



Instruction Manual

3107-1

Specialty Bolt-on Anchorage Connector



Users of this product must read, understand and adhere to the instructions and warnings in this manual before use, as well as those pertaining to other products used in conjunction with this anchorage connector. Employers are obliged under Title 29 CFR to provide training in the use of fall protection, work-positioning and travel restraint products and systems. Failure to adhere to this warning may result in serious injury or death.

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Contents

1. **Overview and Product Description**
2. **Anchorage Considerations**
3. **Installation**
4. **Compatible Equipment**
5. **Warnings and Limitations**
6. **Instructions for Use**
7. **Rescue Planning**
8. **Inspection**
9. **Specifications**
- Appendix A: Illustrations**

1. Overview and Product Description

- 1.1 Overview: This product has been designed specifically for installation and use inside of cooling towers of both wood and fiberglass construction. It may be used in other applications, under the supervision of a qualified person and in accordance with the guidance in Sections 2, 3 and 4 of this manual.

- 1.2 Product Description: This anchorage connector is a bolt-on anchorage connector designed for use by a single person weighing 310 lbs or less (including clothing, tools and equipment) with personal fall arrest systems only. This anchorage connector must not be used with travel restriction or work-positioning systems.

2. Anchorage Considerations:

- 2.1 Minimum Anchorage Strength Requirements: Anchorages (structures) to which this device may be attached must have a minimum static strength of 5,000 lbs in the absence of certification. With the certification of a Qualified Person or Professional Engineer, anchorages having a minimum strength of 3,600 lbs may be utilized provided that it is demonstrated that a safety factor of 2:1 can be achieved.

- 2.2 Anchorage Location: The anchorage must be located adjacent to the work area or fall hazard in a manner such that free-fall is limited to six feet or less and so that swing-fall (see Appendix A) is minimized to the extent possible. Also ensure that sufficient fall clearance exists (See Appendix A, and consult manufacturer's instructions for your Connecting Device(s)). Ensure that there are no obstructions in the fall path – obstructions or protruding structures may cause serious injury or death. This product was designed to be cost effective:

- 2.2.1 In cooling tower applications, an effort should be made to identify/certify as many structural anchor points as possible.

- 2.2.2 3107-1 Anchorage connectors should be installed liberally within the cooling tower structures to provide access to secure anchor points during service and inspection, and to minimize fall distance and swing-fall (see Appendix A).

- 2.2.3 Each 3107-1 Anchorage connector is designed for use by a single user weighing less than 310 lbs: Liberal installations allow multiple workers to have safe access to common working areas.

3. Installation: 3107-1 Anchorage connectors must be installed for use with personal fall arrest systems in a manner such that free-fall is limited to six feet or less, and so as to avoid swing-fall. Ideally, this means that the anchorage must be located at or above the user's back d-ring at all times. See section 5 for additional details.

- 3.1 Cooling Tower installations

- 3.1.1 Select and/or certify with the supervision of a Qualified Person, an anchorage point meeting the requirements of Section 2 of this manual. Install a #3107-1 Anchorage connector at the rated union between a 4x4 upright member and a 2x6 horizontal member on serviceable wood or fiberglass structures. See fig. 3.1.

- 3.1.2 Fiberglass Cooling Towers: 3107-1 Anchorage connector should be installed with the following hardware to the lower fastener connection in galvanized or stainless steel, grade 5 or better:

- (1) ½" x 5" bolt

- (2) ½" flat-washer

- (1) ½" lock-washer

(1) ½" Nut or Nyloc nut

3.1.3 Wood Cooling Towers: 3107-1 Anchorage connector should be installed to the higher or singular fastener connection with the following hardware in galvanized or stainless steel, grade 5 or better:

(1) ½" x 7-1/2" bolt

(2) ½" flat-washer

(1) ½" lock-washer

(1) ½" Nut or Nyloc nut

Figure 3.1

3107-1 Anchorage Connector Installed to Fiberglass Cooling Tower Structure



⚠ CAUTION

When installing 3107-1 Anchorage Connectors in Cooling Tower applications, the anchorage connector must be mounted to the lower fastener on fiberglass structures. On wood structures, it must be mounted to the upper fastener if multiple fasteners are utilized. This caution must be heeded to provide best anchorage strength.

3.2 Non-Cooling Tower Installations

3.2.1 The 3107-1 may be utilized on structures of concrete or steel to provide safe anchorage for single users of personal fall arrest systems, with a maximum user capacity of 310 lbs or less (user, clothing, tools and equipment).

3.2.2 For steel structures, the anchorage point must meet the minimum requirements of Section 2 of this manual, and the anchorage connector must be installed with the following hardware in galvanized or stainless steel, grade 5 or better:

(1) ½" bolt

(2) ½" flat-washers

(1) ½" lock-washer

(1) ½" nut or nyloc nut

3.2.3 For concrete structures, the 3107-1 must be installed using a Hilti® HSL-3-B M12/50 expansion fastener or equivalent, and the concrete composition and dimensions must meet the fastener manufacturer's minimum requirements. For further guidance, contact Reliance.

