User Instruction Manual

10k Rotating Anchor for Steel

This manual is intended to meet the Manufacturer's Instructions as required by the American National Standards Institute (ANSI) Z359 and should be used as part of an employee training program as required by the Occupational Safety and Health Act (OSHA).

WARNING
This product is part of a personal fall arrest, restraint, work-positioning, suspension, or rescue system. A Personal Fall Arrest System (PFAS) is typically composed of an anchorage and a Full Body Harness (FBH), with a connecting device, i.e., a Shock Absorbing Lanyard (SAL), or a Self-Retracting Device (SRD), attached to the dorsal D-ring of the FBH.

These instructions must be provided to the worker using this equipment. The worker must read and understand the manufacturer's instructions for each component or part of the complete system. Manufacturer's instructions must be followed for proper use, care, and maintenance of this product. These instructions must be retained and be kept available for the worker's reference at all times. Alterations or misuse of this product, or failure to follow instructions, may result in serious injury or death.

A Fall Protection Plan must be on file and available for review by all workers. It is the responsibility of the worker and the purchaser of this equipment to assure that users of this equipment are properly trained in its use, maintenance, and storage. Training must be repeated at regular intervals. Training must not subject the trainee to fall hazards.

Consult a doctor if there is reason to doubt your fitness to safely absorb the shock of a fall event. Age and fitness seriously affect a worker's ability to withstand falls. Pregnant women or minors must not use this equipment.

ANSI limits the weight of fall protection equipment users to a maximum of 310 lbs. Products in this manual may have a rated capacity exceeding ANSI capacity limits. Heavy users experience more risk of serious injury or death due to falls because of increased fall arrest forces placed on the user's body. In addition, the onset of suspension trauma after a fall even may be accelerated for heavy users.

The user of the equipment discussed in this manual must read and understand the entire manual before beginning work.

NOTE: For more information consult the ANSI Z359 body of standards.

FallTech
1306 South Alameda Street
Compton, CA 90221, USA
1-800-719-4619
1-323-752-0066
www.FallTech .com

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1. DESCRIPTION

The FallTech 10k Rotating Anchor is a zinc-plated steel fall protection anchorage connector that has a rotating, self-orienting D-ring designed for use in steel applications. Whether using bolt-through or weld-on methods, the FallTech 10k rotating anchor is designed for use in PFAS, restraint, work positioning, suspension applications, or with select FallTech horizontal lifeline systems. For the purposes of this manual, FallTech 10k Rotating Anchor may be referred to as the anchor, anchorage connector, product, equipment, or as the unit.

This manual contains two Appendices, Appendix A and Appendix B. Appendix A contains figures and tables specific to the system discussed in this manual. Appendix B contains figures and tables applicable to fall protection equipment in general. All figure, table, and chart references in this manual are to Appendix A unless otherwise noted. All section and paragraph references are to this manual unless otherwise noted.

1.1 ANSI and OSHA Regulations: The described in this manual when used as instructed in this manual is ANSI Z359.1 and OSHA 1926.502 compliant. See Table 1 and Figure 1 for complete component specifications and system description.

2. Definitions: The following are general definitions of fall protection terms as defined by ANSI Z359.0-2012.

Anchorage - A secure connecting point or a terminating component of a fall protection system or rescue system capable of safely supporting the impact forces applied by a fall protection system or anchorage subsystem.

Anchorage Connector - A component or subsystem that functions as an interface between the anchorage and a fall protection, work positioning, rope access or rescue system for the purpose of coupling the system to the anchorage.

Arrest Distance - The total vertical distance required to arrest a fall. The arrest distance includes the deceleration distance and activation distance.

Authorized Person – A person assigned by the employer to perform duties at a location where the person will be exposed to a fall hazard.

Available Clearance - The distance from a reference point, such as the working platform, to the nearest obstruction that an authorized person might contact during a fall which, if struck, could cause injury.

Capacity - The maximum weight that a component, system or subsystem is designed to hold.

Certification - The act of attesting in writing that the criteria established by these standards or some other designated standard have been met.

Certified Anchorage - An anchorage for fall arrest, positioning, restraint or rescue systems that a qualified person certifies to be capable of supporting the potential fall forces that could be encountered during a fall.

Clearance - The distance from a specified reference point, such as the working platform or anchorage of a fall arrest system, to the lower level that a worker might encounter during a fall.

Clearance Requirement - The distance below an authorized person that must remain clear of obstructions in order to ensure that the authorized person does not make contact with any objects that would cause injury in the event of a fall.

