

## Flexible Vertical Climbing System



This vertical climbing system is composed of two anchorages mounted at the top and bottom of the climbing system with a flexible lifeline connecting the two. A carrier can be attached at any point along the system. This system can be used anywhere there is a risk of a fall during climbing. The system attaches easily to any ladder. The cable grab slides easily up and down allowing technician to climb freely.

Meets all OSHA and ANSI standards for ladder climbing fall protection.

### Material Specifications:

System is specified by the user to meet required needs. Basic model is powder coated mounting brackets with galvanized components as corrosion protection. Components can be specified as stainless as required by user.

Top and Bottom brackets are made from plain carbon steel. Brackets are powder coated to prevent corrosion.

Cable is type 7 x 19 - 3/8" diameter and is either galvanized or stainless steel. All mechanical connections are galvanized steel or stainless steel components.

Cable accessories (thimble, wire rope clips, eye-bolt, swages, etc.) are galvanized or stainless steel or compatible material per requirement.

### System Compatibility

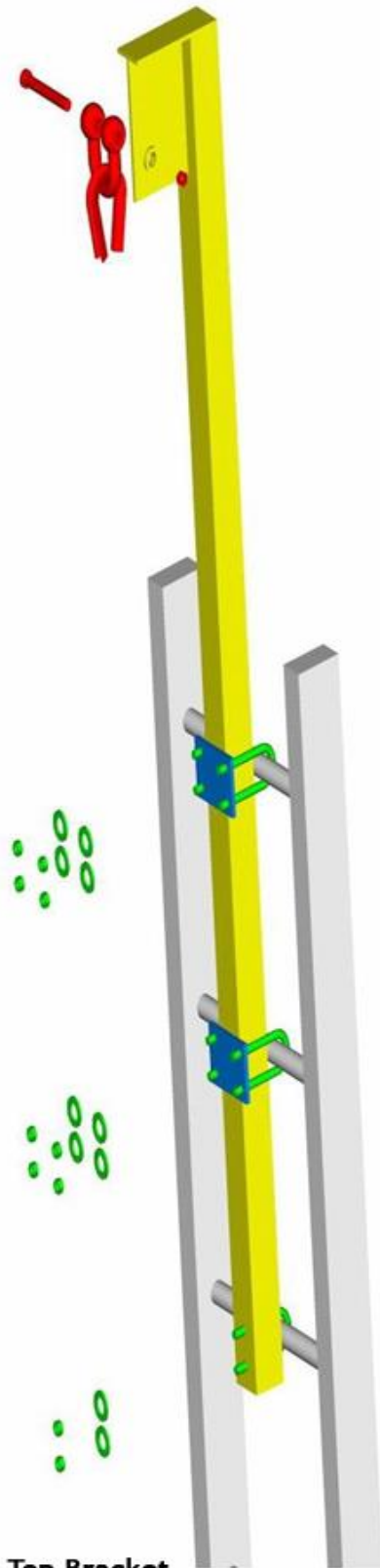
Standard system fits up to 1-1/8" diameter rungs. Use of offset clamps and various sizes of U- bolts allows for connection to most ladder rung sizes.

Cable guides are provided every 25 feet and connect directly to ladder rungs. Cable guides are provided to minimize the effects of wind or other elements on the cable.

Cable comes assembled with swaged end for the top and a free end for the bottom for ease of installation. Cable length is specified at time of order.



## Installation Procedure



Top Bracket  
Figure 1

Install the top bracket by placing the positive connecting U-bolt (bottom U-bolt) around rung located 3 down from the top (Figure 1). This U-bolt goes through the top mount so the threaded portion of the U-bolt is visible on the front of the bracket. Place washer and locking nut on U-bolt. Align bracket in center of rung. Place U-bolts and clamp plates to encapsulate top two rungs (Figure 1).

Again place washers and locking nuts on all U-bolts. Tighten all connections on top bracket. Place swaged end of cable in center of shackle. Place shackle on top bracket in manner such that the shackle is on either side of the bracket. Insert shackle bolt through one side of shackle then bracket then other side of shackle (Figure 1). Tighten nut on end of shackle bolt, place keeper pin in bolt.

Install bottom bracket by placing positive connecting U-bolt (bottom U-bolt) around bottom rung of ladder. Place washer and locking nut on U-bolt.

