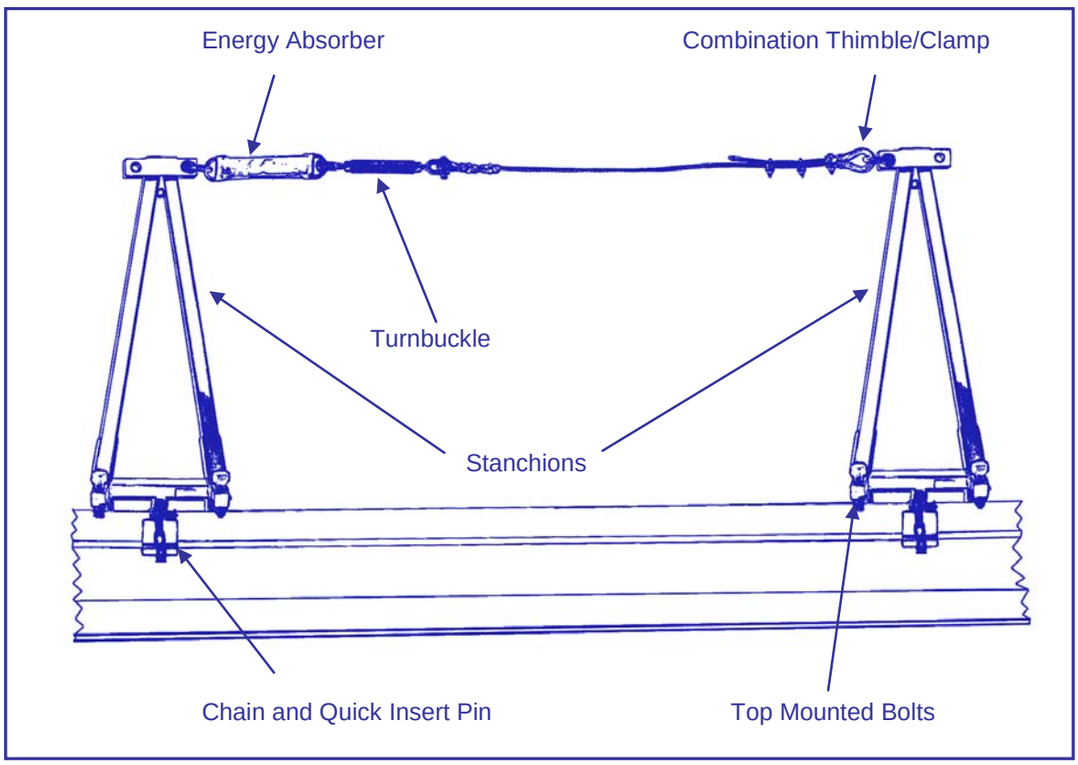
GEMTOR, INC.
...when your life is on the line™
One Johnson Avenue • Matawan, NJ 07747
732-583-6200 • 800-405-9048 • Fax 732-290-9391

OWNER'S MANUAL

Installation, Operating, Inspection and Maintenance Instructions
Gemtor Temporary Single/Multi-Span Horizontal Lifeline System

HL3 Series



⚠ Warning

You must read and fully understand all instructions, or have all instructions explained to you, before attempting to use this device. Equipment must not be installed, operated or inspected by anyone who does not understand this Owner's Manual. Failure to observe these instructions could result in serious injury or death. Careless or improper use of this equipment can result in serious injury or death. Training and instruction review should be conducted before initial use and repeated periodically and without exposing the trainee to a fall hazard. Proper training should also cover the limitations of this product. If you have any questions regarding these instructions or need additional copies, call Gemtor toll free at 800-405-9048.

This user instruction manual is not a substitute for a comprehensive training program.

⚠ IMPORTANT

THESE INSTRUCTIONS SHOULD BE KEPT WITH THE DEVICE AT ALL TIMES.

IMPORTANT OSHA INFO (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 personal fall arrest system, which maintains a safety factor of at least two.

⚠ IMPORTANT

When using any lifeline, regardless of configuration or manufacture, it is important to realize that there are some definite limitations on use that must be considered, and definite work practices that must be followed. Lifelines are flexible anchorages that allow a worker to be tied-off at any point along either a vertical or horizontal span. Unlike a fixed anchorage, lifelines are susceptible to substantial movement, elongation and deflection when subjected to the forces of a fall. These inherent characteristics of a lifeline must be considered when a worker is planning his fall protection system to ensure that he cannot strike a lower level or be otherwise injured.

