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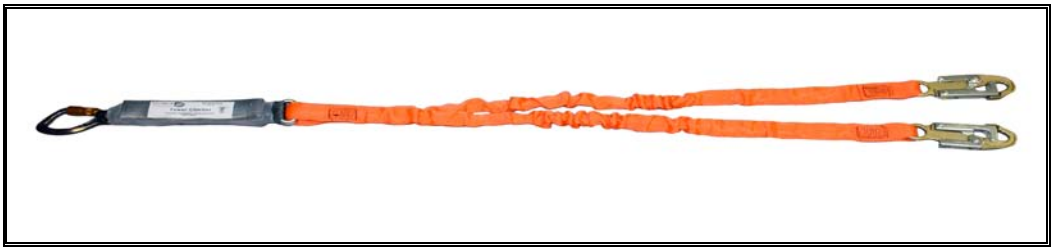
Instructions for MLSB005004 Low Force Energy Absorbing Tower Climbing Lanyard
For Worker Mass Range of 45 to 140 kg



Notice

This lanyard is a custom engineered product, designed by Safety Direct Ltd. and certified by a professional Fall Protection Engineer under CSA Z259.16-04. It is designed to reduce the impact forces of a fall on the anchorage point to less than what would be expected by a conventional lanyard.

The lanyard model MLSB005004, manufactured by Safety Direct Ltd., has been certified by High Engineering Corp. and must be fabricated in accordance to their Drawing 15598-EQ-01. No substitutions are allowed without the express written authorization from High Engineering Corp.

Design

The Lanyard includes a personal energy absorber (PEA) (grey in colour) adjacent to the carabiner that connects to the worker's harness. This PEA is termed the "E3 PEA" in these procedures because it keeps the impact forces below 3 kN (675 lbs), and has a maximum deployment of 61 inches (1.55m). The two legs of the Y-lanyard (orange in colour) also contain energy absorbing material that meets the deployment force requirement of CSA Z259.11 Class E4 (Maximum 4 kN/900 lb), but with only 11 inches (280mm) of available deployment, insufficient to fully meet the requirements of the standard. The purpose of the E4 is to provide a modest amount of energy absorbing capability to keep impact forces below 4 kN in the event that the E3 PEA capability is slightly exceeded.
The two legs of the Y-lanyard use a proprietary snaphook that has been expressly designed for 5/8" or ¾" (16mm or 20 mm) step bolts and proven by testing to withstand side-loading, as may occur when a step bolt bends downwards from the impact of a fall.

IDENTIFICATION

This lanyard can be identified by the grey webbing back up strap in the energy absorber pack and the product labels inserted into the energy absorber pouch. If the webbing in the energy absorber is not grey it IS NOT a E3-E4 tower climbing lanyard!

WARNING

Failure of the user to read and understand all instructions for use of this equipment may result in serious injury or death.

It is recommended that the user complete an approved fall protection training program before using the product.

There should be an approved rescue plan in effect on any work site prior to the commencement of working at heights. The rescue plan must have provision to retrieve any worker, suspended as a result of a fall arrest, without delay in order to reduce the effects of suspension trauma.

In the event of a fall arrest and the energy absorber on the lanyard deploys, the deployed length of the lanyard can increase by up to 1.82 m (6 ft). The total fall distances should be calculated using this increased deployed length to ensure that there is sufficient clearance to the surface below the worksite. The maximum deployed length of lanyard will be up to 11 ft.

General Instructions

All warning labels and instructions must be understood and followed by the user before using the product.

All users must understand the relevant regulations and usage standards for fall protection, pertaining to this product, in the jurisdiction in which it is being used.

Only trained and competent personnel should use these products.
All fall protection equipment must be visually inspected by the worker prior to each use.
All fall protection equipment must be inspected by a competent person on a regular basis (at least annually).

Fall protection equipment must not be altered or modified in any way.

To reduce the possibility of accidental release, a competent person must ensure that all the system components are compatible.

Any equipment exhibiting deterioration, damage or deformation must be removed from service immediately and inspected by a competent person before being returned to service.

All equipment subjected to a fall arrest or fall incident must be removed from service immediately and be tagged for further inspection to determine the disposition of the equipment.

