



## **USER INSTRUCTION MANUAL** **HINGED ROOF ANCHOR**

*This manual is intended to meet industry standards including OSHA and should be used as part of an employee training program as required by OSHA.*

### **DESCRIPTION**

The Hinged Roof Anchor (Figure 1) consists of a forged D-ring attached to steel base. In use, the base is nailed to the roof structure per these instructions. The D-ring is used for connection of the fall arrest or restraint system.

**WARNING:** *This product is part of a fall arrest or restraint system. The users must read and understand the DBI-SALA instructions for each component or part of the complete system. These instructions must be provided to the user of this equipment. The users must read and understand these instructions or have them explained to them before using this equipment. The DBI-SALA instructions must be followed for proper use, care and maintenance of this product. 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 for use of this equipment, contact Capital Safety immediately. (See back cover for contact information.)*

### **1.0 APPLICATION**

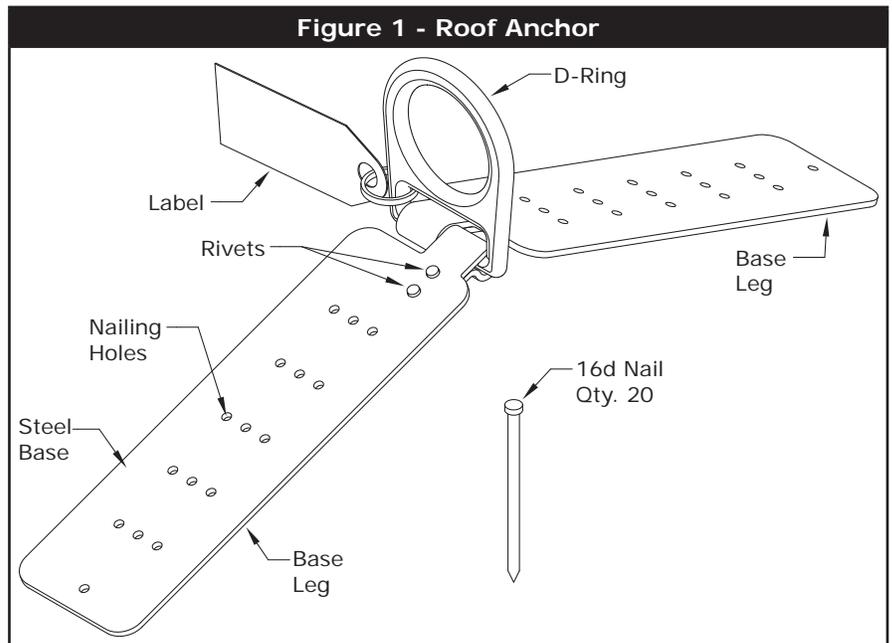
**1.1 PURPOSE:** The Hinged Roof Anchor is designed to be used as a temporarily installed (not for permanent installation) anchorage connector on wood frame structures. This anchorage connector may be used as part of a personal fall arrest or restraint system. Do not attach a lifeline between two or more roof anchors (i.e. horizontal lifeline system). Do not hang, lift or support tools or equipment from this roof anchor or attach guylines for antennas, phone lines, etc.

#### **A. FALL ARREST**

**APPLICATION:** In this application, the roof anchor is used as part of a complete fall arrest system. Such systems typically include a full body harness and some form of connecting subsystem, such as an energy absorbing lanyard. Maximum permissible free fall is 6 feet. This type of system is used where a free fall is possible before the fall is arrested.

#### **B. RESTRAINT APPLICATION:**

In this application, the roof anchor is used as part of a complete restraint system. Such systems typically include a full body harness and a lanyard or restraint line used to restrain or tether the user from reaching a hazard (i.e. leading edge roof work). This type of system is used where no vertical free fall is possible.



