



The Ultimate in Fall Protection

User Instruction Manual D-Ring Anchorage Connector

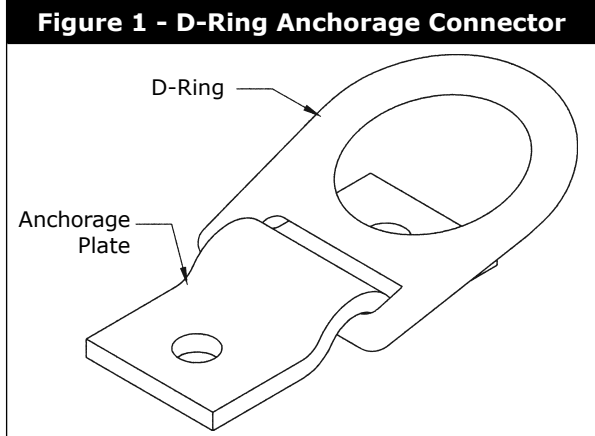
Models: 2101630, 2101632, 2101633, 2101634,
2101636, 2101638, 2109870

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 DBI-SALA.

IMPORTANT: Record the product identification information from the ID label in the "Inspection and Maintenance Log" at the back of this manual



DESCRIPTION

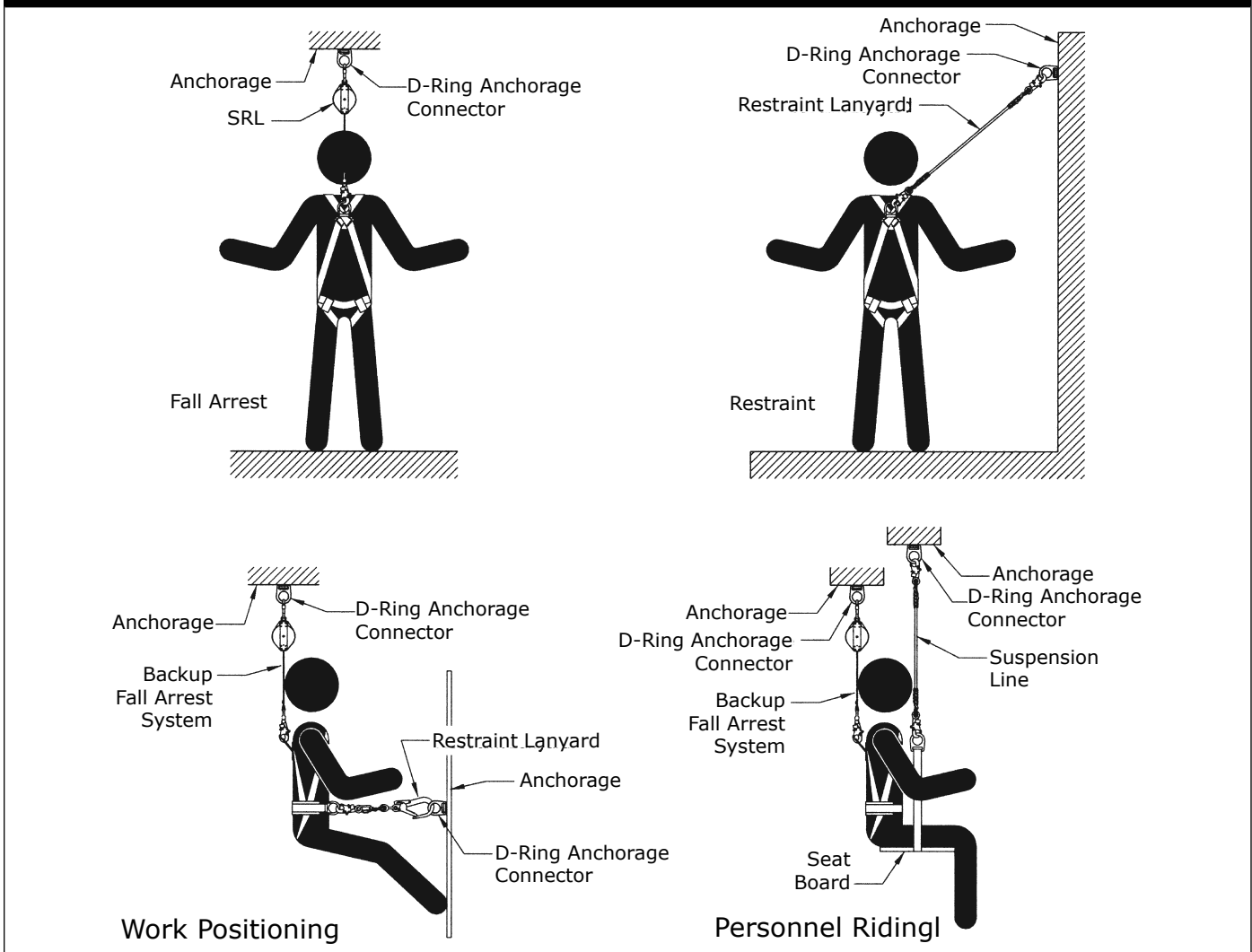
Model	D-Ring	Anchorage Plate	Mounting Hole Dia.
2101630	Forged Steel	Stainless Steel	9/16 in (1.4 cm)
2101632	Forged Steel	Forged Steel, Painted Black	9/16 in (1.4 cm)
2101633	Forged Steel	Stainless Steel	9/16 in (1.4 cm)
2101634	Forged Steel	Forged Steel	9/16 in (1.4 cm)
2101636	Stainless Steel	Stainless Steel	9/16 in (1.4 cm)
2101638	Stainless Steel	Stainless Steel	9/16 in (1.4 cm) / Weld On
2109870	Stainless Steel	Stainless Steel	Weld On (no holes)

