

MSA Sure-Line™

P/N SHL2009000 Cable Horizontal Lifeline

Application, Operation, Maintenance & Inspection Instructions Manual

Please read this manual.
This information is vital to your safety.

WARNING

THESE INSTRUCTIONS MUST BE PROVIDED TO THE USER. MANAGEMENT AND USER MUST READ AND UNDERSTAND THESE INSTRUCTIONS; FAILURE TO DO SO COULD RESULT IN SERIOUS INJURY OR DEATH.

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Application

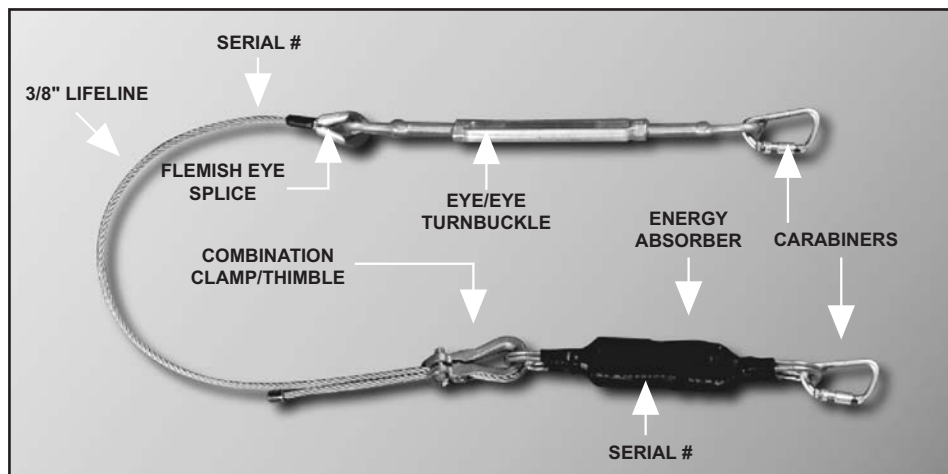
The MSA Sure-Line Horizontal Lifeline System is a light weight cable system that is suspended between two approved anchorage points to provide worker fall protection during horizontal movement. Applications include buildings, bridges, transmission towers, scaffolds, steel erection and other elevated work stations.

Function

The MSA Sure-Line System is easily and quickly installed at temporary work areas. Lifeline tension and adjustment is achieved using cable clamp and turnbuckle. An integral synthetic energy absorber substantially reduces the maximum arrest load acting on the anchorages which prevents damage to the system and provides a visual warning that the system has previously sustained a load equivalent to the force of arresting a fall.



Name of Each Part



(Fig. 1)

Specifications

These systems meet ANSI A10.14 and OSHA regulations.

Standard 60' System* SHL2009060

- working load: 600 lbs (272kg), 2 persons
- total weight: 23.75 lbs (10.7kg)
- max bearing point length 60 ft (18.2m)
(see design statements #17)

Carabiners RCC643

- 12mm offset "D"
- carbon steel, zinc plated
- auto-locking gate / captive bar
- minimum breaking strength 7850 lbs (35kN)
- gate opening 1.0 in (26mm)
- jaw width 0.43 in (12mm)

Energy Absorber

- 2 in (5.0cm) x 1.5 in (3.7cm) x 16 in (40.6cm)
- synthetic tear ply webbing
- dual forged Dee-rings
- shrink-seal cover
- minimum breaking strength 12,750 lbs (57.0kN)

Combination Clamp/Thimble

- cast steel, manganese bronze finish
- heavy duty nuts, grade 8 bolts 3/8 in x 1-3/4 in
- recommended torque 40 ft-lbs
- minimum slippage load 12,500 lbs (55.8kN)

Lifeline

- 3/8 in (9.5mm) 6x36 galvanized cable
- flemish eye splice with heavy duty thimble
- swage button end
- minimum breaking strength 12,800 lbs (57.0kN)

Eye and Eye Turnbuckle

- hot dip galvanized steel
- thread diameter 5/8 in (1.6cm)
- take up 9 in (23cm)
- minimum breaking strength 17,500 lbs (78.1kN)

Cable Slings (not shown)

- 1/4 in (6mm) x 6 ft (1.8m) galvanized steel
- flemish thimble splice eyes both ends, vinyl coated
- minimum breaking strength 5000 lbs (22.2kN)

* **Note:** Cable available in 20, 40 and 60 ft. lengths. Storage bag available on request.

