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USER INSTRUCTION MANUAL

MODEL: US-96760-60/100-CS STEEL

DESCRIPTION: 4 Person Horizontal System - Steel

USER WEIGHT CAPACITY: ANSI 310 LBS. MAX
Including clothing and tools.

MEETS OSHA 1926.502, 1910.140, 1910.66



WARNING

- Avoid moving machinery, thermal, electrical, and/or chemical hazards as contact may cause serious injury or death.
- Avoid swing falls.
- Follow the weight restrictions and recommendations in this manual.
- Remove from service any equipment subjected to fall arrest forces.
- Remove from service any equipment that fails inspection.
- The lifeline shall be installed higher than the shoulder to limit free fall to 6' or less*.
- When using SRDs the lifeline must be positioned overhead. The deceleration of the self retractable lifeline may be much longer as it declaimed when attach to a flexible anchorage attachment.
- Only make sure to use a self retractable lifeline that has anti-ratcheting design and will still function on this temporary horizontal lifeline.
- Do not alter or intentionally misuse this equipment.
- Consult Ultra-Safe, Inc. when using this equipment in combination with components or subsystems other than those described in this manual.
- Do not connect rebar hooks, large carabiners, or large snap hooks to the FBH dorsal D-rings as this may cause a roll-out condition and/or unintentional disengagement.
- Avoid sharp and/or abrasive surfaces and edges.
- Use caution when performing arc welding. Arc flash from arc welding operations, including accidental arcs from electrical equipment, can damage equipment and are potentially fatal.
- Examine the work area. Be aware of the surroundings and workplace hazards that may impact safety, security, and the functioning of fall arrest systems and components.
- Hazards may include, but are not limited to, cable or debris tripping hazards, equipment failures, personnel mistakes, or moving equipment such as carts, barrows, fork lifts, cranes, or dollies. Do not allow materials, tools, or equipment in transit to contact any part of the fall arrest system.
- Do not work under suspended loads.
- The use of independent HLL systems for each person or shorter span lengths or intermediate anchor points is recommended to minimize the potential of the other workers falling.

IMPORTANT

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

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

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

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

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

The user of the equipment discussed in this manual must read and understand the entire manual before beginning work. NOTE: For more information consult the ANSI Z359 body of standards.

APPLICATION

The US-96760-60/100-CS 4-Person Temporary HLL provides horizontal mobility for workers exposed to fall hazards and is designed as an anchorage subsystem for the attachment of up to two PFASs. The HLL is adjustable up to 120' in length for a single span system and is designed to be used as part of a complete PFAS.

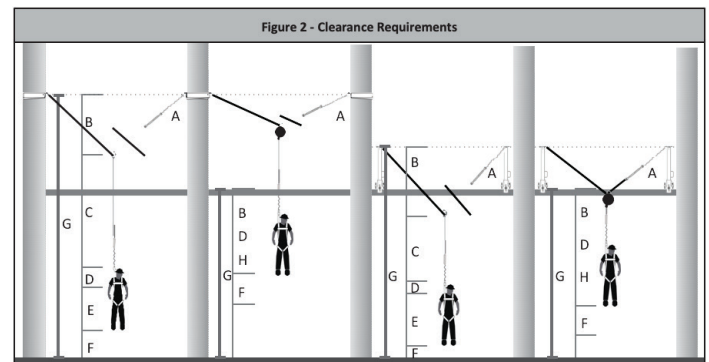
INCLUDES:

- 1 4-Person HLL cable
- 1 Tensioner (Turnbuckle)
- 2 Energy Absorber (Coil Spring)
- 3 DF Clips
- 1 Thimble
- 1 Intermediate

When properly tensioned, the lifeline will react to a fall event of up to two workers by combining the energy absorbing properties of the lifeline energy absorber, the lifeline, and the worker's personal energy absorber.

During a fall event, the stretch of the lifeline and the expansion of the user's PFAS will result in reduced forces to the anchor and to the user's body.