For Fall Arrest applications the locking carabiner adjacent to the Personal Energy Absorber (PEA) must be attached to the Dorsal (rear) D-ring of an approved full body harness and visual confirmation of the locking of the gate on the carabiner must be obtained.

The lanyard should be attached to an anchorage approved by a professional engineer or an anchorage with a load rating of 5,000 lbs or in accordance with the regulations in the jurisdiction in which the equipment is being used when a professional engineer is not available.

Wherever possible the anchorage should be chosen so as to be directly above the work site in order to reduce or eliminate the possibility of a swing fall.

When selecting the anchorage ensure that there is sufficient clearance to the surface below to allow for the following:

1) Deployment of the energy absorber.
2) Stretch of the full body harness.
3) Slippage of the Dorsal D-ring on the full body harness.
4) Stretch of the anchorage means if applicable.

During normal use only one of the legs of the lanyard should be attached to the anchorage point, the remaining leg should be attached to an approved location point on the harness that is designed to tear away if the leg becomes snagged during use. The lanyard leg **not** in use **must not** be attached to the D-ring or webbing component of the full body harness. Both legs should only be attached, simultaneously, to separate anchorages during the traversing process.

If the distance between anchorages in the traversing process exceeds 1.7 times the lanyard leg length, (usually approximately 0.3 meters [1 foot] less than the lanyard's specified length due to the length of the energy absorber), then provision must be made to facilitate the traverse.

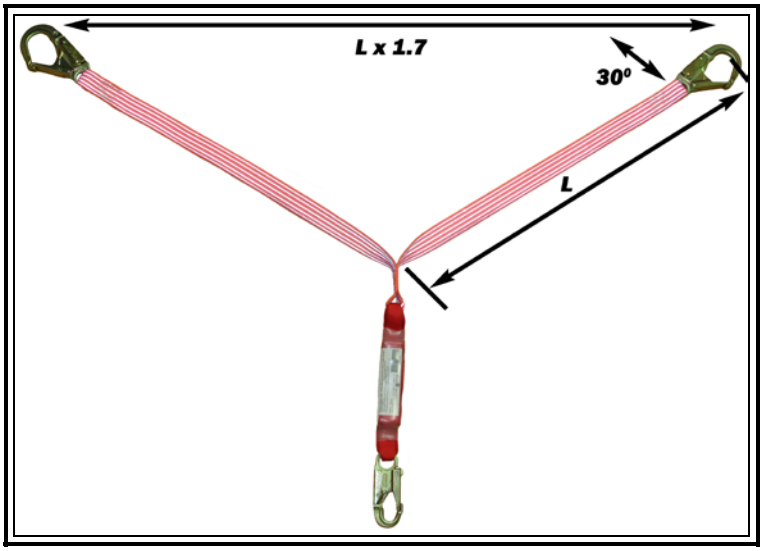
The lanyard should not be modified or altered in any way.

In the event that a lanyard is involved in a fall arrest situation it must be removed from service immediately and discarded.

In the event of a fall arrest the suspended worker should be rescued without delay in order to minimize the effects of suspension trauma.

Intended Use

The 'Y' or Bypass lanyard is intended for use in situations where the worker must be "Tied-Off" 100% of the time at height, but must move between workstations or anchor point in order to complete the task. The 'Y' or Bypass lanyard is designed for only momentary attachment to two (2) anchorages. Attachment of the two legs to separate anchorages simultaneously can result in serious overloading of the lanyard, if the distance between the anchorages exceeds 1.7 times the lanyard length, or if the angle between the lanyard leg and the horizontal is less than 30˚ (degrees).



If the distance between the anchorages exceeds 1.7 times the lanyard leg length then a horizontal lifeline should be used to facilitate the point-to-point transfer.

Failure to observe these restrictions will result in overloading of the lanyard, and could result in catastrophic failure of the lanyard in the event of a fall arrest.

During normal use only one of the lanyard legs should be tied off to an anchorage.

The locking snap hooks at the end of the lanyard legs should have the smallest throat opening necessary to accomplish the task. The use of oversized locking snap hooks could increase the possibility of accidental rollout or overloading of the gate on the snap hook.

The specified Y-lanyard has been designed to reduce the impact force to allow connection to Step Bolts that may not otherwise offer enough strength to meet local OH&S requirements.

