



The Ultimate in Fall Protection

User Instruction Manual for:
 Saflok™ Hybrid Mining Swivel Anchor
 Model Numbers: 2100155, 2100156

USER INSTRUCTION MANUAL

SAFLOK™ HYBRID MINING SWIVEL ANCHOR

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.

WARNING: This product is part of a personal fall arrest, restraint, work positioning, personnel riding, or rescue 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 equipment, or failure to follow these 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 Capital Safety.

IMPORTANT: Record the product identification information from the ID label in the Inspection and Maintenance Log in Section 9.0 of this manual.

DESCRIPTION

The Saflok™ Hybrid Mining Swivel Anchor (Figure 1) is an anchorage connector for fall arrest, restraint, work positioning, personnel riding and rescue systems. Rotation of the Bolt moves the End Termination out or in to expand or contract two Wedges within a friction rock bolt. When the Wedges are fully expanded, the anchor is secured. When the Wedges are fully contracted, the anchor can be removed from the friction rock bolt for reuse. The Swivel Ring is the anchorage connection point and can swivel for use (Figure 1).

Model 2100155 is used with a 39mm friction rock bolt. Model 2100156 is used with a 47mm friction rock bolt.

Figure 1 - Hybrid Mining Swivel Anchor

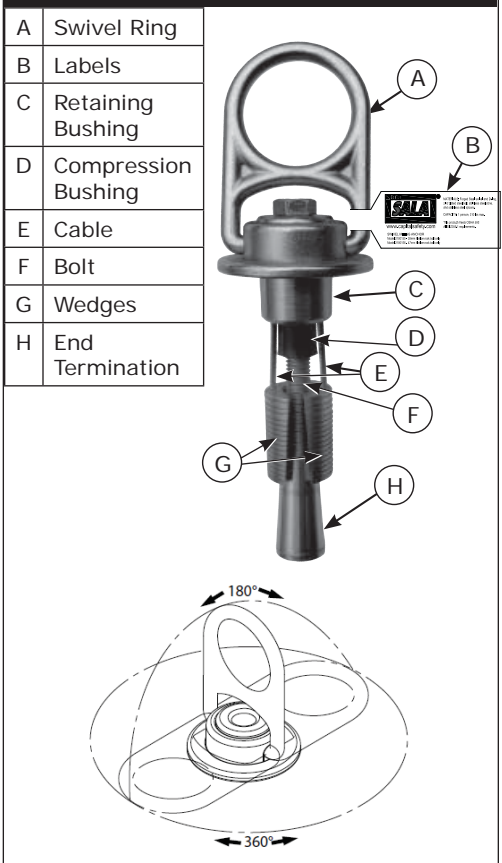
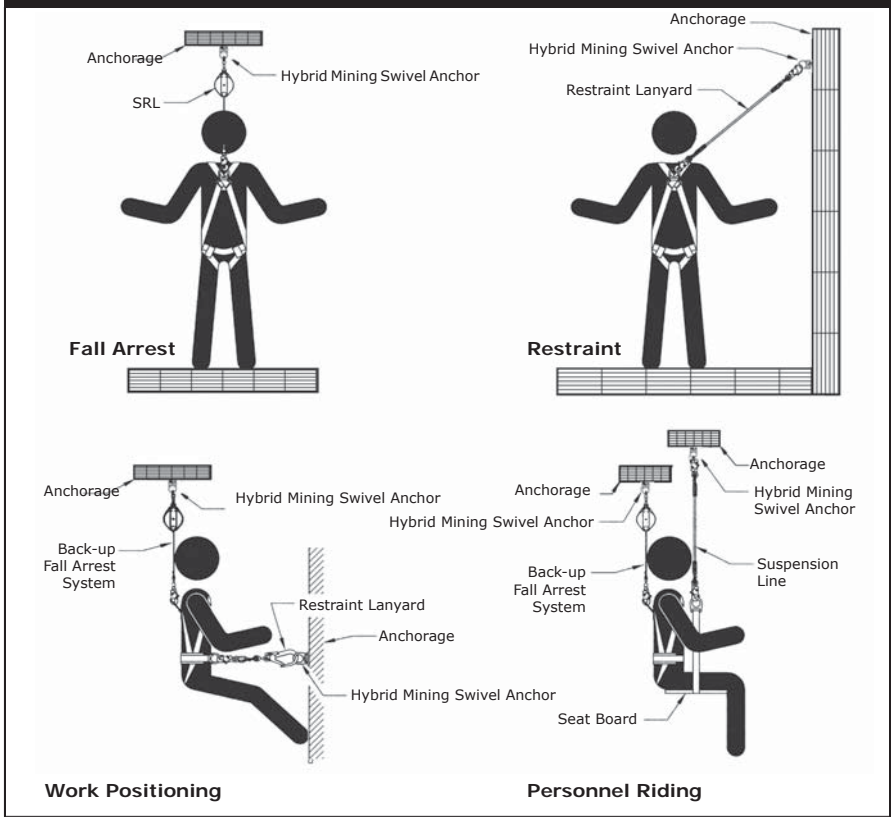


