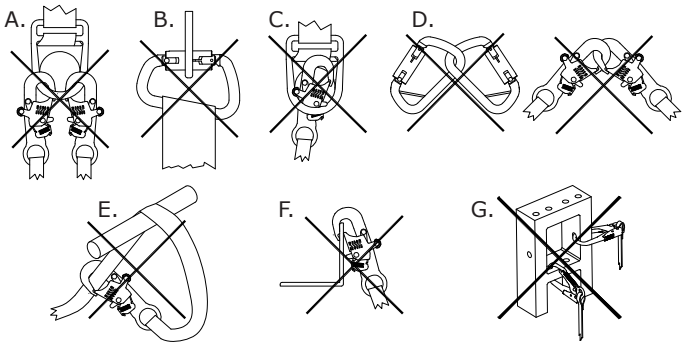


Figure 4 - Making Connections



3.0 INSTALLATION

3.1 OVERVIEW: Installing this product requires effective planning and knowledge of fall clearance requirements. In the event of a fall, there must be enough fall clearance present to safely arrest the user.

3.2 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 specified in these instructions.

A. SHARP EDGES: Avoid working where system components may be in contact with, or scrape against, unprotected sharp edges and abrasive surfaces. All sharp edges and abrasive surfaces should be covered with protective material.

☑ *Only SRD-LEs may be used for applications with unprotected sharp edges or abrasive surfaces.*

3.3 FALL CLEARANCE: It is critical that the user is aware of fall clearance and its requirements before using this product.

A. DEFINITION: Fall clearance is the measure of distance between a user and the next obstruction below them. Before use of this product, the user should determine how much fall clearance is required to prevent them from striking an obstruction should they fall.

A user's **Required Fall Clearance (FC) is the sum of Free Fall (FF), Deceleration Distance (DD), Harness Stretch (HS), and a Safety Factor (SF).** See Figure 5.1 for reference.

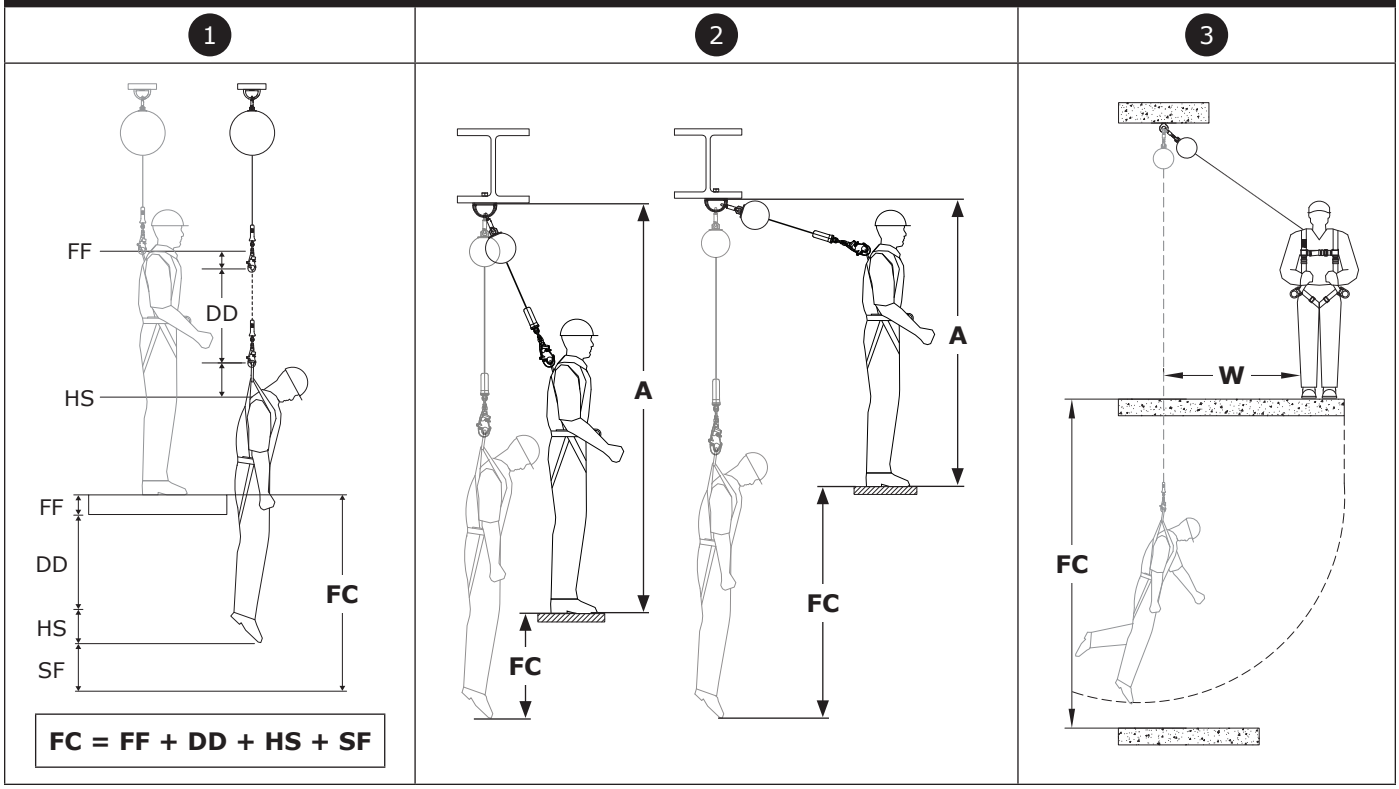
- **Free Fall (FF)** is the distance the user travels before activation of the deceleration device.
- **Deceleration Distance (DD)** is the distance the user falls measured from activation of the deceleration device until stopping.
- **Harness Stretch (HS)** is the amount of slack extending from the user's harness when the user is suspended by their harness attachment element.
- **Safety Factor (SF)** is a set amount of distance added to fall clearance to ensure user safety.

There may be additional factors affecting Required Fall Clearance within your Fall Arrest system, such as D-ring extension length and anchorage deflection. For coverage of these factors, and others not outlined above, refer to the manufacturer instructions for each component of your Fall Arrest system. Additional factors, when provided, should be added to the fall clearance values in this instruction.

B. MINIMIZING REQUIREMENTS: The user should always position their Fall Arrest system to minimize fall potential and potential fall distance. To keep fall clearance requirements to a minimum, it is recommended that the user work as directly below their anchorage point as possible.

- **ANCHORAGE HEIGHT:** The Required Fall Clearance (FC) for a user increases as Anchorage Height (A) decreases. The user experiences a greater amount of free fall when connected to an anchorage point below them, since the user will have to travel that much farther should they fall. See Figure 5.2 for reference.
- **SWING FALLS:** The Required Fall Clearance (FC) for a user increases as User Work Radius (W) increases. Swing falls occur when the anchorage point is not directly above the user when a fall occurs. See Figure 5.3 for reference. The force of striking an object during a swing fall could cause serious injury or death. Do not permit a swing fall if injury could occur.

Figure 5 - Fall Clearance Requirements



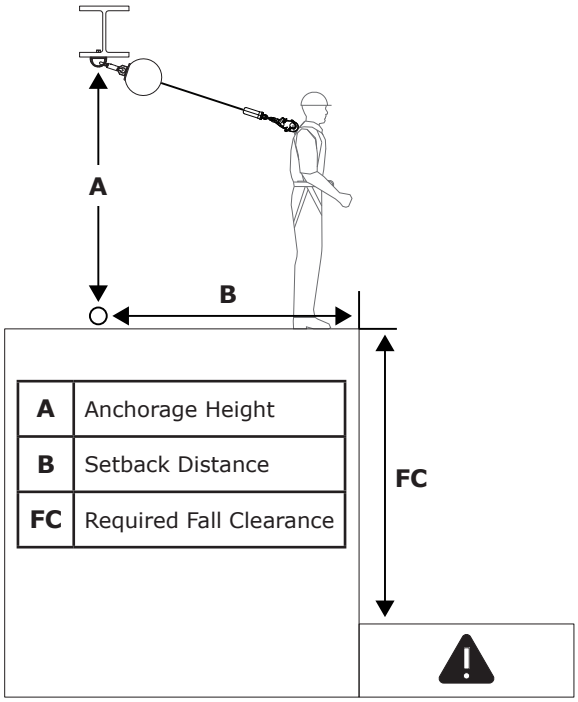
FALL CLEARANCE CHARTS

Required Fall Clearance has been provided within the charts below. To determine Required Fall Clearance:

1. Select the clearance chart that matches your product type and includes a capacity fitting your combined weight.
2. Determine the Anchorage Height (A) of your subsystem. Anchorage Height is measured from the top of the working platform to the bottom of your anchorage connection point.
3. Determine the Setback Distance (B) of your system. Setback Distance is measured from directly below your anchorage connection point to the edge of the working platform.
4. After obtaining your Anchorage Height (A) and Setback Distance (B), use (A) and (B) within the Fall Clearance Chart to determine your Required Fall Clearance (FC).

☑ *When values for (A) and (B) measured by the user do not match those listed in the table, the user should round up to the next highest listed value. If there is no higher listed value, then the user should reduce their intended Anchorage Height or Setback Distance to a lower value.*

☑ *A Safety Factor of 0.45 m (1.5 ft.) and a user height of 1.8 m (6.0 ft.) were used for all values listed. Kneeling or crouching will reduce effective user height and will require an additional 1.0 m (3.28 ft.) of Fall Clearance.*



A	Anchorage Height
B	Setback Distance
FC	Required Fall Clearance

Fall Clearance Chart #1 - 50 ft. (15.2 m) SRD Models

User Weight: 130-310 lb. (59-140 kg)		Ⓑ							
		0 ft. (0 m)	**3 ft. (0.9 m)**	**6 ft. (1.8 m)**	**9 ft. (2.7 m)**	**12 ft. (3.6 m)**	**15 ft. (4.6 m)**	**21 ft. (6.4 m)**	**27 ft. (8.2 m)**
Ⓐ	**<8 ft. (2.4 m)**	6 ft (1.8 m)							
	8 ft. (2.4 m)	6 ft (1.8 m)	8 ft (2.4 m)						
	10 ft. (3 m)	6 ft (1.8 m)	7 ft. (2.0 m)						
	15 ft. (4.6 m)	6 ft (1.8 m)	7 ft. (2.0 m)	8 ft (2.4 m)					
	20 ft. (6.1 m)	6 ft (1.8 m)	7 ft. (2.0 m)	8 ft (2.4 m)	9 ft (2.7 m)				
	25 ft. (7.6 m)	6 ft (1.8 m)	7 ft. (2.0 m)	7 ft. (2.0 m)	9 ft (2.7 m)	10 ft (3.0 m)			
	30 ft. (9.1 m)	6 ft (1.8 m)	7 ft. (2.0 m)	7 ft. (2.0 m)	8 ft (2.4 m)	9 ft (2.7 m)	11 ft. (3.4 m)		
	40 ft. (12.2 m)	6 ft (1.8 m)	7 ft. (2.0 m)	7 ft. (2.0 m)	8 ft (2.4 m)	9 ft (2.7 m)	10 ft (3.0 m)	12 ft (3.6 m)	
	50 ft. (15.2 m)	6 ft (1.8 m)	7 ft. (2.0 m)	7 ft. (2.0 m)	7 ft. (2.0 m)	8 ft (2.4 m)	9 ft (2.7 m)	11 ft. (3.4 m)	14 ft. (4.3 m)
		Ⓕⓒ							

Fall Clearance Chart #2 - 85 ft. (25.9 m) SRD Models

User Weight: 130-310 lb. (59-140 kg)		B											
		0 ft. (0 m)	**3 ft. (0.9 m)**	**6 ft. (1.8 m)**	**9 ft. (2.7 m)**	**12 ft. (3.6 m)**	**15 ft. (4.6 m)**	**21 ft. (6.4 m)**	**27 ft. (8.2 m)**	**33 ft. (10.1 m)**	**39 ft. (11.9 m)**	**45 ft. (13.7 m)**	**51 ft. (15.5 m)**
A	**<8 ft. (2.4 m)**	6 ft (1.8 m)											
	8 ft. (2.4 m)	6 ft (1.8 m)	8 ft (2.4 m)										
	10 ft. (3 m)	6 ft (1.8 m)	7 ft. (2.0 m)										
	15 ft. (4.6 m)	6 ft (1.8 m)	7 ft. (2.0 m)	8 ft (2.4 m)									
	20 ft. (6.1 m)	6 ft (1.8 m)	7 ft. (2.0 m)	8 ft (2.4 m)	9 ft (2.7 m)								
	25 ft. (7.6 m)	6 ft (1.8 m)	7 ft. (2.0 m)	7 ft. (2.0 m)	9 ft (2.7 m)	10 ft (3.0 m)							
	30 ft. (9.1 m)	6 ft (1.8 m)	7 ft. (2.0 m)	7 ft. (2.0 m)	8 ft (2.4 m)	9 ft (2.7 m)	11 ft. (3.4 m)						
	40 ft. (12.2 m)	6 ft (1.8 m)	7 ft. (2.0 m)	7 ft. (2.0 m)	8 ft (2.4 m)	9 ft (2.7 m)	10 ft (3.0 m)	12 ft (3.6 m)					
	50 ft. (15.2 m)	6 ft (1.8 m)	7 ft. (2.0 m)	7 ft. (2.0 m)	7 ft. (2.0 m)	8 ft (2.4 m)	9 ft (2.7 m)	11 ft. (3.4 m)	14 ft. (4.3 m)				
	60 ft. (18.3 m)	6 ft (1.8 m)	7 ft. (2.0 m)	7 ft. (2.0 m)	7 ft. (2.0 m)	8 ft (2.4 m)	8 ft (2.4 m)	10 ft (3.0 m)	13 ft. (3.8 m)	16 ft. (4.7 m)			
	70 ft. (21.3 m)	6 ft (1.8 m)	6 ft (1.8 m)	7 ft. (2.0 m)	7 ft. (2.0 m)	8 ft (2.4 m)	8 ft (2.4 m)	10 ft (3.0 m)	12 ft (3.6 m)	14 ft. (4.3 m)	17 ft. (5.2 m)		
	80 ft. (24.4 m)	6 ft (1.8 m)	6 ft (1.8 m)	7 ft. (2.0 m)	7 ft. (2.0 m)	7 ft. (2.0 m)	8 ft (2.4 m)	9 ft (2.7 m)	11 ft. (3.4 m)	13 ft. (3.8 m)	16 ft. (4.7 m)	19 ft. (5.8 m)	
	90 ft. (27.4 m)	6 ft (1.8 m)	6 ft (1.8 m)	7 ft. (2.0 m)	7 ft. (2.0 m)	7 ft. (2.0 m)	8 ft (2.4 m)	9 ft (2.7 m)	11 ft. (3.4 m)	13 ft. (3.8 m)	15 ft. (4.6 m)	18 ft. (5.3 m)	21 ft. (6.2 m)
		FC											

3.4 FALL CLEARANCE FOR LEADING EDGE: The SRD models covered by this instruction include models made for use with leading edges. Self-Retracting Devices with Leading Edge capabilities (SRD-LEs) must be used in applications where the SRD or its lifeline may come into contact with the leading edge. Do not use any other SRD type in these applications.

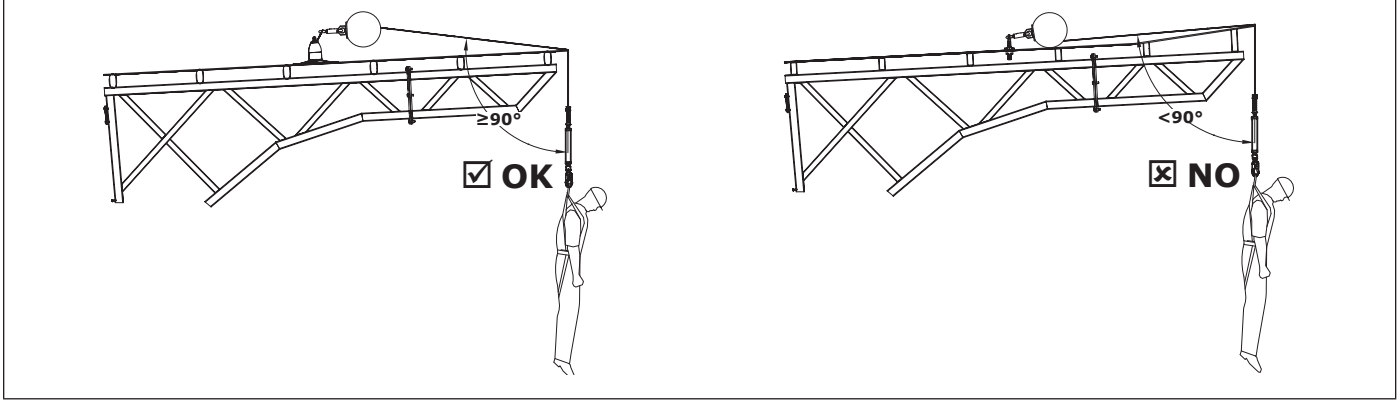
A. PRECAUTIONS: SRD-LEs have a number of unique precautions that must be observed during use. When planning use of an SRD-LE, consider all requirements for SRD-LEs specified in these instructions.

- Users must observe the capacity requirements specified for SRD-LE models in Table 1.
- The SRD-LE must be installed so that, in the event of a fall, the lifeline does not pass over the leading edge at an angle less than 90 degrees. See Figure 6 for reference.
- Install the anchorage point at the same height of or above the edge where a fall might occur. Anchorage points below the edge are dangerous because they cause the lifeline to redirect at an angle less than 90 degrees. See Figure 6 for reference.
- Do not work on the far side of an opening opposite the anchorage point.
- Use of SRD-LEs may require special rescue procedures.
- Never use a D-ring extension with SRD-LEs in leading edge applications.

B. SHARP EDGE TESTS: The SRD-LE models covered in this instruction have been successfully tested for horizontal use and for falls over a steel edge without burrs. As a result, these SRD-LE models may be used in similar situations. All requirements for use of these models must be observed, including required setback distances. Although SRD-LEs are more resistant than SRDs, the user should still, when possible, avoid working where the lifeline will continuously or repeatedly scrape against sharp edges and abrasive surfaces.

C. FALL CLEARANCE REQUIREMENTS: SRD-LE models have their own fall clearance requirements that must be observed. The SRD-LE fall clearance charts must be used for leading edge applications instead of the standard fall clearance charts. Use of the SRD-LE fall clearance charts is not a replacement for use of an SRD-LE.