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

- A. ROOF STRUCTURE:** This anchorage connector is intended to be installed on wood framed structures capable of meeting the anchorage strength requirements as set forth in section 2.4. Consult Capital Safety before using these roof anchors on any other roof material.
- B. CAPACITY:** This anchorage connector is designed for use by persons with a combined weight (person, clothing, tools, etc.) of no more than 310 lbs. Only one personal protective system may be connected to the roof anchor at any time.
- C. PERSONAL FALL ARREST SYSTEM (PFAS) :** PFASs selected for use with this roof anchor must meet the system performance and other criteria as stated in section 3.2.
- D. FREE FALL:** PFASs used with these roof anchors must be rigged in such a way as to limit the free fall to a maximum of 6 feet (reference ANSI Z359.1). See associated connecting subsystem DBI-SALA instructions for further information.
- E. FALL CLEARANCE:** Make certain that enough clearance exists in your fall path to prevent striking an object. The amount of clearance needed is dependent upon the type of connecting subsystem used (energy absorbing lanyard, self retracting lifeline, etc.), and the anchorage location. Refer to the DBI-SALA instructions of the connecting subsystem or component for more information on fall clearance.
- F. RESTRAINT SYSTEMS:** Restraint systems selected for use with this roof anchor must meet the requirements given in section 3.2.
- G. CORROSION:** Use near sea water or other corrosive environments may require more frequent inspections or servicing (replacement) to assure corrosion damage is not affecting the performance of the product.
- H. CHEMICAL HAZARDS:** Solutions containing acids, alkali, or other caustic chemicals, especially at elevated temperatures, may cause damage to this equipment. Consult Capital Safety if doubt exists concerning installing this equipment where chemical hazards are present.
- I. ELECTRICAL HAZARDS:** Do not install roof anchors where they or the user may come into contact with electrical power lines.
- J. TRAINING:** This equipment is intended to be installed and used by persons who have been properly trained on its correct application. See section 4.0.

**1.3** Refer to national consensus (including ANSI Z359.1, applicable local, state, and federal (OSHA) requirements) governing this equipment for more information on anchorage connectors, and associated system components.

## **2.0 SYSTEM REQUIREMENTS**

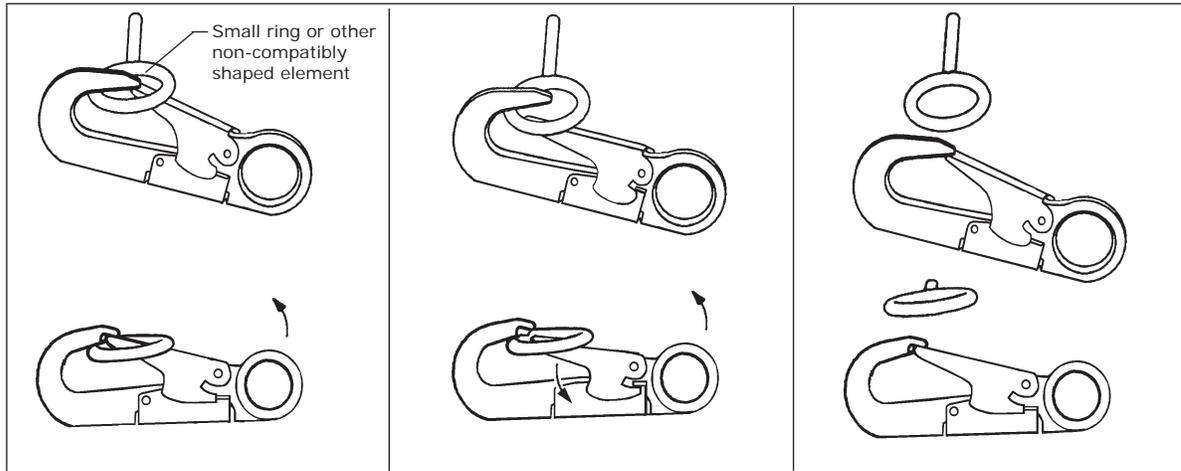
**2.1 COMPATIBILITY OF CONNECTORS:** The Hinged Roof Anchor is designed for use with approved components and subsystems only. Substitutions or replacements made with non-approved components or subsystems may jeopardize compatibility of equipment and may effect the safety and reliability of the complete system.

**2.2 COMPATIBILITY:** 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. Contact the manufacturer 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. See Figure 2. Connectors must be compatible in size, shape, and strength. Self locking snap hooks and carabiners are required by ANSI Z359.1 and OSHA.

**Figure 2 - Unintentional Disengagement (Roll-out)**

If the connecting element that a snaphook (shown) 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 snaphook or carabiner. This force may cause the gate (of either a self-locking or a non-locking snaphook) to open, allowing the snaphook or carabiner to disengage from the connecting point.