Figure 2 - Applications



1.0 APPLICATIONS

1.1 PURPOSE: The DBI-SALA Hybrid Mining Swivel Anchor is designed for use as a reusable anchorage connector for mining applications. See Figure 2 for application illustrations.

- A. PERSONAL FALL ARREST:** The Hybrid Mining Swivel Anchor is used as a component of a personal fall arrest system to protect the user in the event of a fall. Personal fall arrest systems typically include a full body harness and a connecting subsystem (energy absorbing lanyard). Maximum permissible free fall is 6 feet.
- B. RESTRAINT:** The Hybrid Mining Swivel Anchor is used as a component of a restraint system 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.
- C. WORK POSITIONING:** The Hybrid Mining Swivel Anchor is used as a component of a work positioning system to support the user at a work position. Work positioning systems typically include a full body harness, positioning lanyard, and a back-up personal fall arrest system. Maximum permissible free fall is 2 feet.

- D. **PERSONNEL RIDING:** The Hybrid Mining Swivel Anchor is used as a component of a personnel riding system to suspend or transport the user vertically. Personnel riding systems typically include a full body harness, boatswains's chair or seat board, and a back-up personal fall arrest system. No vertical free fall is permitted.
- E. **RESCUE:** The Hybrid Mining Swivel Anchor is used as a component of a rescue system. Rescue systems are configured depending on the type of rescue. No vertical free fall is permitted.

1.2 **LIMITATIONS:** The following application limitations must be recognized and considered before using this product:

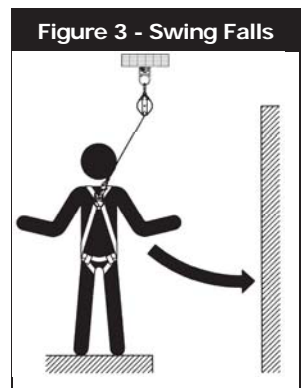
- A. **CAPACITY:** The Hybrid Mining Swivel Anchor is designed for use by persons with a combined weight (clothing, tools, etc.) of no more than 310 lbs (141 kg). No more than one personal protective system may be connected at one time.

NOTE: For emergency rescues it may be acceptable to connect more than one system if the anchorage will support the anticipated loads.

- B. **FREE FALL:** Personal fall arrest systems used with this equipment must be rigged to limit the free fall to 6 feet (ANSI Z359.1). See the personal fall arrest system manufacturer's instructions for more information. Restraint systems must be rigged so that no vertical free fall is possible. Work positioning systems must be rigged so that free fall is limited to 2 feet or less. Personnel riding systems must be rigged so that no vertical free fall is possible. Rescue systems must be rigged so that no vertical free fall is possible.
- C. **FALL CLEARANCE:** There must be sufficient clearance below the user to arrest a fall before the user strikes the ground or other obstruction. The clearance required is dependent on the following factors.
 - Deceleration Distance
 - Free Fall Distance
 - Worker Height
 - Movement of Harness Attachment Element
 - Elevation of D-Ring Anchorage Connector
 - Connecting Subsystem Length

See the personal fall arrest system manufacturer's instructions for more information.

- D. **SWING FALLS:** 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.



