



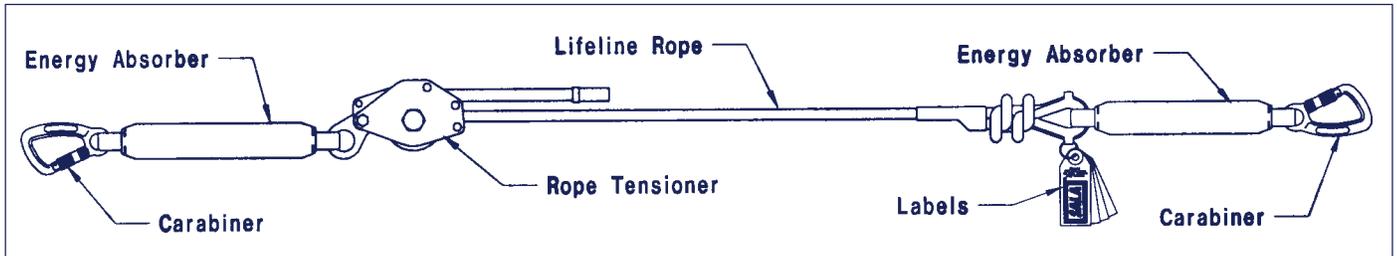
**Instructions for the following series products:**

Vacuum Anchor HLL System

(See back page for specific model numbers.)

**User Instruction Manual  
Vacuum Anchor  
Horizontal Lifeline System**

*This manual is intended to be used as part of an employee training program as required by OSHA.*



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

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

**IMPORTANT:** Record the product identification information from the ID label in the inspection and maintenance log in section 9.0 of this manual.

## 1.0 APPLICATION

**1.1 PURPOSE:** The Vacuum Anchor Horizontal Lifeline System is designed for use as an anchoring means for one or two personal fall arrest systems. Use the Vacuum Anchor Horizontal Lifeline System where horizontal mobility and fall protection are required. The system is used in conjunction with vacuum anchors.

**1.2 LIMITATIONS:** The following limits apply to the installation and use of the Vacuum Anchor Horizontal Lifeline System. Other limitations may apply:

**IMPORTANT:** OSHA regulations state that horizontal lifelines shall be installed and used under the supervision of a qualified person (see below for definition) as part of a complete personal fall arrest system that maintains a safety factor of at least two.

**Qualified Person:** An individual with a recognized degree or professional certificate, and extensive knowledge and experience in the subject field, who is capable of design, analysis, evaluation, and specification in the subject work, project, or product. Refer to OSHA 1910.66, 1926.32, and 1926.502.

- A. HORIZONTAL LIFELINE SPAN:** The maximum span distance is 40 ft. (12.2 m) for a single span system. For multiple span systems, the maximum span distance is 80 ft. (24.4 m) with a maximum subspan length of 40 ft (12.2 m). The span length must be reduced when clearance is limited. See section 3.0 for clearance information.
- B. ANCHORAGE STRUCTURE:** The surface to which the Vacuum Anchors are attached must meet the limitations and strength requirements specified in instruction 5902157.
- C. SYSTEM CAPACITY:** The maximum capacity of the Vacuum Anchor Horizontal Lifeline is two persons. The maximum weight of each person, including tools and clothing, is 310 lbs. (141 kg).