Figure 6 - Angle of Redirection



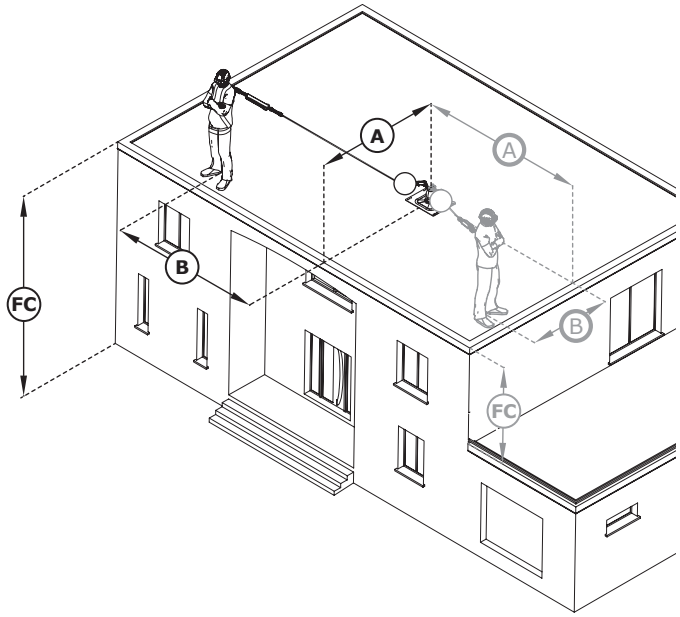
FALL CLEARANCE CHARTS - LEADING EDGE DEVICES (SRD-LE)

Required Fall Clearance has been provided within the charts below. To determine Required Fall Clearance:

1. Select the clearance chart that matches your product type and includes a capacity fitting your combined weight.
2. Determine the Setback Distance (A) of your subsystem. Setback Distance is measured from your anchorage connection point to the edge of the working platform.
3. Determine the Horizontal Distance (B) of your subsystem. Horizontal Distance is measured from the point on the edge directly opposite your anchorage connection point to the point on the edge that equals the furthest extent of your work area.
4. After obtaining your Setback Distance (A) and Horizontal Distance (B), use (A) and (B) within the Fall Clearance Chart to determine your Required Fall Clearance (FC).

☑ *When values for (A) and (B) measured by the user do not match those listed in the table, the user should round up to the next highest listed value. If there is no higher listed value, then the user should reduce their intended Anchorage Height or Setback Distance to a lower value.*

☑ *To determine the fullest extent of the user's work radius, it may be necessary to repeat these steps for each leading edge the user will be near.*



SRD-LE: 130-310 lb. (59-140 kg)		**B**								
		0 ft. (0 m)	**3 ft. (0.9 m)**	**6 ft. (1.8 m)**	**9 ft. (2.7 m)**	**12 ft. (3.6 m)**	**15 ft. (4.6 m)**	**21 ft. (6.4 m)**	**27 ft. (8.2 m)**	**33 ft. (10.1 m)**
A	**<8 ft. (2.4 m)**	17 ft. (5.0 m)								
	8 ft. (2.4 m)	17 ft. (5.0 m)	20 ft. (6.2 m)							
	10 ft. (3 m)	17 ft. (5.0 m)	19 ft. (5.9 m)							
	15 ft. (4.6 m)	17 ft. (5.0 m)	19 ft. (5.9 m)	19 ft. (5.9 m)						
	20 ft. (6.1 m)	17 ft. (5.0 m)	18 ft. (5.5 m)	19 ft. (5.9 m)	20 ft. (6.2 m)					
	25 ft. (7.6 m)	17 ft. (5.0 m)	18 ft. (5.5 m)	18 ft. (5.5 m)	19 ft. (5.9 m)	20 ft. (6.2 m)				
	30 ft. (9.1 m)	17 ft. (5.0 m)	18 ft. (5.5 m)	18 ft. (5.5 m)	19 ft. (5.9 m)	20 ft. (6.2 m)	21 ft. (6.4 m)			
	40 ft. (12.2 m)	17 ft. (5.0 m)	17 ft. (5.0 m)	18 ft. (5.5 m)	18 ft. (5.5 m)	19 ft. (5.9 m)	20 ft. (6.2 m)	22 ft. (6.8 m)		
	50 ft. (15.2 m)	17 ft. (5.0 m)	17 ft. (5.0 m)	17 ft. (5.0 m)	18 ft. (5.5 m)	18 ft. (5.5 m)	19 ft. (5.9 m)	21 ft. (6.4 m)	24 ft. (7.3 m)	
	60 ft. (18.3 m)	17 ft. (5.0 m)	17 ft. (5.0 m)	17 ft. (5.0 m)	18 ft. (5.5 m)	18 ft. (5.5 m)	19 ft. (5.9 m)	21 ft. (6.4 m)	23 ft. (6.9 m)	25 ft. (7.8 m)
		FC								

3.5 CONNECTING TO ANCHORAGE: Figure 7 illustrates typical SRD anchorage connections. The Anchorage (A) should be directly overhead to minimize free fall and swing fall hazards (see Section 3.3.B). Select an anchorage capable of sustaining the static loads defined in Table 1. Depending on system and product configuration, the user may secure the Top Connector (B) of the SRD directly to the anchorage structure or to an anchorage connector or anchorage connection point between.

3.6 CONNECTING TO A HARNESS: Connection of the SRD to a harness will vary per the harness and which attachment element is used. See Figure 8 for reference. To secure, connect the Bottom Connector (A) of the SRD to the Attachment Element (B) of the full body harness. For more information as to which attachment elements may be used, see the manufacturer instructions of your harness.

☑ *The "Product Overview" specifies for which Fall Protection applications your SRD model may be used. Ensure use of your harness complies with these requirements. A full body harness is required for Fall Arrest applications.*

Figure 7 - Connecting to Anchorage

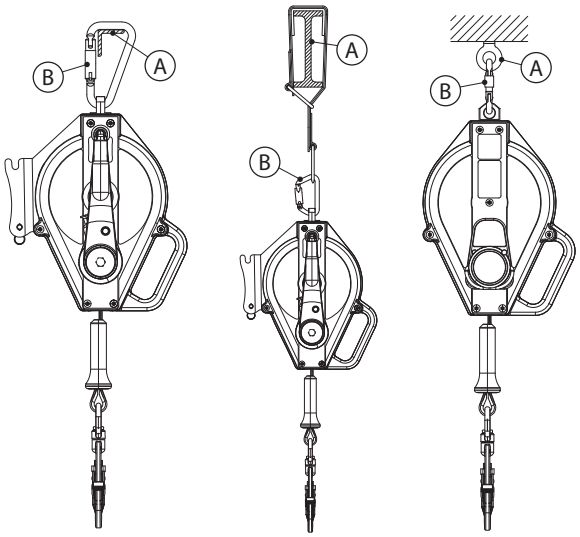
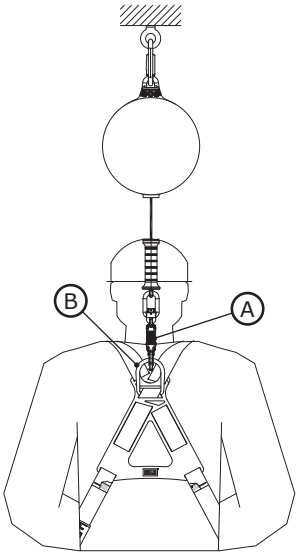


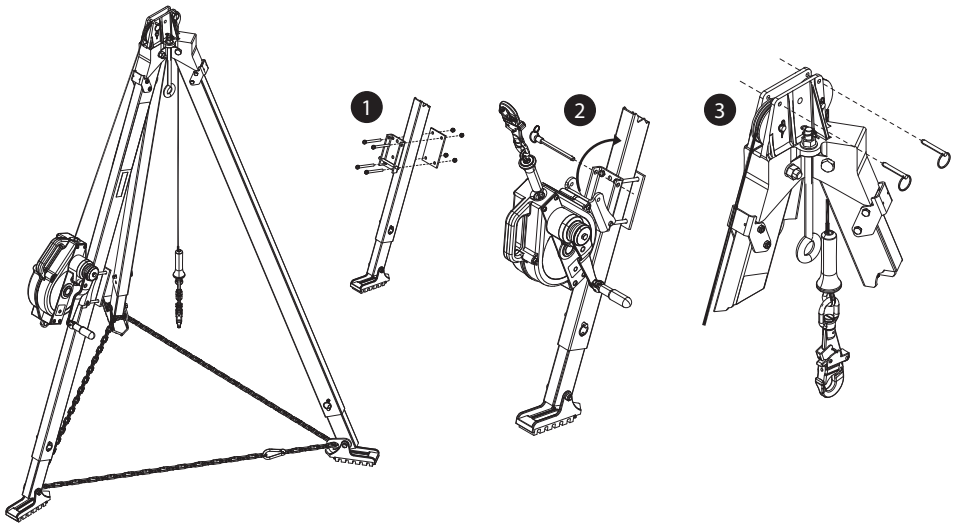
Figure 8 - Connecting to a Harness



3.7 MOUNTING ON A TRIPOD: Self-Retracting Device for Rescue (SRD-R) models covered in this instruction may be mounted onto a tripod by means of their mounting bracket. See Figure 9 for reference. To install the SRD-R on a tripod:

1. **Secure the tripod bracket on the leg of the tripod.** The user should refer to the manufacturer instructions of their tripod for more information on securing the tripod bracket.
2. **Secure the mounting bracket of the SRD-R on the tripod bracket.** Place the mounting bracket onto the tripod bracket, aligning the holes in the mounting bracket with the holes in the tripod bracket. Insert the mounting pin through the holes in both brackets to secure the mounting bracket to the tripod bracket.
3. **Route the lifeline of the SRD-R over the mounting pulleys within the head of the tripod.** Remove the two retainer pins from the head of the tripod. Position the lifeline between the grooves of the mounting pulleys. Reinsert the retainer pins within the head of the tripod.

Figure 9 - Mounting on a Tripod



4.0 USE

4.1 **BEFORE EACH USE:** Verify that your work area and Fall Protection system meet all criteria defined in these instructions. Verify that a formal Rescue Plan is in place. Inspect the product per the 'User' inspection points defined in the "Inspection and Maintenance Log". If inspection reveals an unsafe or defective condition, or if there is any doubt about its condition for safe use, remove the product from service immediately. Clearly tag the product "DO NOT USE". See Section 5 for more information.

4.2 **AFTER A FALL:** If this equipment is subjected to fall arrest or impact force, remove it from service immediately. Clearly tag it "DO NOT USE". See Section 5 for more information.

4.3 **OPERATION:** Before using an SRD, the worker will need to secure the SRD to an anchorage connection point and an attachment element on their full body harness. Once secured, the worker may move within the established safe working area at normal speeds. During use, always allow the SRD lifeline to recoil back into the device under control.

4.4 **TAGLINES:** Depending on the worksite and system configuration, the user may not always be able to reach the SRD at its anchor point. In these situations, a tagline may be necessary. A tagline is a long piece of cord that loops through the bottom connector of the SRD before looping back in on itself. When connected in this way, the user can raise or lower the bottom connector of the SRD to their location by pulling on the tagline.

☑ *Ensure the free end of the tagline does not become entangled with other workers, equipment, or machinery. If necessary, restrain the free end of the tagline.*

4.5 **USE WITH HORIZONTAL SYSTEMS:** The SRDs covered in this instruction are compatible for use with horizontal systems, such as Horizontal Lifeline (HLL) systems and horizontal rail systems. See the manufacturer instructions of your horizontal system for more information on its compatibility with SRDs. SRDs may be used with a horizontal system only if both products allow for such use.

☑ *Required Fall Clearance values presented in these instructions are based on use with a rigid, stationary anchorage point. These values do not apply when the product is used with a Horizontal Lifeline (HLL) system. See the manufacturer instructions of your HLL system for fall clearance charts specific to that system, or for additional factors that must be accounted for before using the charts in these instructions.*

4.6 **RETRIEVAL OPERATION:** The Retrieval Crank of an SRD-R may be used to raise or lower a suspended worker. To use the Retrieval Crank, you must first engage Retrieval mode, then rotate the Crank. See Figure 10 for reference. To activate Retrieval mode and use the Retrieval Crank:

1. Release the Retrieval Crank.
2. Flip the Crank Handle out from the SRD body into its engaged position.
3. Pull and hold the shift knob in the unlocked position.
4. Push the Crank Arm in and release the shift knob to engage Retrieval mode. If needed, rotate the Crank Arm clockwise to help engage the gear.
5. Turn the Retrieval Crank to either raise or lower the suspended worker.
   A. To raise: Turn the Retrieval Crank counterclockwise.
   B. To lower: First, turn the Retrieval Crank counterclockwise to release the fall arrest brake. Then, turn the Retrieval Crank clockwise to lower.

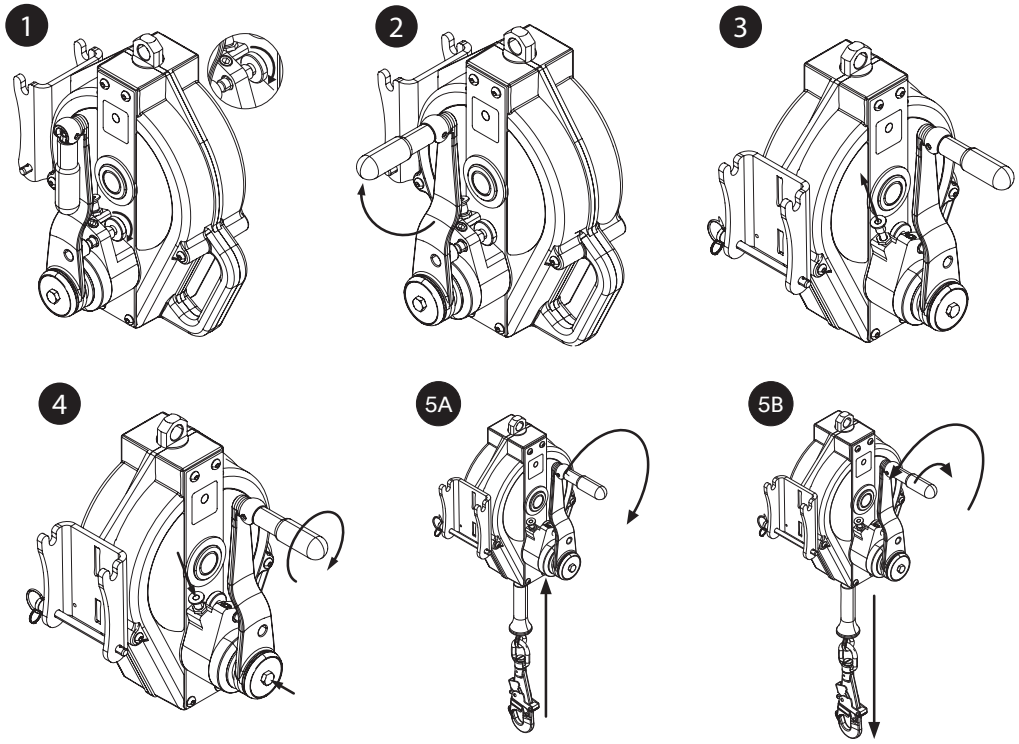
☑ *Do not attempt to operate Retrieval mode when the lifeline is fully retracted. Stop turning the crank as soon as the lifeline is fully retracted or extended.*

☑ *The Rescue Crank is for Rescue applications only. Do not use for any other purpose.*

☑ *3M SRD-Rs do not incorporate an overload clutch to limit forces exerted on the drive components and attached person. Avoid line slack while in Retrieval mode. If the attached worker becomes entangled on an obstruction during retrieval, ensure that the worker is not subjected to excessive force from continued lifting.*

☑ *A minimum load of 75 lb. (33.9 kg) is required to extend the lifeline. A force of 30 lbf (0.13 kN) is required to operate the retrieval system when loaded to capacity.*

Figure 10 - Retrieval Operation



4.7 RETRIEVAL DISENGAGEMENT: The SRD-R should always be disengaged from Retrieval mode after use. To disengage Retrieval mode:

☑ *When Retrieval mode is disengaged, the lifeline should fully retract into the SRD housing. To avoid possible injury, either maintain control of the lifeline or retract the lifeline before disengaging.*

1. Remove any load from the lifeline.
2. Pull and hold the shift knob in the unlocked position.
3. Pull the Crank Arm out to disengage, then release the shift knob.
4. Pull out and rotate the Crank Handle down toward the SRD body into its stowed position.

4.8 USING THE RSQ™ DESCENT KNOB: Some product models are equipped with an RSQ Descent Knob. The RSQ Descent Knob allows users to switch their product between fall arrest and descent modes.

- **Fall Arrest Mode:** In fall arrest mode, the product arrests the user's fall and keeps the user suspended.
- **Descent Mode:** In descent mode, the product controls the descent rate of the user to allow them to descend to a lower level after a fall occurs.

See Figure 11 for reference. To switch the descent knob between the two modes:

1. Pull the descent knob outwards. This will immediately engage descent mode.

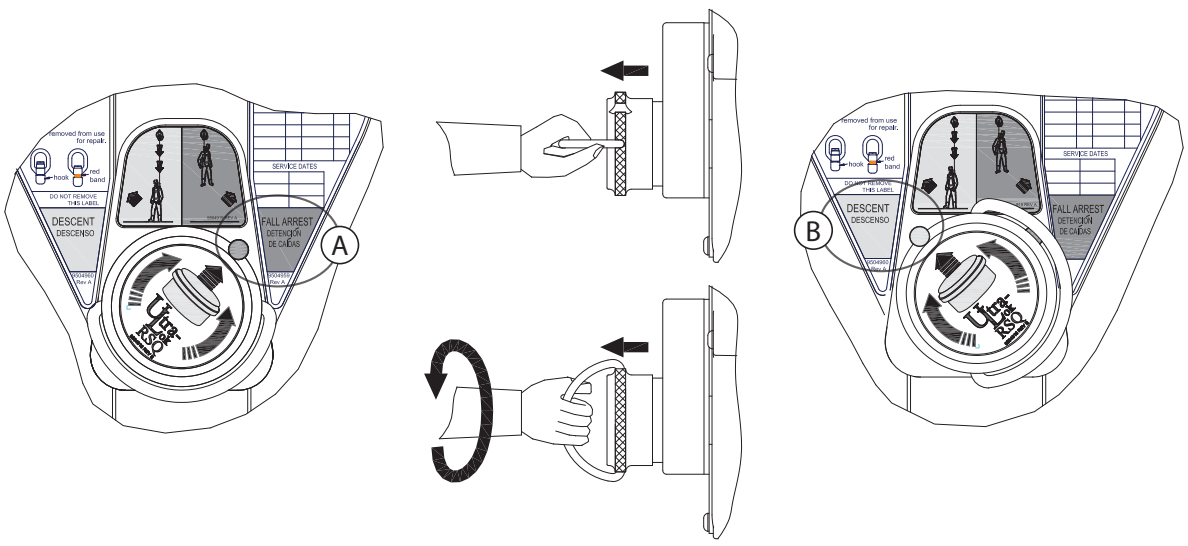
   ☑ *Never switch to descent mode while a user is secured unless that user is ready to descend.*

2. Rotate the descent knob until the arrow points to the selected mode, Fall Arrest (A) or Descent (B), and the knob clicks into the place. Releasing the knob will set the product to that mode.