Usage Instructions

Failure to follow these instructions could result in catastrophic failure of the lanyard in the event of a fall arrest situation.

These procedures are intended to be used by individual workers to arrest an accidental fall while climbing tower legs that are equipped with the prescribed Step Bolts. More than one worker may climb the same leg of the tower at the same time, provided that multiple workers are NOT connected to the same Step Bolt, and when climbing, workers maintain at least 6.0m (20 feet = 20 Step Bolts) clear space between the head of the lower climber and the feet of the higher climber.

Limitations on Using these Procedures

1. Workers must weigh between 100 and 310 lbs (45 to 140 kg), including all PPE, tools and equipment. If persons outside of this range need to follow these procedures, contact a Qualified Fall Protection Engineer for determination of whether or not the system may be used and what changes in equipment may be necessary.
2. Workers must attach to the Step Bolts using only a Safety Direct Model MLSB005004, 1.5m (5 ft) long Y-Lanyard.
3. The Lanyard personal energy absorbers (PEAs) must be dry to prevent unacceptable increases in the deployment force. The lanyard will provide adequate protection when in use in rainy weather. A saturated or saturated and then frozen PEA must never be used.

Clearance Requirements

Using the specified 1.5m (5 ft) Y-lanyard, the minimum required clearances below the step bolt or the working platform depends on the worker(s) always being connected to a step bolt that is at or above shoulder height. The following table shows the required clearances:

	Maximum Worker Weight, including all tools and equipment			
	100 lb	200 lb	275 lb	310 lb
Clearance below Anchorage (Step Bolt)	4.3 m (14.22 ft)	4.9 m (16.23 ft)	5.6 m (18.46 ft)	5.8 m (19.00 ft)
Clearance below Worker's feet	2.8 m (9.22 ft)	3.4 m (11.23 ft)	4.1 m (13.46 ft)	4.3 m (14.00 ft)

Safety Direct Ltd recommends the use of our models MH1011130xx or MH4011132xx Tower Harness when using this lanyard.

If the worker is wearing a comfort harness with stretch webbing, 1.5 feet of additional clearance is required.

It is very important, at all times, to tie off as high as can be reached, particularly when close to the ground.

At the bottom of the tower, commencing or ending the climb, these procedures will not prevent the worker from striking the ground until the worker is standing on a step bolt that is higher than the Clearance Requirements, listed above. When there is not enough clearance, workers must still tie-off because the system will slow the worker down and prevent head-first impacts, reducing the severity of possible injuries.

Step Bolt Anchor Point

Specific Step Bolt types allowed to be used in the “Limitations” section, below, have been proven by testing. The custom Safety Direct MLSB005004 Y-lanyard that must be used with these procedures was developed to maintain an adequate factor of safety.

Pre-use Inspection

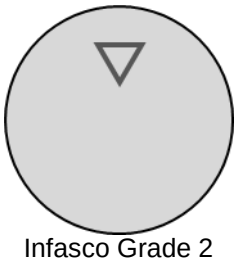
The tower leg that will be climbed must be inspected each time before it is used. This inspection should be visual from the ground and should only take a few seconds. The visual inspection shall continue during the climb, focusing on the condition of the tower and Step Bolts immediately above the climber.

The pre-use inspection must be undertaken at a safe location where there is no danger of falls. Typically, the user will visually inspect from the safety of the ground.