Figure 1 - Typical Single Span Horizontal Lifeline Installation

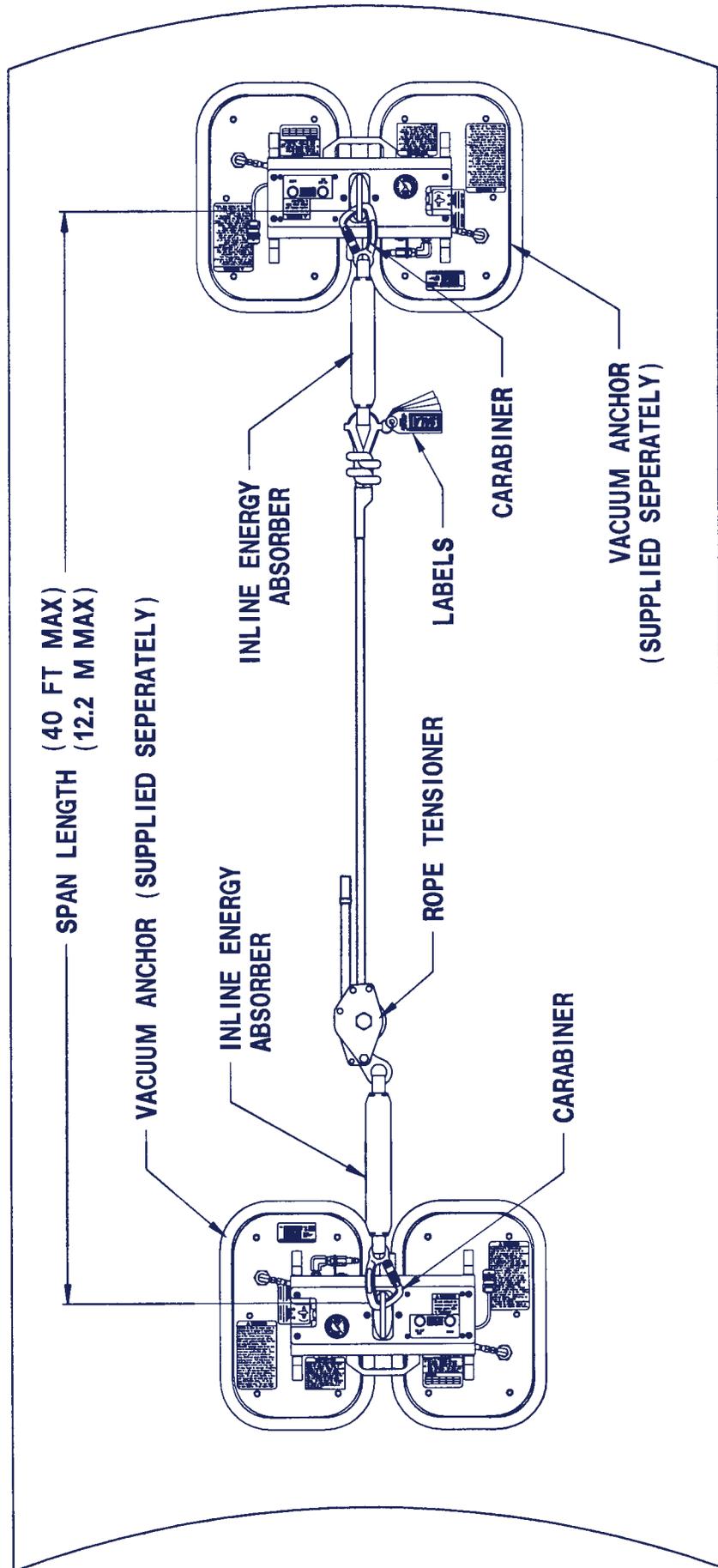
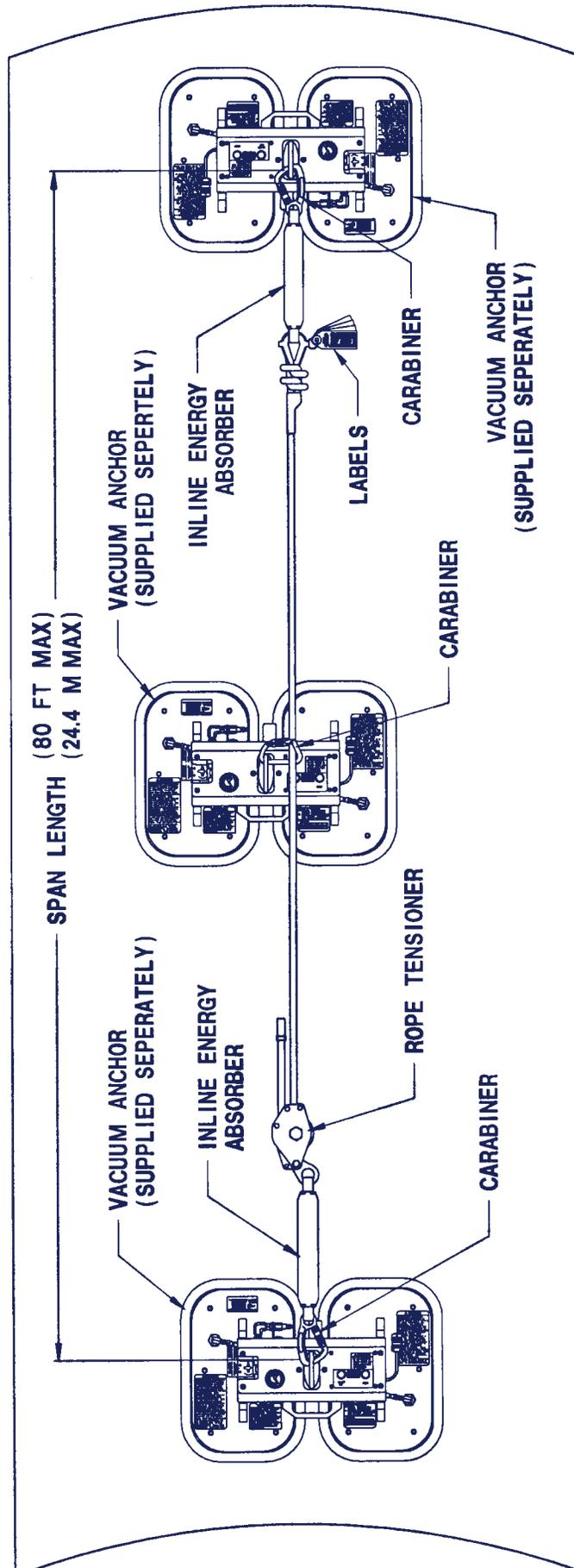


Figure 2 - Typical Multiple Span Horizontal Lifeline Installation



- D. CONNECTING SUBSYSTEM:** A DBI/SALA Force 2 Energy Absorbing Lanyard must be used as the connecting subsystem with the Vacuum Anchor Horizontal Lifeline.
- E. FREE FALL:** Whenever possible, locate the horizontal lifeline such that the user is restrained from reaching a fall hazard. If rigging as a restraint system is not possible, rig system such that the potential free fall is minimized by positioning the horizontal lifeline as high and as far from the edge as possible, and by limiting the lanyard length. Potential free fall must not exceed 11 ft. (3.4 m).
- F. SWING FALLS:** Swing falls occur when a worker is positioned to the side of a horizontal lifeline when a fall occurs. The force of striking an object in a swing fall may cause serious injury or death. Swing falls can be minimized by working as close to the horizontal lifeline as possible.
- G. FALL CLEARANCE:** There must be sufficient clearance below the worker to arrest a fall before striking the lower level or obstruction. See section 3.0 for required clearance information.
- H. BODY SUPPORT:** The Vacuum Anchor Horizontal Lifeline must be used as part of a personal fall arrest system incorporating a full body harness.
- I. ENVIRONMENTAL HAZARDS:** Use of this equipment in areas with environmental hazards 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; heat, chemicals, corrosive environments, high voltage power lines, gases, moving machinery, and sharp edges. Contact DBI/SALA if you have questions about using this equipment where environmental hazards exist.
- J. TRAINING:** This equipment must be installed and used by persons trained in its correct application and use. See section 4.0.