4. Compatible Equipment: This product is designed for use with a single personal fall arrest system having a maximum user capacity of 310 lbs (user, clothing, tools and equipment), which limits free-fall distance to six feet or less, and which will limit maximum arrest forces to 1,800 lbs or less.

4.1 Full Body Harnesses: All users of this system must be equipped with a full body harness meeting the minimum requirements of OSHA subpart M, and featuring a back or dorsal d-ring. This is the only authorized attachment point that may be utilized with this anchorage connector.

4.2 Connecting Devices

4.2.1 Energy-Absorbing Lanyards: Energy-Absorbing Lanyards (EAL's) are the preferred connecting device for use with this product. EAL's used with this product must meet the requirement of either ANSI Z359.1-2007 or ANSI Z359.13. The maximum working length allowed is six feet, and d-ring or anchorage extenders must only be used if it can be demonstrated that free-fall is limited to six feet.

4.2.2 Self-Retracting Devices: Any Reliance Self-Retracting Device may be used as an alternative to EAL's, **provided that the anchorage is located at or above the user's back d-ring at all times during the course of work adjacent to fall hazards. SRD's of other manufacturers may be used only if they are rated to Z359.14, and only if they are not referred to as "Fall-Limiters" on the manufacturer's labelling or instructions.**

4.2.3 Vertical Lifelines/Rope Grabs: Vertical lifelines with rope grabs or fall arrestors are **not recommended** for use with this product. In some circumstances, they may allow the user to be subjected to greater free-fall and swing-fall distances. **Serious injury or death may result from improper use and control of this type of connecting device.**

4.2.4 100% Tie-Off Procedures: It is required that users of this product utilize 100% tie-off procedures.

Connecting Devices used with this product shall be of the twin or dual leg type to facilitate 100% tie-off at all times when exposed to fall hazards.

4.3 Horizontal Lifelines: **Never use this product as an anchorage for Horizontal Lifelines or any other multi-user fall protection system! This product is not rated to sustain Horizontal Lifeline end-loads, or multiple user fall arrest loads. Such misuse may result in serious injury or death.**

4.4 Work-Positioning and Travel Restriction: **Do not use this anchorage for work-positioning or travel restriction systems.** This anchorage connector may deform under static working loads common in these applications, and such deformation may lead to reduced strength over time.

5. Warnings and Limitations:

5.1 Users of this equipment must read, understand and adhere to the instructions, warnings and labels provided with this product. Replacement instructions are available at www.relsafe.com.

5.2 Employers are required to train users of this equipment in accordance with the regulations published under Title 29 CFR, and Reliance recommends a managed fall protection program in accordance with ANSI Z359.2.

5.3 This product must be installed in accordance with Sections 2 and 3 of this manual, and under the supervision of a Qualified Person.

5.4 This product must be inspected by the user, before each use, and at least once annually by a Competent Person. See Section 8 of this manual for inspection procedures and pass/fail criteria.

5.5 Remove any surface contaminants such as concrete, stucco, tar, ice or any other build-up which may interfere with connected sub-systems or may cause cutting or abrasion of other components of your personal fall arrest system.

5.6 Harsh environments or destructive processes may degrade this anchorage connector over time. Beware of the effects of environmental conditions such as extreme heat, corrosive elements, dissimilar metals, etc., which may result in accelerated wear or corrosion. Beware also of destructive processes such as welding, sand-blasting and other processes which may be damaging to this product, the structure to which it is attached, or connected sub-systems. See Section 8.

5.7 Do not attempt to alter or repair this product. Do not deviate from installation or use instructions. If you have questions or concerns, consult with a Qualified Person and contact Reliance immediately.

5.8 Beware of moving equipment, machinery or energized lines and equipment. Contact between such hazards and any element of your personal fall arrest system may result in serious injury or death.



Failure to comply with these instructions and/or the above warnings may result in serious injury or death.

6. Instructions for Use

6.1 Energy-Absorbing Lanyards (EAL's)/Back-worn Self Retracting Devices (This section pertains to the use of Energy Absorbing Lanyards or Compact Self-Retracting Devices commonly worn by the user instead of EAL's)

6.1.1 Perform your inspections of the 3107 anchorage connector(s) and other elements of your personal fall arrest system in accordance with manufacturer's instructions.

6.1.2 When adjacent to a fall hazard, connect the anchorage end of a single leg of your EAL or SRD to the anchorage connector. Attach the free leg of your EAL to the lanyard keeper or lanyard parking location adjacent to the chest strap of your full body harness. Be sure to perform your work, and/or walk and maneuver with care and deliberation. While tied-off, you are tethered to the anchorage connector by a fixed-length connecting device and may lose your footing should you unexpectedly load the anchorage.

