



Fall Protection

ANSI Z359.14

ANSI Z359.12

OSHA 1926:502

OSHA 1910:140

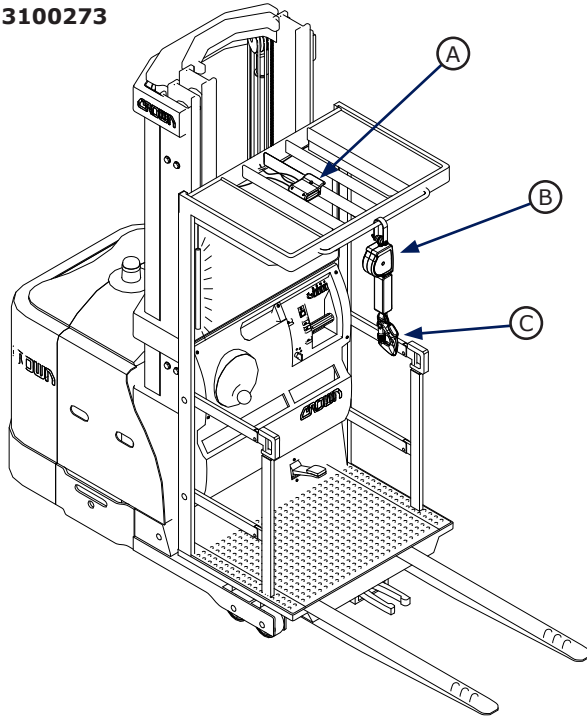
NANO-LOK™

CONNECTED ORDER PICKER SRD System

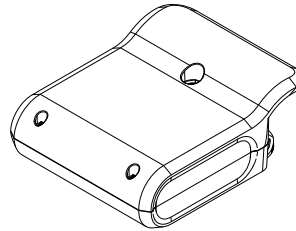
USER INSTRUCTIONS 5908581 Rev. A

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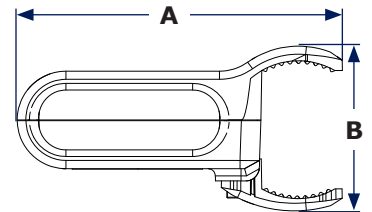
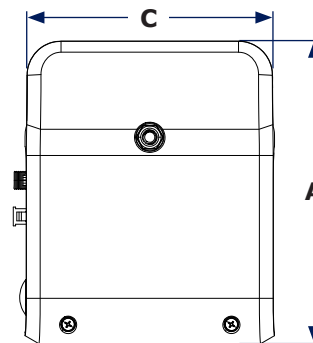
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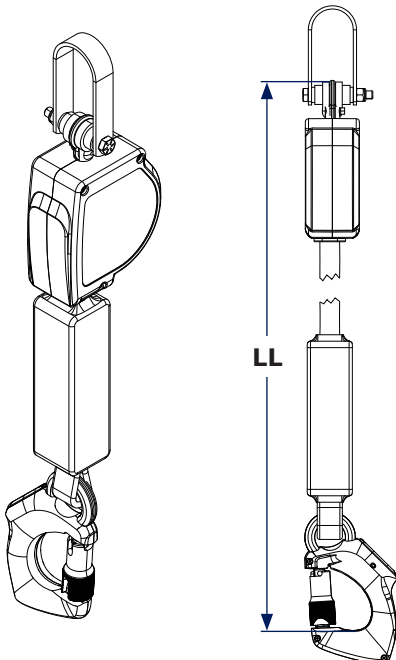
A	B	C
5.25 in (13.3 cm)	3.0 in (7.62 cm)	4.25 in (10.8 cm)



lbs (kg)

0.56 lbs
(0.25 kg)

(B) 3101737



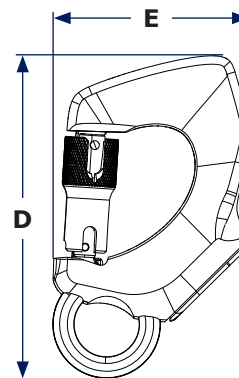
LL

11.0 ft
(3.35 m)

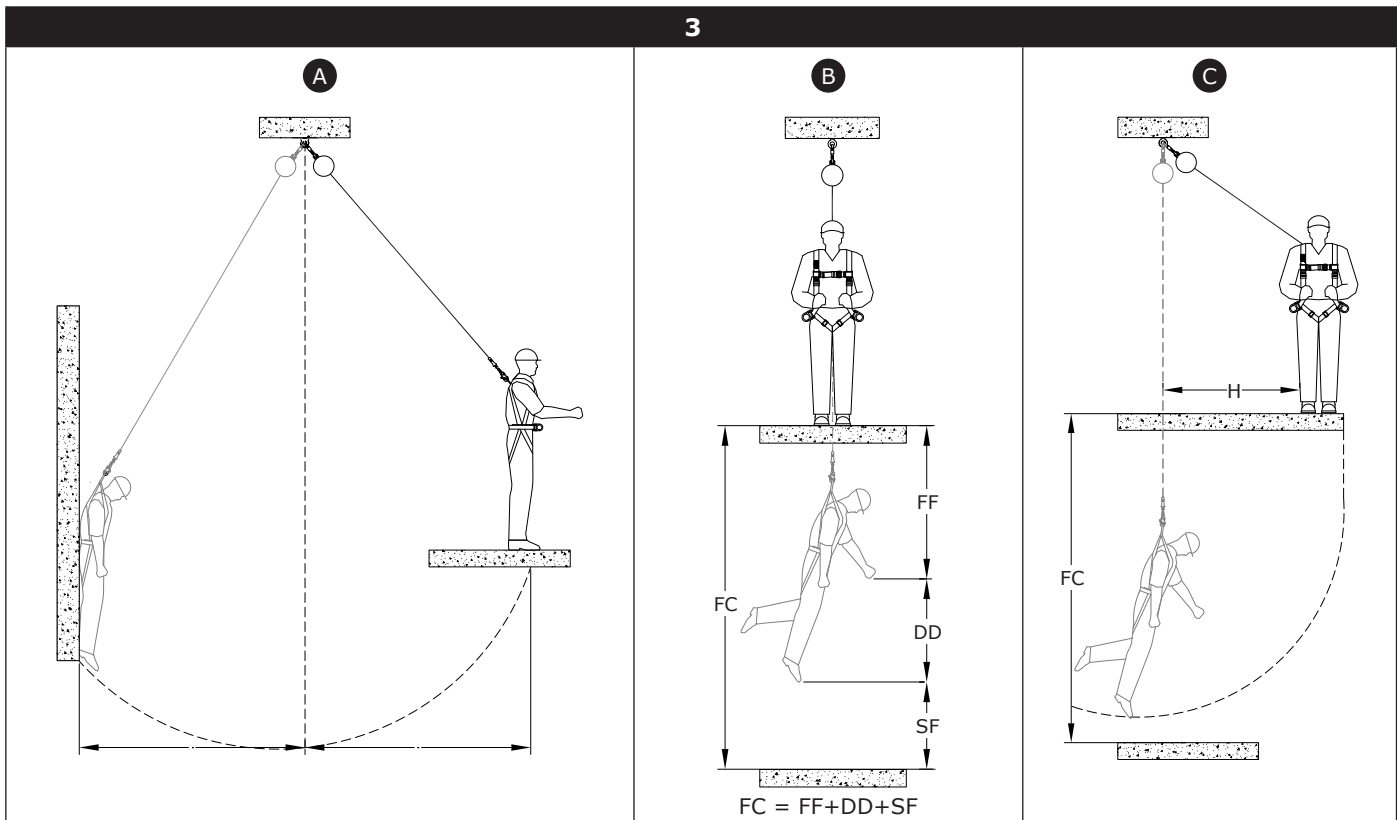
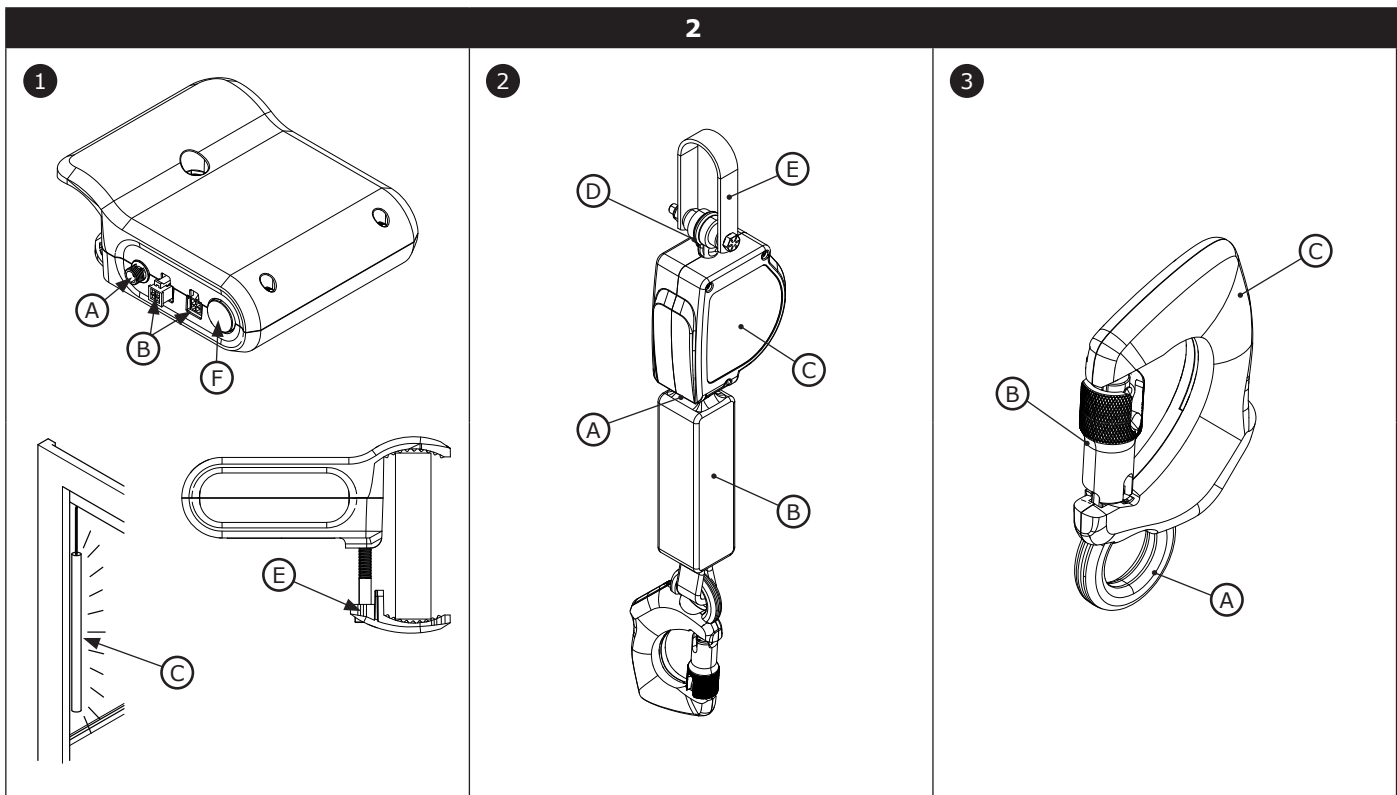
lbs (kg)

