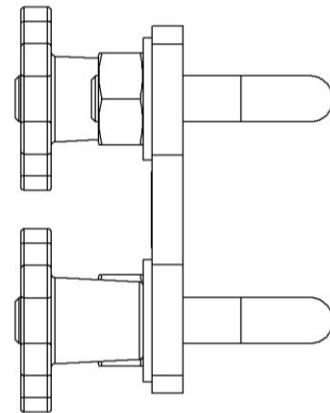
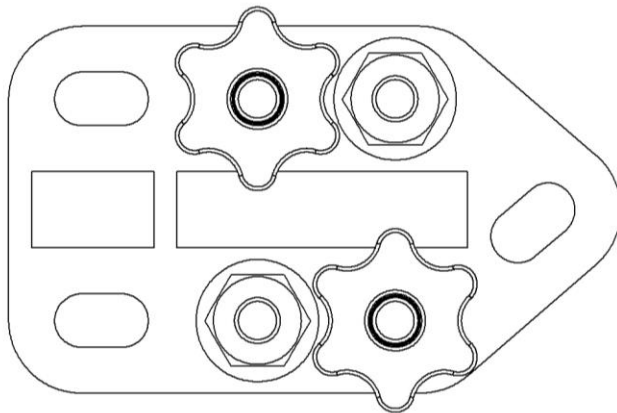




**Reliance Industries, LLC**

**Installation, Operation, Inspection and Maintenance  
Instructions for the Clamp-on Rebar Bracket for Use with  
the Skyline™ Horizontal Lifeline System**

**3088-011**



**Reliance Industries, LLC  
PO Box 2046  
Deer Park, TX 77536  
Ph. (888) 362-2826  
Ph. (281) 930-8000  
Fax (281) 930-8666**



## Important Instructions!

These instructions must be kept on file and available for the users reference at **all** times. The users must read and full understand these instructions or have the instructions explained in detail before using this equipment. **Failure to observe these instructions could result in serious injury or death.**

Prior to use, all workers must be trained in the proper use of all systems and equipment.

A Training and Instruction review should be repeated at regular intervals.

A rescue plan must be prepared; the workers must be trained in its use, and rescue equipment must be on hand prior to any use of this horizontal lifeline system.

This Clamp-on Rebar HLL Bracket is to be used only with a Grade 40 or Grade 60 rebar of #8 through #11 sizes (1" – 1-1/2"). Rebar under #8 size **WILL NOT** be gripped adequately by the clamp. The Clamp-on Rebar HLL Bracket is **NOT** to be used with other grades of rebar.

The Clamp-on Rebar HLL Bracket **MUST NOT** be used as a personal fall arrest anchorage. The Bracket is to be used only as an end anchorage component of a horizontal lifeline system that has been approved by a Qualified Person.

Any questions regarding these instructions should be directed to:

Reliance Industries, LLC  
PO Box 2046  
Deer Park, TX 77536  
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# Important OSHA Regulations Covering the Use of Horizontal Lifeline Systems

OSHA 1910.66 Subpart M – 1926.502 (d)(8):

Horizontal Lifelines shall be designed, installed, and used under the supervision of a qualified person as part of a complete fall arrest system, which maintains a safety factor of at least two.

OSHA 1910.66 (b):

“Qualified Person” means one with a recognized degree or professional certificate and extensive knowledge and experience in the subject field who is capable of design, analysis, evaluation, and specifications in the subject work, project, or product.

OSHA 1910.66 (b):

“Competent Person” means a person who is capable of identifying hazardous or dangerous conditions in the personal fall arrest system or any component thereof, as well as in their application and use with related equipment

OSHA 1910.66:

Personal fall arrest systems shall be rigged such that an employee can neither free-fall more than 6-ft. nor contact any lower surface.

OSHA 1910.66 (n):

The sag in the lifeline should be minimized to prevent the connecting piece of equipment (self-retracting lanyard or other appropriate personal fall arrest device) from sliding down the lifeline to a position which creates a swing hazard during a fall arrest.