   ☑ *The product will remain in descent mode unless the knob is set to fall arrest mode. All positions outside fall arrest mode are descent mode, including when the knob is pulled outwards and when it is set to a neutral position.*

   ☑ *80 lbf - 100 lbf (0.36 kN to 0.45 kN) of force is required to release the descent knob from fall arrest mode.*

Figure 11 - Using the RSQ Descent Knob



4.9 DESCENT APPLICATIONS: Product models with an RSQ Descent Knob may be used to lower users to a lower level or platform for rescue or escape. Descent may be initiated by the user or by an attendant, depending on the situation.

☑ *This product is designed for emergency fall arrest and descent. It may only be used for a single vertical descent. If the product is used for descent, remove it from service immediately.*

A. DESCENT KNOB: Descent may be initiated by setting the descent knob at descent mode. Alternatively, descent mode may be temporarily engaged from fall arrest mode by simply pulling the knob outwards, then releasing the knob at fall arrest mode when the user has finished descending.

☑ *For more information on switching between descent modes, see "Using the RSQ Descent Knob".*

B. ASSISTED RESCUE POLE: In situations where the descent knob is out of reach, the rescue pole (3500201, 3500202) may be used to initiate descent. See Figure 12 for reference. To initiate descent mode:

1. Insert the descent knob within the mouth of the rescue pole, so that the knob is between the two fork prongs.

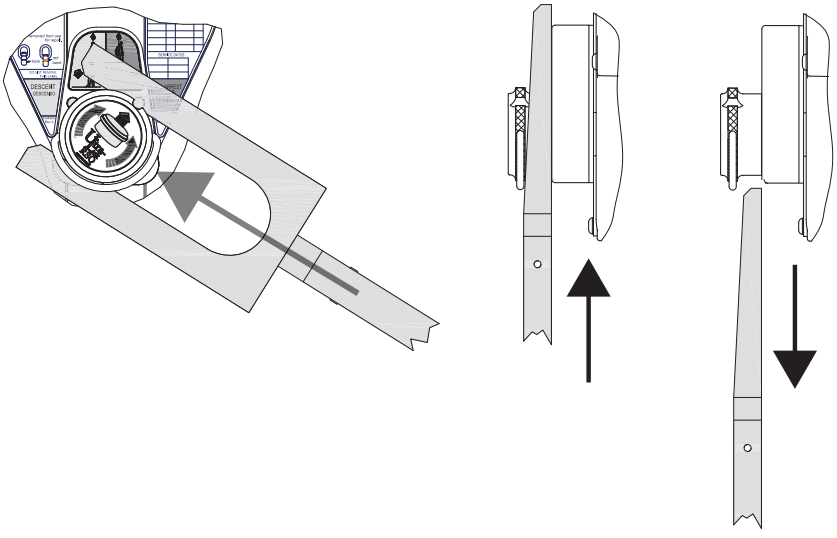
   ☑ *The rescue pole must be straight when inserting the descent knob. If the rescue pole is angled, it could damage the descent knob.*

2. Push the rescue pole forward until the descent knob is fully lodged within the pole's fork. This will cause the fork to pull the knob outwards and initiate descent.

   ☑ *The fork will naturally engage the descent knob because of its shape. Do not attempt to pry the knob.*

   ☑ *Releasing the descent knob will set the knob at its indicated position. If the knob has been pulled out from fall arrest mode, it will re-engage fall arrest mode upon release, as long as the knob has not been rotated.*

Figure 12 - Assisted Rescue Pole



5.0 INSPECTION

☑ *After equipment has been removed from service, it may not be returned to service until a Competent Person confirms in writing that it is acceptable to do so.*

5.1 **INSPECTION FREQUENCY:** The product shall be inspected before each use by a user and, additionally, by a Competent Person other than the user at intervals of no longer than one year. A higher frequency of equipment use and harsher conditions may require increasing the frequency of Competent Person inspections. The frequency of these inspections should be determined by the Competent Person per the specific conditions of the worksite.

5.2 **INSPECTION PROCEDURES:** Inspect this product per the procedures listed in the "Inspection and Maintenance Log". Documentation of each inspection should be maintained by the owner of this equipment. An inspection and maintenance log should be placed near the product or be otherwise easily accessible to users. It is recommended that the product is marked with the date of next or last inspection.

5.3 **DEFECTS:** If the product cannot be returned to service because of an existing defect or unsafe condition, then the product must be either destroyed or sent to 3M or a 3M-authorized service center for repair.

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

6.0 MAINTENANCE, STORAGE, AND REPAIR

☑ *Equipment that is in need of maintenance or scheduled for maintenance should be tagged "DO NOT USE". These equipment tags should not be removed until maintenance is performed.*

6.1 **CLEANING:** Periodically clean the lifeline and the exterior of the product with water and a mild soap solution. Rinse the product thoroughly and air dry. Clean labels as necessary. For more information, please refer to the technical bulletin on our website: *https://www.3M.com/FallProtection/Mechanical-Device-Cleaning*

6.2 **DISPOSAL:** Cut or otherwise disable the lifeline, then dispose of the product appropriately.

6.3 **REPAIR:** Only 3M or parties authorized in writing by 3M may make repairs to this equipment. Do not attempt to disassemble the product or lubricate any parts.

6.4 **STORAGE AND TRANSPORT:** Store and transport the product in a cool, dry, clean environment out of direct sunlight. Avoid areas where chemical vapors may exist. Thoroughly inspect components after extended storage.

7.0 LABELS and MARKINGS

7.1 **SUMMARY:** The "Product Labels" figure illustrates labels and markings present on the product. See below for a summary of information provided with each label and marking.

☑ *Label images are intended to be representative. Please refer to your product labels for specific information.*

☑ *Missing or damaged labels must be replaced. All labels must be fully legible.*

A	Product specifications label
B	Product use and specifications label (Model 3503884 only)
C	Warning statement - read all instructions. Inspection of reserve lifeline and impact indicator.
D	Inspection label
E	3M CSID label
F	Product logo label
G	Do not load the body of the SRD over an edge.
H	Lifeline inspection label
I	Rated for leading edge
J	Product use and specifications label
K	Retrieval crank use label
L	Retrieval crank activation label
M	RSQ Descent Knob label
N	RSQ modes label
O	Product logo label
P	Product specifications label
Q	Product use and specifications label
R	Product use and specifications label
S	Product use and specifications label

8.0 RFID Tag

8.1 **LOCATION:** 3M product covered in these user instructions is equipped with a Radio Frequency Identification (RFID) Tag. RFID Tags may be used in coordination with an RFID Tag Scanner for recording product inspection results. See "RFID Tag Location" for where your RFID Tag is located.

8.2 **DISPOSAL:** Prior to disposing of this product, remove the RFID Tag and dispose/recycle in accordance with local regulations. For more information, please visit our website: *http://www.3M.com/FallProtection/RFID*

9.0 GLOSSARY OF TERMS

9.1 **DEFINITIONS:** The following terms and definitions are used in these instructions.

☑ *For a comprehensive list of terms and definitions, please visit our website: www.3m.com/FallProtection/ifu-glossary*

- **AUTHORIZED PERSON:** A person assigned by the employer to perform duties at a location where the person will be exposed to a fall hazard.
- **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.
- **FALL ARREST SYSTEM:** A collection of Fall Protection equipment configured to protect the user in the event of a fall.
- **QUALIFIED PERSON:** A person with a recognized degree, certificate, or professional standing, or who by extensive knowledge, training, and experience has successfully demonstrated their ability to solve or resolve problems relating to Fall Protection and Rescue systems to the extent required by applicable national, regional, and local regulations.
- **RESCUER:** A person using the Rescue system to perform an assisted rescue.
- **RESTRAINT SYSTEM:** A collection of Fall Protection equipment configured to prevent the user from reaching a fall hazard. No free fall is permitted.
- **USER:** A person who performs activities while protected by a Fall Protection system.

Figure 13 - RFID Tag Location

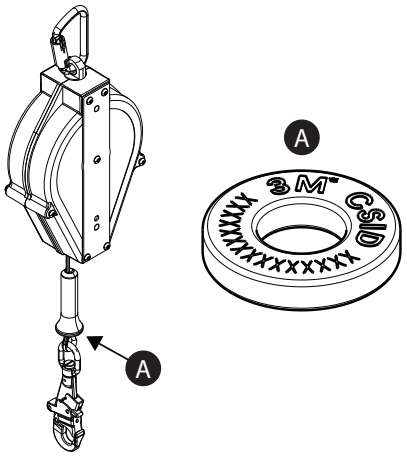


Figure 14 - Product Labels

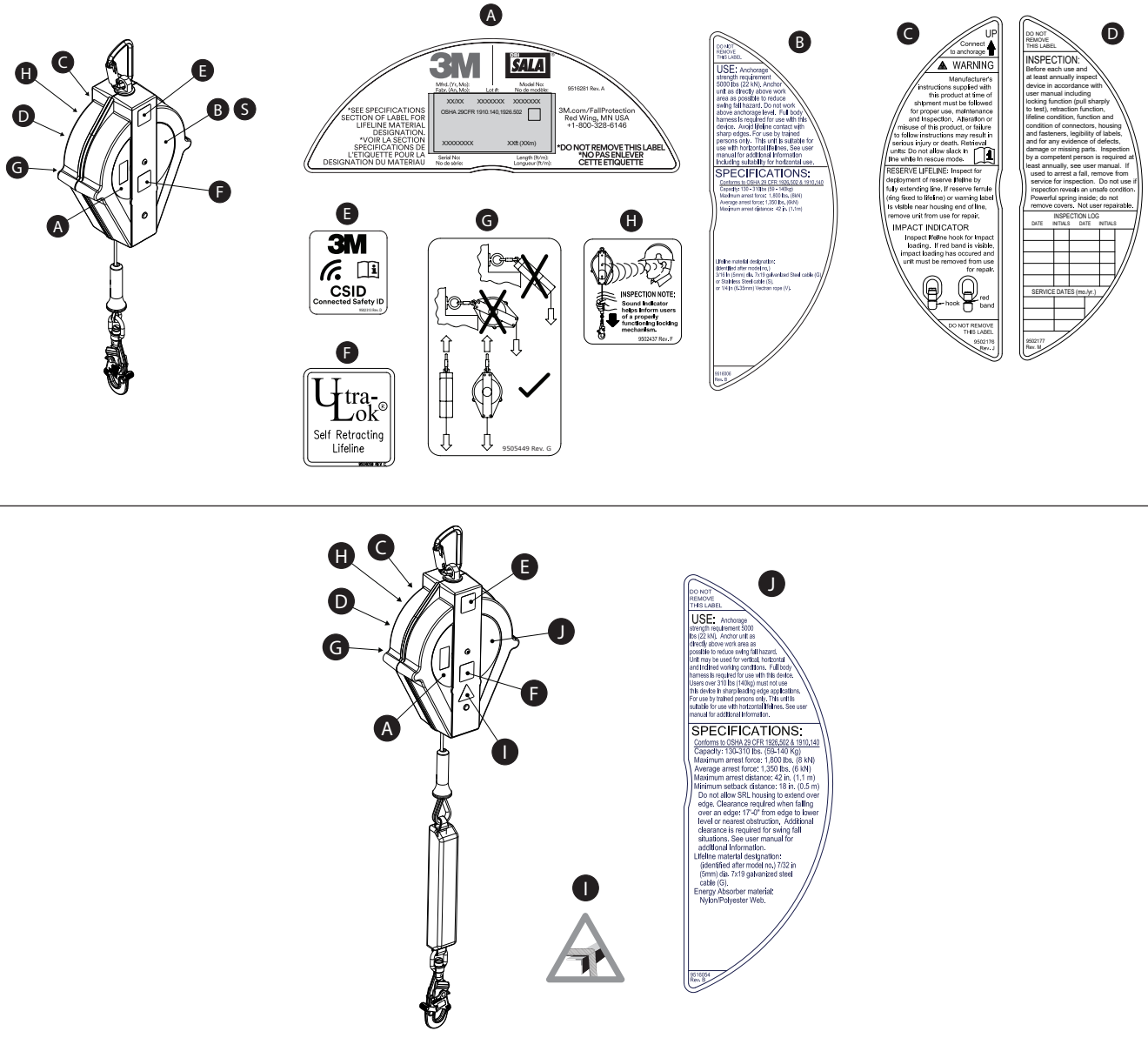
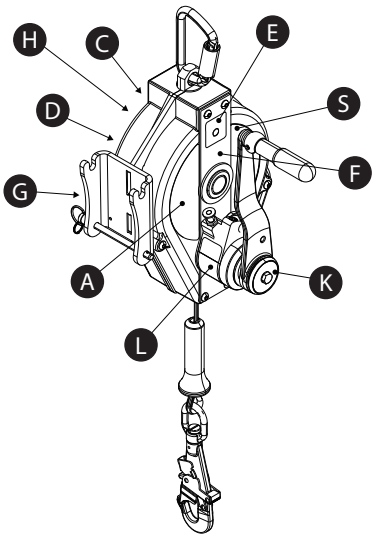
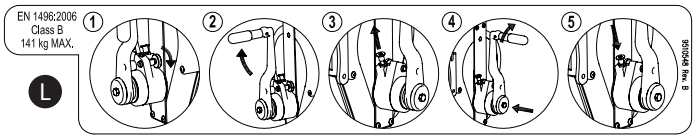
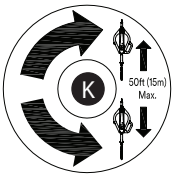
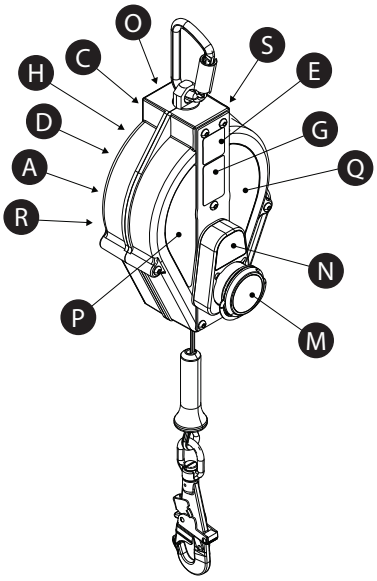


Figure 14 - Product Labels



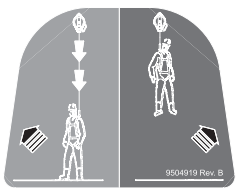






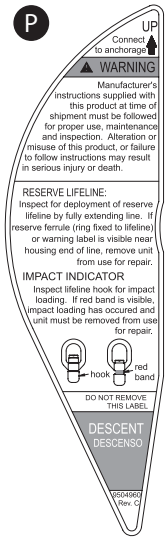
M

N

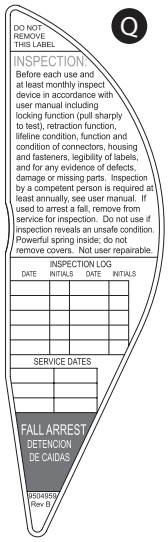


O

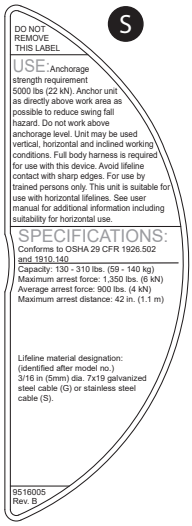
P



Q



S



R

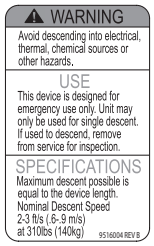


Table 2 – Inspection and Maintenance Log					
Model Number (Serial Number):					
Date Purchased:			**Date of First Use:**		
...					
☑ *This product must be inspected by the user before each use. Additionally, a Competent Person other than the user must inspect this equipment at least once each year.*					
...					
Component	**Inspection Procedure**			**Inspection Result**	
				Pass	**Fail**
SRD - General (Figure 15.1)	Inspect for loose bolts and bent or damaged parts.			☐	☐
	Inspect Housing (A) for distortion, cracks, or other damage.			☐	☐
	Inspect the Swivel Eye (B) for distortion, cracks, or other damage. The swivel eye should be attached securely to the SRD, but should pivot freely.			☐	☐
	The Lifeline (C) should pull out and retract fully without hesitation or creating a slack line condition.			☐	☐
	Ensure device locks up when lifeline is jerked sharply. Lockup should be positive with no slipping.			☐	☐
	Look for signs of corrosion on the entire unit.			☐	☐
Connectors (Figure 15.2)	Inspect all SRD connectors for signs of damage and corrosion. Verify that all connectors are working properly. Where present: Gates (A) should open, close, lock, and unlock properly; Swivel Eyes (B) should rotate without interference; and locking buttons and pins should function correctly.			☐	☐
Swivel Snap Hook and Impact Indicator (Figure 15.3)	Inspect the Impact Indicator. If a red band is shown and the swivel does not turn freely, then impact loading has occurred and the SRD must be removed from service. Do not attempt to reset the Impact Indicator. Return the SRD to an authorized service center for resetting.			☐	☐
Reserve Lifeline (Figure 15.4)	Inspect the reserve lifeline payout. Pull the lifeline out of the SRD until it stops. If a Warning Label or Red Band (X) is visible, the reserve lifeline is spent and the unit must be serviced by an authorized service center before reuse.			☐	☐
Wire Rope Lifeline (Figure 16)	Inspect wire rope for cuts, Kinks (A), Broken Wires (B), Bird-Caging (C), welding splatter, corrosion, chemical contact areas, or Severely-Abraded Areas (D). Slide the Lifeline Bumper (E) up and inspect the Ferrules (F) for damage. Replace the wire rope assembly if there are six or more broken wires in one revolution, or three or more broken wires in one strand in one revolution. Replace the assembly if there are any broken wires within 25 mm (1 in.) of the ferrules.			☐	☐
Synthetic Rope Lifeline (Figure 17)	Inspect rope for Abrasion (A), Cut Strands (B), Pulled Strands (C), Melting (D), Compression (E), Inconsistent Diameter (F), and Discoloration (G). Slide the Lifeline Bumper (H) up and inspect the area below for damage.			☐	☐
Energy Absorber (Figure 18)	Verify that the integral energy absorber has not been activated. Verify that the Lifeline Cover (A) has not pulled out from the Energy Absorber Cover (B) on either end. None of the Energy Absorber Webbing (C) should be exposed. The Energy Absorber Cover should also be secure and free of Tears (D) or other damage.			☐	☐
SRD-R (Figure 19)	Inspect the Crank Arm (A) for distortion or other damage. Ensure that the Retrieval Handle (B) can be folded out and secured in the cranking position.			☐	☐
	Ensure the Retrieval Shift Knob (C) can be pulled out to the unlocked position and then released, locking the Crank Arm in both the engaged and disengaged positions.			☐	☐
	Test the retrieval feature for proper operation by raising and lowering a test weight of at least 75 lb. (34 kg). When the Retrieval Handle is released, the weight should not move and the Retrieval Handle should remain in position. A 'click' sound should be heard when raising the load.			☐	☐
RSQ Descent Knob	A hand pull test should be performed on the descent knob. First, set the descent knob to descent mode. Then, grasp the lifeline and pull firmly to engage the descent mechanism. The person inspecting should pull out approximately 3 ft. (1 m) of the lifeline and must confirm that steady resistance is felt while pulling the lifeline.			☐	☐
Labels (Figure 14)	All labels are present and fully legible.			☐	☐
Fall Protection Equipment	Additional Fall Protection equipment that is used with the product is installed and inspected per the manufacturer instructions.			☐	☐
...					
☑ *If the product fails an inspection procedure, then the product fails overall inspection. If the product fails inspection, remove it from service immediately. Clearly tag the product "DO NOT USE". See Section 5 for more information.*					
...					
Inspection Type:	☐ User	☐ Competent Person	**Overall Inspection Result:**	☐ Pass	☐ Fail
Inspected By:			**Date of Inspection:**		
Signature:			**Next Inspection Due:**		
...					
Additional Notes:					