6.1.3 Ensure that the anchorage is at, or above the level of your back d-ring while working and maneuvering as you are tied-off.

6.1.4 In the event you need to move to another location, utilize the free leg of your EAL or SRD to attach to another anchorage prior to disconnecting the other leg of your lanyard attached to your primary anchorage.

6.1.5 Repeat as necessary until such time as you are no longer exposed to fall hazards.

6.2. Self-Retracting Devices: Traditional Self-Retracting Devices are mounted to the Anchorage on a permanent or semi-permanent basis. This subsection addresses Self-Retracting Devices used in this manner.

6.2.1 Perform your inspections of the 3107 anchorage connector(s) and other elements of your personal fall arrest system in accordance with manufacturer's instructions.

6.2.2 When adjacent to a fall hazard, connect the attachment end of the SRD line to the back d-ring of your full body harness. Be sure to perform your work, and/or walk and maneuver with care and deliberation. While tied-off, you SRD may lock up and cause you to lose your footing should you move or change position rapidly.

6.2.3 In the event you need to move to another location and are still exposed to a fall hazard(s), be sure to connect to the adjacent anchorage by means of the attached SRD or other connecting device before disconnecting from your primary or previous device. See and comply with manufacturer's instructions for your connecting device(s).

7. Rescue Planning

7.1 Under Title 29 CRF, it is the responsibility of the employer to have not only a written site-specific fall protection plan, but a plan to provide for prompt and effective rescue as well.

7.2 Suspension trauma, or orthostatic intolerance is a physiological condition which may occur in a matter of minutes, and may have adverse health effects up to and including death.

7.3 Reliance recommends that employers of the users of this product and all personal fall protection products refer to ANSI Z359.2 for best-practices in managed fall protection programs and rescue planning.



This anchorage product is not intended to support multiple users or post-fall rescue loads. Rescue and/or assisted rescue should be conducted with an independent anchorage adjacent to the location of the fallen worker. Please consult ANSI Z359.2 and/or manufacturer's instructions for your rescue system of choice.

8. Inspection

8.1 Pre-use inspections

8.1.1 Inspect fastening hardware to ensure that the anchorage connector is securely fastened to the structure.

8.1.2 Inspect 3107 anchorage for deformation. If the angle exceeds 90 degrees, the anchorage has likely been damaged in a fall or by some other form of loading and should be replaced.

8.1.3 Inspect 3107 and related fasteners for corrosion. The presence of red-rust indicates severe corrosion, and the anchorage needs to be removed from service and should be destroyed and replaced. The presence of white scale may be cleaned up with a wire brush. If the anchorage connector or fastening hardware exhibits pitting, cracking or any other deterioration, it should be removed from service, destroyed and replaced.

8.1.4 Inspect 3107 anchorage connector for cracking, breaking, burrs and other deformation or deterioration. Should any of these conditions exist, the anchorage connector should be removed from service, destroyed and replaced.

8.1.5 Inspect the structure to ensure that it is in good condition and has not deteriorated. For wood cooling tower structures, inspect for cracked lumber, knots or wood-rot. If these conditions exist, or if there is any question about the integrity of the structure, consult with a Qualified Person before proceeding with work. Check fiberglass structures for cracking or splintering or any other condition which may reduce the strength of the structure. If any of these conditions exist, consult with a Qualified Person before proceeding with work.

8.1.6 For applications to steel structures, inspect the structural anchorage for cracking, deformation, corrosion or any other condition which may have degraded the strength of the anchorage or anchorage connector. Consult with a Qualified Person before proceeding with work if any of these conditions exist.

8.1.7 For applications to concrete structures, check for proper embedment of the fastener and ensure that the anchorage connector is tightly bound to the structure. Check for cracking or spalling of the concrete adjacent to the anchorage. If any of these conditions exist, cease work and consult with a Qualified Person to re-certify or to re-establish another anchorage.

8.1.8 Inspect all other personal fall arrest system components in accordance with manufacturer’s instructions.

8.2 Competent Person Inspections: At least once annually, a competent person should conduct an inspection of anchorages and anchorage connectors in accordance with Section 8.1 of this manual. Should any failure condition exist, remove the anchorage connector(s) from service, destroy and replace immediately. Should a condition exist with the anchorage (structure) consult with a Qualified Person to recertify or remediate the structure before work resumes.