OSHA Standards, Interpretations and Compliance Letters, 02/09/1995-Criteria for personal fall arrest systems:

The free-fall distance is limited to 6 feet. The deceleration distance must not exceed 42 inches; lifeline elongation is not included in deceleration distance; and the total fall distance is unregulated except that the employee cannot make contact with a lower level...The safety factor of two should be applied based on the anticipated maximum arrest force, not the fall energy.



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## System Description

The Clamp-on Rebar HLL Bracket is an end anchorage bracket for use with Skyline™ Horizontal Lifeline systems. The Bracket allows for the rapid installation of a horizontal lifeline to a structurally rigid rebar cage which has been cross-tied in such a fashion that prevents the use of a standard Skyline™ HLL Rebar stanchion. The Rebar HLL Bracket utilizes a threaded j-bolt to allow for rapid installation on rebar sizes #8 through #11.

The Rebar Bracket is clamped onto the rebar that is commonly used by the concrete construction industry. By simply sliding the j-bolt of the bracket over an exposed end of rebar, the Bracket may be locked into place with the hand knob, allowing for easy installation and removal as horizontal lifeline are moved to other locations.

## Installation

Installation of horizontal lifeline systems should be done under the supervision of a Qualified Person trained in their function and use. Use only parts that have been qualified as compatible components by Reliance Industries. Install the system only as specified in the system parameter documents prepared by the computer program system. Ensure that the minimum anchorage strength is at least 2 times the anticipated line tension called out in the system parameter documents. Have the anchorages certified by a qualified person and keep documentation on hand. HLL calculations for minimum required clearance (MRC) are measured below the walking/working surface and assume that the horizontal lifeline is at least 5 ft. above the walking/working surface (unless otherwise specified) in order to limit free-fall to 6 ft. or less as required by OSHA. Always install lifelines horizontally where all end anchorages and bypass supports are at the same elevation. Always install the system per the system parameter documents and NEVER change span length, sub-span length, or number of people allowed on the system once a system is designed and certified. Remember, horizontal lifeline dynamics change with any change to span length, or number of people allowed on the system. Any changes require a new design, and MUST be approved by a qualified person.

This Clamp-on Rebar HLL Bracket is to be used only with a Grade 40 or Grade 60 rebar of #8 through #11 sizes (1" – 1-1/2"). Rebar under #8 size **WILL NOT** be gripped adequately by the clamp. The Clamp-on Rebar HLL Bracket is NOT to be used with other grades of rebar. The rebar utilized for the clamp **MUST** part of a rigid, secured rebar structure that a Qualified Person has certified to possess the minimum required strength as required by OSHA for the expected horizontal lifeline loads.

The Clamp-on Bracket **MUST NOT** be used directly as a personal fall arrest anchorage. The Bracket is to be used as a component of a horizontal lifeline system that has been approved by a Qualified Person. The connection of the personal fall arrest system must only take place to the horizontal lifeline connected to the Clamp-on Bracket **AFTER** it has been certified for use.

## To install the Clamp-on Rebar HLL Bracket

NOTE: Approved fall protection must be worn during Skyline™ lifeline installation at all times. Do not use the horizontal lifeline or its anchorages as personal fall protection anchorages until the system has been completely installed, inspected, and approved for use by a Qualified Person.

1. Refer to the Skyline™ HLL design document to verify the correct height of the HLL above the walking working surface. Measure along the selected rebar for the attachment of the bracket upwards for the height of the horizontal lifeline attachment point. This is the height at the “nose” of the bracket where the HLL will attach to (see Fig. 1 below).
2. Loosen the hand knobs of the j-bolts.
3. If the rebar column is open on the top side, slide the bracket down the exposed end of the rebar until the HLL attachment point is at the height where the horizontal lifeline will be.
4. If the rebar has been tied off above where the bracket will be so that it can not slide down the rebar, remove the nuts and washers from the end of the j-bolts. Push the end of the bolts out of the hole in the back plate. Holding the bracket at the correct height, twist the bolt back into place, and replace the nut and washer (see Fig. 1 below).
5. Twist the bracket on the rebar so that the “nose” of the bracket is pointed towards the location where the opposite end of the HLL will be installed.
6. While positioning the j-bolt between the ribs of the rebar, tighten the hand knobs. Tighten the nuts by torquing it to 50- to 60 ft-lb. to lock the Clamp-on Bracket for rebar into place.