- E. **ENVIRONMENTAL HAZARDS:** 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.
- F. **TRAINING:** 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 family of standards, ANSI A10.32, and local, state, and federal (OSHA) requirements governing occupational safety for additional information regarding personal fall arrest systems and associated components.

2.0 SYSTEM REQUIREMENTS

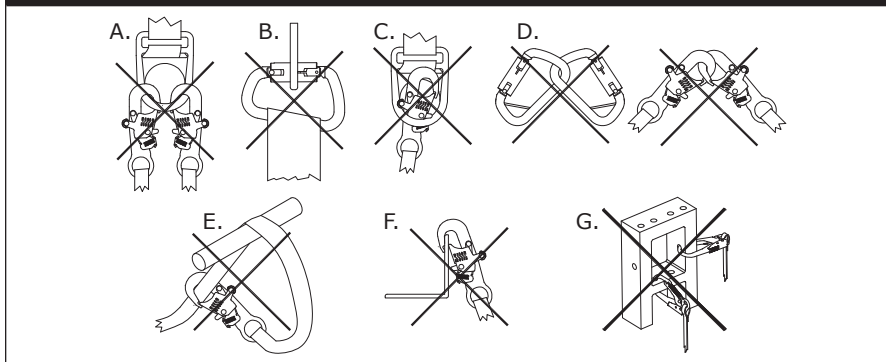
- 2.1 **COMPATIBILITY OF COMPONENTS:** DBI-SALA equipment is designed for use with DBI-SALA approved components and subsystems only. Substitutions or replacements made with non-approved components or subsystems may jeopardize compatibility of equipment and may effect the safety and reliability of the 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. Connectors (hooks, carabiners, and D-rings) must be capable of supporting at least 5,000 lbs. (22 kN). Connectors must be compatible with the anchorage or other system components. See Section 3.8 for additional information on anchorage connections. Do not use equipment that is not compatible. Non-compatible connectors may unintentionally disengage (see Figure 4). 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:** Use only 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 for inappropriate connections. 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: Other than 3,600 lb. (16 kN) gated hooks, 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.

Figure 4 - Inappropriate Connections



- 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.
- G. In a manner that does not allow the connector to align properly while under load.

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 6 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 6 feet and up to a maximum of 12 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 12 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 RESTRAINT SYSTEM: Restraint systems used with this equipment must meet state, federal, OSHA, and ANSI requirements.

2.6 ANCHORAGE STRENGTH: The anchorage strength required is dependent on the application type. The following are the requirements of ANSI Z359.1 for these application types:

- A. **Fall Arrest:** Anchorages selected for fall arrest systems shall have a strength capable of sustaining static loads applied in the directions permitted by the system of at least:
 - 1. 5,000 lbs. (22.2 kN) for non-certified anchorages
 - 2. Two times the maximum arresting force for certified anchorages.
- B. **Restraint:** Anchorages selected for restraint and travel restraint systems shall have a strength capable of sustaining static loads applied in the directions permitted by the system of at least:
 - 1. 1,000 lbs. (4.5 kN) for non-certified anchorages
 - 2. Two times the foreseeable force for certified anchorages.
- C. **Work Positioning:** Anchorages selected for work positioning systems shall have a strength capable of sustaining static loads applied in the directions permitted by the system of at least:
 - 1. 3,000 lbs. (13.3 kN) for non-certified anchorages
 - 2. Two times the foreseeable force for certified anchorages.
- D. **Rescue:** Anchorages selected for rescue systems shall have a strength capable of sustaining static loads applied in the directions permitted by the system of at least:
 - 1. 3,000 lbs. (13.3 kN) for non-certified anchorages
 - 2. Five times the foreseeable force for certified anchorages.
- E. **PERSONNEL RIDING:** The structure to which the Mining Bolt Anchor is attached must sustain static loads applied in the directions permitted by the personnel riding system of at least 2,500 lbs. When more than one personnel riding system is attached to an anchorage, the strengths stated above must be multiplied by the number of personnel riding systems attached to the anchorage.

WARNING: Use of the Hybrid Mining Swivel Anchor for an application that does not meet the anchorage strength requirements stated in this section may result in serious injury or death.