Figure 15 - General Inspection

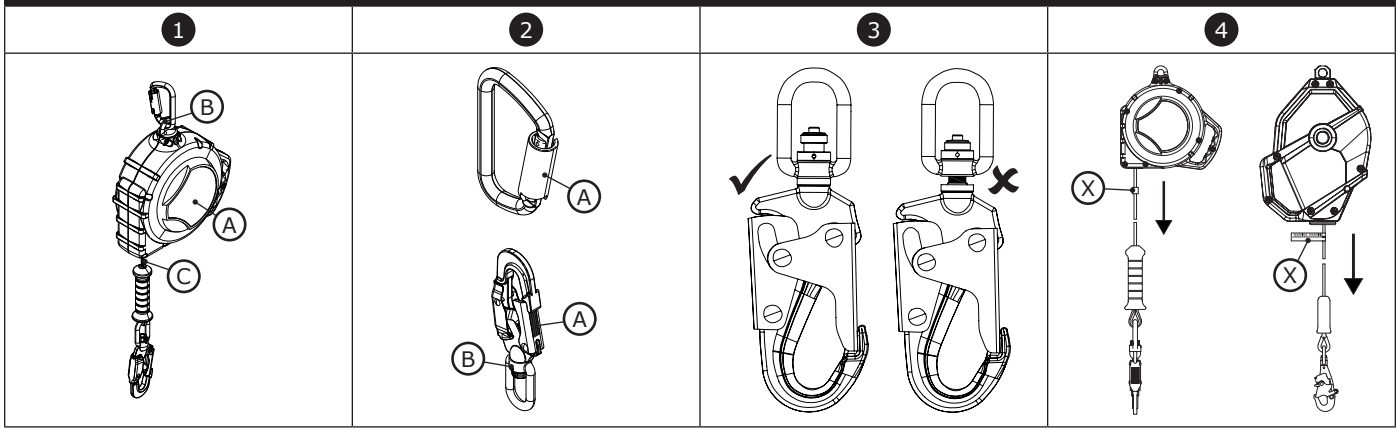


Figure 16 - Wire Rope Lifeline

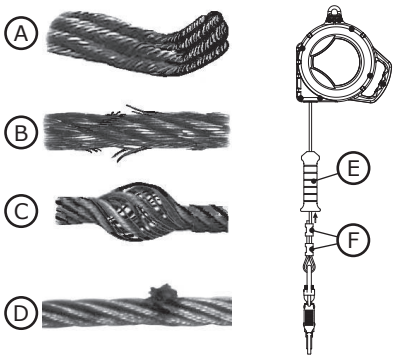


Figure 17 - Synthetic Rope Lifeline

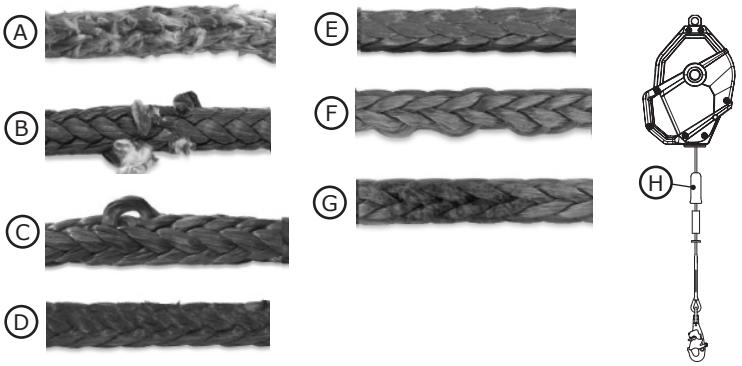


Figure 18 - Energy Absorber Inspection

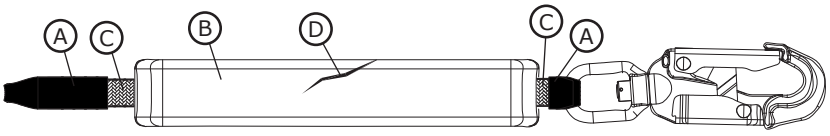
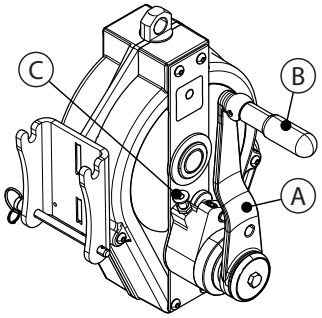


Figure 19 - SRD-R Inspection



PROTECTA

Fall Protection

OSHA 29 CFR 1910.140
OSHA 29 CFR 1926.502

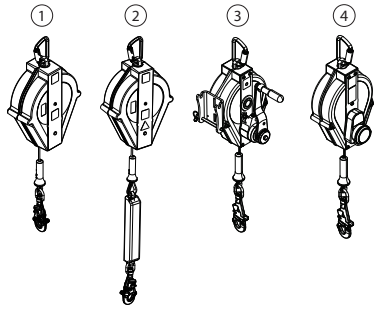
ULTRA-LOK
速差自控器 S

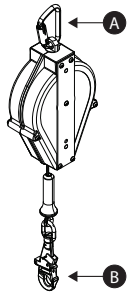
用户使用手册

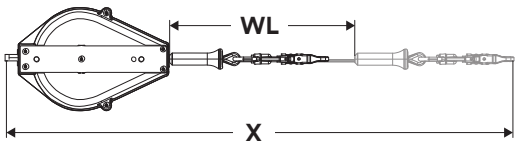
5908123 版本 C

☑ 有关产品代码的标识，请参阅表 1。有关更多产品信息，请参阅“表 1 – 产品规格”。

图 1 – 产品概述







型号		连接器		外壳尺寸	救生索	伸展长度 (X)	工作长度 (WL)
		A	B				
3503882	①	---	C2	规格 A	SS1	50 英尺（15.2 米）	49 英尺（14.9 米）
3503883	①	---	C3	规格 A	SR1	50 英尺（15.2 米）	49 英尺（14.9 米）
3503884	①	---	C2	规格 B	SS1	85 英尺（25.9 米）	84 英尺（25.6 米）
3503885	②	---	C3	规格 B	GS2	55 英尺（16.8 米）	53 英尺（16.2 米）
3503886	③	C1	C3	规格 C	GS1	50 英尺（15.2 米）	49 英尺（14.9 米）
3503887	③	C1	C2	规格 C	SS1	50 英尺（15.2 米）	49 英尺（14.9 米）
3503888	④	---	C3	规格 D	GS1	50 英尺（15.2 米）	49 英尺（14.9 米）
3503889	④	---	C2	规格 D	SS1	50 英尺（15.2 米）	49 英尺（14.9 米）

安全信息

在使用此产品之前，请阅读、理解并遵循这些说明书中包含的所有安全信息。否则可能会导致严重伤害或死亡。

说明书必须提供给装备的用户。请保留这些说明，以备将来参考。

预期用途：

该产品用作完整的坠落防护系统的一部分。

3M 不允许在任何其他应用（包括但不限于材料处理、娱乐或运动相关活动，或这些说明书中未描述的其他活动）中使用该产品，该行为可能会导致严重伤害或死亡。

本产品仅供经过培训的用户在工作场所应用中使用。

⚠ 警告

该产品用作完整的坠落防护系统的一部分。所有用户都必须接受完整的坠落悬挂系统的安全安装和操作培训。**误用本产品可能导致严重伤害或死亡。**有关正确的选择、操作、安装、维护和服务，请参阅所有使用说明书和制造商建议。如需更多信息，请咨询您的主管或联系 3M 技术服务部。

- **为了减少与使用速差自控器相关的风险（此类风险如不能避免，将导致重伤或死亡）：**
  - 在每次使用前和任何坠落事件后，请按照本说明书中规定的程序检查产品。
  - 如果检查发现有不安全或有缺陷的情况，应立即停止使用此产品，并明确标记“请勿使用”。按照这些说明书的要求销毁或修理产品。
  - 任何受到坠落悬挂或冲击力的产品必须立即停止使用。按照这些说明书的要求销毁或修理产品。
  - 确保由不同制造商制造的组件组装而成的坠落悬挂系统兼容并符合所有适用的坠落悬挂法规、标准或要求。在使用这些系统之前，一定要咨询合格或有资质的人员。
  - 确保产品免受所有危害，包括但不限于：与用户、其他工人、运动机械、周围的其他物体缠绕在一起，或被可能落在产品或用户身上的高空落物撞击。
  - 请勿扭曲、系结、打结或使救生索松弛。
  - 避免救生索支脚绊倒危险。将任何未使用的救生索腿带钩挂到全身系带上的救生索固定部件（如果有）。
  - 请勿超过这些说明书中允许的用户数量。
  - 不要在坠落路径受阻的应用中使用。锁定速差器需要畅通的路径。在缓慢移动的材料（例如沙子或粮食）上或封闭空间或受限空间内工作，可能无法让工人达到足够速度来锁定速差器。
  - 作业期间避免突然或快速移动，因为这可能导致 SRD 意外锁定。
  - 安装、使用或移动产品时要小心，因为移动部件可能会产生夹伤点。
  - 当产品可能接触锋利边缘或磨蚀表面时，使用适当的边缘保护。
  - 确保按照这些说明书正确配置和安装产品，以确保安全操作。

- **减少与高空作业有关的风险，如果不加以避免，可能导致严重的伤害或死亡：**
  - 您的健康和身体状况必须允许您安全地在高处工作，以及承受与防坠落事件相关的所有力量。如果您对使用此装备的能力有疑问，请咨询您的医生。
  - 切勿超过坠落悬挂装备的允许负载。
  - 切勿超过您的坠落悬挂装备允许的最大自由坠落距离。
  - 如果您对装备的使用或适用性有疑虑，请勿使用任何未通过检查的坠落悬挂装备。如有任何问题，请联系 3M 技术服务。
  - 某些子系统和组件组合可能会干扰本装备的运行。仅使用兼容的连接。在将此装备与这些说明书中未描述的组件或子系统结合使用之前，请联系 3M 技术服务部。
  - 在运动机械、电气危险、极端温度、化学危险、爆炸性或有毒气体、锋利边缘、磨蚀性表面或可能落到您或您的坠落悬挂装备上的架空材料下方工作时，请采取更多预防措施。
  - 确保根据产品在危险工作环境中的使用是通过评定的。
  - 确保高空作业时有足够的坠落间隙。
  - 切勿修改或更改您的坠落悬挂装备。只有 3M 或 3M 书面授权的人员可以维修 3M 装备。
  - 在使用坠落悬挂装备之前，请确保有书面的救援计划，以便在发生坠落事故时提供及时的救援。
  - 如果发生坠落事故，请立即为坠落的工人寻求医疗救助。
  - 在坠落悬挂应用中仅可使用全身式系带。请勿使用腰带。
  - 尽可能在锚点正下方工作，以尽量减少摆动坠落。
  - 使用本产品进行培训时，必须使用辅助坠落悬挂系统。学员不得暴露于意外跌倒的危险中。
  - 安装、使用或检查产品时，始终佩戴适当的个人防护装备。
  - 切勿在悬挂的负载或工人下方工作。
  - 始终保持 100% 钩挂。

☑ *始终确保您用的是最新版本的 3M 使用说明书。访问 www.3m.com/userinstructions 或联系 3M 技术服务以获取更新的使用说明书。*

产品概述：

图 1 说明了本说明所涵盖的产品型号。速差自控器（SRD）是一种可缩回到坚固外壳中的卷筒式救生索。

本说明涵盖以下 SRD 类型：

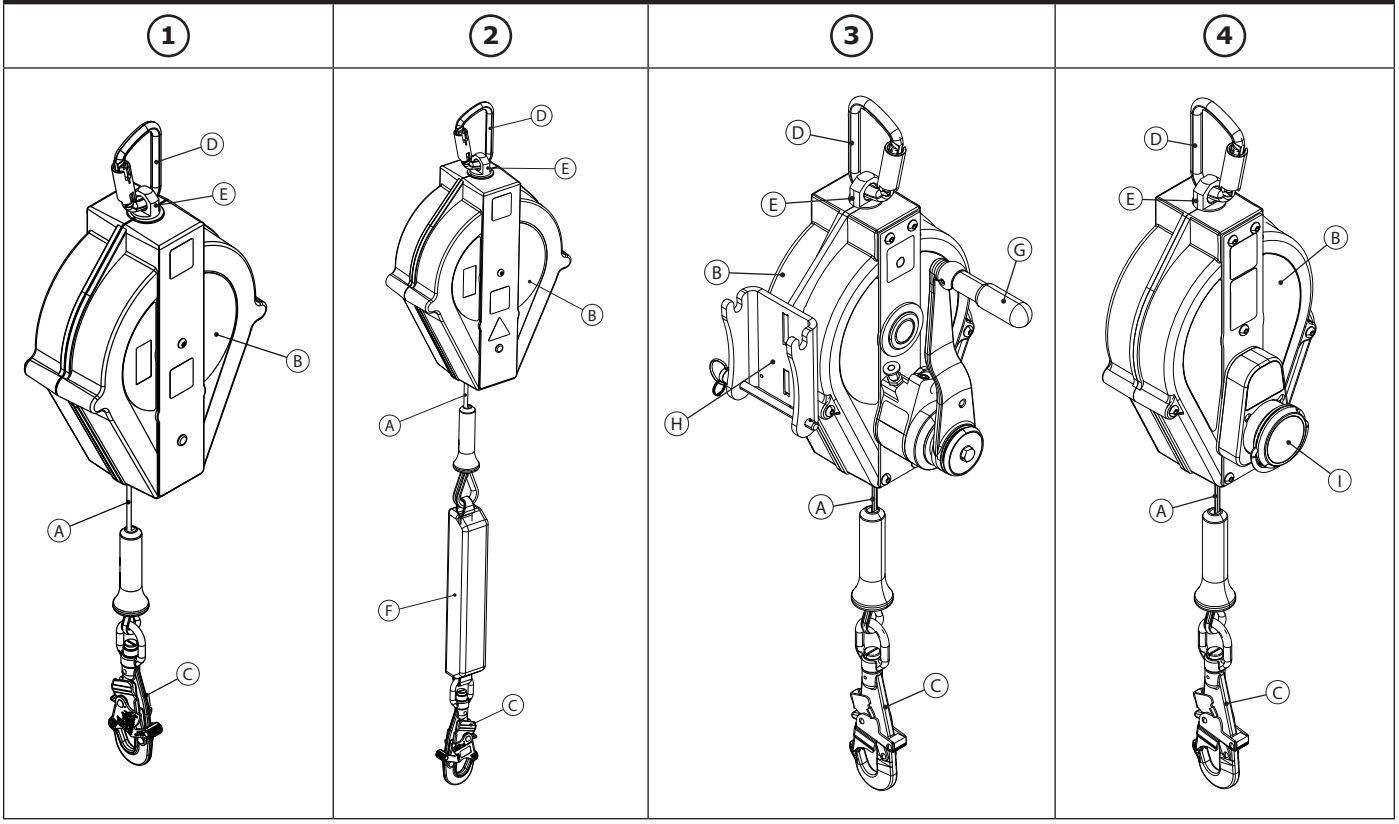
- **速差自控器（图 1.1、2.1）：**速差自控器 (SRD) 适用于救生索在使用过程中通常保持垂直的应用。这种类型可用于坠落悬挂应用。
- **临边速差自控器（图 1.2, 2.2）：**临边速差自控器 (SRD-LE) 适用于救生索在使用过程中基本保持水平的应用。SRD-LE 有一个一体式缓冲器，可承受坠落制动期间安全绳在尖锐或粗糙边缘上的冲击负载，从而最大限度降低用户承受的坠落制动力。这种类型可用于坠落悬挂应用。
- **带救援机构的速差自控器（图 1.3、1.4、2.3、2.4）：**带救援机构的速差自控器 (SRD-R) 包含一种通过提升或降低救援对象来协助救援的一体式工具。这种类型可用于坠落悬挂、限制或救援应用。

图 2 标识了可用 SRD 型号的关键部件。在标准 SRD 中，救生索 (A) 从外壳 (B) 伸出和缩回。SRD 上安装的顶部连接器 (D) 可将 SRD 固定到挂点，并通过旋转环眼 (E) 使安全钩与 SRD 连接。底部连接器 (C) 固定在救生索的末端并连接至用户全身式安全带指定的坠悬挂连接元件上。缓冲器 (F) 可在防坠落过程中消散动能并限制减速力。

本说明中介绍的 SRD-R 型号包括一些附加部件。旋转手柄 (G) 用于在底部连接器 (C) 固定到救援对象的安全带上后收回救生索 (A)。支架 (H) 使 SRD-R 能够在使用过程中安装到三脚架上。一些 SRD-R 型号包括一个 RSQ™ 下降旋钮 (I)，可供用户在防坠落或下降模式之间进行切换。

每个产品型号都有自己特定的尺寸和部件组合，如图 1 所示。有关部件规格的更多信息，请参见表 1。

图 2 – 部件



☑ *在使用本装备之前，将 ID 标签上的产品识别信息记录在本手册背面的“检查和维护日志”中。*

表 1 – 产品规格

系统规格：

挂点：

根据系统应用，以及是否是经过认证的挂点，挂点结构要求有所区别。挂点结构必须承受沿挂点连接器允许的方向施加的静态载荷。

系统应用	认证挂点	非认证挂点	定义条件
坠落悬挂	2 倍最大制动力	5000 磅力（22.2 千牛）	ANSI Z359 OSHA 29 CFR 1910.140，1926.502
限制	2 倍可预见力	1,000 磅力（4.4 千牛）	ANSI Z359
		5000 磅力（22.2 千牛）	OSHA 29 CFR 1910.140，1926.502
围杆作业	2 倍可预见力	3,000 磅力(13.3 千牛)	ANSI Z359 OSHA 29 CFR 1910.140，1926.502
救援	5 倍外加负荷	3,000 磅力(13.3 千牛)	ANSI Z359

当挂点连接不止一套系统时，上述强度必须乘以挂点连接的系统的数量。如需了解更多信息，请参见 ANSI/ASSP Z359.2。

☑ *挂点必须得到合格人员的批准。*

标准： 每个产品型号都经过认证或符合图 1 中列出的适用标准和法规。如果未指定，则适用封面上列出的所有标准和法规。

负载能力： 有关产品负载能力，请参阅性能表。除非另有说明，否则所列负载能力适用于所有兼容应用中的产品。本产品供一名使用者使用，其总重量（包括衣物、工具等）在适用的负载能力范围内。