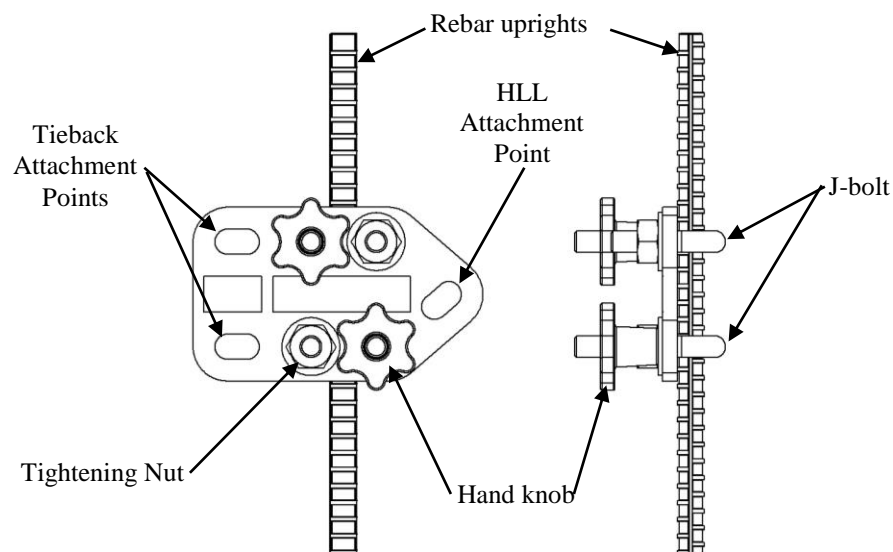


Fig. 1-parts of the HLL Rebar Bracket 3088-011

7. Verify that the hand knobs and nuts are pulling on the j-bolts of the bracket evenly. If not, loosen both the knob and nut, readjust, and retighten so that both are tightened down evenly onto the rebar.

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8. The tieback cables may now be connected to the two tieback attachment points using Reliance Industries approved hardware and independent pieces of rebar that have also been certified by a Qualified person to meet the minimum strength requirements.
9. To install the tieback cable brackets, loosen the hand knobs of the j-bolts.
10. If the rebar column is open on the top side, slide the bracket down the exposed end of the rebar until the bracket is as far down the rebar and close to the cement surface as possible (see Fig. 2).
11. If the rebar has been tied off above where the bracket will be so that it cannot slide down the rebar, remove the nuts and washers from the end of the j-bolts. Push the end of the bolts out of the hole in the back plate. Holding the bracket at the correct height, twist the bolt back into place, and replace the nuts and washers.
12. Twist the bracket on the rebar so that the bracket is aligned towards the HLL Bracket clamp is located where the tieback cables will be installed.
13. While positioning the j-bolts between the ribs of the rebar, tighten the hand knobs. Tighten the nuts by torqueing to 50- to 60 ft-lb. to lock the bracket into place.
14. Repeat Steps 9 through 13 for the second tieback clamp and cable.