1. Force is applied to the snap hook.

2. The gate presses against the connecting ring.

3. The gate opens allowing the snap hook to slip off.

**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.

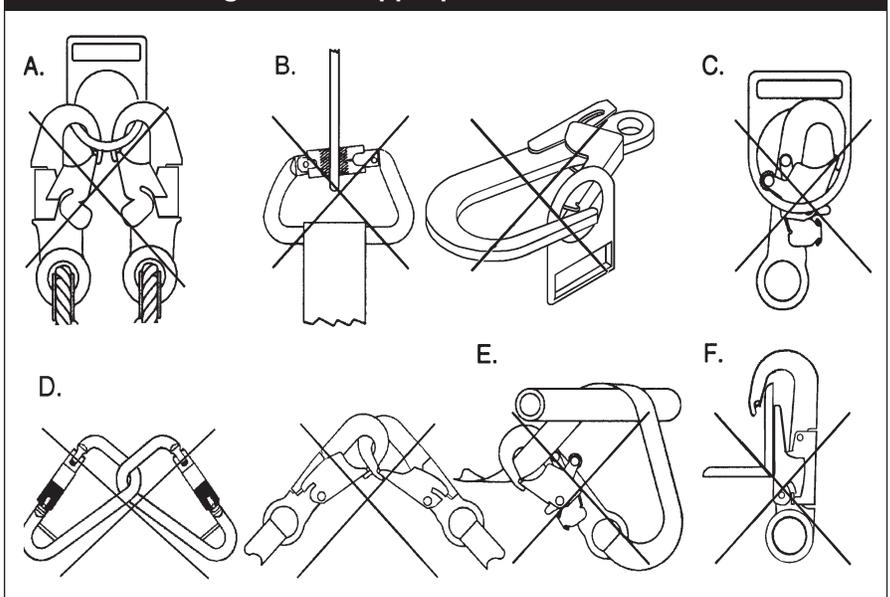
Connectors (snap hooks and carabiners) are designed to be used only as specified in each product's user's instructions. See Figure 3 for inappropriate connections. Snap hooks and carabiners should not be connected:

- 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.

**Figure 3 - Inappropriate Connections**



**2.4 ANCHORAGE STRENGTH:** Depending on the application, the anchorage to which the roof anchor is installed must meet strengths as given below:

**FALL ARREST:** Roof anchors installed for fall arrest applications must be attached to a roof member capable of sustaining static loads in the direction(s) permitted by the PFAS when in use of at least: (A) 3,600 lbs. (16kN) when certification exists (reference ANSI Z359.1 for certification definition); or (B) 5,000 lbs. (22.2kN) in absence of certification. See Figure 4 for roof anchor loading direction limitations. When more than one roof anchor is installed to a roof structure, the strengths given in (A) or (B) above must be met at each roof anchors installation point independently. EXAMPLE: If two roof anchors are installed onto a roof structure, each anchor location must be independently capable of supporting 5,000 lbs. (or 3,600 lbs. with certification).

**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.

**RESTRAINT:** Roof anchors installed for restraint applications must be attached to a roof member capable of sustaining a static load of at least 3,000 lbs. applied in any direction permitted by the restraint system when in use. Each roof anchor installation must be independently capable of sustaining this load.

### 3.0 OPERATION AND USE

**WARNING:** Do not alter or intentionally misuse this equipment. Consult Capital Safety 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. Use caution when using this equipment around moving machinery, electrical hazards, chemical hazards, and sharp edges.

**WARNING:** Do not use this system if you are unable to tolerate the impact of a fall arrest. Age and fitness can seriously affect your ability to withstand a fall. Pregnant women and minors must not use this equipment.

- 3.1 BEFORE INSTALLATION** of this equipment, carefully inspect it to assure it is in serviceable condition. Check for missing or damaged parts, see Figure 1. Legs of the metal base should be flat and free of tears or corrosion. Rivets should be tight and securely clinched. Check for installation nails (20 x 16d nails) or screws (12 x 1/4-14 Teks screws). Refer to section 5.0 for further inspection details. Do not use if inspection reveals an unsafe condition. **NOTE: The Hinged Roof Anchor is designed as a multi-use anchor. Teks screws may not be reused..**
- 3.2 PLAN** your fall arrest or restraint system before starting your work. Take into consider all factors affecting your safety at any time during use. The following list gives some important points to consider when planning your system:
- A. ANCHORAGE:** Select an anchorage point that is rigid and capable of supporting the required loads. See section 2.4. Locate the roof anchor in accordance with section 3.3.
  - B. FREE FALL:** PFASs must be rigged to limit any free fall to a maximum of 6 feet (OSHA and ANSI Z359.1), restraint systems must be rigged such that no vertical free fall is possible. Avoid working above your anchorage level since an increased free fall distance will result.
  - C. PERSONAL FALL ARREST SYSTEM REQUIREMENT:** PFASs used with this roof anchor must meet applicable OSHA, state, federal, and ANSI requirements. PFASs incorporating a full body harness must be capable of arresting a workers fall with maximum arresting force of no greater than 1,800 lbs. and limit the free fall distance to 6 feet or less. The deceleration distance for PFAS must be 42 inches (1.1m) or less. Reference ANSI Z359.1 and OSHA requirements.
  - D. RESTRAINT SYSTEMS:** Restraint systems must meet applicable state and federal requirements.
  - E. FALL CLEARANCE:** Should a fall occur, there must be sufficient clearance in the fall area to arrest the fall before striking the ground or other objects. The actual clearance required is dependent upon the type of fall arrester connecting subsystem used (energy absorbing lanyard, self retracting lifeline, etc.). Refer to the DBI-SALA instructions for fall clearance information.