组件规格：

图 2 参考	组件	材料
Ⓐ	救生索	（参见救生索规格）
Ⓑ	外壳	热塑性聚氨酯或铸造铝合金
Ⓒ	底部连接器	（见连接器规格）
Ⓓ	顶部连接器	（见连接器规格）
Ⓔ	旋转环眼	不锈钢或镀锌钢
Ⓕ	缓冲器	聚酯织物和聚氨酯外罩，带缓冲织带
Ⓖ	旋转手柄	不锈钢臂，带橡胶手柄
Ⓗ	支架	镀锌钢或铝
Ⓘ	RSQ™ 下降旋钮	铝合金

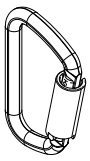
☑ ***内部组件：****速差器内部组件由不锈钢、钢和铝组合制成。*

表 1 – 产品规格

连接器规格：

图 1 参考	型号	描述	材料	活门开口	活门强度
C1	2000112	安全钩	钢	11/16 英寸（17 毫米）	3,600 磅力（16 千牛）
C2	2100044	旋转弹簧钩	不锈钢	3/4 英寸（19 毫米）	3,600 磅力（16 千牛）
C3	9502194	旋转弹簧钩	镀锌钢	3/4 英寸（19 毫米）	3,600 磅力（16 千牛）

☑ ***抗拉强度：****上面列出的每个连接器的抗拉强度为 22.2 千牛（5,000 磅力）。*

C1	C2	C3
		

救生索规格：

图 1 参考	描述
GS1	3/16 英寸（5 毫米）镀锌钢缆
GS2	7/32 英寸（5.5 毫米）镀锌钢缆
SR1	1/4 英寸（6 毫米）Vectran 绳
SS1	3/16 英寸（5 毫米）不锈钢缆

表 1 – 产品规格

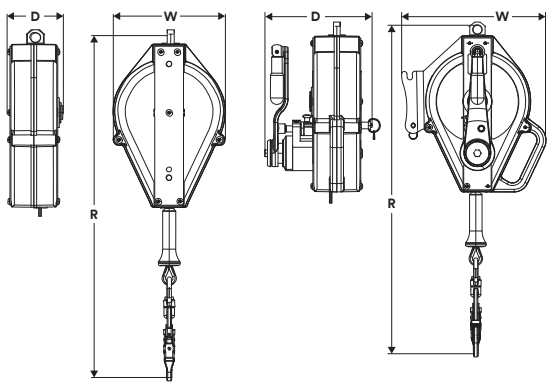
性能 – SRD	OSHA 29 CFR 1910.140，1926.502
承重范围：	130 磅 – 310 磅（59 千克 – 140 千克）
最大制动力：	1,350 磅力（6 千牛） [1,800 磅力（8 千牛），用于 3503884]
平均制动力：	900 磅力（4 千牛） [1,350 磅力（6 千牛），用于 3503884]
最大制动距离： ** 假设 SRD 安装在用户正上方。*	42 英寸（1.1 米）
最大减速度距离： ** 假设 SRD 安装在用户正上方。*	42 英寸（1.1 米）
所需最小坠落间隙： ** 假设 SRD 安装在用户正上方。*	6 英尺（1.8 米）
最大自由坠落距离： **SRD 必须安装在用户 D 形环上方。*	2 英尺（0.6 米）

性能 – SRD-LE	OSHA 29 CFR 1910.140，1926.502
承重范围：	130 磅 – 310 磅（59 千克 – 140 千克）
最大制动力：	1,800 磅力（8 千牛）
平均制动力：	1,350 磅力（6 千牛）
最大制动距离： ** 假设 SRD 安装在用户正上方。*	42 英寸（1.1 米）
最大减速度距离： ** 假设 SRD 安装在用户正上方。*	42 英寸（1.1 米）
所需最小坠落间隙：	垂直：6 英尺（1.8 米） 水平：15 英尺（4.5 米）
最大自由坠落距离： **SRD 必须安装在用户 D 形环上方。*	2 英尺（0.6 米）
最大自由坠落距离 – LE： ** 从用户的 D 形环到工作面的测量值。*	5 英尺（1.5 米）

性能 – SRD-R	OSHA 29 CFR 1910.140，1926.502
承重范围：	130 磅 – 310 磅（59 千克 – 140 千克）
最大制动力：	1,350 磅力（6 千牛）
平均制动力：	900 磅力（4 千牛）
最大制动距离： ** 假设 SRD 安装在用户正上方。*	42 英寸（1.1 米）
最大减速度距离： ** 假设 SRD 安装在用户正上方。*	42 英寸（1.1 米）
所需最小坠落间隙： ** 假设 SRD 安装在用户正上方。*	6 英尺（1.8 米）
最大自由坠落距离： **SRD 必须安装在用户 D 形环上方。*	2 英尺（0.6 米）
最大提升负载：	310 磅（140 千克）

尺寸：

图 1 参考	D	W	R
规格 A	3.4 英寸 （8.64 厘米）	7.9 英寸 （20.0 厘米）	11.6 英寸 （29.47 厘米）
规格 B	4.3 英寸 （10.92 厘米）	10.6 英寸 （26.9 厘米）	13.3 英寸 （33.8 厘米）
规格 C	7.2 英寸 （18.3 厘米）	10.5 英寸 （26.7 厘米）	11.5 英寸 （29.2 厘米）
规格 D	5.9 英寸 （15.1 厘米）	9.1 英寸 （23.2 厘米）	11.6 英寸 （29.47 厘米）



1.0 产品应用

1.1 **目的：**3M 速差自控器（SRD）设计用作坠落防护系统中的连接子系统。钩挂完成后，救生索会随着工人的移动而自动伸缩。如果发生坠落，感测机构会激活装置并阻止坠落。有关系统应用的更多信息，请参阅“产品概述”和表 1。

1.2 **监督：**本装备必须在合格人员的监督下使用。

1.3 **标准：**您的产品符合这些说明书封面上标明的国家或地区标准。如果本产品在原目的地国家 / 地区以外转售，转售商必须以产品使用所在国家 / 地区的语言提供说明书。

> ☑ *有关认证或一致性要求的更多信息，请参阅为您的产品列出的适用标准和法规（例如 ANSI/ASSP Z359 坠落悬挂代码）。*

1.4 **培训：**该装备必须由受过正确应用培训的人员安装和使用。根据国家、地区或地方标准的要求，这些说明书将用作员工培训计划的一部分。本装备的用户和安装者有责任确保其熟悉说明书，接受过正确维护和使用本装备的培训，并了解本装备的操作特性、应用限制和不当使用本装备的后果。

1.5 **救援计划：**使用此装备和连接子系统时，雇主必须有书面的救援计划以及实施该计划的方法，并将该计划传达给用户、授权人员和救援人员。推荐训练有素的现场救援队。应为团队成员提供成功救援所需的装备和技术。应定期提供培训以确保救援人员的熟练程度。应向救援人员提供这些说明书。在救援过程中，应始终与被救援人员进行视觉接触或交流。

2.0 系统要求

2.1 **挂点：**挂点要求因坠落防护应用而异。放置设备的安装结构必须符合表 1 中定义的挂点规范。

2.2 **负载能力：**一个完整的坠落防护系统的用户负载能力，受其额定最大负载能力最低的部件的限制。例如，如果您的连接子系统的负载能力小于安全带，则您必须遵守连接子系统的负载能力要求。有关负载能力要求，请参阅系统每个组件的制造商说明书。

2.3 **环境危险：**在有环境危险的区域使用本装备可能需要额外的预防措施，以防止对用户造成伤害或损坏装备。危险可能包括但不限于：高温、化学品、腐蚀性环境、高压电力线、爆炸性或有毒气体、运动机械、锋利边缘或可能掉落并接触用户或装备的架空材料。如需进一步的说明，请联络 3M 技术服务部门。

2.4 **安全绳危害：**确保安全绳免受所有危害，包括但不限于：与用户、其他工人、运动机械、周围的其他物体纠缠在一起，或被可能落在救生索或用户身上的高空物体撞击。

2.5 **下落路径和 SRD 锁定速度：**不要在坠落路径受阻的应用中使用。锁定速差器需要畅通的路径。在缓慢移动的材质（例如沙子或粮食）上或有限空间内工作，可能无法让工人达到足够速度来锁定速差器。

2.6 **组件兼容性：**3M 设备设计为与 3M 设备搭配使用。与非 3M 装备一起使用必须得到合格人员的批准。使用未经批准的装备进行替换可能会危及装备兼容性，并可能影响您的坠落悬挂系统的安全性和可靠性。在使用前阅读并遵循所有设备的所有说明和警告。

2.7 **连接器兼容性：**当任一组件的尺寸和形状不会导致连接器意外滑脱时，无论方向如何，连接器都与连接元件兼容。连接器必须符合适用标准。连接器在使用过程中必须完全关闭并锁闭。

3M 连接器（挂钩和安全钩）设计为仅按照每本使用说明书中的规定使用。确保连接器与其所连接的系统组件兼容。请勿使用不兼容的装备。使用不兼容的组件可能会导致连接器意外滑脱（参见图 3）。如果连接器所附接的连接元件尺寸过小或形状不规则，则可能发生连接元件向连接器 (A) 的活门施加力的情况。该作用力可能会造成活门打开 (B)，进而使连接器从连接元件 (C) 脱落。

2.8 **连接：**所有连接器都必须在尺寸、形状和强度上全面兼容。请参见图 4 查看连接不当的示例。请勿连接连接器：

A. 连接到已连接另一个连接件的 D 形环。

B. 以会给活门带来负载的方式连接。大型喉状弹簧挂钩不得连接到 D 形环或其他连接元件，除非弹簧挂钩具有 16 千牛（3,600 磅力）的活门强度。

C. 以错误的啮合方式连接时，连接件或连接元件的尺寸和形状不兼容，在未经目视确定的情况下，它们看起来好像完全啮合一样。

D. 相互连接。

E. 直接用于线束织带、挂绳腿材料或系带材料，除非制造商说明明确允许此类连接。

F. 连接到尺寸或形状不允许连接件完全闭合并锁定，或可能导致连接件滑出的任何物体。

G. 以使连接件在负载情况下无法正确对齐的方式进行连接。

图 3 – 连接件兼容性

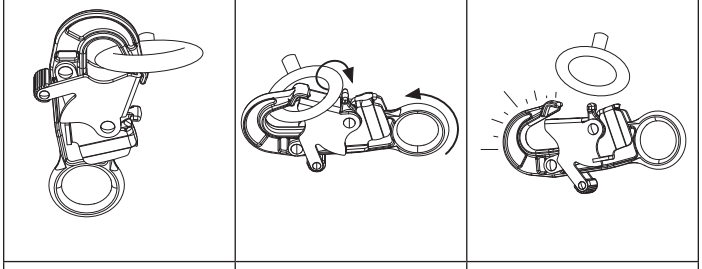
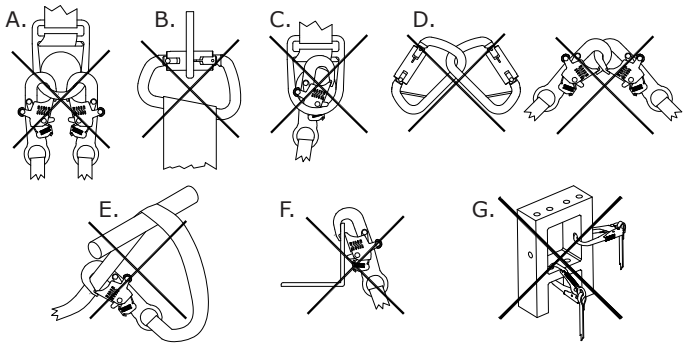


图 4 – 建立连接



3.0 安装

3.1 **概述：**安装本产品需要有效规划和了解坠落间隙要求。如果发生坠落，必须有足够的坠落间隙以安全地拦阻用户。

3.2 **规划：**在开始工作之前规划好您的坠落防护系统。考虑在坠落之前、期间和之后可能影响安全的所有因素。考虑这些说明中规定的所有要求和限制。

A. 锋利边缘：避免在系统部件可能接触或刮擦无保护锋利边缘和磨蚀表面的地方工作。所有锋利的边缘和磨蚀表面都应覆盖保护材料。

☑ *只有 SRD-LE 可用于具有未受保护的锋利边缘或磨蚀性表面的应用。*

3.3 **坠落间隙：**用户必须在使用本产品之前了解坠落间隙及其要求。

A. 定义：坠落间隙是用户与其下方下一个障碍物之间距离的度量。在使用本产品之前，用户应确定需要多大的坠落间隙，以防止在坠落时撞到障碍物。

用户的**所需的坠落间隙 (FC) 是自由坠落距离 (FF)、减速距离 (DD)、系带拉伸 (HS) 和安全系数 (SF) 的和。**请参见图 5.1。

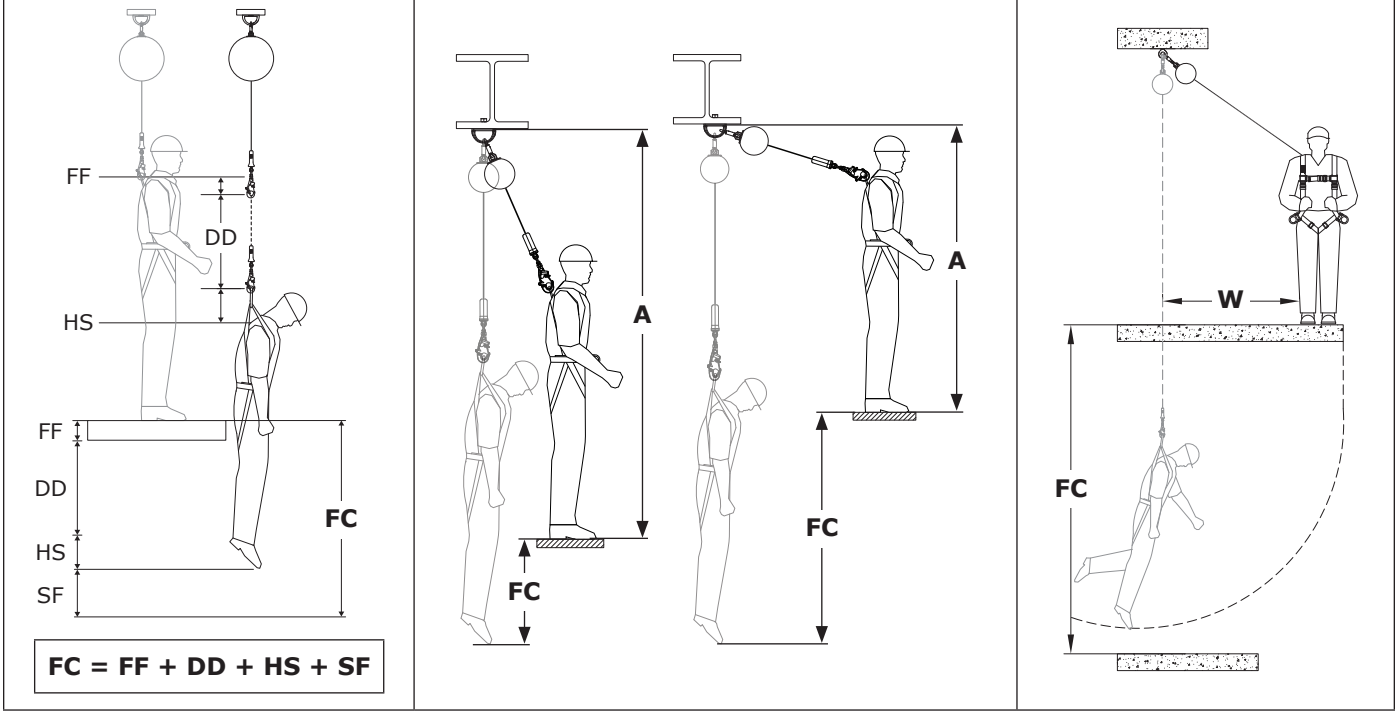
- **自由坠落 (FF)** 是用户在减速装置启动之前移动的距离。
- **减速距离 (DD)** 是从减速装置启动到停止测得的用户坠落距离。
- **系带拉伸 (HS)** 是当用户通过其系带连接元件悬吊时，从用户系带伸出的松弛长度。
- **安全系数 (SF)** 是为确保用户安全而添加到坠落距离的设定距离。

可能还有其他因素会影响您的坠落防护系统的坠落间隙要求，例如 D 形环拉伸长度和挂点的变形量。有关这些因素以及上面未列出的其他因素，请参阅坠落防护系统每个部件的制造商说明。如果提供了其他因素，则应将其添加到本说明中的坠落间隙值中。

B. 最大限度降低要求：用户应不断调整坠落防护系统，以尽量降低坠落的可能性和缩短可能的坠落距离。为将坠落间隙要求降至最低，建议用户尽可能在其挂点正下方工作。

- **挂点高度：**用户所需的坠落间隙 (FC) 随着挂点高度 (A) 的降低而增加。当连接到身体下方的挂点时，用户的自由坠落距离会变大，因为他们的坠落距离将远大于理论距离。请参见图 5.2。
- **摆动坠落：**用户所需的坠落间隙 (FC) 随着用户工作半径 (W) 的增加而增加。当挂点不在用户正上方发生坠落时，就会发生摆动坠落。请参见图 5.3。在摆动坠落过程中，撞击物体的力量可能会导致严重伤害或死亡。如果可能会造成伤害，请勿允许发生摆动坠落。

图 5 – 坠落间隙要求



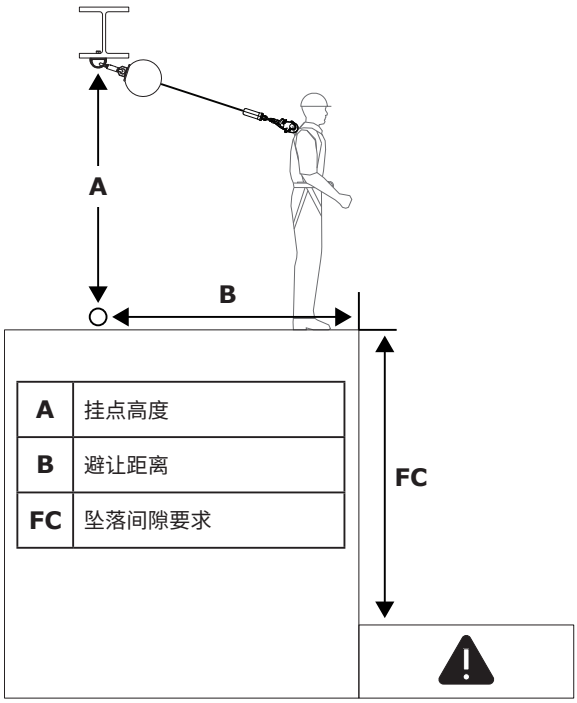
坠落间隙图表

下列图表中提供了所需的坠落间隙。要确定所需的坠落间隙：

1. 选择与您的产品类型相匹配的间隙图表，并包含与您的总重量相符的负载能力。
2. 确定子系统的挂点高度 (A)。挂点高度是从工作平台的顶部到挂点连接点底部的测得距离。
3. 确定系统的避让距离 (B)。避让距离是从挂点连接点正下方到工作平台边缘的测得距离。
4. 获得挂点高度 (A) 和避让距离 (B) 后，使用坠落间隙图中的 (A) 和 (B) 来确定坠落间隙要求 (FC)。

