A Guide to the **ANSI Z359 Family of Standards**

Fall Protection Code

MSA
The Safety Company

ANSI Z359 **Fall Protection Code**

I. ANSI Z359, a Family Of Standards

The ANSI Z359 Fall Protection Code addresses a critical need for guidance in creating fall protection programs and has become the benchmark standard incorporated into many industrial fall protection programs. Delineation of clear lines of authority and responsibility, detailed job planning and expanded training requirements are key among its guidance.

The scope of the standard has expanded beyond fall arrest into other work applications, but continues to adhere to the "systems approach" of the original 1992 edition. The standard also improves strength and performance of products intended to protect worker safety and health. Since 2007, ANSI Z359.1 has been divided into a suite of standards as outlined in the table below.

This document will review and summarize key areas of ANSI Z359 which will affect many US employers, workers, safety professionals, manufacturers and others with a stake in the US national consensus standard for fall protection.

The revised and updated sections within the standard supersede requirements of the previous Z359.1-2007 standard.

It is important to note that safety equipment meeting the previous standard version can remain in service at the equipment owner's discretion until the equipment's end of useful life.

Sections of the revised ANSI Z359 standard include:

Z359.0 Definitions and Nomenclature Used for Fall Protection and Fall Arrest

Z359.1 Safety Requirements for Personal Fall Arrest Systems, Subsystems and Components

Z359.2 Minimum Requirements for a Comprehensive Managed Fall Protection Program

Z359.3 Safety Requirements for Positioning and Travel Restraint Systems

Z359.4 Safety Requirements for Assisted Rescue and Self-Rescue Systems

Z359.5 TBD

Z359.6 Specifications and Design Requirements for Active Fall Protection Systems

Z359.7 Qualification and Verification testing of Fall Protection Products

***Currently under revision with sub-committee**

Z359.8 *Safety Requirements for Rope Access*

Z359.9 *Safety Requirements for Descent Devices*

Z359.10 TBD

Z359.11 *Safety Requirements for Full Body Harnesses*

Z359.12 Connecting Components for Personal Fall Arrest Systems

Z359.13 Personal Energy Absorbers and Energy Absorbing Lanyards

Z359.14 Safety Requirements for Self-Retracting Devices for Personal Arrest and Rescue Systems

Z359.15 *Safety Requirements for Vertical Lifelines*

Z359.16 *Safety Requirements for Fall Arrestors*

Z359.17 *Safety Requirements for Horizontal Lifelines*

Z359.18 *Safety Requirements for Anchorage Connectors*

Z359.0 Definitions and Nomenclature Used for Fall Protection and Fall Arrest

SCOPE This part functions as a dictionary of specialized terms compiled from the other 18 sections, defining each of approximately 150 terms used throughout the new standard, from "Activation Distance" to "Working Line."

Z359.1 Safety Requirements for Personal Fall Arrest Systems, Subsystems and Components

SCOPE This part contains product design criteria and test procedures for fall arrest components, subsystems and systems, just as in the current version of the standard.

Z359.2 Minimum Requirements for a Comprehensive Fall Protection Program

SCOPE The scope of the new Comprehensive Fall Protection Program ("Program") standard identifies this as a guideline for employers with new or existing fall protection programs.

PURPOSE

To identify, evaluate and eliminate (or control) fall hazards through planning
To ensure proper training of personnel
To ensure proper installation and use of fall protection and rescue equipment
To implement safe fall protection and rescue procedures

DUTIES, POLICIES AND TRAINING The new Program standard places emphasis on endorsement by company management of the employer's fall protection program. The standard sets clear, unambiguous duties and responsibilities for each participant in the program, as listed below:

- Employers
- Program Administrator
- Qualified Person
- Competent Rescuer
- Authorized Person
- Competent Person
- Authorized Rescuer
- Trainers

Training is also defined for each role in the organization, as are the requirements for the trainers themselves.

TRAINING AND EVALUATIONS Training from administrators, safety engineers, supervisors, at-risk workers and rescue personnel is extensively addressed by the Program standard. This strong emphasis is based on years of experience of the Z359 committee members and their firmly held belief that, without proper training, fall protection equipment and procedures are inadequate to the task of reducing worker injury and death. Therefore, the Program standard sets new goals for achieving improved training practices throughout the industry. Z359.2 incorporates, by reference of another ANSI standard, Z490.1, Criteria for Accepted Practices in Safety, Health and Environmental Training. Together, the Z359 and Z490.1 provide employers with a comprehensive roadmap to enhanced fall protection training.

FALL PROTECTION PROCEDURES The procedural scheme is based around the Fall Hazard Survey Report. The report is written by trained safety professionals at the Qualified Person or Competent Person level.

It identifies each fall hazard at the work location and recommends one or more methods for eliminating or controlling each identified fall hazard. The fall protection hierarchy, in descending order of preference, is as follow in the chart below :

HIERARCHY OF CONTROLS

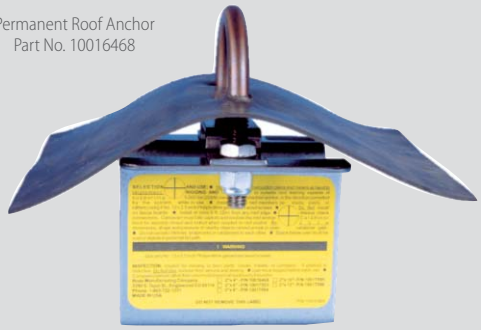
DESIGN REQUIREMENTS FOR FALL PROTECTION SYSTEMS IN NEW FACILITIES Concerns are addressed for the control of fall hazards in new facilities by going upstream, to the architects and engineers who design new plants, factories and other buildings.

The standard provides guidelines for designers to eliminate or control fall hazards in the facilities planning stage, when the cost of doing so is the least burdensome to building owners and occupants. This is a concept widely taught but seldom practiced in the building industry. Z359.2 enters into the record a practical and cost effective method to reduce fall hazards in new buildings that will influence best safety practices for the next generation.

ANCHOR SYSTEMS The Program standard establishes strength criteria for various fall protection anchors, simplifying the design requirements for Fall Arrest, Work Positioning, Travel Restraint, and Rescue systems in one section.

In each case, anchors are divided into two categories, **Certified and Non-Certified**. Certified anchors are those selected under the supervision of a Qualified Person who performs documentation through a process of testing or analysis by a nationally accepted engineering methodology and attests to their capacity.

Permanent Roof Anchor
Part No. 10016468



Non-Certified anchors are those anchors judged by a competent person to be capable of supporting the predetermined anchor forces prescribed by the standard. Fall protection systems connected to non-certified anchors must, in all cases, limit potential free fall distance to six feet or less and be equipped with an energy-absorbing device limiting maximum arrest forces to 1800 pounds or less.

	Non-Certified Anchor	Certified Anchor
FALL ARREST	5,000 lbf static strength	Static strength two times maximum arresting force
WORK POSITIONING	3,000 lbf static strength	Static strength two times foreseeable force
RESTRAINT AND TRAVEL RESTRICTION	1,000 lbf static strength	Static strength two times foreseeable force
RESCUE SYSTEMS	3,000 lbf static strength	Static strength five times the applied load

ROPE ACCESS The Program standard addresses a system of work referred to as Rope Access for the first time in national consensus standards. Rope access is a growing practice involving skilled rope techniques to access work while suspended vertically.

The new standard recognizes and codifies basic principles for this work practice, including the use of two rope lines and the need to operate as a multi-worker team. The Program standard breaks new ground, bringing Rope Access within the fall protection community and adding national recognition to this important work tool.

RESCUE PROCEDURES No fall protection program would be complete without provisions for prompt rescue after a worker has fallen and remains suspended, unable to evacuate him or herself to a safe working level.

Planning for prompt rescue means reaching the rescue subject within **six minutes** after an accidental fall. This rescue type requires planning and coordination on part of the employer's safety professionals.

If your plan calls for assistance by professional rescue services such as municipal fire or local search and rescue teams, advance planning must be undertaken. Involvement of outside services must logically take place prior to an actual emergency and include a documented plan and written confirmation by the rescue agency.

If your plan involves an in-house rescue team, team members must be trained and equipped for the task, a process including regularly scheduled simulations, documented plans and instructions for implementation.

INCIDENT INVESTIGATIONS A Comprehensive Managed Fall Protection Program also includes requirements for incident investigation in the event of an accidental death, injury or property damage. For maximum effectiveness, these investigations must be conducted promptly with well established reporting procedures and documented results.