Installation



WARNING

READ ALL INSTRUCTIONS INCLUDING DESIGN STATEMENTS PRIOR TO ASSEMBLY. USE ALTERNATE FALL PROTECTION DURING INSTALLATION. LIFELINE MUST BE INSTALLED AT A LEVEL ABOVE THE HARNESS ATTACHMENT POINT.

1. Open up turnbuckle to full extension (Fig. 2).
2. Uncoil cable on flat surface.
3. If using cable anchor sling, wrap around anchorage structure at least twice.
4. Attach carabiners at terminations to anchor sling eyes,

... continued on next page



(Fig. 3)



(Fig. 4)



(Fig. 5)



(Fig. 6)

anchor bracket or structural anchor hole (see design statements #18).

5. Loosen nuts on combination clamp / thimble until flush with bolt end.
6. To remove excess sag, hold thimble and push cable through one side of clamp (Fig. 3). By pulling on free end remove slack through other side (Fig. 4).
7. Remove as much sag as possible manually. Ensure cable lies in grooves at end of clamp (Fig. 5). Tighten bolts on combination clamp to 40 ft-lbs.
8. Tension lifeline to specified sag with turnbuckle (see design statements) hold cable eye and rotate turnbuckle body (Fig. 6).

! WARNING

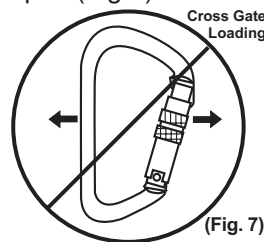
TENSION CABLE BY HAND WITH COMBINATION CLAMP AND TURNBUCKLE. DO NOT USE MECHANICAL TENSIONING DEVICE.

! WARNING

DO NOT ATTACH MORE THAN TWO FALL ARREST SYSTEMS TO LIFELINE. ENSURE THAT THE LIFELINE IS NOT IN USE OR WILL NOT BE USED WHILE DISMANTLING.

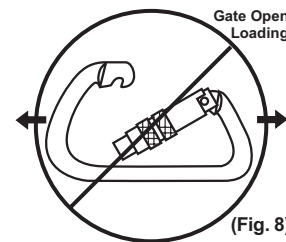
9. Check system before use:

- Inspect lanyard and harness in accordance with manufacturers instructions
- Inspect Sure-Line System in accordance with inspection guidelines (page 4)
- Ensure carabiners are orientated to safely accept a load and properly closed and locked. Avoid cross-gate loading (Fig 7) and loading with gate partially open (Fig 8).



Cross Gate Loading

(Fig. 7)



Gate Open Loading

(Fig. 8)

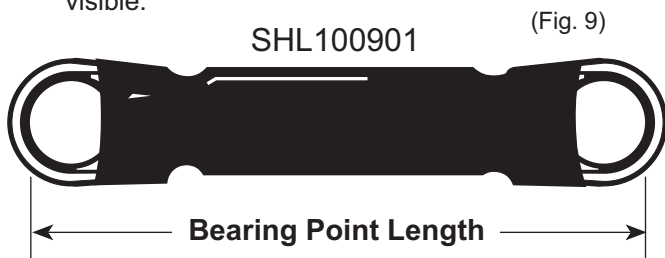
- Check that cable clamp is properly torqued and cable is not crimped.
- Ensure that energy absorber has not been partially expended (see inspection guidelines).

10. Removal

- To remove the Sure-Line System, connect to alternate fall arrest system. Release tension by reversing installation procedure. Disconnect carabiners and store system in accordance with maintenance and storage instructions.

Inspection

1. The MSA Sure-Line System shall be inspected by the user before each use, and additionally, by a competent person other than the user at intervals of no more than one year. Detailed inspections must be recorded in the Inspection Checklist.
2. When inspection reveals defects, damage, or inadequate maintenance of the system, the components affected shall be permanently removed from service to undergo adequate corrective maintenance before return to service.
3. Remove system from service if:
 - the system has been subjected to the forces of arresting a fall;
 - if label is missing or illegible;
 - if there is evidence of improper function, improper fit, or alteration of any component;
 - if inspection reveals excessive wear, defects, damage or misuse to hardware elements or synthetic elements as outlined in inspection guidelines;
 - if the energy absorber bearing point length exceeds 18.0 in (45.7cm);
See Fig. 9 and design statements
 - if red webbing inside energy absorber shrink seal is visible.



