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User Instruction Manual Embedded Concrete Anchorage Connector

This manual is intended to meet the Manufacturer's Instructions as required by ANSI-Z359.1 and should be used as part of an employee training program as required by OSHA.

Instructions for the following series products:
 Embedded Concrete Anchorage Connector
Model Numbers:
 2100050, 2100051, 2100052, 2100053, 2100054, 2100055, 2100060

WARNING: This product is part of a personal fall arrest or restraint system. The user must follow the manufacturer's instructions for each component of the system. These instructions must be provided to the user of this equipment. The user must read and understand these instructions before using this equipment. Manufacturer's instructions must be followed for proper use and maintenance of this equipment. Alterations or misuse of this product, or failure to follow instructions, may result in serious injury or death.

IMPORTANT: If you have questions on the use, care, or suitability of this equipment for your application, contact DBI/SALA.

1.0 APPLICATIONS

1.1 PURPOSE: The embedded concrete anchorage connector is designed as a temporary anchorage connector for a personal fall arrest or restraint system. The Single Loop anchorage connector is designed for a single use and the Double Loop anchorage connector is designed to be reused once after initial installation. See Figure 1. Do not hang, lift, or support tools or equipment from this equipment. When the anchorage connector is used as a component of a personal fall arrest system (PFAS), it typically includes a full body harness and a connecting subsystem (energy absorbing lanyard). Maximum permissible free fall is six feet. When the anchorage connector is used as a component of a restraint system, it must be rigged to prevent the user from reaching a fall hazard. Restraint systems typically include a full body harness and a lanyard or restraint line. No vertical free fall is permitted.

1.2 LIMITATIONS: Consider the following limitations before using this product: This anchorage connector is designed for use by persons with a combined weight (clothing, tools, etc.) of no more than 310 lbs. No more than one personal protective system may be connected at one time. Restraint systems must be rigged so that no vertical free fall is possible. Personal fall arrest systems used with this equipment must be rigged to limit the free fall to six feet (ANSI Z359.1). See the personal fall arrest system manufacturer's instructions for more information. There must be sufficient clearance below the user to arrest a fall before the user strikes the ground or other obstruction. See Figure 2. The clearance required is dependent on the following factors: Elevation of anchorage connector, connecting subsystem length, deceleration distance, movement of harness attachment element, worker height, and free fall distance. See the personal fall arrest system manufacturer's instructions for more information. Swing falls occur when the anchorage point is not directly above the point where a fall occurs. See Figure 3. The force of striking an object in a swing fall may cause serious injury or death. Minimize swing falls by working as close to the anchorage point as possible. Do not permit a swing fall if injury could occur. Swing falls will significantly increase the clearance required when a self retracting lifeline or other variable length connecting subsystem is used. Use of this equipment in areas with environmental hazards may require additional precautions to prevent injury to the user or damage to the equipment. Hazards may include, but are not limited to; heat, chemicals, corrosive environments, high voltage power lines, gases, moving machinery, and sharp edges. Contact DBI/SALA if you have questions about using this equipment where environmental hazards exist. This equipment must be installed and used by persons trained in its correct application and use. See section 4.0.

1.3 APPLICABLE STANDARDS: Refer to national standards, including ANSI Z359.1 and local, state, and federal requirements for more information on personal fall arrest systems and associated components.

2.0 SYSTEM REQUIREMENTS

2.1 COMPATIBILITY OF COMPONENTS: DBI/SALA equipment is designed for use with DBI/SALA approved components and subsystems only. Substitutions or replacements made with non-approved components or subsystems may jeopardize compatibility of equipment and may effect the safety and reliability of the complete system.