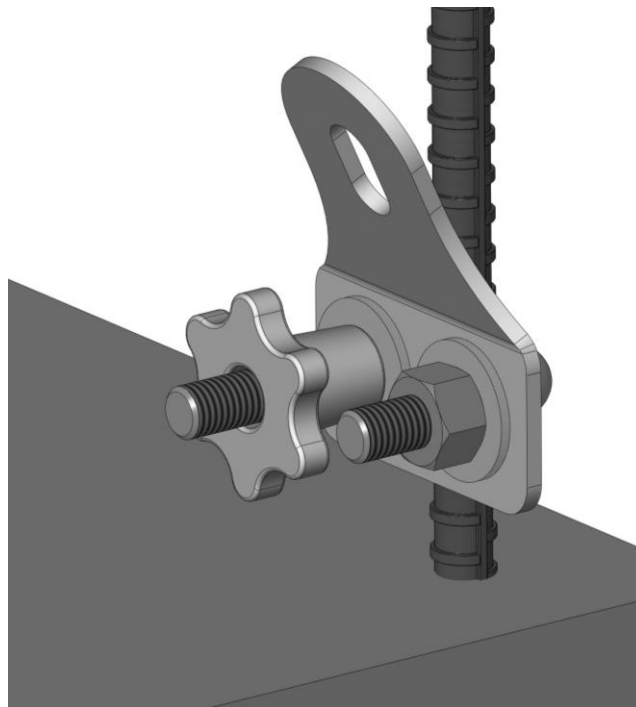


Fig. 2 – HLL Rebar Tieback Clamp 6200-011

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15. Repeat Steps 1 through 14 listed above for a second Rebar HLL Bracket or proceed with the specific instructions accompanying the necessary HLL anchorage to install the second anchorage point at the location of the end of the horizontal lifeline.
16. To begin the installation of the lifeline lay the cable on a flat surface near where the lifeline will be installed (at ground level, or next to the beam where the stanchions have been installed) and remove all bends. Inspect cable for crush spots, broken wires, weld strikes, or any other deformity that may affect the integrity of the cable. Damaged cables must be removed from service immediately.
17. Position the eye end of the wire rope so that it is about 7-ft. (see Figure 3) away from the location of one of the location of the HLL attachment point.