F. **SWING FALLS:** Swing falls occur when the anchor is not directly above the point where a fall occurs. The force of striking an object while swinging can be great and cause serious injury. Minimize swing falls by working as directly below the anchorage as possible (the worker must be positioned within 30 degrees of the roof anchor), see Figure 4. It is acceptable to captivate a lifeline (i.e. rope grab system) to an anchorage close to the work area with a carabiner, see Figure 4. Do not captivate the lifeline of a self retracting lifeline as this may affect the performance of its internal braking.

G. **SHARP EDGES:** Avoid working where the connecting subsystem (i.e. shock absorbing lanyard, self retracting lifeline, full body harness, etc.) or other components will be in contact with, or abrade against, unprotected sharp edges. Do not the loop lanyard around small diameter structural members. If working with equipment near sharp edges is unavoidable, protection against cutting must be provided by using a heavy pad or other means over the exposed sharp edge.

H. **RESCUE:** Should a fall occur, the user (employer) must have a rescue plan and the means at hand to implement it.

I. **AFTER A FALL:** Any equipment which has been subjected to the force of arresting a fall must be removed from service immediately and destroyed, or contact a factory authorized service center for repair.

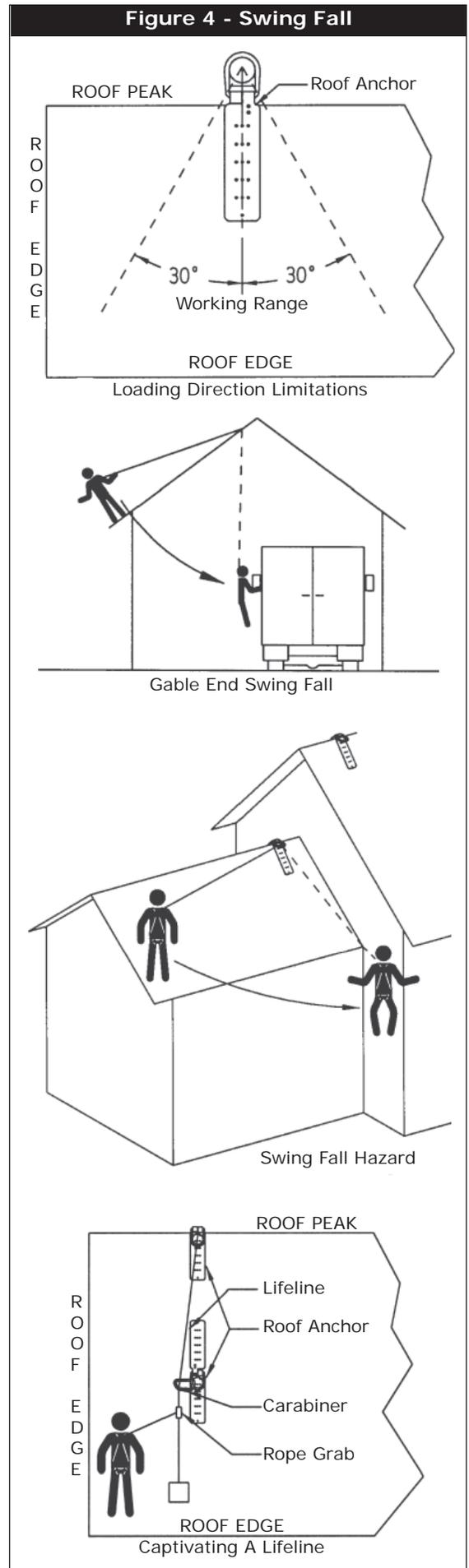
**3.3 INSTALLATION REQUIREMENTS.**

A. **ROOF ANCHOR SITE PLAN:** Before starting the roof construction, a plan should be established as to where the roof anchors will be installed, and when during the construction process they may be used. The following are guidelines on locating roof anchors:

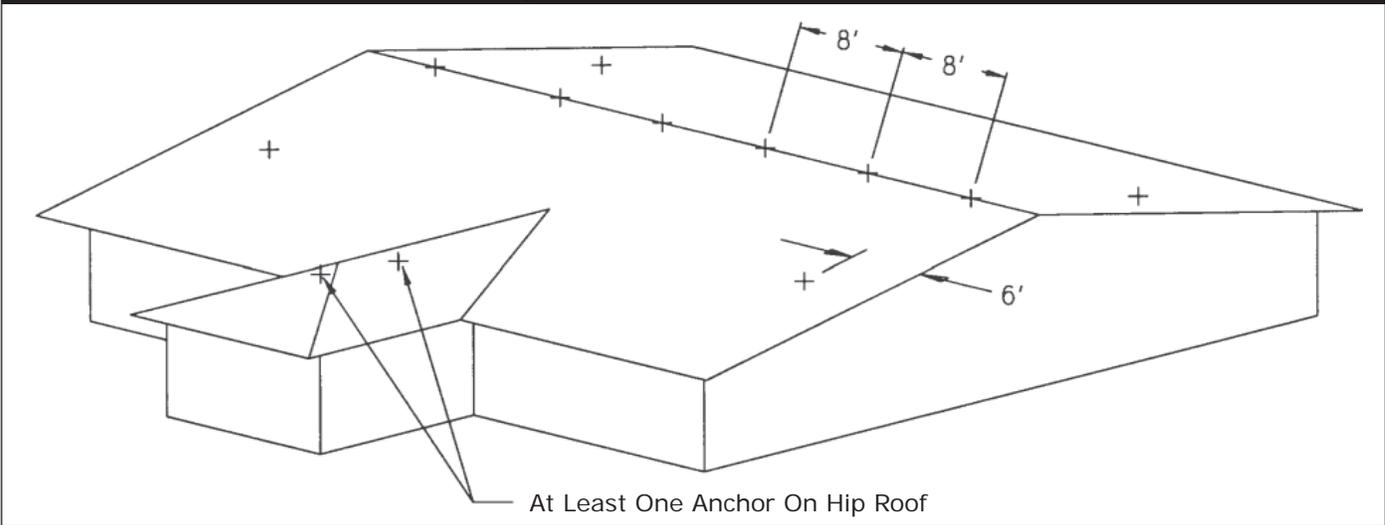
- The roof anchor should be located at the roof peak (when possible) and at least 6 feet from any exposed roof edge. On very small roof areas, locate the roof anchor as far from the roof edge as possible.
- Do not install roof anchors on unsupported roof structures, such as eaves or gable overhangs. Do not install roof anchors on fascia boards.
- Roof anchors should be installed at 8 foot spacings along the roof ridge. Hip roofs require a roof anchor on each hip face.
- On long low pitched roofs, multiple roof anchors should be installed along the gable ends (6 feet from the edge) to reduce swing fall hazards.

Figure 5 shows typical roof anchor locations for various roof configurations.

B. **ROOF FRAMING:** Roof framing members to which the roof anchors are attached must be in good condition. Members must be free of splits, cracks, large knots, or defects that may weaken the member. Do not attach the roof anchor to rotted or deteriorated wood.



**Figure 5 - Anchor Installation**

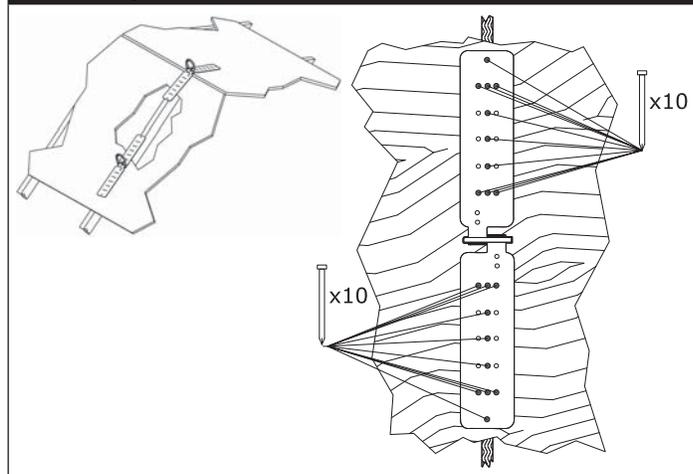


**C. FASTENERS:** The roof anchor may be secured to the roof using either 16d nails (as supplied) or Tek screws (1/4-14 screws need to be long enough for five threads to be exposed beyond the purlins).

**D. ROOF ANCHOR INSTALLATION:** Roof anchors must be installed in accordance with the previously discussed site plan. Site work rules must be followed regarding when an installed roof anchor is ready for use (i.e. after sheathing is in place).