☑ *当用户测量的 (A) 和 (B) 值与表中列出的值不匹配时，用户应四舍五入到下一个最高值。如果没有所列较高值，则用户应将其预期的挂点高度或避让距离减小到较低的值。*

☑ *列出的所有值均使用 0.45 米（1.5 英尺）的安全系数和 1.8 米（6.0 英尺）的用户高度。跪姿或蹲姿会降低用户的有效身高，需增加 1.0 米（3.28 英尺）的坠落间隙。*



A	挂点高度
B	避让距离
FC	坠落间隙要求

坠落间隙图表 #1 – 50 英尺（15.2 米）SRD 型号

用户的体重： 130-310 磅 (59-140 千克)		Ⓑ							
		0 英尺 (0 米)	**3 英尺 (0.9 米)**	**6 英尺 (1.8 米)**	**9 英尺 (2.7 米)**	**12 英尺 (3.6 米)**	**15 英尺 (4.6 米)**	**21 英尺 (6.4 米)**	**27 英尺 (8.2 米)**
Ⓐ	**<8 英尺 (2.4 米)**	6 英尺 (1.8 米)							
	8 英尺 (2.4 米)	6 英尺 (1.8 米)	8 英尺 (2.4 米)						
	10 英尺 (3 米)	6 英尺 (1.8 米)	7 英尺 (2.0 米)						
	15 英尺 (4.6 米)	6 英尺 (1.8 米)	7 英尺 (2.0 米)	8 英尺 (2.4 米)					
	20 英尺 (6.1 米)	6 英尺 (1.8 米)	7 英尺 (2.0 米)	8 英尺 (2.4 米)	9 英尺 (2.7 米)				
	25 英尺 (7.6 米)	6 英尺 (1.8 米)	7 英尺 (2.0 米)	7 英尺 (2.0 米)	9 英尺 (2.7 米)	10 英尺 (3.0 米)			
	30 英尺 (9.1 米)	6 英尺 (1.8 米)	7 英尺 (2.0 米)	7 英尺 (2.0 米)	8 英尺 (2.4 米)	9 英尺 (2.7 米)	11 英尺 (3.4 米)		
	40 英尺 (12.2 米)	6 英尺 (1.8 米)	7 英尺 (2.0 米)	7 英尺 (2.0 米)	8 英尺 (2.4 米)	9 英尺 (2.7 米)	10 英尺 (3.0 米)	12 英尺 (3.6 米)	
	50 英尺 (15.2 米)	6 英尺 (1.8 米)	7 英尺 (2.0 米)	7 英尺 (2.0 米)	7 英尺 (2.0 米)	8 英尺 (2.4 米)	9 英尺 (2.7 米)	11 英尺 (3.4 米)	14 英尺 (4.3 米)
		Ⓕⓒ							

坠落间隙图表 #2 – 85 英尺（25.9 米）SRD 型号

用户的体重：130-310 磅（59-140 千克）		Ⓑ											
		0 英尺（0 米）	**3 英尺（0.9 米）**	**6 英尺（1.8 米）**	**9 英尺（2.7 米）**	**12 英尺（3.6 米）**	**15 英尺（4.6 米）**	**21 英尺（6.4 米）**	**27 英尺（8.2 米）**	**33 英尺（10.1 米）**	**39 英尺（11.9 米）**	**45 英尺（13.7 米）**	**51 英尺（15.5 米）**
Ⓐ	**<8 英尺（2.4 米）**	6 英尺（1.8 米）											
	8 英尺（2.4 米）	6 英尺（1.8 米）	8 英尺（2.4 米）										
	10 英尺（3 米）	6 英尺（1.8 米）	7 英尺（2.0 米）										
	15 英尺（4.6 米）	6 英尺（1.8 米）	7 英尺（2.0 米）	8 英尺（2.4 米）									
	20 英尺（6.1 米）	6 英尺（1.8 米）	7 英尺（2.0 米）	8 英尺（2.4 米）	9 英尺（2.7 米）								
	25 英尺（7.6 米）	6 英尺（1.8 米）	7 英尺（2.0 米）	7 英尺（2.0 米）	9 英尺（2.7 米）	10 英尺（3.0 米）							
	30 英尺（9.1 米）	6 英尺（1.8 米）	7 英尺（2.0 米）	7 英尺（2.0 米）	8 英尺（2.4 米）	9 英尺（2.7 米）	11 英尺（3.4 米）						
	40 英尺（12.2 米）	6 英尺（1.8 米）	7 英尺（2.0 米）	7 英尺（2.0 米）	8 英尺（2.4 米）	9 英尺（2.7 米）	10 英尺（3.0 米）	12 英尺（3.6 米）					
	50 英尺（15.2 米）	6 英尺（1.8 米）	7 英尺（2.0 米）	7 英尺（2.0 米）	7 英尺（2.0 米）	8 英尺（2.4 米）	9 英尺（2.7 米）	11 英尺（3.4 米）	14 英尺（4.3 米）				
	60 英尺（18.3 米）	6 英尺（1.8 米）	7 英尺（2.0 米）	7 英尺（2.0 米）	7 英尺（2.0 米）	8 英尺（2.4 米）	8 英尺（2.4 米）	10 英尺（3.0 米）	13 英尺（3.8 米）	16 英尺（4.7 米）			
	70 英尺（21.3 米）	6 英尺（1.8 米）	6 英尺（1.8 米）	7 英尺（2.0 米）	7 英尺（2.0 米）	8 英尺（2.4 米）	8 英尺（2.4 米）	10 英尺（3.0 米）	12 英尺（3.6 米）	14 英尺（4.3 米）	17 英尺（5.2 米）		
	80 英尺（24.4 米）	6 英尺（1.8 米）	6 英尺（1.8 米）	7 英尺（2.0 米）	7 英尺（2.0 米）	7 英尺（2.0 米）	8 英尺（2.4 米）	9 英尺（2.7 米）	11 英尺（3.4 米）	13 英尺（3.8 米）	16 英尺（4.7 米）	19 英尺（5.8 米）	
	90 英尺（27.4 米）	6 英尺（1.8 米）	6 英尺（1.8 米）	7 英尺（2.0 米）	7 英尺（2.0 米）	7 英尺（2.0 米）	8 英尺（2.4 米）	9 英尺（2.7 米）	11 英尺（3.4 米）	13 英尺（3.8 米）	15 英尺（4.6 米）	18 英尺（5.3 米）	21 英尺（6.2 米）
		ⒻⒸ											

3.4 **临边坠落间隙：**本说明涵盖的 SRD 型号包括用于临边应用的型号。具有临边应用功能的速差自控器（SRD-LE）必须用于 SRD 或其救生索可能与临边接触的应用。请勿在这些应用中使用任何其他 SRD 类型。

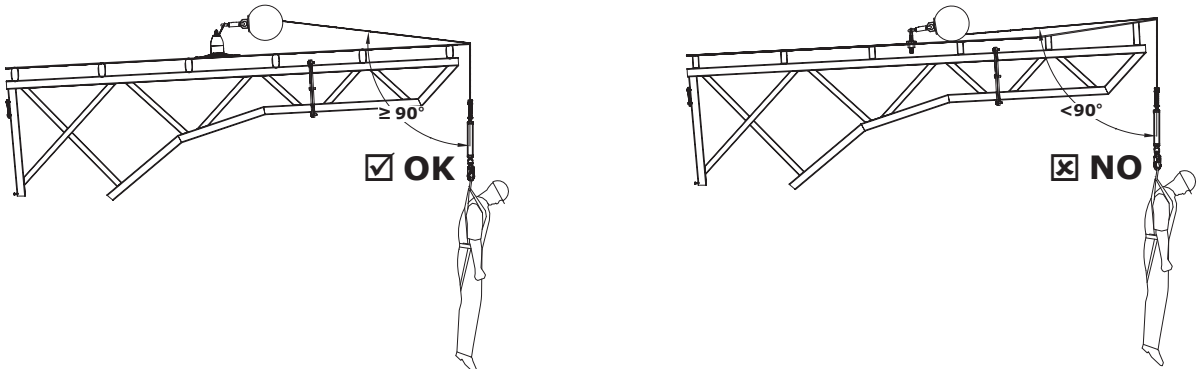
A. 预防措施：SRD-LE 有许多独特的预防措施，在使用过程中必须遵守。在计划使用 SRD-LE 时，应考虑本说明书中规定的对 SRD-LE 的所有要求。

- 用户必须遵守表 1 中为 SRD-LE 型号规定的容量要求。
- SRD-LE 的安装必须确保在发生坠落时，救生索不会以小于 90 度的角度越过临边。请参见图 6。
- 将挂点安装在可能发生坠落的边缘的相同高度或上方。边缘下方的挂点很危险，因为它们会导致救生索以小于 90° 的角度改变方向。请参见图 6。
- 不得在与挂点相对的开口远端作业。
- 使用 SRD-LE 可能需要特殊的救援程序。
- 在前缘应用中，切勿将 D 形环加长杆与 SRD-LE 一起使用。

B. 锐边测试：本说明书中涉及的通过 SRD-LE 型号已经成功通过测试，适用于水平方向使用以及在无毛刺钢制边缘上的坠落防护。因此，这些通过 SRD-LE 型号可能会在类似情况下使用。必须遵守使用这些型号的所有要求，包括所需的避让距离。虽然 SRD-LE 比 SRD 更耐磨，但在可能的情况下，用户仍应避免在救生索会持续或反复刮擦尖锐边缘和磨损表面的地方工作。

C. 坠落间隙要求：SRD-LE 型号有自己的坠落间隙要求，必须遵守这些要求。SRD-LE 坠落间隙图表必须用于临边应用，而不是标准坠落间隙图表。使用 SRD-LE 坠落间隙图并不能替代使用 SRD-LE。

图 6 – 重定向角度



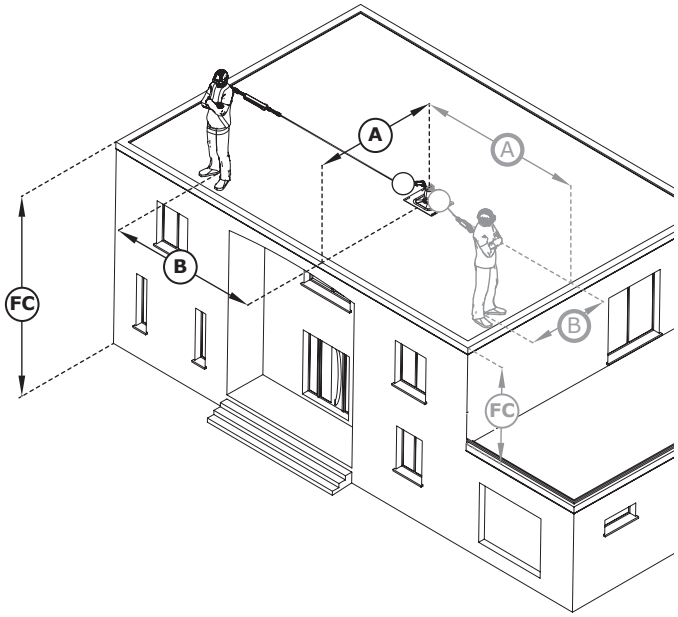
坠落间隙图表 – 临边设备（SRD-LE）

下列图表中提供了所需的坠落间隙。要确定所需的坠落间隙：

1. 选择与您的产品类型相匹配的间隙图表，并包含与您的总重量相符的负载能力。
2. 确定子系统的避让距离 (A)。避让距离是从挂点连接点到工作平台边缘的测得距离。
3. 确定子系统的水平距离 (B)。水平距离是从与挂点连接点正对的边缘点到相当于工作区域最远范围的边缘点之间的距离。
4. 获得避让距离 (A) 和水平距离 (B) 后，使用坠落间隙图中的 (A) 和 (B) 来确定坠落间隙要求 (FC)。

☑ *当用户测量的 (A) 和 (B) 值与表中列出的值不匹配时，用户应四舍五入到下一个最高值。如果没有所列较高值，则用户应将其预期的挂点高度或避让距离减小到较低的值。*

☑ *要确定用户工作半径的最大范围，可能需要对用户靠近的每个临边重复上述步骤。*



SRD-LE： 130-310 磅 (59-140 千克)		**B**								
		0 英尺 (0 米)	**3 英尺 (0.9 米)**	**6 英尺 (1.8 米)**	**9 英尺 (2.7 米)**	**12 英尺 (3.6 米)**	**15 英尺 (4.6 米)**	**21 英尺 (6.4 米)**	**27 英尺 (8.2 米)**	**33 英尺 (10.1 米)**
A	**<8 英尺 (2.4 米)**	17 英尺 (5.0 米)								
	8 英尺 (2.4 米)	17 英尺 (5.0 米)	20 英尺 (6.2 米)							
	10 英尺 (3 米)	17 英尺 (5.0 米)	19 英尺 (5.9 米)							
	15 英尺 (4.6 米)	17 英尺 (5.0 米)	19 英尺 (5.9 米)	19 英尺 (5.9 米)						
	20 英尺 (6.1 米)	17 英尺 (5.0 米)	18 英尺 (5.5 米)	19 英尺 (5.9 米)	20 英尺 (6.2 米)					
	25 英尺 (7.6 米)	17 英尺 (5.0 米)	18 英尺 (5.5 米)	18 英尺 (5.5 米)	19 英尺 (5.9 米)	20 英尺 (6.2 米)				
	30 英尺 (9.1 米)	17 英尺 (5.0 米)	18 英尺 (5.5 米)	18 英尺 (5.5 米)	19 英尺 (5.9 米)	20 英尺 (6.2 米)	21 英尺 (6.4 米)			
	40 英尺 (12.2 米)	17 英尺 (5.0 米)	17 英尺 (5.0 米)	18 英尺 (5.5 米)	18 英尺 (5.5 米)	19 英尺 (5.9 米)	20 英尺 (6.2 米)	22 英尺 (6.8 米)		
	50 英尺 (15.2 米)	17 英尺 (5.0 米)	17 英尺 (5.0 米)	17 英尺 (5.0 米)	18 英尺 (5.5 米)	18 英尺 (5.5 米)	19 英尺 (5.9 米)	21 英尺 (6.4 米)	24 英尺 (7.3 米)	
	60 英尺 (18.3 米)	17 英尺 (5.0 米)	17 英尺 (5.0 米)	17 英尺 (5.0 米)	18 英尺 (5.5 米)	18 英尺 (5.5 米)	19 英尺 (5.9 米)	21 英尺 (6.4 米)	23 英尺 (6.9 米)	25 英尺 (7.8 米)
		FC								

3.5 **连接到挂点：**图 7 说明了典型 SRD 挂点连接。挂点 (A) 应在头顶正上方，以尽量减少自由坠落距离和摆动坠落的危险（参见第 3.3.B 节）。选择能够承受表 1 中所定义静载荷的挂点。根据系统和产品配置，用户可以将 SRD 顶部连接器 (B) 直接固定到挂点结构或者挂点连接器或挂点连接点之间。

3.6 **连接到安全带：**SRD 与安全带的连接会因安全带和使用的连接元件而异。请参见图 8。要固定时，请将 SRD 底部连接器 (A) 连接到全身式安全带的连接元件 (B) 上。有关可以使用哪些连接元件的更多信息，请参阅您的安全带制造商说明。

☑ *“产品概述”指明您的 SRD 型号可用于哪些坠落防护应用。确保安全带的使用符合这些要求。坠落悬挂应用需要配备全身式安全带。*

图 7 – 连接到挂点

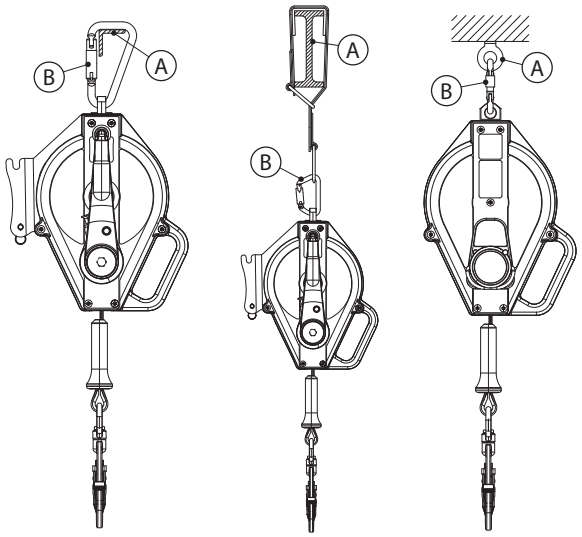
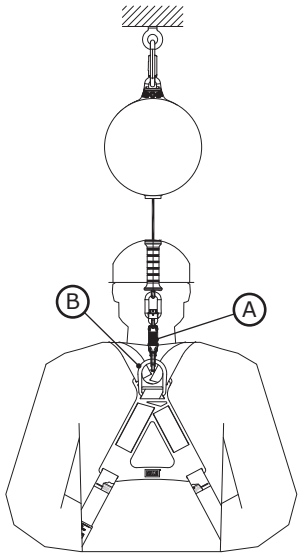


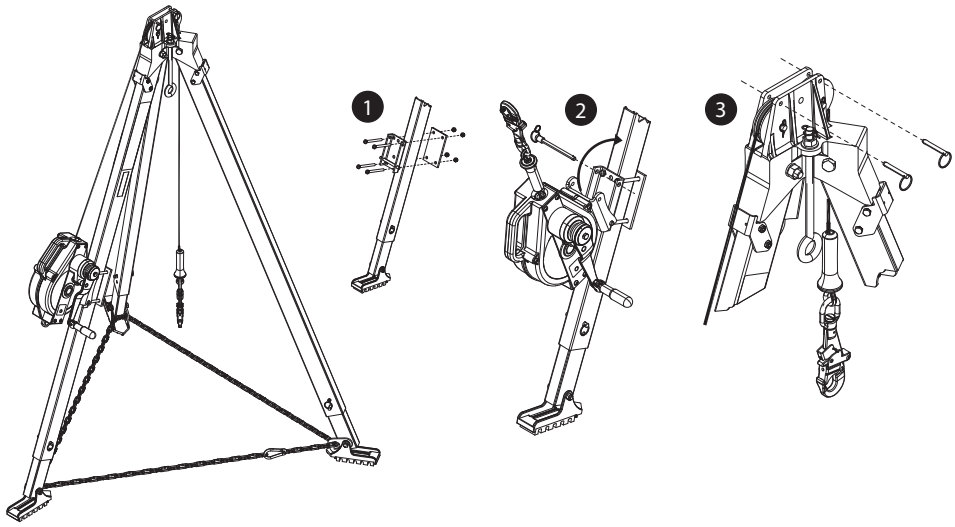
图 8 – 连接到安全带



3.7 **安装在三脚架上：**本说明中带救援机构的速差自控器 (SRD-R) 型号可以通过其安装支架安装到三脚架上。请参见图 9。要将 SRD-R 安装在三脚架上：