1.0 APPLICATIONS

- 1.1 PURPOSE:** The D-ring Anchorage Connector is designed for use as an attachment of a personal fall arrest, restraint, work positioning, personnel riding, or rescue system to an anchorage. See Figure 2 for application illustrations.
- A. PERSONAL FALL ARREST:** The D-ring Anchorage Connector 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 (1.8 m) .
 - B. RESTRAINT:** The D-ring Anchorage Connector 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 D-ring Anchorage Connector 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 D-ring Anchorage Connector 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, boatswain's chair or seat board, and a back-up personal fall arrest system. No vertical free fall is permitted.
 - E. RESCUE:** The D-ring Anchorage Connector 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.

WARNING: Do not use the D-ring Anchorage Connector for applications not addressed in this manual.

Figure 2 - Applications



1.2 LIMITATIONS: Consider the following application limitations before using this equipment:

- A. CAPACITY:** The D-ring Anchorage Connector is designed for use by persons with a combined weight (clothing, tools, etc.) of no more than 310 lbs (141 kg)¹. 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 (1.8 m) per 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 (0.6 m) 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 Attachment Element
 - Elevation of Anchorage Connector
 - Connection Subsystem Length

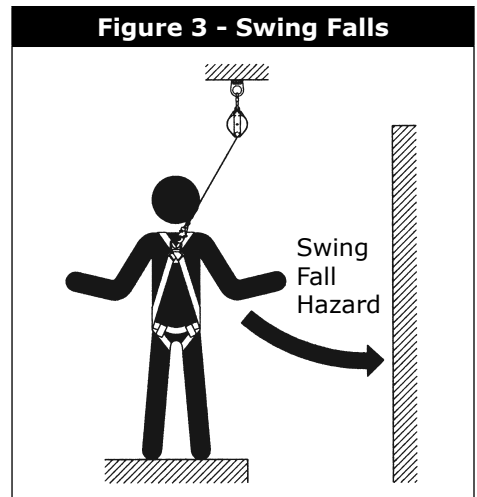
See the Personal Fall Arrest System manufacturer's instructions for more information.

- D. SWING FALLS:** See Figure 3. Swing falls occur when the anchorage point is not directly above the point where a fall occurs. 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.

¹ **Capacity:** 310 lbs (141 kg) is the maximum capacity recommended by ANSI. This product has been tested to the OSHA recommended capacity of 420 lbs (191 kg).