Competent Person - An individual designated by the employer to be responsible for the immediate supervision, implementation and monitoring of the employer's managed fall protection program who, through training and knowledge, is capable of identifying, evaluating and addressing existing and potential fall hazards, and who has the employer's authority to take prompt corrective action with regard to such hazards.

Component - An element or integral assembly of interconnected elements intended to perform one function in the system.

Connecting Subsystem - An assembly, including the necessary connectors, comprised of all components, subsystems, or both, between the anchorage or anchorage connector and the harness attachment point.

Connector - A component or element that is used to couple parts of the system together.

Deceleration Distance - The vertical distance between the user's fall arrest attachment at the onset of fall arrest forces during a fall, and after the fall arrest attachment comes to a complete stop.

Energy (Shock) Absorber - A component whose primary function is to dissipate energy and limit deceleration forces which the system imposes on the body during fall arrest.

Fall Arrest - The action or event of stopping a free fall or the instant where the downward free fall has been stopped.

Fall Hazard - Any location where a person is exposed to a potential free fall.

Free Fall - The act of falling before a fall protection system begins to apply forces to arrest the fall.

Free Fall Distance - The vertical distance traveled during a fall, measured from the onset of a fall from a walking working surface to the point at which the fall protection system begins to arrest the fall.

Harness, Full Body - A body support designed to contain the torso and distribute the fall arrest forces over at least the upper thighs, pelvis, chest and shoulders.

Lanyard. A component consisting of a flexible rope, wire rope or strap, which typically has a connector at each end for connecting to the body support and to a fall arrester, energy absorber, anchorage connector or anchorage.

Lanyard Connecting Subsystem - An assembly, including the necessary connectors, comprised of a lanyard only, or a lanyard and energy absorber.

Personal Fall Arrest System (PFAS) - An assembly of components and subsystems used to arrest a person in a free fall.

Positioning - The act of supporting the body with a positioning system for the purpose of working with hands free.

Positioning Lanyard - A lanyard used to transfer forces from a body support to an anchorage or anchorage connector in a positioning system.

Qualified Person - A person with a recognized degree or professional certificate and with extensive knowledge, training and experience in the fall protection and rescue field who is capable of designing, analyzing, evaluating and specifying fall protection and rescue systems.

Self-Retracting Device (SRD) - A device that contains a drum wound line that automatically locks at the onset of a fall to arrest the user, but that pays out from and automatically retracts onto the drum during normal movement of the person to whom the line is attached. After onset of a fall, the device automatically locks the drum and arrests the fall. Self-retracting devices include self-retracting lanyards (SrL's), self-retracting lanyards with integral rescue capability (SrL-r's), and self-retracting lanyards with leading edge capability (SrL-Le's) and, hybrid combinations of these.

Snaphook - A connector comprised of a hook-shaped body with a normally closed gate or similar arrangement that may be opened to permit the hook to receive an object and, when released, automatically closes to retain the object.

Swing Fall - A pendulum-like motion that occurs during and/or after a vertical fall. A swing fall results when an authorized person begins a fall from a position that is located horizontally away from a fixed anchorage.

WARNING

- **Take action to avoid moving machinery and thermal, electrical and chemical hazards as contact may cause serious injury or death.**
- **Avoid swing falls.**
- **Follow the weight restrictions and recommendations in this manual.**
- **Remove from service any equipment subjected to fall arrest forces.**
- **Do not alter or intentionally misuse this equipment.**
- **Consult FallTech when using this equipment in combination with components or subsystems other than those described in this manual.**
- **-Do not connect rebar hooks, large carabiners, or large snap hooks to the FBH dorsal D-rings as this may cause a roll-out condition and/or unintentional disengagement.**
- **Take action to avoid sharp and/or abrasive surfaces and edges.**
- **Avoid electric hazards. Use caution when performing arc welding. Arc flash from arc welding operations, including accidental arcs from electrical equipment, can damage equipment and are potentially fatal.**
- **Examine the work area. Be aware of the surroundings and workplace hazards that may impact safety, security, and the functioning of fall arrest systems and components.**
- **Hazards may include but not be limited to cable or debris tripping hazards, equipment failures, personnel mistakes, moving equipment such as carts, barrows, fork lifts, cranes, or dollies. Do not allow materials, tools or equipment in transit to contact any part of the fall arrest system.**
- **Do not work under suspended loads.**

3. SYSTEM REQUIREMENTS

3.1 Capacity: The anchor discussed in this manual is rated for a maximum total combined (clothing, tools, etc.) user weight of 425 lbs. Heavyweight users are cautioned. A user weighing 425 lbs. will experience very high fall arrest forces during a fall event. After a fall event, suspension trauma may rapidly develop. Users are advised to deploy suspension trauma relief equipment as soon as possible after a fall event.
To maintain ANSI Z359 compliance, limit user weight to between 130 lbs. to 310 lbs. (58.9-140.6 kg), including clothing, tools, etc.