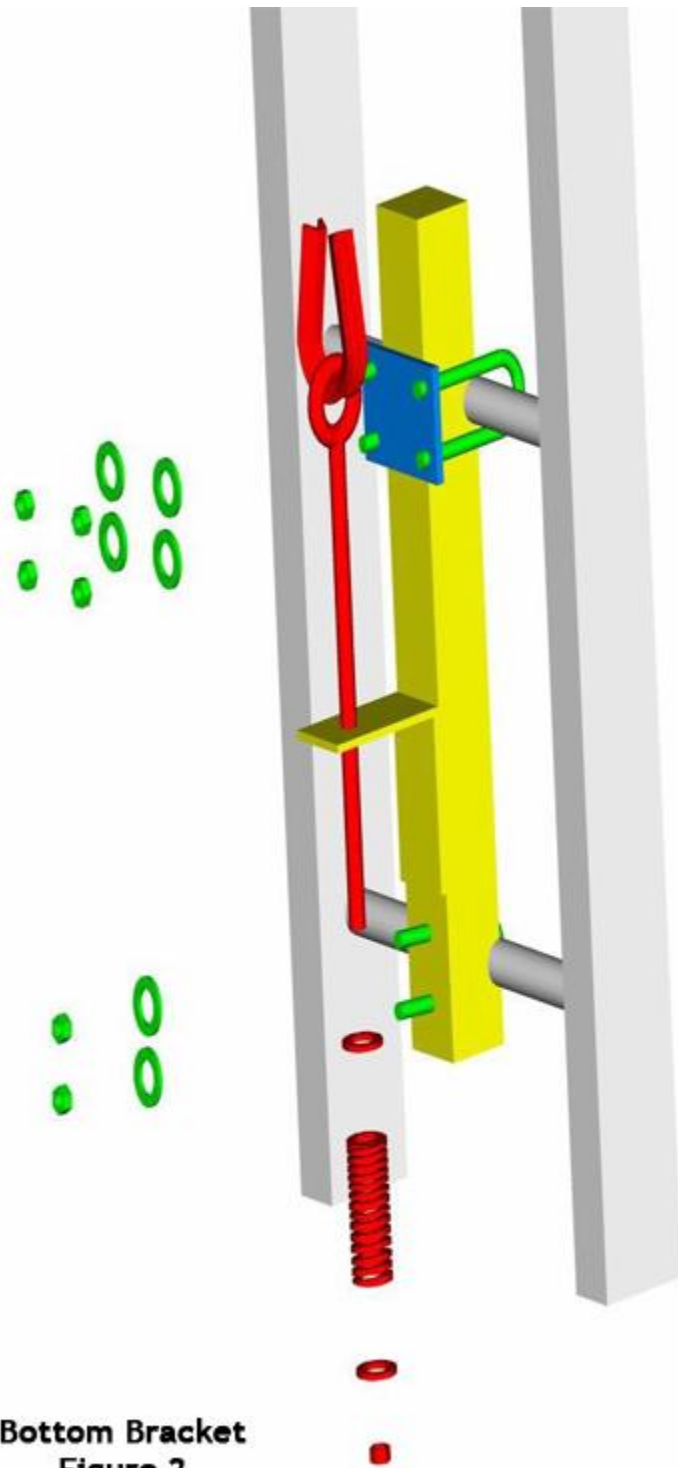
Align bracket in center of rung. Place U-bolts and clamp plate to encapsulate second rung (Figure 2). Place washers and locking nuts on all U-bolts.

Tighten connections to bottom bracket.

Insert Eye-bolt in bottom bracket. Assemble flat washer, die spring, flat washer and nut on bottom side of bracket (Figure 2). Leave connection loose with nut just started on eye-bolt. Place thimble through eye of eye-bolt. Insert free end of cable through eye and around thimble. Pull slack out of cable and place first wire rope clip next to thimble.

\*\*\* Wire rope clips must be oriented so that the U-bolt is placed around dead end (free end that is terminated) and saddle around working side (cable that runs to top of ladder).

Place second wire rope clip on cable in exact same fashion as first. Rope clips must be installed correctly.



**Bottom Bracket  
Figure 2**

The next step is to tighten nut below die spring for tension of cable. Die spring is 3" long. Tighten nut till dimension of die spring is between 2-1/4" and 2".

Cable guides are attached every 25 feet. Guides are installed to a snug fit. Do not over tighten guides as they are made to rotate out of the way should they come in contact with a person during a fall.

### **Curved Ladder System Installation:**

The top bracket (Figure 3) should be positioned on the rungs to allow the user to safely connect and disconnect to the cable between uses. The bracket can be installed up to 12" (30.5 cm) off- center of the ladder if required. Place the U-bolt bracket near the base of the pivoting leg. Using U- bolts, fasten each leg (one on the stationary leg and two on the pivoting leg) onto the corresponding rung of the ladder and tighten the six nuts, ensuring that the legs are held securely in place.