**ATTACHING THE ROOF ANCHOR:** Spread the anchor base legs apart to match the surface it will be mounted on, either a roof peak or a flat surface. Position the anchor on the roof such that the 12 nail holes along the center of the legs are over a framing member. Then, push down to minimize any gap between the anchor and the sheathing and nail. Use only 16d nails to install the anchor: 10 per leg into the rafters (6) and sheathing (4). Install all 20 nails. See Figures 6 and 7. See section 5.0 for pre-use inspection.

**Figure 6 - Anchor Installation (Nails)**

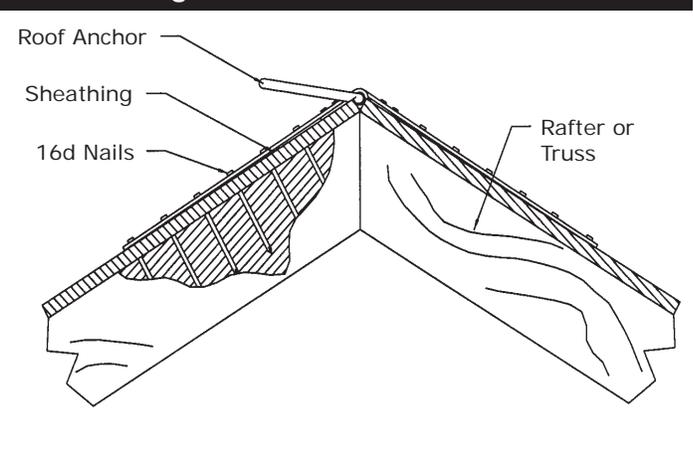


**WARNING:** The Hinged Roof Anchor must be positioned on top of previously secured roof sheathing (do not attach directly to rafter or truss member). All 20 nails must be installed. If the roof anchor is not installed properly, it will not hold the rated loads and serious injury or death could occur.

**WARNING:** Use only 16d nails which have a complete head. Do not use nails from nail guns. Never attach the roof anchor with the legs still together (legs must be spread apart).

**E. STEEL DECKING INSTALLATION:** This anchor may be installed on steel decking with a minimum material thickness of 22 gauge (.030 inch) over Z-purlins with a minimum material thickness of 16 gauge (.064 inch). The maximum span between purlins is 6 feet. Twelve 1/4-14 Tek screws are required to fasten the anchor. The screws should be of sufficient length so that at least five threads are exposed beyond the bottom of the purlin. The screws must be located on the outer two of the long rows of holes, through every other hole. Every screw must penetrate the Z-purlin. The holes in the anchor that will be used with the Tek screws must be drilled out to 1/4 inch diameter. See Figure 8. The anchor should not be used as

**Figure 7 - Anchor Installation**

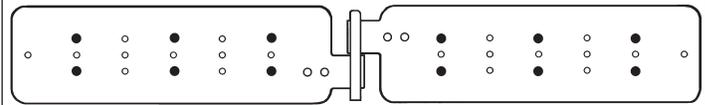


a permanent anchor once the holes have been drilled out because the corrosion protection has been damaged. The anchoring structure needs to meet the requirements of Section 2.4.

**WARNING:** Anchors that have been drilled out may not be reused. After use, the anchor must be removed from service and destroyed.

**F. REMOVAL OF ROOF ANCHOR:** Remove the roof anchor prior to shingling the area with the anchor. To remove it, pry off the anchor from the roof. If the anchors are screwed down, the screws should be removed rather than just prying the anchor from the roof.

**Figure 8 - Anchor Holes**



When using Teks screws, only drill out the darkened holes to 1/4 in. diameter.