Application Limits: The US-96760-60/100-CS 4-Person Temporary HLL is a dynamic anchorage subsystem that will vary in its performance depending upon the length of the system, the number of workers attached and the type of PFAS being used. Care should be taken to understand the capacity of the system, minimum required fall clearance, anchorage strength requirements, total allowable free fall, total allowable fall clearance, and how the user's PFAS will deploy during a fall event. Longer HLL spans will generate more lifeline deflection and sag during a fall event and will result in greater clearance requirements. See Figure 2. It is important to use intermediate anchor points which would significantly help to reduce the fall clearance space and also reduce the other risks could happen.



- A Deployed In-Line Energy Absorber
- B Dynamic Lifeline Sag
- C Deployed EAL (Energy Absorbing Lanyard)
- D D-ring Shift and Harness Stretch
- E Height of Worker
- F Safety Factor
- G Total Required Fall Clearance
- H Total SRD Deceleration Distance from User's Manual*

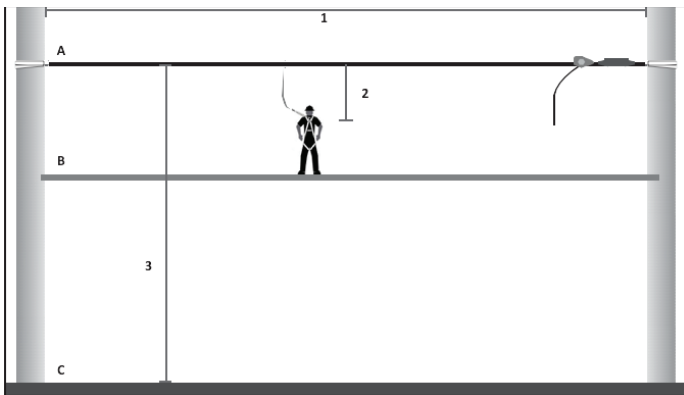
System Capacity: The US-96760-60/100-CS 4-Person Temporary HLL maximum capacity is FOUR workers simultaneously, with each worker weighing no more than 310 lbs. inclusive of clothing, tools, etc.

Anchorage Requirements: End anchors selected for use with this system must be a minimum of 5,000 lbs. (22.2 kN) for one and two workers. If used in applications with leading edge hazards, anchorage locations must be selected so that the deflected HLL shall not come in contact with a leading edge in the event of a fall.

Total Allowable Free Fall: OSHA limits free fall to 6' or less. The HLL system described in this manual is designed to be used overhead and free fall should be limited to 6' unless otherwise specified by a specific anchorage solution.

Clearance Requirements: The US-96760-60/100-CS 4-Person Temporary HLL is designed to react to a fall event by elongating and deflecting to absorb energy. ;PFAS attached to the HLL will also elongate during a fall event. Failure to calculate the fall clearance required when using the system could result in contact with a lower level or obstruction during a fall event and could result in serious injury or death. See tables and charts below for calculating minimum required fall clearance.

Minimum Required Fall Clearance with EAL



Temporary HLL with EAL Minimum Required Fall Clearance

310 lbs. Maximum User Capacity

- 1 Find Span Length in Table Below
- 2 Find Freefall Distance in Table Below
- 3 Required Fall Clearance at the intersection of Span Length and Freefall Distance (see table below)
- A. Overhead Anchorage
- B. Walking/Working Surface
- C. Nearest Lower Level or Obstruction
- * Work below HLL to avoid Swing Fall

CABLE SPAN Feet	ONE PERSON	TWO PERSON Min Safe Work Height Required	THREE PERSON	FOUR PERSON
15'	6' 2"	6' 2"	6' 2"	6' 6"
20'	6' 2"	6' 2"	6' 6"	7' 2"
25'	6' 2"	6' 6"	7' 2"	7' 10"
30'	6' 2"	6' 10"	7' 6"	8' 2"
35'	6' 11"	7' 7"	8' 3"	8' 11"
40'	7' 8"	8' 4"	9' 0"	9' 8"
45'	8' 5"	9' 1"	9' 9"	10' 5"
50'	9' 2"	9' 10"	10' 6"	11' 2"
55'	9' 9"	10' 5"	11' 1"	11' 9"
60'	10' 0"	11' 0"	11' 8"	12' 4"

The Safe Working Height chart for beam work is valid only with Ultra-Safe retractables and Ultra-Safe safety harnesses. Any products used that are not made by Ultra-Safe may dramatically affected the performance of the Horizontal Lifeline system and may therefore invalidate the Safe Working Height Chart. When the actual column spans fall in between those spans shown in Table, round **UP** to the next span indicated and use that safe working height calculations.