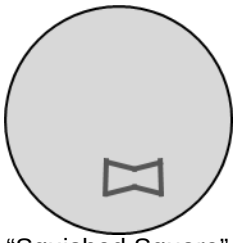
1. Verify that the tower leg and all framed in horizontal members have not been bent, have not sustained other damages and continue to properly support the applicable power lines.
2. Verify that none of the Step Bolts are missing, loose, cracked, corroded, or have been bent.
3. If any damages to the tower or Step Bolts are observed that would impair climbing or the ability to arrest a fall, ascent of the tower shall not proceed. All damages must be reported to the applicable supervisor.
4. Before starting to climb, un-park one leg of the Y-lanyard, reach up and connect it to a Step Bolt above head height, as high as possible.
5. Climb up only until able to reach the next higher Step Bolt. Un-park and transfer the second leg of the Y-lanyard to this Step Bolt.
6. Commence ascending the tower, one Step Bolt at a time, stopping with each step to alternately leapfrog the lowest snaphook of the Y-lanyard above the other snaphook. Always keeping at least one snaphook above the worker's head.
7. Once the worker's feet are at least 5.8m (19 feet) above the ground, climbers may commence alternately leapfrogging the legs of the Y-lanyard onto every second or third Step Bolt, as can be comfortably reached, ensuring that at least one snaphook is connected to a Step Bolt that is above the worker's shoulders, except that when climbing a tower that has Hex bolts AND the climber weighs more than 275 lbs, the climber must always keep at least one snaphook above the worker's head.
8. Additional workers may climb the tower at the same time, following these procedures, provided that the spacing between the head of the lower worker and the feet of the upper worker is always at least 20 Step Bolts.
9. When the work level has been reached, maintain connection to the Step Bolts or other approved anchor points on the tower at all times, either using the Y-lanyard or through protected transfer to other fall protection systems that are established and used in accordance with their own procedures.
10. Proceed with the work, at all times maintaining the proper connection to Step Bolts or other designated fall protection systems.
11. Once the work is completed or when a worker needs to descend, he/she must obtain connection to at least one Step Bolt either using the Y-lanyard or through protected transfer from other fall protection systems back onto the Step Bolts. Ensure that the starting connection to a Step Bolt for descent is at shoulder height (or head height when specified in Step 8) prior to transferring from another fall protection system.
13. Begin climbing down the tower leg until the Step Bolt the Y-lanyard is anchored to is almost out of reach.
14. Connect the second leg of the Y lanyard to a Step Bolt that is at shoulder height (or head height when specified in step 8).
15. Disconnect the higher snaphook of the Y-lanyard from its Step Bolt and reconnect it to a lower Step Bolt that is one to three Step Bolts below the snaphook of the other Y-lanyard that is still connected to a Step Bolt, so it will be higher than the worker's shoulders (or head when specified in step 8), when the higher anchorage is nearly out of reach when climbing down.
16. Climb down until the higher anchorage is nearly out of reach.
17. Repeat steps 15 and 16 until the worker's feet are no lower than 5.8m (19 feet) off the ground.

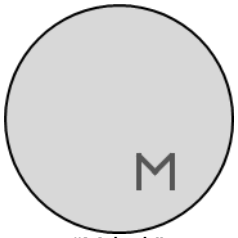
18. Repeat steps 15 and 16 until reaching the ground, except that each new Step Bolt placement must only be one bolt lower than the previous, so that when the highest anchorage is almost out of reach, the other anchorage is always higher than head height.
19. Once safely on the ground, disconnect both legs of the Y-lanyard from the step bolts and park them appropriately on the harness.

The following 5/8 inch or ¾ inch diameter Step Bolts with forged button heads, have been tested and may be climbed in strict accordance with these procedures. The approved step bolts are as identified according to type and markings as illustrated below:


Infasco Grade 2

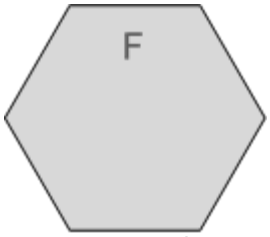
Infasco Fall Arrest Rated


"Squished Square"



"M-bolt"

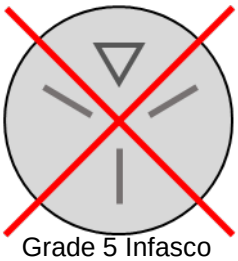
DFL T-0

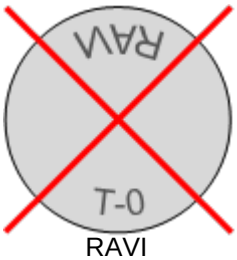


Hex Head*

** Note that Hex Head bolts require workers heavier than 275 lb (125 kg) to connect to step bolts that are at least one foot higher than the worker's shoulders.*

Do Not Connect to Grade 5 Infasco or any other type of Step Bolts not specifically approved in step 3, above.