4. MSA or persons or entities authorized in writing by the manufacturer, shall make repairs to the equipment. No unauthorized repairs and or modifications are allowed.

Inspection Guidelines

1. Inspect all hardware elements for cracks, sharp edges, deformation, corrosion, chemical attack, excessive heating or excessive wear.
2. Inspect steel anchor slings for severe kinking, missing thimbles, broken strands, or damaged or defective swages.
3. Inspect carabiners for poor gate operation and obvious deformation.
4. Inspect cable clamp for deformation or missing hardware.
5. Inspect synthetic elements for fraying, abrasion, discoloration, damaged stitching, stiffness, melting, chemical attack or excessive soiling.
6. Inspect entire length of lifeline for kinks, broken strands, damaged splices or thimbles. Damaged cable can fail at much lower forces than expected. Deterioration and weakening of webbing can be suspected if exposed to chemicals, acids, petroleum based products, excessive sunlight, excessive heat or repeated dampness.
7. Inspect energy absorber for elongation (indicates excessive force applied).

Cleaning, Maintenance, and Storage

1. Maintenance and storage of equipment shall be conducted by the user's organization in accordance with MSA instructions. Unique issues, which may arise due to conditions of use, shall be addressed with MSA.
2. Equipment which is in need of or scheduled for maintenance shall be tagged "DO NOT USE" and removed from service.
3. To clean energy absorber, wipe with a wet sponge. For more difficult stains, use mild soap. **DO NOT USE CHEMICALS OR DETERGENTS.** Rinse off soap with clear water, and hang to dry naturally.
4. Hardware should be wiped with a rag to remove dirt and grease. Lubricate with a light oil to insure good working order and to protect against corrosion. Wipe off excessive amounts of oil to avoid the accumulation of dirt.
5. Store in a clean, dry area free from excessive heat, steam, sunlight, harmful fumes, corrosive agents and rodents.

WARNING

DO NOT USE FALL PROTECTION EQUIPMENT THAT HAS NOT BEEN MAINTAINED AND STORED PROPERLY.

Design Statements

1. The MSA Sure-Line Horizontal Lifeline System shall comply to and be used with consideration to all government or other applicable regulations and standards.
2. The MSA Sure-Line Horizontal Lifeline System is a engineered and thoroughly tested fall arrest product. The system must be used as described in these instructions. No additional equipment should be incorporated into the horizontal lifeline without written approval by MSA. If the buyer chooses to disregard this warning he assumes sole responsibility for the integrity of the entire system.
3. Remove horizontal lifeline fall arrest system from service immediately if the system has sustained a load equivalent to the force of arresting a fall. Tag "do not use", a qualified person shall inspect and recertify the system prior to returning it to active service.
4. An approved personal shock absorber and full body harness is mandatory in the fall arrest system.
5. The MSA Sure-Line Horizontal Lifeline System can accommodate two workers or up to 600 lbs (272kg) simultaneously over a maximum allowable span of 60 ft (18.3m). Anchorage arrest load will not exceed 2460 lbs (11.0kN) when used in accordance to these instructions.
6. Allowing a 2:1 safety factor, end anchorages must be capable of sustaining a force of 5000 lb (22.2 kN) without deformation in directions permitted by the system and must be certified by an engineer in writing.
7. To reduce total fall distance place anchorages at the same level or above workers harness attachment point. Total lanyard length must not exceed 6 ft. (1.8m).
8. If possible, provide additional support for cable anchor slings wrapped on vertical columns.
9. Do not use system adjacent to moving machinery, electrical hazards or in the presence of excessive heat, open flame or molten metal. System should not be used in an environment where temperatures exceed 194°F (90°C).
10. Do not allow synthetic components to come in contact with sharp or abrasive edges or surfaces especially when under tension. Contact during a fall could cause partial or complete loss of strength that may cause failure of the system.
11. Follow tensioning guidelines in instructions. Over-tensioning the lifeline could initiate tear-out of energy absorber or, in the event of a fall overload end anchors.
12. Vertical force applied to the lifeline may be indicated by elongation of the energy absorber. Bearing point length will indicate elongation. In more extreme cases, the red ends of tear-ply webbing will be exposed from under the black shrink seal. It is difficult to determine how much energy absorption remains in a partially deployed unit. Tag "do not use" and return system to manufacturer for replacement of energy absorber.
13. A worker who has been stranded or incapacitated by an injury or medical condition and who is suspended by the system, must be rescued immediately. It is the responsibility of the users employer to devise a rescue method that will effectively evacuate a worker. Rescue equipment and trained personnel must be on hand while the system is in use.
14. A cable horizontal lifeline system will absorb the force of a fall primarily through the energy absorber and personal shock absorber. Total fall distance will increase as the lifeline span increases and if a second worker is added to the system. Fig 9 shows the minimum clearance required between the level of the lifeline and the highest obstacle below the system.