2.2 COMPATIBILITY OF CONNECTORS: Connectors are considered to be compatible with connecting elements when they have been designed to work together in such a way that their sizes and shapes do not cause their gate mechanisms to inadvertently open regardless of how they become oriented. If the connecting element that a snap hook or carabiner attaches to is undersized or irregular in shape, a situation could occur where the connecting element applies a force to the gate of the snap hook or carabiner. This force may cause the gate (of either a self-locking or a non-locking snap hook) to open, allowing the snap hook or carabiner to disengage from the connecting point. Contact DBI/SALA if you have any questions about compatibility. Connectors (hooks, carabiners, and D-rings) must be capable of supporting at least 5,000 lbs. (22.2kN). Connectors must be compatible with the anchorage or other system components. Do not use equipment that is not compatible. Non-compatible connectors may unintentionally disengage. Connectors must be compatible in size, shape, and strength. Self locking snap hooks and carabiners are required by ANSI Z359.1 and OSHA.

2.3 MAKING CONNECTIONS: Only use self-locking snap hooks and carabiners with this equipment. Only use connectors that are suitable to each application. Ensure all connections are compatible in size, shape and strength. Do not use equipment that is not compatible. Ensure all connectors are fully closed and locked. DBI/SALA connectors (snap hooks and carabiners) are designed to be used only as specified in each product's user's instructions. See Figure 4. DBI/SALA snap hooks and carabiners should not be connected:

- A. To a D-ring to which another connector is attached.
- B. In a manner that would result in a load on the gate.

NOTE: Large throat opening snap hooks should not be connected to standard size D-rings or similar objects which will result in a load on the gate if the hook or D-ring twists or rotates. Large throat snap hooks are designed for use on fixed structural elements such as rebar or cross members that are not shaped in a way that can capture the gate of the hook.

- C. In a false engagement, where features that protrude from the snap hook or carabiner catch on the anchor and without visual confirmation seems to be fully engaged to the anchor point.
- D. To each other.
- E. Directly to webbing or rope lanyard or tie-back (unless the manufacturer's instructions for both the lanyard and connector specifically allow such a connection).
- F. To any object which is shaped or dimensioned such that the snap hook or carabiner will not close and lock, or that roll-out could occur.

2.4 PERSONAL FALL ARREST SYSTEM: Personal fall arrest systems used with this equipment must meet applicable state, federal, OSHA, and ANSI requirements. A full body harness must be worn when this equipment is used as a component of a personal fall arrest system. As required by OSHA, the personal fall arrest system must be capable of arresting the user's fall with a maximum arresting force of 1,800 lbs., and limit the free fall to six feet or less. If the maximum free fall distance must be exceeded, the employer must document, based on test data, that the maximum arresting force will not be exceeded, and the personal fall arrest system will function properly. When a free fall greater than six feet, and up to a maximum of twelve feet is possible, DBI/SALA recommends using a personal fall arrest system incorporating a DBI/SALA Force2 Energy Absorbing Lanyard. DBI/SALA has performed testing using the Force2 Energy Absorbing Lanyard in free falls up to twelve feet to ensure the maximum arresting force does not exceed 1,800 lbs., and the system functions properly. The results of these tests are listed in the user instruction manual provided with Force2 Energy Absorbing Lanyards.

2.5 ANCHORAGE STRUCTURE: This equipment is intended to be installed on structures capable of meeting the anchorage strength requirements specified below.

2.6 ANCHORAGE STRENGTH: The anchorage strength required is dependent on the application. Following are anchorage strength requirements for specific applications:

Figure 1 - Embedded Concrete Anchor Connectors

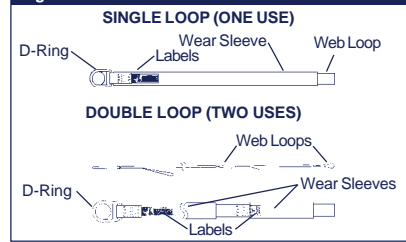


Figure 2 - Fall Clearance

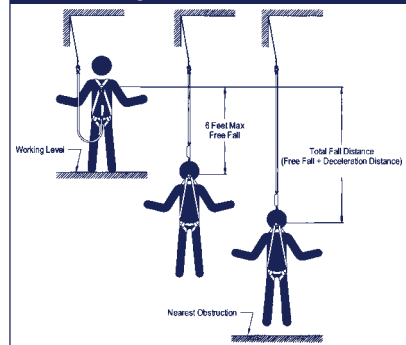
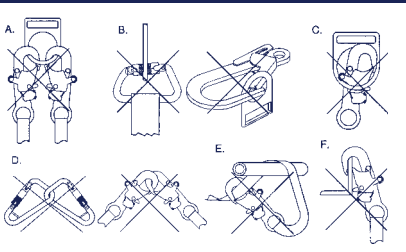