**1.3 APPLICABLE STANDARDS:** Refer to national standards, including ANSI Z359.1 and local, state, and federal (OSHA 1910.66 and 1926.502) requirements for more information on personal fall arrest systems and associated components.

## **2.0 SYSTEM REQUIREMENTS**

**2.1 PERSONAL FALL ARREST SYSTEM COMPONENTS:** The Vacuum Anchor horizontal lifeline must be used with DBI/SALA approved components and subsystems. Substitutions or replacements made with non-approved components or subsystems may jeopardize compatibility of equipment and may effect the safety and reliability of the complete system. Personal fall arrest components used with this system must meet all applicable OSHA and ANSI requirements. A full body harness must be used with this system.

**2.2 PERSONAL FALL ARREST SYSTEM 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 DBI/SALA if you have any questions about compatibility.

Connectors (hooks, carabiners, and D-rings) must be capable of supporting at least 5,000 lbs. (22kN). 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 3. Connectors must be compatible in size, shape, and strength. Self locking snap hooks and carabiners are required by ANSI Z359.1 and OSHA.

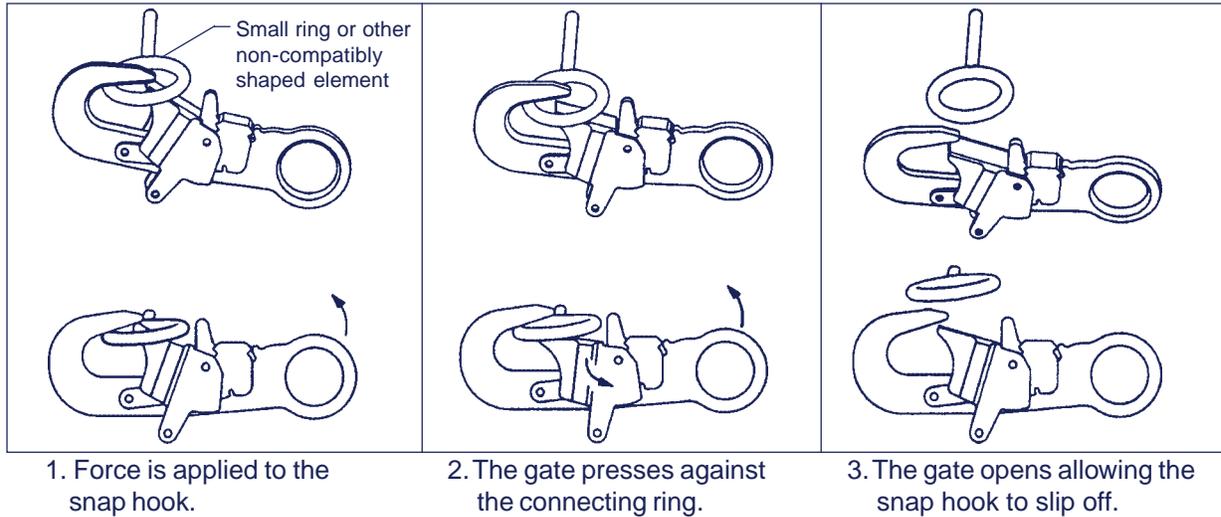
**2.3 MAKING CONNECTIONS:** Only use self-locking snap hooks and carabiners with this equipment. Only use connectors that are suitable to each application. Ensure all connections are compatible in size, shape and strength. Do not use equipment that is not compatible. Ensure all connectors are fully closed and locked.

DBI/SALA connectors (snap hooks and carabiners) are designed to be used only as specified in each product's user's instructions. See Figure 4 for inappropriate connections. DBI/SALA snap hooks and carabiners should not be connected:

- A.** To a D-ring to which another connector is attached.
- B.** In a manner that would result in a load on the gate.

**Figure 3 - Unintentional Disengagement (Roll-out)**

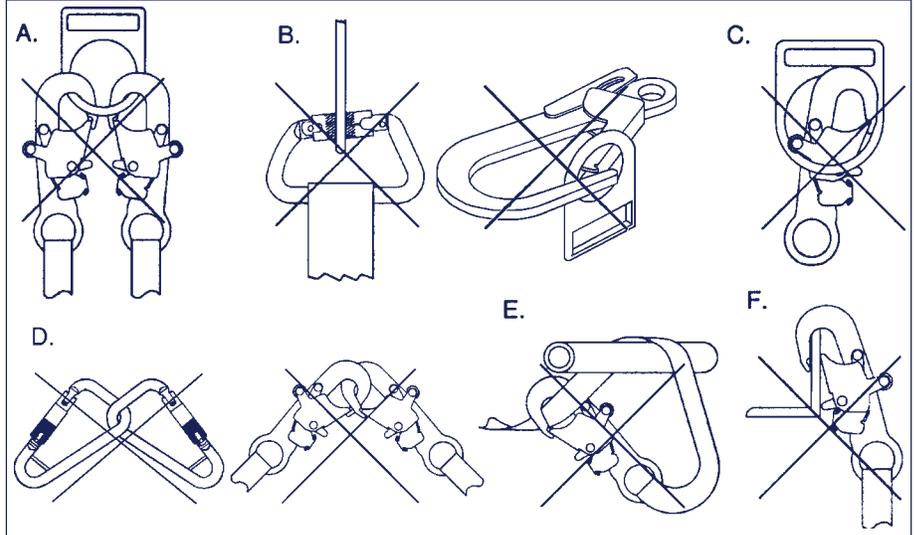
If the connecting element that a snap hook (shown) or carabiner attaches to is undersized or irregular in shape, a situation could occur where the connecting element applies a force to the gate of the snap hook or carabiner. This force may cause the gate (of either a self-locking or a non-locking snap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