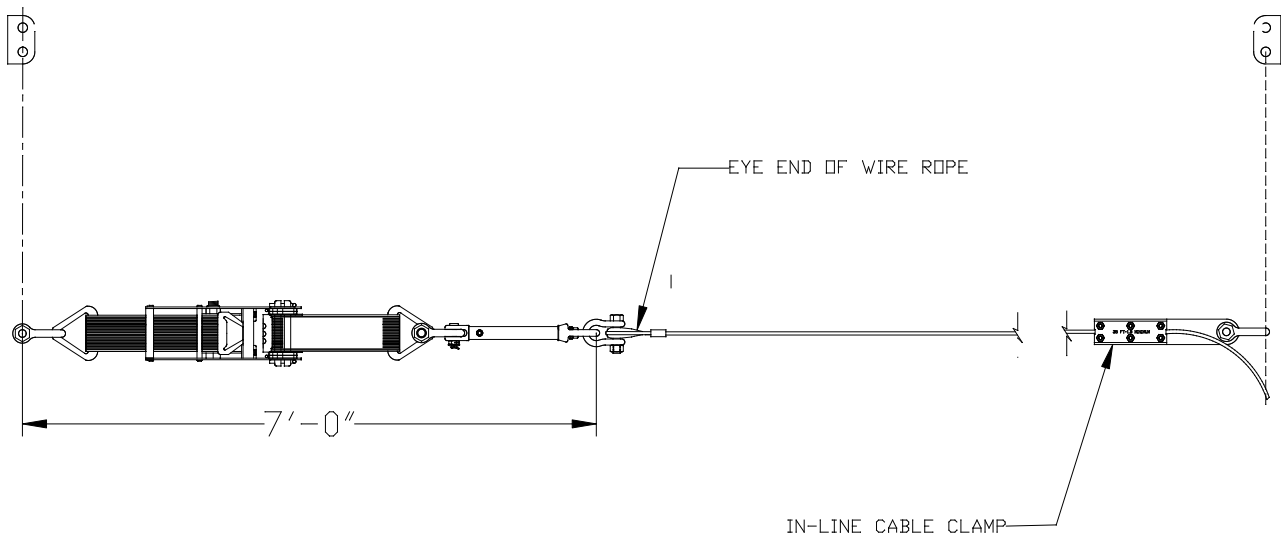


Fig. 3 Skyline™ Horizontal Lifeline Layout

18. Locate the spot on the wire rope on the other end (opposite of the eye end) where it would attach directly to the second attachment point. Mark this location.
19. Remove the 6 bolts and lock washers from the top plate of the In-line cable clamp. Set the top plate aside.
20. On the mark you have measured off, place the wire rope into the grooved lower plate of the In-line cable clamp. Insure that the end of the cable clamp with the hole in it is placed towards the free end of the wire rope.
21. Twist the wire rope and press down into the grooves of the clamp. The wire rope may have to be twisted and untwisted for it to align properly.
22. Place the top plate onto the lower plate, and begin tightening the bolts. Tighten the top plate EVENLY to 35 ft-lb. For more detailed information on using the In-Line Cable Clamp, please refer to the “In-Line Cable Clamp Instruction Manual”.
23. Remove the bolt from one ½-in. bow shackle. Pass the shackle end through the slotted hole of the In-line Cable Clamp. Raise the bow shackle to the attachment point where the horizontal lifeline is to be installed and secure in place with the bolt. Tighten the nut and secure in place with the lock ring.



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24. At the opposite end of the HLL, insert a ½-in. bow shackle through the eye of the wire rope and bolt into place through the eye of the Skyline™ Shock Absorber. Secure the bolt with the nut and replace the lock ring.
25. Attach one ½-in. bow shackle through the triangular d-ring of the 3-in. by 10-ft. long Ratchet Strap, and connect it to the desired attachment point where the horizontal lifeline is to be installed and secure in place with the bolt. Tighten the bow shackle nut and secure with the lock ring.
26. Remove the clevis pin of the Skyline™ Shock Absorber and insert a ½-in. bow shackle into the clevis. Replace the clevis pin and lock ring.
27. Using the ½-in. bow shackle just installed to the shock absorber, connect it to the triangular d-ring of the 3-in. Ratchet load binder. Secure with the nut and lock ring.
28. Begin lifting the horizontal lifeline cable assembly to its intended position (see Figure 4). If Bypass Stanchions or Brackets are being used, the cable must be placed through the center of the bypass fittings before the cable is properly tensioned. Pass the free end of the ratchet strap into the slot of the ratchet. Pull the free end of the ratchet strap to help remove slack from the lifeline cable.

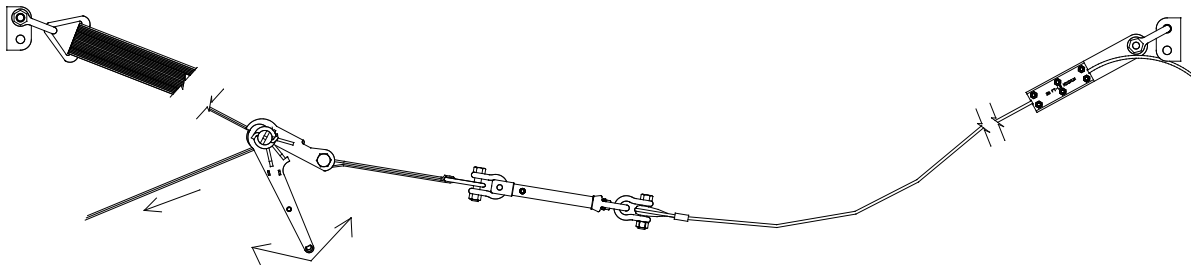


Fig. 4 Tensioning the Horizontal Lifeline

29. While holding the ratchet strap tight, begin tensioning the lifeline, using the ratchet handle.
30. Tighten the ratchet load binder until the line tension just releases the load-indicating washer of the Shock Absorber to spin free. This washer is located just under the eye of the Shock Absorber (see Figure 5). A freely spinning washer indicates that the cable has been pre-tensioned to 1000 lbf.