When more than one worker shares a lifeline* extreme care must be taken to ensure that if one worker falls, lifeline movement, elongation and deflection do not adversely affect the other workers. Specifically, a qualified/competent person must ensure that the system is rigged and the workers are positioned in such a manner so that if one worker falls, it would not cause one or more other workers to fall. To reduce the possibility of serious injury, if more than one worker is within the same segment of a multiple man horizontal lifeline system, the system must be rigged so that lanyard length is greater than potential lifeline deflection and potential free fall distance is minimized.

***Note:** OSHA does not allow more than one worker on a vertical lifeline. Gemtor recommends that only one worker be tied-off between supports on any lifeline.

GENERAL DESCRIPTION

The Gemtor Horizontal Wire Rope Lifeline System (HL3) is designed for use as a temporary, horizontal, fixed safety and grab line that can support the fall of up to two (2) workers attached to the system. It is used in high places such as transmission towers, shipyards, buildings, bridges, and dams, as well as on construction sites.

The HL3 stanchions must be attached to approved anchor points. (Fig. 1) When a worker, who is wearing an approved Full-Body Harness with a Lanyard, attaches himself to the HL3, he is able to move freely along the length of the lifeline to perform his tasks. In the event the worker loses his footing, or otherwise falls, the horizontal lifeline, in combination with the lanyard and harness, will arrest the fall and reduce the possibility of the worker suffering a serious injury.

In order to function properly, the horizontal lifeline must be sufficiently taut. Under proper tension, the HL3 allows the worker's lanyard or other slide piece to move easily along the lifeline. The HL3 can function as a steadying line for a worker as well as a tie off lifeline. In the event of a fall, the falling worker generates many times his weight in the force exerted on the lifeline. The HL3-EA Energy Absorber significantly reduces the force of a fall as applied to both the falling worker and the lifeline anchorages through deflection and elongation. It must be determined prior to use whether the fall space permits the use of the system and what span and lanyard lengths are acceptable for use (see Fig. 2).

SYSTEM COMPONENTS

The Gemtor HL3 basic system consists of the following approved components: (Fig.1)

- One (1) or Two (2) HL3-S1 stanchions. Base system has two, add-on (piggy back) system has one.
- One (1) 5/16" diameter galvanized steel wire rope lifeline with combination clamp and thimble, wire rope clamp turnbuckle and shackles. Length dependant on length of system ordered.
- One (1) HL3-EA Energy Absorber

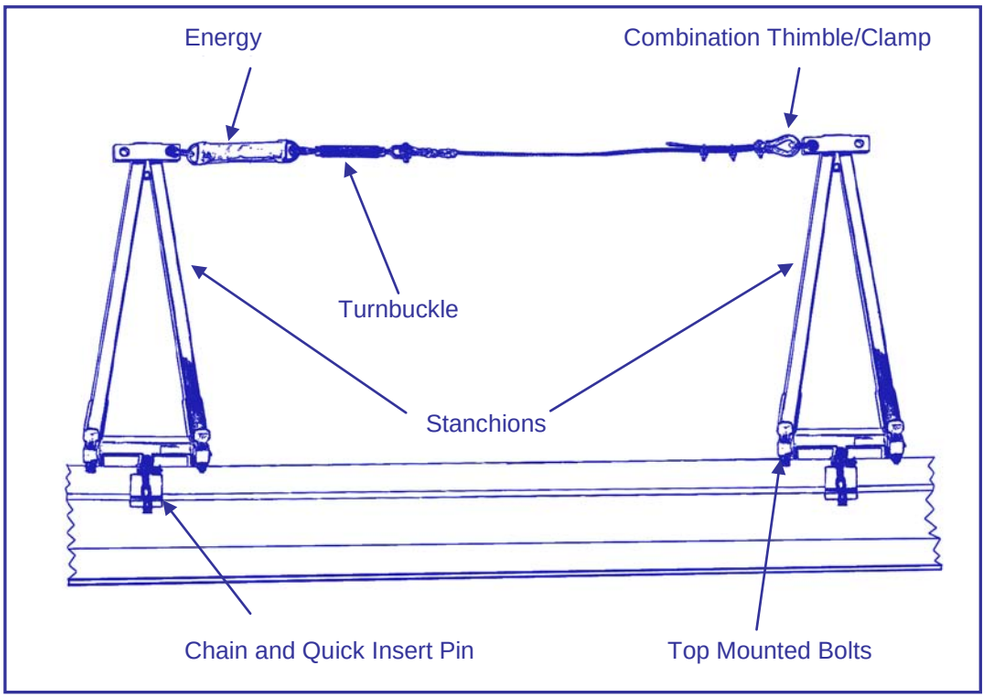


FIGURE 1

AVAILABLE MODELS

HL3-30 – Portable Horizontal Lifeline System for up to 30 ft. span. Includes; two (2) stanchions, energy absorber, cable and hardware.