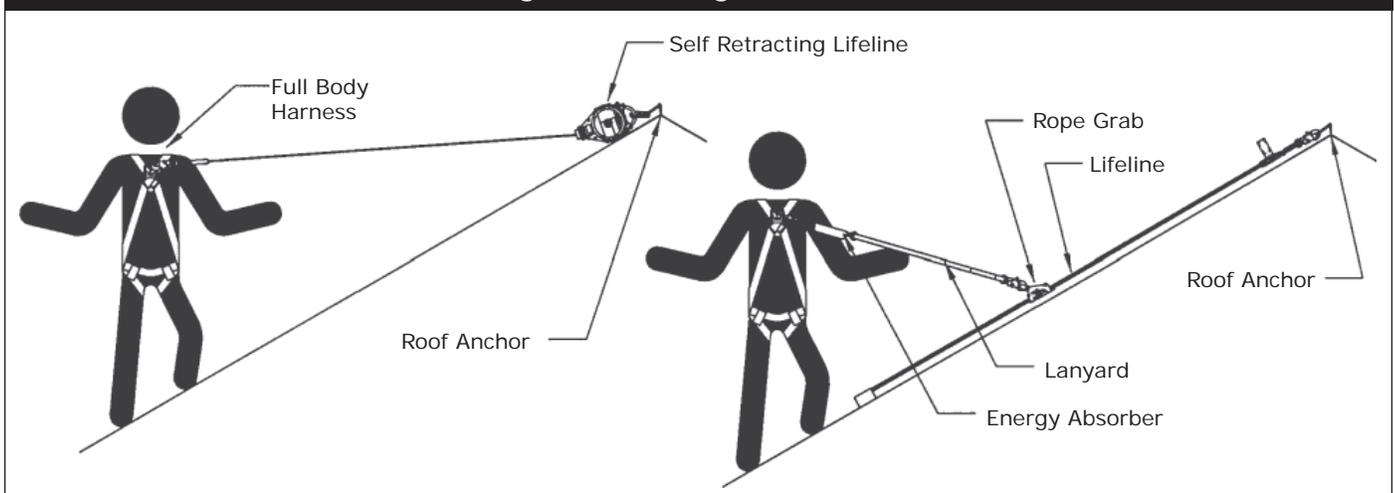
**NOTE:** The Hinged Roof Anchor is designed as a multi-use anchor. New 16d nails must be used for every reinstallation.

**3.4 CONNECTING TO THE ROOF ANCHOR:** Connection to the installed roof anchor may be made using a self locking snap hook or self locking and self closing carabiner only. Do not use a knot to connect a lifeline to the roof anchor. Do not pass the lanyard or lifeline through the roof anchor D-ring and hook back into the lanyard or lifeline. When connecting, make sure the connections are fully closed and locked. Figure 9 illustrates the proper connection of a typical fall arrest or restraint equipment to the roof anchor. When using an energy absorbing lanyard, connect the energy absorber "pack" end to the harness. When using a self retracting lifeline, make sure the device is properly positioned so that the retraction is not hindered. Always protect the lifeline/lanyard from abrading against sharp or abrasive surfaces on the roof. Make sure all the connections are compatible in size, shape, and strength. Never connect more than one personal protective system to any single roof anchor at a time.

**WARNING:** Read and follow manufacturer's instructions for associated equipment (i.e. full body harness, shock absorbing lanyard, self retracting lifeline, etc.) used in your personal fall arrest system.

**WARNING:** For special (Custom) versions of this product, follow the instructions herein. If enclosed, see attached supplement for additional instructions to be followed when using a customized product.

**Figure 9 - Making Connections**



## 4.0 TRAINING

**4.1** It is the responsibility of all users of this equipment to understand these instructions, and to be trained in the correct installation, use, and maintenance of this equipment. These individuals must be aware of the consequences of improper installation or use of this equipment. This user manual is not a substitute for a comprehensive training program. Training must be provided on a periodic basis to ensure proficiency of the users.

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

## 5.0 INSPECTION

### 5.1 FREQUENCY:

- A. Before each use, visually inspect the equipment per steps listed in sections 5.2 and 5.3.
- B. The roof anchor must be inspected by a competent person other than the user at least annually. See sections 5.2 and 5.3 for guidelines. Record the results of each formal inspection in the inspection log found in section 9.0. NOTE: Cal/OSHA requires personal fall arrest systems be inspected prior to each use for wear, damage, and defects and inspected by a competent person<sup>1</sup> at least twice a year, in accordance with the manufacturer's recommendations, with inspection dates documented.

**IMPORTANT:** *If this equipment has been subjected to forces resulting from the arrest of a fall, it must be immediately removed from service and destroyed or returned to the manufacturer for possible repair. See section 5.2.*

### 5.2 INSPECTION STEPS:

- Step 1.** Inspect the Roof Anchor for physical damage. Look carefully for any signs of cracks, dents, or deformities in the metal. Check for bending, the roof anchor legs should be flat. Rivets should be securely attached and fully clinched (not pulling through hole).
- Step 2.** Inspect the Roof Anchor for signs of excessive corrosion.
- Step 3.** Ensure the condition of the roof anchor will support the Roof Anchor loads, see section 2.4. An anchor connected to rotten or deteriorated wood should not be used.
- Step 4:** Ensure the Roof Anchor is still securely attached. If loose, do not use.
- Step 5:** Inspect each system component or subsystem per associated manufacturer's instructions.
- Step 6:** Record the inspection date and results on the inspection log. See section 9.0.

- 5.3 If inspection reveals a defective condition, remove unit from service immediately and destroy, or contact a factory authorized service center for repair.