3.0 INSTALLATION AND USE

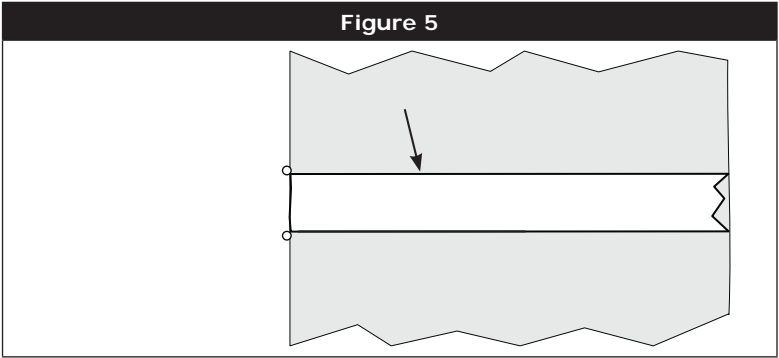
WARNING: Do not alter or intentionally misuse this equipment. Consult Capital Safety when using this equipment in combination with components or subsystems other than those described in this manual. Some subsystem and component combinations may interfere with the operation of this equipment. Use caution when using this equipment around moving machinery, electrical hazards, chemical hazards, sharp edges, and abrasive surfaces.

WARNING: Consult your doctor if there is any reason to doubt your fitness to safely absorb the shock from a fall arrest or suspension. Age and fitness seriously affect a worker's ability to withstand falls. Pregnant women or minors must not use DBI-SALA equipment unless in an emergency situation.

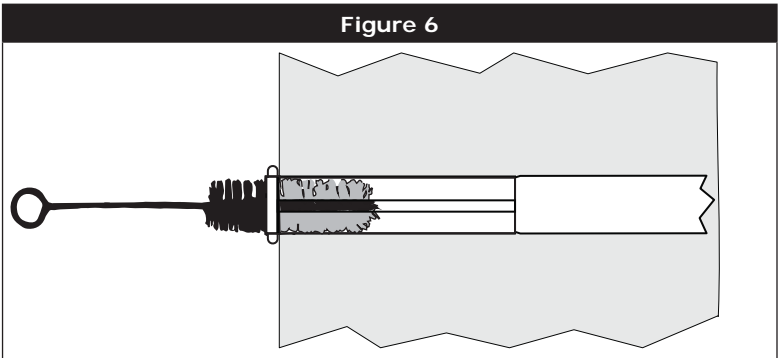
- 3.1 **BEFORE EACH USE:** Before each use of this equipment, carefully inspect it to assure that it is in serviceable condition. Refer to section 5.0 for inspection details. Do not use if inspection reveals an unsafe condition.
- 3.2 **PLANNING:** Plan your system before starting your work. Take into consideration factors that affect your safety before, during, and after a fall. The following list gives some important points to consider:
 - A. **ANCHORAGE:** Select an anchorage capable of supporting the loads specified in Section 2.6.
 - B. **SHARP EDGES:** Avoid working where system components may be in contact with or abrade against sharp edges. If working around sharp edges is unavoidable, provide protection by using a heavy pad over the exposed sharp edge.
 - C. **AFTER A FALL:** Components subjected to the forces of arresting a fall must be removed from service and destroyed.
 - D. **RESCUE:** The employer must have a rescue plan in place prior to the use of this equipment. The rescue plan must provide for a quick safe rescue.
- 3.3 **INSTALLATION REQUIREMENTS:** The following requirements must be observed to ensure safe effective installation of the Mining Bolt Anchor:
 - A. **Anchorage:** A competent person must confirm that the substrate and correctly sized friction rock bolt the Hybrid Mining Swivel Anchor is to be anchored in can withstand the required static load capacity for the application as described in Section 2.6. The Hybrid Mining Swivel Anchor is not intended for use in concrete, hollow block, grout, wood, steel or bare rock.
- 3.4 **INSTALLATION:** To ensure effective installation of the Mining Bolt Anchor, always observe the requirements defined in Section 3.3. Perform the following steps to install the Hybrid Mining Swivel Anchor. Refer to Figure 1 for component identification.