**NOTE:** Large throat opening 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. Large throat snap hooks are designed for use on fixed structural elements such as rebar or cross members that are not shaped in a way that can capture the gate of the hook.

- 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 allow 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.

**Figure 4 - Inappropriate Connections**



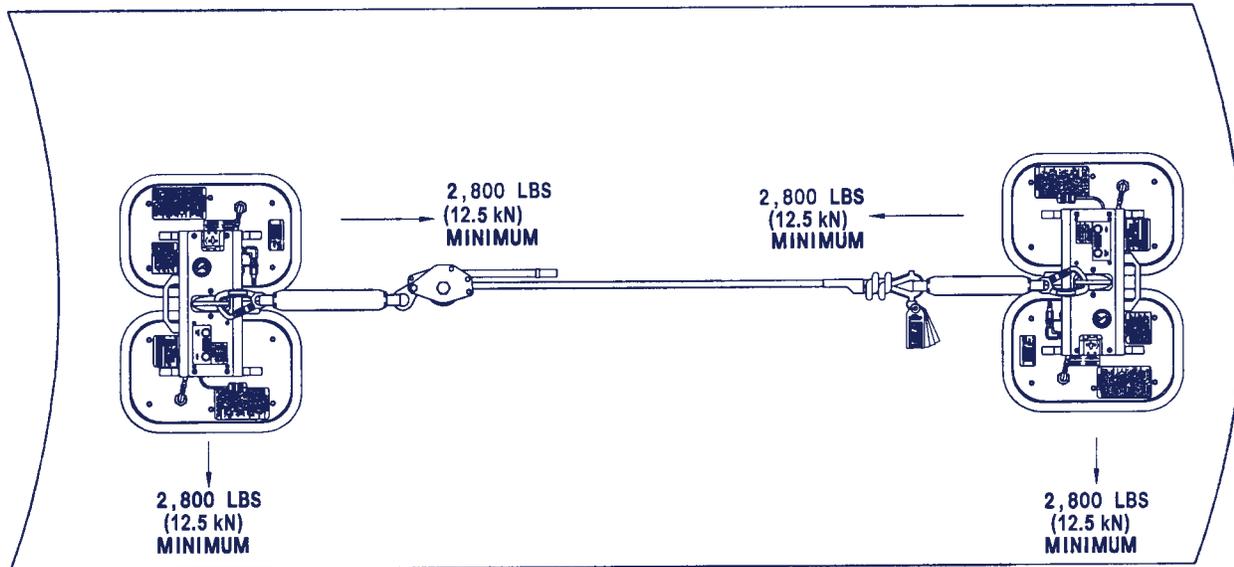
**2.4 ANCHORAGE STRUCTURE:** The anchorage structure must be rigid and capable of supporting at least 2,800 lbs. (12.4 kN) along the axis of the horizontal lifeline. Anchorages must also support at least 2,800 lbs. (12.5 kn) applied in all potential directions of fall arrest that are perpendicular to the axis of the horizontal lifeline. See Figure 5.

**2.5 CONNECTING SUBSYSTEM:** The connecting subsystem is the portion of the personal fall arrest system that connects the horizontal lifeline subsystem to the harness fall arrest attachment element. A DBI/SALA Force 2 Energy Absorbing Lanyard must be used as the connecting subsystem with the Vacuum Anchor Horizontal Lifeline.

### 3.0 OPERATION AND USE

**WARNING:** Do not alter or intentionally misuse this equipment. Consult DBI/SALA when using this equipment in combination with components or subsystems other than those described in this manual. Some subsystem and component combinations may interfere with the operation of this equipment. Use caution when using this equipment around moving machinery, electrical hazards, chemical hazards, and sharp edges.

**Figure 5 - Anchorage Strength Requirements**  
**ANCHORAGE STRENGTH REQUIREMENTS**



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

**3.1 BEFORE EACH USE** inspect this equipment according to section 5.0. Do not use this equipment if inspection reveals an unsafe or defective condition. Plan your use of the fall protection system prior to exposing workers to dangerous situations. Consider all factors affecting your safety before using this system.

- A. Read and understand all manufacturer's instructions for each component of the personal fall arrest system. All DBI/SALA anchorage connectors, harnesses, and connecting subsystems are supplied with separate user instructions. Keep all instructions for future reference.
- B. Review sections 1.0 and 2.0 to ensure system limitations and other requirements have been followed. Review applicable information regarding system clearance criteria. Ensure changes have not been made to the system installation (i.e. length) or to the job site that could affect the required fall clearance. Do not use the system if changes are required.