3.2 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 FallTech if you have any questions about compatibility. 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-closing, self-locking snap hooks and carabiners are specified by OSHA and ANSI Z359.12.

3.3 Compatibility of Components: Equipment is designed for use with approved components and subsystems only. Substitutions or replacements made with non-ANSI Z359 compliant components or subsystems may jeopardize compatibility of equipment and may affect the safety and reliability of the complete system. Ensure compatibility between the connectors if non-FallTech components are used for fall protection.

3.4 Making Connections: Only use self-locking snap hooks, rebar 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. Visually ensure all connectors close and lock completely. Connectors (snap hooks, rebar hooks, and carabiners) are designed for use only as specified in this manual. See Appendix B.

3.5 Personal Fall Arrest System: A PFAS is an assembly of components and subsystems used to arrest a person during a fall event. A PFAS is typically composed of an anchorage and a FBH, with an energy absorbing connecting device, i.e., a SAL, an SRD, or a Fall Arrester Connecting Subsystem (FACSS) attached to the dorsal D-ring of the FBH. PFAS components used with this equipment must meet applicable ANSI Z359 requirements and OSHA regulations. OSHA requires a personal fall arrest system be able to arrest the worker'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.

3.6 Personal Fall Arrest System Anchorage Strength: An anchorage selected for a PFAS must have the strength to sustain a static load applied in the direction permitted by the PFAS of at least two times the maximum arrest force permitted when certification exists, or 5,000 lbs. (22.2 kN) in the absence of certification.

4. APPLICATION (Product Performance)

4.1 Purpose: The purpose of the 10k Rotating Anchor is to provide a versatile multi-directional fall protection single point anchorage connector in steel applications wherein an ANSI/OSHA Personal Fall Arrest System, Restraint, Work Positioning, and Suspension system is necessary to protect against fall hazards. Additionally, two of the anchors may be used with select FallTech Horizontal Lifeline Systems to create an anchorage system designed for the connection of more than one worker to the system. The 10K Rotating Anchor is designed to be attached to steel surfaces by either bolting to or through steel. For non-bolted applications a steel adapter puck is welded to the anchor surface and the 10k Rotating Anchor anchorage connector is bolted to the puck. When correctly installed the anchor has a maximum rated strength of 10,000 lbs. See Figures 1 and 2.

4.1.1 Bolt-Through Application: Bolt-through applications typically occur on steel plate or I-beams of strength enough to meet with the requirements of Section 3. The 10k Rotating Anchor may be installed in vertically or horizontally and is designed to both rotate and swivel in the direction of the load. When bolting the anchor in place care should be taken to use the provided fastener and/or a minimum 5/8" x 4" Grade 8 bolt. When attaching to I-beams with tapered flanges a tapered washer should be used. The attachment bolt should be torqued to the ft. lbs. requirements specified in this manual. Refer to Section 5 for specific installation methods and/or requirements.

4.1.2 Weld-on Application: Weld-on applications entail the installation of a round steel puck that has been pre-drilled and tapped to receive the provided 5/8"-11 Grade 8 Steel Hex Head Cap Screw that is 1.75" in length. The puck has been specifically machined for the attachment of the 10K Rotating anchor and is delivered with a chamfered side for welding the puck in place. Once the puck is welded in place the anchor may be attached as outlined in Section 5 of this manual.

4.1.3 Horizontal Lifeline (HLL) Applications: The anchor detailed in this manual has been designed and tested to accommodate the attachment of horizontal lifelines. A single span horizontal lifeline may be attached between two properly installed anchors. The ultimate tensile strength of the 10k Rotating Anchor exceeds 14,000 lbs. In all cases of horizontal lifeline system attachment, a minimum 2 to 1 safety factor must be maintained. Horizontal lifelines attached to these anchors must have known end loads not to exceed 6000 lbs. FallTech HLL systems may be attached between two properly installed 10k Rotating Anchors. Refer to the User's Instruction Manual specific to the HLL system to be installed to ensure proper installation of the HLL system.