When an Ultra-Safe 18" long D-ring extender is used an additional 18" per worker **MUST BE ADDED** to the minimum safe working heights shown in the Table.

*The use of a shock-absorbing lanyard will greatly affect the safe working height chart and must not be used without consulting Ultra-Safe Fall Protection.

The total number of users permitted on single or multiple span systems for beam applications are outlined in the table.

WARNING

When a worker falls while connected to the horizontal lifeline, the system will deflect. If two or more workers are connected to the same horizontal lifeline, and one worker falls, the other workers may be pulled off the walking-working surface. The potential for the other workers falling increases as the lifeline length increases. The use of independent HLL systems for each person or shorter span lengths or intermediate anchor points is recommended to minimize the potential of the other workers falling.

Rescue: The US-96760-60/100-CS 4-Person Temporary HLL is part of a complete PFAS. It is not intended as a rescue device. Use of this system presents a wide variety of potential rescue scenarios. Users of this system should understand their work environment and develop a rescue plan accordingly. It is recommended that a trained on-site rescue team be present during use of the system.

SYSTEM REQUIREMENTS

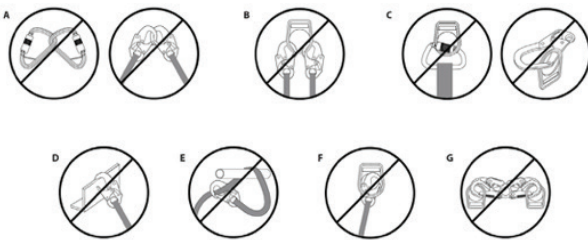
Anchorage Strength: End anchors selected for use with this system must have a minimum rating of 5,000 lbs. (22.2 kN) for one- and two- worker applications.

Structure: The mounting points for the anchorage must be capable of supporting no less than 5,000 lbs. (22.2 kN) for one- and two- worker applications, see Figure 7.

Compatibility of Connectors: Connectors are considered to be compatible with connecting elements when they have been designed to work together in such a way that their sizes and shapes do not cause their gate mechanisms to inadvertently open regardless of how they become oriented. Contact Ultra-Safe, Inc. if you have any questions about compatibility. Connectors must be compatible with the anchorage or other system components. Do not use equipment that is not compatible. Non-compatible connectors may unintentionally disengage. Connectors must be compatible in size, shape, and strength. Self-closing, self-locking snap hooks and carabiners are specified by OSHA and ANSI Z359.12.

Compatibility of Components: Equipment is designed for use with approved components and subsystems only. Substitutions or replacements made with non-ANSI Z359 compliant components or subsystems may jeopardize compatibility of equipment and may affect the safety and reliability of the complete system. Ensure compatibility between the connectors if non-US-96760-60/100-CS components are used for fall protection, see Figure 6.

Incorrect Connections:



A - Never connect two active components (snap hooks or carabiners) to each other.

B - Never connect two active components (snap hooks or carabiners) to a single D-ring at the same time.

C - Never connect in a way that would produce a condition of loading on the gate.

D - Never attach to a object in a manner whereby the gate (of the snap hook or carabiner) would be prevented from fully closing and locking. Always guard against false connections by visually inspecting for

closure and lock.

E - Never attach explicitly to a constituent subcomponent (webbing, cable or rope) unless specifically provided for by the manufacturer's instructions for both subcomponents (snap hook or carabiner and webbing, cable or rope).

F - Never attach in a manner where an element of the connector (gate or release lever) may become caught on the anchor thereby producing additional risk of false engagement.

G - Never attach a spreader snap hook to two side/positioning D-rings in a manner whereby the D-rings will engage the gates; the gates on a spreader must always be facing away from the D-rings during work positioning.