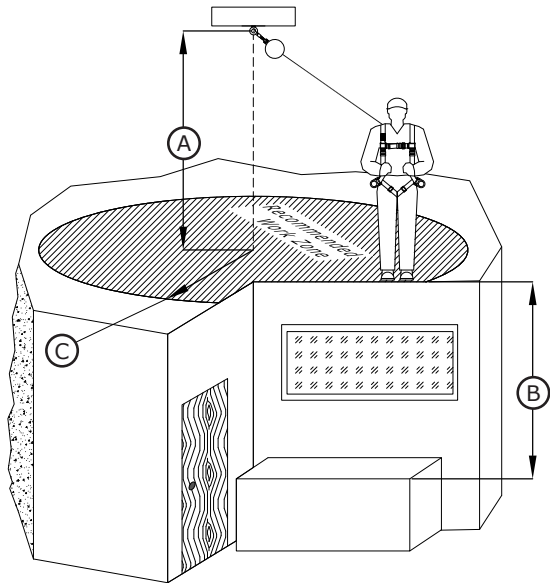
2.53 lbs
(1.15 kg)

(C) 2000037



D	E	F	lbs (kg)
6.25 in (15.87 cm)	3.5 in (8.90 cm)	1.37 in (3.50 cm)	0.45 lbs (0.20 kg)

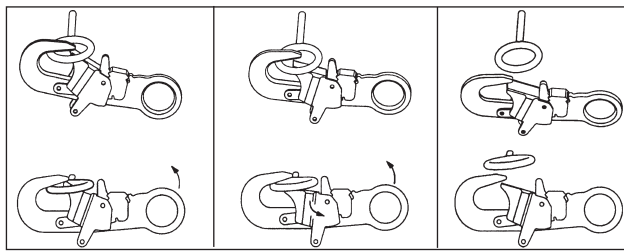




Web SRD: 130-310 lbs (59-140 kg)		(B)				
		<6 ft (1.8 m)	6 ft (1.8 m)	7 ft (2.1 m)	8 ft (2.4 m)	≥9 ft (2.7 m)
(A)	8 ft (2.4 m)		0 ft (0m)	2.6 ft (0.8 m)	3.9 ft (1.2 m)	5.1 ft (1.6 m)
	10 ft (3 m)		0 ft (0m)	3.3 ft (1.0 m)	4.8 ft (1.5 m)	6.1 ft (1.9 m)
	15 ft (4.6 m)		0 ft (0m)	4.5 ft (1.4 m)	6.6 ft (2.0 m)	8.2 ft (2.5 m)
	20 ft (6.1 m)		0 ft (0m)	5.5 ft (1.7 m)	8 ft (2.4 m)	9.9 ft (3.0 m)
	25 ft (7.6 m)		0 ft (0m)	6.4 ft (1.9 m)	9.1 ft (2.8 m)	11.3 ft (3.4 m)
(C)						

Web SRD: 311-420 lbs (141-191 kg)		(B)				
		<8 ft (2.4 m)	8 ft (2.4 m)	9 ft (2.7 m)	10 ft (3.0 m)	≥11 ft (3.4 m)
(A)	8 ft (2.4 m)		0 ft (0m)	2.6 ft (0.8 m)	3.9 ft (1.2 m)	5.1 ft (1.6 m)
	10 ft (3 m)		0 ft (0m)	3.3 ft (1.0 m)	4.8 ft (1.5 m)	6.1 ft (1.9 m)
	15 ft (4.6 m)		0 ft (0m)	4.5 ft (1.4 m)	6.6 ft (2.0 m)	8.2 ft (2.5 m)
	20 ft (6.1 m)		0 ft (0m)	5.5 ft (1.7 m)	8 ft (2.4 m)	9.9 ft (3.0 m)
	25 ft (7.6 m)		0 ft (0m)	6.4 ft (1.9 m)	9.1 ft (2.8 m)	11.3 ft (3.4 m)
(C)						

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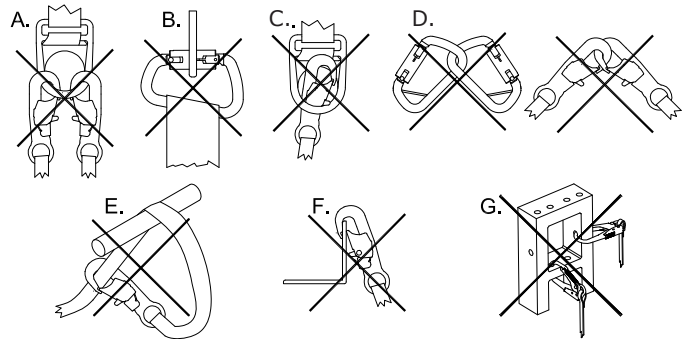


A

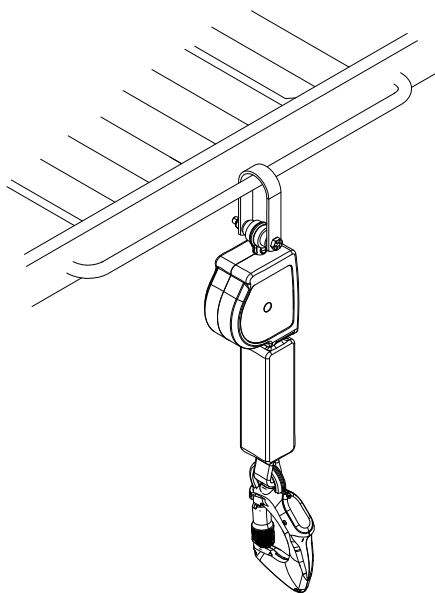
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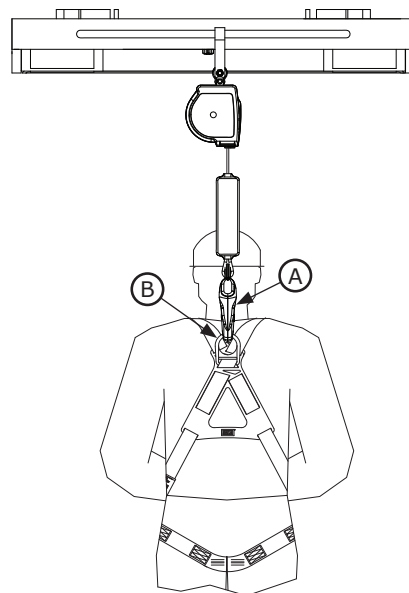
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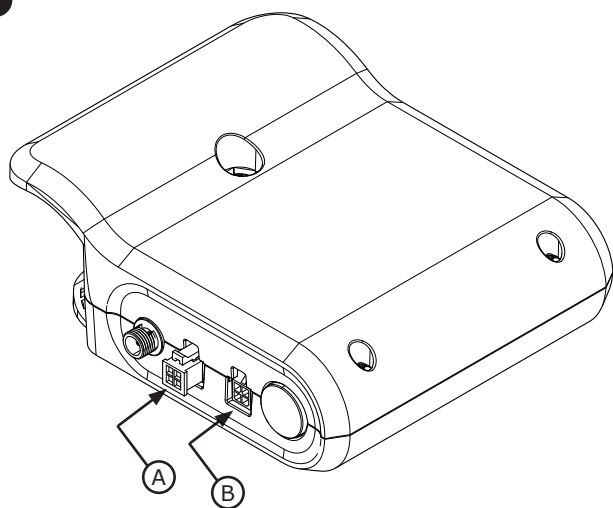


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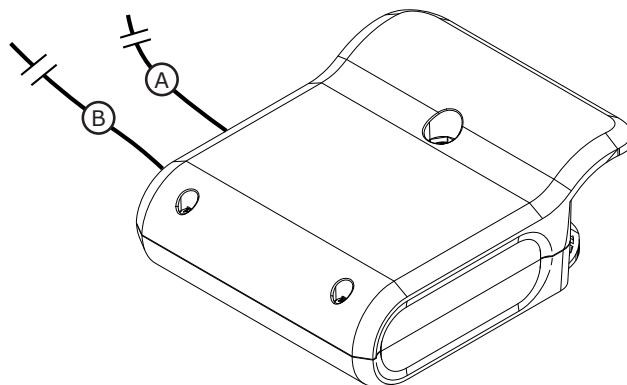