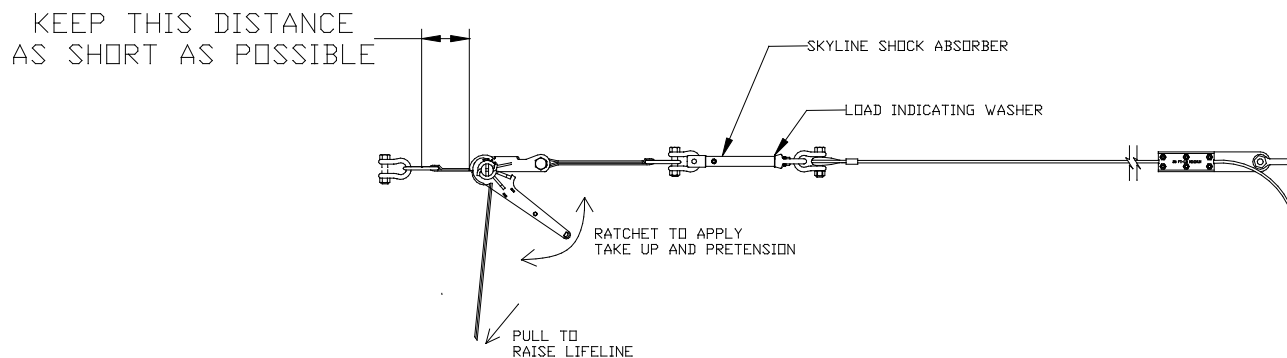


Fig. 5 Shock Absorber Load Indicating Washer

31. Check that the webbing of the ratchet strap has made at least one complete revolution on its mandrel before the correct line tension has been reached. If it has not made a full revolution, release the tension, let 3- to 4-in. of the ratchet strap to slip back out of the load binder and retighten. The strap



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should now make at least one full revolution before the lifeline is properly tensioned. At least one full revolution is necessary for the tensioner to overcome the maximum load without slipping. Excess webbing may be wrapped around the load binder or bundled and secured to prevent the surplus from forming a tripping hazard.

32. Inspect the installation for any defects, such as missing parts, damage, proper anchorage strengths and configuration, proper pre-tensioning, proper cable alignment, proper elevation, defective or non-compatible components. **DO NOT** authorize system use if any defects or discrepancies are found. Check system installation parameters with system installation parameter documents to assure that the correct installation has been performed.
33. Once the system passes all checks by the competent person, the system may be approved for use, and labeled with a permanent identification tag referencing the following information:
  - a. Identification number that will tie the lifeline to the correct computer generated design documents that identify the original design parameters.
  - b. Date of installation.
  - c. Total authorized span length and sub-span length.
  - d. Total number of people allowed on the system at one time.
  - e. The minimum required clearance (MRC) below the walking/working surface.
  - f. The anticipated maximum line tension.
  - g. The required cable pre-tension (normally 1000-lbs.)
34. A separate tag should also be added indicating date of last inspection by the competent person.



## Training

It is the responsibility of the employer to train all workers prior to using this system (per OSHA 1926.503 (a)(1)). The employer shall provide a training program for each employee who might be exposed to fall hazards. The program shall enable each employee to recognize the hazards of falling and shall train each employee in the procedures to be followed in order to minimize these hazards.

The employer shall assure that, as necessary, each employee has been trained by a competent person qualified in the following areas:

- a. OSHA regulations governing the use of horizontal lifelines.
- b. Ability to recognize potential fall and workplace hazards.
- c. Method of inspection of safety equipment.
- d. Rescue procedures.
- e. Installation and removal techniques.

## Planning for Rescue

Prior to system use, a rescue plan must be prepared, the workers must be trained in its use, and the rescue equipment must be on hand to implement it in case of a fall.

Typical rescue plans include (but are not limited to) the following items:

1. List of equipment that must be readily accessible in the event of an emergency and the names of those workers certified to use or operate that equipment.
2. Emergency contact phone numbers (ambulance, hospital, fire department...) and a means to contact them (cell phone, emergency radio).
3. List of employees on the site, and the specific tasks they will perform to effect the rescue.
4. If a confined spacing is to be entered a confined space work permit must be filed and approved.

During installation of horizontal lifeline systems, anchorage points should be identified, and clearly marked in such a manner as to provide a means to rescue a worker at any position along the lifeline system.

## Inspection

Prior to each use, the worker must inspect the system for any physical damage, wear, corrosion, or malfunctioning parts. The Rebar HLL Bracket must be inspected each day prior to use as part of the general lifeline inspection. The Bracket should be inspected to insure that the hand knobs, j-bolts, nuts, and washers are present and intact. The back plate of the bracket should be straight and flat, and no corrosion should be present. The Bracket also should be checked at various times throughout the day to ensure that it remains tightly fastened to the rebar. Additional components of the HLL system must also



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be inspected per the specific instructions provided with the individual or system components. If an inspection reveals a problem or unsafe condition, remove the entire system from service until it can be re-certified by a competent person.