**3.2 SYSTEM INSTALLATION:** Figures 1 and 2 show typical Single Span and Multiple Span Vacuum Anchor horizontal lifeline installations. The horizontal lifeline system should be positioned at a level that will minimize free fall while allowing ease of use. The horizontal lifeline should be positioned near the work location to minimize swing fall hazards. The connecting subsystem length should be kept as short as possible to reduce the potential free fall and required clearance distance. Both Vacuum Anchors must be installed at approximately the same elevation so the horizontal lifeline system is not sloped more than five degrees.

- Step 1.** Determine the locations of the Vacuum Anchors and evaluate the Anchorage Structure strength in accordance with section 2.3. Determine the span length and evaluate the required clearance using Figures 6 and 7 along with Tables 1 and 2. For Multiple Span Systems, use the length of the longest subsystem to evaluate fall clearance.
- Step 2.** Attaching Vacuum Anchors: Refer to the Vacuum Anchor instruction 5902157 for complete installation information.
- Step 3.** Secure each end of the horizontal lifeline to the Vacuum Anchors with the snap hook or carabiner. Loosen and reposition the rope tensioner as required.
- Step 4.** Remove the slack from the horizontal lifeline by pulling the rope through the tensioner by hand. To tension the horizontal lifeline, using a pointed bar or a 1-1/8 inch wrench, turn tensioning nut clockwise until tensioning is no longer possible. Do not modify the rope tensioner to achieve greater lifeline tension. See Figure 8. The final tension will be 300 to 450 lbs. (1.3 - 2.0 kN).