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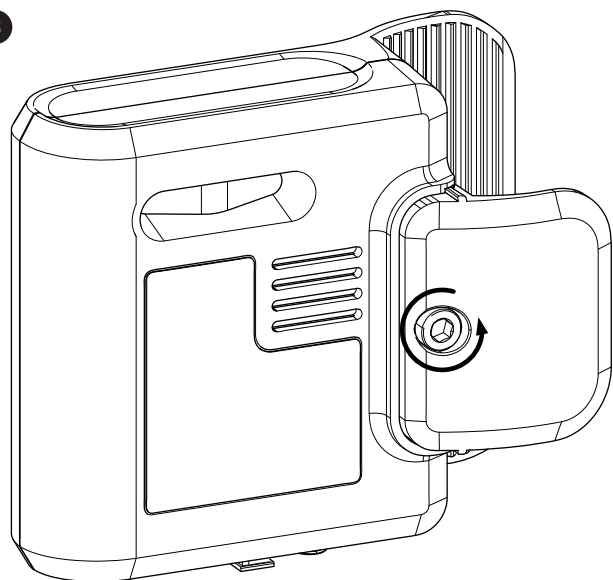
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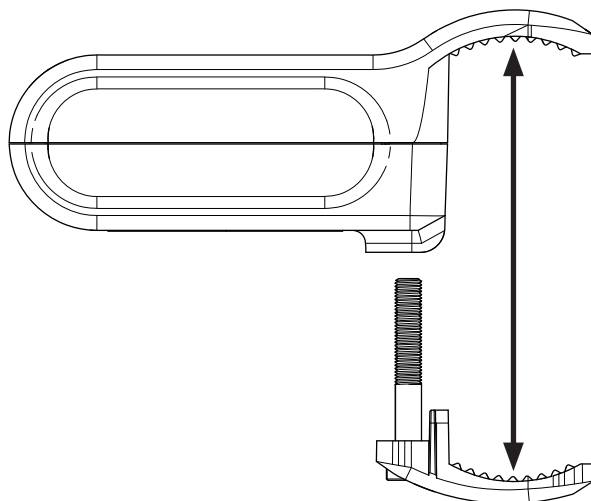
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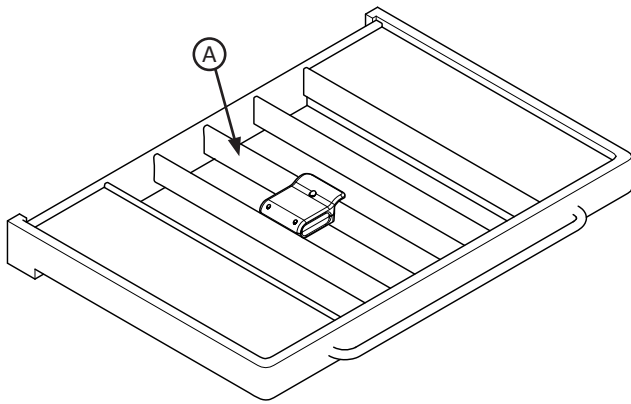
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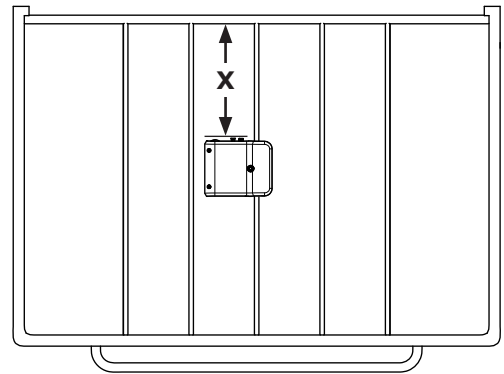
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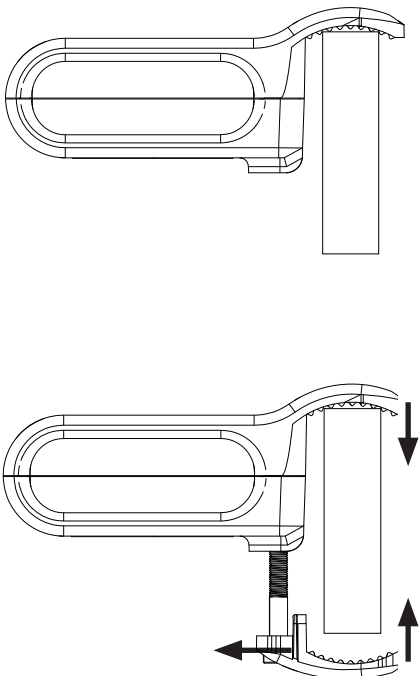
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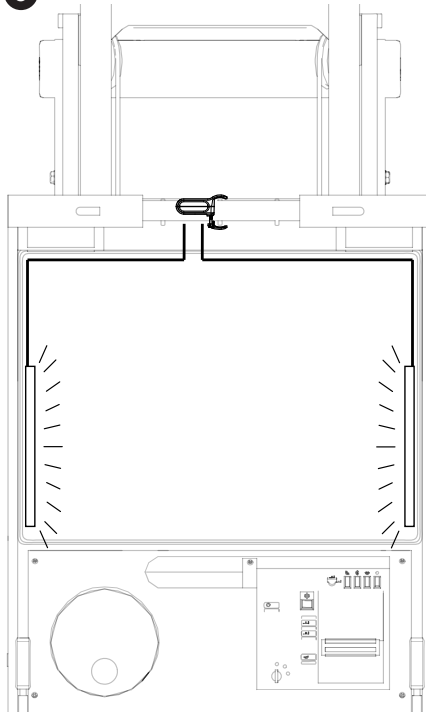
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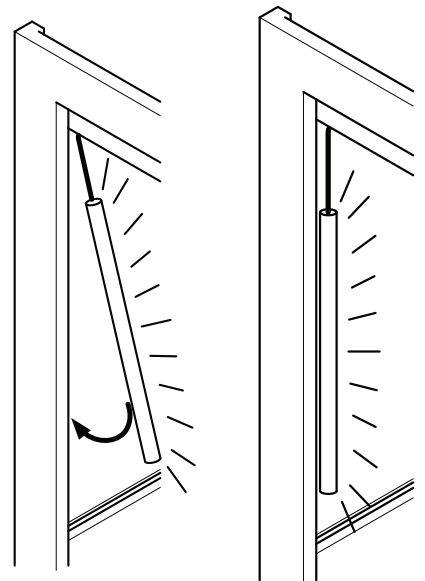
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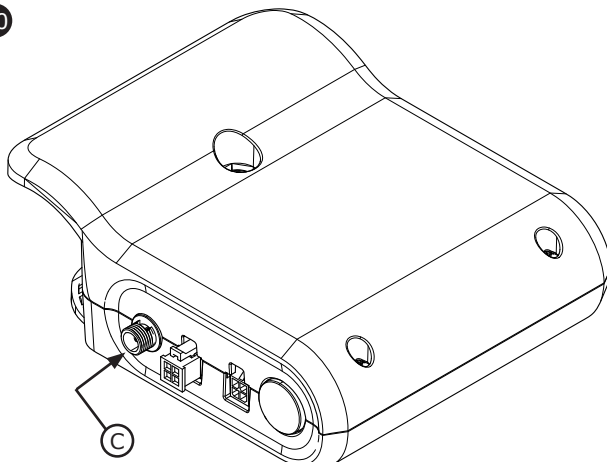
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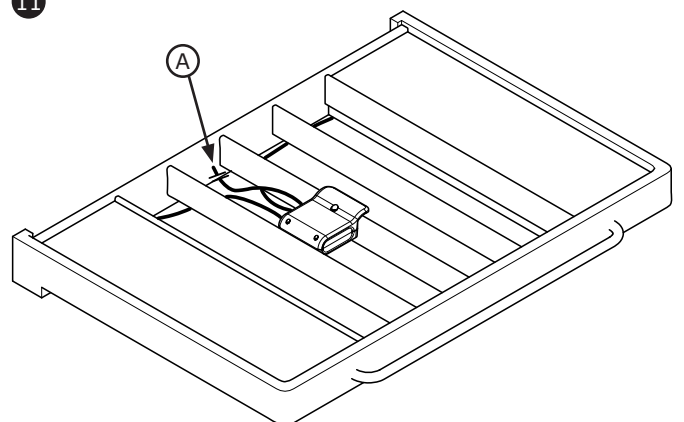
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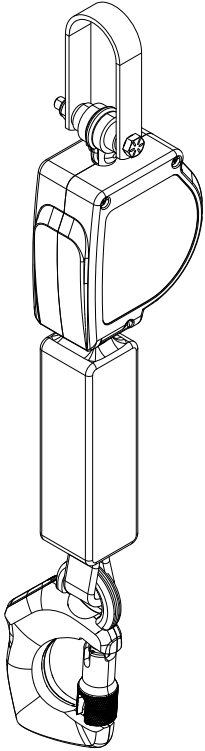
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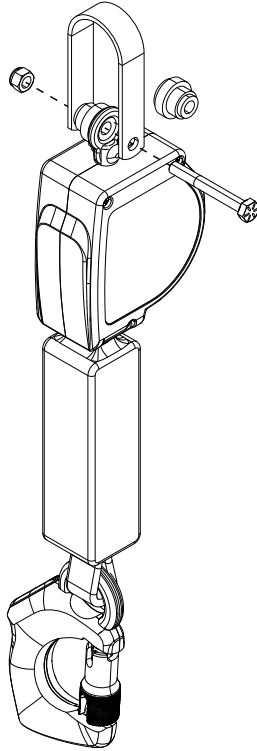
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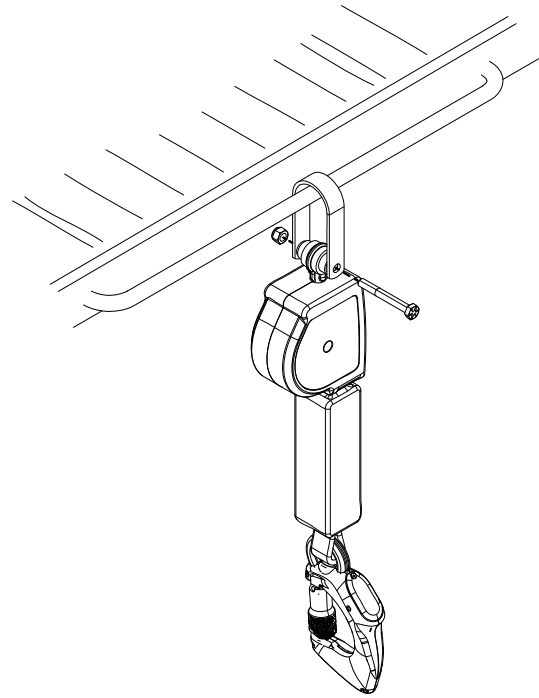
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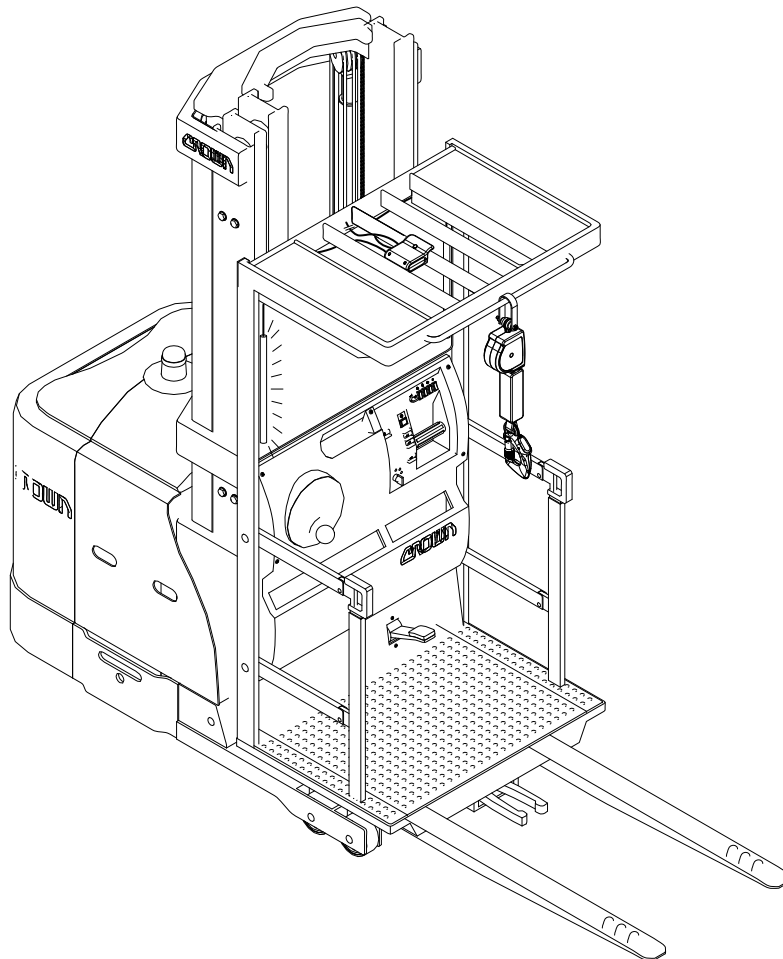
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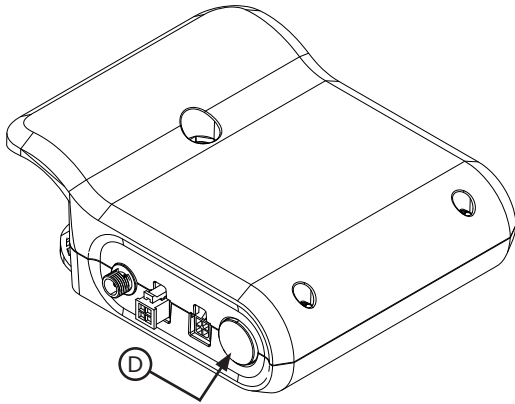