- Step 1.** Select an installed friction rock bolt of the correct size:
39 mm friction rock bolt for Mining Bolt Anchor model 2100155
47 mm friction rock bolt for Mining Bolt Anchor model 2100156

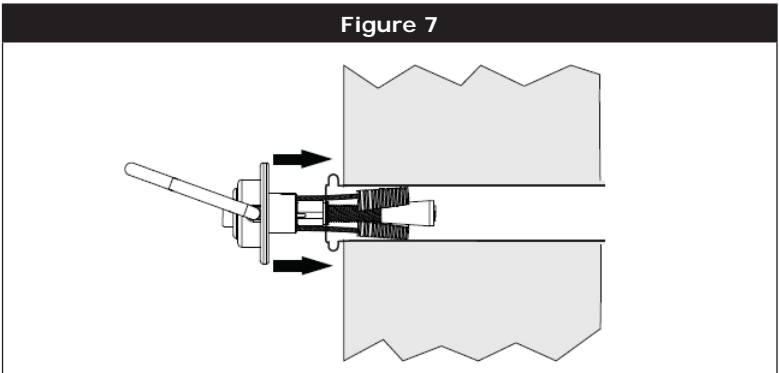
WARNING: The Hybrid Mining Swivel Anchor is *ONLY* to be installed into secured friction rock bolts. Friction rock bolts are tubes that are inserted into rock walls for various applications. (See Figure 5.)



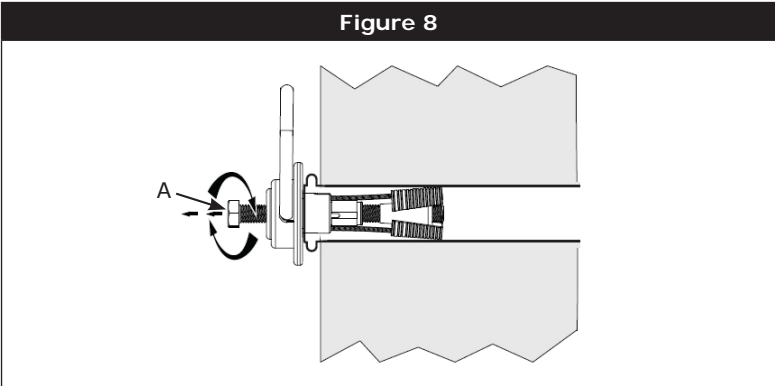
- Step 2.** Use a friction rock bolt brush to remove any debris and clean out the friction rock bolt. (See Figure 6.)



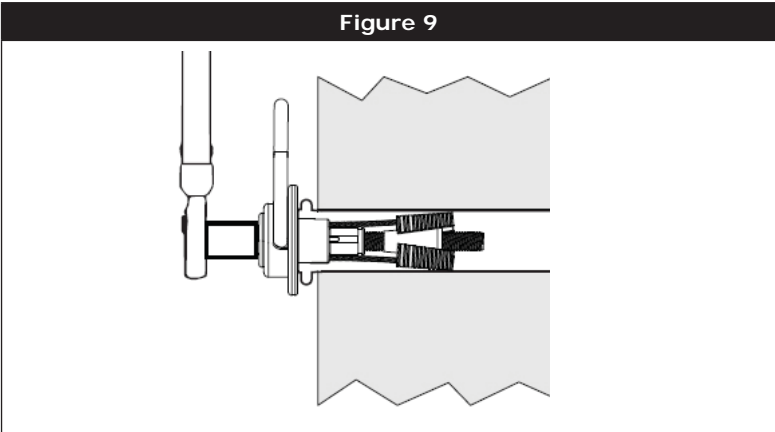
- Step 3.** Insert the anchor into the hole so the base plate rests flat on top of the friction rock bolt surface. The wedges must rest on the surfaces of the friction rock bolt and not on the split area of the friction rock bolt. Do not force. (See Figure 7.)



- Step 4.** Pull up on the bolt (A) while holding the swivel flush with the friction rock bolt. Tighten the bolt on the swivel by turning it clockwise with your fingers until the bolt is fully screwed down. (See Figure 8.)