FIG 9
MINIMUM CLEARANCE REQUIRED
BELOW ANCHOR
(Data based on 6 ft free fall with shock absorbing lanyard)

NUMBER OF WORKERS	SPANS	MINIMUM CLEARANCE REQUIRED
1	30ft (9.14m)	19' - 3 in (5.86m)
1	60ft (18.28m)	22' - 4 in (6.80m)
2	30ft (9.14m)	22' - 6 in (6.85m)
2	60ft (18.28m)	26' - 3 in (8.00m)

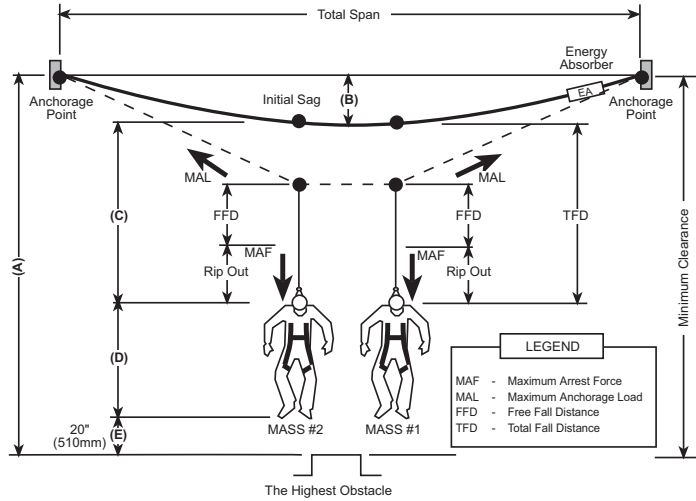
15. Use of intermediate supports will decrease total fall distances. For shorter spans and systems with intermediate supports, use minimum clearance specified for 30 feet. If span is more than 30 ft use 60 foot clearances.
16. Fall arrest system must be attached directly to 3/8" cable. Do not attach to other line components such as carabiner or energy absorber Dee-ring.
17. Maximum bearing point length is measured from carabiner load bearing points and includes all components. Lifeline cable is 3.25 ft. (1.0m) longer than necessary to allow manual attachment to anchors prior to tensioning. Do not attempt to rig the system on spans longer than 60 ft. (18.2m).
18. Anchor hole size and location must be compatible with carabiner size and gate opening. Hole must be at least 5/8" and be centered no more than 1" from edge of steel.

SAG SPECIFICATIONS

Span Length	Minimum Sag
30ft. (9.14m)	2.0 in. (5.0cm)
60 ft. (18.28m)	4.0 in. (10.0cm)

WARNING

IF ANCHOR IS POSITIONED BELOW WORKER'S DEE RING, MINIMUM CLEARANCE REQUIRED WILL INCREASE. DO NOT GUESS THE MINIMUM CLEARANCES FOR SHORTER SPANS OR WITH INTERMEDIATE SUPPORTS. FOR SPECIFIC APPLICATION REQUIREMENTS CONTACT MSA FOR COMPLETE TEST RESULTS.



Minimum Clearance (A) = Initial Sag (B) + T.F.D. (C) + Height of Worker (D) + 20" Safety Margin (E)

Inspection Checklist

Model No. _____ Serial # _____

Date _____

Inspected By _____

Description	Good / Damaged, worn, altered / Missing / Remove from service				Comments
	Good	Damaged, worn, altered	Missing	Remove from service	
CARABINERS (2)					
ENERGY ABSORBER					
LABEL					
CABLE CLAMP (2 bolts and nuts)					
LIFELINE					
TURNBUCKLE					
STEEL ANCHORAGE SLING (2), optional					



2250 S. Tejon St.
Englewood, CO 80110
1-800-672-2222

Made in USA

U.S. Patent
Number
5598900

SURE-LINE™ HORIZONTAL LIFE

MODEL: XXXXXX

DATE OF MFG.: XXXXXX

WARNING: Follow manufacturer's instructions included at time of

Capacity 2 persons maximum 600 lbs (272kg)

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).