The worker, who must also check the pre-tension of the horizontal lifeline system prior to each use, must inspect all system components. A formal inspection must be carried out a minimum of once each year, and be formally documented and kept on file with the system parameter documents.

## Servicing

A qualified person trained in the inspection and servicing of system components must carry out servicing of this system. The company's safety officer should maintain a record log of all servicing and inspection dates. The system and all components must be withdrawn from service if subjected to fall arrest forces. Those components may be returned to service only after being certified by a qualified person. Only original Reliance equipment replacement parts are approved for use in this system. Contact Reliance Industries Engineering with questions and when in need of assistance.

## Warnings and Limitations

Proper care should always be taken to visually scan the work area prior to use. Remove any obstructions, debris, and other materials from, and beneath the work area that could cause injuries or interfere with the operation of this system. Be cautious of swing fall hazards if working horizontally to the side of the lifeline. Always use the shortest lanyard length possible to connect to the lifeline. Be aware of the movements of others on the lifeline at the same time, knowing that if they fall, the sudden motion in the lifeline could pull others off balance. When working at a fixed area, tie off to other suitable overhead anchorage if they exist, allowing the lifeline to be occupied by fewer people.

Users should be familiar with pertinent regulations governing the use of this system and its components. Only trained and competent personnel should install and supervise the use of this system.

Do not exceed manufacturers' recommended span length or maximum number of people on the same lifeline as listed on either the tag attached to the specific horizontal lifeline system, or in the lifeline parameter data sheets.

Do not use these components with any other horizontal lifeline material. Only 3/8 – 7x19 IPS or stainless steel wire rope is allowed, due to its high-energy capacity.

Use only Reliance Industries supplied or qualified compatible components.



**User Instructions**  
**3088 Rebar HLL Bracket**

**Reliance Industries, LLC**

**This Clamp-on Rebar HLL Bracket is to be used only with a Grade 40 or Grade 60 rebar of #8 through #11 sizes (1" – 1-1/2"). Rebar under #8 size WILL NOT be gripped adequately by the clamp. The Clamp-on Rebar HLL Bracket is NOT to be used with other grades of rebar.**

**The Clamp-on Rebar HLL Bracket MUST NOT be used as a personal fall arrest anchorage. The Bracket is to be used as a component of a horizontal lifeline system that has been approved by a Qualified Person.**

**If you have any questions regarding the correct installation or use of this product DO NOT USE. Call Reliance Industries at Ph. (303) 424-8650 or Fax (303) 424-8670.**

# Inspection Log for HLL Systems

Company: \_\_\_\_\_ Location: \_\_\_\_\_ Date: \_\_\_\_\_  
 Job Site: \_\_\_\_\_ HLL Log No.: \_\_\_\_\_ System No.: \_\_\_\_\_

Is this system used as described in the HLL Log No. \_\_\_\_\_ to conform to design document criteria? \_\_\_\_\_

Describe non-conforming conditions in the boxes below:

Inspection Criteria	Missing Parts	Labels Readable	Corrosion	Deformed Parts	Cracked Parts/ Broken wires	Excessive Loading
HLL Identity Tag						
HLL Shock Absorber						
End Clamp complete						
End fittings(bow shackles)						
Shackles						
Wire Rope						
Webbing Strap						
Ratchet Tensioner						
Stanchions						
Tie Back Cables						
Clamp-on knobs and j-bolts present						
Backplate flat						
Back plate flat and not deformed						