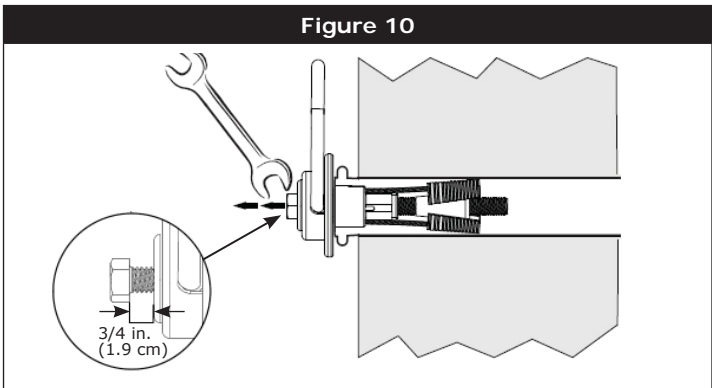


- Step 5.** Use a torque wrench to torque the bolt to 30 ft-lbs (3.38 Nm) for a 5,000 lb (2,268 kg) capacity limit. (See Figure 9.)

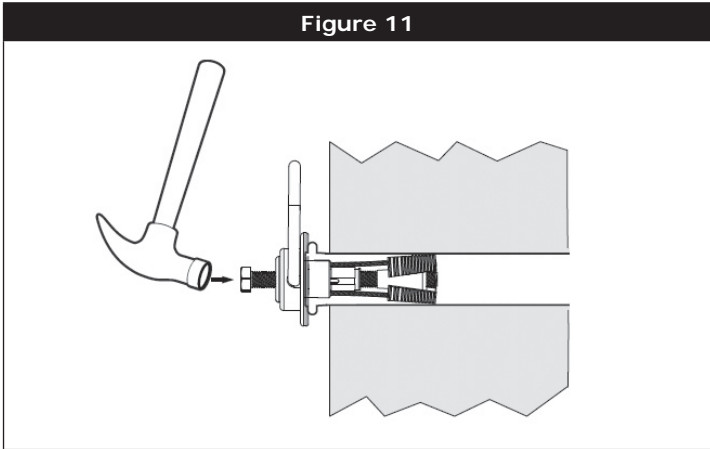


3.5 REMOVAL: To remove the Hybrid Mining Swivel Anchor:

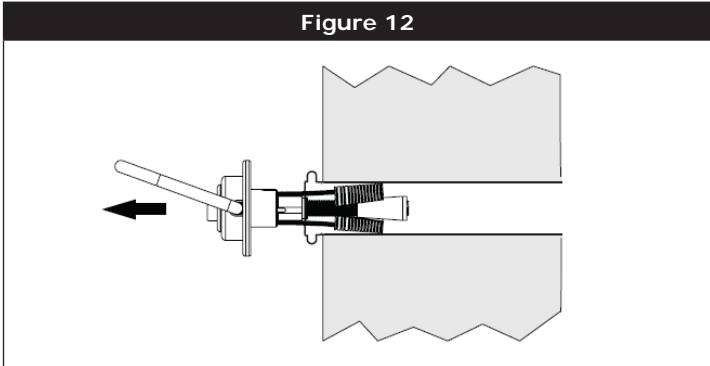
- Step 1.** Loosen bolt so that at least 3/4" (1.9 cm) of threads are exposed. (See Figure 10.)



- Step 2.** Use a hammer to tap down bolt to disengage the end termination from the wedges. (See Figure 11.)



- Step 3.** Pull the anchor out of the friction rock bolt. (See Figure 12.)



- 3.6 REUSE:** The Hybrid Mining Swivel Anchor may be reused if it has not been subjected to a fall force.
- 3.7 DISPOSAL:** Dispose of the Hybrid Mining Swivel Anchor if it has been subjected to fall force or fails inspection (see Section 5) reveals an unsafe or defective condition.

Before disposing of the Hybrid Mining Swivel Anchor, cut the wedges off the retractor cables to eliminate the possibility of inadvertent reuse.

- 3.8 CONNECTIONS:** When using a hook to connect to the Hybrid Mining Swivel Anchor, ensure roll-out cannot occur. Roll-out occurs when interference between the hook and mating connector causes the hook gate to unintentionally open and release. Self-locking snap hooks and carabiners should be used to reduce the possibility of roll-out. Do not use hooks or connectors that will not completely close over the attachment object. See subsystem manufacturer's instructions for information on connecting to the Hybrid Mining Swivel Anchor.