Figure 6 - One Person

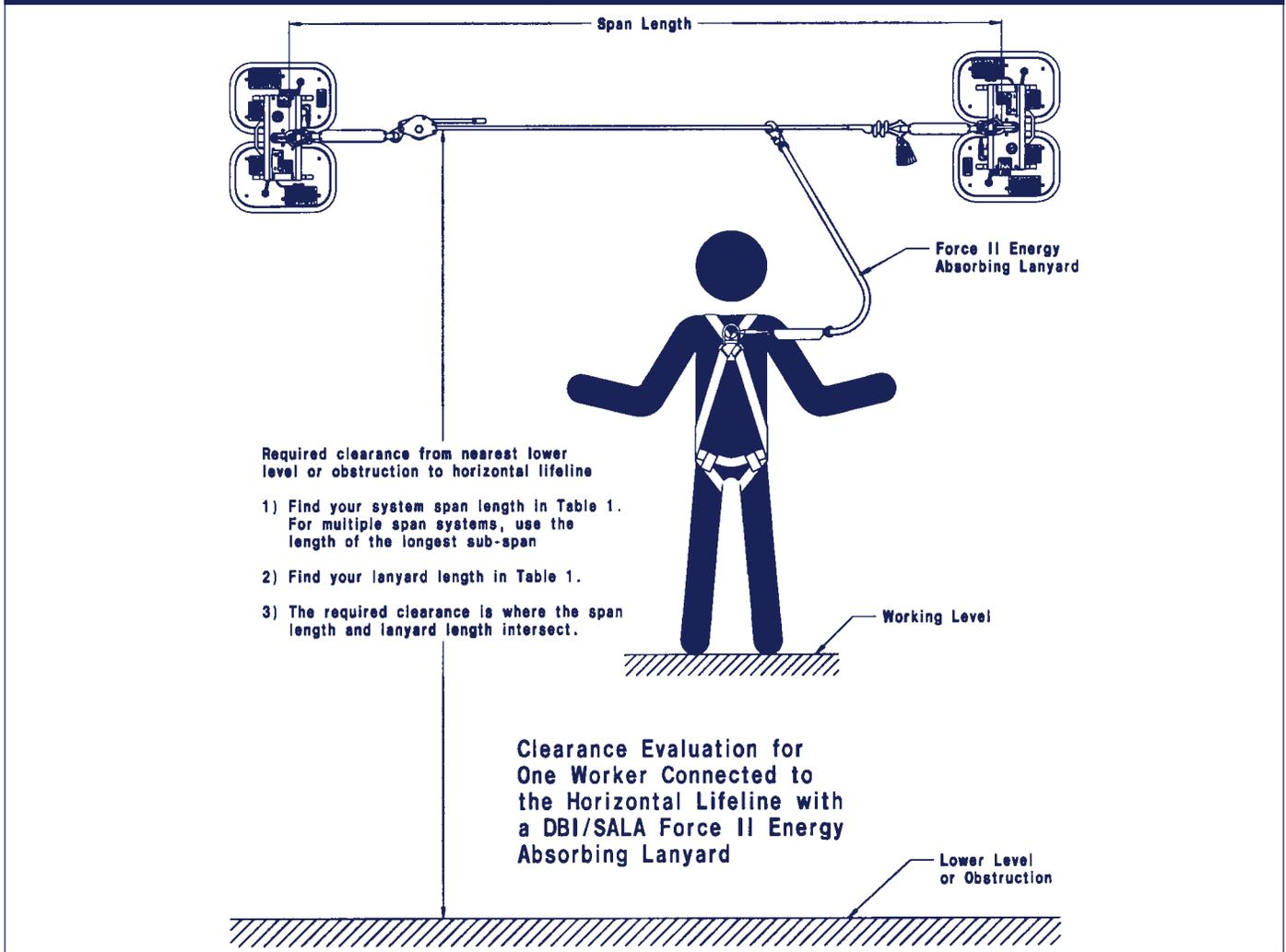


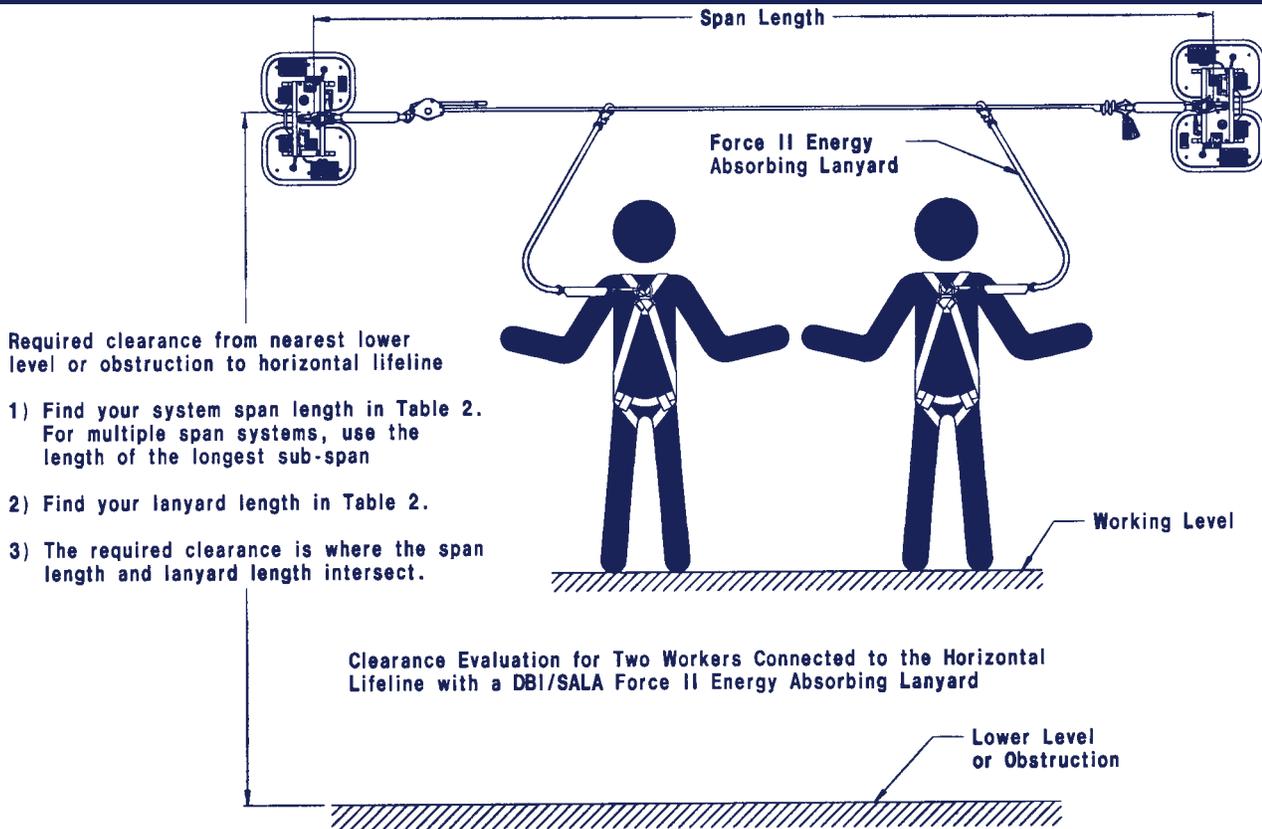
Table 1 - Required Clearance for One Worker Connected to the System with a DBI/SALA Force 2 Energy Absorbing Lanyard

Span Length	Length of Energy Absorbing Lanyard	
	5 ft (1.52 m)	6 ft (1.83 m)
10 ft - 15 ft (3.05 m -4.57 m)	20'-11" (6.38 m)	21'-11" (6.68 m)
15 ft - 20 ft (4.57 m -6.10 m)	21'-6" (6.55 m)	22'-6" (6.86 m)
20 ft - 25 ft (6.10 m -7.62 m)	22'-8" (6.91 m)	23'-8" (7.21 m)
25 ft - 30 ft (7.62 m -9.14 m)	23'-9" (7.24 m)	24'-9" (7.54 m)
30 ft - 35 ft (9.14 m -10.67 m)	24'-11" (7.60 m)	25'-11" (7.90 m)
35 ft - 40 ft (10.67 m -12.19 m)	26'-0" (7.92 m)	27'-0" (8.23 m)

3.3 OPERATION:

- PERSONAL FALL ARREST SYSTEM COMPONENTS:** Inspect and don the full body harness according to manufacturer's instructions. Attach the connecting subsystem (DBI/SALA Force 2 Energy Absorbing Lanyard) to the dorsal connection on the harness.
- CONNECTING TO THE HORIZONTAL LIFELINE SYSTEM:** Approach the work area using the appropriate access equipment. Connect the carabiner or snap hook of your personal fall arrest system to the horizontal lifeline. Connectors must meet all compatibility and strength requirements. See section 2.2.
- HAZARDOUS SITUATIONS:** Do not take unnecessary risks, such as jumping or reaching too far from the edge of the working surface. Do not allow the connecting subsystem to pass under arms or between feet. To avoid swing fall hazards, do not work too far from either side of the horizontal lifeline.