Figure 3 - Swing Falls



Figure 4 - Inappropriate Connections



- A. FALL ARREST:** The structure to which the anchorage connector is attached must sustain static loads applied in the directions permitted by the fall arrest system of at least: 3,600 lbs. with certification of a qualified person, or 5,000 lbs. without certification. See ANSI Z359.1 for certification definition. When more than one personal fall arrest system is attached to an anchorage, the strengths stated above must be multiplied by the number of personal fall arrest systems attached to the anchorage.

From OSHA 1926.500 and 1910.66: Anchorages used for attachment of a personal fall arrest system shall be independent of any anchorage being used to support or suspend platforms, and must support at least 5,000 lbs. per user attached; or be designed, installed, and used as part of a complete personal fall arrest system which maintains a safety factor of at least two, and is supervised by a qualified person.

- B. RESTRAINT:** The structure to which the anchorage connector is attached must sustain static loads applied in the directions permitted by the restraint system of at least 3,000 lbs. When more than one restraint system is attached to an anchorage, the strengths stated above must be multiplied by the number of restraint systems attached to the anchorage.

3.0 INSTALLATION AND USE

WARNING: Do not alter or intentionally misuse this equipment; your safety depends on it. Consult with DBI/SALA if using this equipment with components or subsystems other than those described in this manual. Some subsystem and component combinations may interfere with the operation of this equipment.

WARNING: Consult with your doctor if you doubt your fitness to safely absorb the shock from a fall arrest. Age and fitness can seriously affect your ability to withstand falls. Pregnant women and minors must not use this equipment.

- 3.1 PLAN** your system before installation. Consider all factors that will affect your safety during use of this equipment. The following gives important points to consider when planning your system: A) Select an anchorage that meets the requirements specified in section 2.0. B) Avoid working where system components may be in contact with, or abrade against, unprotected sharp edges. Inspection frequency should be increased when an anchorage connector is installed around sharp edges. C) Components which have been subjected to the forces of arresting a fall must be removed from service and destroyed. D) The employer must have a rescue plan when using this equipment. The employer must have the ability to perform a rescue quickly and safely.

- 3.2 EMBEDDED CONCRETE ANCHOR INSTALLATION:** Both the single loop anchor strap and the double loop concrete anchor install in the same manner. Select a location for the anchorage that will provide the best safety to the user. Once a section of concrete column, or a shear wall has been poured and allowed to cure, place the loop end of the concrete anchor over an exposed section of steel reinforcing bar. Once the concrete anchor is in place, forming of the floor or column may continue. Concrete anchor will be secured by making the next pour, and allowing the concrete to cure. Once forms are removed and the concrete has cured, anchors will remain on the face of a column, or on the seam between shear wall and bottom side of the floor. See Figure 5.

WARNING: Do not use this anchorage until it is embedded in cured concrete. The concrete is an essential part of the anchorage strength and using it without concrete support may cause the anchorage connector to fail and could result in serious injury or death.

3.3 REMOVAL OF EMBEDDED CONCRETE ANCHOR:

Once the fall hazard has been removed, the embedded concrete anchor must be removed. Use a knife or scissors to cut the concrete anchor at the concrete seam. When removing a double loop concrete anchor, make sure the cut is made between the line marked on the attached label and the poured concrete. See Figure 6.

WARNING: The single loop embedded concrete anchor is not reusable. It must be removed and disposed of once the fall hazard has been eliminated. The double loop embedded concrete anchor is not meant for more than two (2) installations. Using this product after removing it from two installations may cause the anchorage connector to fail and could result in serious injury or death.

3.4 SECOND LOCATION INSTALLATION:

To install the double loop embedded concrete anchor at a second site, place the loop created between the end of the wear sleeve and the end stitching over the rebar. Once the anchorage connector is in place, concrete may be poured into the forms. See Figure 7.