Grade 5 Infasco



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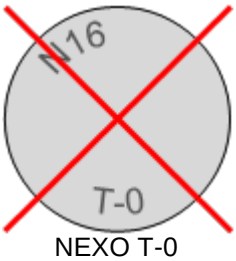
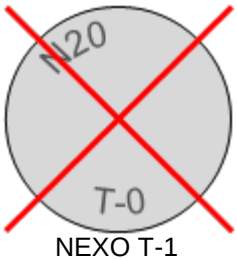
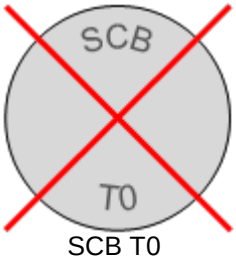


NEXO T-0

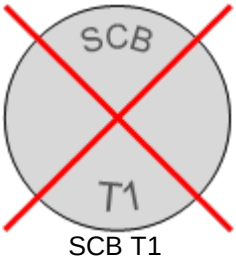


NEXO T-1

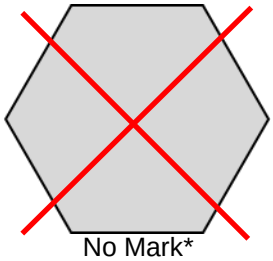
SCB 1018



SCB T0



SCB T1


No Mark*

If you are unsure of the strength of your anchor bolts, contact Safety Direct Ltd. to discuss a test program to ascertain their suitability for use as fall arrest anchor points.

* Safety Direct Ltd. recommends Infasco Z259AD rated step bolts for any new or replacement applications.

Inspection

All lanyards should be inspected by the user before each use and should be visually inspected by a competent person, other than the user, on an annual basis or sooner. A record of these inspections should be kept in a log.

When an inspection reveals any defects the lanyard must be removed from fall arrest service immediately and be tagged to preclude any further use. The lanyard should not be returned to service until it has been reworked or repaired by the manufacturer.

The lanyard should be removed from service immediately if an inspection reveals any of the following:

a) that the lanyard has been subjected to fall arrest service and the energy absorber has been partially deployed.
b) there is evidence of any corrosion or deformation of the hardware connectors and components, including cracks, sharp edges, chemical attack, excessive heat exposure or alteration in any way.
c) function tests show that the gates on carabiners and snap hooks do not lock automatically.
d) if the original labeling on the lanyard has been removed or is illegible.
e) the lanyard material has become adulterated with paint, bitumen, solvent or other chemical reagent.
f) the material used to manufacture the lanyard is compromised, including but not limited to any spliced terminations or stitch patterns, cuts, tears, abrasion, burns, knots, kinks or excessive wear.

Any lanyard removed from service and awaiting inspection should be tagged to indicate that it should not be used until it has been inspected and approved for further fall protection service.

Only persons or organizations authorized in writing by Safety Direct Ltd. shall make repairs to lanyards.

Care and maintenance

Maintenance of the lanyard should be carried out in accordance with the instructions provided by Safety Direct Ltd.

All lanyards should be stored in a clean, dry environment, with limited exposure to the following:

1 sunlight and UV radiation.
2 excessive heat.
3 harmful fumes.
4 corrosive chemicals or environments.

The lanyard can be cleaned by the use of a mild soap solution and warm water and a sponge. The use of harsh detergents or chemical solvents is not recommended. After washing, rinse the lanyard in clean water, and hang the lanyard to air dry away from direct heat and then carry out a further inspection. After washing any hardware should be function tested and lubricated with graphite if necessary.

WARNINGS

The following situations should be avoided when using lanyards:

1) **Snap hooks should not be attached to each other directly.**
2) **Only one snap hook should be attached to each D-ring.**
3) **Unless specifically designed as a "Tie-Back" lanyard the snap hook should not be connected back into the body of the lanyard.**
4) **If one leg of the lanyard is not in use it should not be tied into any harness strap, the primary D-ring, shoulder or positioning D-rings, but should be attached to a tear away fitting on the harness.**
5) **Connecting components attached together must be compatible in order to reduce or eliminate the possibility of snap hook "roll out".**
6) **Do not exceed the maximum separation between two anchorages when transferring between workstations.**

In case of any issues or interpretations arising out of the use of these products or these instructions please contact Safety Direct Ltd. for clarification.

Fall Protection You Can Live With! ®

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