Connectors: Only use self-locking snap hooks, rebar hooks, and carabiners with this equipment. Only use connectors that are suitable to each application. Ensure all connections are compatible in size, shape and strength. Do not use equipment that is not compatible. Visually ensure all connectors close and lock completely. Connectors (snap hooks, rebar hooks, and carabiners) are designed for use only as specified in this manual.

INSTALLATION AND USE

Plan the Personal Fall Arrest System (PFAS): Inspect the HLL subsystem before each use in accordance with the procedures detailed in Section 6. Examine the work area and take action to address hazards. Falls are a serious hazard when working at height. Training and equipment are the tools of fall hazard management. There are several closely related facets of fall hazard management with a PFAS;

- Anchor Point Selection
- Anchorage Connector
- Deceleration Device
- Maximum Arrest Force
- Deceleration Distance
- Minimum Required Fall Clearance (MRFC)
- Body Wear
- Rescue

NOTE: Anchor points/connection points sold separately.

Anchor Point Selection: Select a suitable anchor point. Consider the area where the work is being performed. In an overhead anchorage condition, the area below the anchorage is the work zone. Lateral movement away from the anchorage is hazardous. As distance from the anchor increases, the work zone expands, and so does the hazard. Work zone expansion is measured in feet and has a direct influence on user safety. Always work as close to the anchor as possible.

If used in applications with leading edge hazards, anchorage locations must be selected so that the deflected HLL shall not come in contact with a leading edge in the event of a fall. For below D-ring anchor point installations for use with this HLL system, contact Ultra-Safe, Inc.

Anchorage Connector: Anchorage Connectors used as part of a PFAS should be designed for use with specified anchor points and compatible with the PFAS components and connectors to be used in the assembly of a complete PFAS. Care should be taken to ensure proper assembly, installation and maintenance of all Anchorage Connectors to be used when planning a PFAS. Failure to inspect, assemble, install and/or maintain Anchorage Connectors could result in injury or death.

Connectors/Deceleration Devices: Connectors and Deceleration Devices such as Shock Absorbing Lanyards, Self-Retracting Devices/Lifelines, and Fall Arrestor Connector Subsystems (Vertical Lifeline/Rope Grab Combinations) are designed to connect the user's body wear to the Anchorage Connector and/or Anchor Point of a Personal Fall Arrest System.

Product Assembly and Installation: System installation requires end anchor points that are a minimum of 5,000 lbs. (22.2 kN) for one and two workers. The lifeline shall be installed higher than the shoulder to limit free fall to 6' or less*. When using SRDs the lifeline must be positioned overhead and the SRD must have anti-ratcheting design. The horizontal lifeline should be positioned in a manner to minimize free fall while allowing ease of use. Movement away from the lifeline should be limited to reduce the potential for swing fall. Lifeline end anchors should be installed at approximately the same elevation so that the lifeline itself is not sloped more than 5 degrees.

The entire S Cable Horizontal Lifeline system, and its subsystems, must be inspected prior to each use for wear, damage, and other deterioration. All snap hooks and carabiners must be able to self-close and lock. All webbing and cable must be inspected for tears, cuts, fraying, abrasion, un-splicing, discoloration, or other signs of wear and damage. Sewn terminations should be secure, complete, and not visibly damaged. All cable splices should be secure. System must be properly tensioned. No load indicators shall be deployed. Damaged and other deteriorated and defective components must be immediately removed from service, in accordance with the requirements of OSHA 29 CFR 1910.66 and 1926.502.

Cross Arm Strap System Installation

Step 1. Install Anchorage Connector

Wrap the Cross Arm Strap around the anchorage and pass the small D-ring end through the large D-ring end. Wrap as many times as necessary to achieve desired length, ensuring strap is wrapped at least twice around the end anchorage. A minimum of two wraps around the end anchorage helps prevent sliding of the anchor straps during use. Only connect to the small D-ring of the Cross Arm Strap. Other approved anchorage connectors, which meet the 5,000 lbs strength requirement, may be used in place of the Cross Arm Straps. See anchorage connector user instructions for proper installation.