**NOTE:** *Only Capital Safety or parties authorized in writing may make repairs to this equipment.*

## 6.0 MAINTENANCE, SERVICE, AND STORAGE

- 6.1 No scheduled maintenance is required. If you have any questions concerning the condition of your Roof Anchor, or have any doubt about putting it into service, contact Capital Safety immediately.
- 6.2 Additional maintenance and servicing procedures (i.e. replacement parts) must be completed by a factory authorized service center. Authorization must be in writing.

## 7.0 SPECIFICATIONS

**Material:** Forged alloy D-ring and 1/8 in. thick steel base

**Minimum Breaking Strength:** 3,600 lbs. when loaded within the loading direction limitations as shown in Figure 4.

**Weight:** 1.8 lbs.

**Size:** 5/8 in. x 4 in. x 17 in.

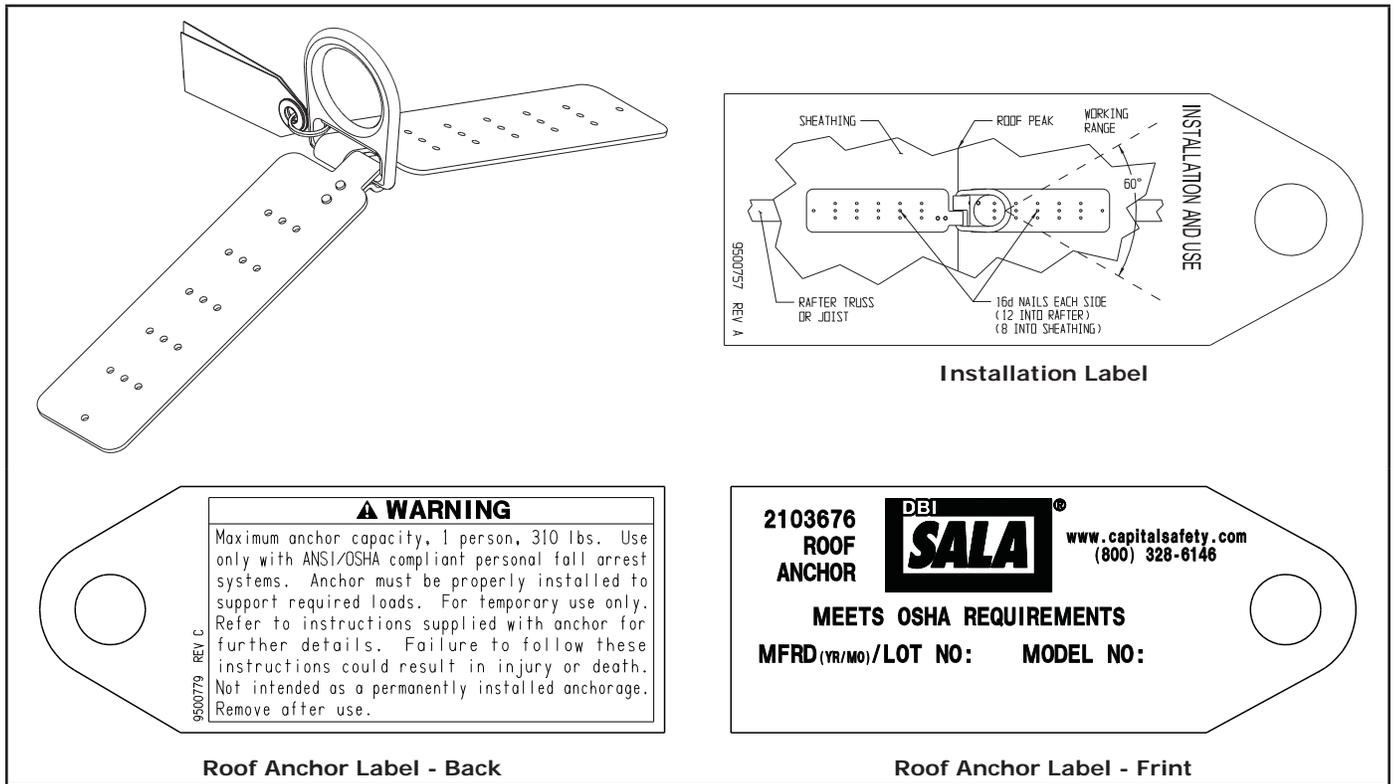
**Capacity:** 310 lbs. (one person)

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<sup>1</sup> **Competent Person:** *An individual knowledgeable of a manufacturer's recommendations, instructions and manufactured components who is capable of identifying existing and predictable hazards in the proper selection, use and maintenance of fall protection.*

## 8.0 LABELING

The following labels must be securely attached and fully legible:







## 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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