4.0 TRAINING

- 4.1 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. Users 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

To ensure safe, efficient operation, the Hybrid Mining Swivel Anchor should be inspected at the intervals defined in Section 5.1. See Section 5.2 for inspection procedures.

5.1 FREQUENCY:

- **Before Each Use:** Visually inspect the Mining Bolt Anchor per steps listed in Sections 5.2 and 5.3.
- **Annually:** A formal inspection of the Mining Bolt Anchor and its connection to the structure must be performed at least annually by a competent person other than the user. The frequency of formal inspections should be based on conditions of use or exposure. See sections 5.2 and 5.3. Record the inspection results in the inspection and maintenance log in section 9.0.

IMPORTANT: Extreme working conditions (harsh environment, prolonged use, etc.) may require increasing the frequency of inspections.

- 5.2 **INSPECTION STEPS:** Per the intervals defined in Section 5.1, inspect the Hybrid Mining Swivel Anchor as follows. (Refer to Figure 1 for component identification):

- Step 1.** Confirm the Hybrid Mining Swivel Anchor is straight and is operating smoothly.
- Step 2.** Confirm the label is attached to the Hybrid Mining Swivel Anchor and is legible (see Section 8).
- Step 3.** Confirm the cables are not kinked, frayed, or damaged.
- Step 4.** Confirm metal components are not damaged or excessively corroded.
- Step 5.** Confirm the wedges and cables operate smoothly and no metal burrs are present. Confirm wedges do not exhibit any deformities.

NOTE: Record the inspection date and results in the Inspection and Maintenance Log (see Section 9.0).

- 5.3 **DEFECTS:** If inspection reveals a defective condition, remove the Hybrid Mining Swivel Anchor from service and dispose in the manner described in Section 3.7.
- 5.4 **PRODUCT LIFE:** The functional life of the Mining Bolt Anchor is determined by work conditions and maintenance. As long as the product passes inspection criteria, it may remain in service.

6.0 MAINTENANCE

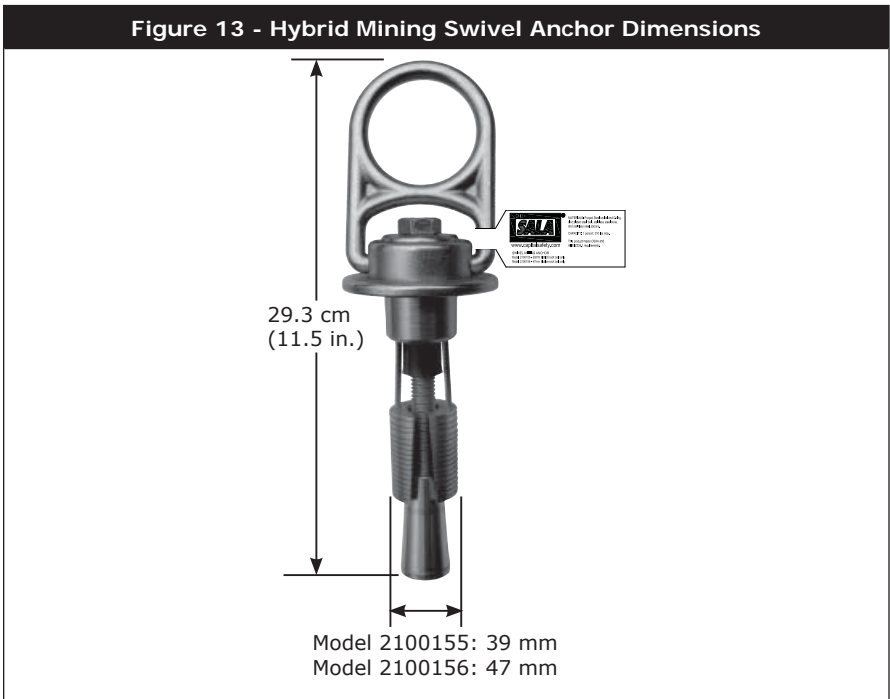
- 6.1 CLEANING:** After each use, blow off the Mining Bolt Anchor with compressed air. Keep the Mining Bolt Anchor free of grease, oils, and dirt.
- 6.2 STORAGE:** Store the Hybrid Mining Swivel Anchor in a clean dry environment. Avoid areas where chemical vapors may exist. Do not pile objects on top of the anchor. Thoroughly inspect the Hybrid Mining Swivel Anchor after extended storage.