**Curved Ladder Top Bracket  
Figure 3**

At this point, cable can be connected to the top bracket and the base of the ladder. Cable guides should be positioned along the curve of the ladder to prevent contact between the cable and ladder. Install using only the hardware provided and do not substitute other fasteners.

## Flexible Vertical Climbing System

It is the responsibility of the worker and their employer to read and understand all directions and warnings.

Health condition of the operator must be compatible with a possible fall arrest operation of the system. A worker must not be assigned to a job when a fall arrest or travel restraint system is required, if that worker is not:

- a) mentally and physically fit for the purpose, especially at heights;
- b) free from the influence of alcohol or drugs;
- c) familiar with the equipment and all applicable safety rules, requirement or regulations;
- d) competent for the job to be performed;
- e) trained for working under the above requirements. Training sessions must be performed under safe conditions.

Never use a fall arrest device or component for any application other than what it has been strictly designed for.

Never alter or modify any part of a fall arrest system.

The climbing structure that the ladder safety system is attached to must be capable of supporting the loads imposed by the system should a fall occur.

The climbing structure must be capable of supporting a load of 4300 pounds for two users. If the system will be used by three persons, then it must support a load of 5600. For four users, 6900.

This safety system will allow at least two but never more than four users at one time; However only one person at a time (except in rescue operations) shall use the same portion of cable between cable guides.

The combination of the user's weight, clothing and tools must not exceed 310 lbs.

The maximum length of the connection between the centerline of the cable and the point of attachment on the harness must not exceed 9 inches.



## Inspection of Ladder Safety System

Inspections should be performed by a qualified person.

Inspection of the systems shall occur at least annually or more often as determined by use and exposure to environment. This does not pertain to the safety harness or cable grab. They should be inspected each and every time before use. See specific harness and grab inspection instructions.

System must be maintained in a safe operating condition.

Inspection of the wire rope clips shall be performed periodically to ensure the clips are tight.

Inspections on the system and connecting hardware shall be performed to determine if there is rust, corrosion, deformation, or deterioration.

Inspection of cable grab must occur before each use.

If the ladder safety system has been used to arrest a fall, the system must be inspected prior to reuse. Inspection must include all brackets, mounting hardware, cable, wire rope clips, swages, shackle, and cable guides. If any component is found to be defective, it must be replaced prior to the next usage of the system. Cable tension may need to be readjusted. Refer to installation instructions to adjust cable tension.

Users should visually inspect the system while in use.

Users should report any defects to the proper authorities.

Records must be maintained of inspections and maintenance.

## Inspection of Harness

Inspection of Harness must be performed before each use. Refer to harness manufacturer for instructions.



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## Inspection of Cable Grab

The cable grab must be inspected prior to each use and periodically by a qualified person. If damage is found on the cable grab, remove it from service immediately and replace it.

Cable grabs should be inspected for:

- a) moving parts are functioning properly and not clogged by dirt or debris;
- b) deformation, alteration, or other damage is not evident;
- c) springs are intact and functioning properly;
- d) all rivets are secure;
- e) operation and function of grab is not disrupted in any fashion.

If there is a shock absorber or lanyard installed on the grab, inspect it for wear, any cuts, frays, abrasions, or any other defect that may inhibit the performance of the shock absorber.

Inspect all connectors to ensure that self-locking snap or carabiner functions properly.

## Cable Grab User Instructions

Ensure that the cable grab and cable on the system are compatible. While pushing on the center of the plunger shaft, remove the shaft from the grab shroud. Lift up on the lanyard pin and twist the internal mechanism out and away from the shroud.

**\*\*\*\* Make sure the up arrow on the grab is pointing upwards.**

Place grab on cable so the mechanism can close the cable into the shroud.

Re insert plunger shaft into grab.

**\*\*\*\* Make sure grab is working properly.**

This can be tested by pulling up on the snap hook. The grab should glide easily up the cable. Now tug downward on the snap hook. The grab should lock on the cable and allow for no movement. Lifting upwards on the snap hook will release the locking mechanism and the grab should slide up and down the cable freely.

Attach the snap hook to the D-Ring in the center front of the harness belt.





## VCL - Modified Top Piece Instructions



STEP 1: Take the swaged end of your cable component of the vertical lifeline and place in in the slot as shown below.

STEP 2: Place the half inch bolt through one hole on the head piece, through the eye of the swaged portion of the cable, and through the hole on the other end of the head piece. Screw on the locknut, tightening it so that the bolt is snugly in place.

STEP 3: The cable will be able to rotate around the bolt, being limited by the head piece.