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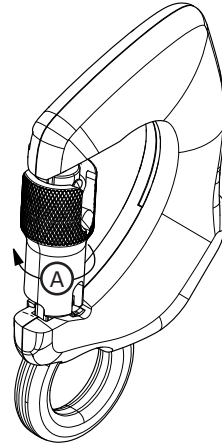


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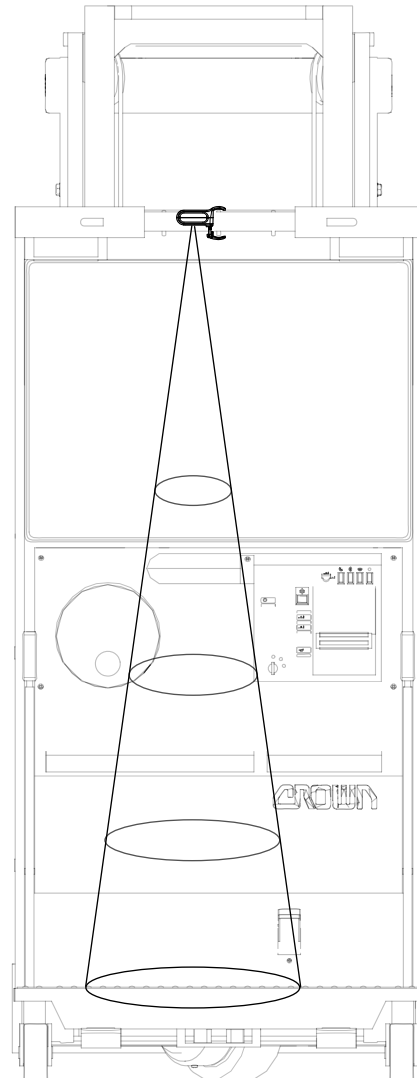
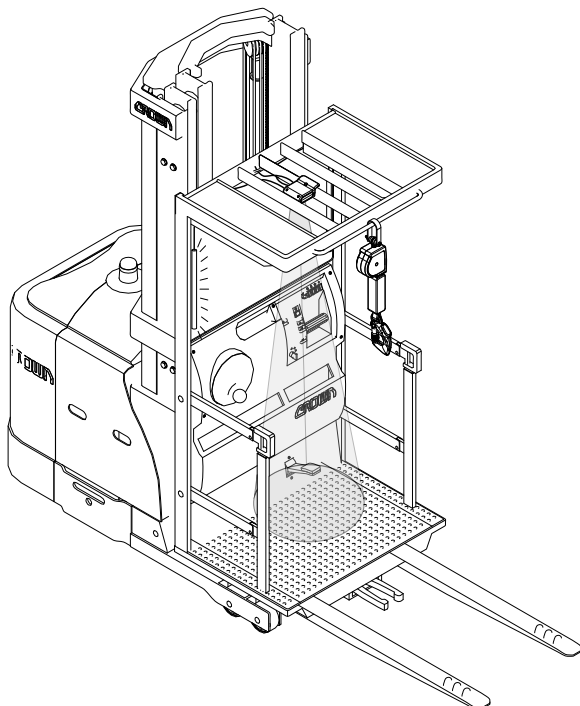
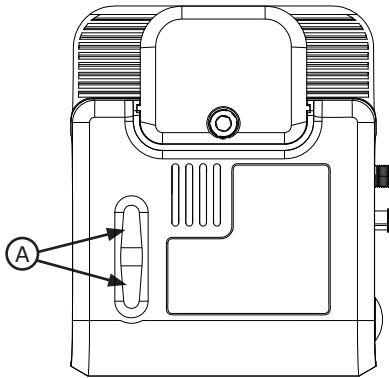
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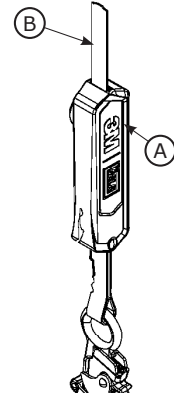
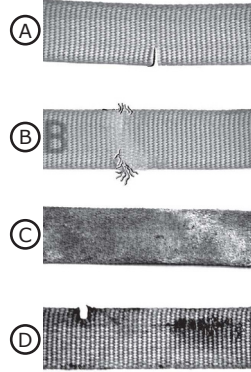
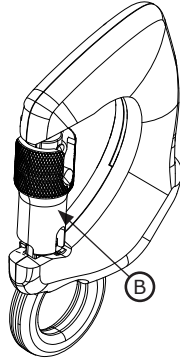
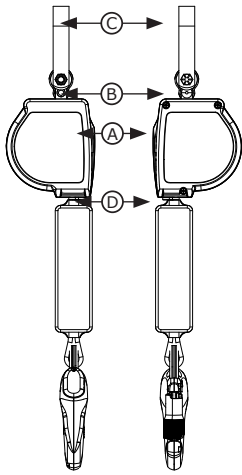
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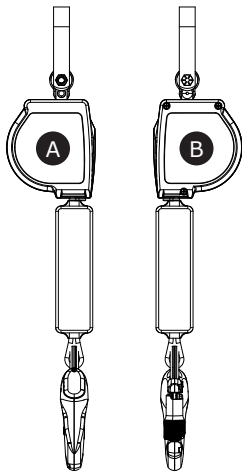
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13