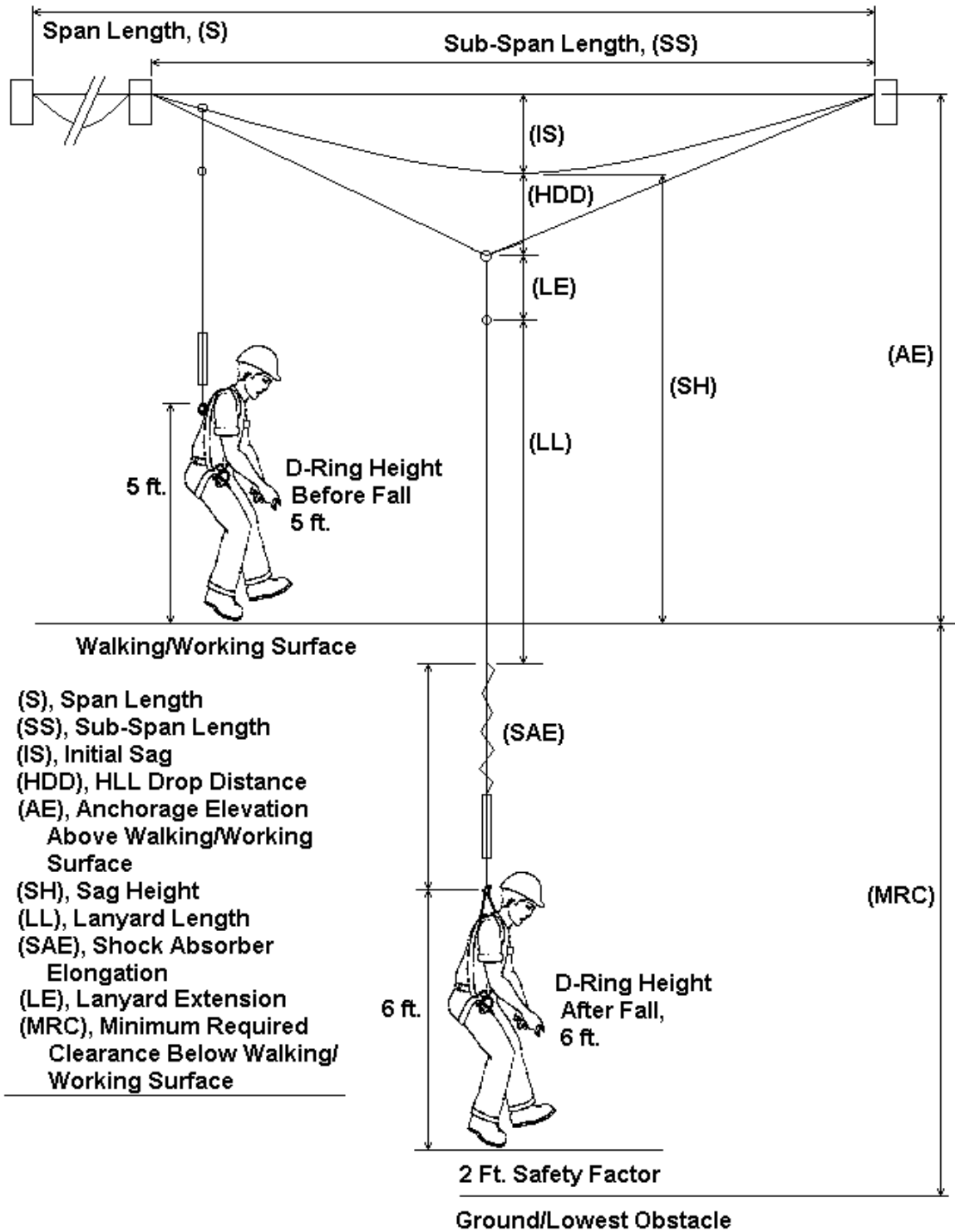
Is Shock Absorber pre-tension set correctly \_\_\_\_\_

Has a Rescue Plan been prepared \_\_\_\_\_

Is Rescue Equipment on hand \_\_\_\_\_

Have workers been trained in the Rescue Procedures and been given a copy of the Rescue Plan \_\_\_\_\_

# Skyline™ Horizontal Lifeline Diagram



- (S), Span Length
- (SS), Sub-Span Length
- (IS), Initial Sag
- (HDD), HLL Drop Distance
- (AE), Anchorage Elevation Above Walking/Working Surface
- (SH), Sag Height
- (LL), Lanyard Length
- (SAE), Shock Absorber Elongation
- (LE), Lanyard Extension
- (MRC), Minimum Required Clearance Below Walking/Working Surface