HL3-60 – Portable Horizontal Lifeline System for up to 60 ft. span. Includes; two (2) stanchions, energy absorber, cable and hardware.

HL3-120 – Multi-span Portable Horizontal Lifeline System for up to 120 ft. span. Includes; two (2) end stanchions, one (1) passable intermediate stanchion, energy absorber, cable and hardware.

HL3-180 – Multi-span Portable Horizontal Lifeline System for up to 180 ft. span. Includes; two (2) end stanchions, two (2) passable intermediate stanchions, energy absorber, cable and hardware.

HL3-3A – Portable Horizontal Lifeline Add-on System for up to 30 ft. span. Includes; one (1) stanchion, energy absorber, cable and hardware.

HL3-6A – Portable Horizontal Lifeline Add-on System for up to 60 ft. span. Includes; one (1) stanchion, energy absorber, cable and hardware.

HL3-12A – Multi-span Portable Horizontal Lifeline Add-on system for up to 120 ft. span. Includes; one (1) end stanchions, one (1) passable intermediate stanchion, energy absorber, cable and hardware.

HL3-18A – Multi-span Portable Horizontal Lifeline Add-on system for up to 180 ft. span. Includes; one (1) end stanchions, two (2) passable intermediate stanchions, energy absorber, cable and hardware.

COMPONENTS & REPLACEMENT PARTS

HL3-S1 – Additional stanchion for portable horizontal lifeline system

HL3-IA – Bolt-on, passable intermediate adapter for use with HL3-S1

HL3-IS - Intermediate stanchion converts single-span system to multi-span system or allows multi-span system to be expanded up to 180 ft. total length.

HL3-EA – Replacement Energy absorber

HL-628-30 – Replacement galvanized steel cable lifeline and hardware for HL3-30 or HL3-3A

HL-628-60 – Replacement galvanized steel cable lifeline and hardware for HL3-60 or HL3-6A

HL-628-120 – Replacement galvanized steel cable lifeline and hardware for HL3-120 or HL3-12A

HL-628-180 – Replacement galvanized steel cable lifeline and hardware for HL3-180 or HL3-18A