EVALUATING PROGRAM EFFECTIVENESS A critical component in fall hazard elimination and control is regular evaluation of your Managed Fall Protection Program's effectiveness. This continuous improvement process builds on program strengths and deficiency corrections. Evaluations should examine the Program to determine if objectives have been accomplished and achieved according to your written Managed Fall Protection Program.

Z359.3 Safety Requirements for Work Positioning and Travel Restraint Systems

SCOPE Z359.3 is the new product standard for work positioning and travel restraint systems. Before examining its product requirements, it is helpful to define these terms:

Work Positioning Defined Supporting a worker on a vertical surface while working with hands free. Work positioning systems are designed to prevent falls from occurring. When fall hazards are present, positioning systems must be used in conjunction with separate and independent personal fall arrest systems.

Travel Restraint Defined Limiting a worker's travel in such a manner that a fall hazard zone cannot be reached. Restraint systems do not support a portion of the worker's weight and are used only on walking/working surfaces sloping between zero and 18.4 degrees.

FULL BODY HARNESSES Full body harnesses must meet Z359.11 requirements for fall arrest. In addition, work positioning and travel restraint attachment elements (D-rings) must withstand a dynamic strength test consisting of a 3.3 foot freefall with a 282 pound test weight.

WORK POSITIONING AND TRAVEL RESTRAINT LANYARDS Lanyards within this section must be designed and tested to withstand a static load of 5,000 pounds force without breaking.

Rebar Chain Assembly

Z359.4 Safety Requirements for Assisted Rescue and Self-Rescue Systems, Subsystem and Components

SCOPE Z359.4 establishes requirements for design, performance, marking, qualification, instruction, training, use, maintenance and removal from service of products used in rescue and evacuation.

EQUIPMENT COVERED IN THE STANDARD:

- Connectors
- Rope tackle blocks
- Anchorage connectors
- Self-retracting lanyards with integral rescue capability
- Harnesses
- Winches/hoists
- Descent control devices
- Lanyards

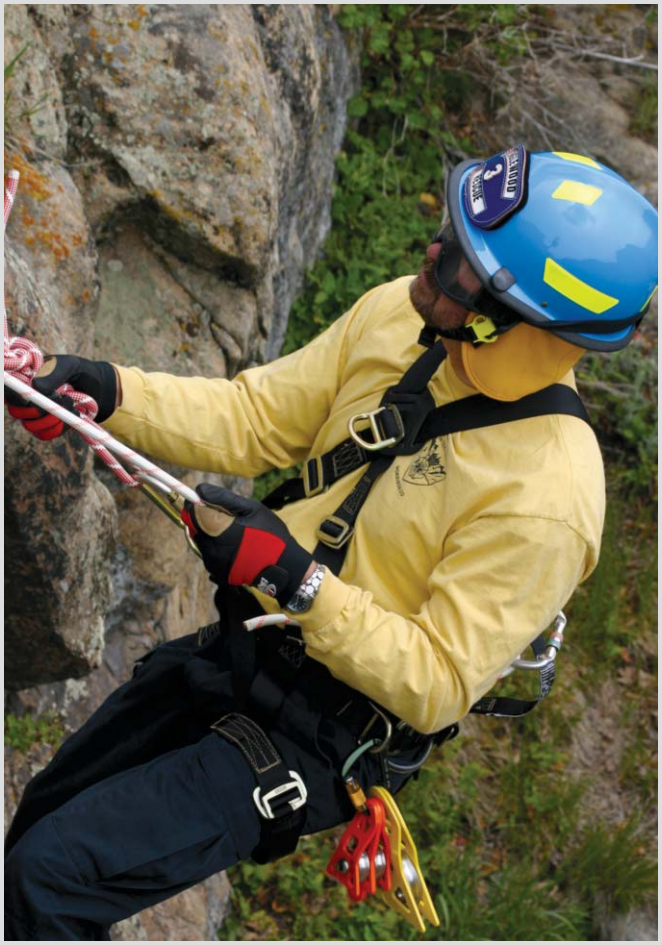
PURPOSE AND APPLICATION This standard is directed at rescue systems used in pre-planned rescue applications for one to two persons where fall hazards exist.

EXCEPTIONS Exceptions include construction, sports-related activities, rope access rescue techniques employed by certified rescue technicians or other tasks that have established national consensus standards. Competent Persons must determine suitability of equipment in this standard for activities conducted in hazardous atmospheres.

The standard does not preclude trained rescue professionals such as fire service rescue teams from using the equipment when desired. However, the standard does not specifically intend for products to be used in emergency rescue situations where equipment is covered by other standards, including the National Fire Protection Association NFPA 1983 Standard for Life Safety Equipment.

SYSTEM REQUIREMENTS

- For one-person rescue system, capacity is 130 to 310 pounds
- For two-person rescue system, capacity is 160 to 600 pounds.
- Connectors must meet the requirements of Z359.12.



Rescue Utility System

36C snaphook

Confined Space Kit

Z359.6 Specifications and Design Requirements for Active Fall Protection Systems

SCOPE The Z359.6 standard is a resource for engineers involved in custom-engineered fall protection system design, usually intended for a single purpose or location and most often installed permanently for the life of the facility.

Passive fall protection systems such as guardrails and nets are not covered by this standard. Work positioning systems are also outside the standard's scope, as are design and performance requirements for manufactured fall arrest components meeting Z359 Fall Protection Code equipment standards.

Engineered fall protection systems employers, owners, and end-users may find this to be useful in specifying to engineering departments and contractors the standard to be followed in active fall protection system design.

DRAWINGS AND SPECIFICATIONS Each engineered fall protection system must be documented with drawings and specifications, prepared by or under an engineer's direction. Drawings and specs must provide particular minimum information, including:

A statement defining system type (fall restraint, fall arrest, etc.)
A system layout drawing
A specification of number, location, and qualifications of system workers
System use environmental limitations
System expected performance information
Clearance requirements
Assembly and installation instructions
Minimum anchorage strength
System inspection, maintenance, and repair directions
A rescue plan
Statements that the system must not be modified or relocated except as specified
Verification of the "as built" system configuration
Frequency of engineer-recertified anchor structure

When the system is designed by a professional engineer, that engineer must be registered in the state where work is performed; he/she must stamp and seal each drawing and specification issued.

MATERIALS, EQUIPMENT AND OTHER DESIGN REQUIREMENTS Manufactured fall protection components used in the fall protection system must meet applicable sections of Z359 Fall Protection Code.

An active fall protection system designer must specify all equipment and hardware to help ensure compatible connections. The engineer is permitted latitude in equipment choice and design approach, but the complete fall protection system must ensure that:

Fall arrest forces are limited to 1,800 pounds or less.
Adequate clearance is available in the potential fall path.
The complete system maintains a safety factor of at least two times the maximum anticipated load.

SAFETY CRITERIA The fall protection system designer must account for several enumerated load requirements, including:

Dead loads from the system's static weight, and the structure to which it is attached.
Fall arrest or travel restraint loads applied to the system.
Live loads due to anchor structure intended use and occupancy.
Wind, snow, earthquake, or other loads that may be applied to anchor structure.
Effects resulting from temperature fluctuations, materials creep, or structure settlement.

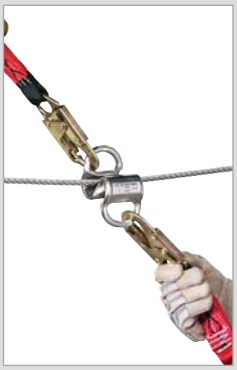
The engineer is guided in these decisions by the International Building Code.

CRITERIA FOR STRENGTH, FORCES ON THE BODY AND CLEARANCE DISTANCES The design standard provides detailed guidance to the engineer in calculating strength requirements, using formulas approved for factored resistance in fall protection systems, including factored resistance for materials not covered by ANSI Limit States Design Code.

The design standard additionally provides the engineer with criteria for determining forces on the body, and clearance distances for fall protection systems.