- 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 REFER TO NATIONAL STANDARDS INCLUDING: ANSI Z359 (.0, .1, .2, .3, and .4) family of standards on fall protection, ANSI A10.32, and applicable local, state and federal (OSHA) requirements governing occupational safety for more information about work positioning systems.



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. 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. (22kN). Connectors must be compatible with the anchorage or other system components. Do not use equipment that is not compatible. Noncompatible 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.

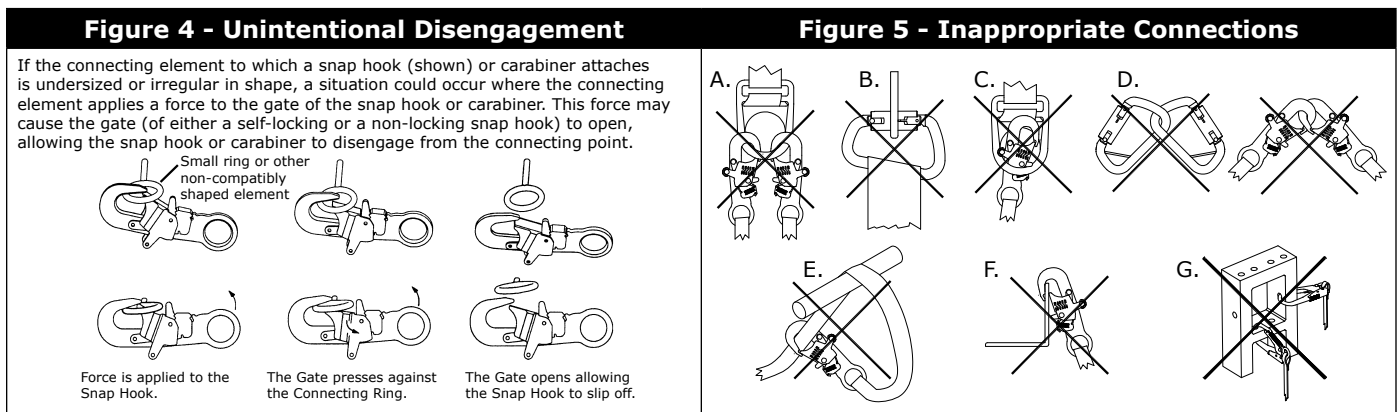
- 2.3 MAKING CONNECTIONS:** Only use self-locking snap hooks and carabiners with this equipment. Only use connectors that are suitable to each application. Ensure all connections are compatible in size, shape and strength. Do not use equipment that is not compatible. Ensure all connectors are fully closed 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 5 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: 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 allows 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 (8 kN), and limit the free fall to 6 ft. (1.8 m) 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 ft. (1.8 m), and up to a maximum of 12 ft (3.7 m) 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 ft. (3.7 m) to ensure the maximum arresting force does not exceed 1,800 lbs (8 kN), 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 359.1 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, or
 2. Two times the maximum arresting force for certified anchorages. When more than one fall arrest system is attached to an anchorage, the strengths set forth in (1) and (2) above shall be multiplied by the number of systems attached to the anchorage.
- 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, or
 2. Two times the foreseeable force for certified anchorages. When more than one restraint and travel restraint system is attached to an anchorage, the strengths set forth in (1) and (2) above shall be multiplied by the number of systems attached to the anchorage.
- 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: A) 3,000 pounds (13.3kN) for non-certified anchorages or B) Two times the foreseeable force for certified anchorages. When more than one work positioning system is attached to an anchorage, the strengths previously set forth in (A) and (B) shall be multiplied by the number of systems attached to the anchorage.
- 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, or
 2. Five times the foreseeable force for certified anchorages. When more than one rescue system is attached to an anchorage, the strengths set forth in (1) and (2) above shall be multiplied by the number of systems attached to the anchorage.

WARNING: Mark or label the D-ring Anchorage Connector with the intended application. Use of this equipment for an application that does not meet the anchorage strength requirements stated above may result in serious injury or death.

3.0 INSTALLATION AND USE

WARNING: Do not alter or intentionally misuse this equipment. Consult DBI-SALA 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 and chemical hazards, and sharp edges.