1. **将三脚架支架固定在三脚架腿上。**用户应参阅三脚架制造商的说明，了解有关固定三脚架支架的更多信息。
2. **将 SRD-R 的安装支架固定在三脚架支架上。**将安装支架放到三脚架托架上，将安装支架上的孔与三脚架托架上的孔对齐。将安装销插入两个支架上的孔中，以将安装支架固定到三脚架支架上。
3. **将 SRD-R 的救生索穿过三脚架头部的安装滑轮。**从三脚架头部卸下两个固定销。将救生索放在安装滑轮的凹槽之间。将固定销重新插入三脚架头部。

图 9 – 安装在三脚架上



4.0 使用

4.1 **每次使用前：**验证您的工作区域和坠落悬挂系统是否符合这些说明书中定义的所有标准。验证是否有正式救援计划。根据“检查和维护日志”中定义的“用户”检查点检查产品。如果检查发现不安全或有缺陷的状况，或者如果对产品的安全使用状况有任何疑问，请立即停止使用产品。清楚地标记产品“请勿使用”。如需了解更多信息，请参见第 5 部分。

4.2 **坠落之后：**如果此装备受到坠落悬挂或冲击力，请立即停止使用。清楚地在上面标记“请勿使用”。如需了解更多信息，请参见第 5 部分。

4.3 **操作：**在使用 SRD 之前，工人需要将 SRD 固定到挂点连接点和全身式安全带上的连接元件。固定好后，工人可以在既定的安全工作区内以正常速度移动。在使用过程中，一定要让 SRD 救生索在控制下回缩到设备中。

4.4 **吊绳：**根据工作场所和系统配置的不同，用户不一定总能到达 SRD 的锚点。在这种情况下，可能有必要使用吊绳。吊绳是一条长绳，穿过 SRD 的底部连接器，然后再绕回到自身上。以这种方式连接时，用户可以通过拉动吊绳将 SRD 的底部连接器升高或降低到自己的位置。

> ☑ *确保吊绳的自由端不会与其他工人、设备或机器缠在一起。如有必要，限制吊绳的自由端。*

4.5 **与水平系统一起使用：**本说明中涵盖的SRD 与水平系统兼容，例如水平救生索 (HLL) 系统和水平导轨系统。有关其与 SRD 兼容性的更多信息，请参阅水平系统的制造商说明。只有当两种产品都允许这样使用时，SRD 才能与水平系统一起使用。

> ☑ *本说明书中列出的所需坠落净空值是以使用刚性固定锚固点为基础的。这些数值不适用于与水平救生索 (HLL) 系统一起使用的产品。有关 HLL 系统专用的坠落间隙图表，或在使用本说明中的图表之前必须考虑的其他因素，请参阅 HLL 系统制造商的说明。*

4.6 **收回操作：**SRD-R 的收回曲柄可用于提升或降低悬挂的工人。要使用”收回曲柄“，必须首先启动”收回“模式，然后旋转”曲柄“。请参见图 10。若要激活收回模式并使用收回曲柄：

1. 松开收回曲柄。
2. 将曲柄手柄从 SRD 主体翻出，进入啮合位置。
3. 拉出并握住转换旋钮至未锁定位置。
4. 将曲柄臂向内推并释放转换旋钮以啮合收回模式。如果需要，顺时针旋转曲柄臂以帮助啮合齿轮。
5. 转动收回曲柄，提升或降低悬挂的工人。
   A. 若要上升：逆时针旋转收回曲柄。
   B. 若要下降：首先，逆时针旋转收回曲柄，松开防坠落制动器。然后，顺时针旋转收回曲柄，使其下降。

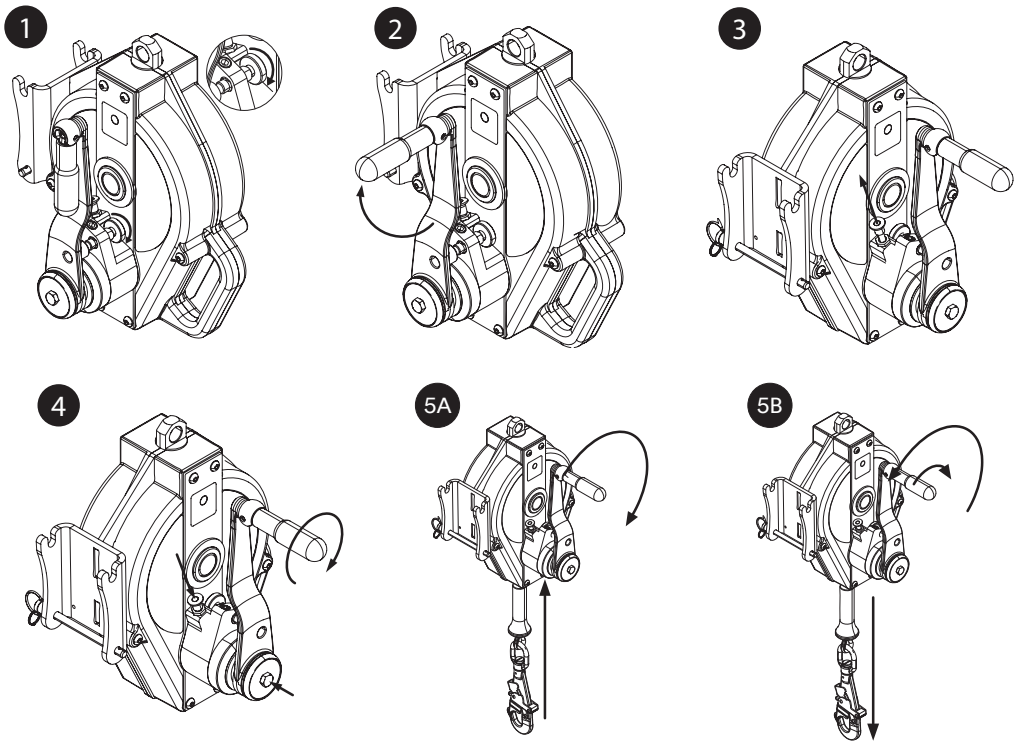
> ☑ *当救生索完全收回时，不要尝试操作回收模式。一旦救生索完全收回或伸出，立即停止转动曲柄。*

> ☑ *救援曲柄仅用于救援应用。请勿用于任何其他用途。*

> ☑ *3M SRD-R 没有采用过载离合器来限制施加在驱动部件和附着人员身上的力。在收回模式时，避免绳索松弛。如果在回收过程中，挂住的工人被障碍物缠住，应确保工人不会因继续提升而受到过大的力。*

> ☑ *延长救生索所需的最小负载为 75 磅（33.9 千克）。当负载达到最大负载能力时，需要 30 磅（0.13 千牛）的力才能操作收回系统。*

图 10 – 收回操作



4.7 **解除收回：**在使用后应始终解除 SRD-R 的收回模式。**若要脱离收回模式：**

☑ *在脱离收回模式时，救生索应完全缩回 SRD 外壳中。为避免可能的伤害，应保持对救生索的控制或在脱离前收回救生索。*

1. 卸下救生索上的任何负载。
2. 拉出并握住转换旋钮至未锁定位置。
3. 拉出曲柄臂以脱离，然后释放转换旋钮。
4. 拉出曲柄手柄并朝着 SRD 主体向下旋转至存放位置。

4.8 **使用 RSQ™ 下降旋钮：**某些产品型号配有 RSQ 下降旋钮。RSQ 下降旋钮允许用户切换产品的防坠落模式和下降模式。

- **防坠落模式：**在防坠落模式下，该产品可阻止用户坠落，并使用户保持悬空状态。
- **下降模式：**在下降模式下，产品会控制用户的下降速度，使其在发生坠落后能下降到较低的高度。

请参见图 11。在两种模式之间切换下降旋钮：

1. 向外拉下降旋钮。这将立即启动下降模式。

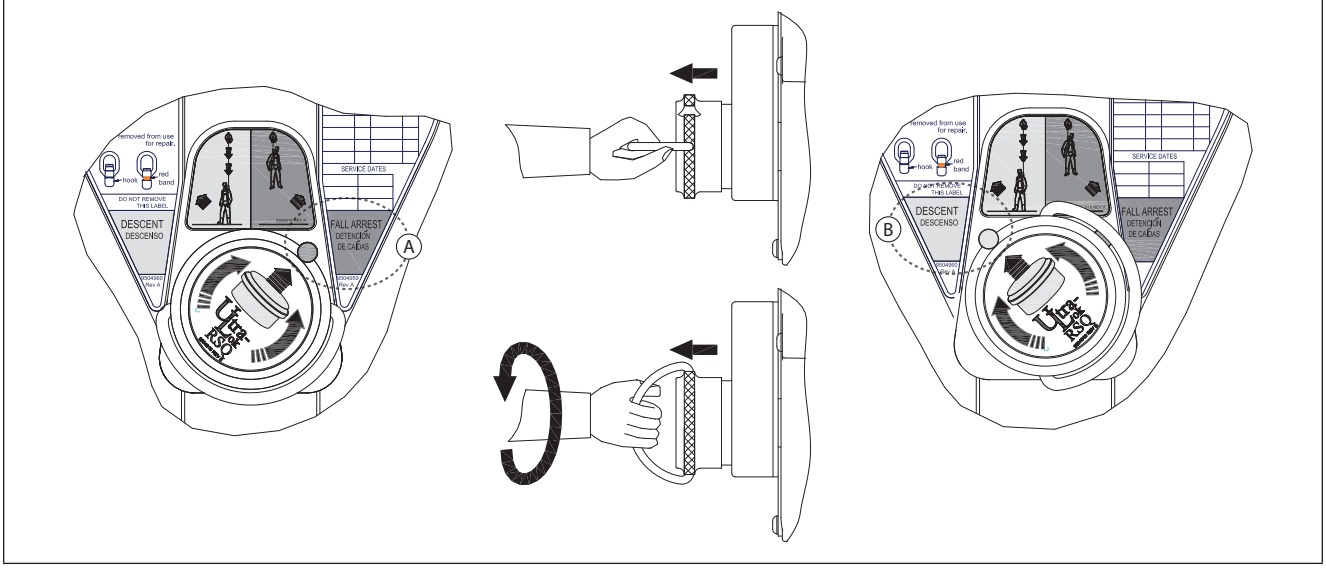
☑ *除非用户已准备好下降，否则切勿在保护用户时切换到下降模式。*

2. 旋转下降旋钮，直到箭头指向所选模式：防坠落 (A) 或下降 (B)，旋钮卡入到位。松开旋钮将把产品设置为该模式。

☑ *除非旋钮设置为防坠落模式，否则产品将保持下降模式。防坠落模式之外的所有位置均为下降模式，包括旋钮向外拉时和旋钮调至空档位置时。*

☑ *从坠落防护模式释放下降旋钮需要 80 磅力 – 100 磅力（0.36 千牛 – 0.45 千牛）的力。*

图 11 – 使用 RSQ 下降旋钮



4.9 **下降应用：**带有 RSQ 下降旋钮的产品型号可用于将用户降至较低的楼层或平台，以便救援或逃生。视情况而定，用户或服务人员可启动下降功能。

> ☑ *该产品专为紧急防坠落和下降而设计。只能用于单次垂直下降。如果此产品已用于下降，立即停止使用产品。*

A. **下降旋钮：**可以通过将下降旋钮设置为下降模式来启动下降。另外，只需向外拉动旋钮，就可以从防坠落模式临时切换到下降模式，然后在用户完成下降时松开防坠落模式下的旋钮。

> ☑ *有关在下降模式之间切换的更多信息，请参阅”使用 RSQ 下降旋钮”。*

B. **辅助救援杆：**在无法触及下降旋钮的情况下，可使用救援杆（3500201、3500202）启动下降。请参见图 12。要启动下降模式：

1. 将下降旋钮插入救援杆口内，使旋钮位于两个叉刺之间。

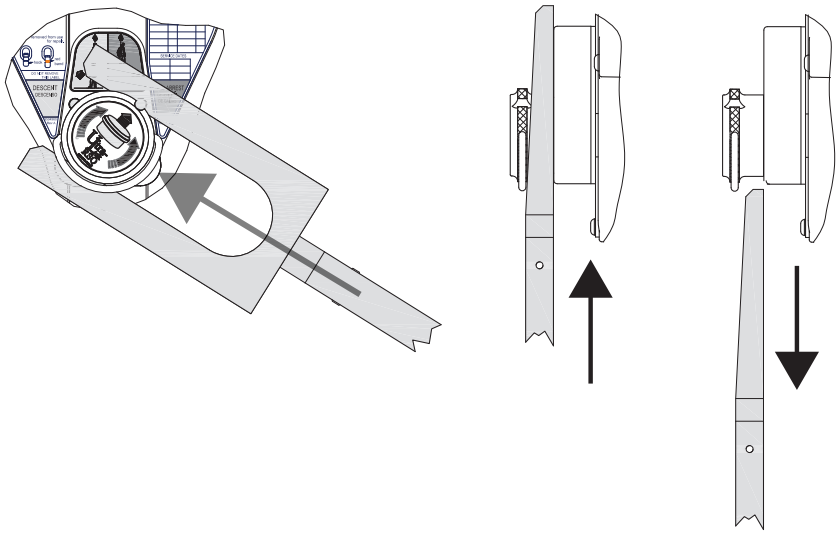
> ☑ *插入下降旋钮时，救援杆必须是直的。如果救援杆倾斜，可能会损坏下降旋钮。*

2. 将救援杆向前推，直到下降旋钮完全插入杆叉。这将导致叉子向外拉动旋钮并开始下降。

> ☑ *由于其形状，叉子会自然地接合下降旋钮。不要试图撬动旋钮。*

> ☑ *松开下降旋钮会将旋钮置于指定位置。如果旋钮已从防坠落模式中拉出，只要旋钮没有旋转，松开后就会重新进入防坠模式。*

图 12 – 辅助救援杆



5.0 检查

☑ *装备停止使用后，在合格人员书面确认可以使用之前，不得恢复使用。*

5.1 **检查频率：**用户每次使用前均应检查产品，此外，用户以外的合格人员对产品进行检查的间隔不应超过一年。更高频率的装备使用和更恶劣的条件，可能需要增加合资格人员检查的频率。这些检查的频率应由合格人员根据工地的具体条件确定。

5.2 **检查程序：**按照“检查和维护日志”中列出的程序检查本产品。该装备的所有者应保存每次检查的文件。检查和维护日志应放置在产品附近或以其他方式方便用户访问。建议在产品上标注下一次或最后一次检查的日期。

5.3 **缺陷：**如果产品由于存在缺陷或不安全状况而无法恢复使用，则必须销毁产品或将产品送至 3M 或 3M 授权服务中心进行维修。

5.4 **产品寿命：**产品的使用寿命由工作条件和维护情况决定。只要产品通过检查标准，即可继续投入使用。

6.0 维护、存放和修理

☑ *需要维护或计划维护的装备应标记为“请勿使用”。在执行维护之前，不应移除这些装备标签。*

6.1 **清洁：**定期用清水和温和的肥皂液清洁救生索和产品外部。彻底冲洗产品并晾干。根据需要清洁标签。有关更多信息，请参阅我们网站上的技术公告：*https://www.3M.com/FallProtection/Mechanical-Device-Cleaning*

6.2 **弃置：**剪断或以其他方式使救生索无法使用，然后适当处理此产品。

6.3 **维修：**仅 3M 或经 3M 书面授权的机构方能维修该设备。不要试图拆解产品或润滑任何部件。

6.4 **存放和运输：**在避免阳光直射的凉爽、干燥、清洁环境中储存和运输产品。避开可能存在化学气体的区域。在长期存放后，应彻底检查各个组件。

7.0 标签和标记

7.1 **摘要：**“产品标签”图说明产品上显示的标签和标记。请参阅下文，了解每个标签和标记提供的信息摘要。

☑ *标签图像用于呈现标签的大致内容。有关具体信息，请参阅您的产品标签。*

☑ *标签缺失或损坏必须更换。所有标签必须清晰可见。*

A	产品规格标签
B	产品使用和规格标签（仅限型号 3503884）
C	警告声明 – 阅读所有说明。检查预留救生索和冲击指示器。
D	检查标签
E	3M CSID 标签
F	产品徽标标签
G	不要将 SRD 在边缘上使用。
H	救生索检查标签
I	仅用于前沿
J	产品使用和规格标签
K	收回曲柄使用标签
L	收回曲柄激活标签
M	RSQ 下降旋钮标签
N	RSQ 模式标签
O	产品徽标标签
P	产品规格标签
Q	产品使用和规格标签
R	产品使用和规格标签
S	产品使用和规格标签

8.0 射频识别标签

8.1 **位置：**本使用说明中涵盖的 3M 产品均配备无线射频识别 (RFID) 标签。RFID 标签可与 RFID 标签扫描仪搭配使用以记录产品检查结果。请参阅“RFID 标签位置”，了解 RFID 标签的位置。

8.2 **弃置：**在弃置本产品之前，去除 RFID 标签并根据当地法规弃置 / 回收。欲了解更多信息，请访问我们的网站：*http://www.3M.com/FallProtection/RFID*

9.0 专业术语

9.1 **定义：**这些说明书中使用了以下术语和定义。

☑ *有关术语和定义的完整列表，请访问我们的网站：www.3m.com/FallProtection/ifu-glossary*

- **授权人员：**由雇主指定在会面临坠落危险的位置执行任务的人员。
- **合格人员：**能够识别周围环境或工作条件中不利员工健康或对其有危害或危险的现有和预期危险，同时亦有权采取及时纠正措施来消除这些危险的人员。
- **坠落悬挂系统：**一套坠落悬挂装备，配置用于在坠落时保护用户。
- **合格人员：**拥有公认的学位、证书或专业地位的人，或通过广泛的知识、培训和经验成功地证明他们有能力解决与坠落悬挂和救援系统相关问题，符合适用的国家、地区和地方法规的要求。
- **救援人员：**使用救援系统执行辅助救援的人员。
- **区域限制系统：**一套坠落悬挂装备，配置用于防止用户发生坠落危险。不允许自由坠落。
- **用户：**在有坠落悬挂系统保护的情况下进行活动的人。