See Page 11 for additional product detail

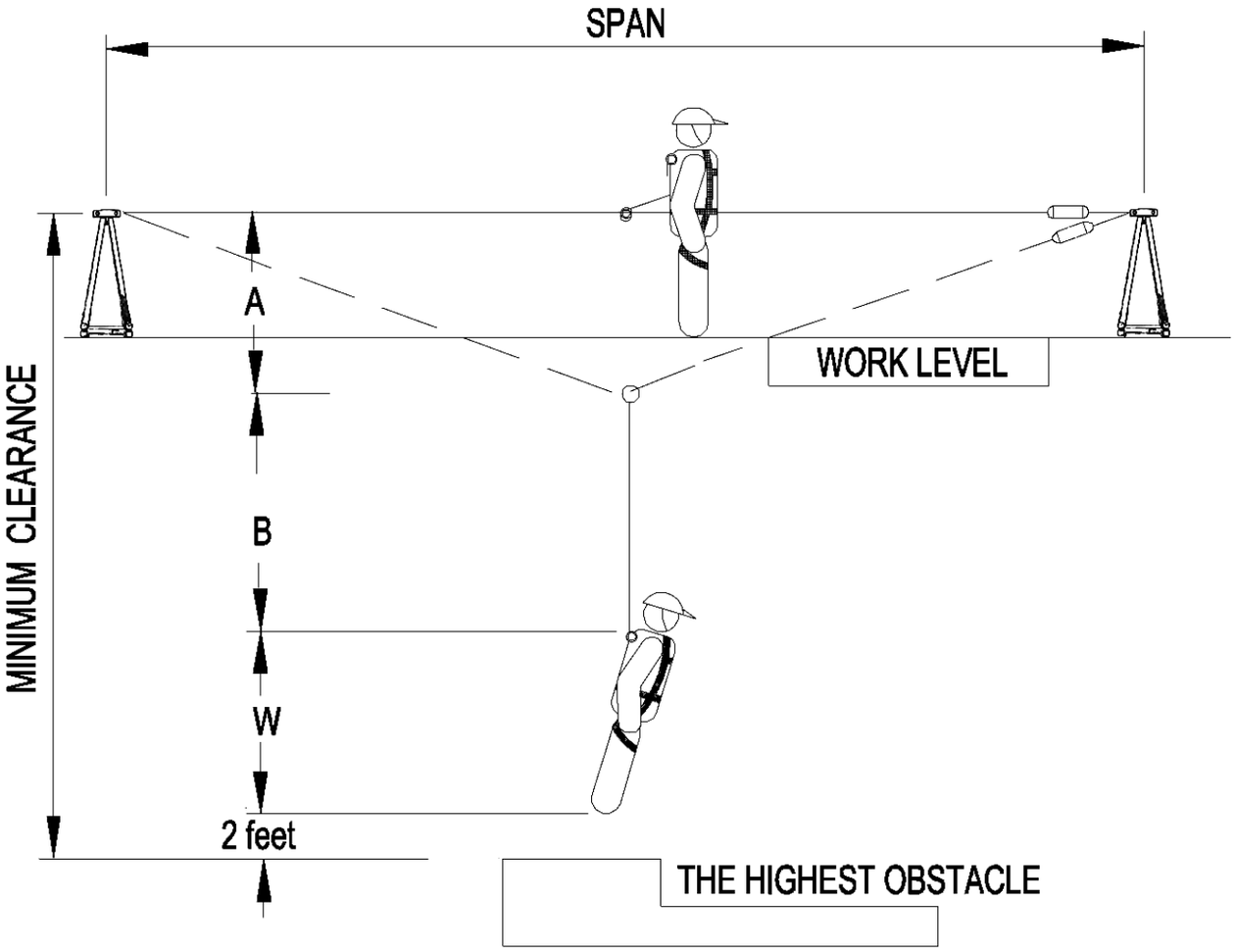


FIGURE 2

MC - MINIMUM CLEARANCE
A - LIFELINE DEFLECTION
B - LANYARD
W - AVERAGE HEIGHT OF WORKER
2 ft. - SAFETY MARGIN

MC=A+B+W+2’

EXAMPLE (Based on 30 ft. span

DEFLECTION - 4’ 10”
*LANYARD - 4’
AVERAGE HEIGHT OF WORKER - 6’
SAFETY MARGIN - 2’

MC=4’ 10”+4’+6’+2’ = 16’ 10”

Minimum Clearance required above lower level or highest obstacle (includes 2 ft. safety margin)

Span (ft.)	Lanyard* Length (ft.) 3	4	5	6**
30	15’ 10”	16’ 10”	17’ 10”	18’ 10”
60	18’ 9”	19’ 9”	20’ 9”	21’ 9”

* Lanyard without energy absorber, energy absorbing lanyard can increase fall distance (Minimum clearance) by up to 42”.
** Refer to page 7 for more information on lanyard length and free fall distances.

INSTALLATION

⚠ IMPORTANT

Only trained and competent personnel who have read and understand all instructions shall install this Wire Rope Horizontal Lifeline System.

All parts of this system must be made or approved by Gemtor, the manufacturing company. Substitutions or replacement with non-approved components will endanger the integrity of the system and may affect the reliability and safety of the total system.

Proper precautions should always be taken to remove any obstructions, debris, and other material from the work area that could cause injury or interfere with the operation of the system. Before work begins, caution should always be taken to insure that all equipment will be clear of recognized hazards.

⚠ WARNING

There are special requirement and considerations that must be known and followed when two workers are to be tied off to the same HL3. It is important to thoroughly read and observe the specific installation and operation procedure for two workers.

The HL3 must be installed between two anchor points that are at approximately the same level. Any additional lifeline supporting points must be at approximately the same level as the two anchor points. Each anchor point must be stable, on the same horizontal plane and independent of the work surface and activity. **Figure 2** gives the required minimum clearance, at which the HL3 must be installed.

The HL3 complete system comes with the system's components properly assembled in series.

Anchor points must meet OSHA requirements.

ATTACHING INTERMEDIATE ADAPTER TO STANCHION (if applicable):

1. The intermediate adapter is designed to be attached to the top of an HL3-S1 stanchion.
2. Place one piece of the adapter on each side of the top of the stanchion ensuring that the holes are aligned.
3. The notch on one of the adapter plates should rest on the top of the stanchions attachment plate.
4. Insert the supplied ⅜” x 3¼” hex bolts through the predrilled holes.
5. Secure the bolts with the supplied 3/8” Nylock hex nut.
6. Tighten the bolts until snug with 9/16” wrenches. Do not over tighten.

7. The intermediate adapter is designed to allow for the lanyard hook to remain connected to the lifeline during pass through to ensure 100% tie off with a single lanyard.
8. The maximum cable length when incorporating intermediate stanchions is 180 feet. The distance between stanchions shall be no more than 60 feet. A maximum of two (2) workers are permitted between any two stanchions at any time.