CONNECTING TO THE ANCHORAGE CONNECTOR: Connect to the installed anchorage connector with a self locking snap hook or self locking carabiner only. Do not pass the lanyard or lifeline through the anchorage connector D-ring and hook back into lanyard or lifeline. Ensure connections are fully closed and locked. See Figure 8 for connection of typical fall arrest or restraint equipment to the anchorage connector. When using an energy absorbing lanyard, connect the energy absorber pack end to the harness. Ensure self retracting lifeline is positioned so that retraction is not hindered. Always protect the lifeline or lanyard from abrading against sharp or abrasive surfaces in your work area. Ensure all connections are compatible in size, shape, and strength. Never connect more than one personal protective system to a single anchorage connector.

4.0 TRAINING

It is the responsibility of the user to assure they are familiar with these instructions, and are trained in the correct care and use of this equipment. The user must also be aware of the operating characteristics, application limits, and the consequences of improper use of this equipment.

IMPORTANT: Training must be conducted without exposing the trainee to a fall hazard. Training should be repeated on a periodic basis.

5.0 INSPECTION

Before each use, inspect the D-ring. It must not be damaged, broken, distorted or have any sharp edges, burrs, cracks, worn areas, or corrosion. Inspect the webbing for fraying, cuts, or discoloration due to exposure to chemicals, fumes or ultraviolet damage.

Before second installation of a double loop embedded concrete anchorage, inspect the anchorage for any sign of damaged webbing, stitching, or hardware. If inspection reveals any damage, the anchorage must not be used and must be disposed of immediately.

6.0 SPECIFICATIONS

Hardware: Forged alloy steel D-ring.

Webbing: 1 3/4-inch polyester strength member, 2 1/4-inch polyester wear pad.

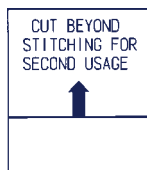
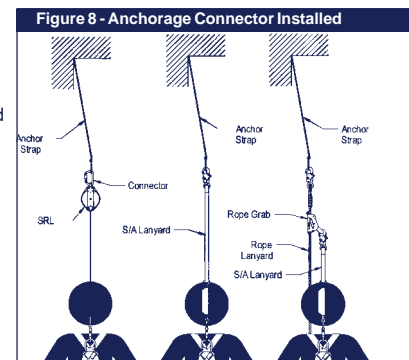
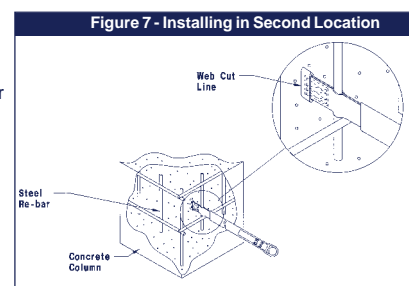
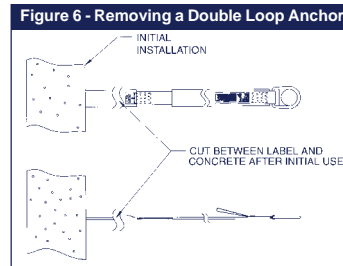
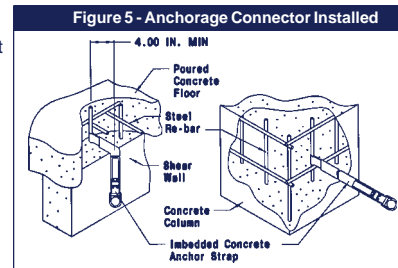
Minimum Breaking Strength: 5,000 lbs. when loaded within the recommended working range.

Capacity: 310 lbs. (one person)

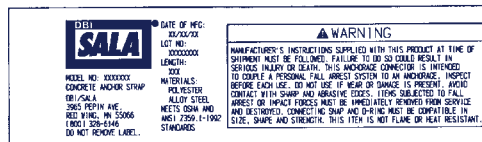
Meets ANSI Z359.1 and OSHA requirements.

7.0 LABELING

These labels must be securely attached to the anchorage connector and fully legible. See Figure 1 for label locations.



Second Use Label



Warning/Installation Label