Inspection Record

Original Date of Installation:				Qualified Person Cert./Signature:	
Competent Person Inspection Date	Pass/Fail	Competent Person Inspection Date	Pass/Fail	Competent Person Inspection Date	Pass/Fail

9. Specifications

Anchorage Connector Class:	AD
Material of Construction:	SAE 304 Stainless Steel
Minimum Strength:	5,000 lbs / 22.2 kN
Maximum Capacity:	310 lbs / 140 kg
Approved Applications:	Fall Arrest Only
Standards/Regulations:	OSHA 1926.502 ANSI Z359.1

Appendix A: Illustrations

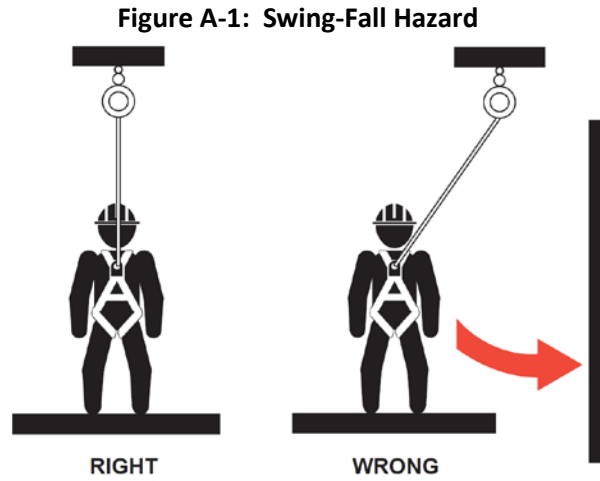
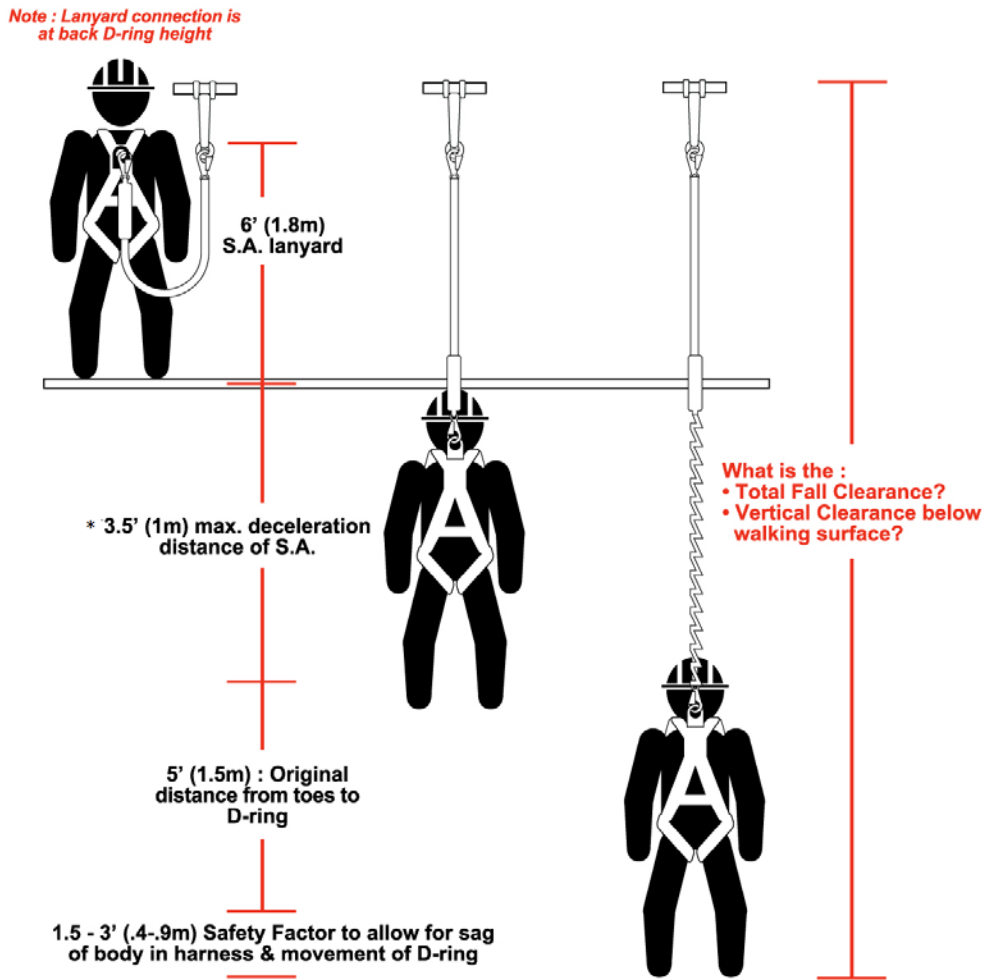


Figure A-2: Fall Clearance Calculation



**Deceleration distance is dependent on the connecting device you choose. This value may vary from 24" – 60" or greater depending on the device and manufacturer. Consult manufacturer's instructions for complete information on clearance requirements before installing or using this anchorage connector. Failure to properly calculate clearance requirements may result in serious injury or death.*