14



A

www.capitalsafety.com
Capital Safety
+1-800-328-6146
Red Wing, MN, USA

DBI
SALA

Mfrd. (Yr, Mo):	Lot :	Model No. :	Length (ft/m) :
Fabr. (An, Mo):	No de modèle :	Longueur (ft/m) :	

Meets OSHA
ANSI Z359.14 CLASS B
ANSI A10.32
ISO17025 accredited verification to ANSI Z359.7

Average arresting force / Force d'arrêt moyenne: ≤ 900 lbs (4 kN)
Max arresting force / Force d'arrêt maximale: ≤ 1350 lbs (6 kN)
Arrest distance (when anchored overhead)
Distance de chute libre (quand ancré au-dessus de la tête): 3 1/2 ft (1.07 m)

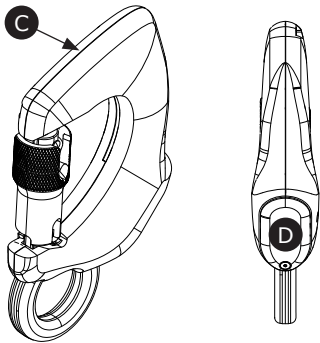
2R See I-Safe Tag for Serial Number
Voir l'étiquette I-Safe pour le numéro de série
Do not remove this label / Ne pas enlever cette étiquette
Patent Pending

B

DBI
SALA

NANO-LOK™
SELF RETRACTING LIFELINE

EXTENDED LENGTH

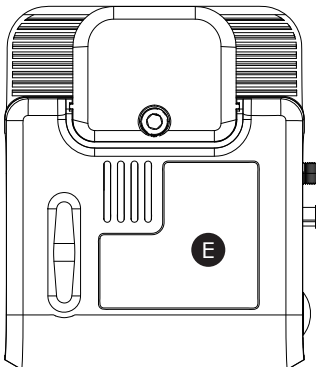


C

MFG DATE	ANSI Z359.12
LOT #	
MFG ID	

D

MN#2000037 5171 LBS (23Kn)
FCC ID: DGFPD3100273
IC: 458A - PSD3100273



E

3M | **SALA**

Mfrd. (Yr, Mo): Lot#: Model No.:

3M DBI Sala Nano-Lok Connected
Order Picker Self Retract
MN#6848924
FCC ID: DGFPD3100273
IC 458A - PSD3100273
Tech. Support: 3M.com/FallProtection Made in USA

SAFETY INFORMATION

EN

Please read, understand, and follow all safety information contained in these instructions prior to the use of this Connected Order Picker Self-Retracting Lifeline. FAILURE TO DO SO COULD RESULT IN SERIOUS INJURY OR DEATH.

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

Intended Use:

The Connected Order Picker Self-Retracting Lifeline is intended for use as part of a complete personal fall protection system. The Connected Order Picker Self-Retracting Lifeline is intended to provide real-time feedback of connection status during standard work activity. The Connected Order Picker Self-Retracting Lifeline is intended for use in industrial and commercial applications where connection will be completed on horizontal metal anchors.

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

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

WARNING

The Connected Order Picker Self-Retracting Lifeline is part of a personal fall protection system. It is expected that all users be fully trained in the safe installation and operation of their personal fall protection system. **Misuse of this device could result in serious injury or death.** For proper selection, operation, installation, maintenance, and service, refer to these User Instructions and all manufacturer recommendations, see your supervisor, or contact 3M Technical Services.

- **To reduce the risks associated with fire and explosion which, if not avoided, could result in serious injury or death:**
 - Device is not Intrinsically Safe. Do not use this device in flammable or explosive environments.
- **To reduce the risks associated with working with an Anchorage Connector which, if not avoided, could result in serious injury or death:**
 - Inspect the system before each use, and after any fall event, in accordance with the procedures defined in these User Instructions.
 - If inspection reveals an unsafe or defective condition, remove the device from service and destroy it immediately.
 - Any device that has been subject to fall arrest or impact force must be immediately removed from service and labeled "UNUSABLE". Refer to the User Instructions or contact 3M Fall Protection.
 - Ensure all connecting subsystems (e.g. lanyards) are kept free from all hazards including, but not limited to, entanglement with other workers, yourself, moving machinery, or other surrounding objects.
 - Never allow slack in the lifeline. Do not tie or knot the lifeline.
 - Never rely on the LED or audio indicators for proof of safe connection to your fall protection equipment. Always follow appropriate safety procedures and practices.
 - Avoid sudden or quick movements during normal work operation.
 - Never remove the pre-attached lanyards or self-retracting devices from the carabiner.
 - Ensure the device is rigged appropriately for the intended use.
 - Ensure that fall protection systems/subsystems assembled from components made by different manufacturers are compatible and meet the requirements of applicable standards, including the ANSI Z359 or other applicable fall protection codes, standards, or requirements. Always consult a Competent or Qualified Person before using these systems.
- **To reduce the risks associated with working at height which, if not avoided, could result in serious injury or death:**
 - Ensure your health and physical condition allow you to safely withstand all of the forces associated with working at height. Consult with your doctor if you have any questions regarding your ability to use this equipment.
 - Never exceed allowable capacity of your fall protection equipment.
 - Never exceed maximum free fall distance of your fall protection equipment.
 - Do not use any fall protection equipment that fails pre-use or other scheduled inspections, or if you have concerns about the use or suitability of the equipment for your application. Contact 3M Technical Services with any questions.
 - Some subsystem and component combinations may interfere with the operation of this equipment. Only use compatible connections. Consult 3M prior to using this equipment in combination with components or subsystems other than those described in the User Instructions.
 - Use extra precautions when working around moving machinery (e.g. top drive of oil rigs), electrical hazards, extreme temperatures, chemical hazards, explosive or toxic gases, sharp edges, or below overhead materials that could fall onto you or your fall protection equipment.
 - Use Arc Flash or Hot Works devices when working in high heat environments.
 - Avoid surfaces and objects that can damage the user or equipment.
 - Ensure there is adequate fall clearance when working at height.
 - Never modify or alter your fall protection equipment. Only 3M or parties authorized in writing by 3M may make repairs to the equipment.
 - Prior to use of fall protection equipment, ensure a rescue plan is in place which allows for prompt rescue if a fall incident occurs.
 - If a fall incident occurs, immediately seek medical attention for the fallen worker.
 - Do not use a body belt for fall arrest applications. Use only a Full Body Harness.
 - Minimize swing falls by working as directly below the anchorage point as possible.
 - If training with this device, a secondary fall protection system must be utilized in a manner that does not expose the trainee to an unintended fall hazard.
 - Always wear appropriate personal protective equipment when installing, using, or inspecting the device/system.

☒ Prior to installation of this equipment, record the product identification information from the ID label in the "Inspection and Maintenance Log" (Table 3) located at the back of this manual.

PRODUCT DESCRIPTION:

Figure 1 illustrates the 3M™ DBI-SALA® Nano-Lok™ Connected Order Picker System. The components of the system work together to create an electronic field that detects the user's presence within the order picker vehicle. When the user is not tied off with the Self-Retracting Device (SRD) and attached Carabiner, the Feedback Lights will flash and an alarm will sound.

Figure 2 illustrates components of the Connected Order Picker System. The Connected Sensor Box (1) detects the user's presence within the cab. The Power Input (A) receives the power cable and directs power to the system. The Feedback Output Plugs (B) move power from the Sensor Box and into the Feedback Lights (C), which flash in response to the tie-off status of the user. The Housing (D) holds the pieces of the Sensor Box together. The Adjustable Grip (E) enables the Sensor Box to be secured to the cab top of an order picker vehicle. The Pairing Button (F) is used to pair the Sensor Box with the Connected Carabiner.

The Nano-Lok Self-Retracting Device (2) is attached to the cab top of the order picker and arrests the user in the event of a fall. The Lifeline (A) extends and retracts with movement of the user, locking at the sudden application of downward force. The Energy Absorber (B) breaks in the event of a fall, absorbing the energy of the impact. The Housing (C) contains the drum-wound Lifeline. The Swivel (D) receives the Cab Mount (E), which secures the SRD to the cab top of the order picker vehicle.

The Connected Aluminum Carabiner (3) detects and passes information regarding the user's tie-off status to the Sensor Box. The Connection Eye (A) enables the SRD to secure to the Carabiner. The Gate (B) opens and closes around the attachment point, allowing the Carabiner to secure to the dorsal D-ring of a Full Body Harness. The Shroud (C) is attached to the body of the Carabiner and contains all of the electrical components of the Carabiner.

Table 1 – Specifications

System Specifications:			
Capacity:	1 Person with a combined weight (clothing, tools, etc.) of no more than: 310 lbs (140 kg) for compliance with ANSI standards, or 420 lbs (191 kg) for compliance with OSHA.		
Anchorage:	The Connected Order Picker System is designed to be attached to the cab top of an order picker vehicle. For the system to be used, the vehicle must be capable of withstanding the following values: <table border="1"> <tr> <td>ANSI/OSHA</td><td>5,000 lbs (22.2 kN)</td></tr> </table> The Connected Order Picker System must be used for Fall Arrest applications only. All components of the system must be used in conjunction with one another.	ANSI/OSHA	5,000 lbs (22.2 kN)
ANSI/OSHA	5,000 lbs (22.2 kN)		
Dimensions:	See Figure 1 for the dimensions of each component of the Connected Order Picker System.		
Product Weight:	The weight of the Connected Order Picker System is 3.94 lbs (1.79 kg). See Figure 1 for the weight values of individual components.		
Standards:	The Connected Order Picker System is tested in accordance with the standards identified on the front cover of this instruction.		
Service Temperature:			
Maximum Arresting Force:	The Maximum Arresting Force shall be limited to no greater than 1350 lbs (6 kN).		
Battery Use:	The Connected Aluminum Carabiner is compatible with CR2032 coin cell batteries only.		