图 13 – RFID 标签位置

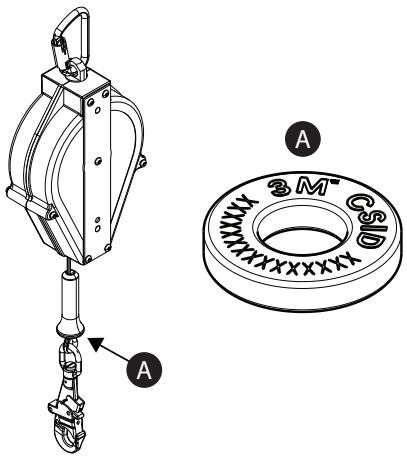


图 14 – 产品标签

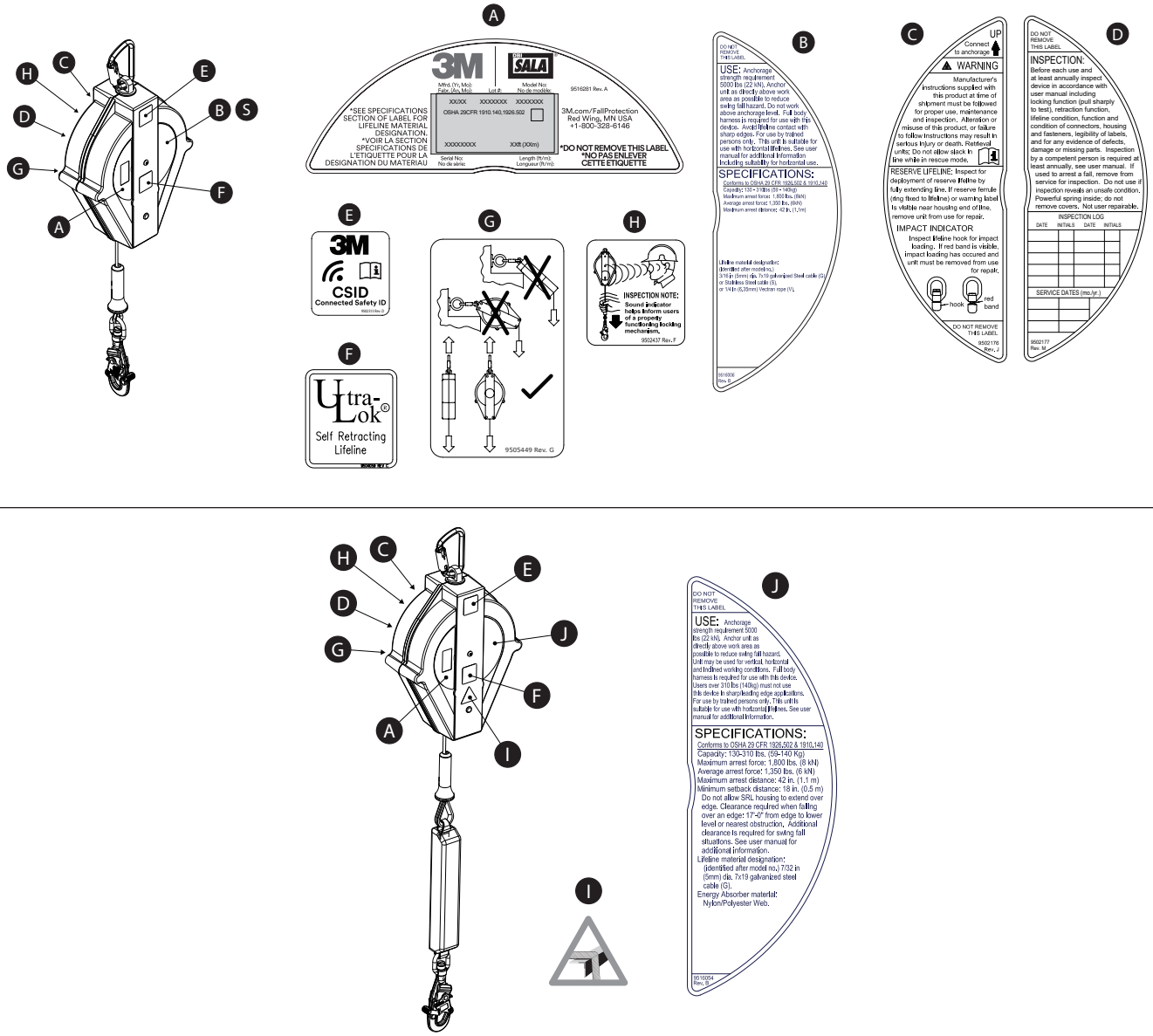
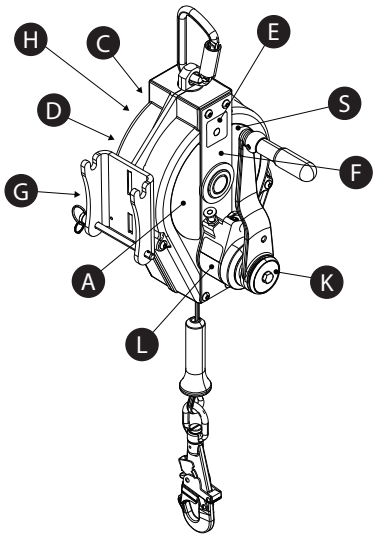
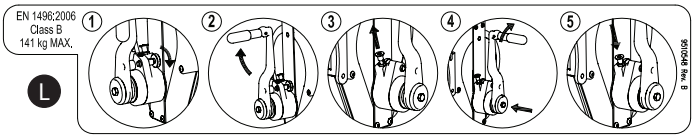
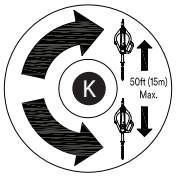
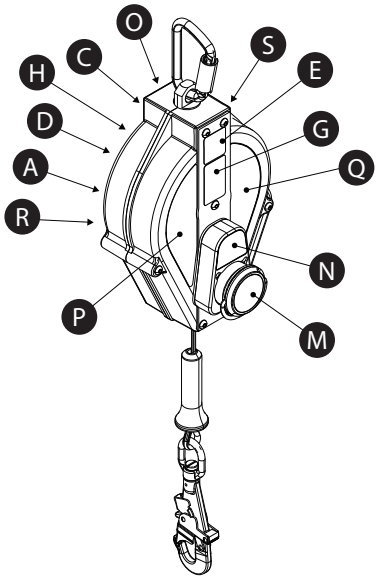


图 14 – 产品标签



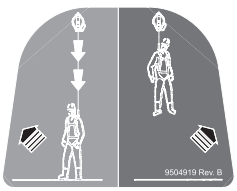






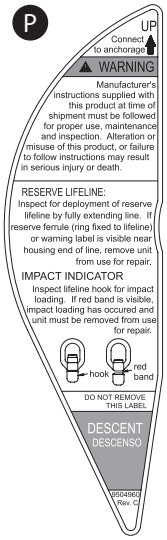
M

N

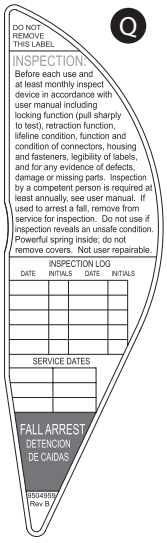


O

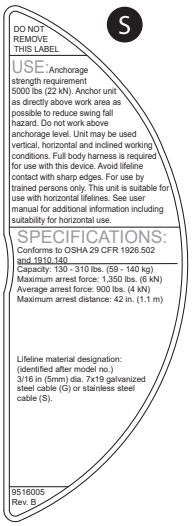
P



Q



S



R

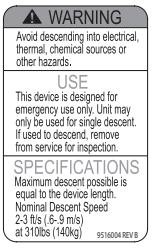


表 2 – 检查和维护日志

型号（序列号）：					
购买日期：			**首次使用日期：**		
...					
☑ *本产品在每次使用前必须由用户进行检查。此外，用户以外的合格人员必须每年至少检查一次此装备。*					
...					
组件	**检查程序**			**检查结果**	
				通过	**未通过**
SRD – 一般检查（图 15.1）	检查螺栓是否松动，部件是否弯曲或损坏。			☐	☐
	检查外壳 (A) 是否有变形、裂缝或其他损坏。			☐	☐
	检查旋转环 (B) 是否有变形、裂缝或其他损坏。旋转环应牢固连接到 SRD 上，但应该能自由旋转。			☐	☐
	救生索 (C) 应顺畅地完全拉出和收回，否则将会导致救生索松弛。			☐	☐
	确保设备在救生索被猛拉时能锁定。锁定应为正向，且不会滑动。			☐	☐
	寻找整套设备的腐蚀迹象。			☐	☐
连接器（图 15.2）	检查所有 SRD 连接器是否有损坏和腐蚀的迹象。验证所有连接器是否正常工作。如有：活门 (A) 应正确打开、关闭、锁定和解锁;旋转吊环 (B) 应无干扰地旋转;并且锁定按钮和锁定销应正常工作。			☐	☐
旋转抓钩和冲击指示器（图 15.3）	检查冲击指示器。如果显示红带并且旋转接头不能自由转动，则已发生冲击载荷，必须停止使用 SRD。不要试图重置冲击指示器。将速差器返回至授权服务中心进行重置。			☐	☐
备用救生索（图 15.4）	检查救生索被拉开的情况将救生索拉出速差器，直到拉不动为止。如果警告标签或红带 (X) 可见，则备用救生索已经使用，设备必须由授权服务中心维修才能再次使用。			☐	☐
钢缆救生索（图 16）	检查钢丝绳是否有切口、扭结 (A)、断丝 (B)、钢丝打结 (C)、焊接飞溅、腐蚀、化学接触区域或严重磨蚀区域 (D)。向上滑动救生索缓冲器 (E) 并检查金属环 (F) 是否损坏。如果一周缠绕有 6 根或更多断丝，或一周缠绕的一股中有 3 根或更多断丝，则更换钢缆组件。如果金属环的 25 毫米（1 英寸）长度中有任何断线情况，请更换组件。			☐	☐
合成绳索救生索（图 17）	检查编织绳是否有磨蚀 (A)、断股 (B)、拉股 (C)、熔化 (D)、压缩 (E)、直径不一致 (F) 和变色 (G)。向上滑动救生索缓冲器 (H) 并检查以下区域是否损坏。			☐	☐
缓冲器（图 18）	确认一体式缓冲器未激活。检查救生索盖 (A) 是否从缓冲器盖 (B) 的任一端拉出。缓冲器织带 (C) 均不得外露。缓冲器盖还应牢固且没有撕裂 (D) 或其他损坏。			☐	☐
SRD-R（图 19）	检查曲柄臂 (A) 是否有变形或其他损坏。确保收回手柄 (B) 可以折叠并且固定在摇动位置。			☐	☐
	确保收回转换旋钮 (C) 可拉出至未锁定位置，然后释放，在啮合与松脱位置锁定曲柄臂。			☐	☐
	通过升降至少 75 磅（34 千克）的测试重物测试收回功能是否正常运行。释放收回手柄时，重物不应移动且收回手柄应保持位置不变。提升重物时应听到“咔哒”声。			☐	☐
RSQ 下降旋钮	应在下降旋钮上执行手动拉动测试。首先，将下降旋钮设置为下降模式。然后，抓住救生索并用力拉动以使下降机构啮合。检查人员应拉出大约 3 英尺（1 m）的救生索，并且必须确认在拉动救生索时感觉到稳定的阻力。			☐	☐
标签（图 14）	所有标签均清晰可见。			☐	☐
坠落悬挂装备	根据制造商说明书，安装和检查与产品一起使用的附加坠落悬挂装备。			☐	☐
...					
☑ *如果产品未通过检验程序，则产品未通过整体检验。如果产品未通过检查，请立即停止使用。清楚地标记产品“请勿使用”。如需了解更多信息，请参见第 5 部分。*					
...					
检查类型：	☐ 用户	☐ 合格人员	**整体检查结果：**	☐ 通过	☐ 未通过
通过检查：			**检查日期：**		
签名：			**下次检验到期时间：**		
...					
补充说明：					

图 15 – 一般检查

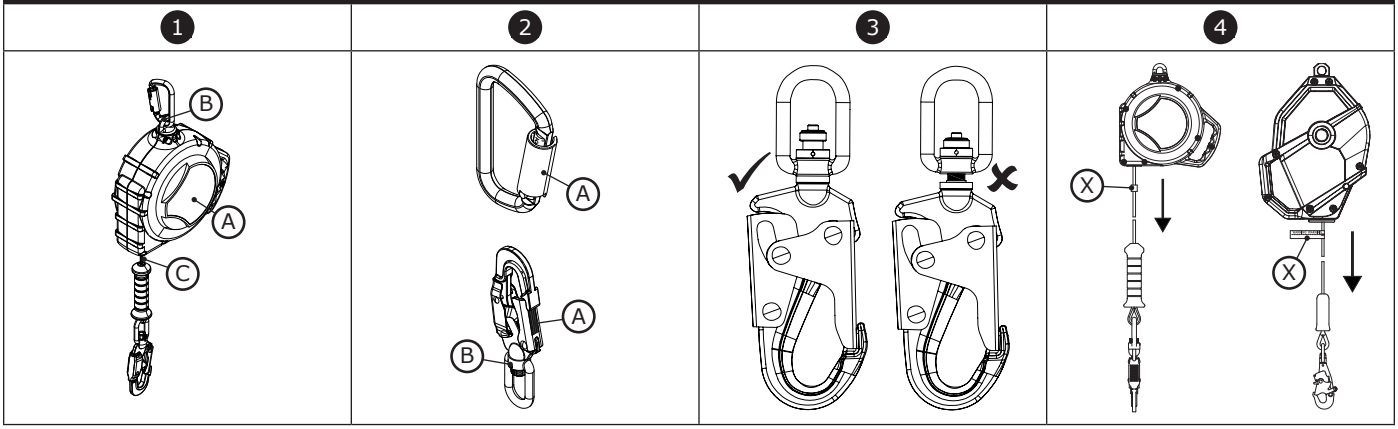


图 16 – 钢丝绳救生索

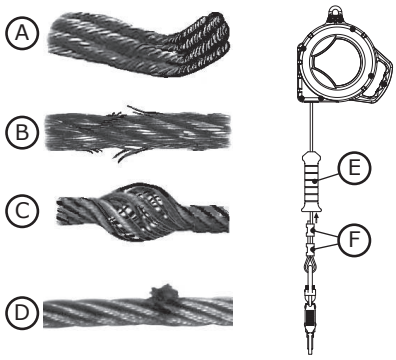


图 17 – 合成绳索救生索

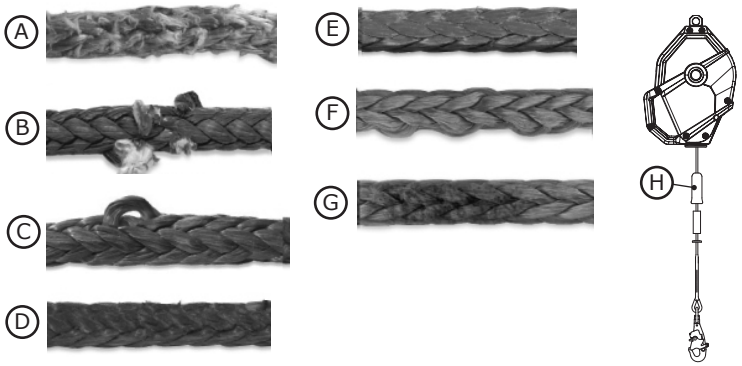


图 18 – 缓冲器检查

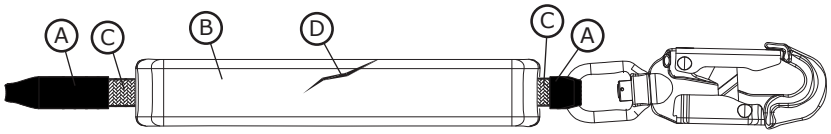
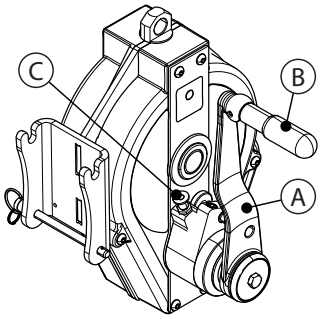


图 19 – SRD-R 检查



全球产品质保、有限补救和责任限制

质量保证 已制定了以下保证条款，以代替原来所有明示或暗示的质量保证或条件，包括对适销性或特定用途适用性的暗示保证或条件。

除非当地法律另有规定，否则 3M 坠落防护系列产品保证在工艺和材料方面不存在任何出厂缺陷，本质量保证期始于原始所有人安装或初次使用之日起一年内。

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3M | DBI SALA® PROTECTA®

Fall Protection

USA
3833 SALA Way
Red Wing, MN 55066-5005
Toll Free: 800.328.6146
Phone: 651.388.8282
Fax: 651.388.5065
3Mfallprotection@mmm.com

Canada
600 Edwards Blvd, Unit #2
Mississauga, ON L5T 2V7
Phone: 905.795.9333
Toll-Free: 800.387.7484
Fax: 888.387.7484
3Mfallprotection-ca@mmm.com

Brazil
Rodovia Anhanguera, km 110
Sumaré – SP
CEP: 13181-900
Brasil
Phone: 0800-013-2333
falecoma3m@mmm.com

Mexico
Av. Santa Fe No. 190
Col. Santa Fe, Ciudad de Mexico
CP 01219, Mexico
Phone: 01 800 120 3636
3msaludocupacional@mmm.com

EMEA (Europe, Middle East, Africa)
EMEA Headquarters:
Le Broc Center
Z.I. 1re Avenue - BP15
06511 Carros Le Broc Cedex
France
Phone: + 33 04 97 10 00 10
Fax: + 33 04 93 08 79 70
informationfallprotection@mmm.com

United Kingdom
3M Centre
Cain Road
Bracknell, RG12 8HT
Phone: 0870 60800 60
www.3M.co.uk/construction

Slovakia
Capital Safety Group - Banská Bystrica, s.r.o.
Jegorovova 35
974 01 Banská Bystrica
Slovak Republic
Phone: + 421 (0)47 00 330
Fax: + 421 (0)47 00 336
informationfallprotection@mmm.com

Australia & New Zealand
137 McCredie Road
Guildford
Sydney, NSW, 2161
Australia
Toll-Free : 1800 245 002 (AUS)
Toll-Free : 0800 212 505 (NZ)
3msafetyaucs@mmm.com

Asia
Singapore:
1 Yishun Avenue 7
Singapore 768923
Phone: +65-6450 8888
Fax: +65-6552 2113
TotalFallProtection@mmm.com

China:
38/F, Maxdo Center, 8 Xing Yi Rd
Shanghai 200336, P R China
Phone: +86 21 62753535
Fax: +86 21 52906521
3MFallProtecton-CN@mmm.com

Korea:
3M Koread Ltd
18F, 82 Uisadang-daero,
Yeongdeungpo-gu, Seoul
Phone: +82-80-033-4114
Fax: +82-2-3771-4977
3msupport.kr@mmm.com

Japan:
3M Japan Ltd
6-7-29, Kitashinagawa, Shinagawa-ku,
Tokyo
Phone: +81-570-011-321
Fax: +81-3-6409-5818
psd.jp@mmm.com

WEBSITE:
3M.com/FallProtection

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