Step 2. Connect Integral Energy Absorber to End Anchorage

Connect the Integral Energy Absorber to the small D-ring of the Cross Arm Strap using one of the supplied carabiners. Connect the tensioner to the opposite anchorage point (cross arm strap) via the other supplied snap hook

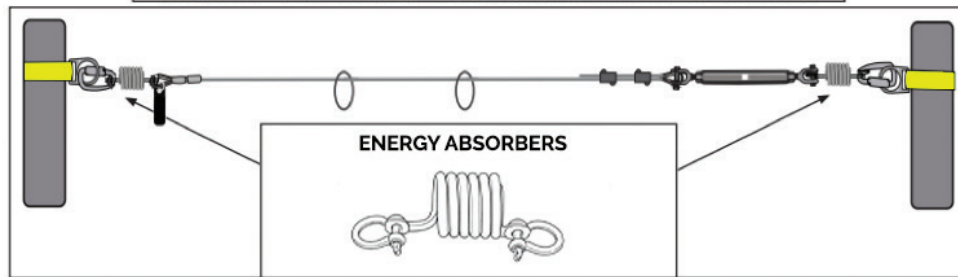
Step 3. Attach Free End of Cable to Tensioner

Prior to attaching the cable to the tensioner, turn both ends of the tensioner to increase its overall length. Determine the approximate span length of cable required. After determining the length needed, form a thimble attachment point on the free end of the cable. Remove the bolt from the clevis on the tensioner. Take the extra supplied thimble and form the cable in a loop using the thimble as a guide (See Figure 9A). Wrap the cable around the thimble ensuring there is a minimum 12" tail of cable to allow connection of the fist grips. Insert the thimble and cable loop into the open end of the clevis, and re-install the clevis bolt ensuring it is through the thimble (See Figure 9B). Remove excess slack from the system by hand and attach the free end of the cable back to itself using the supplied fist grips (See Figure 9B). Torque fist grips to 35 ft lbs. (See Figure 9C)

Step 4. Tension the System

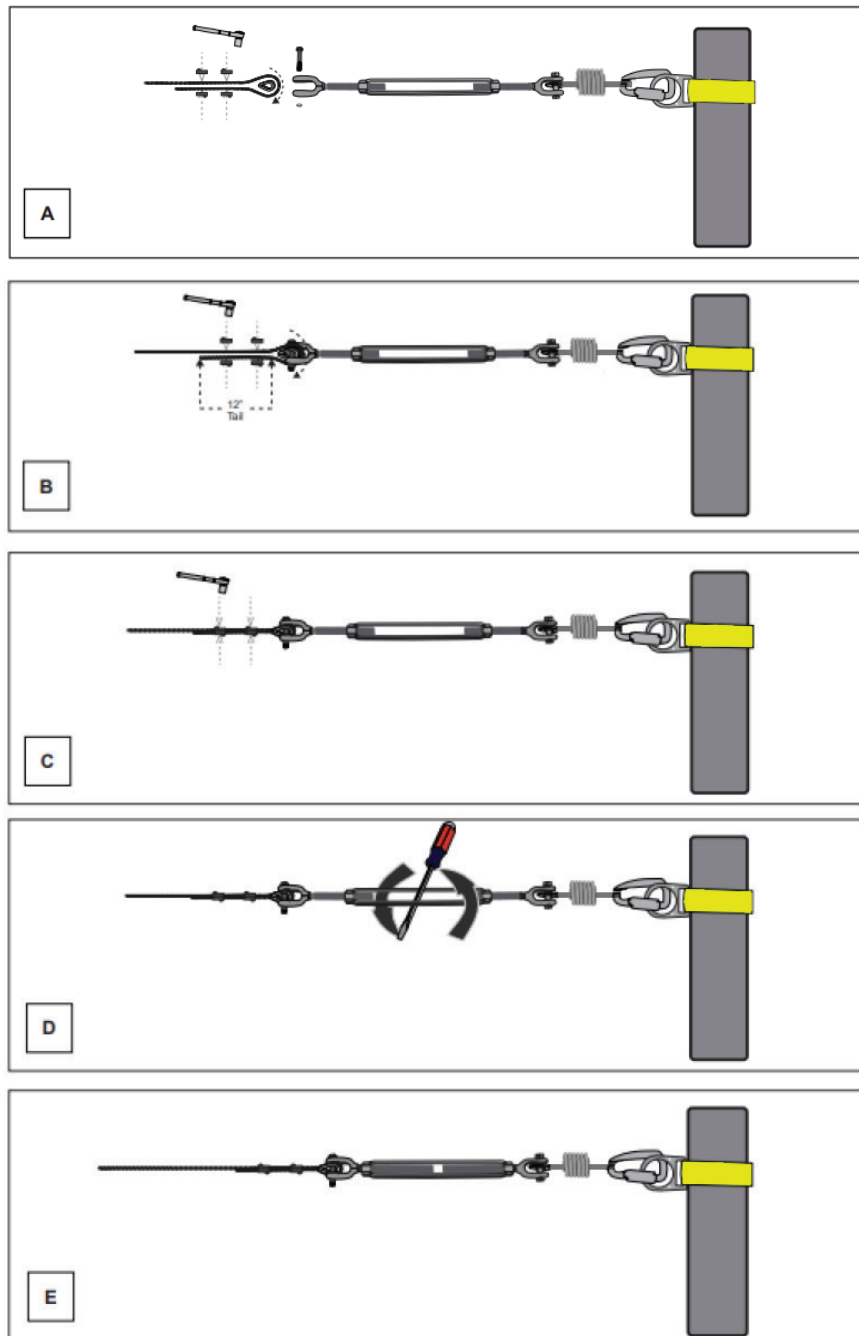
Insert a large screwdriver, bar, etc... into the gap between the threaded rods of the tensioner. This gap was created in Step 3 when extending the overall length of the tensioner. Rotate the body of the tensioner which draws the ends of the tensioner assembly towards the center of the unit, thereby tensioning the system (See Figure 9D & 9E). To determine proper tension of the system, refer to the HLL Sag Table (Figure 12, Page 18), and tension until proper sag