Component Specifications:	
Figure 2 Reference	Component
①	Connected Sensor Box
②	Nano-Lok Self-Retracting Device (SRD)
③	Connected Aluminum Carabiner
☒ See below for the specifications of each system component.	

Connected Sensor Box (Figure 2.1):

Figure Reference	Component	Materials
Ⓐ	Power Input	Wire: 18 AWG bare copper stranded; Insulation: PVC
Ⓑ	Feedback Output Plugs	Housing: Polyester; Plating: Phosphor Bronze; Overmold: PVC
Ⓒ	Feedback Lights (Connected LED Feedback Indicating Lights)	Cable Clips/Cable Ties: Black nylon plastic
Ⓓ	Housing	Black polycarbonate/PBT plastic
Ⓔ	Adjustment Clamp	Black polycarbonate/PBT plastic
Ⓕ	Pairing Button	Black ABS plastic

Table 1 – Specifications

Nano-Lok Self-Retracting Device (Figure 2.2):

Figure Reference	Component	Materials
(A)	Lifeline	Dyneema webbing
(B)	Energy Absorber	Polyester webbing
(C)	Housing	Blue super-tough nylon plastic
(D)	Swivel	Alloy steel
(E)	Cab Mount	Alloy steel

Connected Aluminum Carabiner (Figure 2.3):

Figure Reference	Component	Materials
(A)	Connection Eye	7075 Aluminum alloy
(B)	Gate	7075 Aluminum alloy
(C)	Shroud	Black polycarbonate/PBT plastic

Performance Specifications:

Electrical Power (Connected Sensor Box):

Recommended Operating Voltage:	24 VDC
Minimum Operating Voltage:	12 VDC
Maximum Operating Voltage:	26 VDC
Current Requirement:	200 mA at 24 VDC; 400 mA at 12 VDC

SRD Specifications (Z359.14 Class B)	ANSI	OSHA
Capacity Range	130 lbs - 310 lbs (59 kg - 140 kg)	130 lbs - 420 lbs (59 kg - 191 kg)
Maximum Arresting Force	1,350 lbs (6.0 kN)	1,350 lbs (6.0 kN)
Average Arresting Force	900 lbs (4.0 kN)	900 lbs (4.0 kN)
Arrest Distance	42 in (1.07 m)	42 in (1.07 m)
Minimum Fall Clearance Required¹	6.0 ft (1.83 m)	6.0 ft (1.83 m)
Maximum Free Fall²	2.0 ft (0.6 m)	2.0 ft (0.6 m)

1 - Assumes the SRD is mounted directly above (overhead) the end user.

2 - SRD must be mounted above user D-ring.

RF Regulatory Information (FCC Rules and ISED):

FCC ID: DGFPSD3100273

IC: 485A - PSD3100273

This device complies with Part 15 of the FCC Rules and with the license-exempt RSS(s) of Innovation, Science and Economic Development (ISED) Canada. Operation is subject to the following two conditions:

- 1) This device may not cause harmful interference.
- 2) This device must accept any interference received, including interference that may cause undesired operation.

The 3M™ DBI-SALA® Connected Order Picker SRD System is designed to meet the regulatory requirements in those jurisdictions in which it is offered. Changes or modifications not expressly approved by 3M Company could void the user's authority to operate the 3M™ DBI-SALA® Connected Order Picker SRD System.

Cet appareil est conforme à la partie 15 des règles de la FCC et aux CNR applicables aux appareils exemptés de licence d'Innovation, Sciences et Développement économique Canada (ISED). Le fonctionnement est assujéti aux deux conditions suivantes:

- 1) cet appareil peut provoquer des interférences nuisibles;
- 2) cet appareil doit accepter toute interférence reçue, y compris les interférences qui peuvent causer un fonctionnement indésirable.

Le système de dispositif autorétractable pour manutentionnaires connecté DBI-SALA® 3M^{MC} a été conçu conformément aux exigences réglementaires des territoires de compétence dans lesquelles il est offert. Tout changement ou modification non expressément approuvé par 3M peut annuler le droit de l'utilisateur d'utiliser le système de dispositif autorétractable pour manutentionnaires connecté DBI-SALA® 3M^{MC}.

1.0 APPLICATION

- 1.1 PURPOSE:** The Connected Order Picker System is designed to provide workers with real-time feedback on anchor status and to prevent the fall of the user through use of this feedback system alongside a Self-Retracting Device (SRD). When used properly, the Connected Order Picker System is designed to eliminate or substantially reduce the risk of a fall which would otherwise lead to injury or death. The Connected Order Picker System is designed for vehicles meeting the requirements listed in Table 1.

☒ *The Connected Order Picker System is intended for use in Fall Arrest¹ applications only. Do not attempt to use any component of the Connected Order Picker System for any other purpose or outside the system.*

- 1.2 STANDARDS:** Your Connected Order Picker System conforms to the national or regional standard(s) 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.

- 1.3 TRAINING:** This system must be installed and used by persons trained in its correct application. This manual is to be used as part of an employee training program as required by ANSI and OSHA, and/or regional regulations. 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.

- 1.4 LIMITATIONS:** Always consider the following limitations when installing or using this equipment:

- **Capacity:** The Connected Order Picker System is for use by one person with a combined weight (clothing, tools, etc.) meeting the capacity requirements specified in Table 1 for your standard(s). Ensure all of the components in your system are rated to a capacity appropriate to your application.
- **Anchorage:** Order picker vehicles used for anchorage of the SRD must meet the requirements specified in Table 1. When more than one fall arrest system is attached to an anchorage, the strengths set forth in Table 1 shall be multiplied by the number of systems attached to the anchorage.

☒ *From OSHA 1926.502 and 1910.140: Anchorages used for attachment of personal fall arrest systems shall be independent of any anchorage being used to support or suspend platforms, and capable of supporting at least 5,000 lbs. per user attached, or be designed, installed, and used as part of a complete personal fall arrest systems which maintains a safety factor of at least two, and is under the supervision of a Qualified Person.*

- **Locking Speed:** Situations which do not allow for an unobstructed fall path should be avoided. Working in confined or cramped spaces may not allow the body to reach sufficient speed to cause the SRD of the Connected Order Picker System to lock if a fall occurs. A clear path is required to assure positive locking of the SRD.
- **Free Fall:** Properly using an SRD in overhead applications will minimize free fall distance. To prevent an increased free fall distance, follow the instructions below:
 - Never clamp, knot, or otherwise prevent the lifeline from retracting or staying taut.
 - Avoid any slack in the lifeline of the SRD.
 - Do not work above the level of your anchorage.
 - Do not lengthen SRDs by connecting a lanyard or similar component without consulting 3M.

For product-specific information relating to free fall and fall clearance values, refer to Table 1 of this instruction.

- **Swing Falls:** Swing Falls occur when the anchorage point is not directly above the point where a fall occurs. The force of striking an object in a swing fall may cause serious injury (see Figure 3A). Minimize swing falls by working as directly below the anchorage point as possible (Figure 3B).
- **Fall Clearance:** Figure 3B illustrates Fall Clearance Calculation. Fall Clearance (FC) is the sum of Free Fall (FF), Deceleration Distance (DD) and a Safety Factor (SF): $FC = FF + DD + SF$. D-Ring Slide and Harness Stretch are included in the Safety Factor. Fall Clearance values have been calculated and are charted in Figure 4. A Safety Factor of 1 m (3.28 ft) was used for all values in Figure 4.

For falls from a standing position where the SRD is anchored directly overhead (Figure 3B), SRD Fall Arrest Systems should have the minimum Fall Clearances specified in Table 1. Falls from a kneeling or crouching position will require an additional 1 m (3 ft) of Fall Clearance. In a swing fall situation (Figure 3C), the total vertical fall distance will be greater than if the user had fallen directly below the anchorage point and may require additional Fall Clearance. Figure 4 and the accompanying table define the Maximum Work Radius (C) for various SRD Anchorage Heights (A) and Fall Clearances (B). The Recommended Work Zone is limited to the area located within the Maximum Work Radius.

- **Hazards:** Use of this equipment in areas where surrounding hazards exist may require additional precautions to reduce the possibility of injury to the user or damage to the equipment. Hazards may include, but are not limited to: high heat, caustic chemicals, corrosive environments, high voltage power lines, explosive or toxic gases, moving machinery, or overhead materials that may fall and contact the user or fall arrest system. Avoid working where the lifeline of the SRD may cross or tangle with that of another worker. Avoid working where an object may fall and strike the lifeline, resulting in loss of balance or damage to the lifeline. Do not allow the lifeline to pass under arms or between legs.
- **Sharp Edges:** Avoid working where the lifeline will be in contact with or abrade against unprotected sharp edges. Where contact with a sharp edge is unavoidable, cover the edge with a protective material.

- 1.6 INSPECTION FREQUENCY:** The system shall be inspected by the user before each use and, additionally, by a Competent Person¹ other than the user at intervals of no longer than one year.² Inspection procedures are described in the "Inspection and Maintenance Log". Results of each inspection should be recorded on copies of the "Inspection and Maintenance Log".