ATTACHING STANCHION TO BEAM:

1. Stanchions may be attached while the beam is on the ground.
2. Mark mounting location of end and intermediate stanchions based on the specification set forth in the horizontal lifeline's instructions. Take into account any work-site specific requirements.
3. Loosen mounting bolts so that space is equal to flange thickness +1/8"
4. Place stanchion on top flange of I-beam.
5. Tighten mounting bolts so that it is snug against flange, do not tighten completely.
6. Loosen threaded rod at end of chain so that approximately 1" of rod is visible beyond adjustment handle.
7. Position flange clamp (hook) so that it is against the edge of the flange.
8. Pull chain through flange clamp to remove all slack.
9. Insert locking pin through hole in flange clamp and through chain. Make sure that locking pin balls are visible on the opposite side of the clamp.
10. Rotate adjustment handle clockwise until it is snug, do not over-tighten.
11. Loosen mounting bolts one turn.
12. Tighten adjustment handle completely, hand tighten only, do not use tools.
13. Tighten mounting bolts completely (approx 75 ft-lbs), do not over tighten.
14. Repeat steps 3 – 13 for second end stanchion.

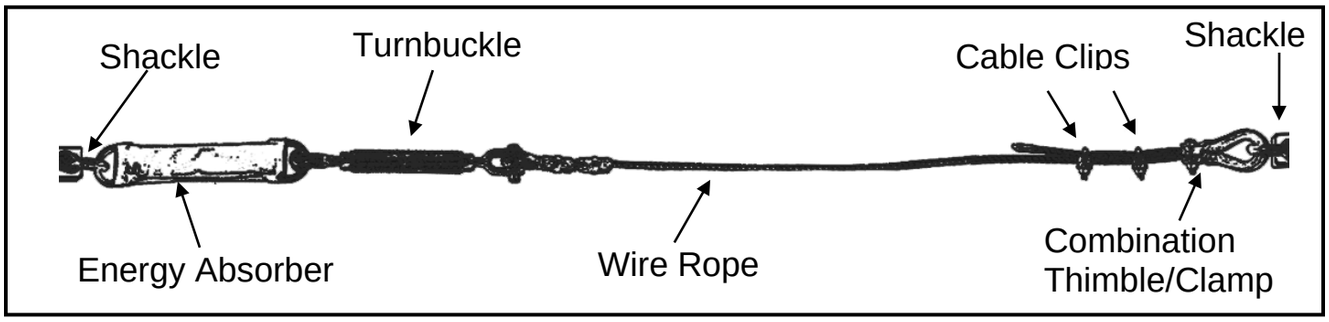
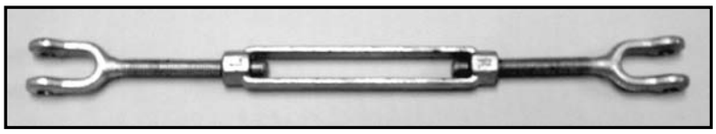


FIGURE 3

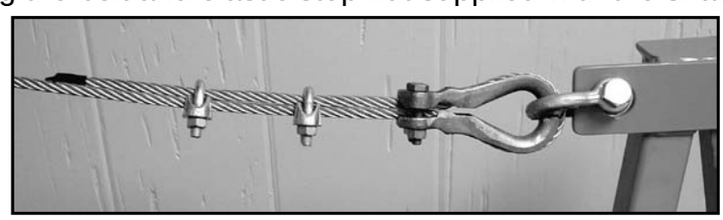
ATTACHING LIFELINE TO STANCHION:



1. Adjust the turnbuckle so that approximately ½" of threads are visible through the slot.

2. Connect the turnbuckle between the energy absorber and the fixed thimble on the cable lifeline using the bolt and elastic stop nut supplied with the turnbuckle.

3. Attach the Shackle on the energy absorber end on the lifeline to the inside hole of one of the stanchions using the bolt and elastic stop nut supplied with the shackle.



4. Connect the opposite end of the lifeline (end with Combination clamp/thimble) to inside hole on next stanchion using the bolt and elastic stop nut supplied with the shackle.
5. Wearing gloves pull the lifeline through the combination clamp and thimble to remove slack. Tighten the combination clamp and thimble to 19 ft/lbs. position one fist grip cable clip approximately 5" from the combo clamp/thimble and tighten to 30 ft. lbs. position a second fist grip cable clip halfway between the combo clamp/thimble and the first fist grip cable clip tighten to 30 ft. lbs.
6. Tighten the line, by rotating the turnbuckle body. Care must be taken to ensure that the lifeline does not twist while tightening the turnbuckle.
7. Repeat for additional span if applicable.