**Figure 7 - Two People**



**Table 2 - Required Clearance for Two Workers Connected to the System with a DBI/SALA Force 2 Energy Absorbing Lanyard**

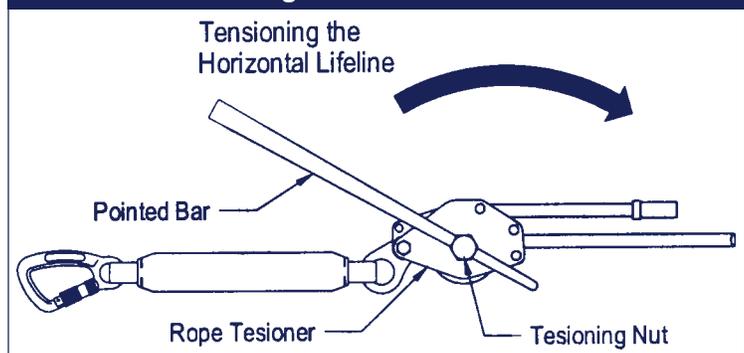
Span Length	Length of Energy Absorbing Lanyard	
	5 ft (1.52 m)	6 ft (1.83 m)
10 ft - 15 ft (3.05 m -4.57 m)	22'-10" (6.96 m)	23'-10" (7.26 m)
15 ft - 20 ft (4.57 m -6.10 m)	23'-6" (7.16 m)	24'-6" (7.47 m)
20 ft - 25 ft (6.10 m -7.62 m)	24'-9" (7.54m)	25'-9" (7.85 m)
25 ft - 30 ft (7.62 m -9.14 m)	26'-0" (7.92 m)	27'-0" (8.23 m)
30 ft - 35 ft (9.14 m -10.67 m)	27'-3" (8.31 m)	28'-3" (8.61 m)
35 ft - 40 ft (10.67 m -12.19 m)	28'-6" (8.69 m)	29'-6" (8.99 m)

**D. TWO PERSONS CONNECTED TO THE HORIZONTAL LIFELINE SYSTEM:** When a person falls while connected to the horizontal lifeline, the system will deflect. If two persons are connected to the same horizontal lifeline, and one person falls, the second person may be pulled off the working surface due to deflection. The potential for the second person falling increases as the horizontal lifeline span length increases. The use of independent horizontal lifeline systems for each person, or shorter span length, is recommended to minimize the potential of the second person falling.

**E. FREE FALL:** Whenever possible, locate the horizontal lifeline such that the user is restrained from reaching a fall hazard. If rigging as a restraint system is not possible, rig system such that the potential free fall is minimized by positioning the horizontal lifeline as high and as far from the edge as possible, and by limiting the lanyard length. Potential free fall must not exceed 11 ft. (3.4 m).

**F. SHARP EDGES:** Avoid working where the connecting subsystem or other system

**Figure 8 - Tensioner**



components will be in contact with, or abrade against, unprotected sharp edges. If working around sharp edges is unavoidable, a protective cover must be used to prevent cutting of the personal fall arrest system components.

**G. IN THE EVENT OF A FALL:** The responsible party must have a rescue plan and the ability to implement a rescue. Tolerable suspension time in a full body harness is limited, so a prompt rescue is critical.

**H. RESCUE:** With the number of potential scenarios for a worker requiring rescue, an on-site rescue team is beneficial. The rescue team is given the tools, both in equipment and technique, to perform a successful rescue.

**3.4 SYSTEM REMOVAL:** When no longer required, the horizontal lifeline system should be removed from the job site.

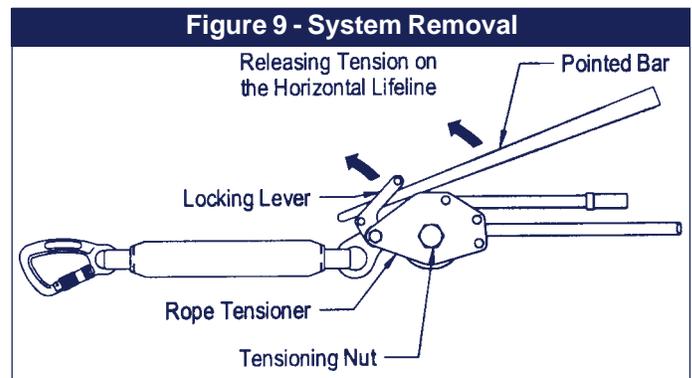
**A. RELEASE TENSION ON THE HORIZONTAL LIFELINE:**

**Step 1.** Lift the locking lever and position the pointed bar under the locking lever as shown in Figure 9.

**Step 2.** Push the pointed bar in a upward motion to unlock the lever.

**Step 3.** Loosen the tensioning nut by inserting the pointed bar through the hole in the nut (or use a 1-1/8 inch wrench) and turn the tensioning nut counterclockwise.

**Step 4.** Remove all knots and kinks in the rope before storage.



**4.0 TRAINING**

**4.1** It is the responsibility of the user to assure they are familiar with these instructions, and are trained in the correct care and use of this equipment. User must also be aware of the operating characteristics, application limits, and the consequences of improper use of this equipment. Training should be provided on a periodic basis to ensure rescuers proficiency.

**5.0 INSPECTION**

**5.1 BEFORE EACH INSTALLATION:** Inspect all system components according to these or other manufacturer's instructions. System components must be formally inspected by a qualified person, other than the user, at least annually. Formal inspections should concentrate on visible signs of deterioration or damage to the system components. Items found to be defective must be replaced. Do not use components if inspection reveals an unsafe or defective condition. Record results of each inspection in the inspection and maintenance log in section 9.0 of this manual.