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

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

2.0 SYSTEM REQUIREMENTS

- 2.1 RESCUE PLAN:** When using this equipment and connecting subsystem(s), the employer must have a rescue plan and the means at hand to implement and communicate that plan to users, authorized persons³, and rescuers⁴. A trained, on-site rescue team is recommended. Team members should be provided with the equipment and techniques to perform a successful rescue. Training should be provided on a periodic basis to ensure rescuer proficiency.
- 2.2 INSPECTION FREQUENCY:** The Connected Order Picker System shall be inspected by the authorized person⁵ or rescuer⁶ before each use (see Table 3). Additionally, inspections shall be conducted by a Competent Person other than the user. Extreme working conditions (harsh environment, prolonged use, etc.) may necessitate more frequent Competent Person inspections. The Competent Person shall use the *Inspection Schedule (Table 2)* to determine appropriate inspection intervals. Inspection procedures are described in the *Inspection & Maintenance Log (Table 3)*. Results of the Competent Person inspection should be recorded in the *Inspection and Maintenance Log*.
- 2.3 SRD OPERATION:** Normal operation of the SRD will allow the lifeline to extend and retract with no hesitation or slack as the worker moves at normal speeds. If a fall occurs, a speed sensing brake system will activate, stopping the fall and absorbing much of the energy created. Sudden or quick movements should be avoided during normal work operation, as this may cause the SRD to lock up. For falls which occur near the end of the lifeline travel, a reserve lifeline system or Energy Absorber has been incorporated to reduce the fall arrest forces.
- 2.4 COMPONENT COMPATIBILITY:** 3M equipment is designed for use with 3M approved components and subsystems only. Substitutions or replacements made with non-approved components or subsystems may jeopardize compatibility of equipment and may affect the safety and reliability of the complete system.
- 2.5 CONNECTOR COMPATIBILITY:** Connectors are considered to be compatible with connecting elements when they have been designed to work together in such a way that their sizes and shapes do not cause their gate mechanisms to inadvertently open regardless of how they become oriented. Contact 3M if you have any questions about compatibility. Connectors (hooks, carabiners, and D-rings) must be capable of supporting at least 5,000 lbs. (22.2 kN). Connectors must be compatible with the anchorage or other system components. Do not use equipment that is not compatible. Non-compatible connectors may unintentionally disengage (see Figure 5). Connectors must be compatible in size, shape, and strength. If the connecting element to which a snap hook or carabiner attaches is undersized or irregular in shape, a situation could occur where the connecting element applies a force to the gate of the snap hook or carabiner (A). This force may cause the gate to open (B), allowing the snap hook or carabiner to disengage from the connecting point (C). Self-locking snap hooks and carabiners are required by ANSI Z359 and OSHA.
- 2.6 MAKING CONNECTIONS:** Snap hooks and carabiners used with this equipment must be self-locking. Ensure all connections are compatible in size, shape and strength. Do not use equipment that is not compatible. Ensure all connectors are fully closed and locked. 3M connectors (snap hooks and carabiners) are designed to be used only as specified in each product's user's instructions. See Figure 6 for examples of inappropriate connections. Do not connect snap hooks and carabiners:
- A. To a D-ring to which another connector is attached.
 - B. In a manner that would result in a load on the gate. Large throat snap hooks should not be connected to standard size D-rings or similar objects which will result in a load on the gate if the hook or D-ring twists or rotates, unless the snap hook complies is equipped with a 3,600 lb (16 kN) gate. Check the marking on your snap hook to verify that it is appropriate for your application.
 - C. In a false engagement, where features that protrude from the snap hook or carabiner catch on the anchor, and without visual confirmation seems to be fully engaged to the anchor point.
 - D. To each other.
 - E. Directly to webbing or rope lanyard or tie-back (unless the manufacturer's instructions for both the lanyard and connector specifically allows such a connection).
 - F. To any object which is shaped or dimensioned such that the snap hook or carabiner will not close and lock, or that roll-out could occur.
 - G. In a manner that does not allow the connector to align properly while under load.

Table 2 – Inspection Schedule

Type of Use	Application Examples	Conditions of Use	Inspection Frequency
Infrequent to Light	Rescue and Confined Space, Factory Maintenance	Good Storage Conditions, Indoor or Infrequent Outdoor Use, Room Temperature, Clean Environments	Annually
Moderate to Heavy	Transportation, Residential Construction, Utilities, Warehouse	Fair Storage Conditions, Indoor and Extended Outdoor Use, All Temperatures, Clean or Dusty Environments	Semi-Annually to Annually
Severe to Continuous	Commercial Construction, Oil and Gas, Mining	Harsh Storage Conditions, Prolonged or Continuous Outdoor Use, All Temperatures, Dirty Environment	Quarterly to Semi-Annually

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

4 Rescuer: Person or persons other than the rescue subject acting to perform an assisted rescue by operation of a rescue system.

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

6 Rescuer: Person or persons other than the rescue subject acting to perform an assisted rescue by operation of a rescue system.

3.0 INSTALLATION

☒ *Installation of the Connected Order Picker System must be supervised by a Qualified Person¹. The order picker vehicle must be certified by a Competent Person as meeting the criteria for a Certified Anchorage, or that it is capable of supporting the potential forces that could be encountered during a fall.*

3.1 PLANNING: Plan your fall protection system prior to installation of the Connected Order Picker System. Account for all factors that may affect your safety before, during, and after a fall. Consider all requirements and limitations defined in these User Instructions.

3.2 INSTALLING THE CONNECTED SENSOR BOX AND FEEDBACK LIGHTS: Figure 9 illustrates installation of the Connected Sensor Box and its attached Connected LED Feedback Indicating Lights. The Sensor Box is designed to be secured on the cab top, just above the working area of the vehicle. To install the Sensor Box and Feedback Lights:

1. Plug the cables for the Feedback Lights (A and B) into the back of the Sensor Box. Ensure that these cables do not become entangled at any point during the installation process.
2. Turn the adjustment bolt of the Sensor Box to the left to loosen the adjustment clamp.
3. Remove the adjustment bolt and adjustment clamp from the Sensor Box.
4. Measure the standing platform and find the center. Place the Sensor Box on the middle rung (A) of the cab top or on the rung nearest to the platform center. Ensure the Sensor Box is set back 'X' inches from the edge of the cab top, where 'X' is equivalent to the center measurement.
5. Reattach the adjustment clamp to the bottom of the Sensor Box. Turn the adjustment bolt right until the Sensor Box is secured tightly to the cab top.
6. Thread the cables of the Feedback Lights around the rim of the order picker window. Placement of the cables should enable the Feedback Lights to be placed as seen in Figure 9.6. If any part of the cable should not stay, use the provided cable clips. These clips have an adhesive backing and may be placed on the top rungs and side bars of the order picker window frame. A single cable tie should be used with each cable clip to secure the cable in place.
7. After placement of the cables, remove the protective strip from the adhesive strip on the back of the Feedback Lights. Place one Feedback Light on either end of the order picker window, ensuring that the glow of the Feedback Lights will be clearly visible.
8. Plug the power cord (C) into the back of the already-mounted Sensor Box. Ensure that the power cord does not become entangled with the cables of the Feedback Lights.
9. Plug the input end of the power cord (A) into the available power source. The white-striped wire of the power cord is positive (+) and must be hardwired to a power source of 12-24 V. Use any leftover cable clips and cable ties to manage access wires.

3.3 INSTALLING THE NANO-LOK SELF-RETRACTING DEVICE WITH CONNECTED CARABINER: Figure 10 illustrates installation of the Nano-Lok SRD with Connected Aluminum Carabiner. The SRD is designed to connect to the dorsal D-ring of the user's full body harness, arresting the user in the event of a fall. The Carabiner has added electronic functionality that enables it to pair with the Sensor Box. When paired with the Sensor Box, the Carabiner will send information about the connection status of the user to the Sensor Box. To install the SRD with Connected Carabiner:

1. Ensure that each component of the SRD is present. The Cab Top Bracket (A) must be used with the SRD (B), along with the Carabiner (C).
2. Remove the locking pin (A) from the Cab Top Bracket and disassemble the Cab Top Bracket.
3. Reassemble the Cab Top Bracket on the SRD eyebolt over the end rung (A) of the cab top. Reinsert the locking pin (B) to hold the Bracket together.
4. Verify that the SRD and its Carabiner are installed properly.

4.0 OPERATION

☒ *Avoid close proximity of the Connected Aluminum Carabiner with implanted medical devices. Connected Carabiners contain magnets and Bluetooth capabilities. Contact your medical device manufacturer regarding safe operation of the system.*

4.1 BEFORE EACH USE: Verify that your work area and Personal Fall Arrest System (PFAS) meet all criteria defined in Section 2 and that a formal Rescue Plan is in place. Inspect the Connected Order Picker System per the 'User' inspection points defined on the "Inspection and Maintenance Log" (Table 2). If inspection reveals an unsafe or defective condition, do not use the system. Remove the system from service and contact 3M regarding replacement or repair.

4.2 AFTER A FALL: If any component of the Connected Order Picker System is subjected to the forces of arresting a fall, the system must be removed from service immediately, clearly marked "DO NOT USE", and forwarded to 3M for replacement or repair.

4.3 FALL ARREST CONNECTIONS: A Full Body Harness must be used with the Connected Order Picker System. Figure 8 illustrates connection of the SRD between the Harness and the cab top. Connect the Carabiner (A) on the SRD to the dorsal D-ring (B) on the Full Body Harness. Consult the harness manufacturer's instructions for details regarding use of the harness connection points.

4.4 BLUETOOTH PAIRING: The Carabiner and Sensor Box are paired at the factory and will be ready for operation with the Connected Order Picker System. See Figure 11 for reference. To pair the Sensor Box with the Carabiner:

1. Press and hold for two seconds the pairing button (D) on the side of the Sensor Box. This will put the Sensor Box into pairing mode, during which a blue wave pattern will display on the Feedback Lights.
2. Open and close the gate lock of the Carabiner five times within a two-second period. To open and close the gate lock, rotate the gate back and forth (A). This will put the Carabiner into pairing mode.