Note: It is also acceptable to attach the combination thimble/clamp to the energy absorber using the supplied shackle, bolt and elastic stop nut and the turnbuckle to the inside hole of the stanchion using the supplied bolt and elastic stop nut. This configuration will allow you to get closer to the energy absorber end of the lifeline while still attached to the line.

MAXIMUM WORKER CAPACITY

At most, two (2) workers may be connected to the HL3 within each span of 60 feet or less. This meets OSHA requirements and ensures that the system's capacity is not exceeded. Read entire instruction manual for other restrictions that may apply.

TWO WORKERS CONNECTED WITHIN A SINGLE SPAN

A worker who falls while secured to a horizontal lifeline will cause the wire rope to deflect within the span to which the worker is connected. If two workers are connected within the same span and one worker falls, the second worker may be pulled off the working surface and fall due to deflection of the lifeline. The potential for a second worker falling increases as the length of the span increases. This is due to greater deflection of the lifeline.

SPECIFICATIONS

ANCHORAGE POINTS

All anchor points (OSHA) must be capable of withstanding 5,000 lbs. static load in the direction in which it might be stressed by the lifeline.

LIFELINE

The lifeline is made of 5/16” diameter, 7 x 19 galvanized steel wire rope with a breaking strength of 12,000 lbs.

ENERGY ABSORBER

Zinc plated alloy steel D-rings, polyester webbing. Minimum Tensile Strength 5,000 lbs., Peak Dynamic Pullout Load = 2,000 lbs., Maximum Elongation 42”.

FASTENERS

High strength grade-8 bolts and nuts are used to secure the combination clamp and thimble and wire rope clamp. Forged steel turnbuckle and shackles.

HARNESSES AND LANYARDS

Only use Harnesses and Lanyards that are intended for the type of work to be performed and that meet applicable OSHA and ANSI standards. Harnesses and lanyards shall be used in accordance with the conditions set forth in their respective instruction manual(s).

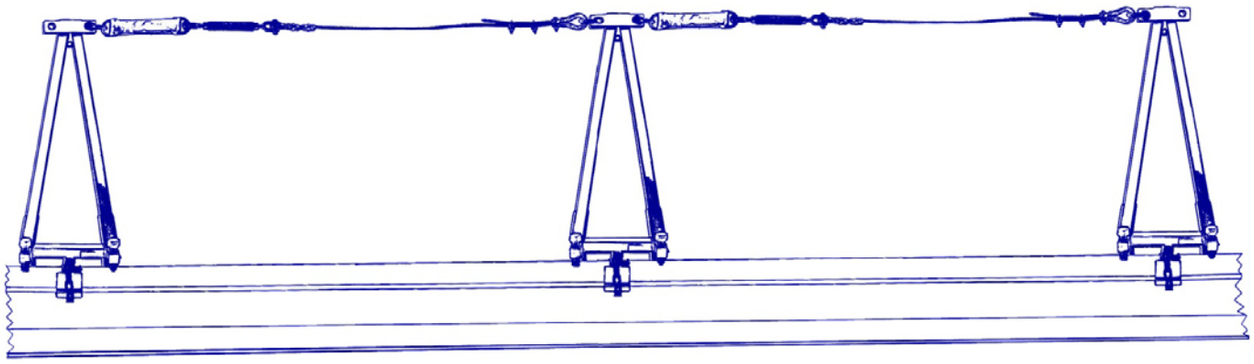
OTHER IMPORTANT INFORMATION

END STANCHIONS

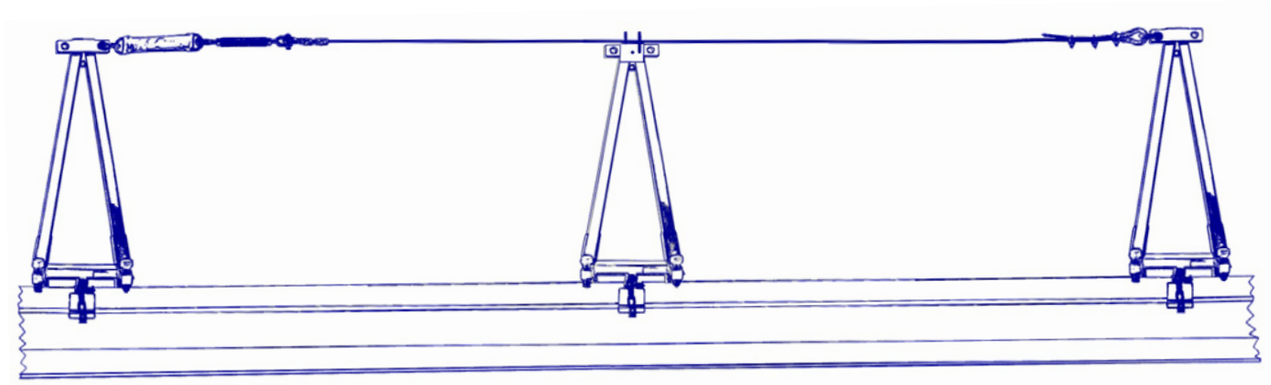
The End Stanchions, made of steel, are readily positioned and secured to either the top flange of an I-beam. The special clamps used to secure the stanchions can be adjusted to fit the flanges of most I-beams. The stanchions, when securely in place, are offset from the beam in order to provide free movement of worker along the beam.