FIGURE 8 - COIL ENERGY ABSORBER INSTALLATION EXAMPLE



NOTE: If setting up HLL for 4 persons, please use 2 energy absorbers. One on each end.

FIGURE 9 - TENSIONER OPERATION



is achieved.

MAINTENANCE, SERVICE AND STORAGE

Maintenance: Clean the horizontal lifeline with water and mild detergent. Do not allow excessive build-up of dirt, paint or other agents that may cause damage or hardening of the rope fibers. Do not treat the lifeline with heat to dry or clean the lifeline. Hardening of the ropes fibers from external elements may result in a loss of strength or alter the properties of the rope in a manner that could cause the HLL to fail to operate or perform properly.

Service: There are no specific service requirements for this system component.

Storage: The system should be stored in its carry bag and kept out of direct sunlight. Store in a clean, dry and chemical free environment.

MATERIALS

Cable:	Galvanized Steel
Energy Absorber:	Steel
Connectors:	Steel
Tension Adjuster:	Steel

INSPECTION

Pre-Use Inspection: Prior to each use the HLL system should be inspected by the user for damage, wear and to ensure the lifeline is properly tensioned. Please review the inspection checklist for inspection requirements.

Inspection Frequency: Other than pre-use inspection, the US-96760-60/100-CS 4-Person Temporary HLL should be inspected by a competent person at least once a year.

Inspection Checklist: A general inspection should be done at the intervals specified in this manual. Inspect as follows:

Step 1: Inspect labels. Ensure legibility of content. If labels are missing or illegible, remove the system from service.

Step 2: Inspect all metal components for cracks, corrosion, deformities, missing parts or noticeable defects. Metal components include O-rings, carabiners, thimble eyes, rope tensioner, D-rings, ferrules etc.

Step 3: Inspect rope for wear, paying special attention to the areas of rope most likely in contact with the tensioner teeth. Rope should not present frayed strands, cuts, abrasions, burn marks, and discoloration indicating UV damage.* Thimble eyes should be firmly in place and there should be no build-up of foreign matter such as paint, dirt, rust, concrete or cement etc.

**Minor fuzziness of rope of rope is acceptable so long as the inner white core of the rope is not openly exposed.*

Inspection Results: Inspection results should be recorded by a competent person at least once a year.

Inspection Document: Record inspection results on the inspection record provided below, or similar document.