3. A successful pairing will be indicated by a green confirmation pattern on the Feedback Lights and an audible chirp from the Sensor Box.
4. If a pairing failure occurs, repeat the pairing procedure. Pairing failure is often caused by the gate lock actions not being completed within the two-second timeframe. If pairing failure continues to happen, check the battery of the Carabiner.

☒ A pairing failure is indicated by a short, flashing yellow pattern on the Feedback Lights and a descending pair of tones from the Sensor Box. A pairing failure will occur if the Sensor Box does not detect the Carabiner within 30 seconds.

- 4.5 SYSTEM PLACEMENT:** The SRD should be positioned directly above the user. The Sensor Box should be positioned directly above the center of the order picker platform. Placement of the Sensor Box should cover as much of the standing area as possible. See Figure 12 for reference. The sensors (A) should be unobstructed and should have a clear view of the center of the platform.
- 4.6 USER INTERFACE:** The Connected Order Picker System relies on the Feedback Lights and Sensor Box to indicate the tie-off status of the user. The Sensor Box and Carabiner collect information via electronic sensors and then relay this information back to the user through the system. Different blink patterns and sounds emitting from the system will indicate different situations to the user:

Reason	Occurs When...	Status Indication
Tie-Off Alert	User is within the detection radius of the Sensor Box but is not tied-off to the Carabiner.	Stage of alert patterns, escalating with time until the user completes tie-off: • <i>First:</i> Feedback Lights emit constant red glow. • <i>Second:</i> Feedback Lights pulse red. • <i>Third:</i> Feedback Lights flash brighter red and Sensor Box chirps audible alert tone.
Tie-Off Confirmation	User connects the Carabiner to the D-ring of their Full Body Harness.	Green blink of the Feedback Lights.
System Power Up	The Sensor Box is supplied with electrical power.	Red, green, and blue chase pattern on Feedback Lights, with an audible chirp from the Sensor Box. If the Sensor Box detects a self-test failure, it will play a series of descending tones instead of a chirp.
Low Battery - Carabiner	User is within the detection radius of the Sensor Box but is not tied-off to the Carabiner, and the Carabiner is reporting a 'Low Battery' status.	Escalating alert pattern (as seen in 'Tie-Off Alert'), but with the top and bottom portions of the Feedback Lights displaying yellow instead of red.
Bluetooth Pairing	System is in Bluetooth pairing mode, due to a press and hold of the pairing button on the Sensor Box.	Blue wave pattern on the Feedback Lights. See Section 4.4 for more information.
No Bluetooth Connection	User is within the detection radius of the Sensor Box, but no communication is coming from the Carabiner.	Escalating alert pattern (as seen in 'Tie-Off Alert'), but with the top and bottom portions of the Feedback Lights displaying blue instead of red.
Hard Fault on Sensor Box	A hardware failure is detected at power-up on the Sensor Box. The Sensor Box should be serviced.	Short red blink once every three seconds.
Hard Fault on Carabiner	User is within the detection radius of the Sensor Box, but is not tied-off to the Carabiner and the Carabiner is reporting a hardware failure. The Carabiner should be serviced.	Escalating alert pattern (as seen in 'Tie-Off Alert'), but with the top and bottom portions of the Feedback Lights displaying violet instead of red.

- 4.7 BATTERY REPLACEMENT:** The battery of the Connected Carabiner should be replaced whenever a 'Low Battery' status is indicated by the user interface of the Connected Order Picker System. See Table 1 for a list of compatible batteries.

☒ Use only batteries listed in these User Instructions. Use of any other battery may present a risk of fire or explosion.

5.0 INSPECTION

- 5.1 INSPECTION FREQUENCY:** The Connected Order Picker System must be inspected at the intervals defined in Section 1. Inspection procedures are described in the "Inspection and Maintenance Log" (Table 2). Inspect all other components of the Fall Protection System per the frequencies and procedures defined in the manufacturer's instructions.
- 5.2 DEFECTS:** If inspection reveals an unsafe or defective condition, remove the Connected Order Picker System from service immediately and contact 3M regarding replacement or repair. Do not attempt to repair the Fall Arrest System.

☒ Only 3M or parties authorized in writing may make repairs to the Connected Order Picker System.

- 5.3 PRODUCT LIFE:** The functional life of the Fall Arrest System is determined by work conditions and maintenance. As long as each component of the Connected Order Picker System passes inspection criteria, it may remain in service.

6.0 MAINTENANCE, SERVICE, and STORAGE

6.1 CLEANING: Periodically clean the Connected Order Picker System's metal components with a soft brush, warm water, and a mild soap solution. Ensure parts are thoroughly rinsed with clean water.

Cleaning procedures for the SRD are as follows:

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

6.2 SERVICE: Only 3M or parties authorized in writing by 3M may make repairs to this equipment. If a component of the Connected Order Picker System has been subject to fall arrest force or if inspection reveals an unsafe or defective condition, remove the system from service and contact 3M regarding replacement or repair.

6.3 STORAGE AND TRANSPORT: When not in use, store and transport the components of the Connected Order Picker System 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

Figure 14 illustrates labels on the Connected Order Picker System and their locations. All labels must be present on the system. Labels must be replaced if they are missing or not fully legible.

Table 3 – Inspection and Maintenance Log

Inspection Date:		Inspected By:	
Components:	Inspection: (See Section 1 for <i>Inspection Frequency</i>)	User	Competent Person¹
Connected Sensor Box (Figure 2.1)	Inspect the Housing (D), Adjustment Clamp (E), and Pairing Button (F) for damage: Look for cracks, dents, and deformities.	☐	☐
	Inspect the lens for smudges or dust that could interfere with user detection.	☐	☐
	Ensure that the Adjustment Clamp and its adjustment bolt move freely and secure properly.	☐	☐
	Verify that the Power Input (A), the Feedback Output Plugs (B), and the Feedback Lights (C) are free of any cuts or abrasions. The cables should be fully secured at each connection point and there should be no loose portions of wire.	☐	☐
Nano-Lok SRD (Figure 2.2)	Inspect for loose fasteners and bent or damaged parts.	☐	☐
	Inspect the Housing (C) and Cab Mount (E) for damage: Look for cracks, dents, and deformities.	☐	☐
	Inspect the Swivel (D) for distortion, cracks, and deformities. The Swivel should be attached securely to the SRD, but should pivot freely.	☐	☐
	The Lifeline (A) should pull out and retract fully without hesitation and without creating a slack line condition.	☐	☐
	Verify that the integral Energy Absorber (B) has not been activated. An open cover or torn cover, webbing pulled out of the cover, torn or frayed webbing, ripped stitching, etc. are indicators of an activated Energy Absorber.	☐	☐
	Ensure the SRD locks up when the Lifeline is jerked sharply. Lockup should be positive with no slipping.	☐	☐
	Inspect the entire SRD for signs of corrosion.	☐	☐
Connected Aluminum Carabiner (Figure 2.3)	Inspect the Connection Eye (A) and Shroud (C) for damage: Look for cracks, dents, and deformities.	☐	☐
	Verify that the Gate (B) opens and closes freely. The gate must fully open and close.	☐	☐
	Inspect the entire Carabiner for signs of corrosion.	☐	☐
Labels (Figure 14)	Verify that all labels on the system are present and fully legible.	☐	☐
PFAS and Other Equipment	Additional Personal Fall Arrest System (PFAS) equipment (harness, SRD, etc) that are used with the Connected Order Picker System should be installed and inspected per the manufacturer's instructions.	☐	☐

Serial Number(s):	Date Purchased:
Model Number:	Date of First Use:
Corrective Action/Maintenance:	Approved By:
	Date:
Corrective Action/Maintenance:	Approved By:
	Date:
Corrective Action/Maintenance:	Approved By:
	Date:
Corrective Action/Maintenance:	Approved By:
	Date:
Corrective Action/Maintenance:	Approved By:
	Date:
Corrective Action/Maintenance:	Approved By:
	Date:
Corrective Action/Maintenance:	Approved By:
	Date:

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

U.S. PRODUCT WARRANTY, LIMITED REMEDY AND LIMITATION OF LIABILITY

WARRANTY: THE FOLLOWING IS MADE IN LIEU OF ALL WARRANTIES OR CONDITIONS, EXPRESS OR IMPLIED, INCLUDING THE IMPLIED WARRANTIES OR CONDITIONS OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE.

Unless otherwise provided by applicable law, 3M fall protection products are warranted against factory defects in workmanship and materials for a period of one year from the date of installation or first use by the original owner.

LIMITED REMEDY: Upon written notice to 3M, 3M will repair or replace any product determined by 3M to have a factory defect in workmanship or materials. 3M reserves the right to require product be returned to its facility for evaluation of warranty claims. This warranty does not cover product damage due to wear, abuse, misuse, damage in transit, failure to maintain the product or other damage beyond 3M's control. 3M will be the sole judge of product condition and warranty options.

This warranty applies only to the original purchaser and is the only warranty applicable to 3M's fall protection products. Please contact 3M's customer service department at 800-328-6146 or via email at 3MFallProtection@mmm.com for assistance.

LIMITATION OF LIABILITY: TO THE EXTENT PERMITTED BY APPLICABLE LAW, 3M IS NOT LIABLE FOR ANY INDIRECT, INCIDENTAL, SPECIAL OR CONSEQUENTIAL DAMAGES INCLUDING, BUT NOT LIMITED TO LOSS OF PROFITS, IN ANY WAY RELATED TO THE PRODUCTS REGARDLESS OF THE LEGAL THEORY ASSERTED.



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EU DECLARATION OF CONFORMITY:
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