7.0 SPECIFICATIONS

7.1 MATERIALS:

Swivel Ring:	Forged Steel	End Termination:	Stainless Steel
Cable:	Aircraft Cable	Compression Bushing:	Polyethylene
Retaining Bushing:	Zinc Plated Steel	Bolt:	Zinc Plated Steel
Wedges:	Stainless Steel	Sleeve:	Zinc Plated Steel
Tensile Strength:	5,000 lbf. (22 kN) minimum		
Compliance:	ANSI Z359.1-2007, ANSI Z359.7-2011 and OSHA 1926.502		

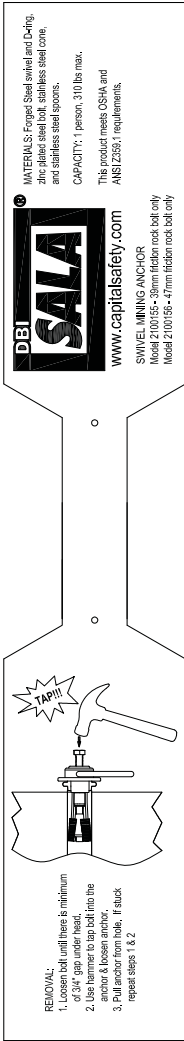
- 7.2 DIMENSIONS:** See Figure 13 for physical dimensions of the Hybrid Mining Swivel Anchor.



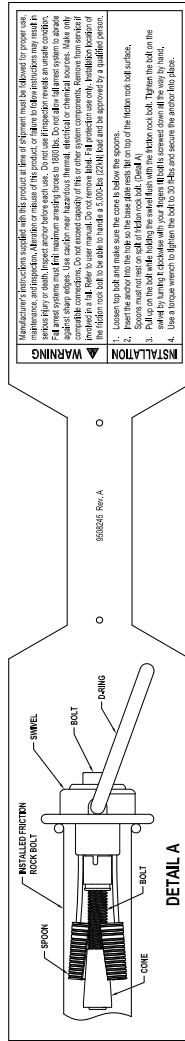
8.0 LABELING

The following labels should be securely attached to the Hybrid Mining Swivel Anchor:

Front



Back



9.0 INSPECTION AND MAINTENANCE LOG

SERIAL NUMBER: _____

MODEL NUMBER: _____

DATE PURCHASED: _____ DATE FIRST USED: _____

INSPECTION DATE	INSPECTION ITEMS NOTED	CORRECTIVE ACTION	MAINTENANCE PERFORMED
Approved By: _____			
Approved By: _____			
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INSPECTION DATE	INSPECTION ITEMS NOTED	CORRECTIVE ACTION	MAINTENANCE PERFORMED
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LIMITED LIFETIME WARRANTY

Warranty to End User: D B Industries, Inc., dba CAPITAL SAFETY USA ("CAPITAL SAFETY") warrants to the original end user ("End User") that its products are free from defects in materials and workmanship under normal use and service. This warranty extends for the lifetime of the product from the date the product is purchased by the End User, in new and unused condition, from a CAPITAL SAFETY authorized distributor. CAPITAL SAFETY'S entire liability to End User and End User's exclusive remedy under this warranty is limited to the repair or replacement in kind of any defective product within its lifetime (as CAPITAL SAFETY in its sole discretion determines and deems appropriate). No oral or written information or advice given by CAPITAL SAFETY, its distributors, directors, officers, agents or employees shall create any different or additional warranties or in any way increase the scope of this warranty. CAPITAL SAFETY will not accept liability for defects that are the result of product abuse, misuse, alteration or modification, or for defects that are due to a failure to install, maintain, or use the product in accordance with the manufacturer's instructions.

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