4.2 Application Limits: The 10k rotating anchor is a multi-purpose anchor designed for single user attachment of a PFAS, restraint, work-positioning or suspension system. Unless a properly install HLL system is attached between two anchors, no more than one user may be attached the anchor.

4.2.1 Use Limitations and Warnings:

a) Capacity of substrate should be verified by a qualified person prior to installation of anchor.
b) Proper installation should be verified by a competent person before use. See Section 5.
c) Anchor is designed for use in temperatures between -40º F and 130º F.
d) Care should be taken when using the anchor to avoid moving machinery, electrical hazards, sharp edges, abrasive surfaces, and corrosive environments.
e) Anchor should be used for fall protection only and is not meant for material handling
f) Labels should be present and legible.

4.2.2 Connecting Components:

a) All connections to the anchorage connector must be made with compatible connecting components that comply with ANSI Z359.12.
b) Large throat opening connectors such as rebar hooks and large carabiners may be connected only when the 10k Rotating Anchor is installed above the user's full body harness dorsal D-ring and must be installed in such a manner that the load during a fall event shall be applied along the major axis of the connector.
c) No more than one connector shall be attached to the anchor at a time.
d) Connectors shall be oriented in such a manner that the gate of the connector is free of potential impact or damage during a fall event.

4.3 Rescue: The equipment described in this manual is not specifically designed for rescue but may be included as part of a rescue plan. A rescue plan should be established by a qualified person prior to use of this equipment.

5. INSTALLATION AND USE

5.1. Plan the Personal Fall Arrest System (PFAS): Inspect the "Product" before each use in accordance with the procedures detailed in Section 7. Examine the work area and take action to address hazards. Falls are a serious hazard when working at height. Training and equipment are the tools of fall hazard management. There are several closely related facets of fall hazard management with a PFAS;

- Anchor Point Selection
- Anchorage Connector
- Deceleration Device
    - Maximum Arrest Force
    - Deceleration Distance
    - Minimum Required Fall Clearance (MRFC)
- Body Wear

- Rescue

5.1.1 Anchor Point Selection: Select a suitable anchor point. Consider the area where the work is being performed. In an overhead anchorage condition, the area below the anchorage is the work zone. In a below the D-ring anchorage condition, the work zone is the area adjacent to anchor point. Lateral movement away from the anchorage is hazardous. As distance from the anchor increases, the work zone expands, and so does the hazard. Work zone expansion is measured in feet and has a direct influence on user safety. Always work as close to the anchor as possible. See section 2.6 for anchorage strength requirements.

5.1.2: Anchorage Connector: Anchorage Connectors used as part of a Personal Fall Arrest System should be designed for use with specified anchor points and compatible with the PFAS components and connectors to be used in the assembly of a complete PFAS. Care should be taken to ensure proper assembly, installation and maintenance of all Anchorage Connectors to be used when planning a PFAS. Failure to inspect, assemble, install and/or maintain Anchorage Connectors could result in injury or death.

5.1.3 Connectors/Deceleration Devices: Connectors and Deceleration Devices such as Shock Absorbing Lanyards, Self-Retracting Devices and Lifelines, and Fall Arrestor Connector Subsystems (Vertical Lifeline/Rope Grab Combinations) are designed to connect the user's body wear to the Anchorage Connector and/or Anchor Point of a Personal Fall Arrest System. Connectors designed for use in a PFAS perform in a variety of ways depending upon but not limited to such factors as method of use, anchor point location, environment, user weight, and system stretch or elongation. Each Connector used as part of a PFAS should be designed for the intended application and used only with compatible components. The primary function of a Connector designed for use in a PFAS is to arrest and decelerate a worker's fall and dissipate forces applied to both the user of the PFAS and the PFAS Anchor Point. Mandatory considerations for safely planning a PFAS include understanding the following:

- **Maximum Arrest Force:** During a fall event, each Connector/Deceleration Device used as part of a PFAS will perform as detailed in its user's instruction manual and/or on its label and apply a force to both the worker's body and to the anchorage connector. In order to properly plan a complete PFAS the user must determine the maximum allowable forces that may be applied to the body and anchorage connector during a fall event and establish a PFAS system that maintains a minimum safety factor of two.
- **Deceleration Distance:** Typical Connecters/Deceleration Devices used as part of a complete PFAS will, during a fall event, elongate as they absorb energy. Each Connector/Deceleration Device will perform as specified in its user's instruction manual. Care should be taken by the user of the PFAS system to know and understand the total potential elongation of the specific Connector/Deceleration Device.
- **Minimum Required Fall Clearance:** During a fall event using a PFAS, the elongation of a typical Connector/Deceleration Device when combined with the original length of the Connector/Deceleration Device, must be added to the height of the worker with consideration given to stretch of the Full Body Harness. In sum, the total length of the PFAS system when deployed must not exceed the available clearance below the walking working surface. Failure to properly calculate Minimum Required Fall Clearance could result in serious injury or death. See Appendix B for more information on Minimum Required Fall Clearance.
- **Swing Fall:** When using a typical Connector/Deceleration Device in a PFAS, anchorage location and lateral movement of the worker will affect the total stopping distance of a worker during a fall event. Swing occurs as a result of worker moving laterally away from their anchor and then experiencing a fall event. During a fall event as the PFAS deploys it will cause the worker to pendulum back toward and past their anchorage. Care should be taken to avoid obstructions in the worker's path during a swing fall. In many cases the lateral movement of the worker may result in the need for additional fall clearance. Care should be taken to understand the potential additional fall clearance required due to swing fall.

5.2 Product Assembly and Installation: The 10k Rotating Anchor may be installed on steel surfaces either by bolting through or welding to a steel surface. The installation procedures detailed in this section must be adhered to for proper installation. **Failure to follow the installation instructions could a failure of the anchor during a fall event and result in serious injury or death.**

5.2.1 Bolt-Through Steel Installation:

a) Minimum Hardware Requirements:

1) 5/8"-11 Grade 8 Steel Hex Head Cap Screw (HHCS), minimum length 4"
2) 5/8"-11 Grade 8 Locking Hex Nut
3) 5/8" Lock Washer or Equivalent

b) Minimum Steel Surface Requirements:

1) 3/4" steel plate thickness
2) 3" minimum edge distance
3) 10,000 lb. load rated structure (If installing for HLL use ensure minimum 2 to 1 safety factor)

c) Installation Instructions:

1) Drill 5/8" hole perpendicular to the steel surface and at least 3" away from any edge of steel.
2) Fasten the rotating anchor to the steel surface using the appropriate hardware.
3) Torque the bolt to 75-90 ft-lbs.
4) Rotating anchor must be flush with steel surface when installed.

*If necessary, use tapered washers with I-beams that have tapered flanges.

5.2.2 Weld-On Installation:

a) Minimum Hardware Requirements:

1) 5/8”-11 Grade 8 Steel Hex Head Cap Screw (HHCS), 1.75” Length
2) 5/8” Internal Tooth Lock Washer

b) Minimum Steel Surface Requirements:

1) 3/8” steel plate thickness
2) 10,000 lb. load rated structure (If installing for HLL use ensure minimum 2 to 1 safety factor)

c) Installation Instructions:

1) Place chamfered side of Weld-On Puck face down on the steel surface.
2) Performed by an AWS certified welder
3) Weld the puck onto steel surface (Minimum 3/8” Fillet)
4) Ensure that the weld bead flows into the puck’s chamfer.
5) Fasten the rotating anchor to the welded-on puck using the provided hardware. Torque the bolt to 75-90 ft-lbs.

6. SPECIFICATIONS: See Table 1

7. MAINTENANCE, SERVICE AND STORAGE

7.1 Maintenance: No maintenance required, if unit appears damaged, has been subjected to fall forces or does not pass inspection, remove it from service.
7.2 Service: There are no specific service requirements for this anchorage.
7.3 Storage: If the unit is removed from its installation location it should be stored in a dry area free of corrosive elements that may harm or cause it not to function.

8. INSPECTION

8.1 Pre-Use Inspection: The anchor must be visually inspected prior to each use.

8.2 Inspection Frequency: In addition to visual inspection the Anchor must be inspected annually by a competent or qualified person to ensure proper torque of the Hex Head Cap Screw.

8.3 Inspection Checklist: The anchor should be inspected for the following:

-Cracks
-Bends
-Deformation
-Corrosion
-Product Labeling
-Pitting
-Torque
-Smooth operation of the rotating/swiveling D-ring.

8.4 Inspection Results: Should the anchor fail inspection it should be removed from service until deemed serviceable by a competent or qualified person.

8.5 Inspection Document: Record inspection results on the Inspection Record provided in Appendix B, or on a similar document

9. LABELS

The labels must be present and legible.