**5.2 INSTALLED SYSTEMS:** An inspection of the horizontal lifeline system by a qualified person must be conducted after the system is installed. The system must be periodically inspected by a qualified person when left installed for an extended period, and prior to each day's use. Periodic inspections should be performed at least monthly, or more frequently when site conditions and use warrant. Inspections of installed systems should include the inspection steps listed in section 5.3.

**5.3 BEFORE SYSTEM USE:**

**Step 1.** Inspect all metal components (hooks, carabiners, rope tensioner, etc.) for cracks, deformities, corrosion, or other damage that may affect their strength or operation.

**Step 2.** Inspect rope for concentrated wear. Material must be free of frayed strands, broken yarns, cuts, abrasions, burns, and discoloration. The rope must be free of knots, excessive soiling, paint build-up, and rust staining. Knots must be tight and thimbles must be held firmly in place. Check for chemical or heat damage; indicated by brown, discolored, or brittle areas. Check for ultraviolet damage; indicated by discoloration and splinters and slivers along the rope surface. All of the above factors are known to reduce rope strength.

**Step 3.** Inspect the in-line energy absorber. Connecting hook must be free of cracks, corrosion, and other damage. See Step 1. Inspect webbing; material must be free of cuts, abrasions, burns and discoloration. The webbing should be free of excessive soiling, paint build-up, and rust staining. Check for chemical or heat damage, indicated by brown, discolored or brittle areas. Check for ultraviolet damage, indicated by discoloration and splinters and slivers along the web surface. Check for extension of the energy absorbing device. Return the system for repairs if extended.

**Step 4.** Inspect system labels. The labels must be present and fully legible. See section 8.0.

**IMPORTANT:** If this equipment is subjected to the forces of a fall arrest, it must be removed from service and destroyed, or returned to DBI/SALA for inspection or repair.

**5.4** If inspection reveals an unsafe or defective condition, remove unit from service and destroy, or contact DBI/SALA for possible repair.

**IMPORTANT:** Only DBI/SALA or parties authorized in writing may make repairs to this equipment.

**5.5 USER EQUIPMENT:** Inspect harness and energy absorbing lanyard according to manufacturer's instructions.

## 6.0 MAINTENANCE, SERVICING, STORAGE

**6.1 CLEANING AND MAINTENANCE:** Clean the horizontal lifeline system with water and a mild detergent. Wipe dry with a clean, dry cloth and hang to air dry. Do not force dry with heat. An excessive build-up of dirt, paint, etc. may prevent the system from working properly, and in severe cases, weaken the rope. A lubricant may be applied to the moving parts of the rope tensioner. Do not allow lubricant to contact the rope tensioner teeth.

**6.2 STORAGE:** Store this horizontal lifeline system in a clean, dry environment, out of direct sunlight. Avoid areas where chemical vapors are present. Thoroughly inspect the system after extended storage.

**6.3 USER EQUIPMENT:** Maintain, service, and store user equipment according to manufacturer's instructions.

## 7.0 SPECIFICATIONS

### 7.1 MATERIALS:

**Rope Tensioner:** Steel, plated

**Lifeline Rope:** Nylon

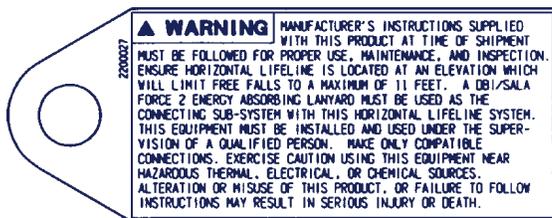
**Carabiner:** Aluminum Alloy

**Energy Absorbers:** Polyester and Nylon

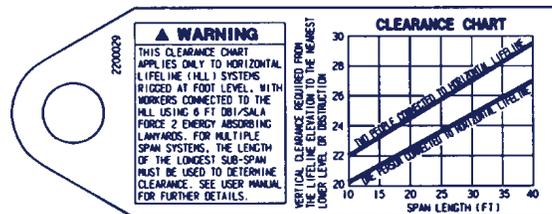
**Snap Hooks:** Alloy steel, plated

## 8.0 LABELING

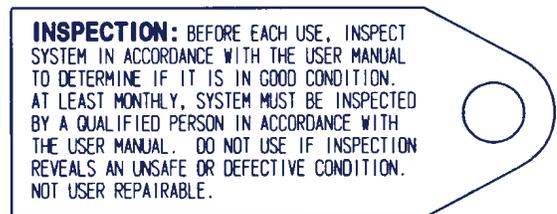
**8.1** These labels must be present and fully legible:



Vacuum Anchor  
Warning Label



Vacuum Anchor  
Clearance Label





## WARRANTY

Equipment offered by DBI/SALA is warranted against factory defects in workmanship and materials for a period of two years from date of installation or use by the owner, provided that this period shall not exceed two years from date of shipment. Upon notice in writing, DBI/SALA will promptly repair or replace all defective items. DBI/SALA reserves the right to elect to have any defective item returned to its plant for inspection before making a repair or replacement. This warranty does not cover equipment damages resulting from abuse, damage in transit, or other damage beyond the control of DBI/SALA. This warranty applies only to the original purchaser and is the only one applicable to our products, and is in lieu of all other warranties, expressed or implied.

This instruction applies to the following models:

2200401  
2200402  
2200403  
2200404  
2200405  
2200406  
2200425

Additional model numbers may appear on the next printing of these instructions



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This manual is available for download at [www.salagroup.com](http://www.salagroup.com).



Form: 5902166  
Rev: C