WORK AREAS GREATER THAN 60 FEET

When the work area to be protected exceeds 60 feet, intermediates or additional systems must be used. Models HL3-120 and HL3-180 include intermediate stanchions that divide the systems into multiple spans. HL3-3A, HL3-6A, HL3-12A and HL3-18A are supplied with all the components necessary to add to an existing system. Under no circumstance shall a HL3 system be modified or otherwise used with any single span that exceeds 60 feet in length.



Base HL3 Horizontal Lifeline System with Add-on system



Multi-span HL3 Horizontal Lifeline System

FIGURE 4

STEEL ERECTION AND PORTABLE POSTS

During steel erection, the HL3 can be installed on I-beams at ground level, before they are raised into place on the structure.

FREE FALL DISTANCES AND LANYARD LENGTH

To ensure compliance with OSHA regulations, and decrease the possibility of a fall related injury, special care must be taken to ensure that free falls do not exceed 6 ft. Whenever a worker is tied-off (connected) to an anchorage (a horizontal lifeline is considered an anchorage) that is below the attachment point on his harness, the free fall will be equal to the length of the lanyard plus the distance from the harness attachment point to the anchorage.
i.e. if you are using a 6 ft. lanyard and your harness attachment point is 1 ft. above a horizontal lifeline, your free fall would be 7 ft.

In the above example, the maximum allowable lanyard would be 5 ft. (5 ft. + 1 ft. = 6 ft.)
You should always use the shortest possible lanyard to keep Minimum Clearance requirements as small as possible. A shorter free fall will decrease Minimum Clearance by reducing elongation, deceleration distance and deflection.

TRAINING:

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. [OSHA 1926.503(a)(1)]

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

(i) The nature of fall hazards in the work area;
(ii) The correct procedures for erecting, maintaining, disassembling, and inspecting the fall protection systems to be used;
(iii) The use and operation of guardrail systems, personal fall arrest systems, safety net systems, warning line systems, safety monitoring systems, controlled access zones, and other protection to be used;
(iv) The role of each employee in the safety monitoring system when this system is used;
(v) The limitations on the use of mechanical equipment during the performance of roofing work on low-sloped roofs;
(vi) The correct procedures for the handling and storage of equipment and materials and the erection of overhead protection; and
(vii) The role of employees in fall protection plans;
(viii) The standards contained in this subpart. [OSHA1926.503(a)(2)]

The employer shall verify compliance with paragraph (a) of this section by preparing a written certification record. The written certification record shall contain the name or other identity of the employee trained, the date(s) of the training, and the signature of the person who conducted the training or the signature of the employer. If the employer relies on training conducted by another employer or completed prior to the effective date of this section, the certification record shall indicate the date the employer determined the prior training was adequate rather than the date of actual training. [OSHA 1926.503(b)(1)]

INSPECTION

Before each use, a visual inspection should be made, by a competent person other then the installer, for physical damages, wear and corrosion on the HL3 component parts. Periodic inspection should be performed at least monthly. Check all parts for damage cracks, wear, corrosion, malfunctioning parts. Inspect the lifeline for fraying, other damages or wear. Inspect webbing for cuts, frays, or burns. Inspect each system component in accordance with its associated operation as explained in the manual. If the inspection reveals a problem or an ineffective condition, remove the unit from the service. Items found to be defective may only be replaced with Gemtor approved components.

SERVICING

Servicing must be carried out by a qualified person trained in the inspection and replacement of the system. A record log of all servicing and inspection dates of the system should be maintained by the company's safety officer. The system and all components must be withdrawn from service if subjected to fall arresting force. Only original Gemtor Inc. equipment replacement parts are approved for use in this product. Contact Gemtor Inc. Customer Service Department at Phone # 732-583-6200 - Fax # 732-290-9391 if you have any questions.

STORAGE

Clean to remove any dirt, cement, paint or other materials that may have accumulated. Store all components in a dry area when not in use.

WARNINGS AND LIMITATIONS

Proper precautions should always be taken to remove any obstructions, debris, and other materials from the work area that could cause injuries or interfere with the operation of the system. Caution should always be taken to insure that all equipment is clear of recognized hazards before work begins.