FALL PROTECTION SYSTEM LOADS AND FORCES This section describes methods to be used by the engineer in calculating forces applied to an active fall protection system to stop or prevent falls. Included in this section is extensive description of means for determining loads from:

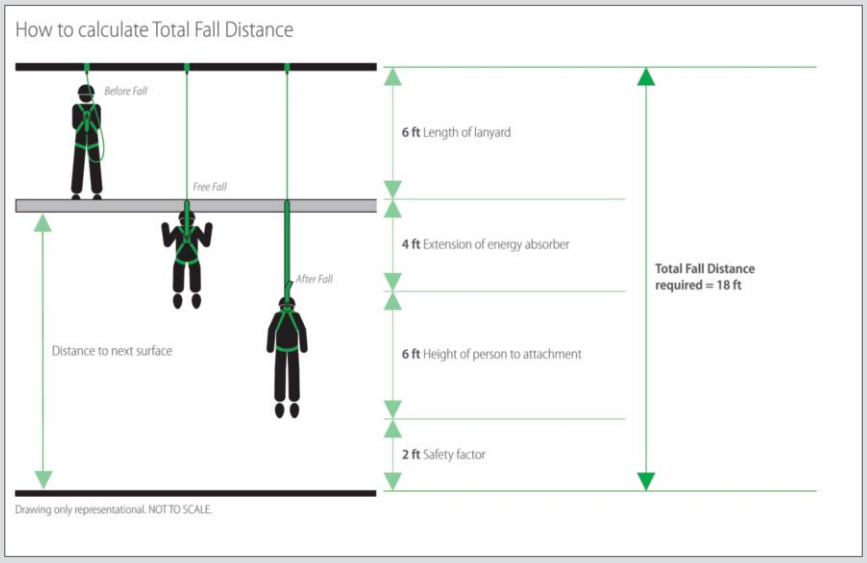
- Horizontal lifeline systems; single & multiple spans.
- Multiple worker falls on the same fall arrest system.



Gravity® Horizontal Lifeline Bypass Shuttles

CLEARANCES FOR FALL ARREST SYSTEMS Next to calculating loads, clearance calculation is the most important evaluation the engineer must perform in fall protection system design. In order to determine minimum clearances, the engineer must accurately calculate the total system fall distance based upon each of the following variables:

FREE FALL DISTANCE	The unimpeded worker fall distance, which ends when all system slack is removed and further worker displacement, is resisted by forces developed in the system.
DECELERATION DISTANCE	The distance over which the fall arrest system reacts to bring the falling worker to a complete stop.
STRETCH OUT	The stretch of the body support harness, plus worker's body reaction deceleration forces.
SWING FALL DISTANCE	Allowance for additional fall distance created by a pendulum-type fall.
SAFETY MARGIN	The margin of safety added to allow for unforeseen conditions; the margin of safety is different for rigid and flexible anchor systems.



Z359.7 Qualification and Verification Testing of Fall Protection Products

SCOPE Z359.7 is the standard for Qualification and Verification testing. It includes requirements for third-party and manufacturer testing, encompassing both testing laboratories, and witness testing of fall protection products. It also specifies the minimum requirements for test equipment and the number of test specimens to be used when testing. Furthermore, the respective product standard specifies performance and design requirements for individual products. All standard requirements must be met before any product can be considered in compliance with any Z359 Standard.

TESTING LABORATORIES Qualification and verification testing of fall protection products must be performed in accordance with the standard requirements and the relevant Z359 Standard. The standard defines a product as "a component, subsystem or system inclusive of all packaging, markings and instructions at the point of sale by a manufacturer." All testing must be conducted through either an accredited third-party testing facility or an in-house manufacturing lab, as long as they are compliant with this standard. These laboratories must be accredited to ISO 17011, "General Requirements for Accreditation Bodies" to ensure conformity with test and documentation requirements set forth in this standard. They must also be compliant with ISO 17025 "General Requirements for the Competence of Testing and Calibration Laboratories". In addition, tested products must meet the complete and most current edition of the Z359 Standard and cannot claim compliance to portions or segments of the requirements.

Third Party Certified by: SEI SAFETY EQUIPMENT INSTITUTE

Equipment Drop Test Structure

In compliance with the Z359 standard, the drop test structure must have sufficient clearance, e.g., height and lateral clearance, within the drop zone, beneath the test anchorage or anchorage connector of the structure without interference or obstructions before termination of the tests. Additional drop test structure requirements in the standard include minimum natural frequency of the structure and maximum elastic deformation of the anchorage and connector at the point of attachment.

Test Weight and Test Torso

The ANSI Z359.7 standard requires the use of a 282lb test weight, however, both the test weight and test torso depend on the specific tests being performed. There may be a requirement for different test weight masses, so it is best to refer to the respective Z359 Standard being tested to for specific weight specifications, including size, mass, center of gravity, etc.

Test Instrumentation

Securely attached to the anchorage or anchorage connector, a load cell (transducer) shall register peak loads and must be accurate within 0.5% of its range. This section also specifies a minimum sampling rate and corner frequencies.

Testing Requirements

New and unused regular production units, from a standard production lot, of a given product model, conforming in all respects to the manufacturers specifications, shall be used for testing purposes. Qualification testing is the initial testing of a product, while verification testing is intended to ensure continuous compliance after said product has been previously qualified. When performing qualification testing, a minimum of three test specimens will be tested. While a minimum of one sample of each compliant product will be evaluated for the purposes of verification testing.

Fall Protection Product Qualification and/or Verification Testing Options

This standard is intended to ensure that there is continuity in testing performed by all third-party testing and manufacturing laboratories. A laboratory must either be a third-party or a manufacturer's laboratory, accredited to perform compliance testing to the Z359 Standard, to be able to perform qualification and verification testing.

Manufacturers' Test Laboratory

The manufacturers' test laboratory may perform testing of fall protection products. But, it is important to be aware that if testing is conducted in a manufacturer's laboratory, the testing must be verified by a professional engineer or witnessed by an accredited third-party lab representative.

DUTIES AND RESPONSIBILITIES OF THE MANUFACTURER If modifications are made that may affect the strength or performance of a product, directly effecting test results, then additional testing will be required in compliance with the applicable standard, in its entirety.

The Manufacturer will:

- Provide complete units to the testing laboratory that are identical in form to that of the end-user product.
- Maintain all design, performance evaluation and testing documentation. This information must be maintained for the duration of the specific product models production life and for subsequent years, after production has ended.

Z359.12 Connecting Components for Personal Fall Arrest Systems

SCOPE The Z359.12 standard for connecting components is intended primarily to be followed by fall protection equipment manufacturers. The standard contains detailed design and test requirements for fall protection component hardware used in full-body harnesses and lanyards. Hardware examples covered in the standard are as follows:

- Snaphooks
- Carabiners
- D-rings, oval rings and O-rings
- Buckles
- Adjusters

Of hardware described in this standard, only carabiners are typically sold as separate components in fall protection systems. Other hardware items are incorporated as integral elements of the components to which they are attached.

DESIGN AND TESTING CRITERIA The standard's importance to equipment owners and end-users is a higher protection level afforded by specific connecting hardware design and performance criteria including:

- Minor axis load tests applied to snaphook and carabiner gates
- Dynamic load testing following conditioning for abrasion, UV exposure, and cold temperature exposure

Minor Axis Load Testing

Minor axis load testing is a requirement applied selectively to snaphooks and carabiners designed without a captive eye feature.

The captive eye is the circular ring at one connector end to which a lanyard web or rope thimble is connected. The reason for a minor axis load test addition is to help prevent a failure mode in which the operable gate is loaded by lanyard pressure against the inside of the gate.

Minor axis loading can occur when webbing or rope works its way around the carabiner body so that fall forces are directed against the gate, pushing it out and away from the connector body. This is the weakest loading orientation for some carabiner and snaphook designs. The minor axis load test helps to ensure that potential gate disengagement, commonly known as roll-out, will not occur when the connector is subjected to the worst anticipated loading configuration. Note that carabiners and snaphooks which are constructed with a circular eye are not susceptible to minor axis loads against the gate mechanism.

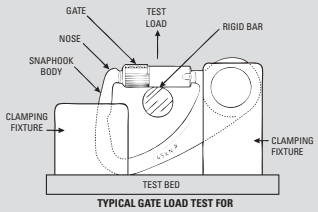
Dynamic Load Testing

Dynamic load testing is another connector standard test requirement. Standards writers believe it is possible to reveal design deficiencies in connectors not otherwise observed in static testing by subjecting hardware to dynamic loads, duplicating impact forces occurring in an accidental fall. Prior to dynamic testing, hardware is first subjected to a series of conditioning tests. These tests are intended to further simulate environments encountered in actual use and include exposure to abrasion, ultra-violet light, and cold temperature prior to dynamic testing.

Minimum Breaking Strength and Corrosion Resistance

Connector hardware is tested for static strength to 5,000 pounds and for corrosion resistance by prolonged salt spray exposure. Carabiners, snaphooks, D-rings, and O-rings must also be subjected to proof load testing (a strength test applied to each piece of hardware) to 3,600 pounds.

MARKINGS AND INSTRUCTIONS Connector hardware such as carabiners, which are sold as separate components, will bear a standard compliance marking. Connectors are also permanently marked with major axis strength, indicated by marking 22K or 5,000 pounds for connectors with operable gates. Test procedures exert static loads on the gate face, gate side and from inside the gate outward, forcing the gate away from the nose of the device. **The gates are then stamped or permanently marked with a load rating of 3600 lbs or 16K.**



TYPICAL GATE LOAD TEST FOR SNAPHOOK AND CARABINER

Instructions provide hardware construction and strength information and also include compatibility and proper use guidance.


36C snaphook | 36CL snaphook | AL36CL snaphook | FP5K snaphook | Carabiner

Z359.13 Personal Energy Absorbers and Energy Absorbing Lanyards

SCOPE This standard establishes requirements for the performance, design, qualification testing, markings and instructions, inspections, maintenance and storage, and removal from service of personal energy absorbers and energy-absorbing lanyards.

CLASSIFICATIONS FOR PERSONAL ENERGY ABSORBERS AND LANYARDS Personal energy absorbers are now divided into two distinct classes:

6 ft FF (FF indicates free-fall distance)
12 ft FF

A 6 ft. FF personal energy absorber is for use in applications where total free-fall distance is limited to six feet or less. A 12 ft. FF personal energy absorber is intended for use when potential free-fall distance increases up to twelve feet. In some applications, workers lack any means for tie-off overhead. The only anchor structure suitable for fall arrest may be located at workers' feet. For example, when erecting steel buildings, iron-workers on the uppermost deck may have no means to connect their personal fall arrest systems to an overhead anchor. In such cases, the only available anchor is the steel beam at foot level. When equipped with a standard 6ft. energy-absorbing lanyard, potential free-fall distance can be up to 12 ft. For this reason, manufacturers have designed personal energy absorbers to arrest a fall from 12 ft. while maintaining maximum arrest forces below OSHA's 1,800 lb limit. The trade-off in using a specially-designed 12 ft. FF energy-absorbing lanyard is that elongation of the energy absorber element will be greater, requiring additional clearance below the fall path. **The capacity for both classes of personal energy absorbers remains within the range of 130 to 310 pounds. Equipment designed for workers outside of this range are beyond the standard's scope.**

Performance Specifications for Personal Energy Absorbers

The maximum forces and extension permitted for personal energy absorbers under the new standard is summarized in the table below:

CONDITIONING	AMBIENT DRY	AMBIENT WET	HOT DRY
6 FT. FF MAAF*	900 lbf	1,125 lbf	900 lbf
MDD#	48 inches (4 ft)	48 inches (4 ft)	48 inches (4 ft)
12 FT FF MAAF	1,350 lbf	1,575 lbf	1,350 lbf
MDD	60 inches (5 ft)	60 inches (5 ft)	60 inches (5 ft)

** MAAF = Maximum Average Arrest Force*

Maximum arrest force may not exceed 1,800 lbf

 # MDD = Maximum Deployment Distance (deceleration distance)

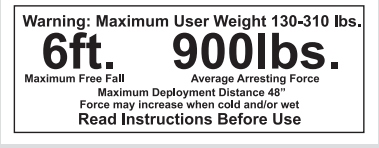
Personal Energy-Absorbing Sub-Assembly
Part No. 10088064

Maximum deployment distance for a 6 ft. FF personal energy absorber is now forty-eight inches, increased from forty-two inches in the previous Z359.1-2007 Fall Protection Code version. Maximum deployment distance for a 12 ft. FF personal energy absorber is up to sixty inches, or five feet of elongation permitted for energy absorbers in this class.

ADDITIONAL TESTING Test requirements have been added to the standard to further improve safety and performance of personal energy absorbers and energy-absorbing lanyards. All personal energy absorbers must now undergo environmental conditioning under hot, cold, and wet exposures. Lanyard leg materials must be conditioned by prolonged exposure to abrasion, simulating actual-use abrasive environments and must retain static strength to resist twice maximum loads imposed by a fall.

Workman Twin-Leg Energy-Absorbing Lanyard
Part No. 10113163

MARKINGS AND INSTRUCTIONS With the creation of a new class of 12 ft. FF personal energy absorbers and energy-absorbing lanyards, new requirements have been created for differentiating this device class from familiar 6 ft. FF lanyards. Labels on personal energy absorbers will clearly distinguish between the two classifications. The 6 ft. FF personal energy absorbers must be marked with large black letters/white background indicating the six feet maximum free fall and 900 pounds average arresting force. 12 ft. FF personal energy absorbers must be marked with large white letters/black background indicating twelve feet and 1350 pounds.



Z359.14 Safety Requirements for Self-Retracting Devices for Personal Fall Arrest and Rescue Systems

SCOPE This standard establishes requirements for the performance, design, qualification testing, markings and instructions, inspections, maintenance and storage, and removal from service of self-retracting devices (SRDs), including self-retracting lanyards (SRLs), self-retracting lanyards with integral rescue capability (SRL-Rs), and self-retracting lanyards with leading-edge capability (SRL-LEs). It also establishes the requirements for self-retracting devices intended for use in personal fall arrest or rescue systems for authorized persons within the capacity range of 130 to 310 pounds.

General Requirements

INTEGRAL CONNECTORS Snaphooks or carabiners which are integral to self-retracting devices must meet the requirements of ANSI Z359.12. Integral rings or similar openings intended to accept a snaphook or carabiner should be designed to minimize the possibility of rollout of a mating snaphook or carabiner.

VISUAL LOAD INDICATOR Self-retracting devices must include a visual load indicator that will activate in a fall event.

RETRACTION TENSION The retraction tension of the self-retracting device line should be between 1.25 and 25 pounds at all points in the range of motion.

SELF-RETRACTING DEVICE CLASSIFICATIONS Self- retracting devices are classified according to dynamic performance. Class A devices have a maximum deployment distance of 24 inches; Class B devices have a maximum deployment distance of 54 inches.

Class A Devices	Class B Devices
Dry conditions: The arrest distance must not exceed 24 inches and the average arresting force must not exceed 1,350 pounds, or a maximum peak of 1,800 pounds.	**Dry conditions:** The arrest distance must not exceed 54 inches and the average arresting force must not exceed 900 pounds, or a maximum peak of 1,800 pounds.
Hot/Wet/Cold: The average arresting force must not exceed 1,575 pounds, or a maximum peak of 1,800 pounds.	**Hot/Wet/Cold:** The average arresting force must not exceed 1,125 pounds, or a maximum peak of 1,800 pounds.

SELF-RETRACTING LANYARDS WITH INTEGRAL RESCUE CAPABILITY (SRL-R)

- Engages in rescue mode at any time, not possible to inadvertently change to or from rescue mode
- Raise or lower with minimum 3:1 mechanical advantage
- In rescue mode, will automatically stop and hold a load if rescuer relinquishes control
- Means to stabilize device during use in rescue mode
- Static Strength of 3,100 lbf

SELF-RETRACTING LANYARDS WITH LEADING EDGE CAPABILITY (SRL-LE) The line constituent of SRL-LEs must include an integral energy absorber element adjacent to the end of the line which connects to the body support. The energy absorber should meet the requirements of ANSI Z359.13. If the SRL-LE device housing is intended to be connected to the body support and can only be used in this orientation, then an energy absorber is not required.

INSPECTION REQUIREMENTS				
Type of Use	**Application Examples**	**Conditions of Use**	**Inspection Frequency Competent Person**	**Factory Authorized Inspection**
Infrequent to Light	Rescue and confined space, factory maintenance	Good storage conditions, indoor or infrequent outdoor use, room temperature, clean environment	Annually	At least every 2-5 years, but not longer than intervals required by the manufacturer
Moderate to Heavy	Transportation, residential construction, utilities warehouse	Fair storage conditions, indoor and extended outdoor use, all temperatures, clean or dusty environments	Semi-annually to annually	At least every 1-2 years, but not longer than intervals required by the manufacturer
Severe to Continuous	Commercial construction, oil and gas, mining	Harsh storage conditions, prolonged or continuous outdoor use, all temperatures, dirty environment	Quarterly to semi-annually	At least annually, but not longer than intervals required by the manufacturer

INSPECTION Inspections shall be conducted by a competent person other than the user, and by a factory authorized inspection entity.

Inspection criteria for the equipment should be set by the program administrator. This criteria must equal or exceed the most restrictive of the criteria established by this standard or the manufacturer's instructions. Inspection criteria should be kept current in relationship to changing patterns or conditions of use.

Documentation of equipment inspections must be maintained by the program administrator. This documentation shall include, at a minimum, the identity of the equipment, inspection date, name of the competent person conducting the inspection and the results of that inspection.

The equipment must be permanently removed from service or undergo corrective maintenance in accordance with the manufacturer's recommendations before return to service, when an inspection reveals one or more of the following:

- Defects in equipment
- Damage to equipment
- Inadequate maintenance of equipment
- Activated load indicators
- Activated warning systems or devices
- Any other condition that calls into question the suitability of the equipment for its intended purpose.

In addition to the inspection requirements of the manufacturer's instructions, the equipment should be inspected for:

- Absence or illegibility of markings or tags.
- Absence of any elements affecting the equipment form, fit or function.
- Evidence of defects in or damage to hardware elements including cracks, sharp edges, deformation, corrosion, chemical attack, excessive heating, alteration and excessive wear.
- Evidence of defects in or damage to straps, wire rope, or ropes including fraying, crushing, unsplicing, unlaying, kinking, knotting, roping, broken or pulled stitches, broken or pulled wires or multiple broken wires, excessive elongation, chemical attack, excessive soiling, abrasion, alteration, needed or excessive lubrication, excessive aging and excessive wear.
- Alteration, absence of parts, or evidence of defects in, damage to or improper function of mechanical devices and connectors.
- Any other condition that calls into question the suitability of the equipment for its intended purpose.

If the equipment has arrested a fall, the equipment must be removed from service, marked or tagged "UNUSABLE" and either disposed of or serviced in accordance with the manufacturer's recommendation.

MSA recommends inspecting equipment prior to each use by the user and requires that all SRL's be inspected by a competent person other than the user at intervals of no more than six (6) months per applicable standard or as specified by a formal fall protection program. Quarterly inspections are required if used in severe conditions.

ENERGY-ABSORBING LANYARDS			
STANDARD	**OSHA 29CFR Part 1910**	**OSHA 29 CFR Part 1926**	**ANSI Z359.13-2013**
MARKET APPLICATION	General Industry	Construction	General Industry
IS IT A VOLUNTARY STANDARD?	No, mandated by law	No, mandated by law	Yes, voluntary
HEIGHT REQUIREMENT FOR FALL PROTECTION	4 ft	6 ft	4 ft
MAXIMUM FREE FALL DISTANCE	6 ft	6 ft	6 ft
MAXIMUM ARREST FORCE	1,800 lbf	1,800 lbf	1,800 lbf
AVERAGE ARREST FORCE	N/A	N/A	900 lbf
MAXIMUM DECELERATION DISTANCE OF ENERGY-ABSORBER	3.5 ft (42 in)	3.5 ft (42 in)	**6 ft Free Fall:** 4ft (48 in) **12 ft Free Fall:** 5 ft (60 in)
WEIGHT CAPACITY	75 - 400 lbs.	75 - 400 lbs.	130 - 310 lbs.
INSPECTION FREQUENCY	Prior to each use, by user	Prior to each use, by user	Prior to each use, by user. At least annually by a Competent Person.
REQUIRED ANCHORAGE STRENGTH	**Non-Certified Anchors:** 5,000 lbf **Certified Anchors:** 2x the maximum arrest force	**Non-Certified Anchors:** 5,000 lbf **Certified Anchors:** 2x the maximum arrest force	**Non-Certified Anchors:** 5,000 lbf **Certified Anchors:** 2x the maximum arrest force

SELF-RETRACTING DEVICES				
STANDARD	**OSHA 29CFR Part 1910**	**OSHA 29 CFR Part 1926**	**ANSI Z359.14-2012**	
CLASS			Class A	Class B
MARKET APPLICATION	General Industry	Construction	General Industry	General Industry
IS IT A VOLUNTARY STANDARD?	No, mandated by law	No, mandated by law	Yes, voluntary	Yes, voluntary
HEIGHT REQUIREMENT FOR FALL PROTECTION	4 ft	6 ft	4 ft	4 ft
MAXIMUM FREE FALL DISTANCE	2 ft	2 ft	2 ft	2 ft
MAXIMUM ARREST FORCE	1,800 lbf	1,800 lbf	1,800 lbf	1,800 lbf
AVERAGE ARREST FORCE	N/A	N/A	Dry - 1350 lbf Hot/Wet/Cold - 1,575 lbf	Dry - 900 lbf Hot/Wet/Cold - 1125 lbf
MAXIMUM DEPLOYMENT DISTANCE	3.5 ft (42 in)	3.5 ft (42 in)	2ft (24 in)	5ft (54 in)
WEIGHT CAPACITY	75 - 400 lbs. (tested at 220 lbs)	75 - 400 lbs. (tested at 220 lbs)	130 - 310 lbs. (tested at 282 lbs)	130 - 310 lbs. (tested at 282 lbs)
INSPECTION FREQUENCY	Prior to each use, by user	Prior to each use, by user	Prior to each use, by user. Recommended every 6 months or at least annually by a Competent Person. Factory recertification depending on use.	Prior to each use, by user. Recommended every 6 months or at least annually by a Competent Person. Factory recertification depending on use.
REQUIRED ANCHORAGE STRENGTH	**Non-Certified Anchors:** 5,000 lbf **Certified Anchors:** 2x the maximum arrest force	**Non-Certified Anchors:** 5,000 lbf **Certified Anchors:** 2x the maximum arrest force	**Non-Certified Anchors:** 5,000 lbf **Certified Anchors:** 2x the maximum arrest force	**Non-Certified Anchors:** 5,000 lbf **Certified Anchors:** 2x the maximum arrest force

CLARIFICATION: *OSHA & ANSI use different test methods, specifically the test weights. An ANSI product still meets the OSHA standard if it is tested using the OSHA test weight.*

OSHA Reference Information

QUALIFIED PERSON V. COMPETENT PERSON Per OSHA definitions: A **"Qualified"** person is one who, by possession of a recognized degree, certificate, or professional standing, or who by extensive knowledge, training, and experience, has successfully demonstrated his ability to solve or resolve problems relating to the subject matter, the work, or the project.

A **"Competent"** person is one who is capable of identifying existing and predictable hazards in the surroundings or working conditions which are unsanitary, hazardous, or dangerous to employees, and who has authorization to take prompt corrective measures to eliminate them.

MSA ANSI Z359 Compliant Products

Full-Body Harnesses

EVOTECH HARNESS	Part Number	Description
	1 10105931	EVOTECH Harness, BACK D-ring ,Tongue Buckle leg straps, Qwik-Connect chest strap, Shoulder Padding, Standard (STD)
	2 10105932	EVOTECH Harness, BACK D-ring, Tongue Buckle leg straps, Qwik-Connect chest strap, Shoulder Padding, X-Large (XLG)
	1 10105940	EVOTECH Harness, BACK D-ring ,Qwik-Connect leg straps, Qwik-Connect chest strap, Shoulder Padding, Standard (STD)
	2 10105941	EVOTECH Harness, BACK D-ring ,Qwik-Connect leg straps, Qwik-Connect chest strap, Shoulder Padding, X-Large (XLG)
	1 10105933	EVOTECH Harness, BACK & HIP D-rings, Tongue Buckle leg straps, Qwik-Connect chest strap, Shoulder Padding, Standard (STD)
	2 10105935	EVOTECH Harness, BACK & HIP D-rings, Tongue Buckle leg straps, Qwik-Connect chest strap, Shoulder Padding, X-Large (XLG)
	1 10105942	EVOTECH Harness, BACK & HIP D-rings, Qwik-Connect leg straps, Qwik-Connect chest strap, Shoulder Padding, Standard (STD)
	2 10105943	EVOTECH Harness, BACK & HIP D-rings, Qwik-Connect leg straps, Qwik-Connect chest strap, Shoulder Padding, X-Large (XLG)

EVOTECH CONSTRUCTION HARNESS	Part Number	Description
	10112708	EVOTECH Construction Harness w/integral backpad, BACK & HIP D-rings, Tongue Buckle leg straps, Qwik-Connect chest strap, Shoulder Padding, Standard (STD)
	10112709	EVOTECH Construction Harness w/integral backpad, BACK & HIP D-rings, Tongue Buckle leg straps, Qwik-Connect chest strap, Shoulder Padding, X-Large (XLG)
	10112742	EVOTECH Construction Harness w/integral backpad, BACK & HIP D-rings, Qwik-Connect leg straps, Qwik-Connect chest strap, Shoulder Padding, Standard (STD)
	10112743	EVOTECH Construction Harness w/integral backpad, BACK & HIP D-rings, Qwik-Connect leg straps, Qwik-Connect chest strap, Shoulder Padding, X-Large (XLG)
	2 10112710	EVOTECH Construction Harness w/integral backpad, BACK, HIP & CHEST D-rings, Tongue Buckle leg straps, Qwik-Connect chest strap, Shoulder Padding, Standard (STD)
	2 10112741	EVOTECH Construction Harness w/integral backpad, BACK, HIP & CHEST D-rings, Tongue Buckle leg straps, Qwik-Connect chest strap, Shoulder Padding, X-Large (XLG)
	2 10112744	EVOTECH Construction Harness w/integral backpad, BACK, HIP & CHEST D-rings, Qwik-Connect leg straps, Qwik-Connect chest strap, Shoulder Padding, Standard (STD)
	2 10112745	EVOTECH Construction Harness w/integral backpad, BACK, HIP & CHEST D-rings, Qwik-Connect leg straps, Qwik-Connect chest strap, Shoulder Padding, X-Large (XLG)

Full-Body Harnesses

EVOTECH TOWER HARNESS	Part Number	Description
	10112758	EVOTECH Harness, BACK D-ring ,Tongue Buckle leg straps, Qwik-Connect chest strap, Shoulder Padding, Standard (STD)
	10112759	EVOTECH Harness, BACK D-ring, Tongue Buckle leg straps, Qwik-Connect chest strap, Shoulder Padding, X-Large (XLG)
	10112760	EVOTECH Harness, BACK D-ring ,Qwik-Connect leg straps, Qwik-Connect chest strap, Shoulder Padding, Standard (STD)
	10112761	EVOTECH Harness, BACK D-ring ,Qwik-Connect leg straps, Qwik-Connect chest strap, Shoulder Padding, X-Large (XLG)

TECHNACURV HARNESS	Part Number	Description
	1 10041591	TechnaCurv Harness, Vest-Style, BACK D-ring, Tongue Buckle leg straps, Qwik-Fit chest strap, Standard (STD)
	1 10041592	TechnaCurv Harness, Vest-Style, BACK D-ring, Tongue Buckle leg straps, Qwik-Fit chest strap, X-Large (XLG)
	1 10041599	TechnaCurv Harness, Vest-Style, BACK D-ring, Tongue Buckle leg straps, Qwik-Fit chest strap, Shoulder Padding, Standard (STD)
	10041600	TechnaCurv Harness, Vest-Style, BACK D-ring, Tongue Buckle leg straps, Qwik-Fit chest strap, Shoulder Padding, X-Large (XLG)
	2 10041603	TechnaCurv Harness, Vest-Style, BACK & HIP D-rings, Tongue Buckle leg straps, Qwik-Fit chest strap, Shoulder Padding, Standard (STD)
	10041604	TechnaCurv Harness, Vest-Style, BACK & HIP D-rings, Tongue Buckle leg straps, Qwik-Fit chest strap, Shoulder Padding, X-Large (XLG)
	1 10041595	TechnaCurv Harness, Vest-Style, BACK & HIP D-rings, Tongue Buckle leg straps, Qwik-Fit chest strap, Standard (STD)
	10041596	TechnaCurv Harness, Vest-Style, BACK & HIP D-rings, Tongue Buckle leg straps, Qwik-Fit chest strap, X-Large (XLG)

TECHNACURV CONSTRUCTION HARNESS	Part Number	Description
	2 10054402	TechnaCurv Construction Harness w/integral backpad, Vest-Style, BACK & HIP D-rings, Tongue Buckle leg straps, Qwik-Fit chest strap, Shoulder Padding, Standard (STD)
	10054720	TechnaCurv Construction Harness w/integral backpad, Vest-Style, BACK & HIP D-rings, Tongue Buckle leg straps, Qwik-Fit chest strap, Shoulder Padding, X-Large (XLG)
	10063654	TechnaCurv Construction Harness w/integral backpad, Vest-Style, BACK & HIP D-rings, Tongue Buckle leg straps, Qwik-Fit chest strap, Shoulder Padding, Standard (STD), Hi-Viz Green Webbing
	10063656	TechnaCurv Construction Harness w/integral backpad, Vest-Style, BACK & HIP D-rings, Tongue Buckle leg straps, Qwik-Fit chest strap, Shoulder Padding, X-Large (XLG), Hi-Viz Green Webbing

Full-Body Harnesses

WORKMAN HARNESS	Part Number	Description
	1 10072479	Workman Harness, BACK D-ring, Qwik-Fit leg straps, Qwik-Fit chest strap, Standard (STD)
	1 10072480	Workman Harness, BACK D-ring, Qwik-Fit leg straps, Qwik-Fit chest strap, X-Large (XLG)
	1 10072487	Workman Harness, BACK D-ring, Tongue Buckle leg straps, Qwik-Fit chest strap, Standard (STD)
	1 10072488	Workman Harness, BACK D-ring, Tongue Buckle leg straps, Qwik-Fit chest strap, X-Large (XLG)
	1 10072483	Workman Harness, BACK & HIP D-rings, Qwik-Fit leg straps, Qwik-Fit chest strap, Standard (STD)
	1 10072484	Workman Harness, BACK & HIP D-rings, Qwik-Fit leg straps, Qwik-Fit chest strap, X-Large (XLG)
	2 10072490	Workman Harness, BACK & HIP D-rings, Tongue Buckle leg straps, Qwik-Fit chest strap, X-Small (XSM)
	1 10072491	Workman Harness, BACK & HIP D-rings, Tongue Buckle leg straps, Qwik-Fit chest strap, Standard (STD)
	10108744	Workman Harness, BACK & CHEST D-rings, Tongue Buckle leg straps, Qwik-Fit chest strap, Standard (STD)
	10108745	Workman Harness, BACK & CHEST D-rings, Tongue Buckle leg straps, Qwik-Fit chest strap, X-Large (XLG)
	2 10108768	Workman Harness, BACK, HIP & CHEST D-rings, Tongue Buckle leg straps, Qwik-Fit chest strap, Standard (STD)
	10108769	Workman Harness, BACK, HIP & CHEST D-rings, Tongue Buckle leg straps, Qwik-Fit chest strap, X-Large (XLG)

WORKMAN CONSTRUCTION HARNESS	Part Number	Description
	1 10077571	Workman Construction Harness, BACK & HIP D-rings, Tongue Buckle leg straps, Qwik-Fit chest strap, Integral Back Pad & Tool Belt, Shoulder Pads, Standard (STD)
	1 10077572	Workman Construction Harness, BACK & HIP D-rings, Tongue Buckle leg straps, Qwik-Fit chest strap, Integral Back Pad & Tool Belt, Shoulder Pads, X-Large (XLG)

THERMATEK HARNESS	Part Number	Description
	1 10020062	Thermatek Welder's Harness, BACK & HIP D-rings, Qwik-Fit leg & chest straps, Green Kevlar Nomex Webbing, Standard (STD)
	10020066	Thermatek Welder's Harness, BACK & HIP D-rings, Qwik-Fit leg & chest straps, Green Kevlar Nomex Webbing, X-Large (XLG)

Full-Body Harnesses

GRAVITY WELDER HARNESS	Part Number	Description
	1 10103216	Gravity Welder Harness, Back D-ring, Qwik-Fit Leg Buckles, Standard (STD), Kevlar Webbing
	1 10103217	Gravity Welder Harness, Back D-ring, Qwik-Fit Leg Buckles, X-Large (XLG), Kevlar Webbing

ARCSAFE HARNESS	Part Number	Description
	10060101	ArcSafe Pullover Harness, BACK WEB Loop, Qwik-Fit leg straps, Standard (STD)
	10060102	ArcSafe Pullover Harness, BACK WEB Loop, Qwik-Fit leg straps, X-Large (XLG)
	10082569	ArcSafe Pullover Harness, BACK, HIP & BELAY WEB Loops, Tongue Buckle leg straps, Rubber Hardware Covers, Standard (STD)
	10082570	ArcSafe Pullover Harness, BACK, HIP & BELAY WEB Loops, Tongue Buckle leg straps, Rubber Hardware covers, X-Large (XLG)

Energy-Absorbing Lanyards (ANSI Z359.13)

WORKMAN ENERGY-ABSORBING LANYARDS	Part Number	Description
	1 10113157	Workman Single-Leg Energy-Absorbing Lanyard, 6', 36C snaphooks, Tieback version, ANSI Z359.13
	1 10113158	Workman Single-Leg Energy-Absorbing Lanyard, 6', 36C snaphooks, ANSI Z359.13
	1 10113164	Workman Single-Leg Energy-Absorbing Lanyard, 6', 36C snaphook & 36CL Rebar snaphook, ANSI Z359.13
	1 10113159	Workman Twin-Leg Energy-Absorbing Lanyard, 6', (2) 36C snaphooks, ANSI Z359.13
	1 10113162	Workman Twin-Leg Energy-Absorbing Lanyard, 6', (2) 36C snaphooks, Tieback version, ANSI Z359.13
	1 10113163	Workman Twin-Leg Energy-Absorbing Lanyard, 6', 36C snaphook & (2) 36CL Rebar snaphooks, ANSI Z359.13

FP5K ENERGY-ABSORBING WEB LANYARDS	Part Number	Description
	1 10107207	FP5K Energy-Absorbing Single-Leg Web Lanyard, 6', Tieback version, 36C snaphook & FP5K snaphook, Adjustable, ANSI Z359.13
	1 10107208	FP5K Energy-Absorbing Twin-Leg Web Lanyard, 6', Tieback version, 36C snaphook & (2) FP5K snaphooks, Adjustable, ANSI Z359.13

Energy-Absorbing Lanyards (ANSI Z359.13)

FP5K ENERGY-ABSORBING CABLE LANYARDS	Part Number	Description
	10107209	FP5K Energy-Absorbing Single-Leg Cable Lanyard, 6', Tieback version, 36C snaphook & FP5K snaphook, Fixed, ANSI Z359.13
	10107210	FP5K Energy-Absorbing Twin-Leg Cable Lanyard, 6', Tieback version, 36C snaphook & (2) FP5K snaphooks, Fixed, ANSI Z359.13

SURE-STOP ENERGY-ABSORBING WEB LANYARDS	Part Number	Description
	1 10088259	Sure-Stop Single-Leg Energy-Absorbing Web Lanyard, 6', Adjustable, 36C steel snaphooks, ANSI Z359.13
	1 10088260	Sure-Stop Single-Leg Energy-Absorbing Web Lanyard, 6', Adjustable, 36C steel snaphook & 36CL Rebar snaphook, ANSI Z359.13
	10088265	Sure-Stop Twin-Leg Energy-Absorbing Web Lanyard, 6', Adjustable, (2) 36C steel snaphooks, ANSI Z359.13
	1 10088266	Sure-Stop Twin-Leg Energy-Absorbing Web Lanyard, 6', Adjustable, (2) 36CL Rebar snaphooks, ANSI Z359.13
	10088216	Sure-Stop Single-Leg Energy-Absorbing Web Lanyard, 6', Fixed length, Sewn Loop & 36C steel snaphook, ANSI Z359.13
	1 10088213	Sure-Stop Single-Leg Energy-Absorbing Web Lanyard, 6', Fixed length, 36C steel snaphooks, Tieback version, ANSI Z359.13
	10088267	Sure-Stop Twin-Leg Energy-Absorbing Web Lanyard, 6', Fixed length, (2) 36C steel snaphooks, ANSI Z359.13
	10088268	Sure-Stop Twin-Leg Energy-Absorbing Web Lanyard, 6', Fixed length, (2) 36CL Rebar snaphooks, ANSI Z359.13
	10088269	Sure-Stop Twin-Leg Energy-Absorbing Web Lanyard, 6', Fixed length, Sewn Loop & (2) 36CL Rebar snaphooks, ANSI Z359.13
	1 10088214	Sure-Stop Twin-Leg Energy-Absorbing Web Lanyard, 6', Fixed length, (2) 36C steel snaphooks, Tieback version, ANSI Z359.13
	10088215	Sure-Stop Twin-Leg Energy-Absorbing Web Lanyard, 6', Fixed length, Sewn Loop & (2) 36C steel snaphooks, Tieback version, ANSI Z359.13
	10088217	Sure-Stop Twin-Leg Energy-Absorbing Web Lanyard, 6', Fixed length, Sewn Loop & (2) 36C steel snaphooks, ANSI Z359.13

SURE-STOP ENERGY-ABSORBING CABLE LANYARDS	Part Number	Description
	10088120	Sure-Stop Single-Leg Energy-Absorbing Cable Lanyard, 6', Fixed length, 36C steel snaphooks, ANSI Z359.13
	10088211	Sure-Stop Twin-Leg Energy-Absorbing Cable Lanyard, 6', Fixed length, (2) 36C steel snaphooks, ANSI Z359.13
	10088212	Sure-Stop Twin-Leg Energy-Absorbing Cable Lanyard, 6', Fixed length, (2) 36CL Rebar snaphooks, ANSI Z359.13

SURE-STOP ENERGY-ABSORBING ROPE LANYARDS	Part Number	Description
	10088221	Sure-Stop Single-Leg Energy-Absorbing Rope Lanyard, 6', Adjustable, 36C steel snaphooks, ANSI Z359.13
	2 10088219	Sure-Stop Single-Leg Energy-Absorbing Rope Lanyard, 6', Fixed length, 36C steel snaphooks, ANSI Z359.13
	10092985	Sure-Stop Single-Leg Energy-Absorbing Rope Lanyard, 6', Adjustable, 36C steel snaphook & 36CL steel snaphook, ANSI Z359.13
	10088220	Sure-Stop Twin-Leg Energy-Absorbing Rope Lanyard, 6', Fixed length, (2) 36C steel snaphooks, ANSI Z359.13

Energy-Absorbing Lanyards (ANSI Z359.13)

DIAMOND ENERGY-ABSORBING LANYARDS	Part Number	Description
	2 10088065	Diamond Single-Leg Energy-Absorbing Lanyard, 6', 36C steel snaphooks, ANSI Z359.13
	10088066	Diamond Single-Leg Energy-Absorbing Lanyard, 6', 36C steel snaphook & 36CL Rebar snaphook, ANSI Z359.13
	10088069	Diamond Twin-Leg Energy-Absorbing Lanyard, 6', 36C snaphook & (2) 36C steel snaphooks, ANSI Z359.13
DIAMOND KEVLAR ENERGY-ABSORBING LANYARDS	**Part Number**	**Description**
	10125910	Diamond Single-Leg KEVLAR Energy-Absorbing Lanyard, 6', 36C steel snaphooks, ANSI Z359.13
	10125921	Diamond Single-Leg KEVLAR Energy-Absorbing Lanyard, 6', 36C steel snaphook & 36CL Rebar snaphook, ANSI Z359.13
	10125922	Diamond Twin-Leg KEVLAR Energy-Absorbing Lanyard, 6', 36CS swivel snaphook & (2) 36C steel snaphooks, ANSI Z359.13
	10125923	Diamond Twin-Leg KEVLAR Energy-Absorbing Lanyard, 6', 36CS swivel snaphook & (2) 36CL Rebar snaphooks, ANSI Z359.13
THERMATEK ENERGY-ABSORBING CABLE LANYARDS	**Part Number**	**Description**
	1 10088246	Thermatek Single-Leg Energy-Absorbing Cable Lanyard, 6', 36C steel snaphooks, ANSI Z359.13
	10088250	Thermatek Twin-Leg Energy-Absorbing Cable Lanyard, 6', 36C steel snaphooks, ANSI Z359.13
	10127309	Thermatek Twin-Leg Energy-Absorbing Cable Lanyard, 6', (2) FP5K steel snaphooks, ANSI Z359.13
ARCSAFE ENERGY-ABSORBING LANYARDS	**Part Number**	**Description**
	1 10107200	ArcSafe Single-Leg Energy-Absorbing Lanyard, 6', Hitch Loop, 36C steel snaphook, ANSI Z359.13
	1 10107201	ArcSafe Twin-Leg Energy-Absorbing Lanyard, 6', Hitch Loop, (2) 36C steel snaphook, ANSI Z359.13
	10107202	ArcSafe Twin-Leg Energy-Absorbing Lanyard, 6', Hitch Loop, (2) 36CL steel snaphooks, ANSI Z359.13
ENERGY-ABSORBING SUB-ASSEMBLY	**Part Number**	**Description**
	10088064	Sure-Stop Sub-Assembly Energy Absorber w/D-ring & 36C steel snaphook, ANSI Z359.13

Self-Retracting Devices

WORKMAN SRL	Part Number	Description
	1 10119507	Workman SRL, 30', Galvanized Cable, 36CS swivel snaphook, ANSI Z359.14
	1 10120724	Workman SRL, 30', Stainless Steel Cable, 36CS steel swivel snaphook, ANSI Z359.14
	1 10121834	Workman SRL, 50', Galvanized Cable, 36CS steel swivel snaphook, ANSI Z359.14
	1 10121778	Workman SRL, 50', Stainless Steel Cable, 36CS steel swivel snaphook, ANSI Z359.14

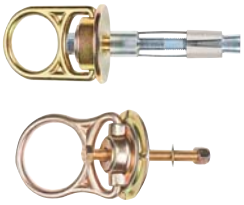
WORKMAN WEB PFL	Part Number	Description
	1 10093353	Workman Web PFL, 12', 36C steel snaphook, includes 1" steel carabiner, ANSI Z359.14
	1 10093354	Workman Web PFL, 12', 36C steel snaphook, ANSI Z359.14
	10093355	Workman Web PFL, 10', AL36C steel snaphook, ANSI Z359.14

WORKMAN CABLE PFL	Part Number	Description
	2 10104793	Workman Cable PFL, 12', 36C steel snaphook, includes 1" steel carabiner, ANSI Z359.14
	10104794	Workman Cable PFL, 12', 36C steel snaphook, ANSI Z359.14
	10104795	Workman Cable PFL, 10', AL36C aluminum snaphook, ANSI Z359.14

WORKMAN TWIN-LEG PFL	Part Number	Description
	1 10120052	Workman Twin Leg PFL, 6', 36C steel snaphooks, ANSI Z359.14
	1 10118937	Workman Twin Leg PFL, 6', 36CL steel rebar snaphooks, ANSI Z359.14
	1 10120050	Workman Twin Leg PFL , 6', AL36CL aluminum rebar snaphooks, ANSI Z359.14
	1 10125271	Workman Twin Leg Tieback PFL, 6', FP5K snaphooks, ANSI Z359.14

DYNA-LOCK SRL	Part Number	Description
	1 506615	Dyna-Lock SRL, 20' Nylon Web, 36CS steel swivel snaphook, ANSI Z359.14
	1 10017931	Dyna-Lock SRL, 20' Stainless Steel Cable, 36CS swivel snaphook, ANSI Z359.14
	10088390	Dyna-Lock SRL, 20', Backpacker (for use w/RCD System) Nylon Web, 36CS swivel snaphook, ANSI Z359.14
	1 506202	Dyna-Lock SRL, 30' Galvanized Wire Rope, 36CS steel swivel snaphook, ANSI Z359.14
	2 506203	Dyna-Lock SRL, 30' Stainless Steel Wire Rope, 36CS steel swivel snaphook, ANSI Z359.14
	1 506204	Dyna-Lock SRL, 50' Galvanized Wire Rope, 36CS steel swivel snaphook, ANSI Z359.14
	2 506205	Dyna-Lock SRL, 50' Stainless Steel Wire Rope, 36CS steel swivel snaphook, ANSI Z359.14
	506206	Dyna-Lock SRL, 70' Galvanized Wire Rope, 36CS steel swivel snaphook, ANSI Z359.14
	506207	Dyna-Lock SRL, 70' Stainless Steel Wire Rope, 36CS steel swivel snaphook, ANSI Z359.14
	506208	Dyna-Lock SRL, 95' Galvanized Wire Rope, 36CS steel swivel snaphook, ANSI Z359.14
	506209	Dyna-Lock SRL, 95' Stainless Steel Wire Rope, 36CS steel swivel snaphook, ANSI Z359.14

Anchorage Connectors

MEGA SWIVEL ANCHORAGE CONNECTORS		Description
	10144957	10K MEGA Swivel Hybrid Kit
	10144944	5K MEGA Swivel Anchorage Connector Kit, Zinc-plated for STEEL
	10144945	5K MEGA Swivel Anchorage Connector Kit, Zinc-plated for CONCRETE
	10144949	5K MEGA Swivel Anchorage Connector Kit, Stainless Steel for STEEL
	10144950	5K MEGA Swivel Anchorage Connector Kit, Stainless Steel for CONCRETE
	10129084	10K MEGA Swivel Anchorage Connector Kit, Zinc-plated for STEEL
	10129085	10K MEGA Swivel Anchorage Connector Kit, Zinc-plated for CONCRETE
REMOVABLE CONCRETE ANCHORS		**Description**
	10144960	5K Drop through Anchorage Connector, 8.5'
	10144961	5K Toggle Lok Anchorage Connector
	1 10081594	5K Removable Concrete Anchor
	1 10081570	10K Removable Concrete Anchor
BEAM GRIPS	**Part Number**	**Description**
	1 10144431	Workman FP Stryder Beam Grip, 4"-13.5" beam
	10144432	Workman FP Stryder Beam Grip, 14"-23.5" beam
ANCHORAGE STRAPS	**Part Number**	**Description**
	1 505282	Anchorage Connector Strap, Yellow Nylon, Single D-ring, 5'
	10001621	Anchorage Connector Strap, Yellow Nylon, Single D-ring, 6'
	10002183	Anchorage Connector Strap, Yellow Nylon, Single D-ring, 10'
	10036028	Anchorage Connector Strap, Yellow Nylon, Double D-ring, 3'
	1 10023490	Anchorage Connector Strap, Yellow Nylon, Double D-ring, 5'
	10037533	Anchorage Connector Strap, Yellow Nylon, Double D-ring, 12'
	SFP2267503	Double D-Ring Anchorage Connector Strap, 3'
	1 SFP2267504	Double D-Ring Anchorage Connector Strap, 4'
	SFP2267506	Double D-Ring Anchorage Connector Strap, 6'
	10023487	Thermatek Anchorage Connector Strap, Kevlar Web, 6'

Carabiners

CARABINERS	Part Number	Description
	1 10089205	Steel Carabiner, 9/16" Gate Opening, Auto-Locking, ANSI Z359
	1 10089207	Steel Carabiner, 1" Gate Opening, Auto-Locking, ANSI Z359
	1 10089209	Steel Carabiner, 2.1" Gate Opening, Auto-Locking, ANSI Z359

Confined Space Entry

CONFINED SPACE ENTRY KITS	Part Number	Description
	10153723	Workman Tripod, 65' Workman Winch, galvanized cable, 50' Lynx Rescuer, ANSI
	10153101	Workman Tripod, 65' Workman Winch, stainless steel cable, 50' Lynx Rescuer, ANSI
	10153724	Workman Tripod, 65' Workman Winch, galvanized cable, 50' Dynevac II Rescuer, ANSI
	10153102	Workman Tripod, 65' Workman Winch, stainless steel cable, 50' Dynevac II Rescuer, ANSI
WORKMAN WINCH	**Part Number**	**Description**
	10153757	Workman Winch, Galvanized Cable, 65 ft.
	10147301	Workman Winch, Stainless Steel Cable, 65 ft.
LYNX HOIST	**Part Number**	**Description**
	10016568	Lynx Hoist, Galvanized Cable, 105 ft.
	10016566	Lynx Hoist, Stainless Steel Cable, 105 ft.

Confined Space Entry

LYNX RESCUERS	Part Number	Description
	10011744	Workman Tripod, 65' workman Winch, galvanized cable, 50' Lynx Rescuer, ANSI
	10011745	Workman Tripod, 65' workman Winch, stainless steel cable, 50' Lynx Rescuer, ANSI
DYNEVAC II RESCUERS	**Part Number**	**Description**
	10127293	Dynevac II, 50', Stainless Steel Cable, 36CS swivel snaphook, ANSI
	10127295	Dynevac II, 95', Stainless Steel Cable, 36CS swivel snaphook, ANSI
CONFINED SPACE ENTRY COMPONENTS	**Part Number**	**Description**
	10102002	Workman Tripod, 8 ft.
	506232	Mounting Bracket for 30' & 50' Lynx Rescuer/Dynevac II
	506216	Mounting Bracket for 70' & 95' Lynx Rescuer/Dynevac II
	506222	Pulley
	10089207	Carabiner

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The MSA Fall Protection Promise

MSA promises to replace any MSA harness and/or textile lanyard FREE of charge if a user falls while properly using our product. If the fall occurs while using an MSA mechanical device, we will re-certify the device FREE of charge.

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Products should be returned with a signed copy of the accident report to:

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- Symbols with a 1 denote Tier I product status
- Symbols with a 2 denote Tier II product status
- Black symbols denote that the maximum order quantity for priority shipping is 100 units
- Red symbols denote that the maximum order quantity for priority shipping is 50 units

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For a complete copy of the ANSI Z359 Family of Standards, please contact the American Society of Safety Engineers, Des Plaines, IL, or online at http://www.asse.org.

Note: This bulletin contains only a general description of the products shown. While uses and performance capabilities are described, under no circumstances shall the products be used by untrained or unqualified individuals and not until the product instructions including any warnings or cautions provided have been thoroughly read and understood. Only they contain the complete and detailed information concerning proper use and care of these products.

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ID 2302-27-MC / Jan 2014

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