WARNING: Consult with your doctor if there is reason to doubt your fitness to safely absorb the shock from a fall arrest. Age and fitness seriously affect a worker's ability to withstand falls. Pregnant women or minors must not use the DBI-SALA D-ring Anchorage Connector.

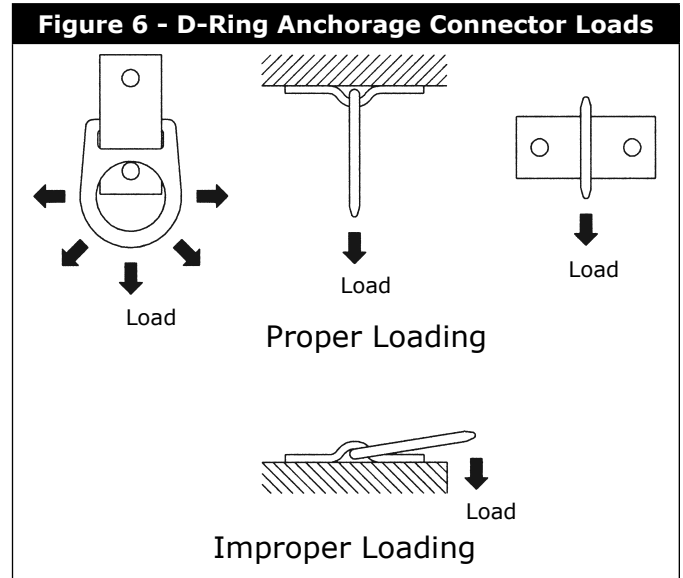
- 3.1 BEFORE EACH USE OF THIS EQUIPMENT** inspect it according to section 5.0 of this manual.
- 3.2 PLAN YOUR SYSTEM BEFORE INSTALLATION:** Consider all factors that will affect your safety during use of this equipment. The following list gives important points to consider when planning your system:
- A. ANCHORAGE:** Select a rigid 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, unprotected sharp edges.
 - C. AFTER A FALL:** Any equipment which has been subjected to the forces of arresting a fall or exhibits damage consistent with the effect of fall arrest forces as described in Section 5, must be removed from service immediately and destroyed by the user, the rescuer, or an authorized person.
 - D. RESCUE:** When using this equipment, the employer must have a rescue plan and the means at hand to implement it and communicate that plan to users, authorized persons, and rescuers.

3.3 INSTALLATION REQUIREMENTS:

A. D-RING ANCHORAGE CONNECTOR

LOCATION: Select a location on a suitable strength anchorage that will provide overall safety and proper loading as shown in Figure 6. The anchorage must be free of deformities or defects that may weaken the structure.

- B. INSTALLATION:** The D-ring Anchorage Connector may be attached to the structure using fasteners or welding. Use fasteners that will meet the strength requirements specified in section 2.6. DBI-SALA recommends using 1/2-inch diameter, grade 5 bolts. Welded installations must be installed by a certified professional welder in accordance with the latest codes and specifications of the American Welding Society. Welds must support the loads specified in section 2.6. Do not weld the D-ring. The D-ring must swivel freely. Welded installations should be verified by a qualified person for strength by calculation or by proof loading the installation in the intended direction(s) of intended use to 3,600 lbs (16 kN). Protect finished welds from corrosion with paint or other finish. Do not electroplate the D-ring. Installations should be verified by a qualified person for strength by calculation in the intended direction(s) of intended use.



- 3.4 MAKING CONNECTIONS:** When using a hook to connect to the D-ring Anchorage Connector, 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 D-ring Anchorage Connector.

4.0 TRAINING

- 4.1** It is the responsibility of the user and the purchaser of this equipment to assure that they are familiar with these instructions, trained in the correct care and use of, and are aware of the operating characteristics, application limits, and the consequences of improper use of this equipment.

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

5.0 INSPECTION

5.1 FREQUENCY:

- **Before Each Use:** Inspect the D-ring Anchorage Connector according to sections 5.2 and 5.3.
- **Formal Inspection:** A formal inspection of the D-ring Anchorage Connector 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.

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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