NOTE: Users should be familiar with pertinent regulations governing this equipment. All individuals who use this product must be correctly instructed on how to use this system, and must read and understand the following instructions before use:

- Only trained and competent personnel should install and use this system and its components.
- Do not exceed listed work lengths.
- Use Gemtor supplied components only.

Equipment must be inspected before each use; if bent, damaged or if parts have been substituted **DO NOT USE.** Return to Gemtor for reconditioning or repair.

IF YOU HAVE ANY QUESTIONS CONCERNING THE CORRECT USAGE OF THIS OR ANY GEMTOR PRODUCT, DO NOT USE, CALL (TOLL FREE) 1-800-405-9048
Do not try to adjust, repair or modify any Gemtor equipment; for prompt service, please contact: Gemtor, Inc., One Johnson Avenue, Matawan, NJ 07747, Phone: 732-583-6200

IN THE EVENT OF A FALL

As per OSHA, "The employer shall provide for prompt rescue of employees in the event of a fall or shall assure that employees are able to rescue themselves." A full-body harness increases the tolerable suspension time over that of a body belt considerably. Even when using a full body harness, a quick rescue is critical. To ensure a quick response, a method must be in place to assure a fallen worker is immediately noticed.

AFTER A FALL

Should a fall occur, the workers harness and lanyard and all lifeline components must be discarded and replaced with exception of the stanchions. The stanchions may be reused only after thorough inspection by a competent person with the ability to determine if the stanchions are suitable to be reused. If there is any question as to the integrity of the stanchions, they must not be reused.

HL3 MODELS, OPTIONS AND PARTS

Models

HL3-30 – Single-span HLL system, 30 ft.
- 2 – HL3-S1
- 1 – HL-628-30
- 1 – HL3-EA

HL3-60 – Single-span HLL system, 60 ft.
- 2 – HL3-S1
- 1 – HL-628-60
- 1 – HL3-EA

HL3-120 – Multi-span HLL system, with passable intermediate stanchion, 120 ft. Includes:
- 2 – HL3-S1
- 1 – HL3-IS
- 1 – HL-628-120
- 1 – HL3-EA

HL3-180 – Multi-span HLL system, with passable intermediate stanchions, 180 ft. Includes:
- 2 – HL3-S1
- 2 – HL3-IS
- 1 – HL-628-120
- 1 – HL3-EA

HL3-3A – Add-on for single-span HLL system, 30 ft.
Same components as HL3-30 except with one (1) HL3-S1 end stanchion

HL3-6A – Add-on for single-span HLL system, 60 ft.
Same components as HL3-60 except with one (1)1 HL3-S1 end stanchion

HL3-120 – Add-on for multi-span HLL system, with passable intermediate stanchion, 120 ft. Includes:
Same components as HL3-120 except with one (1) HL3-S1 end stanchion

HL3-180 – Add-on for multi-span HLL system, with passable intermediate stanchions, 180 ft. Includes:
Same components as HL3-180 except with one (1) HL3-S1 end stanchion

Components and Replacement Parts

HL3-S1 – End stanchion

HL3-IA – Bolt-on, passable intermediate head for HL3-S1

HL3-IS – Intermediate stanchion converts single-span system to multi-span system or allows multi-span system to be expanded up to 180 ft. total length. Includes:
- 1 – HL3-S1
- 1 – HL3-IA

HL3-EA – Energy absorber for HL-3 systems. For single-span systems up to 60 ft. or multi-span systems up to 180 ft.

HL3-628-30 – Cable and hardware for HL3 system, 30 ft., includes cable with swaged eye, combo thimble/clamp, shackles, fist grips and turnbuckle.

HL3-628-60 – Cable and hardware for HL3 system, 60 ft., includes cable with swaged eye, combo thimble/clamp, shackles, fist grips and turnbuckle.

HL3-628-120 – Cable and hardware for HL3 system, 120 ft., includes cable with swaged eye, combo thimble/clamp, shackles, fist grips and turnbuckle.

HL3-628-180 – Cable and hardware for HL3 system, 180 ft., includes cable with swaged eye, combo thimble/clamp, shackles, fist grips and turnbuckle.

HL628 lifeline and hardware packages include:
- One (1) 5/6” diameter 7 x 19 galvanized steel wire rope (cable) lifeline with swaged thimble at one end. (length based on model ordered)
- Two (2) shackles with bolts and elastic stop nuts
- One (1) turnbuckle with bolts and elastic stop nuts
- One (1) combination thimble/clamp
- Two (2) cable clips

INSPECTION LOG:

NOTES: