



# USER INSTRUCTIONS

## MSA HORIZON<sup>®</sup> Horizontal Lifeline Anchorage Connecting Subsystem

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# USER INSTRUCTIONS

## MSA HORIZON®

### I. General Information

#### Horizontal Lifeline

#### Anchorage Connecting Subsystems

#### WARNING

*National standards and state, provincial and federal laws require the user to be trained before using this product. Use this manual as part of a user safety training program that is appropriate for the user's occupation. These instructions must be provided to users before use of the product and retained for ready reference by the user. The user must read, understand (or have explained), and heed all instructions, labels, markings and warnings supplied with this product and with those products intended for use in association with it. FAILURE TO DO SO MAY RESULT IN SERIOUS INJURY OR DEATH.*

### 1.0 INTRODUCTION

- 1.1 PURPOSE OF MSA HORIZON HORIZONTAL LIFELINE SUBSYSTEM:** The HORIZON horizontal lifeline anchorage connecting subsystem is a vertically flexible, horizontally mobile anchorage connector. The HORIZON horizontal lifeline subsystem is used primarily as an anchorage connector in personal fall arrest systems. Other components are required to make up complete systems. A HORIZON horizontal lifeline anchorage connecting subsystem, properly installed under the supervision of a qualified person, will reduce the force applied to the anchorage structure by a horizontal lifeline during fall arrest of up to five individuals. The HORIZON horizontal lifeline anchorage connecting subsystem provides freedom of user movement along the length of the installation without the need to detach and re-attach between suitable anchorages. Never attempt to use the HORIZON horizontal lifeline anchorage connecting subsystem for protection against falls of equipment or materials.
- 1.2 RESPONSIBILITIES OF "QUALIFIED PERSONS" AND "COMPETENT PERSONS":** The MSA HORIZON horizontal lifeline anchorage connecting subsystem must be designed, installed and used under the supervision of a qualified person. A qualified person is defined as "...one with a recognized degree of 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.", as defined in OSHA, 29 CFR 1910.66, Appendix C. Federal Register, July 28, 1989.

The Formal Inspection of MSA HORIZON horizontal lifeline anchorage connecting subsystems is required at least every six months. This inspection must be performed by either a qualified person or a competent person. "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", as defined in OSHA, 29 CFR 1910.66, Appendix C. Federal Register, July 28, 1989.

Federal regulations require that specially trained individuals perform or supervise the following functions: design, installation, use, training and inspection. The qualified person must supervise the design, installation and use of the HORIZON horizontal lifeline anchorage connecting subsystem. The qualified person may also conduct training of competent persons and subsystem users and may perform the semi-annual Formal Inspections. The competent person may conduct user training and perform the Formal Inspections.

- 1.3 COMPLIANCE:** Use of the HORIZON horizontal lifeline anchorage connecting subsystem must comply with these User Instructions and, further, is subject to approval under the user's safety rules and regulations, safety director, supervisor, and a qualified person. Be certain the selection of the HORIZON horizontal lifeline anchorage connecting subsystem is suited for the intended use and work environment. If there is any conflict between these User Instructions and other directives or procedures of the user's organization, do not use the HORIZON horizontal lifeline anchorage connecting subsystem until such conflicts are resolved. Consult all local, state, and federal Occupational Health and Safety Administration (OSHA) requirements for personal safety equipment. Also refer to the latest revision of ANSI Z359.1 and ANSI A10.14 standards for more information on anchorages and associated system components. In Canada, refer to provincial and federal regulations and to CSA Z259.10, Z259.11, Z259.1 and Z259.2.
- 1.4 DEFINITION OF ANCHORAGES AND ANCHORAGE CONNECTORS:** There are several different general types of anchorages, including: beams, columns, railroad rails, concrete structures and other user specified types. Each of these general types of anchorages requires a specific anchorage connecting subsystem. The anchorage is the existing structure capable of

supporting the system loads. The HORIZON horizontal lifeline anchorage connecting subsystem is designed to link up to five PFAS's to a suitable anchorage. The components of the HORIZON horizontal lifeline anchorage connecting subsystem selected depends upon the type of anchorage available. For example, one common anchorage type is an overhead beam which has been determined by a qualified person to be suitable as a PFAS anchorage. For overhead beams the recommended anchorage connector is the MSA HORIZON horizontal lifeline Suspension Anchorage. It is designed to accommodate most structural I-beam sizes. Other MSA HORIZON horizontal lifeline anchorage connecting subsystems are available to suit most anchorage configurations. Contact MSA with questions regarding specific anchorage situations.

**1.5 GUIDE TO THESE USER INSTRUCTIONS: Chapter I, General Information;** contains information pertinent to all HORIZON horizontal lifeline anchorage connecting subsystem applications. Read this chapter first. **Chapter II, Anchorages;** describes a specific type of anchorage connecting subsystem. For your particular subsystem you will learn how to select subsystem components. In addition you will be given detailed installation instructions and information on the use, inspection and care of your HORIZON horizontal lifeline anchorage connecting subsystem. Read this entire chapter, where appropriate it may be necessary to refer to Chapter IV, Appendices. **Chapter III, Rescue;** discusses planning, equipment required and general instructions to effect rescue or evacuation of one or more fallen workers after a fall event. It is important to read and understand (or have explained) and heed all information presented in all of the chapters prior to installation and use.

**Chapter IV, Appendix A, Components;** gives detailed descriptions, specifications and illustrations of all available HORIZON horizontal lifeline anchorage connecting subsystem components. Information for ordering and specifying any of the HORIZON horizontal lifeline anchorage connecting subsystem components is included. Chapter II, Anchorages, lists the components of your subsystem, Appendix A includes a detailed description of each of these components. **Chapter IV, Appendix B, Load Charts;** is intended for the qualified person and provides a tabular reference for anchorage loading, subsystem component capacities and personal fall arrest forces for allowable connecting subsystem combinations. **Chapter IV, Appendix C, Total Fall Distance;** is intended for the qualified person and contains a detailed methodology of calculating total fall distance and for determining the necessary clear space in the potential fall path. **Chapter IV, Appendix D, Customer Survey/Data Worksheet;** is to be completed by the user organization and submitted to the qualified person as an aid in determining the appropriate HORIZON horizontal lifeline anchorage connecting subsystem best suited to the available structural anchorage and the workplace geometry and intended work tasks.

## 2.0 TRAINING

It is the responsibility of the purchaser of the HORIZON horizontal lifeline anchorage connecting subsystem to assure that HORIZON horizontal lifeline subsystem users are made familiar with these User Instructions and trained by a competent person in: (1) workplace hazard awareness and hazard identification, evaluation and control; (2) how to properly select, inspect, use, store and maintain the HORIZON horizontal lifeline anchorage connecting subsystem; (3) how to determine and acceptably limit free fall distance, total fall distance, and maximum arresting force; (4) proper attachment locations on the HORIZON horizontal lifeline anchorage connecting subsystem and proper attachment methods, including compatibility of connections to reduce the probability of accidental disengagement ("rollout"); (5) how to evacuate from a hazardous space; (6) what to do after a fall to protect the user from injury, including emergency rescue planning and execution; and (7) the consequences of improper use of the HORIZON horizontal lifeline anchorage connecting subsystem and associated equipment and of failure to follow instructions and training. Training must be conducted without undue exposure of the trainee to hazards. The effectiveness of training should be periodically assessed (at least annually) and the need for more training or retraining determined. MSA offers training programs. Contact MSA for training information.

## 3.0 HAZARDS IDENTIFICATION, EVALUATION AND CONTROL

### CAUTION

**Do not use the HORIZON horizontal lifeline subsystem unless a qualified person has inspected the workplace and determined that identified hazards can neither be eliminated nor exposures to them prevented.**

Prior to selecting a HORIZON horizontal lifeline anchorage connecting subsystem or other personal protective equipment, the qualified person must make a workplace assessment of hazards and conditions where the equipment is required. Such assessment must, at a minimum, identify the presence of:

- Hot objects
- Sparks
- Flames
- Heat-producing operations
- Confined space hazards
- Chemicals
- Electrical hazards
- Environmental contaminants
- Sharp objects
- Anchorage availability/location
- Abrasive surfaces
- Moving equipment
- Moving materials
- Unguarded openings
- Climatic factors
- Weather factors
- Unstable/uneven surfaces
- Slippery surfaces

Foreseeable changes in any of these conditions, taken individually or collectively, must be identified, evaluated and controlled. The materials and construction of the HORIZON horizontal lifeline anchorage connecting subsystem and associated equipment must be considered in the selection process such that these workplace conditions are suitably addressed and responded to. The equipment must match the work situation and workplace environmental factors.

The workplace assessment must identify all paths of intended user movement and all hazards along such paths. The qualified person must identify the required range of mobility in each hazard zone and note the location and distance to all obstructions in potential fall paths. Lateral obstructions which could be contacted in a pendular fall arrest must be noted. An assembly connecting a harness to the anchorage must be selected which will satisfactorily limit total fall distance and allow for dynamic elongation and activation distance of the assembly.

## 4.0 HORIZON HORIZONTAL LIFELINE SUBSYSTEM SELECTION AND APPLICATIONS

**4.1 SELECTION OF HORIZON HORIZONTAL LIFELINE ANCHORAGE CONNECTING SUBSYSTEMS:** The selection of a MSA HORIZON horizontal lifeline anchorage connecting subsystem must be performed under the supervision of a qualified person. The type of HORIZON horizontal lifeline anchorage connecting subsystem chosen depends upon the type of suitable anchorages available and the workplace geometry. The general types of anchorages for which a HORIZON horizontal lifeline anchorage connecting subsystem may be suited include: beams, columns, railroad rails, concrete structures, flying steel and other user or site specific anchorages. Any question as to the suitability of a HORIZON horizontal lifeline anchorage connecting subsystem to a particular anchorage should be directed to the qualified person.

Every anchorage location selected for use as an attachment point of the HORIZON horizontal lifeline anchorage connecting subsystem, as part of a personal fall arrest system (PFAS), must have a strength capable of supporting a static load, applied in directions permitted by the system: a) of at least 5000 lbf (22.2 kN) per person attached, or, b) when designed, installed and used under the supervision of a qualified person, have a design factor of at least two. A minimum of two anchorages are required for each installation. The total number of anchorages required depends upon the workplace geometry and the intended paths of user movement.

The nature of the work to be performed and the geometry of the site, including availability of suitable anchorages, may require the installation of the HORIZON horizontal lifeline anchorage connecting subsystem to be either linear or nonlinear. A linear installation may have a single span or multiple spans, depending upon the length of the intended work path. A nonlinear installation may transfer the work path either horizontally (e.g. around a corner or obstruction) or vertically (e.g. moving to another work elevation) and would therefore be a multi-span system.

Single span HORIZON horizontal lifeline anchorage connecting subsystems require that a suitable anchorage be located at either end of the installation. A single span may be positioned above the work surface to a greater height than multi-span systems. It is possible to remotely connect the intermediate anchorage connector (such as MSA snaphooks) or to connect to the lifeline and descend into the working level. In a single span system it is not necessary that the user be able to reach the lifeline, as there are no by-pass fittings to pass the intermediate anchorage connector through.

Multi-span HORIZON horizontal lifeline anchorage connecting subsystems require suitable anchorages at both ends of the lifeline and at predetermined intervals along the lifeline. Each of the end and intermediate anchorages must meet the strength requirements stated in these instructions. A multi-span subsystem must be positioned within reach by the user, above the work surface. To move along the length of the lifeline it is necessary for each user to manipulate the intermediate anchorage connector through the by-pass fittings. This by-pass feature allows the user to be continuously connected to the lifeline while performing work along the full length of the installation.

For all variations of the HORIZON horizontal lifeline anchorage connecting subsystem installations (linear or nonlinear, single or multiple spans, specific to each anchorage type), it is necessary that the selection process includes consideration and resolution by a qualified person of the following points:

- A backup PFAS for each worker may be required during the process of installation of the HORIZON horizontal lifeline anchorage connecting subsystem.
- Use only compatible personal fall arrest attachment components when connecting to and working with the MSA HORIZON horizontal lifeline anchorage connecting subsystem. MSA produces a complete line of components for use in personal fall arrest systems that meet this requirement.
- Access must be provided that does not expose the workers to the hazards of falling, during entry into and exit from a work area using a MSA HORIZON horizontal lifeline anchorage connecting subsystem for personal fall arrest.
- Each end point anchorage and each intermediate anchorage (for multi-span subsystems) must meet the strength requirements stated in these instructions and must be located along the length of the installation at intervals no greater

than allowed by the specific type of MSA HORIZON horizontal lifeline anchorage connecting subsystem chosen.

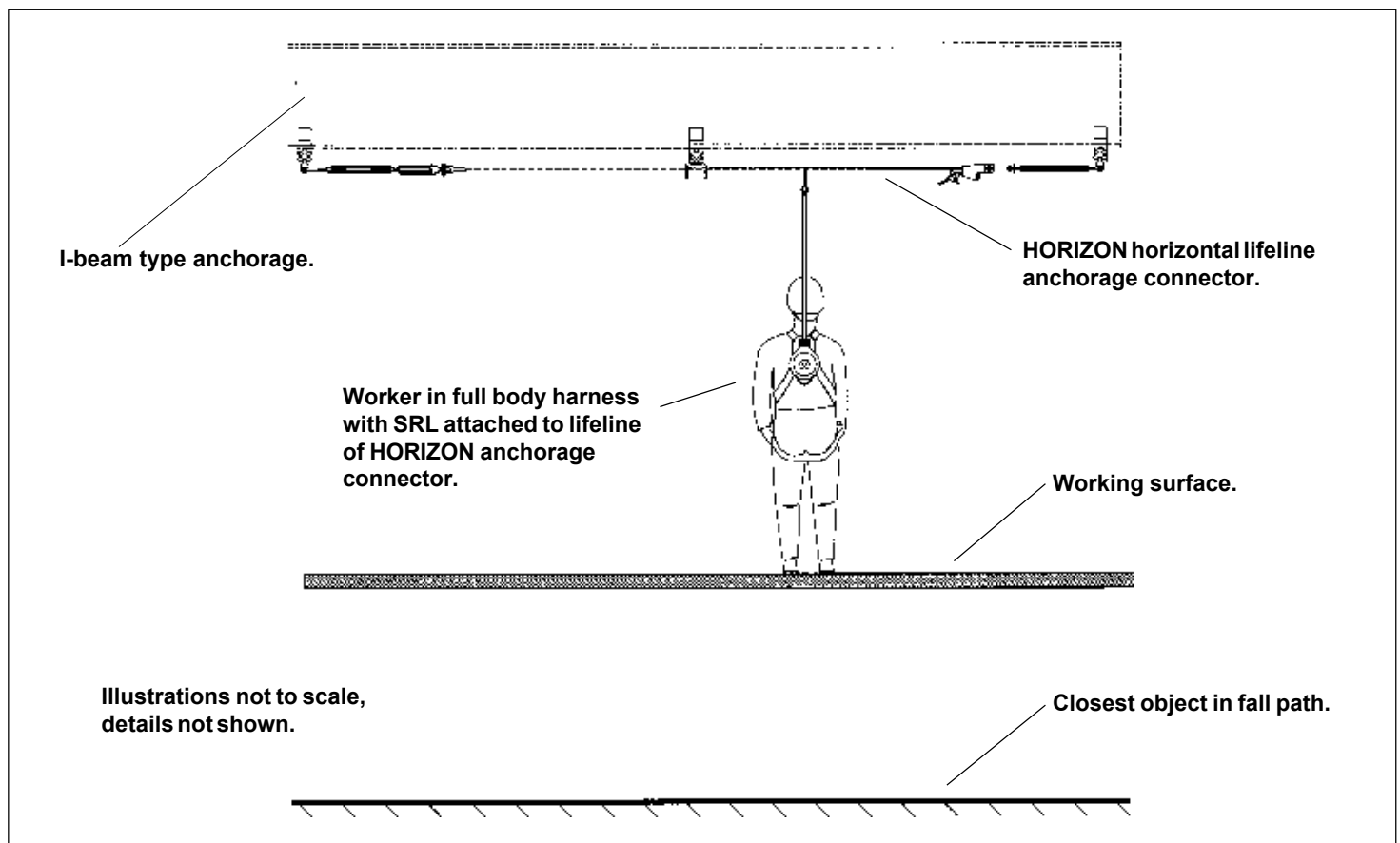
- All HORIZON horizontal lifeline anchorage connecting subsystem installations must have sufficient clearance around and below the intended paths of user movement to allow for deployment of system components during fall arrest. The total fall distance must be determined by a qualified person and be used in the selection of anchorage locations and HORIZON horizontal lifeline anchorage connecting subsystem installations.

The Customer Survey/Data Worksheet (P/N 690107) is provided as a means for the user to collect and communicate information needed by the qualified person in the specification of the appropriate HORIZON horizontal lifeline anchorage connecting subsystem for the work area and work tasks to be performed. This information may also be helpful in the event the anchorage is other than one of the common types and a custom subsystem installation is required. Contact MSA to discuss unique installation requirements.

**Appendix D** contains a copy of this Customer Survey / Data Worksheet to be completed by the user and provided to the qualified person as part of the installation definition and specifications.

**4.2 TYPICAL APPLICATIONS:** The HORIZON horizontal lifeline anchorage connecting subsystem can be used in fall arrest and other systems on buildings, bridges, roofs, tank cars, and hopper cars. It is suitable in most manufacturing, construction, oilfield, refinery, maintenance, and industrial settings. The HORIZON horizontal lifeline anchorage connecting subsystem is one component of multi-component systems. The user should always consult with a qualified person to determine if the HORIZON horizontal lifeline anchorage connecting subsystem is suitable for the specific intended application before placing it in use. The figure below shows a multi-span configuration of one typical application of the suspension anchorage type.

**4.3 USAGE LIMITATIONS:** The following applications limitations must be considered and planned for before using the HORIZON horizontal lifeline subsystem.



- 4.3.1 PHYSICAL LIMITATIONS:** The HORIZON horizontal lifeline anchorage connecting subsystem is designed for use by up to five (5) persons, each with a combined total weight of 310 lbs (140 kg), including clothing, tools, and other user-borne objects. Persons with muscular, skeletal, or other physical disorders should consult a physician before using a personal fall arrest system that includes a HORIZON horizontal lifeline anchorage connecting subsystem. Pregnant women and minors must never use these systems. Increasing age and lowered physical fitness may reduce a person's ability to withstand shock loads during fall arrest or prolonged suspension. Consult a physician if there is any question about physical ability to safely use this product to arrest a fall or suspend.
- 4.3.2 CHEMICAL HAZARDS:** Acidic, alkaline, chlorine based or other environments with harsh substances may damage the hardware elements of this HORIZON horizontal lifeline anchorage connecting subsystem. If working in a chemically aggressive environment, consult MSA to determine acceptable system components for your specific conditions. When working in the presence of chemicals, more frequent inspection of the system components is required.
- 4.3.3 HEAT:** Do not use HORIZON horizontal lifeline anchorage connecting subsystem in environments with temperatures greater than 185° F (85° C). Protect the HORIZON horizontal lifeline anchorage connecting subsystem when used near welding, metal cutting, or other heat producing activities. Sparks may damage the lifeline and reduce its strength.
- 4.3.4 CORROSION:** Do not expose HORIZON horizontal lifeline anchorage connecting subsystem to corrosive environments for prolonged periods. Organic substances and salt water are particularly corrosive to metal parts. When working in a corrosive environment, more frequent inspection, cleaning and drying of the HORIZON horizontal lifeline anchorage connecting subsystem is required.
- 4.3.5 ELECTRICAL HAZARDS:** Use extreme caution when working near energized electrical sources. Metal hardware on the HORIZON horizontal lifeline subsystem and on other components connected to it will conduct electric current. Maintain a safe working distance at least 10 feet (3 m) from electrical hazards.
- 4.3.6 MOVING MACHINERY:** When working near moving machinery parts (e.g. conveyors, rotating shafts, presses, etc.), make sure that there are no loose elements in any part of the system. Maintain a safe working distance from machinery which could entangle such elements as the lifeline and attached lanyards, harness webbing, straps, etc.
- 4.3.7 SHARP EDGES AND ABRASIVE SURFACES:** Do not expose the HORIZON horizontal lifeline anchorage connecting subsystem line to sharp edges or abrasive surfaces that could cut, fray, abrade or weaken the lifeline. When work around sharp edges or abrasive surfaces is unavoidable, use heavy padding or other protective barriers to prevent direct contact.
- 4.3.8 WEAR AND DETERIORATION:** Any component of the HORIZON horizontal lifeline anchorage connecting subsystem which shows signs of excessive wear, deterioration or malfunction must be removed from use and marked "UNUSABLE" until repaired or replaced. During the time that any component of the subsystem has been removed, the entire system shall be marked as "UNUSABLE" until the component is replaced and the system is functional.
- 4.3.9 IMPACT FORCES:** Any HORIZON horizontal lifeline anchorage connecting subsystem which has been subjected to the forces of arresting a fall must be immediately removed from service and marked as "UNUSABLE" until submitted to, and released from, Formal Inspection procedures.

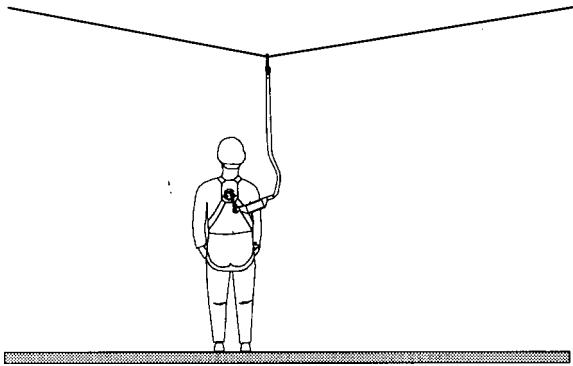
## 5.0 SYSTEMS REQUIREMENTS

The HORIZON horizontal lifeline subsystem is the anchorage connector subsystem for use in personal fall arrest systems. The HORIZON horizontal lifeline anchorage connecting subsystem may be suited for use in other multi-component systems. Without the other necessary components of a system, the HORIZON horizontal lifeline anchorage connecting subsystem serves no useful purpose. There are several different types of systems for use at heights.

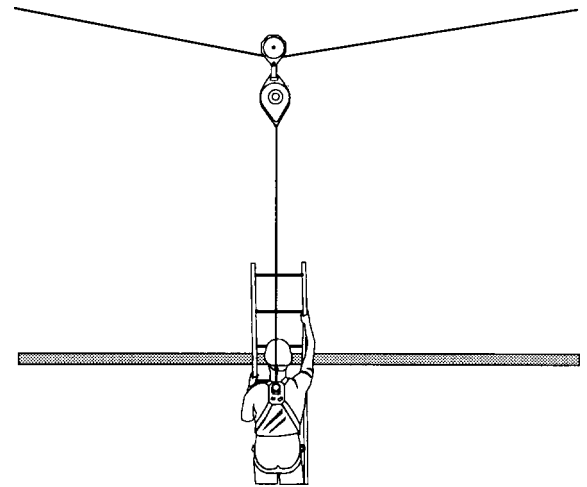
- 5.1 SYSTEM TYPES:** Systems are classified according to their intended purposes. There are six classifications of systems which may be used individually or in combinations. The six basic systems classifications are:

- Fall Arrest
- Personnel Riding
- Climbing Protection
- Rescue
- Restraint
- Evacuation

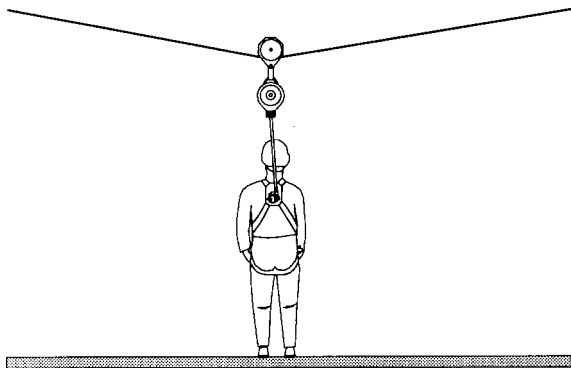
- 5.1.1 FALL ARREST SYSTEMS:** A fall arrest system is an assembly of components and subsystems, including the necessary connectors, used to arrest the user in a fall from a working height and suspend the user until rescue can be effected. A fall arrest system must always include a full body harness and connecting means between the harness and the HORIZON horizontal lifeline anchorage connecting subsystem. Such connecting means may consist of a lanyard, energy (shock) absorber, fall arrester (rope grab), lifeline, self-retracting lanyard or suitable combinations of these. The HORIZON horizontal lifeline anchorage connecting subsystem is suited for use in personal fall arrest systems when designed, installed and used under the supervision of a qualified person. The HORIZON horizontal lifeline anchorage connecting subsystem is acceptable for use in a personal fall arrest systems,



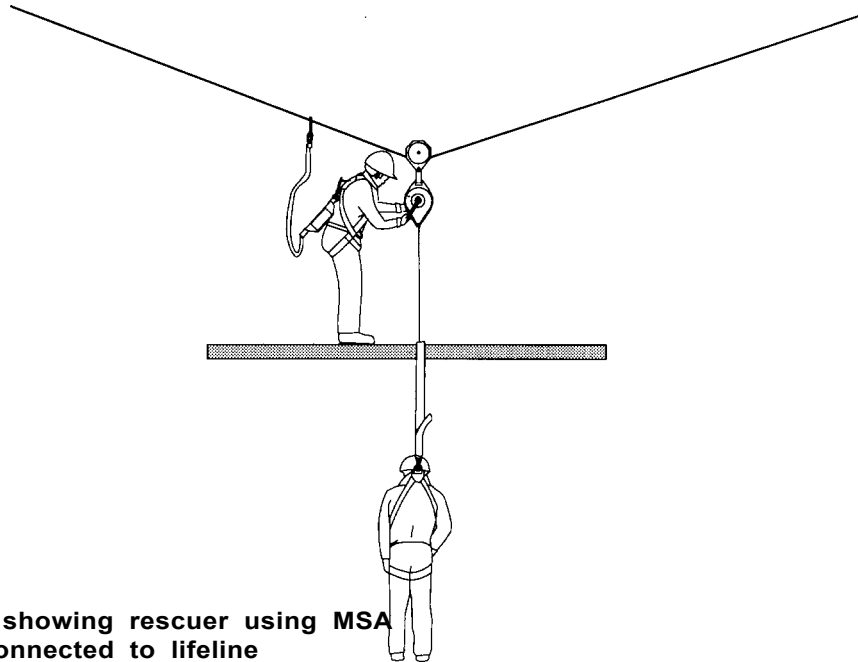
**Personal fall arrest system showing MSA Dyna Brake shock absorbing lanyard connected to lifeline of HORIZON subsystem.**



**Ladder climbing system showing MSA 16 m Dyna-Lock connected to lifeline of HORIZON subsystem.**



**Personal fall arrest system showing MSA Back Packer connected to lifeline of HORIZON subsystem.**



**Rescue system showing rescuer using MSA Dynevac SRL connected to lifeline of HORIZON subsystem.**

when combined with other necessary components of the complete system:

- full body harness;
- lanyard with integral shock absorber, or, self-retracting lanyard;
- intermediate anchorage connector (such as MSA carabiner, snaphook or snatch block pulley).

**5.1.1.1 Lanyard Connecting Subsystem** is the term applied to an assembly, including the necessary connectors, which is comprised of a lanyard and a shock absorber. The lanyard and shock absorber are usually permanently coupled together along with

self-locking snaphooks at each end. The subsystem is attached between the fall arrest attachment (back D-ring) of a harness and the HORIZON horizontal lifeline anchorage connecting subsystem.

- 5.1.1.2 Fall Arrester Connecting Subsystem** is the term applied to an assembly, including the necessary connectors, which is comprised of a fall arrester (rope grab) and a vertical lifeline. Sometimes a lanyard or lanyard with integral shock absorber, including the necessary connectors, is connected to the rope grab. The vertical lifeline must have a lifeline tensioner (counter weight), a connector for anchoring it, and may have a shock absorber. A fall arrester such as MSA Fallbloc and a vertical lifeline connector such as MSA Carabiner are intermediate anchorage connectors. The subsystem is attached between the fall arrest attachment (back D-ring) of a full body harness and the HORIZON horizontal lifeline anchorage connecting subsystem. Fall arrester connecting subsystems are sometimes suitable for use in climbing protection systems.
- 5.1.1.3 Self-Retracting Lanyard Connecting Subsystem** is the term applied to an assembly, including the necessary connectors, comprised of a self-retracting lanyard only or a self-retracting lanyard and added shock absorber at the point of attachment to the user's full body harness. The MSA Dyna-Lock and Dynevac with appropriate mounting brackets are self-retracting lanyard connecting subsystems. The subsystem is attached between the fall arrest attachment (back D-ring) of the harness and a suitable anchorage or anchorage connector, such as the HORIZON horizontal lifeline anchorage connecting subsystem. These subsystems are sometimes suitable for use in climbing protection systems.
- 5.1.2 CLIMBING PROTECTION SYSTEMS:** A climbing protection system is an assembly of components and subsystems, including the necessary connectors, used to arrest the user in a fall from a working height and suspend the user until rescue can be effected. Such systems are used for climbing ladders and structures that are designed for climbing. They may either be temporary (portable) or permanent. The MSA ROPOD is a temporary (portable) anchorage connector suitable for use in some climbing protection systems. Permanent climbing protection systems are: (a) of the rigid rail type such as the MSA Dyna-Glide™ systems, or (b) of the flexible wire rope type such as the MSA HORIZON horizontal lifeline anchorage connecting subsystem. Contact MSA for more information about Dyna-Glide climbing protection systems. The HORIZON horizontal lifeline subsystem may be used in climbing protection systems when designed, installed and used under the supervision of a qualified person.
- 5.1.3 RESTRAINT SYSTEMS:** A restraint system is an assembly of components and subsystems, including the necessary connectors, used to:
- (a) stabilize and partially support the user at an elevated work location and allow free use of both hands. This type of restraint system is referred to as a work positioning system or, simply, a positioning system. **The HORIZON horizontal lifeline subsystem is generally not suited for use in work positioning systems.**
  - (b) restrict the user's motion so as to prevent reaching a location where a fall hazard exists. This type of system is referred to as a travel restriction system. The HORIZON horizontal lifeline subsystem may be used in certain travel restriction systems, when designed, installed and used under the supervision of a qualified person. A travel restriction system consists of a full body harness and a fixed length or adjustable length lanyard connected between any one of the harness D-rings and the HORIZON horizontal lifeline anchorage connecting subsystem.
- 5.1.4 PERSONNEL-RIDING SYSTEMS:** A personnel-riding system is an assembly of components and subsystems, including the necessary connectors, used for lifting and lowering a worker to and from a work station which is not accessible by other preferred means, and potentially for positioning the worker while at that work station. Personnel-riding systems are of two general types, namely: (a) the mobile supported aerial platform type (e.g. manually- and self-propelled platforms and vehicle-mounted platforms), and (b) suspended personnel hoisting type (e.g. suspended scaffolds, suspension seats, and suspension harnesses). When working on mobile supported aerial platforms, the user should use a restraint system anchored to the platform to provide restraint against falling from the platform. When working with the suspended personnel hoisting type of system, the user must employ a fall arrest system of either the self-retracting lanyard type or the fall arrester (rope grab) type. A Dyna-Hoist in conjunction with Bosun's Chair with spreader bar are suitable for fully suspended work positioning. It is permissible to use the MSA Pullover harness as a suspension harness for making access to the work station if the access time is of very short duration and the use of a suspension seat is not possible. The MSA Dynevac is suitable for backup fall arrest and emergency rescue and controlled ascent and descent applications. Contact MSA for separate instructions on the associated equipment used in personnel-riding systems. The HORIZON horizontal lifeline anchorage connecting subsystem may be used in certain personnel-riding systems, when designed, installed and used under the supervision of a qualified person.
- 5.1.5 RESCUE SYSTEMS:** A rescue system is an assembly of components and subsystems, including the necessary connectors, used for moving an incapacitated or isolated person from a hazardous place to a safe place under alert or emergency conditions. An isolated person is one who has no available means of access to a safe place or is physically stranded or trapped. Rescue systems require actions of specially trained rescuers to effect the rescue of the incapacitated or isolated person. The MSA HORIZON horizontal lifeline anchorage connecting subsystem is suitable for rescue applications, when designed, installed and used under the supervision of a qualified person. Conduct the workplace assessment and system planning described in these instructions prior to including the HORIZON horizontal lifeline anchorage connecting subsystem in a rescue system. Ensure that all criteria are met, under the supervision of a qualified person. MSA strongly recommends that the user select a full body harness with a chest D-ring to provide for rescue.



**5.1.6 EVACUATION SYSTEMS:** An evacuation system is an assembly of components and subsystems, including the necessary connectors, employed by the user to move, unassisted by others, from a hazardous place to a safe place under alert or emergency conditions. An evacuation system consists of a full body harness and connecting means between the harness and the HORIZON horizontal lifeline anchorage connecting subsystem. Such connecting means may consist of: (a) the MSA Dynescape Automatic Descender, (b) the MSA Dynescape Manual Descender, or (c) the MSA Fallbloc System. See the separate instructions for this equipment. The HORIZON horizontal lifeline anchorage connecting subsystem may be used in evacuation systems, when designed, installed and used under the supervision of a qualified person.

**5.1.7 COMBINATIONS OF SYSTEMS:** Systems for fall arrest, restraint, climbing protection, personnel-riding, rescue and evacuation are often used in various combinations. For example, personnel-riding systems must be backed up by a separate and independent fall arrest system. Hands-on training is required to obtain the necessary information and skills needed to work with combinations of systems. Refer to the separate instructions accompanying the several components and subsystems necessary to make up these systems.

## 5.2 COMPATIBILITY OF SYSTEM PARTS

**5.2.1 COMPATIBILITY OF COMPONENTS AND SUBSYSTEMS:** The MSA HORIZON horizontal lifeline anchorage connecting subsystem is designed to be used with MSA approved components and connecting subsystems. Use of the HORIZON horizontal lifeline anchorage connecting subsystem with products made by others that are not approved in writing by MSA may adversely affect the functional compatibility between system parts and the safety and reliability of the complete system. Connecting subsystems must be suitable for use in the application (e.g. fall arrest, climbing protection, rescue or personnel-riding). MSA produces a complete line of connecting subsystems for each application. Contact MSA for further information. Refer to the manufacturer's instructions supplied with the component or connecting subsystem to determine suitability. Contact MSA with any questions regarding compatibility of equipment used with the HORIZON horizontal lifeline anchorage connecting subsystem.

**5.2.2 COMPATIBILITY OF CONNECTORS:** Connectors, such as D-rings, snaphooks, and carabiners, must be rated at 5,000 lbf (22 kN) minimum breaking strength. MSA connectors meet this requirement. Connecting hardware must be compatible in size, shape, and strength. Non-compatible connectors may accidentally disengage ("rollout"). Always verify that the connecting snaphook or carabiner and the D-ring on a full body harness or connection element of the anchorage or anchorage connector are compatible. Use only self-closing, self-locking snaphooks and carabiners (as defined and required by ANSI Z359.1) with the HORIZON horizontal lifeline anchorage connecting subsystem.

**5.2.3 ANCHORAGES AND ANCHORAGE CONNECTORS:** Anchorages for the HORIZON horizontal lifeline anchorage connecting subsystem, used as part of a personal fall arrest system, must have a strength capable of supporting a static load, applied in directions permitted by the system: a) of at least 5,000 lbf (22.2 kN) per person attached, or, b) when designed, installed and used under the supervision of a qualified person, with a design factor of at least two. These requirements are consistent with OSHA requirements under 29 CFR 1910, Subpart I, and 29 CFR 1926, Subpart M. The MSA HORIZON horizontal lifeline anchorage connecting subsystem is designed for connection of up to 5 personal fall arrest systems, each with a maximum user weight of 310 lbs (140kg), including clothing, tools and other user-borne objects. The anchorage strength required for each specific installation will vary depending upon the system configuration, the number of concurrent system users and the sequence of events that load the system during fall arrest. Different combinations and timing of fall arrest forces imparted to the system will change the loads experienced by the anchorages. It is necessary that the qualified person consider all possible events and combinations and design the system and select the anchorages accordingly. In addition, it is recommended that the user of personal fall arrest systems refer to ANSI Z359.1, Section 7, for important considerations in equipment selection, rigging, use, and training. Contact MSA for information regarding custom design applications for the HORIZON horizontal lifeline anchorage connecting subsystem.

**Appendix B** contains information to be used by the qualified person to calculate anchorage strength requirements and system loading characteristics for the MSA HORIZON horizontal lifeline anchorage connecting subsystem.

## 6.0 PLANNING THE USE OF SYSTEMS

A qualified person must select the components, materials, anchorage and anchorage connectors to match the system application, the work, workplace hazards, and the environment. Perform the hazard identification and evaluation described in these instructions. Then plan the system(s) before starting work. Consider all possible paths of user movement and all factors that could affect the user's safety before, during, and after a fall anywhere along these paths. Consider the following points when planning the system(s).

**6.1 ANCHORAGE AND ANCHORAGE CONNECTOR SELECTION:** Determine the necessary locations of anchorages to assure that the user will be continuously connected when exposed to hazards of falling. Select anchorages that are stable and have the strength required by these instructions. Carefully select the locations of the anchorages to: (a) reduce possible free fall distance, (b) prevent swing fall hazards, and (c) provide clear space in the potential fall paths to avoid striking an object. Do not select anchorage locations that will require the user to work above them as this will increase the potential free fall and total fall distances.

Select an appropriate type of HORIZON horizontal lifeline anchorage connecting subsystem suited to the availability of anchorages and to the workplace geometry of the installation.

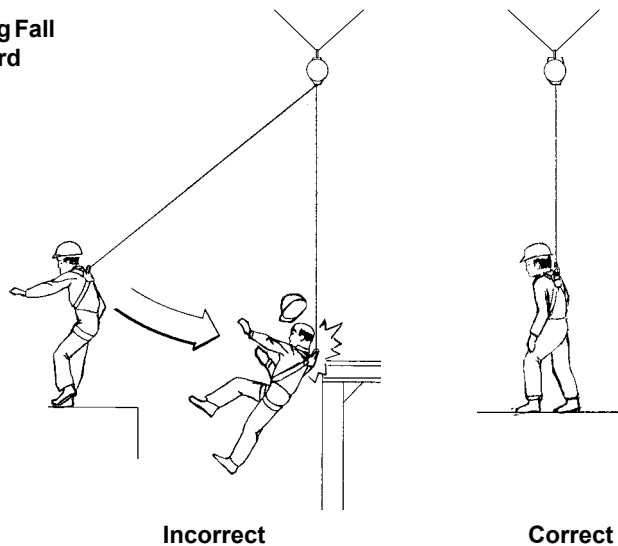
**Appendix C** contains information to be used by the qualified person to calculate total fall distance and clear space in fall path required for the MSA HORIZON horizontal lifeline anchorage connecting subsystem.

Selection of a suitable anchorage for use with the HORIZON horizontal lifeline subsystem requires: (a) the anchorage to meet the minimum strength requirements in Appendix B, (b) that the selection of the HORIZON horizontal lifeline anchorage connecting subsystem type is best suited to the unique characteristics of the available anchorages, and, (c) that there are anchorage points along the length of the installation to permit attaching the appropriate mounting hardware unique to each HORIZON horizontal lifeline anchorage connecting subsystem type.

The following subsections describe points that should be considered and resolved during the design and specification of an anchorage as part of a system that includes the HORIZON horizontal lifeline anchorage connecting subsystem.

- 6.2 INTERMEDIATE ANCHORAGE CONNECTOR SELECTION:** An intermediate anchorage connector is a component of a complete system used to link the user's body support to the HORIZON horizontal lifeline anchorage connecting subsystem lifeline. Other components (such as a MSA lanyard) are needed to link the intermediate anchorage connector to the attachment element (back D-ring) of the user's full body support. Depending upon user movements and workplace geometry of the HORIZON horizontal lifeline anchorage connecting subsystem, suitable intermediate anchorage connectors include snaphooks, carabiners, snatch block pulleys, or Starpass™ glider.
- 6.3 USER MOVEMENTS:** Identify all necessary movements of the user and the materials and equipment needed to perform the planned work. Plan for avoidance of the crossing or tangling of connecting subsystems of two or more workers. Anticipate user movements that might introduce hazards of the connecting subsystem passing under, about or between body parts or invite the user to clamp, knot or otherwise prevent the connecting subsystem from functioning properly. Establish controls to prevent these occurrences.
- 6.4 PENDULUM (SWING) FALLS:** Swing falls can occur when the system is not anchored directly above the user. The force of striking an object in a pendular motion can cause serious injury. Always minimize swing falls by working as directly below the anchorage point as possible.

#### Swing Fall Hazard



Swing fall hazards must be minimized by anchoring directly above the user's work space.

- 6.5 CLEAR SPACE IN FALL PATH:** Make certain that enough clearance is available in all potential fall paths to prevent striking an object. The amount of clearance needed depends upon the type of connecting subsystem used, and the location of the anchorage or anchorage connector. The fall path includes the vertical space directly below the user and the horizontal distance between the worker's initial location and the center of the horizontal lifeline span. Clear space in the fall path must be calculated by a qualified person, using the information provided in Appendix C.
- 6.6 HAZARDS IDENTIFIED IN WORKPLACE ASSESSMENT:** All hazards of the type set forth in these instructions must be addressed and suitable controls planned and implemented. For example, if work must be performed near unavoidable sharp edges, plan to protect against cutting by use of heavy padding or other means of covering the sharp edge.

## 7.0 INSTALLATION AND INSTRUCTIONS FOR USE

The design, installation and use of the HORIZON horizontal lifeline anchorage connecting subsystem must be performed under the supervision of a qualified person. Proper installation will require at least two persons, each equipped with independent personal fall arrest systems. Equipment required to complete the installation includes: steel mallet, open-end wrenches (1/2" to 1" sizes), gloves, pliers, adjustable wrench and a measuring tape of sufficient length to measure the lifeline from anchor point to anchor point.

### 7.1 GENERAL PRECAUTIONS:

- 7.1.1 DO NOT** install at locations where debris or objects falling from above could contact the lifeline, fall arrest system or workers.
- 7.1.2 DO NOT** leave anything hanging or attached unattended to the lifeline. Attach only compatible connectors.
- 7.1.3 DO NOT** pass the lifeline or other lines over sharp edges. This can cause cutting and bending of cable strands. In the event of a fall it can also increase the shock loads on the body. If the lifeline can come in contact with corners and sharp edges, protect the line by using heavy padding on such corners or edges.
- 7.1.4 DO NOT** cross over the lanyard of another worker. This can create a hazard because movement of one person can unbalance the other. In the event of a fall by one person, there is a likelihood that the other person will be caused to fall as well. Entanglement of lanyards or lanyard interference with the work of other persons are additional hazards which are caused by the crossing of lanyards.
- 7.1.5 DO NOT** clamp off or stand on the line. Clamping or standing on the line for the purpose of removing line tension or other reasons can cause line slack, loss of balance, swing falls and line damage.
- 7.1.6 DO NOT** allow the lanyard to pass beneath the neck or arms, between the legs or to wrap around the body or limbs. Keep the line taut and behind the back at all times to prevent interference with work operations and looping of line which could produce bodily injury in a fall.
- 7.1.7 DO NOT** attach the personal fall arrest connector to any of the elements or components of the HORIZON horizontal lifeline anchorage connecting subsystem other than to the wire rope lifeline.
- 7.1.8 DO** wear gloves when handling and inspecting the line with the hands. This will prevent cuts, abrasion and wire slivers.

## 8.0 CARE, MAINTENANCE AND STORAGE

Proper functioning and length of useful life of the HORIZON horizontal lifeline anchorage connecting subsystem depends on the user's proper care, maintenance and storage of the product.

Inspect the HORIZON horizontal lifeline anchorage connecting subsystem in accordance with these User Instructions. Heed all caution labels and instructions as these are intended to prevent damage to the product as well as guide the user in correctly using the HORIZON horizontal lifeline anchorage connecting subsystem.

- 8.1 CLEANING INSTRUCTIONS:** Clean periodically with mild detergent and water, dry completely. Check that the wire rope and other components are free of grease and dirt or accumulations that could hinder system performance. The environment of the surrounding work area will dictate the frequency of the cleaning of the components of the system. Questions concerning HORIZON horizontal lifeline anchorage connecting subsystem condition and cleaning should be directed to MSA.

**8.2 MAINTENANCE AND SERVICE:** Proper maintenance is both preventive and corrective in nature. Major maintenance can only be performed at the factory. Routine maintenance, including cleaning, wire rope lubrication and removal of broken wire ends is all that is permissible for the user to perform. Lubrication must only be applied to a clean, dry line because it is effective only when the dressing comes in contact with metal. If inspection reveals build-up of contaminants, use a densely bristled fiber brush (NOT wire) to remove the contaminants. Never use gasoline or kerosene as a solvent. Pay particular attention to cleaning the gaps between the wire rope strands so lubricant can penetrate into the core and fill these gaps to seal out moisture and foreign particles.

Use a low viscosity lubricant having moisture resistant, non-corrosive properties. It may be applied by brushing on or swabbing with a cloth saturated with the lubricant. Wipe off excess lubricant with a clean dry cloth. It is impossible to specify the time intervals between lubrications. The lifeline should be properly lubricated at all times and thorough periodic inspections will indicate when it must be done. In corrosive environs the line should be cleaned and lubricated more frequently. If the HORIZON horizontal lifeline anchorage connecting subsystem is taken out of service for an appreciable length of time, the line should be cleaned and lubricated before storage.

Check the adjustment of the fasteners and lock nuts at the various locations on the system components so that they are tight and properly adjusted. Check that the wedge is properly seated in the open wedge socket. Equipment which is damaged or in need of maintenance must be tagged as "UNUSABLE" and removed from service. Corrective maintenance (other than cleaning) and repair, such as replacement of elements, must be performed by the MSA factory. Do not attempt field repairs.

**8.3 STORAGE:** Store the HORIZON horizontal lifeline anchorage connecting subsystem in a cool, dry and clean place in coils or on a reel. Avoid areas where heat, moisture, oil and chemicals or their vapors or other degrading elements may be present. Equipment which is damaged or in need of maintenance should not be stored in the same area as usable equipment. Heavily soiled, wet, or otherwise contaminated equipment should be properly maintained (e.g. dried and cleaned) prior to storage. Never allow the HORIZON horizontal lifeline anchorage connecting subsystem components to rest for lengthy periods of time on concrete or ash floors as the lime sulfur and ash can cause corrosion. Prior to using equipment which has been stored for long periods of time, a Formal Inspection should be performed by a competent person inspector.



# USER INSTRUCTIONS

## MSA HORIZON™

### II. Suspension Anchorage Horizontal Lifeline Anchorage Connecting Subsystem

#### 1.0 SUSPENSION ANCHORAGE HORIZONTAL LIFELINE SUBSYSTEM COMPONENTS

TABLE 1. HORIZONTAL LIFELINE SUBSYSTEM COMPONENTS, SUSPENSION ANCHORAGE

COMPONENT MODEL NO.	DESCRIPTION	MATERIAL	BEAM SIZE			
			AISI W-BEAM		AISI S-BEAM	
506682	BeamGrip Anchorage Connector	Alloy Steel Zinc Plated	Minimum W5 x 16.0	Maximum W27 x 146.0	Minimum S5 x 10.0	Maximum S18 x 70.0
506636	BeamGrip By-Pass Fitting	Alloy Steel Zinc Plated				
506637	BeamGrip End Fitting	Alloy Steel Zinc Plated				
415836	Horizon Shock Absorber with Integral Turnbuckle	Alloy Steel Stainless Steel				
506648	3/8" dia. Wire Rope with Jaw End	Steel Galvanized				
506662	12" Turnbuckle with Plate	Alloy Steel Galvanized				
506563	3/8" Open Wedge Socket	Alloy Steel Galvanized				
506649	3/8" Wire Rope Clip	Alloy Steel Galvanized				
10015183	Starpass™ Flow Thru By-Pass Component	Alloy Steel Stainless Steel				
10015184	Starpass Glider Component	Alloy Steel Stainless Steel				
415171	Beam Grip Anchorage Connector	Alloy Steel Zinc Plated	Minimum W6 x 20	Maximum W24 x 62	Minimum S18 x 54.7	Maximum S24 x 106
415172	Beam Grip Anchorage Connector	Alloy Steel Zinc Plated	Minimum W8 x 48	Maximum W30 x 108	N/A	Maximum N/A
415173	Beam Grip Anchorage Connector	Alloy Steel Zinc Plated	Minimum W10 x 88	Maximum W36 x 170	N/A	Maximum N/A

**NOTES TO TABLE 1:**

- (1) Quantity of each component depends upon number of spans in completed installation.
- (2) See description section in these instructions for a diagram of a typical system.
- (3) See Appendix A for component descriptions and specifications.

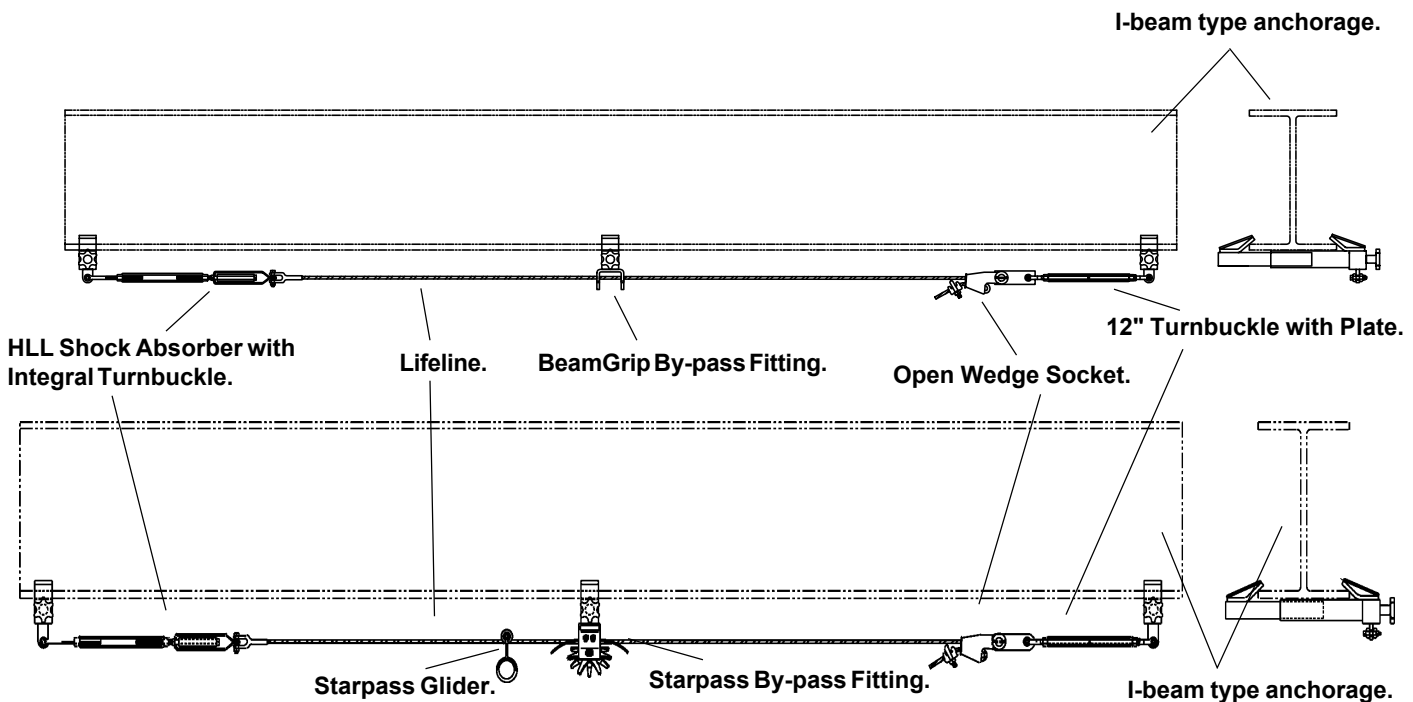
## 1.1 SPECIFICATIONS - MSA HORIZON HORIZONTAL LIFELINE SUBSYSTEM, SUSPENSION ANCHORAGE

- All MSA HORIZON horizontal lifeline anchorage connecting subsystem components meet applicable OSHA regulations. These instructions and the labels on the product fulfill the requirements of the regulation.
- The HORIZON horizontal lifeline anchorage connecting subsystem, and the other subsystems and components that make up the personal fall arrest system must be installed and used under the supervision of a qualified person.
- The installed subsystem length ranges from 20 to 280 ft (6 to 86 m), in 20 ft (6 m) spans between supports for multispan systems.
- The maximum unsupported span is 40 ft (12 m).
- Lifeline, 3/8 in (10 mm) diameter, 7 x 19 filler, preformed, improved plow steel wire rope, galvanized finish, 1WRC, Lang lay, with minimum breaking strength of 14,400 lbf (64.4 kN).
- Maximum capacity of five individuals (maximum two people per span), each up to 310 lbs (140 kg) including weight of the user plus clothing, tools and other user-borne objects.
- Use of the HORIZON horizontal lifeline anchorage connecting subsystem requires the use of individual personal fall arrest systems limiting the dynamic force during fall arrest to 900 lbf (4 kN) for each individual on the lifeline.
- The HORIZON horizontal lifeline anchorage connecting subsystem fits most standard S-beam and W-beam cross-sections. Customer to specify dimensions for each installation. Refer to Customer Survey/Data Worksheet P/N 690107.
- The HORIZON horizontal lifeline anchorage connecting subsystem may be used indoors and outdoors.
- The length of the lifeline must be calculated for each installation, see section in these instructions for calculation.

## 2.0 DESCRIPTION OF HORIZON HORIZONTAL LIFELINE, SUSPENSION ANCHORAGE

The MSA HORIZON horizontal lifeline anchorage connector subsystem is designed to significantly reduce the hazardous load amplification problems associated with attaching personal fall arrest systems to horizontal lifelines. This system absorbs energy at a controlled rate regardless of lifeline length and provides pre-determined elongation of the lifeline length, which reduces forces transmitted to the anchorages and to the user of an attached personal fall arrest system. This engineered system must be used only in conjunction with compatible MSA fall arrest components that limit vertical fall arrest forces to under 900 lbf (4.0 kN) per person. The energy absorbing capacity of the HORIZON horizontal lifeline anchorage connecting subsystem permits the design of multiple person systems with minimal increases in the required anchorage strength. Each system is manufactured for use by one to five persons. Users are able to traverse the entire length of the installation without disconnecting and reconnecting from the anchorage connector.

The HORIZON horizontal lifeline anchorage connecting subsystem consists of several components that, when properly installed, provide the user(s) with a suitable anchorage connector for the attachment of a personal fall arrest system(s) (PFAS). The quantity of the BeamGrip Anchorage Connectors and BeamGrip By-Pass Fittings depends upon the configuration of the completed installation. The length of the lifeline is calculated based upon the configuration of the completed installation. A method to calculate the required lifeline length is presented in these instructions. The components necessary to create a complete subsystem are described in the sections that follow.



Complete subsystem installation, shown for a 2 span multispan system.

### 3.0 PLANNING THE USE OF SYSTEMS

- 3.1 NUMBER OF INDIVIDUAL COMPONENTS REQUIRED FOR EACH SYSTEM:** The total number required of each subsystem component will vary depending upon the configuration of the specific installation. Every system that installs with anchorage clamps (BeamGrips) will require one each of these: HORIZON Shock Absorber with Integral Turnbuckle, Horizontal Lifeline, 12" Turnbuckle with Plate, Open Wedge Socket and 3/8" Wire Rope Clip. Every system will require two (2) BeamGrip Anchorage Connectors with End Fittings, installed at opposite ends of the lifeline. Additionally, each system will have a varying number of BeamGrip Anchorage Connectors with By-Pass Fittings. The BeamGrip Anchorage Connectors with Starpass Flow Through or manual By-Pass Fittings must be installed at intervals along the installation of no more than 40 ft (12 m). 20ft (6m) is recommended for Starpass applications.
- 3.2 CALCULATION OF LINE LENGTH FOR HORIZONTAL LIFELINE:** For the purpose of specifying a horizontal lifeline (MSA P/N 506648) for use in the HORIZON horizontal lifeline anchorage connecting subsystem, add 6 ft (1.8 m) to the dimension between the end points of the installation. For example, if the distance between the end points of the anchorage is 100 ft (30.5 m), the total length of the horizontal lifeline is 106 ft (32.3 m). The additional length is useful during installation and may be removed upon completion of the installation. See section 4.1 step10.

### 4.0 INSTALLATION AND INSTRUCTIONS FOR USE

The design, installation and use of the HORIZON horizontal lifeline anchorage connecting subsystem must be performed under the supervision of a qualified person. Proper installation will require at least two persons, each equipped with independent personal fall arrest systems. Equipment required to complete the installation includes: steel mallet, open-end wrenches (1/2" to 1" sizes), gloves, pliers, adjustable wrench and a measuring tape of sufficient length to measure line from anchor point to anchor point.

#### ⚠ CAUTION

**Do not expose workers to fall hazards while performing the installation. The use of a separate, independent personal fall arrest system for each installation worker is required.**

#### 4.1 INSTALLATION

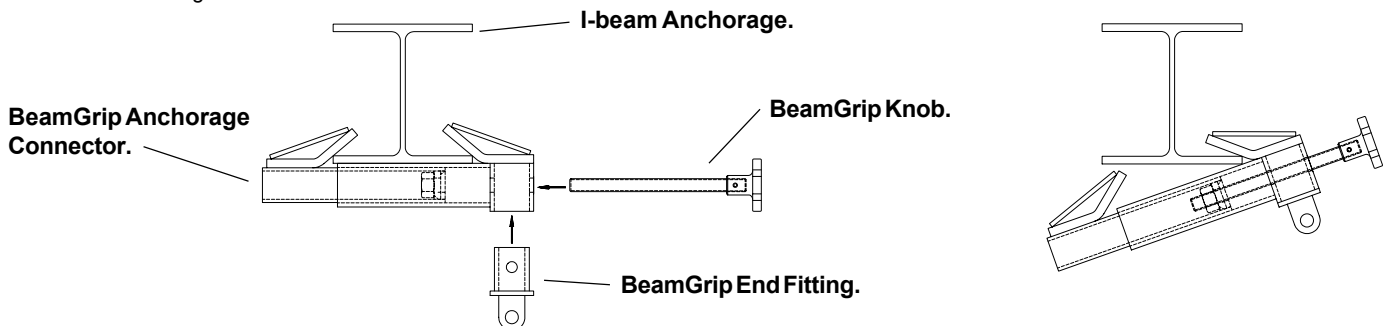
- Step 1:** Assemble the BeamGrip End Fittings (2 total) each to a BeamGrip Anchorage Connector by removing the adjusting screw and inserting through the holes in the end fitting. For each BeamGrip Starpass Flow Through By-Pass or manual By-Pass Fitting, assemble to a BeamGrip Anchorage Connector in a similar fashion. For example, for a 140 ft (42.7 m) installation, 2 end fittings and minimum of 3 by-pass fittings are required.
- Step 2:** Attach the BeamGrip Anchorage Connectors with the appropriate fittings and in the correct orientation to the proper locations on the beam anchorage.

Attach BeamGrip Anchorage Connectors with Starpass Flow Through By-Pass or manual By-Pass Fittings to the beam anchorage at 20 ft (6 m) to 40 ft (12 m) intervals.

**Step a.** Remove threaded rod by unscrewing knob. Insert appropriate fitting into BeamGrip socket. (Oriented to correct loading direction)

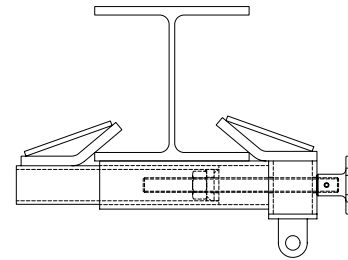
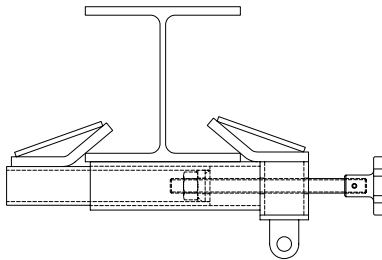
**Step c.** Hook one end of grip to one side of I-beam flange.

**Step b.** Re-insert threaded rod and spread the grip ends to clear the I-beam flange.

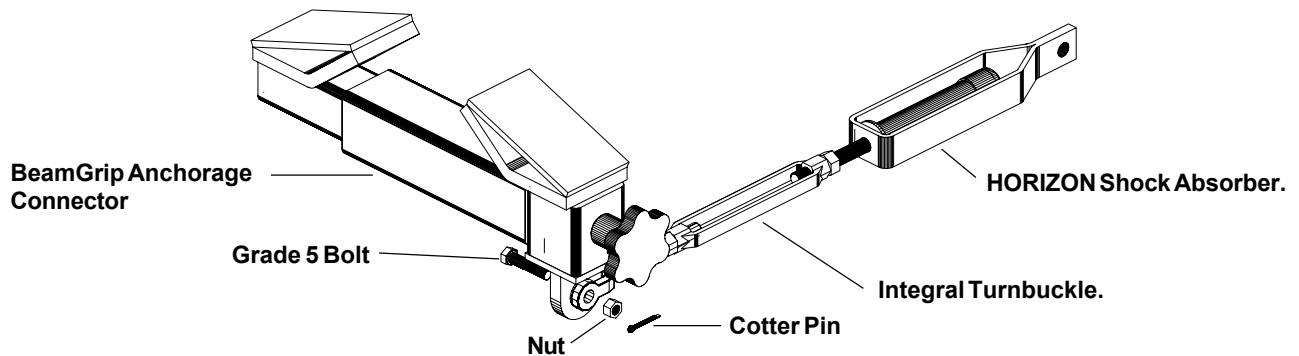


**Step d.** Attach other end of grip to opposite side of I-beam.

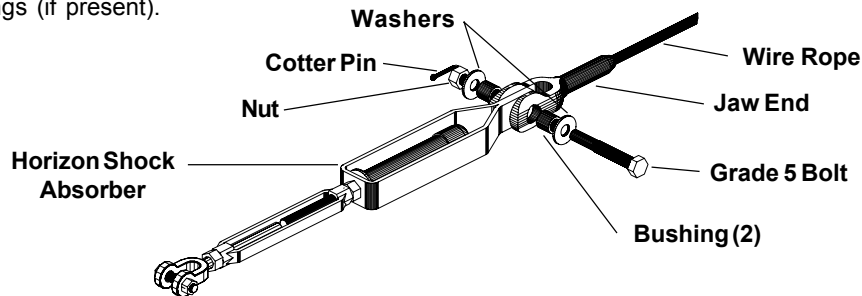
**Step e.** Turn knob until Beam Grip is secured to the I-beam flange. Continue to turn knob until knob is flush against square tube. **Hand tighten as tight as possible.**



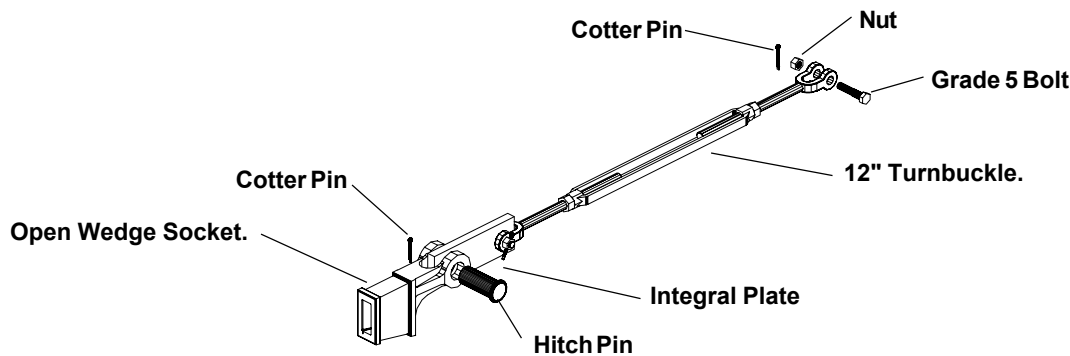
**Step 3:** Attach the HORIZON shock absorber to the end fitting at the end of the installation, using the bolt with nut and safety cotter provided with the shock absorber. Adjust the turnbuckle to the fully extended position. The tube of the shock absorber has a machined area that seats into the positioning washer and is held in place by the lock nut at the end of the turnbuckle. Check that the lock nut is finger tight.



**Step 4:** With gloved hands, carefully uncoil the lifeline and attach the jaw end of the lifeline to the end of the turnbuckle. Align the jaw end of the wire rope with the frame of the Horizon shock absorber. Assemble the bolt, washers, bushings and nut as shown in the accompanying illustration. Tighten the nut to the bolt and insert the cotter pin in the hole at the end of the bolt. Next, feed rope through Starpass Flow Thru By-Pass (refer to section 4.2) or reeve the wire rope through the by-pass fittings (if present).

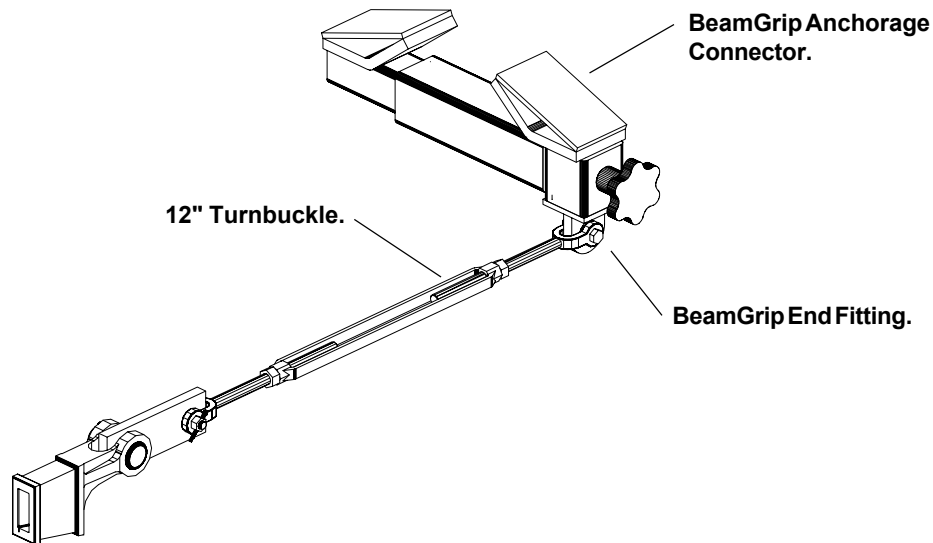


**Step 5:** Assemble the Open Wedge Socket to the 12" Turnbuckle with Plate using the attachment pin with safety cotter provided. Adjust the turnbuckle to the fully extended position.



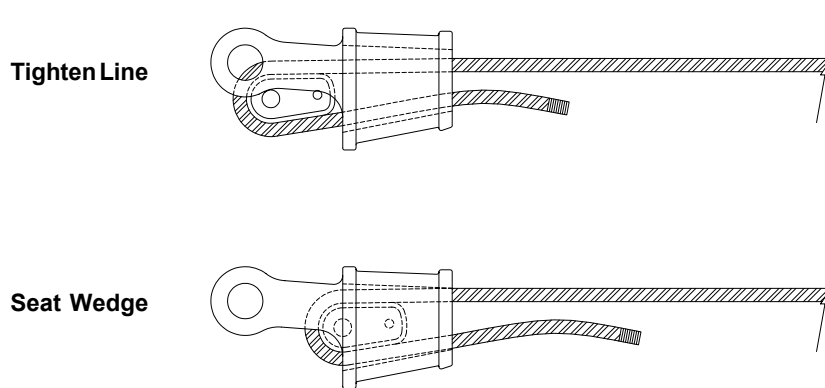


**Step 6:** Attach the assembled open wedge socket & 12" turnbuckle with plate to the end fitting on the other end of the installation. The end of the 12" turnbuckle away from the plate has a bolt and nut with safety cotter for attachment to the end fitting.



**Step 7a: Standard Design and Installation**

Reeve the wire rope through the open wedge socket and partially back through the socket, around the wedge (which should remain loose until seated). Tighten the line by physically pulling until all possible slack is removed. Seat the wedge into the cup of the open wedge socket with a steel mallet.



**Step 7b: Alternate Design and Installation**

Important Safety Information - Read and Follow Inspection and Maintenance Safety

- Always inspect socket, wedge and pin before using.
- Do not use parts showing cracks.
- Do not use modified or substitute parts.
- Repair minor nicks or gouges to socket or pin by lightly grinding until surfaces are smooth. Do not reduce original dimension more than 10%. Do not repair by welding.
- Inspect permanent assemblies annually, or more often in severe operating conditions.

**Assembly Safety**

Use only with standard 6 to 8 strand wire rope of designated size. For intermediate size rope, use next larger size socket. For example: When using 9/16" diameter wire rope use a 5/8" size Wedge Socket Assembly. Welding of the tail on standard wire rope is not recommended. The tail length of the dead end should be a minimum of 6 rope diameters but not less than 6" (See Figure 1).

Proper match socket, wedge and clip (See Table 1) to wire rope size.

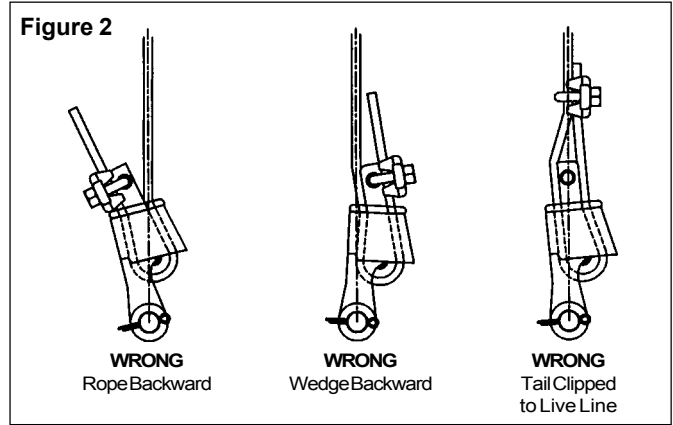
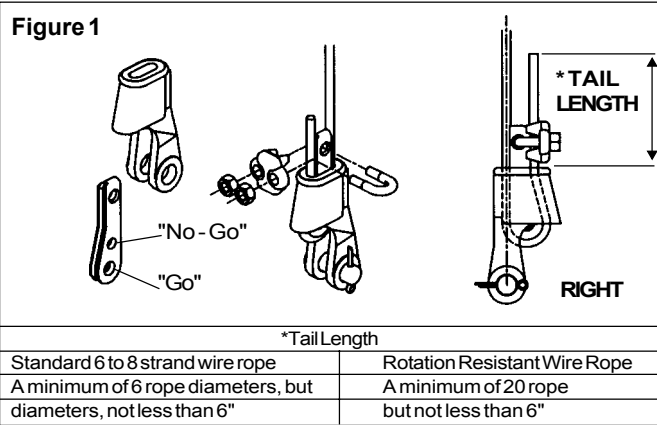
Align live end of rope, with center line of pin. (See Figure 1)

Secure dead end section of rope. (See Figure 1)

Tighten nuts on clip to recommend torque. (Table 1)  
 Do not attach dead end to live end or install wedge backwards. (See Figure 2)  
 Use a hammer to seat Wedge and Rope as deep into socket as possible before applying first load.

**WARNING**

**Loads may slip or fall if the Wedge Socket is not properly installed.**  
**A falling load can seriously injure or kill.**  
**Read and understand these instructions before installing the Wedge Socket.**  
**Do not side load the Wedge Socket.**  
**Apply first load to fully seat the Wedge and Wire Rope in the socket. This load should be of equal or greater weight than loads expected in use.**



**TABLE 1**

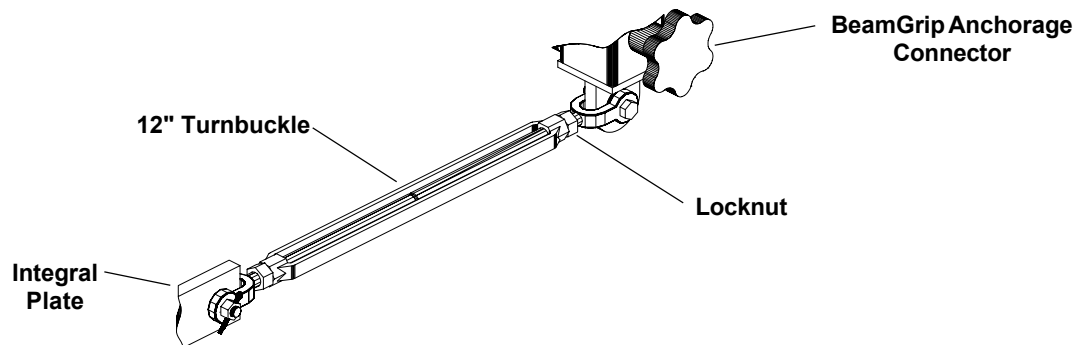
Rope Size	3/8	1/2	5/8	3/4	7/8	1	1- 1/8	
Clip Size	3/8	1/2	5/8	3/4	7/8	1	1- 1/8	
*Torque Ft./Lbs	45	65	95	130	225	225	225	

\* The tightening torque values shown are based upon the threads being clean, dry, and free of lubrication.

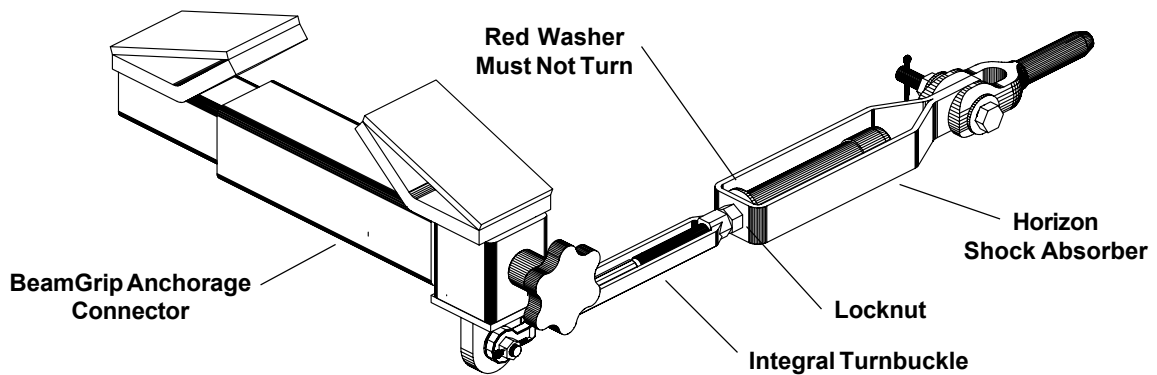
**Operating Safety**

Apply first load to fully seat the Wedge and Wire Rope in the socket. This load should be of equal or greater weight than loads expected in use.  
 Efficiency rating of the Wedge Socket termination is based upon the catalog breaking strength of Wire Rope. The efficiency of a properly assembled Wedge Socket is 80%.  
 During use, do not strike the dead end section with any other elements of the rigging (Called two blocking).

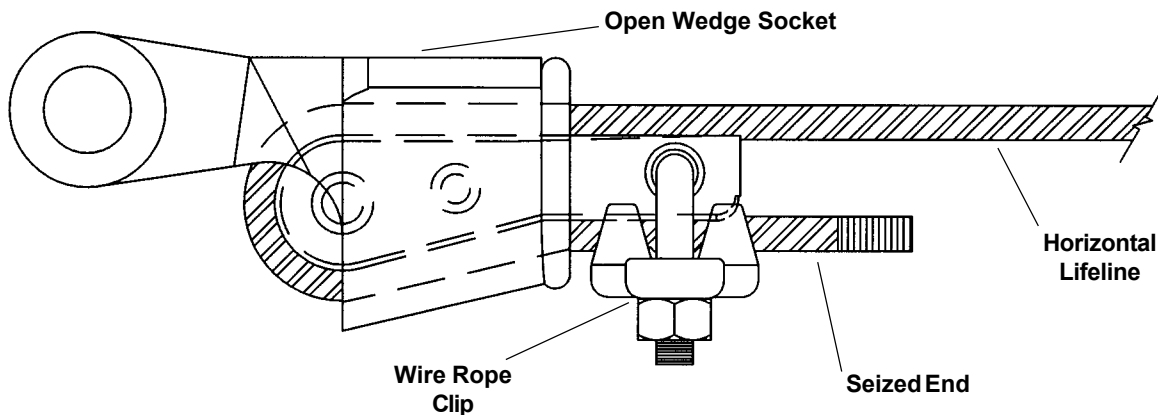
**Step 8:** Adjust the 12" turnbuckle to remove remaining slack in the lifeline. Line slack is seen in the catenary (sag) in the line between each end fitting and the by-pass fittings. Tighten the 12" turnbuckle until the line is visibly mostly flat. It may be necessary to release the open wedge socket and physically pull the line through, until there is enough adjustment in the turnbuckle to remove the remaining line slack. Measure the sag between the bottom of the beam and the top of the wire rope at locations near the end fitting, Starpass or manual by-pass fitting and the center of each span along the installation, adjust the turnbuckle until the dimensions are equal at each location. When adjustment is complete, seat the lock nut at the end of the turnbuckle.



**Step 9:** Final tensioning is done by adjusting the turnbuckle that is integral to the shock absorber at the end of the installation. There is a red washer inside the frame of the shock absorber that, when adjustment is properly made, will no longer spin freely by hand. Adjust the tension of the line using the turnbuckle until the red washer no longer turns freely. Seat the lock nut on the end of the turnbuckle. Tighten by hand the lock nut that is located next to the frame on the shock absorber, keeping the inner sleeve of the shock absorber tight against the frame.

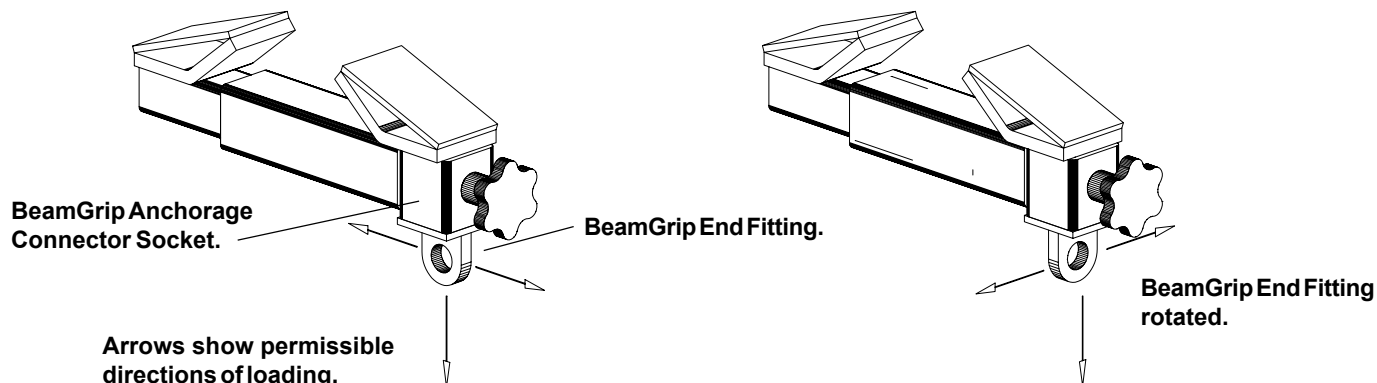


**Step 10:** Attach the 3/8" wire rope clip to within 3 in (8 cm) of the open wedge socket on the free end of the line located at the other end of the installation. If an excess of wire rope hangs down past the open wedge socket, it is permissible to cut the line and remove the excess. Apply 3 seizings of three wraps each onto the line at no more than 12 in (31 cm) from the wire rope clip to prevent the wire rope from fraying. Cut the wire rope away from the seizings and discard.



**Step 11:** The qualified person must inspect the installation prior to system use, checking that the beam grips and fittings are tight to the beam anchorage, the lifeline was not damaged during installation, the lifeline has been properly reeved through each Starpass or manual by-pass fitting, the wire rope clip is in place and the excess line end seized and removed properly and that the wedge is seated properly into the cup of the open wedge socket.

**INSTALLATION NOTE:** It is permissible to attach the Beam Grip End Fittings such that loading from the lifeline is applied in only in the directions shown by these diagrams. Loading should occur only in the plane of the mounting plate and never at an angle to the plate. It is acceptable to rotate the end fitting in its socket to achieve a different loading direction suitable to a specific installation.



### CAUTION

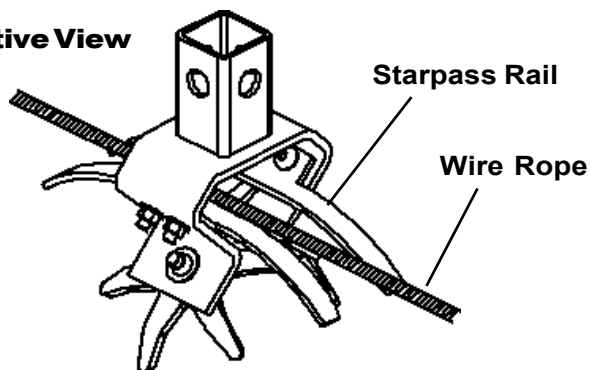
Check that the wedge is seated properly and not cocked or poorly seated in the cup of the open wedge socket. This condition will be noticeable during tensioning if the line never seems to adjust to the proper tension to remove the sag between each end fitting and by-pass fittings.

**4.2 STARPASS™ INSTALLATION:** The Starpass hands-free by-pass can be installed at selected points between the Horizon Horizontal Lifeline end anchors. MSA recommends installing the Starpass as an intermediate support at intervals of 20 - 50 feet, depending on the total span length and the number of persons on the system. The Starpass must be aligned in a straight line between the end anchors. **DO NOT** attempt to place the Starpass component or other components of the Horizon HLL system in a configuration that bends at an angle, as in turning a corner.

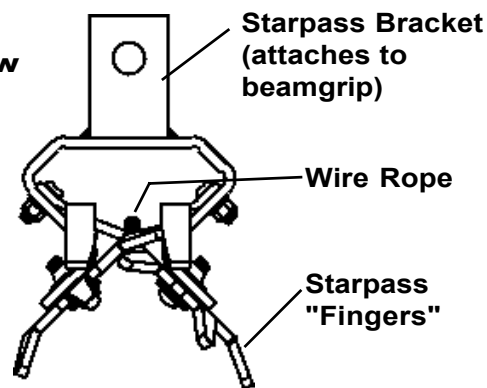
#### 4.2.1 INSTALLATION INSTRUCTIONS:

- Step 1:** Assemble Starpass Flow Thru By-Pass to Beamgrip anchors in same manner as the Horizon End Fittings, illustrated in Section 4.2 Steps 1 and 2.
- Step 2:** Check the alignment of the Starpass with the end anchors. The path of the horizontal lifeline must be a straight line.
- Step 3:** Assemble the Horizon Lifeline to one end anchor and pass the free end of the lifeline through the inside of each Starpass. Note: For ease of installation, rest the wire lifeline on the Starpass rail. This will prevent the line from jamming in the fingers of the mechanism during installation. Once installed, the line will not interfere with the operation of the Starpass mechanism. Refer to Figure 1

**Figure 1  
Perspective View**

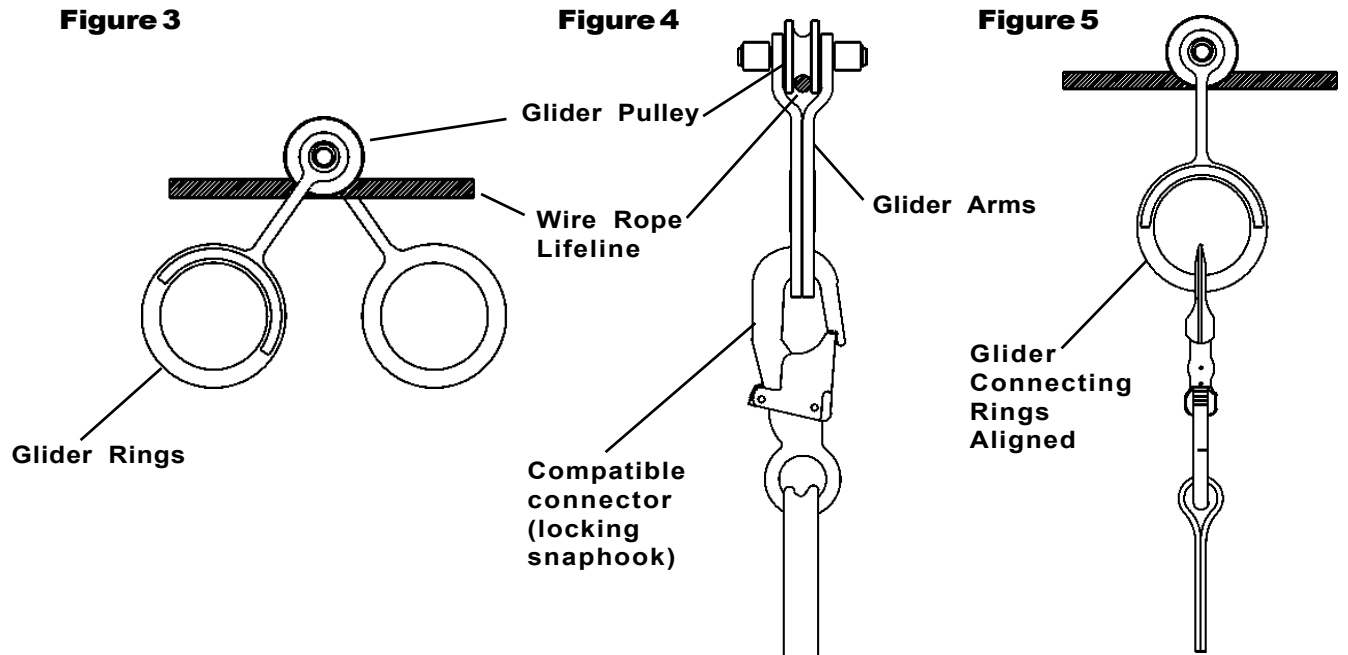


**Figure 2  
End View**



- Step 4:** Tension the Horizon Lifeline as described in Section 4.1 steps 7a and 7b. Lifeline should rest on the angle formed between the two star shaped elements of the Starpass. Refer to Figure 2.

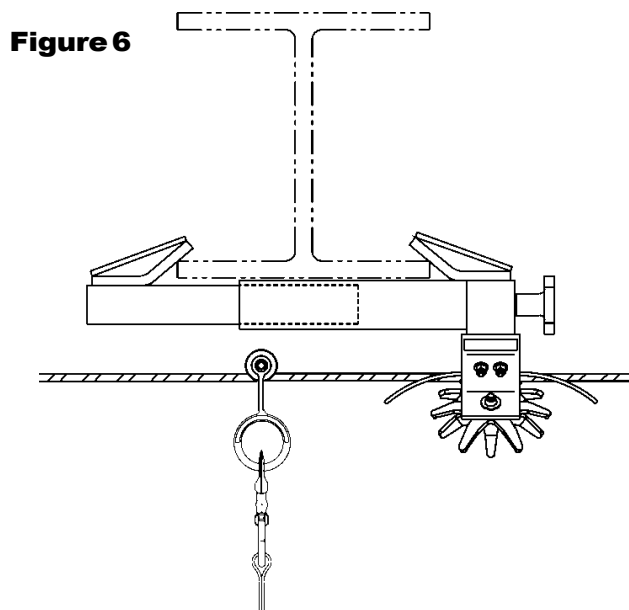
- Step 5:** Attach the Starpass Glider anchorage connecting component by spreading the two arms of the Glider apart and placing the pulley on the lifeline. Refer to Figure 3.
- Step 6:** Close the two arms of the Glider together until the ring elements are aligned.
- Step 7:** Connect a compatible carabiner or snaphook through both rings to fully capture and enclose the Glider about the lifeline. Refer to Figures 4 and 5.



**CAUTION**

*The Glider must be connected to the Personal Fall Arrest System by means of a compatible locking snaphook or carabiner. The snaphook or carabiner MUST pass through and retain both rings of the Glider.*

- Step 8:** Inspect the completed Starpass installation.
  - Stars should rotate without interference. Tips of the stars should not touch the sides of the Starpass bracket.
  - Lifeline must pass through the stars resting on the angle formed by the two star-shaped elements.
  - Glider must move freely along the lifeline and pass through the Starpass mechanism with no more than 5 - 10 lbs of pulling force. Refer to figure 6 for an illustration of a completed starpass installation.



 **CAUTION**

*Restrict travel below the Starpass to an area within an arc of 30°, or 15° on either side of the lifeline.*

#### 4.2.2 TROUBLESHOOTING:

If you experience difficulty in achieving smooth operation of the Starpass hands-free by-pass, refer to the following recommendations:

- The Starpass rotating stars must be properly aligned both vertically and horizontally to the Horizontal Lifeline.
- Ensure proper line tension has been set for the horizontal lifeline. Excessive sag in the line will result in greater force to pull the Glider through the Starpass.
- Use the Starpass only with MSA Horizon 3/8" diameter steel lifeline. Lifelines of other manufacture or diameter will not function correctly with the Starpass mechanism and are not recommended.
- Increase the number of intermediate supports or decrease the distance between supports in the Horizon HLL system. This action will reduce sag on the lifeline and improve performance in the operation of the Starpass hands-free by-pass.
- Inspect the Starpass component. The mechanism must be free of dirt or debris which could prevent the free rotation of the stars. Inspect the Starpass rails for cracks, breaks, or deformation which could interfere with movement of the Glider through the Starpass.
- Inspect the Glider for cracks, breaks, or deformation which could interfere with movement of the Glider through the Starpass. Remove from use if inspection reveals an unsafe condition.

**4.3 HORIZON HORIZONTAL LIFELINE SUBSYSTEM INSPECTION BEFORE EACH USE:** Inspect the HORIZON horizontal lifeline anchorage connecting subsystem to verify that it is in serviceable condition. Gloves should be worn to prevent injury while handling the HORIZON horizontal lifeline anchorage connecting subsystem and its wire rope. Examine every inch of the HORIZON Horizontal Lifeline working line for severe wear, frays or broken strands, corrosion, cuts, or other damage. See section 11 for inspection details. Do not use the HORIZON horizontal lifeline anchorage connecting subsystem if inspection reveals an unsafe condition.

#### 4.4 INSTRUCTIONS FOR USE

Understand and inspect the HORIZON horizontal lifeline anchorage connecting subsystem before each use. Follow the inspection before use as explained in these instructions. Read this User Instruction and the product labels and understand them prior to using the HORIZON horizontal lifeline anchorage connecting subsystem. Read and understand all User Instructions for these and other system components prior to using them.

- Step 1:** Attach directly to the lifeline, up to five persons each with a total weight of no more than 310 lbs (140 kg), including weight of user, clothing, tools and other user-borne objects, prior to entering the fall hazard area.
- Step 2:** Use of the system will require movement along the length of the horizontal lifeline, and through the by-pass fittings. To pass from one span to the next, rotate the intermediate connector up past the first finger of the by-pass and then rotate the connector in the opposite direction to clear the second finger. If using the Starpass Flow Through By-Pass, walk normally through intermediate supports.
- Step 3:** Adjust the length of each personal fall arrest system lanyard to the shortest length practical for the work at hand. This will reduce the potential free fall distance.
- Step 4:** Connect only to the wire rope lifeline with the connector of the personal fall arrest system, avoiding the connecting components of the anchorage connector subsystem (e.g. do not attach to the turnbuckles, shock absorber or the open wedge socket.) If using the Starpass Flow Through By-Pass, connect with Starpass Glider on wire rope by spreading open the arms, place glider on cable, close arms and connect with the connector of the personal fall arrest system.

## 5.0 INSPECTION BEFORE EACH USE

- 5.1 INSPECTION FREQUENCY:** The HORIZON horizontal lifeline anchorage connecting subsystem must be inspected by the user before each use. Additionally, the HORIZON horizontal lifeline anchorage connecting subsystem must be inspected by a competent person other than the user at intervals of no more than six months. The competent person inspection is referred to as Formal Inspection. See Formal Inspection procedures in these instructions.

Any time inspection reveals conditions not specifically covered by these instructions the user or competent person inspector must consult with the qualified person to determine disposition.

### CAUTION

If the HORIZON horizontal lifeline subsystem has been subjected to fall arrest forces, it must be immediately removed from use and marked as "UNUSABLE" until subjected to a Formal Inspection and approved for use by a qualified person.

- 5.2 PROCEDURE FOR INSPECTION BEFORE EACH USE:** Inspect the entire HORIZON horizontal lifeline anchorage connecting subsystem in accordance with the steps as described in these instructions. Additional inspection requirements specifically for the wire rope are described in these instructions. The formal inspection section and Appendix A of these instructions show the location of the components of the HORIZON horizontal lifeline anchorage connecting subsystem.

#### 5.2.1 INSPECTION OF HORIZON HORIZONTAL LIFELINE SUBSYSTEM COMPONENTS:

**Step 1:** Inspect the HORIZON horizontal lifeline anchorage connecting subsystem component labels to verify that they are present and legible. Appendix A shows the text as it appears on each of these labels. The formal inspection section contains illustrations showing the location of the labels. Check the Formal Inspection Grid to be sure a Formal Inspection has been performed within the last six months. If the Grid does not indicate that a Formal Inspection has been performed within the last six months (by being punched), or if any labels are missing or illegible, remove the HORIZON horizontal lifeline anchorage connecting subsystem from use and mark it as "UNUSABLE" until a Formal Inspection is performed by a competent person.

**Step 2:** Inspect each of the BeamGrip Anchorage Connectors and the fitting that is attached, either the Starnpass or manual By-Pass Fitting or the End Fitting. The anchorage connectors should be securely fastened to the beam anchorage and the fittings should be tight in the sleeve of the connector. Inspect and tighten the adjustment knob holding the anchorage connector to the beam. Check the beam for marks and scraping along the length of the beam, which may be evidence that the anchorage connectors could have slipped, due to loading during fall arrest, since the last inspection. Inspect all welds. Check for signs of deformation, cracks or breaks that may indicate the system has been exposed to damaging loads. Also, if using the Starnpass Flow through By-Pass to inspect stars and rails. The star bolts should be tight and when the cable is lifted off, they should spin freely. The rails should be tight and non-deformed.

**Step 3:** Inspect the HORIZON Shock Absorber with Integral Turnbuckle to verify that the device has not been subjected to the forces of arresting a fall. Evidence that the device has been exposed to the forces of fall arrest include deformation and bulging of the shock absorber tube and a separation between the lock nut and the frame of the shock absorber. If the device has been loaded, remove from use and label as "UNUSABLE" until destroyed.

Inspect the tension of the lifeline and adjust the turnbuckle as needed. If the red washer turns freely by hand, adjust the turnbuckle until the red washer will not turn with hand pressure. Check for the presence of the bolt with nut and safety cotter. During adjustment, determine that the turnbuckle functions properly and that the line is properly tightened. Check the lock nut at the back of the frame of the shock absorber and tighten by hand if it is loose.

**Step 4:** Inspect the 12" Turnbuckle with Plate located at the other end of the installation. Inspect the tension of the lifeline and adjust the turnbuckle as needed. During adjustment, determine that the turnbuckle functions properly and that the line is properly tightened. Check and tighten by hand the lock nut that holds the turnbuckle adjustment. Check for deformation, cracks or loose parts that could weaken the system. Check for the presence of the bolt and nut with safety cotter, replace any missing pieces or elements. Use of this turnbuckle for maintenance adjustments would be necessary only if the adjustment could not be made at the shock absorber end of the installation.

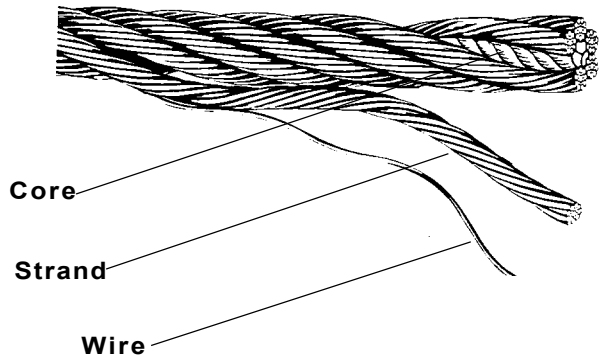
- Step 5:** Inspect the Open Wedge Socket to ensure that the line is held securely. Check for loose connections, cracks, pits, or other damage or deterioration that will reduce the strength of the system. Check that the wedge is seated securely in the cup of the open wedge socket.
- Step 6:** Inspect the 3/8" wire rope clip and tighten as needed. Inspect the seizing on the free end of the wire rope and tighten or replace as needed to prevent line fraying.
- Step 7:** Starpass Gliders used in the Starpass Flow Through By-Pass should be inspected for any deformation in the bends and arms that would affect the performance. Make sure the retaining rings are in place and are not loose. Check that the roller wheels are not severely gouged and are able to freely rotate. Rotate the pulley making sure that it does not bind on anything.

### 5.2.2 INSPECTION OF WIRE ROPE AND FITTINGS:

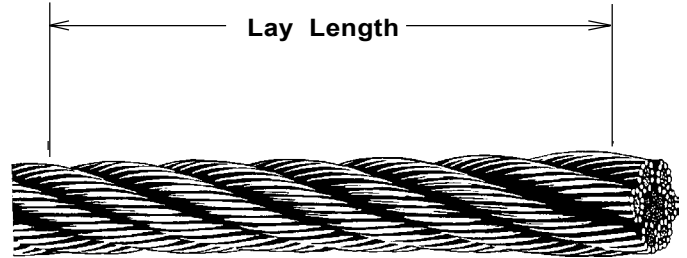
- Step 1:** Remove the HORIZON horizontal lifeline anchorage connecting subsystem from use if there is any evidence of cracks, distortion, excessive corrosion, wear, loosening or biting into the wire rope.
- Step 2:** Wear gloves during inspection to prevent cuts and slivers when running hands over the wire rope. Over the entire length of the line: Check for broken wire strands. Flexing the line can reveal hidden breaks. Remove broken wire ends as soon as possible by bending them back and forth (with fingers if possible) in the direction of the line length. In this way the wire strand will usually break inside the line and leave a sharp end jutting out. DO NOT tug on the broken wire ends with pliers as this will leave jagged ends and can cause damage elsewhere to the strand. Record the location of the broken wire strand in the Inspection Log.
- Step 3:** Carefully review the HORIZON horizontal lifeline anchorage connecting subsystem Inspection Log for the location of previously detected broken wire strands which, cumulatively, may require removing the product from use. Remove from use if there are six or more randomly distributed broken wire strands in one wire lay, or three or more broken wire strands in one strand in one lay. [A wire lay is the length along the line in which one strand makes a complete revolution around the wire rope. This is about 1.5 inches (38 mm) for the HORIZON horizontal lifeline.] Remove from use if there are any broken wire strands within 1 inch (25 mm) of the end terminals of the wire rope.
- Step 4:** Check for worn or abraded wire strands. These areas are caused by friction and are usually brighter in appearance. Remove the HORIZON horizontal lifeline anchorage connecting subsystem from use if any of the surface strands in one area are worn by a third or more of their diameter.
- Step 5:** Check for bulges or reduction wire rope diameter. This is an indication of serious internal line damage. An increase or decrease in diameter of 0.05 inches (1.3 mm) in any area is cause for removing the product from use.
- Step 6:** Check for corrosion characterized by discoloration of the wire strands. There is no simple way to tell when corrosion has excessively weakened the line. The user inspector must keep in mind that corrosion will usually develop inside the line before evidence is visible on the surface. The judgment of a qualified person should be sought when signs of corrosion are evident. Pitting is a particularly serious sign of advanced corrosion. The presence of rust along with broken wires in a given area (particularly in the vicinity of end fittings) is cause for removal of the product from use.
- Step 7:** Check for insufficient lubrication and excessive contamination in the grooves between strands of the line. Packed grease, dirt, paint or other contaminants in these grooves keeps the lubricant from penetrating to prevent internal friction and corrosion.
- Step 8:** Check for snagged wires and crushed or flattened strands. Remove from use if any of these conditions exists.
- Step 9:** Check for unlaying and bird-caging of strands. This condition is characterized by the formation of gaps, loops and excessive clearance between strands. Remove from use if any of these conditions are detected.
- Step 10:** Check for kinks or bends in the line. Once a kink has been made by improper handling (allowing slack), the damage is permanent. A bend is evidence that a kink was once formed. Remove from use if this is detected.
- Step 11:** Check for heat damage, torch burns and electric arc strikes. If any evidence of these conditions exists, remove the HORIZON horizontal lifeline anchorage connecting subsystem from use.



**Composition of Wire Rope (Lifeline)**

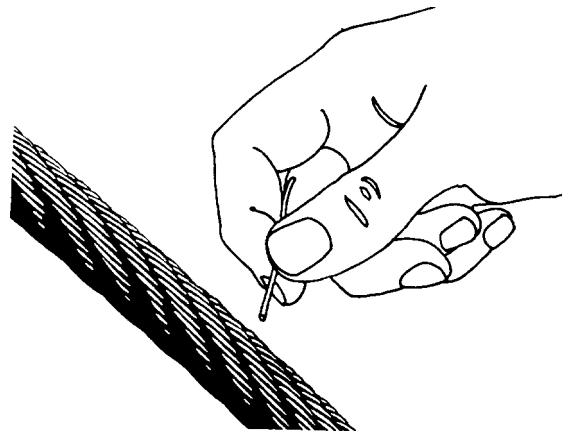
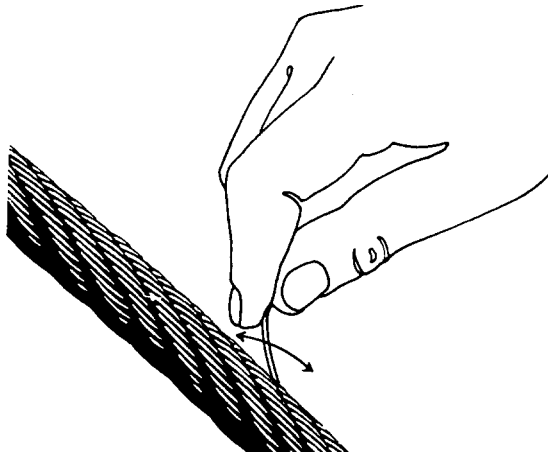


**Measurement of Lay Length**



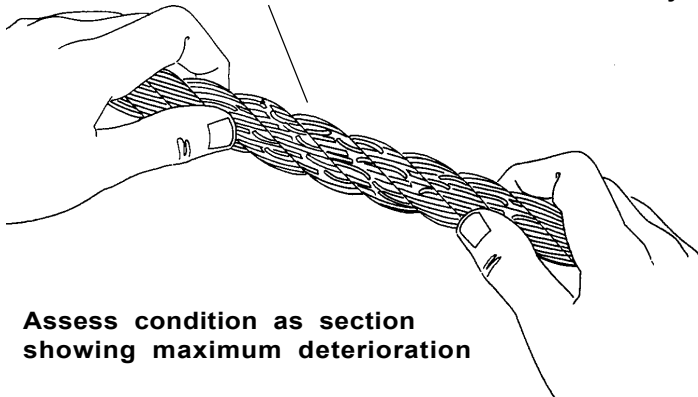
**One revolution of a strand about the core**

**Correct Way to Remove Broken Wires**



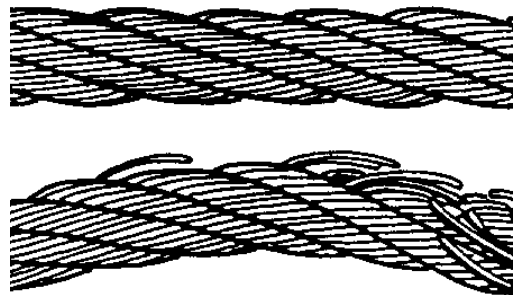
**Assessment of Broken Wires**

Replace wire rope if there are:  
-6 or more broken wires in one lay,  
-3 or more broken wires in one strand in one lay



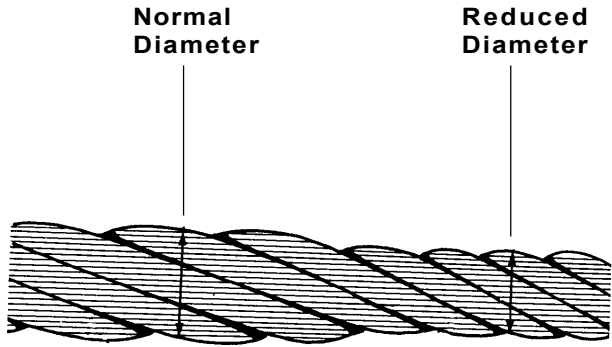
**Assess condition as section showing maximum deterioration**

**Flex Wire Rope During Inspection**

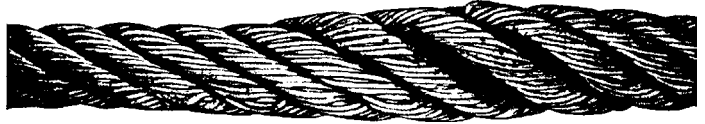


**Flexing can reveal hidden breaks**

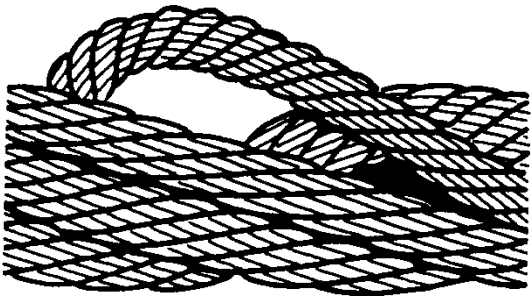
**Change in Wire Rope Diameter**



**Crushed Wire Rope**



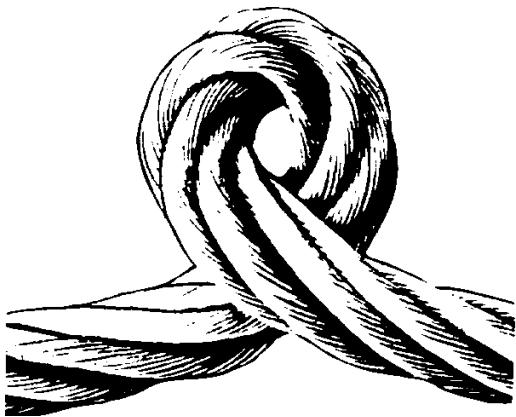
**Unlaying of Wire Rope**



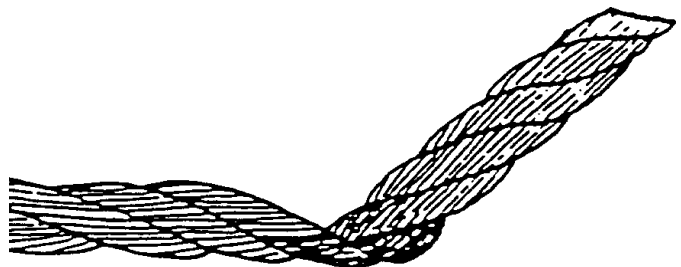
**Bird-caging of Wire Rope**



**Kinked Wire Rope**



**Bent Wire Rope**



- 5.3 CORRECTIVE ACTION:** When inspection in accordance with these instructions reveals signs of inadequate maintenance, the HORIZON horizontal lifeline anchorage connecting subsystem must be immediately removed from service and marked as "UNUSABLE" until destroyed or subjected to maintenance by the user's organization. Defects, damage, excessive wear and/or aging are generally not repairable. If detected, immediately remove the HORIZON horizontal lifeline anchorage connecting subsystem from use and mark it as "UNUSABLE" until destroyed. For final disposition, submit the HORIZON horizontal lifeline anchorage connecting subsystem to a qualified person who is authorized to perform Formal Inspection. If there is any question as to repairability, contact MSA or a service center authorized in writing by MSA before further use of the HORIZON horizontal lifeline anchorage connecting subsystem.

## 6.0 FORMAL INSPECTION

### CAUTION

Only MSA or parties with written authorization from MSA may make repairs to the HORIZON horizontal lifeline subsystem.

- 6.1 FORMAL INSPECTION FREQUENCY:** The HORIZON horizontal lifeline anchorage connecting subsystem must be formally inspected by a competent person other than the user at intervals of no more than six months. (The qualifications of a competent person are established by OSHA.) If the HORIZON horizontal lifeline subsystem is exposed to severe working conditions, more frequent formal inspections may be required. The frequency of inspection by a competent person should be established by the user's organization based on such factors as the nature and severity of workplace conditions, modes of use, and exposure time of the equipment. The competent person should perform a methodical and thorough visual and tactile inspection by following the inspection procedure in these instructions. The inspection results should be recorded in the Formal Inspection Log and retained for reference. In addition, if the HORIZON horizontal lifeline anchorage connecting subsystem passes Formal Inspection, the competent person should mark the date (month/year) of Formal Inspection on the grid supplied with the labels on each HORIZON horizontal lifeline anchorage connecting subsystem. The user should never punch this grid; however, the user should check it before each use to be sure a Formal Inspection has been performed within the last six months.
- 6.2 CONTROL OF EQUIPMENT:** The user's organization should establish and enforce a policy and procedure whereby any HORIZON horizontal lifeline anchorage connecting subsystem that is found to be defective, damaged, or in need of maintenance be immediately removed from use, marked as "UNUSABLE" and immediately thereafter submitted to custody of the competent person responsible for Formal Inspection. This has the benefits that: a) defective equipment is secured from further use until proper action is taken; b) uniform standards are applied for determining whether the equipment is acceptable or not acceptable for further use; c) uniform methods of cleaning and other maintenance are applied; and d) there is a central point for evaluation of conditions that may be recurring and require preventive measures such as coordination with the equipment manufacturer, selection of alternate equipment, additional training of equipment users, or changes to the workplace conditions.
- 6.3 FORMAL INSPECTION PROCEDURE:** The Formal Inspection Procedure is similar to the user's inspection before each use described in these instructions. However, it differs in three important respects, namely: a) it is performed by a competent person other than the user who is trained and authorized to perform Formal Inspection for the user's organization; b) it is more detailed and is methodically recorded on a Formal Inspection Log that is kept on file for future reference; and c) it results in final disposition of the equipment as either "acceptable" (indicated by the formal inspector marking the current month/year in the Formal Inspection Grid on one of the product labels) or as "not acceptable" followed by destruction of the product. The described detailed inspection record keeping is needed in order to trace detected defects to their causes. A simplified alternative procedure is also explained below.

There are three forms that are important to the Formal Inspection Procedure. They are the Formal Inspection Diagram ("DIAGRAM"), the Formal Inspection Log ("LOG"), and the Formal Inspection Checklist ("CHECKLIST"). These forms relate and refer to each other so it is necessary to understand their purposes and uses before discussing the inspection procedure.

- 6.3.1 DIAGRAM:** This is a line drawing of the HORIZON horizontal lifeline anchorage connecting subsystem components with numbered callouts of the parts. The numbers called out in the diagram correspond to those shown on the column titled "INSP. POINT" on the LOG.
- 6.3.2 LOG:** This is the form to be used to record observations made during the Formal Inspection. The Model No., Serial No. and Date Made are recorded by the inspector from the information on the cover of this User Instruction and from the product label. The formal inspector's name and the inspection date are entered by the inspector. The "Disposition" entry is the last entry made on this form after all observations have been recorded. The entry is either "Acceptable" (A) or "Not Acceptable" (N). The columns on the LOG are as follows:

**INSP. POINT** - Inspection point. The HORIZON horizontal lifeline anchorage connecting subsystem part designated in the callouts on the DIAGRAM.

**DESCRIPTION** - Name of the HORIZON horizontal lifeline anchorage connecting subsystem inspection point. There are three broad categories of inspection points, namely, metallic parts, wire rope (cable) and non-metallic parts.

**QTY/H** - Quantity per HORIZON horizontal lifeline anchorage connecting subsystem. The quantity of each HORIZON horizontal lifeline anchorage connecting subsystem inspection point that must be inspected.

**PTY** - Priority. A Priority "1" indicates a critical part. If one or more not acceptable conditions are found by inspection of Priority 1 parts, the HORIZON horizontal lifeline subsystem is not acceptable for use. A Priority "2" indicates a non-critical part. If three or more not acceptable conditions are found by inspection of Priority 2 parts, the HORIZON horizontal lifeline anchorage connecting subsystem is not acceptable for use.

**COND.** - Condition. The condition of the HORIZON horizontal lifeline anchorage connecting subsystem part is indicated here by entry of the appropriate Condition Code shown on the CHECKLIST (e.g. M0, C0, N0 etc.). Alternatively, the inspector may simply enter "FAIL" if a defective condition exists and make no entry if no defect exists.

**OVERALL ASSESS.** - Overall assessment. The inspector's evaluation of the overall acceptability or non-acceptability of the part category (i.e. metallic, non-metallic). The appropriate Overall Assessment Code defined on the CHECKLIST is entered here (e.g. MA, CA, NA ). Alternatively, the inspector may simply enter "FAIL" if a defective condition exists and make no entry if no defect exists.

**COMMENTS** - Indicate pertinent inspector observations here.

**6.3.3 CHECKLIST AND CODES:** This is a table which categorizes the different types of HORIZON Horizontal Lifeline parts into two broad categories (i.e. metallic, non-metallic). For each of these categories, the formal inspector checks the HORIZON horizontal lifeline anchorage connecting subsystem parts for each of the associated conditions (e.g. deformed, fractured, missing, loose, etc.). The codes for the detected conditions are entered in the Condition column on the LOG (e.g. M0, C0, N2, etc.). Overall assessment codes are given, along with the criteria for assigning them, so the inspector can decide if the HORIZON horizontal lifeline anchorage connecting subsystem is acceptable or not acceptable for further use (e.g. MA, CN, NN). Alternatively, instead of using these codes, the inspector may simply enter "FAIL" if a defective condition exists and make no entry if no defect exists.

#### **6.3.4 FORMAL INSPECTION PROCEDURAL STEPS:**

**Step 1:** Record on the LOG the Model No., Serial No. and Date Made information shown on this User Instruction and from the product labels. Record the inspector's name and inspection date.

**Step 2:** Arrange the HORIZON horizontal lifeline anchorage connecting subsystem components so the parts to be inspected are readily visible.

**Step 3:** Starting with the metallic category of parts shown on the LOG, inspect each part (inspection point) one at a time. Refer to the DIAGRAM for identification of each Inspection Point. Each part must be inspected for the possible presence of the conditions shown on the CHECKLIST. Enter in the Condition column on the LOG the proper Condition Code (listed on the CHECKLIST) or "FAIL" if a defect exists. If there is any question whether the HORIZON horizontal lifeline subsystem condition has materially changed since the last Formal Inspection, retrieve and review the prior Formal Inspection records for the specific HORIZON horizontal lifeline anchorage connecting subsystem installation.

**Step 4:** Repeat steps 2 and 3 for the non-metallic categories of part types.

**Step 5:** Determine whether the part (inspection point) is acceptable or not acceptable. If a Priority 1 inspection point has a defective condition, enter in the Overall Assessment column of the LOG the proper code taken from the CHECKLIST (e.g. MN, NN) or simply "FAIL." For Priority 2 inspection points, count the number of defective conditions identified in the Condition column of the LOG. If there is a total of three or more defective conditions for Priority 2 inspection points the HORIZON horizontal lifeline anchorage connecting subsystem is not acceptable for further use.

**Step 6:** Determine disposition of the HORIZON horizontal lifeline anchorage connecting subsystem. If in step 6 it has been determined that the HORIZON horizontal lifeline anchorage connecting subsystem is not acceptable, enter "N" or "FAIL" in the Disposition space on the LOG. In addition, a notation should be made in this space as to whether the HORIZON horizontal lifeline anchorage connecting subsystem is to be destroyed, returned to manufacturer/distributor, etc.

**Step 7:** If in step 5 it has been determined that the HORIZON horizontal lifeline anchorage connecting subsystem is acceptable for further use, enter "A" or "PASS" in the Disposition space on the LOG. Mark the Formal Inspection Grid on the appropriate HORIZON horizontal lifeline subsystem component label with the date (month/year) corresponding to the inspection date to indicate to HORIZON horizontal lifeline subsystem users that the product has passed inspection as of that date.

**Step 8:** File the LOG for future reference.

6.4 FORMAL INSPECTION CHECKLIST AND CODES

TYPE OF PART INSPECTED	CONDITION	COND. CODE	OVERALL ASSESSMENT CODE	LEGEND
Metallic	Deformed/fractured Corroded/deep pits Missing/loose Heat exposure Chemical exposure Burrs/sharp edges Cuts/deep nicks Malfunction Other No visible change	M1 M2 M3 M4 M5 M6 M7 M8 M9 M0	MA - (Metallic acceptable)  MN - (Metallic not acceptable)	<p><b>Disposition:</b> A - (Acceptable) N - (Not acceptable)  Enter "A" (or "PASS") or "N" (or "FAIL") in "Disposition" blank on Formal Inspection Log.</p> <p><b>Criteria for disposition of "N" (Not acceptable):</b>  (1) If there is one or more Overall Assessment Code of "N" type (e.g. MN, PN, SN or CN) on a Priority 1 item.</p>
Non-Metallic	Cut/broken Wear damage Missing/loose Burns/heat exposure Chemical exposure Cracked/Split Other No visible change	N1 N2 N3 N4 N5 N6 N7 N0	NA - (Non-Metallic acceptable)  NN - (Non-Metallic not acceptable)	
Wire rope (cable)	Cut/broken wire Abrasion/wear/corrosion Partially missing/altered Burns/heat exposure Chemical exposure Kinked/unlaid strands Reduced diameter Malfunction Other No visible change	C1 C2 C3 C4 C5 C6 C7 C8 C9 C0	CA - (Cable acceptable)  CN - (Cable not acceptable)	

## 6.5 FORMAL INSPECTION LOG, EXAMPLE

**HORIZON Horizontal Lifeline Anchorage Connecting Subsystem Components***BeamGrip Anchorage Connector*Model No.: 506635 Serial No.: 437581 Inspector: J. W. Doe Date Made: 5/92*BeamGrip By-Pass Fitting*Model No.: 506636 Serial No.: 437581 Inspection Date: 12/13/92 Disposition: N-*BeamGrip End Fitting*Model No.: 506637 Serial No.: 437581 See item 24. Return for factory repair.*HORIZON Shock Absorber with Integral Turnbuckle*Model No.: 415836 Serial No.: 437581*Horizontal Lifeline*Model No.: 506648 Serial No.: 437581 *Open Wedge Socket* Model No.: 506563 Serial No.: 437581*12" Turnbuckle*Model No.: 506662 Serial No.: 437581 *3/8" Wire Rope Clip* Model No.: 506649 Serial No.: 437581*Starpass™ Flow Through By-Pass Fitting*Model No.: 10015183 Serial No.: 437581 *Starpass™ Glider* Model No.: 10015184 Serial No.: 437581

INSP. POINT	DESCRIPTION	QTY/H	PTY	COND (a)	OVERALL ASSESS.(a)	COMMENTS
<b>METALLIC PARTS</b>						
<b>BeamGrip Anchorage Connector (b)</b>						
1	Rectangular Tube	3	1	M7	MA	Scratches, not damaged
2	Plates	2	1	M0	MA	
3	Knob	1	1	M0	MA	
4	Weld Joints	ALL	1	M0	MA	
<b>BeamGrip By-Pass Fitting (b)</b>						
5	Fingers	2	1	M0	MA	
6	Base Plate	1	1	M0	MA	
7	Rectangular Tube	1	1	M0	MA	
8	Weld Joints	ALL	1	M0	MA	
<b>BeamGrip End Fitting (b)</b>						
9	Eye	1	1	M0	MA	
10	Plate	1	1	M0	MA	
11	Rectangular Tube	1	1	M0	MA	
12	Weld Joints	ALL	1	M0	MA	
<b>HORIZON Shock Absorber with Integral Turnbuckle</b>						
13	Frame	1	1	M0	MA	
14	Jaw	1	1	M0	MA	
15	Bolt and Nut with Cotter	1	1	M0	MA	
16	Turnbuckle Frame	1	1	M0	MA	
17	Turnbuckle Lock Nut	1	1	M0	MA	
18	Shock Absorber Tube	1	1	M0	MA	
19	Red Washer	1	1	M0	MA	
20	Lock Nut	1	1	M0	MA	
<b>Continued on next page.</b>						

6.5 FORMAL INSPECTION LOG, EXAMPLE, continued

INSP. POINT	DESCRIPTION	QTY/H	PTY	COND (a)	OVERALL ASSESS.(a)	COMMENTS
<b>METALLIC PARTS</b>						
<b>Horizontal Lifeline</b>						
21	Wire Rope	(b)	1	C0	CA	
22	Jaw	1	1	C0	CA	
23	Bolt and Nut with Cotter	1	1	C0	CA	
<b>12" Turnbuckle with Plate</b>						
24	Turnbuckle Frame	1	1	M1	MA	Frame bent, doesn't adjust
25	Threaded Rod with Jaw	1	1	M0	MA	
26	Bolt and Nut with Cotter	1	1	M0	MA	
27	Lock Nut	1	1	M0	MA	
28	Plate	1	1	M0	MA	
<b>Open Wedge Socket</b>						
29	Body	1	1	M0	MA	
30	Wedge	1	1	M0	MA	
31	Pin with 2 Cotters	1	1	M0	MA	
<b>3/8" Wire Rope Clip</b>						
32	U-bolt with 2 Nuts	1	1	M0	MA	
33	Clamp	1	1	M0	MA	
<b>Starpass Flow Through By-Pass</b>						
34	Weld	ALL	1	N0	NA	
35	Rectangular Tube		1	N0	NA	
36	Bracket		1	N0	NA	
37	Rails		1	N0	NA	
38	Stars		1	N0	NA	
39	Star Bolts and Nuts		1	N0	NA	
40	Rail Bolts		1	N0	NA	
<b>Starpass Glider</b>						
41	Arm		1	N0	NA	
42	Roller wheel		1	N0	NA	
43	Permanent Shoulder		1	N0	NA	
44	Snap Ring		1	N0	NA	
45	Pulley		1	N0	NA	
<b>NON-METALLIC PARTS</b>						
46	Label, Name		1	N0	NA	
47	Label, Date of Manufacturing		1	N0	NA	
48	Label, Warning for Glider		1	N0	NA	
49	Label, Capacity of Glider		1	N0	NA	
50	Label, Beam Grip Anch. Connector	2	1	N0	NA	
51	Label, Knob Warning	2	1	N0	NA	
52	Label, HORIZON Shock Absorber	2	1	N2	NA	Scuffed, still legible

(a) Optional simplified PASS/FAIL inspection format: Whenever an acceptable condition is found, the entry in the COND. and OVERALL ASSESS. columns may be left blank. Whenever a defective condition is found enter "FAIL." The inspection may end upon detection of a single Priority 1 defect.

(b) Quantity for each component will depend upon the specific installation, user to determine and write in on User Inspection Log.

**6.5 FORMAL INSPECTION LOG, EXAMPLE****HORIZON Horizontal Lifeline Anchorage Connecting Subsystem Components***BeamGrip Anchorage Connector*

Model No.: \_\_\_\_\_ Serial No.: \_\_\_\_\_ Inspector: \_\_\_\_\_ Date Made: \_\_\_\_\_

*BeamGrip By-Pass Fitting*

Model No.: \_\_\_\_\_ Serial No.: \_\_\_\_\_ Inspection Date: \_\_\_\_\_ Disposition: \_\_\_\_\_

*BeamGrip End Fitting*

Model No.: \_\_\_\_\_ Serial No.: \_\_\_\_\_

*HORIZON Shock Absorber with Integral Turnbuckle*

Model No.: \_\_\_\_\_ Serial No.: \_\_\_\_\_

*Horizontal Lifeline*Model No.: \_\_\_\_\_ Serial No.: \_\_\_\_\_ *Open Wedge Socket* Model No.: \_\_\_\_\_ Serial No.: \_\_\_\_\_*12" Turnbuckle*Model No.: \_\_\_\_\_ Serial No.: \_\_\_\_\_ *3/8" Wire Rope Clip* Model No.: \_\_\_\_\_ Serial No.: \_\_\_\_\_*Starpass™ Flow Through By-Pass Fitting*Model No.: \_\_\_\_\_ Serial No.: \_\_\_\_\_ *Starpass™ Glider* Model No.: \_\_\_\_\_ Serial No.: \_\_\_\_\_

INSP. POINT	DESCRIPTION	QTY/H	PTY	COND (a)	OVERALL ASSESS.(a)	COMMENTS
<b>METALLIC PARTS</b>						
<b><i>BeamGrip Anchorage Connector (b)</i></b>						
1	Rectangular Tube	3	1			
2	Plates	2	1			
3	Knob	1	1			
4	Weld Joints	ALL	1			
<b><i>BeamGrip By-Pass Fitting (b)</i></b>						
5	Fingers	2	1			
6	Base Plate	1	1			
7	Rectangular Tube	1	1			
8	Weld Joints	ALL	1			
<b><i>BeamGrip End Fitting (b)</i></b>						
9	Eye	1	1			
10	Plate	1	1			
11	Rectangular Tube	1	1			
12	Weld Joints	ALL	1			
<b><i>HORIZON Shock Absorber with Integral Turnbuckle</i></b>						
13	Frame	1	1			
14	Jaw	1	1			
15	Bolt and Nut with Cotter	1	1			
16	Turnbuckle Frame	1	1			
17	Turnbuckle Lock Nut	1	1			
18	Shock Absorber Tube	1	1			
19	Red Washer	1	1			
20	Lock Nut	1	1			
<b><i>Continued on next page.</i></b>						



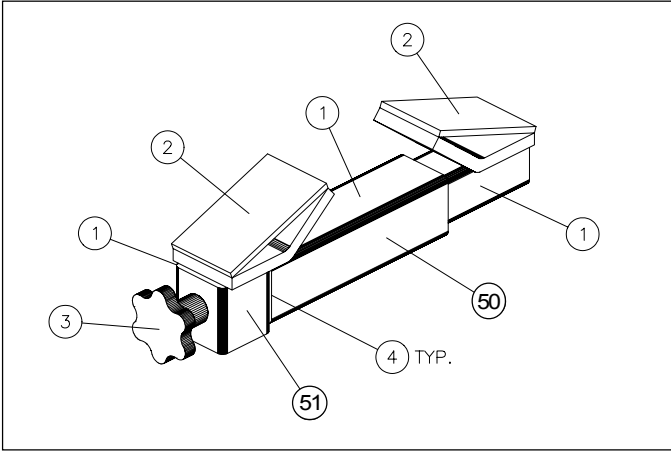
6.5 FORMAL INSPECTION LOG, EXAMPLE, continued

INSP. POINT	DESCRIPTION	QTY/H	PTY	COND (a)	OVERALL ASSESS.(a)	COMMENTS
<b>METALLIC PARTS</b>						
<b>Horizontal Lifeline</b>						
21	Wire Rope	(b)	1			
22	Jaw	1	1			
23	Bolt and Nut with Cotter	1	1			
<b>12" Turnbuckle with Plate</b>						
24	Turnbuckle Frame	1	1			
25	Threaded Rod with Jaw	1	1			
26	Bolt and Nut with Cotter	1	1			
27	Lock Nut	1	1			
28	Plate	1	1			
<b>Open Wedge Socket</b>						
29	Body	1	1			
30	Wedge	1	1			
31	Pin with 2 Cotters	1	1			
<b>3/8" Wire Rope Clip</b>						
32	U-bolt with 2 Nuts	1	1			
33	Clamp	1	1			
<b>Starpass Flow Through By-Pass</b>						
34	Weld	ALL	1			
35	Rectangular Tube		1			
36	Bracket		1			
37	Rails		1			
38	Stars		1			
39	Star Bolts and Nuts		1			
40	Rail Bolts		1			
<b>Starpass Glider</b>						
41	Arm		1			
42	Roller wheel		1			
43	Permanent Shoulder		1			
44	Snap Ring		1			
45	Pulley		1			
<b>NON-METALLIC PARTS</b>						
46	Label, Name		1			
47	Label, Date of Manufacturing		1			
48	Label, Warning for Glider		1			
49	Label, Capacity of Glider		1			
50	Label, Beam Grip Anch. Connector	2	1			
51	Label, Knob Warning	2	1			
52	Label, HORIZON Shock Absorber	2	1			

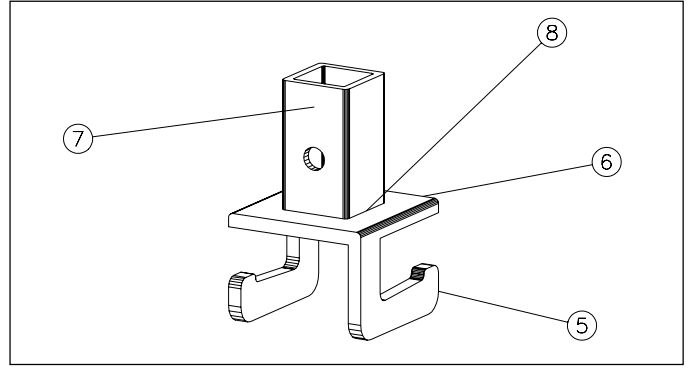
(a) Optional simplified PASS/FAIL inspection format: Whenever an acceptable condition is found, the entry in the COND. and OVERALL ASSESS. columns may be left blank. Whenever a defective condition is found enter "FAIL." The inspection may end upon detection of a single Priority 1 defect.

(b) Quantity for each component will depend upon the specific installation, user to determine and write in on User Inspection Log.

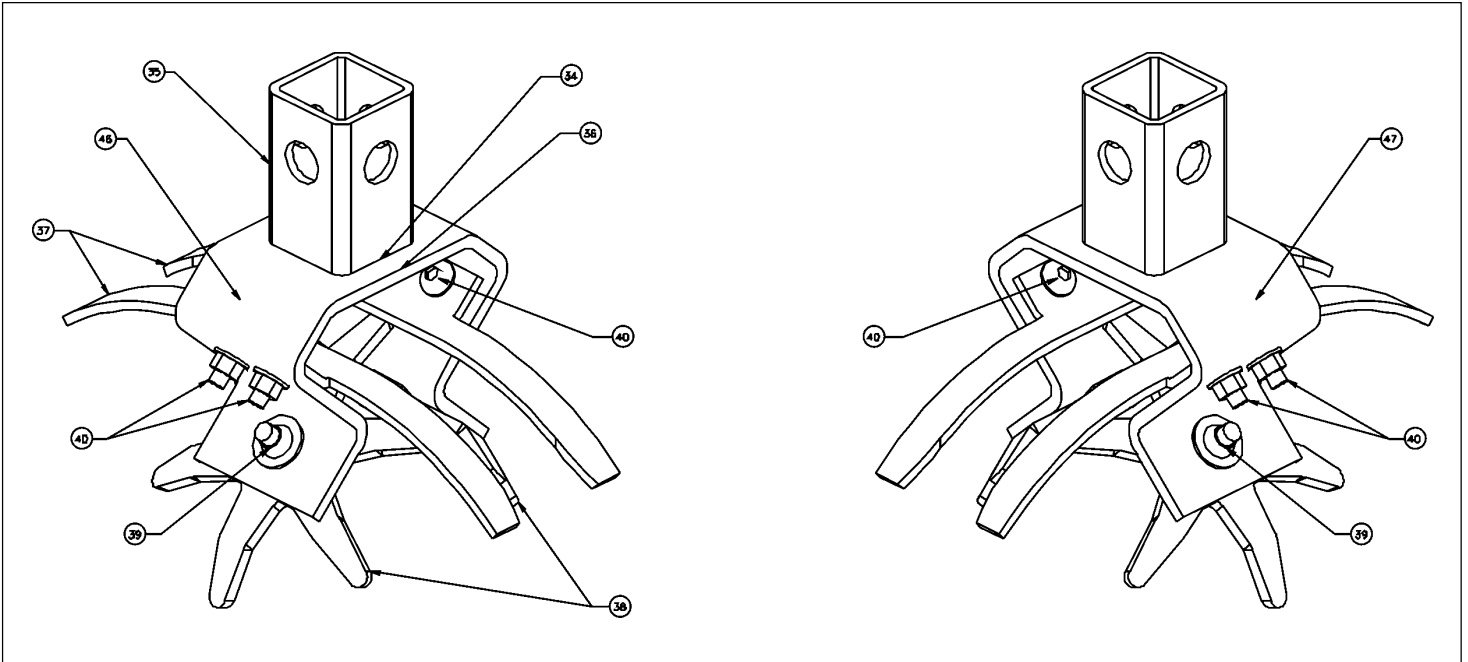
6.6 FORMAL INSPECTION DIAGRAMS



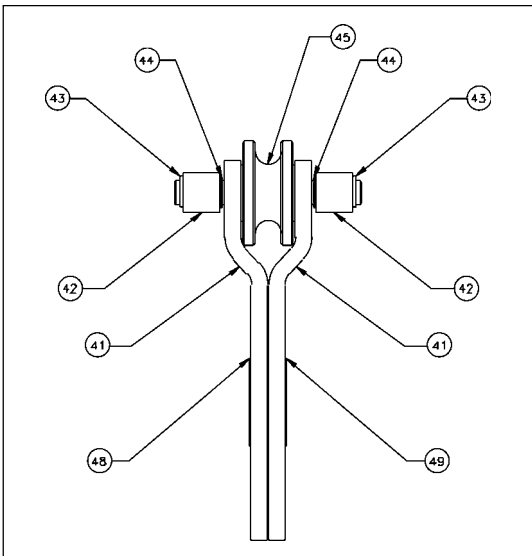
BeamGrip Anchorage Connector



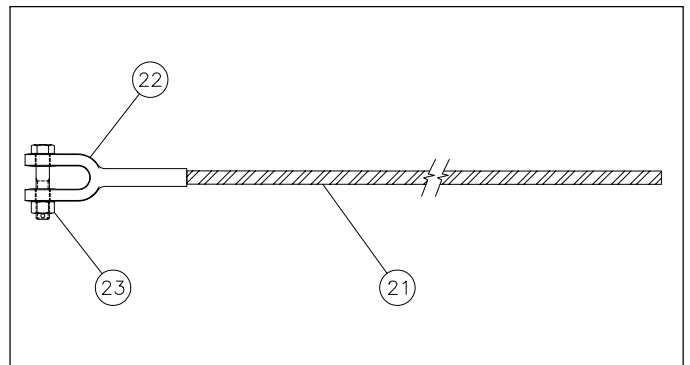
BeamGrip By-Pass Fitting



Starpass Flow Through By-Pass Fitting

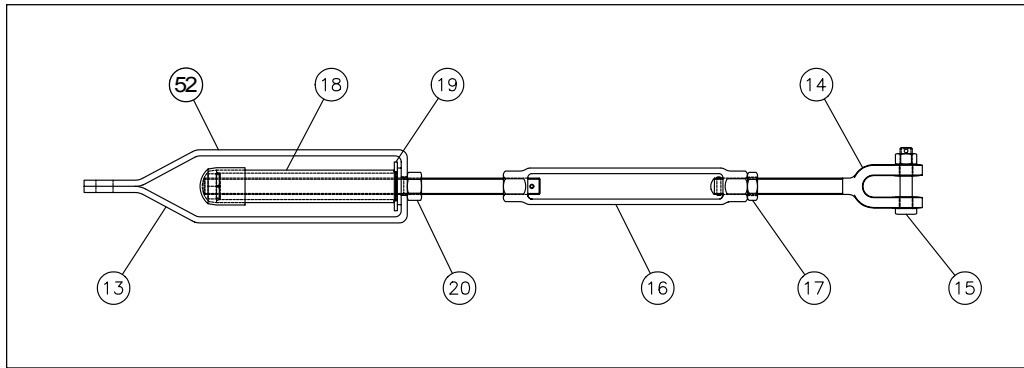


Starpass Glider

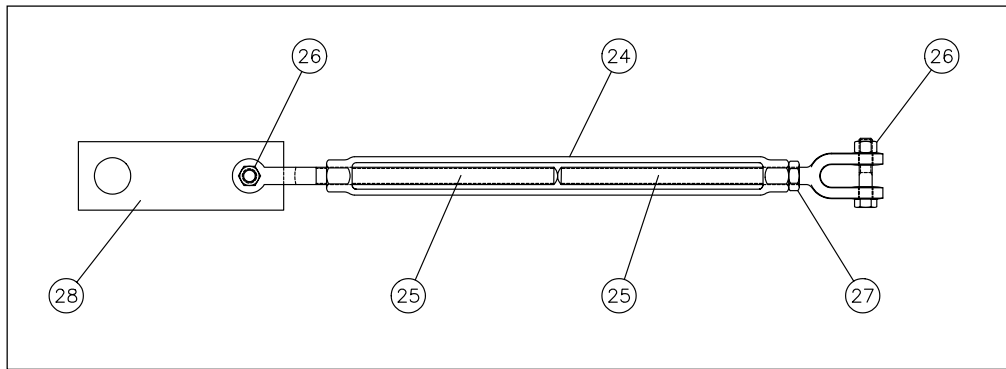


Horizontal Lifeline Cable

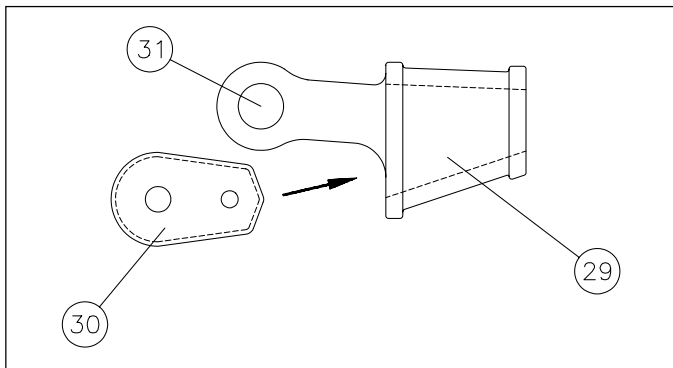
6.6 FORMAL INSPECTION DIAGRAMS



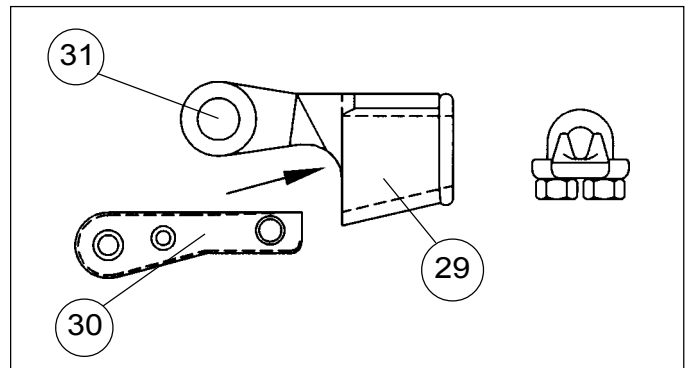
HORIZON Shock Absorber with Integral Turnbuckle



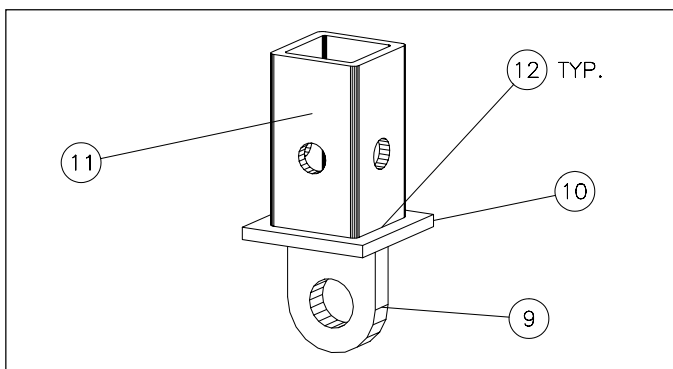
12" Turnbuckle with Plate



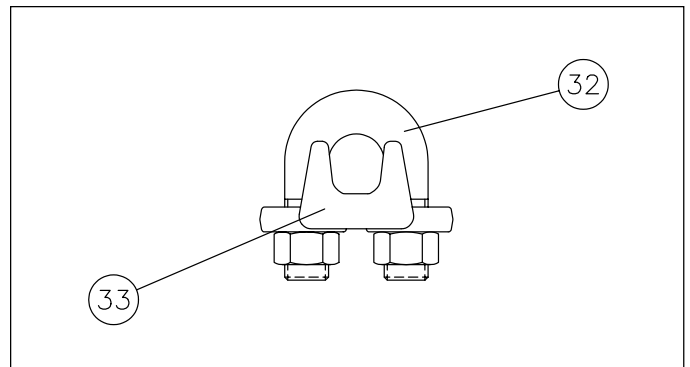
Open Wedge Socket



Open Wedge Socket Alternate Configuration



BeamGrip End Fitting



3/8" Wire Rope Clip



## USER INSTRUCTIONS

### MSA HORIZON™

## III. Stanchion Anchorage Horizontal Lifeline Anchorage Connecting Subsystem

### 1.0 STANCHION ANCHORAGE HORIZONTAL LIFELINE SUBSYSTEM COMPONENTS

TABLE 1. HORIZONTAL LIFELINE SUBSYSTEM COMPONENTS, STANCHION ANCHORAGE

COMPONENT MODEL NO.	DESCRIPTION	MATERIAL	BEAM SIZE			
			AISI W-BEAM		AISI S-BEAM	
506682	BeamGrip Anchorage Connector	Alloy Steel	Minimum	Maximum	Minimum	Maximum
		Zinc Plated	W5 x 16.0	W27 x 146.0	S5 x 10.0	S18 x 70.0
506647	BeamGrip By-Pass Stanchion	Alloy Steel Zinc Plated				
506646	BeamGrip End Stanchion	Alloy Steel Zinc Plated				
506665	BeamGrip Stanchion Insert	Alloy Steel Zinc Plated				
415836	Horizon Shock Absorber with Integral Turnbuckle	Alloy Steel Stainless Steel				
506648	3/8" dia. Wire Rope with Jaw End	Steel Galvanized				
506645	Cable Clamp	Alloy Steel Galvanized				
506649	3/8" Wire Rope Clip	Alloy Steel Galvanized				
415171	Beam Grip Anchorage Connector	Alloy Steel	Minimum	Maximum	Minimum	Maximum
		Zinc Plated	W6 x 20	W24 x 62	S18 x 54.7	S24 x 106
415172	Beam Grip Anchorage Connector	Alloy Steel	Minimum	Maximum	Minimum	Maximum
		Zinc Plated	W8 x 48	W30 x 108	N/A	N/A
415173	Beam Grip Anchorage Connector	Alloy Steel	Minimum	Maximum	Minimum	Maximum
		Zinc Plated	W10 x 88	W36 x 170	N/A	N/A

**NOTES TO TABLE 1:**

- (1) Quantity of each component depends upon number of spans in completed installation.
- (2) See description section in these instructions for a diagram of a typical system.
- (3) See Appendix A for component descriptions and specifications.

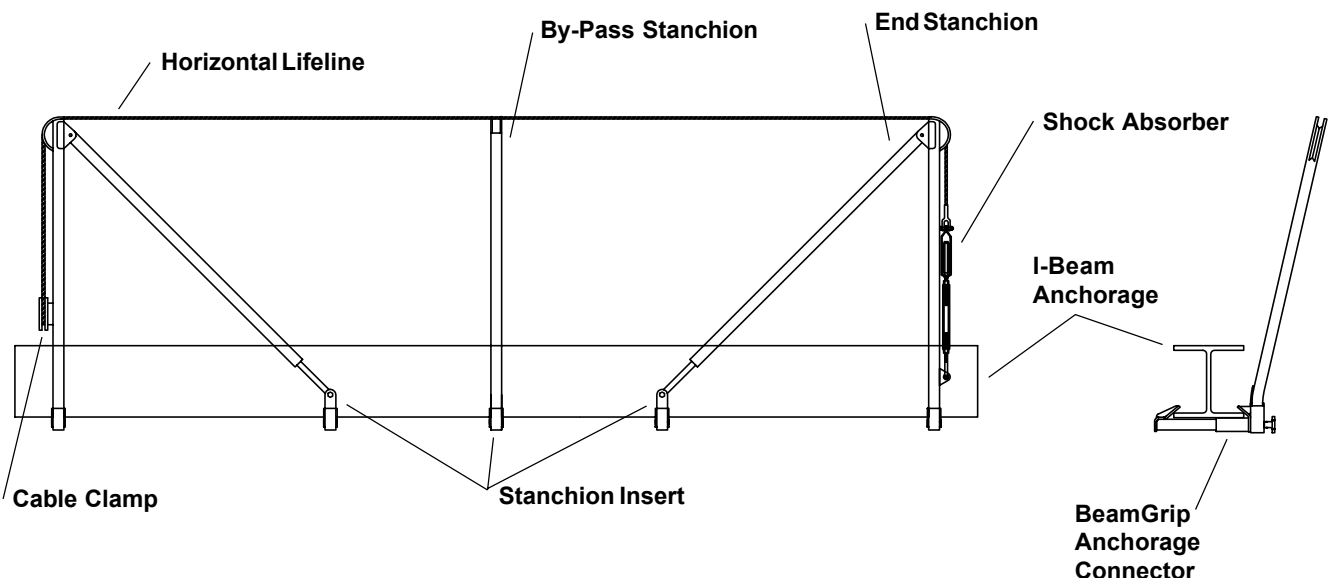
**1.1 SPECIFICATIONS - MSA HORIZON HORIZONTAL LIFELINE SUBSYSTEM, STANCHION ANCHORAGE**

- All MSA HORIZON horizontal lifeline anchorage connecting subsystem components meet applicable OSHA regulations. These instructions and the labels on the product fulfill the requirements of the regulation.
- The HORIZON horizontal lifeline anchorage connecting subsystem, and the other subsystems and components that make up the personal fall arrest system must be installed and used under the supervision of a qualified person.
- The installed subsystem length ranges from 40 to 160 ft (12 to 48 m), in 40 ft (12 m) spans between supports for multispan systems.
- The maximum unsupported span is 40 ft (12 m).
- Lifeline, 3/8 in (10 mm) diameter, 7 x 19 filler, preformed, improved plow steel wire rope, galvanized finish, 1WRC, Lang lay, with minimum breaking strength of 14,400 lbf (64.4 kN).
- Maximum capacity of five individuals, each up to 310 lbs (140 kg) including weight of the user plus clothing, tools and other user-borne objects.
- Use of the HORIZON horizontal lifeline anchorage connecting subsystem requires the use of individual personal fall arrest systems limiting the dynamic force during fall arrest to 900 lbf (4 kN) for each individual on the lifeline.
- The HORIZON horizontal lifeline anchorage connecting subsystem fits most standard S-beam and W-beam cross-sections. Customer to specify dimensions for each installation. Refer to Customer Survey/Data Worksheet P/N 690107.
- The HORIZON horizontal lifeline anchorage connecting subsystem may be used indoors and outdoors.
- The length of the lifeline must be calculated for each installation, see section in these instructions for calculation.

**2.0 DESCRIPTION OF HORIZON HORIZONTAL LIFELINE, STANCHION ANCHORAGE**

The MSA HORIZON horizontal lifeline anchorage connector subsystem is designed to significantly reduce the hazardous load amplification problems associated with attaching personal fall arrest systems to horizontal lifelines. This system absorbs energy at a controlled rate regardless of lifeline length and provides predetermined elongation of the lifeline length, which reduces forces transmitted to the anchorages and to the user of an attached personal fall arrest system. This engineered system must be used only in conjunction with compatible MSA fall arrest components that limit vertical fall arrest forces to under 900 lbf (4.0 kN) per person. The energy absorbing capacity of the HORIZON horizontal lifeline anchorage connecting subsystem permits the design of multiple person systems with minimal increases in the required anchorage strength. Each system is manufactured for use by one to five persons. Users are able to traverse the entire length of the installation without disconnecting and reconnecting from the anchorage connector.

The HORIZON horizontal lifeline anchorage connecting subsystem consists of several components that, when properly installed, provide the user(s) with a suitable anchorage connector for the attachment of a personal fall arrest system(s) (PFAS). The quantity of the BeamGrip Anchorage Connectors and BeamGrip By-Pass Stanchions depends upon the configuration of the completed installation. The length of the lifeline is calculated based upon the configuration of the completed installation. A method to calculate the required lifeline length is presented in these instructions. The components necessary to create a complete subsystem are described in the sections that follow.



**Complete subsystem installation, shown for a 2 span multispan system.**

### 3.0 PLANNING THE USE OF SYSTEMS

- 3.1 NUMBER OF INDIVIDUAL COMPONENTS REQUIRED FOR EACH SYSTEM:** The total number required of each subsystem component will vary depending upon the configuration of the specific installation. Every system that installs with anchorage clamps (BeamGrips) will require one each of these: HORIZON Shock Absorber with Integral Turnbuckle, Horizontal Lifeline, Cable Clamp and 3/8" Wire Rope Clip. Every system will require two (2) BeamGrip Anchorage Connectors with Stanchions, installed at opposite ends of the lifeline. Additionally, each system will have a varying number of BeamGrip Anchorage Connectors with By-Pass Stanchions. Every system requires a BeamGrip Stanchion Insert installed to each BeamGrip Stanchion and each BeamGrip By-Pass Stanchion. The BeamGrip Anchorage Connectors with By-Pass Stanchions must be installed at intervals along the installation of no more than 40 ft (12 m).
- 3.2 CALCULATION OF LINE LENGTH FOR HORIZONTAL LIFELINE:** For the purpose of specifying a horizontal lifeline (MSA P/N 506648) for use in the HORIZON horizontal lifeline anchorage connecting subsystem, add 10 ft (3.0 m) to the dimension between the end points of the installation. For example, if the distance between the end points of the anchorage is 100 ft (30.5 m), the total length of the horizontal lifeline is 110 ft (33.5 m). The additional length is useful during installation and may be removed upon completion of the installation. See section 8.1.

### 4.0 INSTALLATION AND INSTRUCTIONS FOR USE

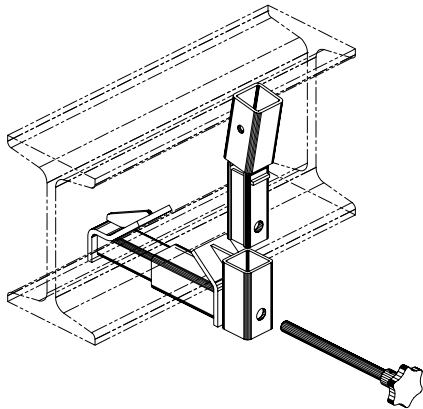
The design, installation and use of the HORIZON horizontal lifeline anchorage connecting subsystem must be performed under the supervision of a qualified person. Proper installation will require at least two persons, each equipped with independent personal fall arrest systems. Equipment required to complete the installation includes: steel mallet, open-end wrenches (1/2" to 1" sizes), Torque wrench (ft-lbs), gloves, pliers, adjustable wrench and a measuring tape of sufficient length to measure line from anchor point to anchor point.

#### ⚠ CAUTION

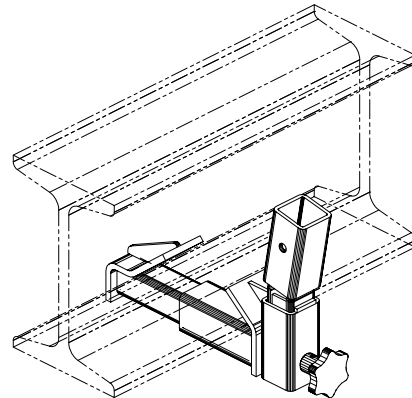
Do not expose workers to fall hazards while performing the installation. The use of a separate, independent personal fall arrest system for each installation worker is required.

#### 4.1 INSTALLATION

- Step 1:** Attach one BeamGrip Anchorage Connector with the appropriate fittings and in the correct orientation to the proper location on the beam anchorage.



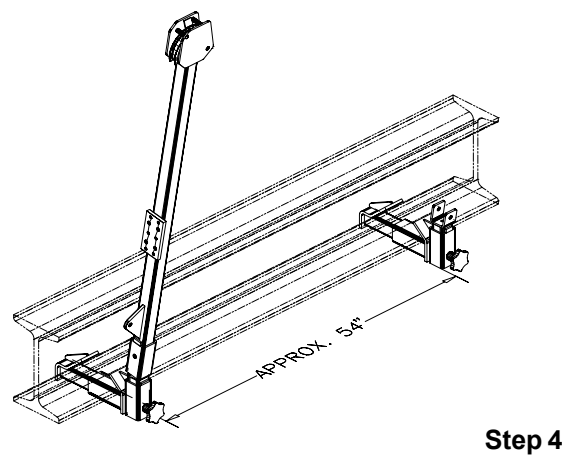
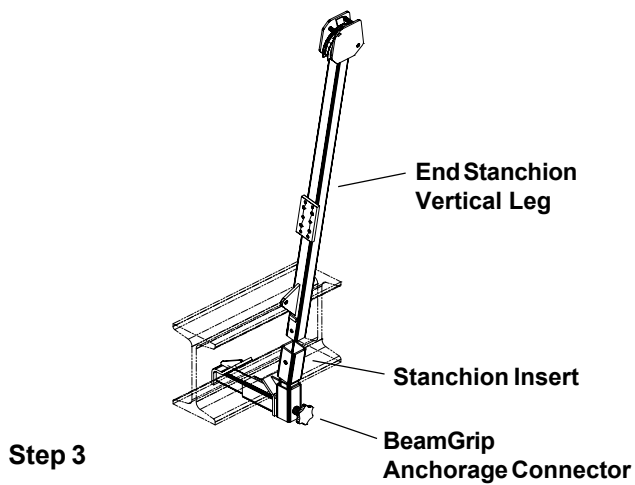
Step 1



Step 2

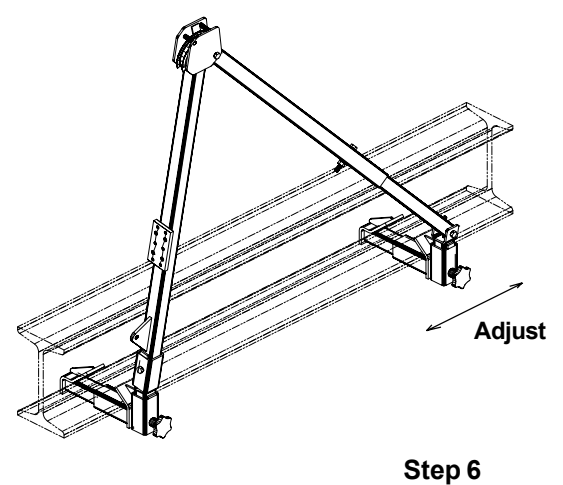
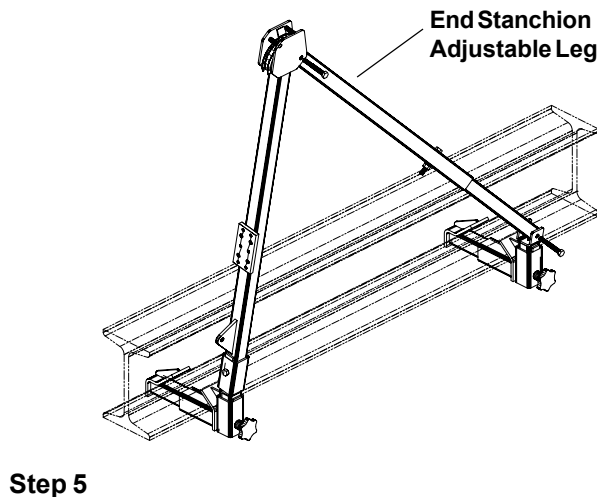
- Step 2:** Assemble a BeamGrip Stanchion Insert to the BeamGrip Anchorage Connector by removing the adjusting screw and inserting through the holes in the stanchion insert.

**Step 3:** Insert the vertical leg of the BeamGrip End Stanchion to the BeamGrip Anchorage Connector (from step one) by removing the adjusting screw and inserting through the holes in the end stanchion leg base.



**Step 4:** Measure over approximately 54 in (1.4 m) and attach a second BeamGrip Anchorage Connector to the beam anchorage. This anchorage connector will be used for assembly to the angled stanchion leg of the BeamGrip End Stanchion. Assemble a BeamGrip Stanchion Insert to the mating part of the BeamGrip Anchorage Connector as in step one.

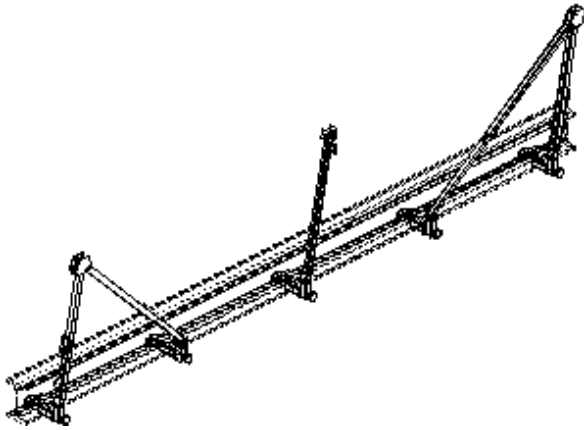
**Step 5:** Attach the adjustable leg of the BeamGrip End Stanchion to the second BeamGrip Anchorage Connector.



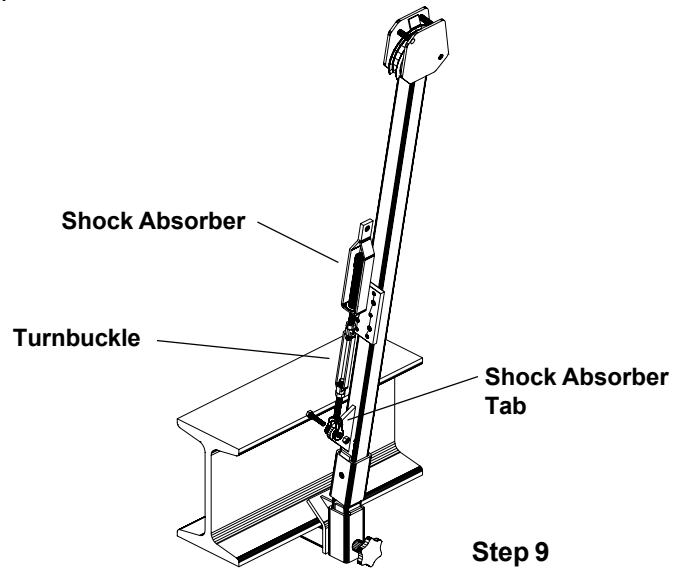
**Step 6:** While maintaining a 45 deg. angle move the second BeamGrip Anchorage Connector as need to maintain the proper angle.

**Step 7:** Measure from the first BeamGrip Anchorage Connector down the length of the beam anchorage the distance of the completed installation. Install a BeamGrip Anchorage Connector and BeamGrip End Stanchion following steps one through six above, at the opposite end of the installation. Assemble both End Stanchions with the adjustable, angled legs toward the center of the installation.

**Step 8:** Attach BeamGrip Anchorage Connectors with By-Pass Stanchions to the beam anchorage at intervals of no more than 40 ft (12 m). For each BeamGrip By-Pass Stanchion, assemble to a BeamGrip Anchorage Connector and BeamGrip Stanchion Insert as described above. For example, for a 140 ft (42.7 m) installation, 2 end stanchions and minimum of 3 by-pass stanchions are required.



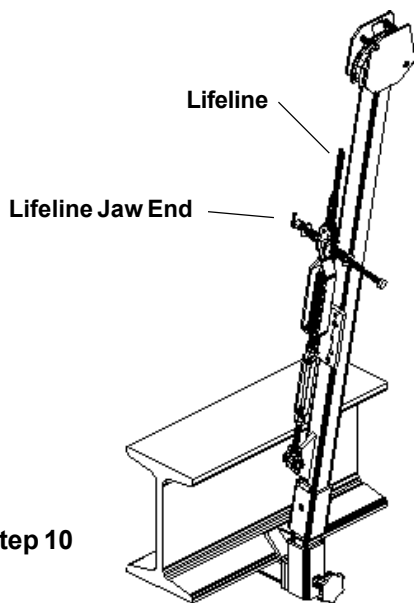
Step 8



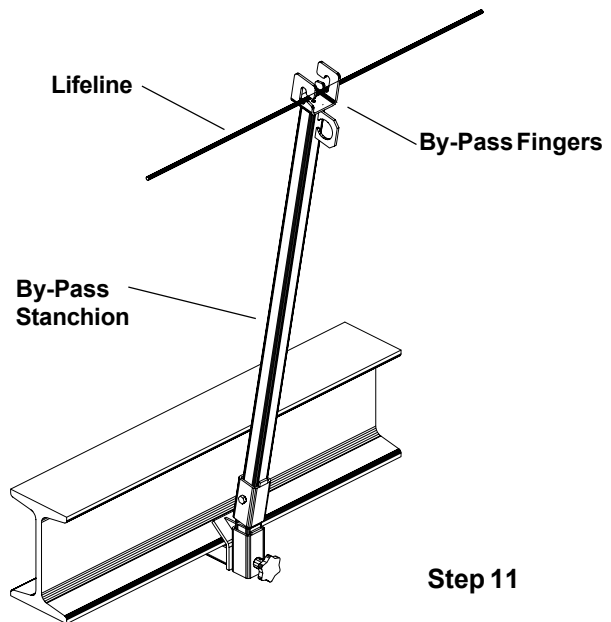
Step 9

**Step 9:** Attach the HORIZON shock absorber to the Shock Absorber Tab on the vertical stanchion leg at the end of the installation, using the bolt with nut and safety cotter provided with the shock absorber. Adjust the turnbuckle to the fully extended position. The tube of the shock absorber has a machined area that seats into the positioning washer and is held in place by the lock nut at the end of the turnbuckle. Check that the lock nut is finger tight.

**Step 10:** With gloved hands, carefully uncoil the lifeline and attach the jaw end of the lifeline to the end of the turnbuckle. A bolt with nut and safety cotter is supplied with the lifeline for attachment to the shock absorber with integral turnbuckle.



Step 10

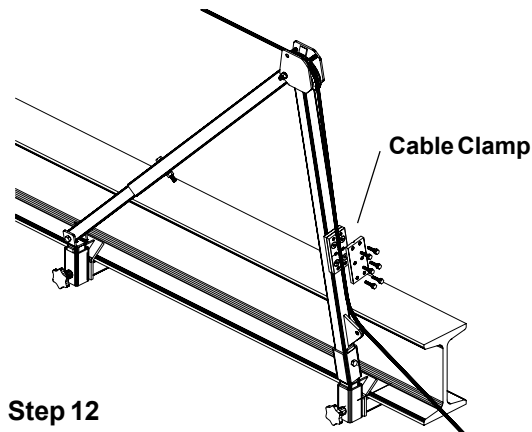


Step 11

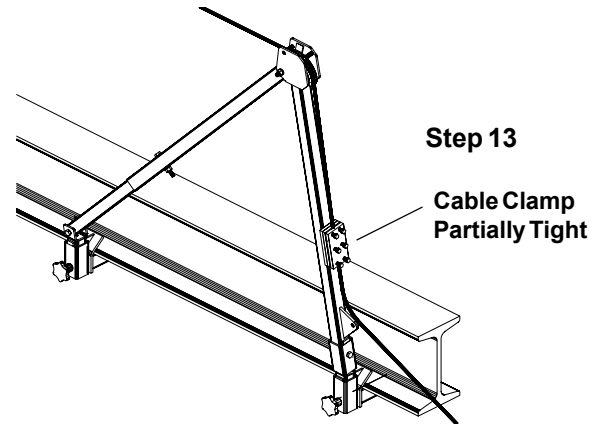
**Step 11:** Reeve the wire rope through the top of the end stanchion and through each by-pass stanchion to the end of the installation.



**Step 12:** Unbolt the top plate of the cable clamp on the end stanchion at the opposite end of the installation. Reeve the wire rope into the center groove of the clamp.



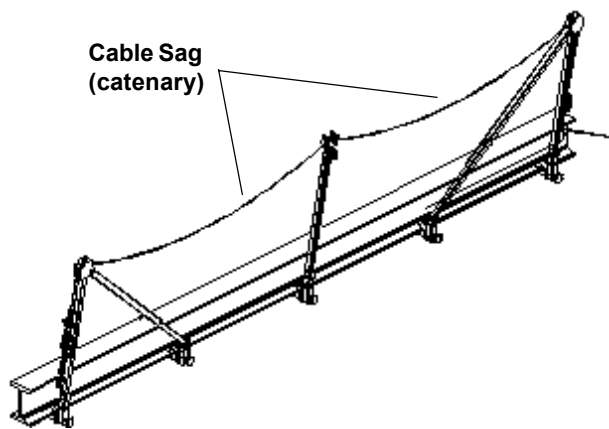
Step 12



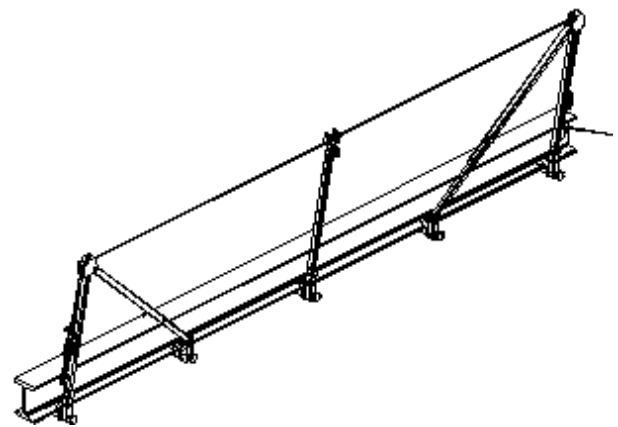
Step 13

**Step 13:** Replace the top plate of the cable clamp and install the six bolts, do not tighten the bolts.

**Step 14:** Tighten the wire rope by physically pulling on the end until the line is visibly mostly flat. Line slack is seen in the catenary (sag) in the line between each end stanchion and the by-pass stanchions. Measure the sag between the top of the beam and the bottom of the wire rope at locations near the end stanchion, by-pass stanchions and the center of each span along the installation, physically tighten until the dimensions are equal at each location. Tighten and torque the six bolts to 25 ft-lbs.



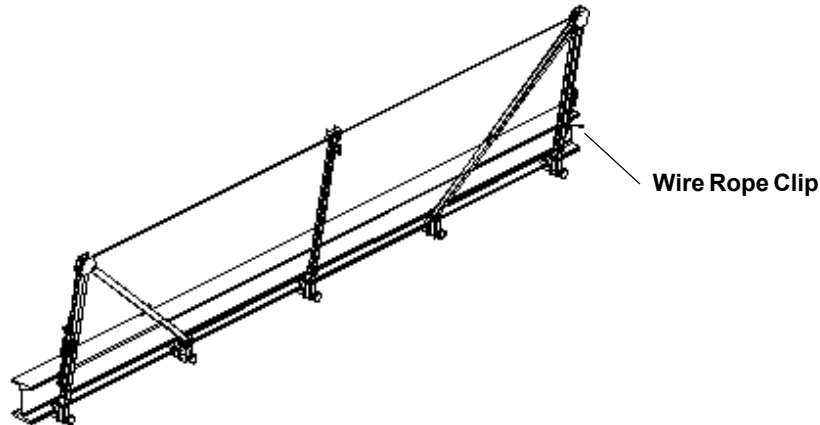
Step 14



Step 15

**Step 15:** Remove all remaining slack until all catenary is gone by adjusting the turnbuckle on the shock absorber. There is a red washer inside the frame of the shock absorber that, when adjustment is properly made, will no longer spin freely by hand. Adjust the tension of the line using the turnbuckle until the red washer no longer turns freely. When adjustment is complete, seat the lock nut at the end of the turnbuckle. Tighten by hand the lock nut that is located next to the frame on the shock absorber, keeping the inner sleeve of the shock absorber tight against the frame.

**Step 16:** Attach the 3/8" wire rope clip to within 3 in (8 cm) of the cable clamp on the free end of the line located at the other end of the installation. If an excess of wire rope hangs down past the cable clamp, it is permissible to cut the line and remove the excess. Apply 3 seizings of three wraps each onto the line at no more than 12 in (31 cm) from the wire rope clip to prevent the wire rope from fraying. Cut the wire rope away from the seizings and discard.



**Step 16**

**Step 17:** The qualified person must inspect the installation prior to system use, checking that the beam grips and fittings are tight to the beam anchorage, the lifeline was not damaged during installation, the lifeline has been properly reeved through each by-pass stanchion, the wire rope clip is in place and the excess line end seized and removed properly.

**4.2 HORIZON HORIZONTAL LIFELINE SUBSYSTEM INSPECTION BEFORE EACH USE:** Inspect the HORIZON horizontal lifeline anchorage connecting subsystem to verify that it is in serviceable condition. Gloves should be worn to prevent injury while handling the HORIZON horizontal lifeline anchorage connecting subsystem and its wire rope. Examine every inch of the HORIZON Horizontal Lifeline working line for severe wear, frays or broken strands, corrosion, cuts, or other damage. See section 5 for inspection details. Do not use the HORIZON horizontal lifeline anchorage connecting subsystem if inspection reveals an unsafe condition.

### 4.3 INSTRUCTIONS FOR USE

Understand and inspect the HORIZON horizontal lifeline anchorage connecting subsystem before each use. Follow the inspection before use as explained in these instructions. Read this User Instruction and the product labels and understand them prior to using the HORIZON horizontal lifeline anchorage connecting subsystem. Read and understand all User Instructions for these and other system components prior to using them.

- Step 1:** Attach directly to the lifeline, up to five persons each with a total weight of no more than 310 lbs (140 kg), including weight of user, clothing, tools and other user-borne objects, prior to entering the fall hazard area.
- Step 2:** Use of the system will require movement along the length of the horizontal lifeline, and through the by-pass stanchions. To pass from one span to the next, rotate the intermediate connector up past the first finger of the by-pass and then rotate the connector in the opposite direction to clear the second finger.
- Step 3:** Adjust the length of each personal fall arrest system lanyard to the shortest length practical for the work at hand. This will reduce the potential free fall distance.
- Step 4:** Connect only to the wire rope lifeline with the connector of the personal fall arrest system, avoiding the connecting components of the anchorage connector subsystem (e.g. do not attach to the stanchion legs, shock absorber or the cable clamp).

## INSPECTION BEFORE EACH USE

- 5.1 INSPECTION FREQUENCY:** The HORIZON horizontal lifeline anchorage connecting subsystem must be inspected by the user before each use. Additionally, the HORIZON horizontal lifeline anchorage connecting subsystem must be inspected by a competent person other than the user at intervals of no more than six months. The competent person inspection is referred to as Formal Inspection. See Formal Inspection procedures in these instructions.

Any time inspection reveals conditions not specifically covered by these instructions the user or competent person inspector must consult with the qualified person to determine disposition.

### CAUTION

**If the HORIZON horizontal lifeline subsystem has been subjected to fall arrest forces, it must be immediately removed from use and marked as "UNUSABLE" until subjected to a Formal Inspection and approved for use by a qualified person.**

- 5.2 PROCEDURE FOR INSPECTION BEFORE EACH USE:** Inspect the entire HORIZON horizontal lifeline anchorage connecting subsystem in accordance with the steps as described in these instructions. Additional inspection requirements specifically for the wire rope are described in these instructions. The formal inspection section and Appendix A of these instructions show the location of the components of the HORIZON horizontal lifeline anchorage connecting subsystem.

**5.2.1 INSPECTION OF HORIZON HORIZONTAL LIFELINE SUBSYSTEM COMPONENTS:**

**Step 1:** Inspect the HORIZON horizontal lifeline anchorage connecting subsystem component labels to verify that they are present and legible. Appendix A shows the text as it appears on each of these labels. The formal inspection section contains illustrations showing the location of the labels. Check the Formal Inspection Grid to be sure a Formal Inspection has been performed within the last six months. If the Grid does not indicate that a Formal Inspection has been performed within the last six months (by being punched), or if any labels are missing or illegible, remove the HORIZON horizontal lifeline anchorage connecting subsystem from use and mark it as "UNUSABLE" until a Formal Inspection is performed by a competent person.

**Step 2:** Inspect each of the BeamGrip Anchorage Connectors and the stanchion that is attached, either the By-Pass Stanchion or the End Stanchion. The anchorage connectors should be securely fastened to the beam anchorage and the stanchions with inserts should be tight in the sleeve of the connector. Inspect and tighten the adjustment knob holding the anchorage connector to the beam. Check the beam for marks and scraping along the length of the beam, which may be evidence that the anchorage connectors could have slipped, due to loading during fall arrest, since the last inspection. Inspect all welds. Check for signs of deformation, cracks or breaks that may indicate the system has been exposed to damaging loads.

**Step 3:** Inspect the HORIZON Shock Absorber with Integral Turnbuckle to verify that the device has not been subjected to the forces of arresting a fall. Evidence that the device has been exposed to the forces of fall arrest include deformation and bulging of the shock absorber tube and a separation between the lock nut and the frame of the shock absorber. If the device has been loaded, remove from use and label as "UNUSABLE" until destroyed.

Inspect the tension of the lifeline and adjust the turnbuckle as needed. If the red washer turns freely by hand, adjust the turnbuckle until the red washer will not turn with hand pressure. Check for the presence of the bolt with nut and safety cotter. During adjustment, determine that the turnbuckle functions properly and that the line is properly tightened. Check the lock nut at the back of the frame of the shock absorber and tighten by hand if it is loose.

**Step 4:** Inspect the Cable Clamp to ensure that the line is held securely. Check for loose connections, cracks, pits, or other damage or deterioration that will reduce the strength of the system. Check that the lay of the wire rope is seated securely in the machined grooves of the cable clamp.

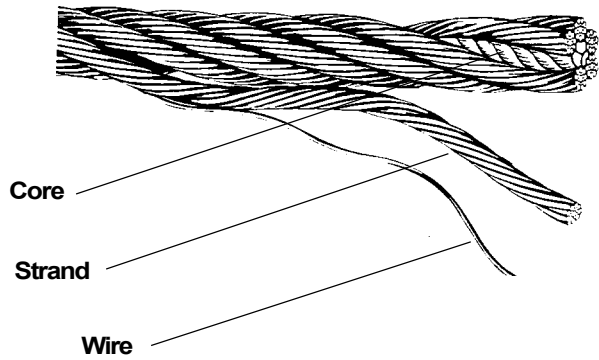
**Step 5:** Inspect the 3/8" wire rope clip and tighten as needed. Inspect the seizing on the free end of the wire rope and tighten or replace as needed to prevent line fraying.

### 5.2.2 INSPECTION OF WIRE ROPE AND FITTINGS:

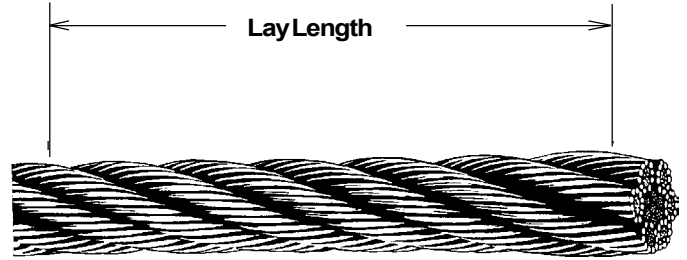
- Step 1:** Remove the HORIZON horizontal lifeline anchorage connecting subsystem from use if there is any evidence of cracks, distortion, excessive corrosion, wear, loosening or biting into the wire rope.
- Step 2:** Wear gloves during inspection to prevent cuts and slivers when running hands over the wire rope. Over the entire length of the line: Check for broken wire strands. Flexing the line can reveal hidden breaks. Remove broken wire ends as soon as possible by bending them back and forth (with fingers if possible) in the direction of the line length. In this way the wire strand will usually break inside the line and leave a sharp end jutting out. DO NOT tug on the broken wire ends with pliers as this will leave jagged ends and can cause damage elsewhere to the strand. Record the location of the broken wire strand in the Inspection Log.
- Step 3:** Carefully review the HORIZON horizontal lifeline anchorage connecting subsystem Inspection Log for the location of previously detected broken wire strands which, cumulatively, may require removing the product from use. Remove from use if there are six or more randomly distributed broken wire strands in one wire lay, or three or more broken wire strands in one strand in one lay. [A wire lay is the length along the line in which one strand makes a complete revolution around the wire rope. This is about 1.5 inches (38 mm) for the HORIZON horizontal lifeline.] Remove from use if there are any broken wire strands within 1 inch (25 mm) of the end terminals of the wire rope.
- Step 4:** Check for worn or abraded wire strands. These areas are caused by friction and are usually brighter in appearance. Remove the HORIZON horizontal lifeline anchorage connecting subsystem from use if any of the surface strands in one area are worn by a third or more of their diameter.
- Step 5:** Check for bulges or reduction wire rope diameter. This is an indication of serious internal line damage. An increase or decrease in diameter of 0.05 inches (1.3 mm) in any area is cause for removing the product from use.
- Step 6:** Check for corrosion characterized by discoloration of the wire strands. There is no simple way to tell when corrosion has excessively weakened the line. The user inspector must keep in mind that corrosion will usually develop inside the line before evidence is visible on the surface. The judgment of a qualified person should be sought when signs of corrosion are evident. Pitting is a particularly serious sign of advanced corrosion. The presence of rust along with broken wires in a given area (particularly in the vicinity of end fittings) is cause for removal of the product from use.
- Step 7:** Check for insufficient lubrication and excessive contamination in the grooves between strands of the line. Packed grease, dirt, paint or other contaminants in these grooves keeps the lubricant from penetrating to prevent internal friction and corrosion.
- Step 8:** Check for snagged wires and crushed or flattened strands. Remove from use if any of these conditions exists.
- Step 9:** Check for unlaying and bird-caging of strands. This condition is characterized by the formation of gaps, loops and excessive clearance between strands. Remove from use if any of these conditions are detected.
- Step 10:** Check for kinks or bends in the line. Once a kink has been made by improper handling (allowing slack), the damage is permanent. A bend is evidence that a kink was once formed. Remove from use if this is detected.
- Step 11:** Check for heat damage, torch burns and electric arc strikes. If any evidence of these conditions exists, remove the HORIZON horizontal lifeline anchorage connecting subsystem from use.

**5.3 CORRECTIVE ACTION:** When inspection in accordance with these instructions reveals signs of inadequate maintenance, the HORIZON horizontal lifeline anchorage connecting subsystem must be immediately removed from service and marked as "UNUSABLE" until destroyed or subjected to maintenance by the user's organization. Defects, damage, excessive wear and/or aging are generally not repairable. If detected, immediately remove the HORIZON horizontal lifeline anchorage connecting subsystem from use and mark it as "UNUSABLE" until destroyed. For final disposition, submit the HORIZON horizontal lifeline anchorage connecting subsystem to a qualified person who is authorized to perform Formal Inspection. If there is any question as to repairability, contact MSA or a service center authorized in writing by MSA before further use of the HORIZON horizontal lifeline anchorage connecting subsystem.

**Composition of Wire Rope (Lifeline)**

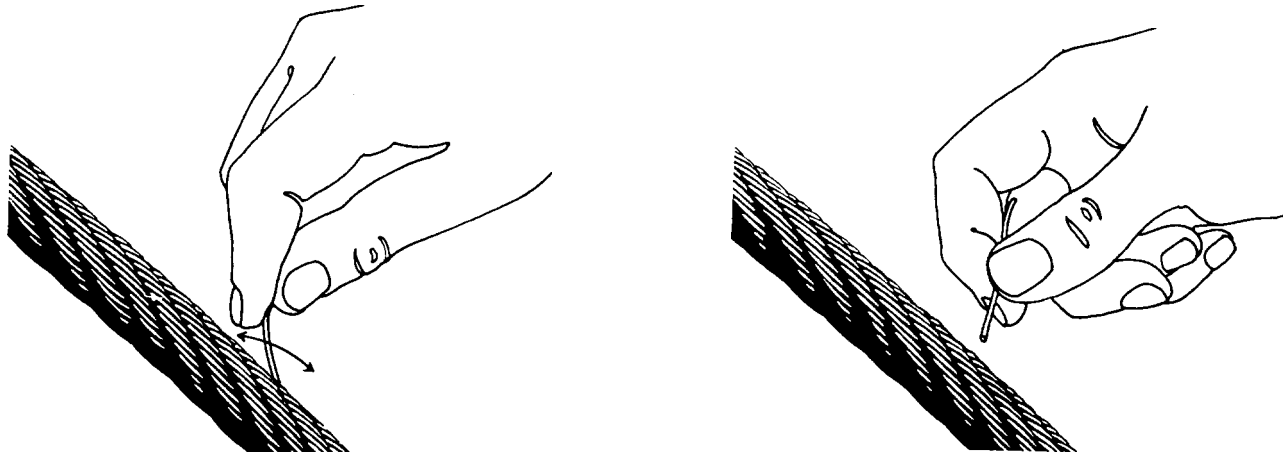


**Measurement of Lay Length**



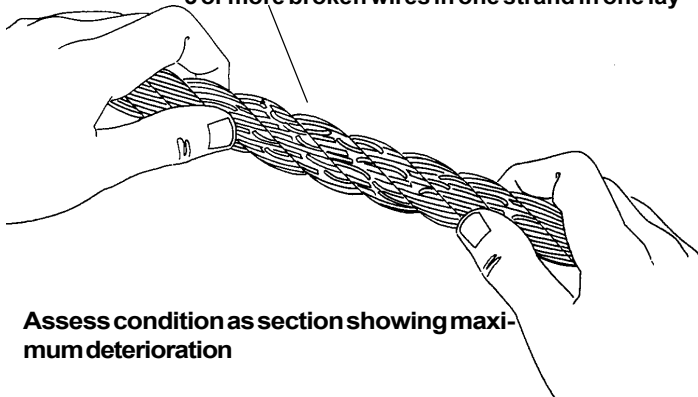
One revolution of a strand about the core

**Correct Way to Remove Broken Wires**



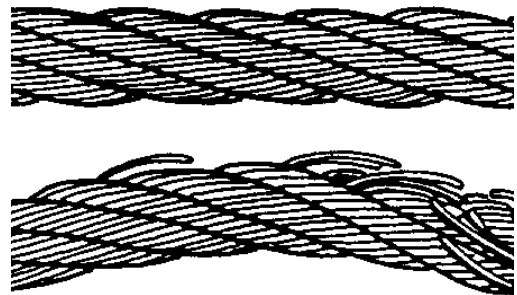
**Assessment of Broken Wires**

Replace wire rope if there are:  
-6 or more broken wires in one lay,  
-3 or more broken wires in one strand in one lay



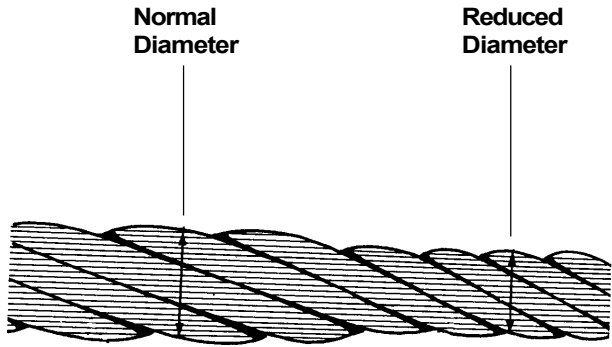
Assess condition as section showing maximum deterioration

**Flex Wire Rope During Inspection**

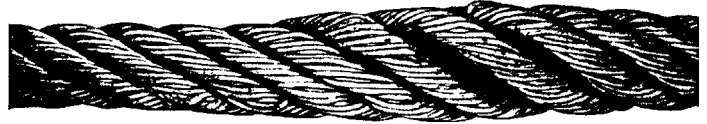


Flexing can reveal hidden breaks

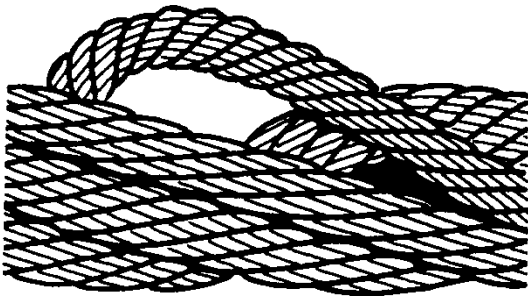
**Change in Wire Rope Diameter**



**Crushed Wire Rope**



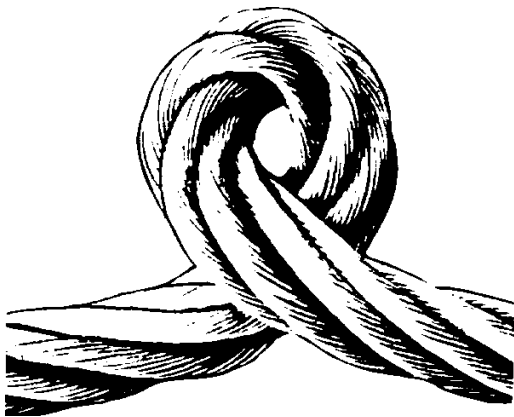
**Unlaying of Wire Rope**



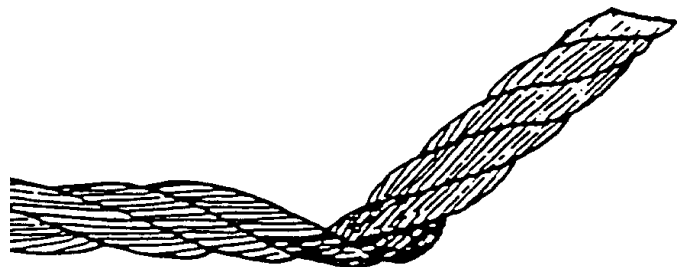
**Bird-caging of Wire Rope**



**Kinked Wire Rope**



**Bent Wire Rope**



## 5.0 FORMAL INSPECTION

### ! CAUTION

Only MSA or parties with written authorization from MSA may make repairs to the HORIZON horizontal lifeline subsystem.

- 6.1 FORMAL INSPECTION FREQUENCY:** The HORIZON horizontal lifeline anchorage connecting subsystem must be formally inspected by a competent person other than the user at intervals of no more than six months. (The qualifications of a competent person are established by OSHA.) If the HORIZON horizontal lifeline subsystem is exposed to severe working conditions, more frequent formal inspections may be required. The frequency of inspection by a competent person should be established by the user's organization based on such factors as the nature and severity of workplace conditions, modes of use, and exposure time of the equipment. The competent person should perform a methodical and thorough visual and tactile inspection by following the inspection procedure in these instructions. The inspection results should be recorded in the Formal Inspection Log and retained for reference. In addition, if the HORIZON horizontal lifeline anchorage connecting subsystem passes Formal Inspection, the competent person should mark the date (month/year) of Formal Inspection on the grid supplied with the labels on each HORIZON horizontal lifeline anchorage connecting subsystem. The user should never punch this grid; however, the user should check it before each use to be sure a Formal Inspection has been performed within the last six months.
- 6.2 CONTROL OF EQUIPMENT:** The user's organization should establish and enforce a policy and procedure whereby any HORIZON horizontal lifeline anchorage connecting subsystem that is found to be defective, damaged, or in need of maintenance be immediately removed from use, marked as "UNUSABLE" and immediately thereafter submitted to custody of the competent person responsible for Formal Inspection. This has the benefits that: a) defective equipment is secured from further use until proper action is taken; b) uniform standards are applied for determining whether the equipment is acceptable or not acceptable for further use; c) uniform methods of cleaning and other maintenance are applied; and d) there is a central point for evaluation of conditions that may be recurring and require preventive measures such as coordination with the equipment manufacturer, selection of alternate equipment, additional training of equipment users, or changes to the workplace conditions.
- 6.3 FORMAL INSPECTION PROCEDURE:** The Formal Inspection Procedure is similar to the user's inspection before each use described in these instructions. However, it differs in three important respects, namely: a) it is performed by a competent person other than the user who is trained and authorized to perform Formal Inspection for the user's organization; b) it is more detailed and is methodically recorded on a Formal Inspection Log that is kept on file for future reference; and c) it results in final disposition of the equipment as either "acceptable" (indicated by the formal inspector marking the current month/year in the Formal Inspection Grid on one of the product labels) or as "not acceptable" followed by destruction of the product. The described detailed inspection record keeping is needed in order to trace detected defects to their causes. A simplified alternative procedure is also explained below.

There are three forms that are important to the Formal Inspection Procedure. They are the Formal Inspection Diagram ("DIAGRAM"), the Formal Inspection Log ("LOG"), and the Formal Inspection Checklist ("CHECKLIST"). These forms relate and refer to each other so it is necessary to understand their purposes and uses before discussing the inspection procedure.

- 6.3.1 DIAGRAM:** This is a line drawing of the HORIZON horizontal lifeline anchorage connecting subsystem components with numbered callouts of the parts. The numbers called out in the diagram correspond to those shown on the column titled "INSP. POINT" on the LOG.
- 6.3.2 LOG:** This is the form to be used to record observations made during the Formal Inspection. The Model No., Serial No. and Date Made are recorded by the inspector from the information on the cover of this User Instruction and from the product label. The formal inspector's name and the inspection date are entered by the inspector. The "Disposition" entry is the last entry made on this form after all observations have been recorded. The entry is either "Acceptable" (A) or "Not Acceptable" (N). The columns on the LOG are as follows:

**INSP. POINT** - Inspection point. The HORIZON horizontal lifeline anchorage connecting subsystem part designated in the callouts on the DIAGRAM.

**DESCRIPTION** - Name of the HORIZON horizontal lifeline anchorage connecting subsystem inspection point. There are three broad categories of inspection points, namely, metallic parts, wire rope (cable) and non-metallic parts.

**QTY/H** - Quantity per HORIZON horizontal lifeline anchorage connecting subsystem. The quantity of each HORIZON horizontal lifeline anchorage connecting subsystem inspection point that must be inspected.

**PTY** - Priority. A Priority "1" indicates a critical part. If one or more not acceptable conditions are found by inspection of Priority

1 parts, the HORIZON horizontal lifeline subsystem is not acceptable for use. A Priority "2" indicates a non-critical part. If three or more not acceptable conditions are found by inspection of Priority 2 parts, the HORIZON horizontal lifeline anchorage connecting subsystem is not acceptable for use.

**COND.** - Condition. The condition of the HORIZON horizontal lifeline anchorage connecting subsystem part is indicated here by entry of the appropriate Condition Code shown on the CHECKLIST (e.g. M0, C0, N0 etc.). Alternatively, the inspector may simply enter "FAIL" if a defective condition exists and make no entry if no defect exists.

**OVERALL ASSESS.** - Overall assessment. The inspector's evaluation of the overall acceptability or non-acceptability of the part category (i.e. metallic, non-metallic). The appropriate Overall Assessment Code defined on the CHECKLIST is entered here (e.g. MA, CA, NA ). Alternatively, the inspector may simply enter "FAIL" if a defective condition exists and make no entry if no defect exists.

**COMMENTS** - Indicate pertinent inspector observations here.

**6.3.3 CHECKLIST AND CODES:** This is a table which categorizes the different types of HORIZON Horizontal Lifeline parts into two broad categories (i.e. metallic, non-metallic). For each of these categories, the formal inspector checks the HORIZON horizontal lifeline anchorage connecting subsystem parts for each of the associated conditions (e.g. deformed, fractured, missing, loose, etc.). The codes for the detected conditions are entered in the Condition column on the LOG (e.g. M0, C0, N2, etc.). Overall assessment codes are given, along with the criteria for assigning them, so the inspector can decide if the HORIZON horizontal lifeline anchorage connecting subsystem is acceptable or not acceptable for further use (e.g. MA, CN, NN). Alternatively, instead of using these codes, the inspector may simply enter "FAIL" if a defective condition exists and make no entry if no defect exists.

#### **6.3.4 FORMAL INSPECTION PROCEDURAL STEPS:**

**Step 1:** Record on the LOG the Model No., Serial No. and Date Made information shown on this User Instruction and from the product labels. Record the inspector's name and inspection date.

**Step 2:** Arrange the HORIZON horizontal lifeline anchorage connecting subsystem components so the parts to be inspected are readily visible.

**Step 3:** Starting with the metallic category of parts shown on the LOG, inspect each part (inspection point) one at a time. Refer to the DIAGRAM for identification of each Inspection Point. Each part must be inspected for the possible presence of the conditions shown on the CHECKLIST. Enter in the Condition column on the LOG the proper Condition Code (listed on the CHECKLIST) or "FAIL" if a defect exists. If there is any question whether the HORIZON horizontal lifeline subsystem condition has materially changed since the last Formal Inspection, retrieve and review the prior Formal Inspection records for the specific HORIZON horizontal lifeline anchorage connecting subsystem installation.

**Step 4:** Repeat steps 2 and 3 for the non-metallic categories of part types.

**Step 5:** Determine whether the part (inspection point) is acceptable or not acceptable. If a Priority 1 inspection point has a defective condition, enter in the Overall Assessment column of the LOG the proper code taken from the CHECKLIST (e.g. MN, NN) or simply "FAIL." For Priority 2 inspection points, count the number of defective conditions identified in the Condition column of the LOG. If there is a total of three or more defective conditions for Priority 2 inspection points the HORIZON horizontal lifeline anchorage connecting subsystem is not acceptable for further use.

**Step 6:** Determine disposition of the HORIZON horizontal lifeline anchorage connecting subsystem. If in step 6 it has been determined that the HORIZON horizontal lifeline anchorage connecting subsystem is not acceptable, enter "N" or "FAIL" in the Disposition space on the LOG. In addition, a notation should be made in this space as to whether the HORIZON horizontal lifeline anchorage connecting subsystem is to be destroyed, returned to manufacturer/distributor, etc.

**Step 7:** If in step 5 it has been determined that the HORIZON horizontal lifeline anchorage connecting subsystem is acceptable for further use, enter "A" or "PASS" in the Disposition space on the LOG. Mark the Formal Inspection Grid on the appropriate HORIZON horizontal lifeline subsystem component label with the date (month/year) corresponding to the inspection date to indicate to HORIZON horizontal lifeline subsystem users that the product has passed inspection as of that date.

**Step 8:** File the LOG for future reference.



6.4 FORMAL INSPECTION CHECKLIST AND CODES

TYPE OF PART INSPECTED	CONDITION	COND. CODE	OVERALL ASSESSMENT CODE	LEGEND	
Metallic	Deformed/fractured	M1	MA - (Metallic acceptable) MN - (Metallic not acceptable)	<b>Disposition:</b> A - (Acceptable) N - (Not acceptable)  Enter "A" (or "PASS") or "N" (or "FAIL") in "Disposition" blank on Formal Inspection Log.  <b>Criteria for disposition of "N" (Not acceptable):</b>  (1) If there is one or more Overall Assessment Code of "N" type (e.g. MN, CN or NN) on a Priority 1 item.	
	Corroded/deep pits	M2			
	Missing/loose	M3			
	Heat exposure	M4			
	Chemical exposure	M5			
	Burrs/sharp edges	M6			
	Cuts/deep nicks	M7			
	Malfunction	M8			
	Other	M9			
	No visible change	M0			
Non-Metallic	Cut/broken	N1	NA - (Non-Metallic acceptable) NN - (Non-Metallic not acceptable)		
	Wear damage	N2			
	Missing/loose	N3			
	Burns/heat exposure	N4			
	Chemical exposure	N5			
	Cracked/Split	N6			
	Other	N7			
	No visible change	N0			
Wire rope (cable)	Cut/broken wire	C1	CA - (Cable acceptable) CN - (Cable not acceptable)		
	Abrasion/wear/corrosion	C2			
	Partially missing/altered	C3			
	Burns/heat exposure	C4			
	Chemical exposure	C5			
	Kinked/unlaid strands	C6			
	Reduced diameter	C7			
	Malfunction	C8			
	Other	C9			
	No visible change	C0			

6.5 FORMAL INSPECTION LOG, EXAMPLE

**HORIZON Horizontal Lifeline Anchorage Connecting Subsystem Components**

*BeamGrip Anchorage Connector*  
 Model No.: 506682 Serial No.: 437581 Inspector: J. W. Doe Date Made: 5/92  
*BeamGrip By-Pass Stanchion*  
 Model No.: 506647 Serial No.: 437581 Inspection Date: 12/13/92 Disposition: N -  
*BeamGrip End Stanchion*  
 Model No.: 506646 Serial No.: 437581 See item 29. Return for factory repair.  
*HORIZON Shock Absorber with Integral Turnbuckle*  
 Model No.: 415836 Serial No.: 437581  
*Horizontal Lifeline*  
 Model No.: 506648 Serial No.: 437581 *Cable Clamp* Model No.: 506645 Serial No.: 437581  
*BeamGrip Stanchion Insert* Model No.: 506665 Serial No.: 437581 *3/8" Wire Rope Clip* Model No.: 506649 Serial No.: 437581

**Inspection Log Notes:**

- (a) Optional simplified PASS/FAIL inspection format: Whenever an acceptable condition is found, the entry in the COND. and OVERALL ASSESS. columns may be left blank. Whenever a defective condition is found enter "FAIL." The inspection may end upon detection of a single Priority 1 defect.
- (b) Quantity for each component will depend upon the specific installation, user to determine and write in on User Inspection Log.

## 6.5 FORMAL INSPECTION LOG, EXAMPLE, continued

INSP. POINT	DESCRIPTION	QTY/H	PTY	COND (a)	OVERALL ASSESS.(a)	COMMENTS	
<b>METALLIC PARTS</b>							
<b>BeamGrip Anchorage Connector (b)</b>							
1	Rectangular Tube	3	1	M7	MA	Scratches, not damaged	
2	Plates	2	1	M0	MA		
3	Knob	1	1	M0	MA		
4	Weld Joints	ALL	1	M0	MA		
<b>BeamGrip By-Pass Stanchion (b)</b>							
5	Fingers	2	1	M0	MA		
6	Base Plate	1	1	M0	MA		
7	Rectangular Tube	1	1	M0	MA		
8	Weld Joints	ALL	1	M0	MA		
<b>BeamGrip End Stanchion (b)</b>							
9	Pins	2	1	M0	MA		
10	Side Plate	2	1	M0	MA		
11	Rectangular Tube	2	1	M0	MA		
12	Inner and Outer Telescope Tubes	ALL	1	M0	MA		
13	Cable Guide	1	1	M0	MA		
14	Tab, Shock Absorber Mounting	1	1	M0	MA		
15	Plate, Cable Clamp Mounting	1	1	M0	MA		
16	Bolt, Nut and Pin	3 sets	1	M0	MA		
17	Weld Joints	1	1	M0	MA		
<b>HORIZON Shock Absorber with Integral Turnbuckle</b>							
18	Frame	1	1	M0	MA		
19	Jaw	1	1	M0	MA		
20	Bolt and Nut with Cotter	1	1	M0	MA		
21	Turnbuckle Frame	1	1	M0	MA		
22	Turnbuckle Lock Nut	1	1	M0	MA		
23	Shock Absorber Tube	1	1	M0	MA		
24	Red Washer	1	1	M0	MA		
25	Lock Nut	1	1	M0	MA		
<b>Horizontal Lifeline</b>							
26	Wire Rope	(b)	1	C0	CA		
27	Jaw	1	1	C0	CA		
28	Bolt & Nut with Cotter, Washer, Inserts	1 set	1	C0	CA		
<b>Cable Clamp</b>							
29	Plates	2	1	M1	MN	Frame bent, doesn't adjust	
30	Clamp Bolts	6	1	M0	MA		
31	Mounting Bolts	4	1	M0	MA		
<b>BeamGrip Stanchion Insert</b>							
32	Tubing	1	1	M0	MA		
33	Welds	ALL	1	M0	MA		
<b>3/8" Wire Rope Clip</b>							
34	U-bolt with 2 Nuts	1	1	M0	MA		
35	Clamp	1	1	M0	MA		
<b>NON-METALLIC PARTS</b>							
36	Label, Beam Grip Anch. Connector	3	1	N0	NA	Scuffed, still legible	
37	Label, Knob Warning	2	1	N0	NA		
38	Label, HORIZON Shock Absorber	2	1	N2	NA		
39	Label, Stanchion	2	1	N0	NA		
40	Label, Clamp Torque Instructions	1	1	N0	NA		
41	Label, By-Pass Stanchion	1	1	N2	NA		

**6.5 FORMAL INSPECTION LOG**

**HORIZON Horizontal Lifeline Anchorage Connecting Subsystem Components**

*BeamGrip Anchorage Connector*

Model No.: \_\_\_\_\_ Serial No.: \_\_\_\_\_ Inspector: \_\_\_\_\_ Date Made: \_\_\_\_\_

*BeamGrip By-Pass Stanchion*

Model No.: \_\_\_\_\_ Serial No.: \_\_\_\_\_ Inspection Date: \_\_\_\_\_ Disposition: \_\_\_\_\_

*BeamGrip End Stanchion*

Model No.: \_\_\_\_\_ Serial No.: \_\_\_\_\_

*HORIZON Shock Absorber with Integral Turnbuckle*

Model No.: \_\_\_\_\_ Serial No.: \_\_\_\_\_

*Horizontal Lifeline*

Model No.: \_\_\_\_\_ Serial No.: \_\_\_\_\_

*Cable Clamp*

Model No.: \_\_\_\_\_ Serial No.: \_\_\_\_\_

*BeamGrip Stanchion Insert*

Model No.: \_\_\_\_\_ Serial No.: \_\_\_\_\_

*3/8" Wire Rope Clip*

Model No.: \_\_\_\_\_ Serial No.: \_\_\_\_\_

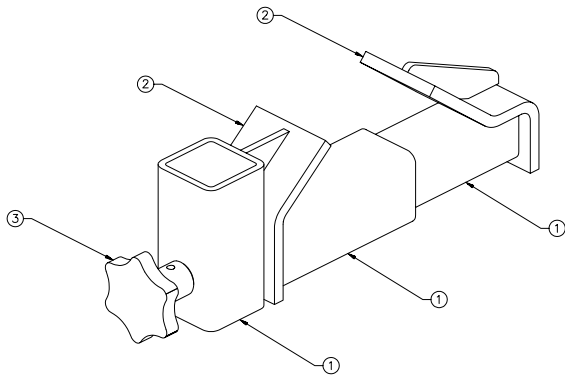
**Inspection Log Notes:**

- (a) Optional simplified PASS/FAIL inspection format: Whenever an acceptable condition is found, the entry in the COND. and OVERALL ASSESS. columns may be left blank. Whenever a defective condition is found enter "FAIL." The inspection may end upon detection of a single Priority 1 defect.
- (b) Quantity for each component will depend upon the specific installation, user to determine and write in on User Inspection Log.

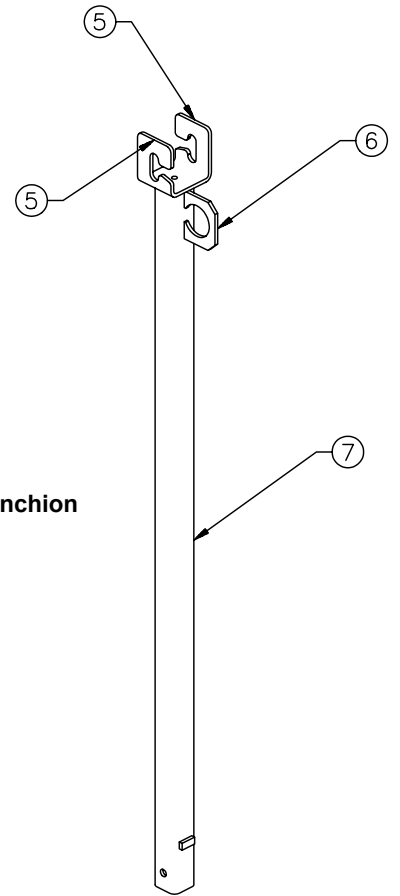
## 6.5 FORMAL INSPECTION LOG, continued

INSP. POINT	DESCRIPTION	QTY/H	PTY	COND (a)	OVERALL ASSESS.(a)	COMMENTS
<b>METALLIC PARTS</b>						
<b>BeamGrip Anchorage Connector (b)</b>						
1	Rectangular Tube	3	1			
2	Plates	2	1			
3	Knob	1	1			
4	Weld Joints	ALL	1			
<b>BeamGrip By-Pass Stanchion (b)</b>						
5	Fingers	2	1			
6	Base Plate	1	1			
7	Rectangular Tube	1	1			
8	Weld Joints	ALL	1			
<b>BeamGrip End Stanchion (b)</b>						
9	Pins	2	1			
10	Side Plate	2	1			
11	Rectangular Tube	2	1			
12	Inner and Outer Telescope Tubes	ALL	1			
13	Cable Guide	1	1			
14	Tab, Shock Absorber Mounting	1	1			
15	Plate, Cable Clamp Mounting	1	1			
16	Bolt, Nut and Pin	3 sets	1			
17	Weld Joints	1	1			
<b>HORIZON Shock Absorber with Integral Turnbuckle</b>						
18	Frame	1	1			
19	Jaw	1	1			
20	Bolt and Nut with Cotter	1	1			
21	Turnbuckle Frame	1	1			
22	Turnbuckle Lock Nut	1	1			
23	Shock Absorber Tube	1	1			
24	Red Washer	1	1			
25	Lock Nut	1	1			
<b>Horizontal Lifeline</b>						
26	Wire Rope	(b)	1			
27	Jaw	1	1			
28	Bolt & Nut with Cotter, Washer, Inserts	1 set	1			
<b>Cable Clamp</b>						
29	Plates	2	1			
30	Clamp Bolts	6	1			
31	Mounting Bolts	4	1			
<b>BeamGrip Stanchion Insert</b>						
32	Tubing	1	1			
33	Welds	ALL	1			
<b>3/8" Wire Rope Clip</b>						
34	U-bolt with 2 Nuts	1	1			
35	Clamp	1	1			
<b>NON-METALLIC PARTS</b>						
36	Label, Beam Grip Anch. Connector	3	1			
37	Label, Knob Warning	2	1			
38	Label, HORIZON Shock Absorber	2	1			
39	Label, Stanchion	2	1			
40	Label, Clamp Torque Instructions	1	1			
41	Label, By-Pass Stanchion	1	1			

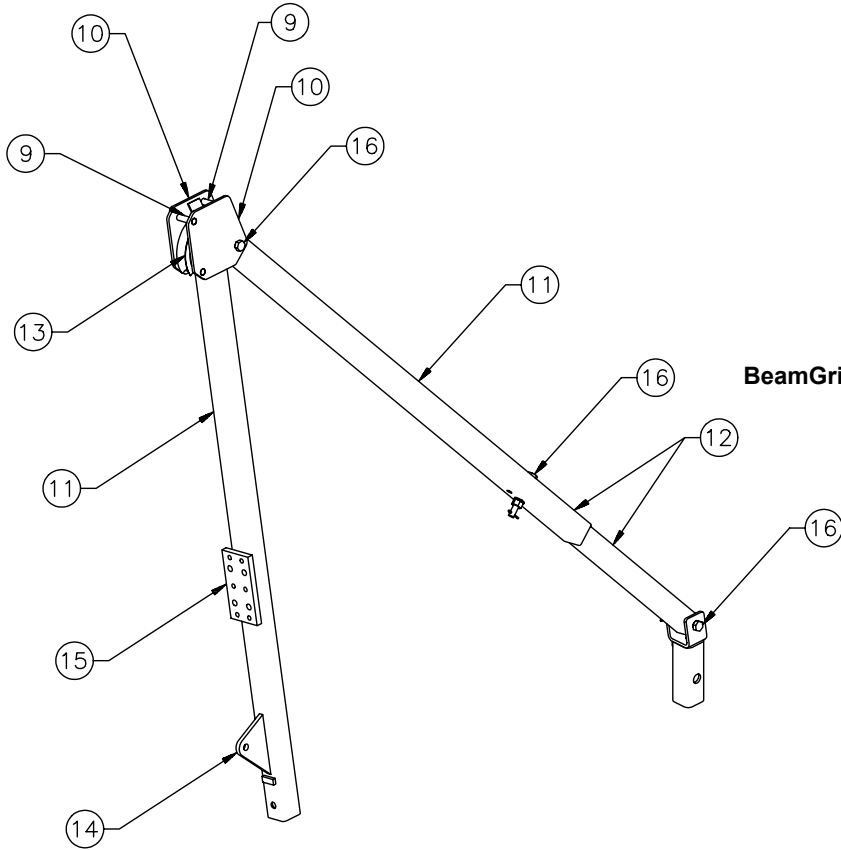
6.6 FORMAL INSPECTION DIAGRAMS



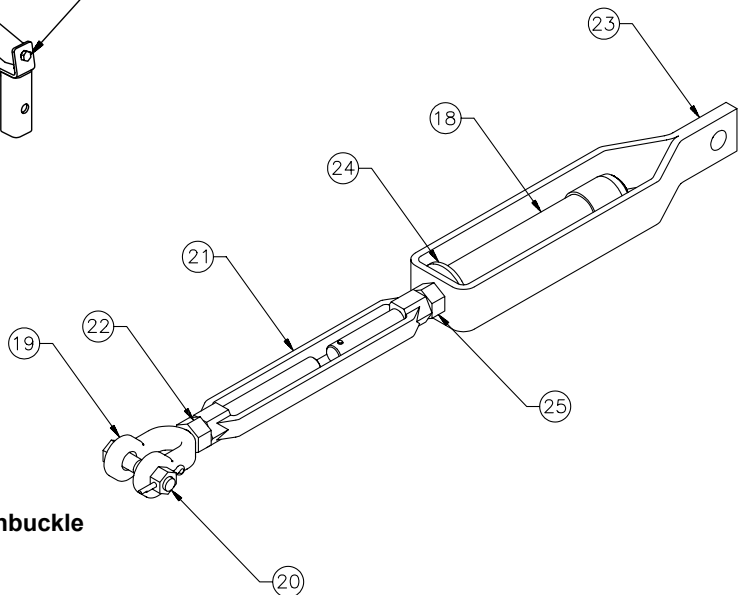
BeamGrip By-Pass Stanchion



BeamGrip Anchorage Connector

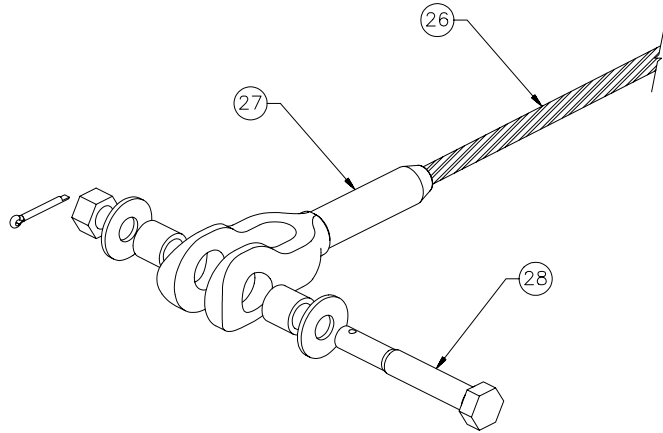


BeamGrip End Stanchion

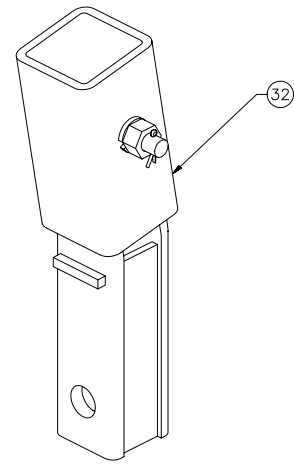


HORIZON Shock Absorber with Integral Turnbuckle

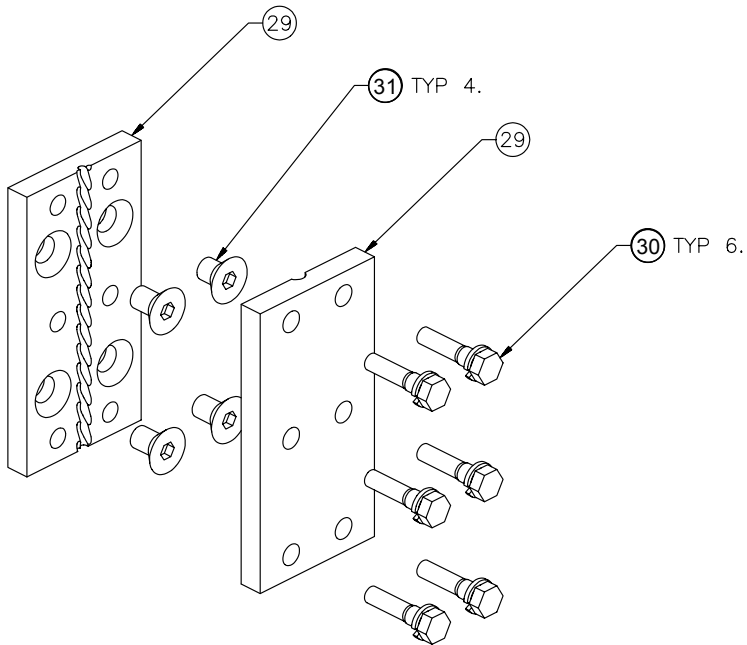
6.6 FORMAL INSPECTION DIAGRAMS



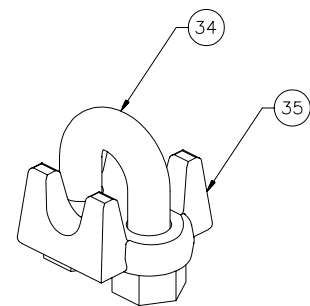
Horizontal Lifeline Cable



BeamGrip Stanchion Insert



BeamGrip Cable Clamp



3/8" Wire Rope Clip

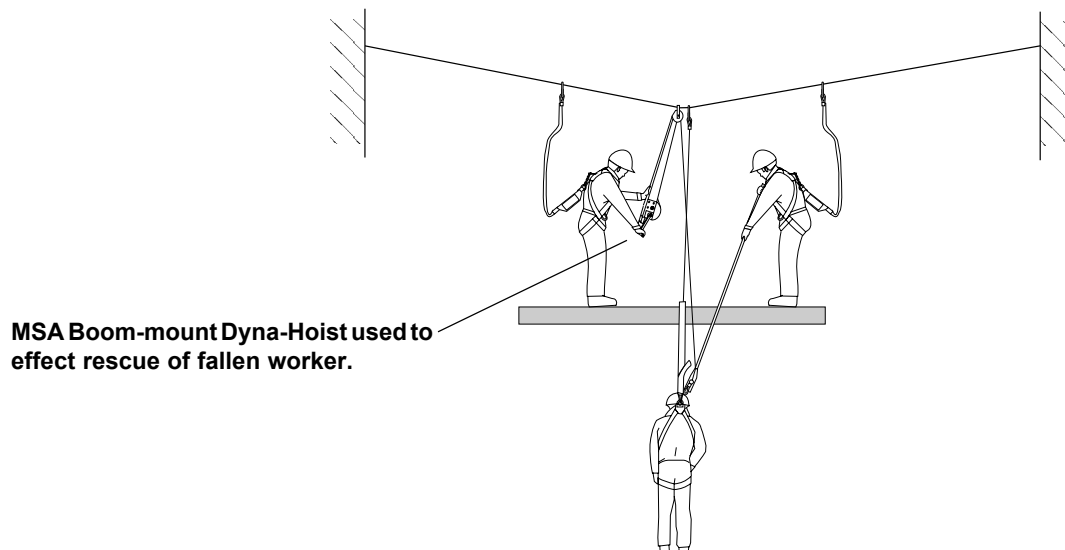


# USER INSTRUCTIONS

## MSA HORIZON™

### IV. Rescue Horizontal Lifeline Anchorage Connecting Subsystem

The user must have a rescue plan and the means at hand to implement it. The plan must take into account the equipment and special training necessary to effect prompt rescue under all foreseeable conditions. Although a rescue plan and the means to implement it must always be in place, it is a good idea to provide means for user evacuation without assistance of others. This will usually reduce the time to get to a safe place and reduce or prevent the risk to rescuers. MSA offers a complete Rescue and Evacuation subsystem for use with the HORIZON horizontal lifeline subsystem, see diagram for subsystem components. Contact MSA for more information. See separate instructions.





## USER INSTRUCTIONS

### MSA HORIZON™

## V. Appendix A - Components of Horizontal Lifeline Anchorage Connecting Subsystems

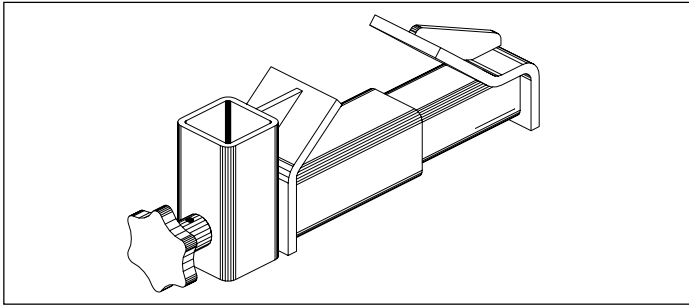
### 1.0 HORIZON HORIZONTAL LIFELINE SUBSYSTEM COMPONENTS

This appendix contains information for all of the available components used in the several HORIZON horizontal lifeline anchorage connecting subsystem types. Each unique installation will include only the components needed for use with the subsystem type chosen. Subsystem types are available for use with: beams, columns, flying steel, railroad rails, concrete structures and other user specified types. This information includes: component dimensions, illustrations, specifications and labels and markings. The table in Chapter II shows the components needed for the particular subsystem type to be installed. Many of the components described are part of more than one of the subsystem types. Contact MSA with questions regarding the components required to create a particular subsystem type.

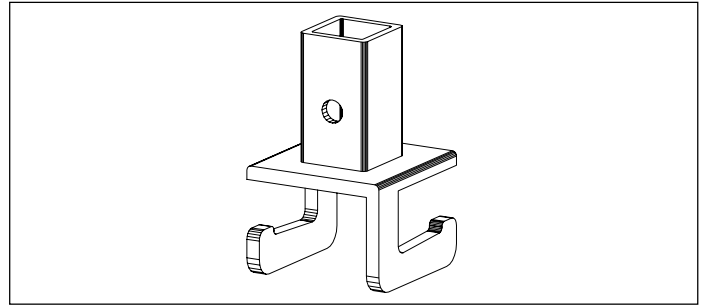
Part No.	Component	Dimension		Approximate Weight	
		(inch)	(cm)	lbs	kg
506682	BeamGrip Anchorage Connector	13.3 x 5.1 x 3	(33.8 x 13 x 7.6)	16	7.3
506636	BeamGrip By-pass	8.3 x 3 x 2.8	(21 x 7.6 x 7.1)	2.4	1.1
506637	BeamGrip End Fitting	7 x 2.5 x 2	(17.8 x 6.4 x 5.1)	2.1	1.0
506646	BeamGrip End Stanchion	3.8 x 8.8 x 70	(9.7 x 22.4 x 178)	52	23.6
506647	BeamGrip By-Pass Stanchion	3 x 3.8 x 55.3	(7.6 x 9.7 x 140)	30	13.6
506665	BeamGrip Stanchion Insert	2.5 x 3.8 x 11	(6.4 x 9.7 x 28)	7	3.2
415836	HORIZON Shock Abs. w/ Tbuckle	22 x 2 x 1.2	(22.1 x 5.1 x 3)	3.5	1.6
506648	Horizontal Lifeline	0.4 x length	(1 x length)	0.24 /ft	0.4 /m
506662	12" Turnbuckle with Plate	19 x 1.9 x 1.1	(48.3 x 4.8 x 2.8)	2.4	1.1
506563	Open Wedge Socket with Cable Clamp	6.8 x 3.5 x 2	(17.3 x 8.9 x 5.1)	4.6	2.1
506649	3/8" Cable Clip	1.9 x 1.9 x 1.6	(4.8 x 4.8 x 4.1)	0.5	0.2
506645	Cable Clamp	0.5 x 3 x 6	(1.3 x 7.6 x 15)	6.3	2.9
415171	Beam Grip Anchorage Connector	17.2 x 5.1 x 3		18.4	8.4
415172	Beam Grip Anchorage Connector	29.15 x 5.1 x 3		20.6	9.3
415173	Beam Grip Anchorage Connector	34.1 X 5.1 x 3		22.8	10.3
10015183	Starpass™ Flow Through By-Pass	10 x 12 x 7		6.9	
10015184	Starpass™ Glider	6 x 2.75 x 1.625		0.85	



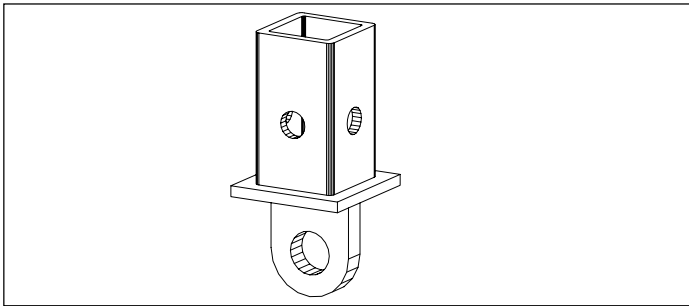
**2.0 COMPONENT ILLUSTRATIONS**



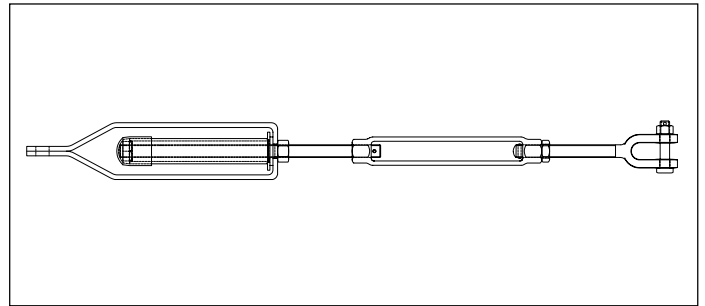
**BeamGrip Anchorage Connector**



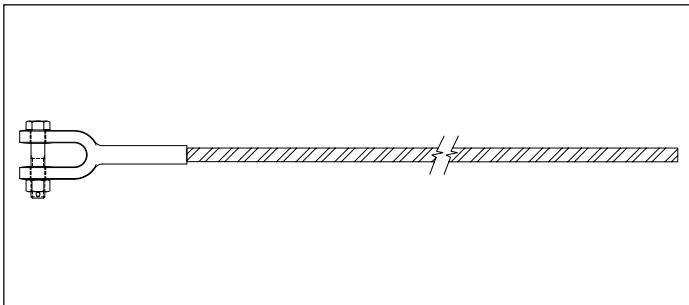
**BeamGrip By-Pass Fitting**



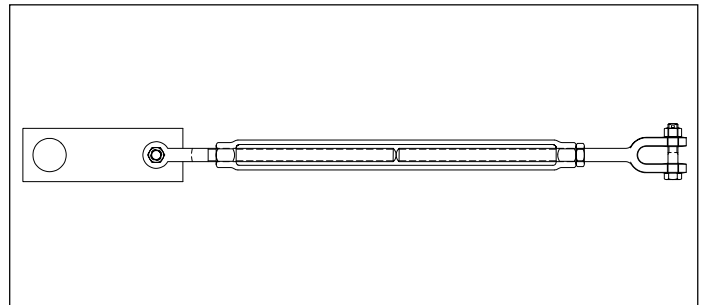
**BeamGrip End Fitting**



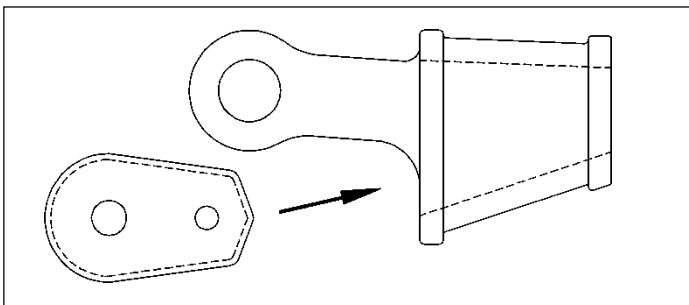
**HORIZON Shock Absorber with Integral Turnbuckle**



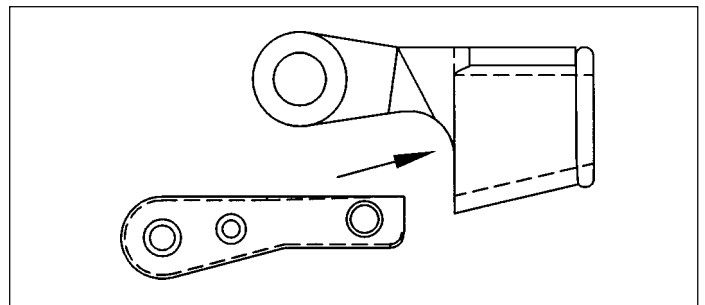
**Horizontal Lifeline Cable**



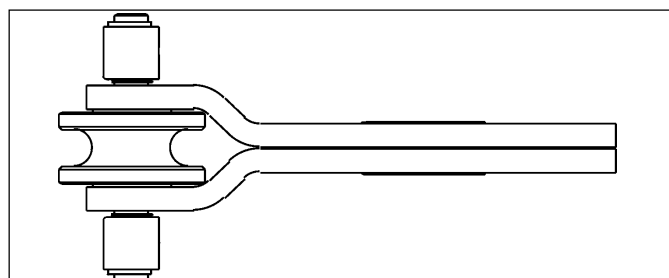
**12" Turnbuckle with Plate**



**Open Wedge Socket**

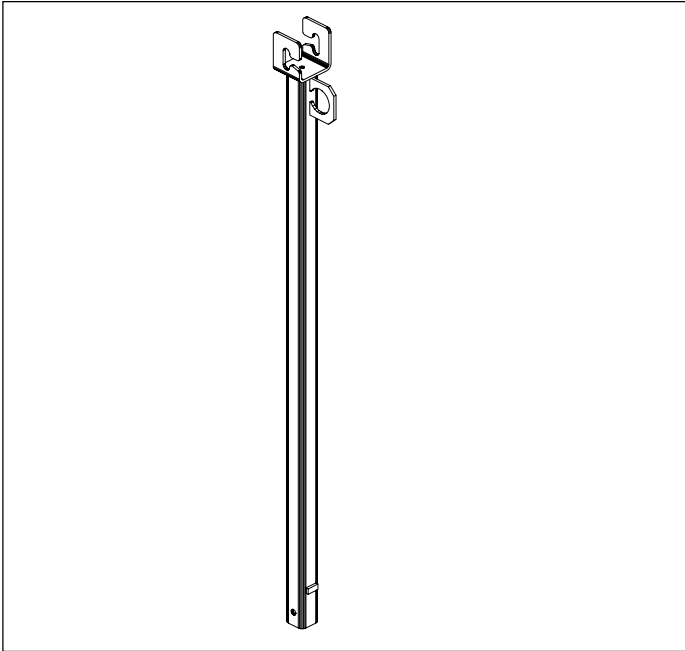


**Open Wedge Socket Alternate Design**

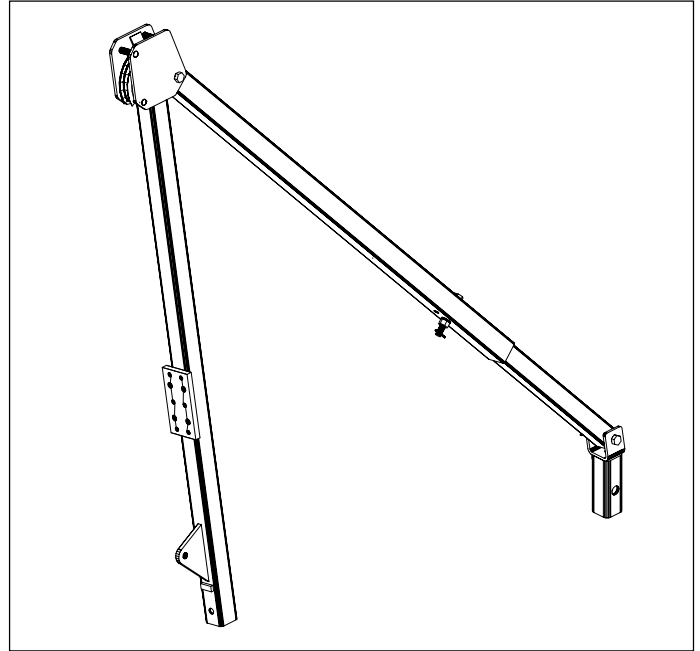


**Starpass Glider**

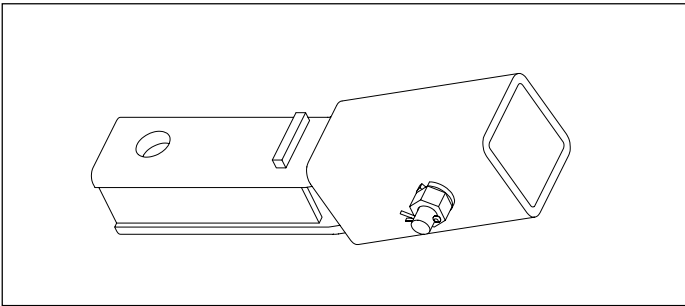
**2.0 COMPONENT ILLUSTRATIONS, CONTINUED**



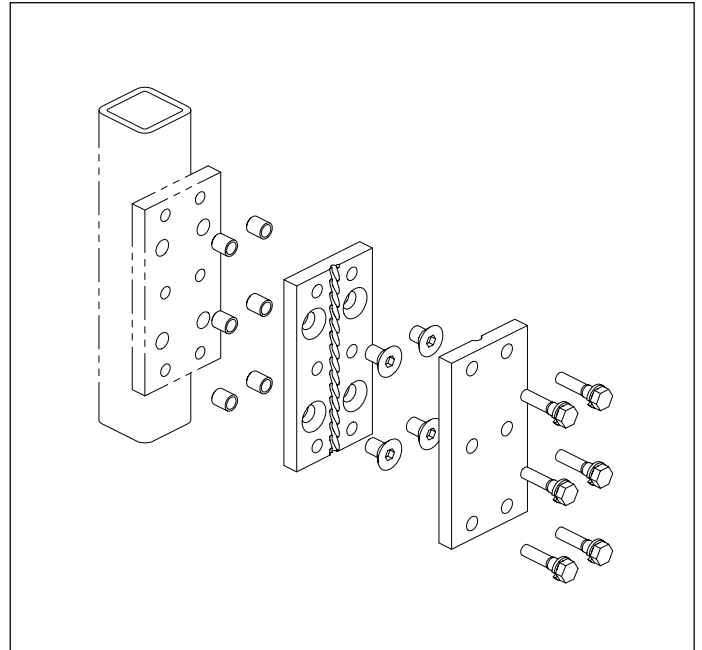
**BeamGrip By-Pass Stanchion**



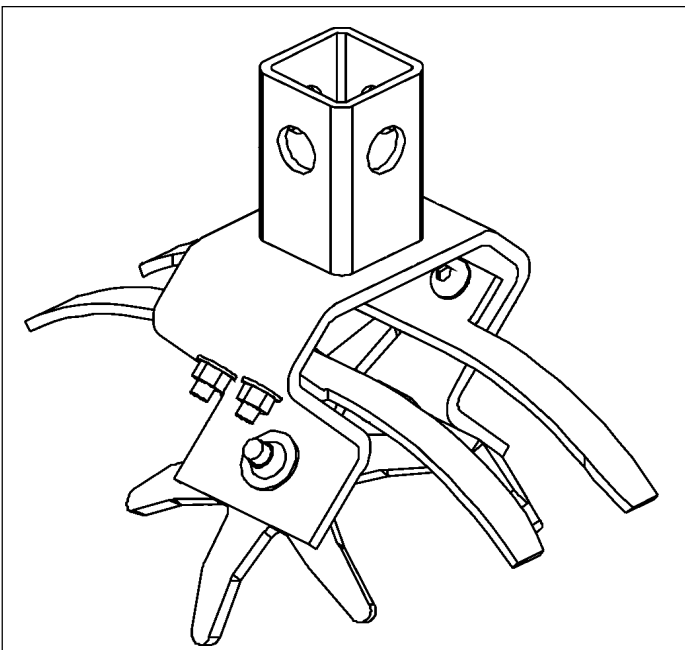
**BeamGrip End Stanchion**



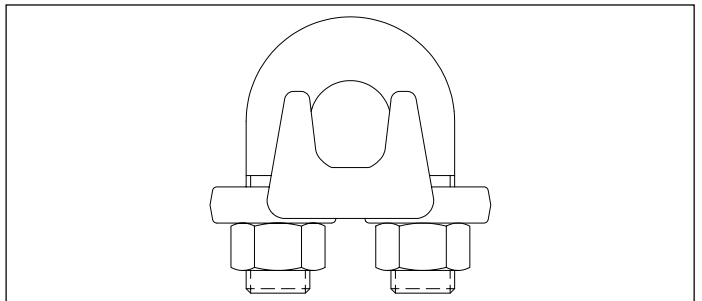
**BeamGrip Stanchion Insert**



**Cable Clamp**



**Starpass Flow Through By-Pass**



**3/8" Wire Rope Clip**

## 3.0 COMPONENT SPECIFICATIONS



### 3.1 HORIZON HORIZONTAL LIFELINE SUBSYSTEM COMPONENTS


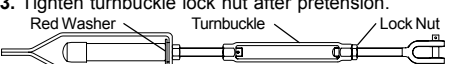

- 3.1.1 BEAMGRIP ANCHORAGE CONNECTOR:** P/N 506682, installed to a suitable beam or column anchorage, serves to mount either the BeamGrip By-Pass Fitting (P/N 506636) or the BeamGrip End Fitting (P/N 506637) for suspension systems, or, the BeamGrip By-Pass Stanchion (P/N 506647) or the BeamGrip End Stanchion (P/N 506646) for stanchion systems. One BeamGrip Anchorage Connector is required at either end of the lifeline, and one is required at each intermediate support (up to 40' intervals) interval along the length of the installation. The BeamGrip Anchorage Connector may be attached to the underside of a suitable beam or in an inverted position to the top of a suitable beam.
- 3.1.2 BEAMGRIP BY-PASS FITTING:** P/N 506636, is mounted to the BeamGrip Anchorage Connector (P/N 506682) at no more than 40 ft (12 m) intervals along the length of the installation. The lifeline is reeved through the fingers of the By-Pass and is elevated to the level of the By-Pass. The By-Pass is a load-bearing component integral to the function of the HORIZON horizontal lifeline subsystem. The fitting permits the user to travel the length of the lifeline without disconnecting from the system.
- 3.1.3 BEAMGRIP BY-PASS STANCHION:** P/N 506647, is mounted to the BeamGrip Anchorage Connector (P/N 506682) at no more than 40 ft (12 m) intervals along the length of the installation. The lifeline is reeved through the fingers of the By-Pass and is elevated to the level of the By-Pass. The By-Pass is a load-bearing component integral to the function of the HORIZON horizontal lifeline subsystem. The fitting permits the user to travel the length of the lifeline without disconnecting from the system.
- 3.1.4 BEAMGRIP END FITTING (2):** P/N 506637, is mounted to the BeamGrip Anchorage Connector (P/N 506682) at each end of the lifeline, and secures the lifeline to the anchorages at either end of the installation.
- 3.1.5 BEAMGRIP END STANCHION (2):** P/N 506646, is mounted to the BeamGrip Anchorage Connector (P/N 506682) at each end of the lifeline, and secures the lifeline to the anchorages at either end of the installation.
- 3.1.6 BEAMGRIP STANCHION INSERT (AS REQUIRED):** P/N 506665, is mounted to the BeamGrip Anchorage Connector (P/N 506682) at each support location (end stanchion or by-pass stanchion) along the length of the installation. The insert adapts the BeamGrip anchorage connector to mount the stanchion ends or by-passes.
- 3.1.7 HORIZON SHOCK ABSORBER WITH INTEGRAL TURNBUCKLE:** P/N 415836, joins one end of the lifeline to the Beam Grip End Fitting. The shock absorber reduces the amplified forces which would otherwise be transferred to the structural anchorages during a fall. This turnbuckle is used during final tension adjustment to set the proper line tension and sag angle.
- 3.1.8 HORIZONTAL LIFELINE:** P/N 506648, is a length of 3/8 in (10 mm) diameter wire rope with a minimum tensile strength of 14,400 lbs (64.4 kN) which serves as an anchorage connector for a mobile personal fall arrest system.
- 3.1.9 12" TURNBUCKLE WITH PLATE:** P/N 506662, joins one end of the lifeline to the Beam Grip End Fitting opposite the shock absorber. This turnbuckle is used to pre-tension the lifeline during initial installation.
- 3.1.10 OPEN WEDGE SOCKET:** P/N 506563, is an intermediate connector between the 12" Turnbuckle with Plate (P/N 506662) and the Horizontal Lifeline (P/N 506648). The Open Wedge Socket provides a suitable connection that does not kink the lifeline, preventing release of the line from the end connection.
- 3.1.11 3/8" WIRE ROPE CLIP:** P/N 506649, clamps to the end of the lifeline and acts as a backup, preventing the end of the lifeline from reeving back through the Open Wedge Socket (P/N 506563).
- 3.1.12 CABLE CLAMP:** P/N 506645, clamps the end of the lifeline to the BeamGrip end stanchion.
- 3.1.13 STARPASS FLOW THROUGH BY-PASS:** P/N 10015183, is mounted to the BeamGrip Anchorage Connector (P/N 506682) at no more than 40 ft intervals along the length of the installation. Position the BeamGrip in a straight line with the other components. The lifeline is reeved above the stars so the cable will fit in the groove made by the fingers. The Starpass FT is a load-bearing component integral to the function of the HORIZON horizontal lifeline subsystem. The fitting permits the user to travel the length of the lifeline without disconnecting from the system.
- 3.1.14 STARPASS GLIDER:** P/N 10015184, attaches anywhere along the length of the cable. The Glider arms swing open to allow easy attachment to the cable. The arms must be closed prior to use and any MSA connector may be used to attach to the rings.

## 4.0 COMPONENT LABELS AND MARKINGS



### 4.1 HORIZON HORIZONTAL LIFELINE SUBSYSTEM COMPONENT LABELS AND MARKINGS

- 4.1.1 SHOCK ABSORBER:** Two labels, Lexan material, located on either side of the frame. Date of manufacture and Serial No. steel stamped on the frame.
- 4.1.2 BEAMGRIP ANCHORAGE CONNECTOR:** Four labels, two on each side, Lexan material, located on each side of the body. Includes the inspection grid.
- 4.1.3 STARPASS FLOW THROUGH BY-PASS:** Two labels, Lexan material. Date of manufacture and product name
- 4.1.4 STARPASS GLIDER:** Two labels, one on each side, Lexan material. Warning label, capacity label and date of manufacture stamped on side.

 <p><b>HORIZON®</b> HORIZONTAL LIFELINE SHOCK ABSORBER Made in U.S.A.</p> <p><b>Material:</b> Steel, Nickle plated    <b>Model:</b> 415836 <b>Free Fall Limit:</b> 6 ft (1.8 m) OSHA, ANSI Z359.1; 5 ft (1.5 m) ANSI <b>Meets:</b> OSHA requirements MSAFP, 2250 S. Tejon St., Englewood, CO 80110-1000, 1-800-672-2222</p> <p style="text-align: right;">P/N 622986 Rev A</p>	<p style="text-align: center;"> <b>CAUTION</b></p> <p>READ AND HEED USER INSTRUCTIONS BEFORE INSTALLING OR USING THIS PRODUCT. FAILURE TO DO SO MAY RESULT IN SERIOUS INJURY OR DEATH.</p> <ul style="list-style-type: none"> <li>■ System must be designed, installed and used under supervision of a qualified safety engineer.</li> <li>■ Must pretension lifeline before use.</li> <li>■ Maintain unobstructed space below lifeline, per instructions.</li> </ul>
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<p style="text-align: center;"> <b>CAUTION</b></p> <p><b>INSTALLATION- 1.</b> Connect horizontal lifeline shock absorber to anchorage and to lifeline per manufacturer's instructions. <b>2.</b> Tighten turnbuckle until red washer cannot move. Backoff turnbuckle ¼ turn, red washer must rotate. <b>3.</b> Tighten turnbuckle lock nut after pretension.</p>  <p style="text-align: right;">P/N 622987</p>	<p style="text-align: center;"> <b>CAUTION</b></p> <p><b>INSPECTION</b> - Inspect for malfunction and missing, broken, distorted, damaged, corroded, weakened or worn parts. See separate instructions for inspection details. If product is defective, deployed or if one year passes without formal inspection, remove from use. Label "UNUSABLE" until reinspected, repaired or destroyed.</p> <ul style="list-style-type: none"> <li>■ User must inspect before each use.</li> <li>■ A competent person must formally inspect at least every 6 months.</li> </ul>
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### HORIZON Shock Absorber with Integral Turnbuckle

 <p><b>BEAMGRIP™</b> Made in U.S.A.</p> <p><b>Model:</b> 506682 <b>Material:</b> Carbon Steel, Yellow Zinc Plated</p> <p><b>SPECIFICATIONS</b>- Use only with compatible MSA Horizon® Horizontal Lifeline components.</p> <p><b>Rated Capacity:</b> 12,500 lbf (55 kN).</p> <p><b>Beam Capacity:</b> flange width:</p> <table border="0"> <tr> <td>506682-001:</td> <td>6 in (15 cm) min., 8 in (20 cm) max.</td> </tr> <tr> <td>506682-002:</td> <td>8 in (20 cm) min., 10 in (25 cm) max.</td> </tr> <tr> <td>506682-003:</td> <td>10 in (25 cm) min., 12 in (30 cm) max.</td> </tr> </table> <p><b>Net Weight:</b> approximately 16 lbs (7.3 kg).</p> <p><b>MSA FP</b> 2250 South Tejon St. Englewood, CO 80110-1000 1-800-672-2222    P/N 623137 Rev A</p>	506682-001:	6 in (15 cm) min., 8 in (20 cm) max.	506682-002:	8 in (20 cm) min., 10 in (25 cm) max.	506682-003:	10 in (25 cm) min., 12 in (30 cm) max.	<p style="text-align: center;"> <b>WARNING</b></p> <p>READ AND HEED USER INSTRUCTIONS BEFORE INSTALLING OR USING THIS PRODUCT. FAILURE TO DO SO MAY RESULT IN SERIOUS INJURY OR DEATH.</p> <ul style="list-style-type: none"> <li>■ System must be designed, in stalled and used under supervision of a qualified person.</li> <li>■ Make sure the BeamGrip is properly seated on the beam and the adjusting knob is tightened completely before each use.</li> <li>■ Do not connect anything to the BeamGrip except compatible MSA Horizon® Horizontal Lifeline components.</li> <li>■ Only connect to beams of sufficient strength. (Beams must have sufficient torsional stiffness to carry loads.)</li> <li>■ Make sure loading will not degrade column strength.</li> <li>■ Do not connect to beams that may tilt, twist or move under loads.</li> </ul> <p style="text-align: right;">P/N 623138</p>
506682-001:	6 in (15 cm) min., 8 in (20 cm) max.						
506682-002:	8 in (20 cm) min., 10 in (25 cm) max.						
506682-003:	10 in (25 cm) min., 12 in (30 cm) max.						

### BeamGrip Anchorage Connector

**⚠ CAUTION**

**INSTALLATION**-(Removal = Perform steps 1-5 in reverse order.)

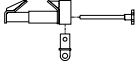
**Step 1.** Remove threaded rod by unscrewing knob. Insert appropriate fitting into BeamGrip socket.

**Step 2.** Re-insert threaded rod and spread the grip ends to clear the I-beam flange.


**Step 3.** Hook one end of grip to one side of I-beam flange.

**Step 4.** Attach other end of grip to opposite side of I-beam.


**Step 5.** Turn knob until BeamGrip is secured to the I-beam flange. Continue to turn knob until knob is flush against square tube. **Hand tighten.**  
(See separate instructions for installation details.)




Step 1.



Step 3.



Step 4.



Step 5.

P/N 622990 Rev A

**⚠ CAUTION**

**INSPECTION** - Inspect for malfunction and missing, broken, distorted, damaged, corroded, weakened or worn parts. See separate instructions for inspection details. If product is defective or if one year passes without formal inspection, remove from use. Label "UNUSABLE" until reinspected, repaired or destroyed.

- User must inspect components and beam clamp tightness before each use.
- A competent person must formally inspect at least every six months.


FORMAL INSPECTION GRID												
	J	F	M	A	M	J	J	A	S	O	N	D
96												
97												
98												
99												
00												

PUNCH GRID ON DATE OF FIRST USE

P/N 622991 Rev A

**⚠ CAUTION**

WHEN INSTALLATION IS COMPLETE, INNER TUBE OF ASSEMBLY



MUST BE VISIBLE THROUGH VIEWHOLE.

P/N 623152

**⚠ CAUTION**

**Knob  
MUST  
Be Tight**

P/N 622992

**BeamGrip Anchorage Connector Knob**

**BeamGrip Anchorage Connector**

Rose Manufacturing Company  
**STARPASS™ FLOW-THRU SYSTEM**  
 P/N 10015183  
 Meets ANSI A10.14 and OSHA requirements.  
 Before using this product, user **MUST** read and heed all manufacturer's instructions.

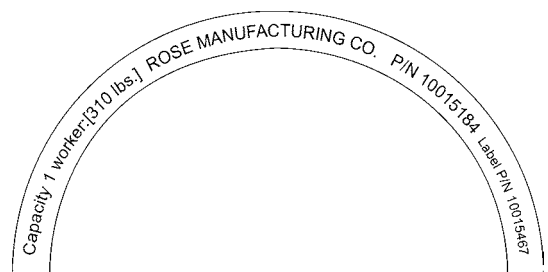
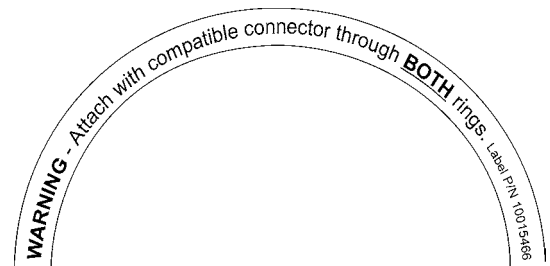


Label P/N 10015468

DATE OF MANUFACTURE -				
YEAR	1999	2000	2001	2002
MONTH	JAN	FEB	MAR	APR
	MAY	JUN	JUL	AUG
	SEP	OCT	NOV	DEC

P/N 623022

**Starpass Flow Through By-Pass**



**Starpass Glider**



## USER INSTRUCTIONS

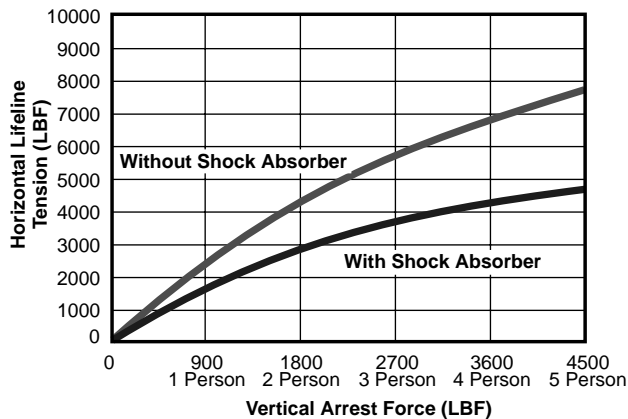
### MSA HORIZON™

## VI. Appendix B - Load Charts Horizontal Lifeline Anchorage Connecting Subsystem

### 1.0 HORIZON HORIZONTAL LIFELINE SUBSYSTEM LOADING

The information in this appendix is to be used by the qualified person as an aid in determining installation requirements for a HORIZON horizontal lifeline anchorage connecting subsystem. This information is needed in order to determine the total fall distance as described in Appendix C. All data should be verified as it pertains to the specific installation geometry and work to be performed. The minimum anchorage strength is 5,000 lbf (22.2 kN) per person attached to the system, OR, certification of a 2:1 design factor for the specific installation, under the supervision of a qualified person.

**HORIZON HORIZONTAL LIFELINE  
Anchorage Loading Chart**



**HORIZON SHOCK ABSORBER  
Load Chart**

(140 ft Length - 20 ft Spans)

Input Force (F1)	Anchorage Load (F2)	Anchorage Load (F3)	Change of Elevation (h)
1 Pers.	1,860 lbf	2,280 lbf	37.75 inches
2 Pers.	3,000 lbf	3,840 lbf	38.00 inches
3 Pers.	3,460 lbf	4,480 lbf	41.50 inches
4 Pers.	4,000 lbf	6,880 lbf	42.00 inches
5 Pers.	4,720 lbf	7,640 lbf	48.00 inches

Based on 140 ft length with supported spans of 20 ft

F1 - Lanyard Energy Absorber rated at 900 lbf

F2 - With HORIZON® Shock Absorber

F3 - Without HORIZON® Shock Absorber

**Notes:** 1) All data in this section are approximate.



## USER INSTRUCTIONS

### MSA HORIZON™

#### **VII. Appendix C - Customer Survey / Data Worksheet Horizontal Lifeline Anchorage Connecting Subsystem**

The information in this appendix is to be completed by the user and provided to the qualified person as an aid to determine the appropriate HORIZON horizontal lifeline anchorage connecting subsystem to suit the intended work and workplace geometry.



The Name in Safety at Heights And Confined Spaces

## Customer Survey/Data Worksheet

Horizon® Horizontal Lifeline Anchorage Connecting Subsystem

### PART I: ACCOUNT INFORMATION

Customer Name: \_\_\_\_\_

Address: \_\_\_\_\_

Contact Name: \_\_\_\_\_

Telephone No.: \_\_\_\_\_ Fax No.: \_\_\_\_\_

Representative/Sales Agent/Distributor: \_\_\_\_\_

Telephone No.: \_\_\_\_\_ Fax No.: \_\_\_\_\_

### PART II: GENERAL INFORMATION

- Type of Industry: \_\_\_\_\_
- Submission deadline for job quote: \_\_\_\_\_
- Completion deadline for installation: \_\_\_\_\_
- Purpose of system: \_\_\_\_\_
- Geographic location of installation (City, County, State): \_\_\_\_\_
- System indoors or outdoors: \_\_\_\_\_
- How many people will use system at one time: \_\_\_\_\_
- Do workers require additional fall arrest equipment: \_\_\_\_\_
- Does customer have a current rescue plan: \_\_\_\_\_
- How many rescuers are required to perform rescue: \_\_\_\_\_
- Will rescuers need to use Horizontal Lifeline (HLL) for personal fall arrest anchorage: \_\_\_\_\_
- Does customer need additional rescue equipment: \_\_\_\_\_
- Is purpose of system fall arrest or travel restriction: \_\_\_\_\_
- Are there hazardous environmental conditions: \_\_\_\_\_
- Does customer have structural engineering services available to design anchorages: \_\_\_\_\_
- Is there sufficient existing structure to support the system: \_\_\_\_\_
- Construction material of the support structure: \_\_\_\_\_
- Does customer have other lifelines already installed: \_\_\_\_\_ by whom: \_\_\_\_\_
- Vertical arrest force & maker of personal fall arrest shock absorber to be used: \_\_\_\_\_
- Maker of harness to be used: \_\_\_\_\_
- How will access to the HLL occur (stairs, ladder, walking, other): \_\_\_\_\_
- Type of system required: single span \_\_\_\_\_ multiple spans \_\_\_\_\_ stanchion \_\_\_\_\_



**PART III: STRUCTURAL INFORMATION**

**Beam Anchored Systems:**

- Will anchorage brackets bolt to existing structure \_\_\_\_\_ , weld to existing structure \_\_\_\_\_ , or clamp to existing structure \_\_\_\_\_

Please describe: \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

- Will the system incorporate MSA BeamGrip anchorage connectors? If so, will they attach to columns or girders: \_\_\_\_\_
- I-beam type & size: \_\_\_\_\_ Flange width: \_\_\_\_\_ Flange thickness: \_\_\_\_\_
- For stanchion systems will the beam grips attach to the top flange or bottom flange of the I-beams: \_\_\_\_\_
- Distance from centerline of horizontal lifeline to nearest edge of walking/working surface: \_\_\_\_\_
- Width of walking/working surface: \_\_\_\_\_

**Rail Anchored Systems:**

- Rail type & size: \_\_\_\_\_
- Rail flange width: \_\_\_\_\_ Rail flange thickness: \_\_\_\_\_
- Thickness of ballast beneath rail flange: \_\_\_\_\_
- Distance from centerline of rail to nearest edge of walking/working surface: \_\_\_\_\_
- Width of walking/working surface: \_\_\_\_\_

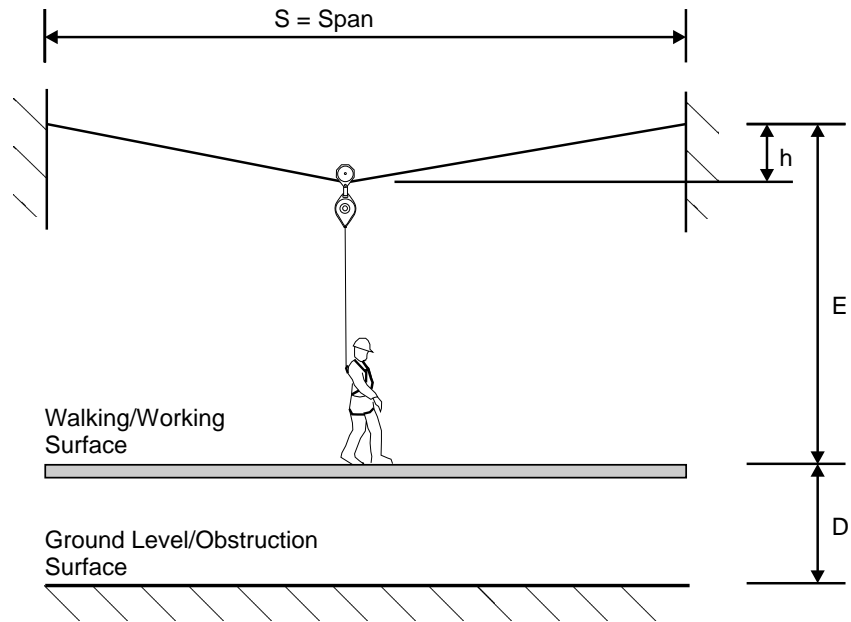
**Other Anchorage Systems:**

- Type of anchorage (wood column, concrete beam, etc.): \_\_\_\_\_

Please describe: \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

Please sketch:

**PART IV: SINGLE SPAN SYSTEM**

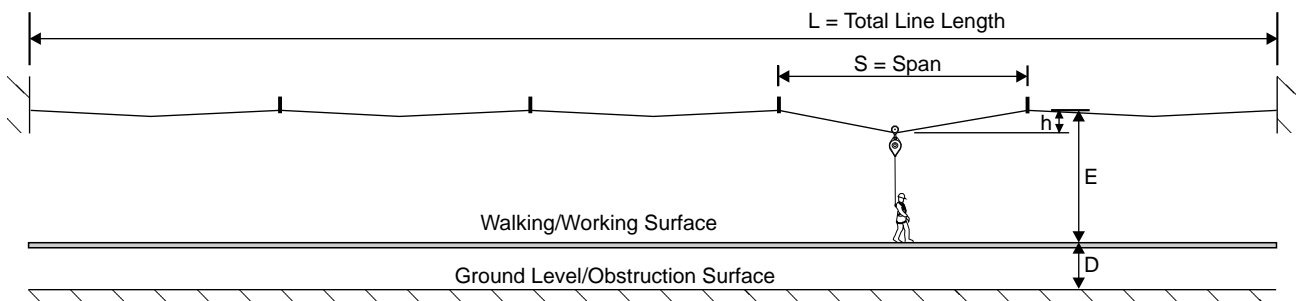


Please fill in the blank spaces below:

- \_\_\_\_\_ **S** = Span length between anchorages
- \_\_\_\_\_ **E** = Elevation of HLL anchorage above walking/working surface
- \_\_\_\_\_ **D** = Elevation of walking/working surface above ground/obstruction

(**h** = Change of elevation of HLL upon fall arrest (see table 1 of MSA Product Data Sheet P/N 690108))

**PART V: MULTISPAN SYSTEM**

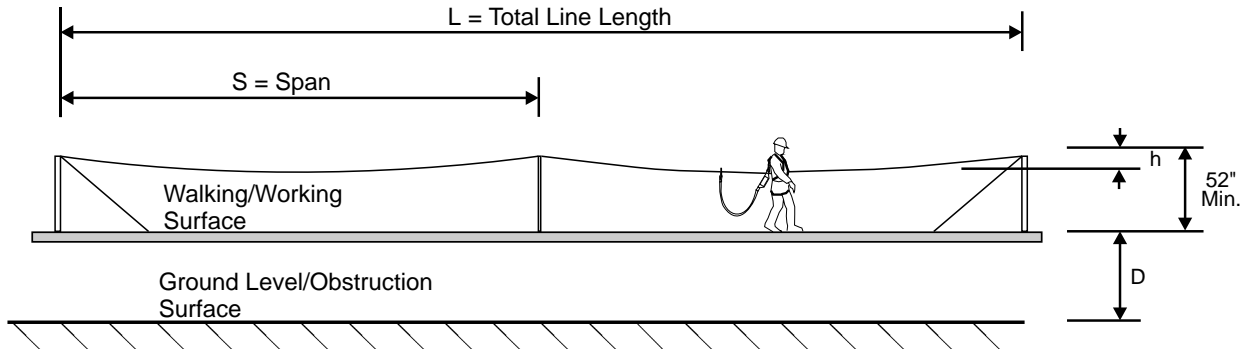


Please fill in the blank spaces below:

- \_\_\_\_\_ **L** = Total Line Length
- \_\_\_\_\_ **S** = Span length between anchorages
- \_\_\_\_\_ **E** = Elevation of HLL anchorage above walking/working surface
- \_\_\_\_\_ **D** = Elevation of walking/working surface above ground/obstruction

(**h** = Change of elevation of HLL upon fall arrest (see table 1 of Rose Product Data Sheet P/N 690109))

**PART VI: STANCHION SYSTEM**



Please fill in the blank spaces below:

- \_\_\_\_\_ **L** = Total Line Length
- \_\_\_\_\_ **S** = Span length between anchorages
- \_\_\_\_\_ **D** = Elevation of walking/working surface above ground/obstruction

(**h** = Change of elevation of HLL upon fall arrest (see table 1 of MSA Product Data Sheet P/N 690110))

**PART VII: SKETCH OF SYSTEM LAYOUT**

Please complete and include overall dimensions or provide engineering drawing, if available.

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## LIMITED WARRANTY

**Express Warranty** – MSA warrants that the product furnished is free from mechanical defects or faulty workmanship for a period of one (1) year from first use or eighteen (18) months from date of shipment, whichever occurs first, provided it is maintained and used in accordance with MSA's instructions and/or recommendations. Replacement parts and repairs are warranted for ninety (90) days from the date of repair of the product or sale of the replacement part, whichever occurs first. MSA shall be released from all obligations under this warranty in the event repairs or modifications are made by persons other than its own authorized service personnel or if the warranty claim results from misuse of the product. No agent, employee or representative of MSA may bind MSA to any affirmation, representation or modification of the warranty concerning the goods sold under this contract. MSA makes no warranty concerning components or accessories not manufactured by MSA, but will pass on to the Purchaser all warranties of manufacturers of such components. THIS WARRANTY IS IN LIEU OF ALL OTHER WARRANTIES, EXPRESS, IMPLIED OR STATUTORY, AND IS STRICTLY LIMITED TO THE TERMS HEREOF. MSA SPECIFICALLY DISCLAIMS ANY WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE.

**Exclusive Remedy** - It is expressly agreed that the Purchaser's sole and exclusive remedy for breach of the above warranty, for any tortious conduct of MSA, or for any other cause of action, shall be the repair and/or replacement, at MSA's option, of any equipment or parts thereof, that after examination by MSA are proven to be defective. Replacement equipment and/or parts will be provided at no cost to the Purchaser, F.O.B. Purchaser's named place of destination. Failure of MSA to successfully repair any nonconforming product shall not cause the remedy established hereby to fail of its essential purpose.

**Exclusion of Consequential Damages** - Purchaser specifically understands and agrees that under no circumstances will MSA be liable to Purchaser for economic, special, incidental, or consequential damages or losses of any kind whatsoever, including but not limited to, loss of anticipated profits and any other loss caused by reason of the non-operation of the goods. This exclusion is applicable to claims for breach of warranty, tortious conduct or any other cause of action against MSA.

**For additional information, please contact the Customer Service Department at 1-800-MSA-2222 (1-800-672-2222).**

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