MODEL NUMBER

USER INSTRUCTIONS

DYNEVAC® II

SELF RETRACTING LANYARD (SRL) AND EMERGENCY RESCUER WITH FIELD RESET CAPABILITY

WARNING

National standards and state, provincial and federal laws require the user to be trained before using this product. Use this manual as part of a user safety training program that is appropriate for the user's occupation. These instructions must be provided to users before use of the product and retained for ready reference by the user. The user must read, and understand (or have explained), and heed all instructions, labels, markings and warnings supplied with this product and with those products intended for use in association with it. FAILURE TO DO SO MAY RESULT IN SERIOUS INJURY OR DEATH.

1.0 DYNEVAC II MODELS AND SPECIFICATIONS

TABLE 1. MSA DYNEVAC II MODELS COVERED BY THESE INSTRUCTIONS

MODEL	DESCRIPTION	STEEL LINE (WIRE ROPE)	LINE LENGTH	HOUSING SIZE	APPROX. NET WEIGHT
10007782	Dynevac II 50 ft.	Stainless 3/16" Diameter	50 ft. (16 m) (38x23x15 cm)	15x9x6 in	33 lbs (15 kg)
10007783	Dynevac II 95 ft.	Stainless 3/16" Diameter	95 ft. (30 m) (38x23x15 cm)	20x12x6 in	51 lbs (23 kg)

1.1 DYNEVAC II SRL WITH EMERGENCY RESCUER

Meets: OSHA requirements, ANSI A10.14, ANSI Z359.1 and CSA Z259.2 standards.

Materials: Formed steel housing, zinc plated. Aluminum drum. Forged steel snaphook.

Lifeline: Stainless steel rope, 3/16 inch (5 mm) diameter, minimum breaking strength 3100 lbf (13.7 kN).

Capacity: Maximum for personnel is 310 lbs (140 kg) including weight of the user plus clothing, tools and other user-borne objects. Minimum capacity is 75 lbs (34 kg).

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Field Reset: Dynevacs may be reset in the field to convert the unit from self-retracting lanyard mode to hoist mode (emergency retrieval) and back again, repeatedly, without tools.

Brake: Auto braking of the drum will function with the handle released while the unit is in the emergency retrieval mode.

Line Locking: The lifeline will lock at a velocity of 4.5 ft./sec (1.4 m/s). Locking mechanism is mechanical and does not rely on centrifugal force to engage.

Line Tension: The lifeline is maintained at a constant tension of approximately 3 lbf (1.4 kg) to reduce total fall distance.

Total Fall Distance: Including free fall distance and elongation for fall arrest is less than 36 inches (0.9 m).

STANDARD LINE LENGTHS	50 FEET (16 M)	95 FEET (30 M)
Housing Size:	15 X 9 X 6 in	20 X 12 X 6 in
	(38x23x15 cm)	(51x31x15cm)
Net Weight:	33 lbs (15 kg)	51 lbs (23 kg)
Maximum Arresting Forces:	900 lbf (4 kN)	900 lbf (4 kN)
Emergency Retrieval (Hoisting) Performance - When Lifting 220 lbs (100 kg):		
Cranking Force:	26 lbf (1.1 kN)	21 lbf (1.0 kN)
Approximate Lifting Speed:	25 ft./min (7.6 m/min)	25 ft./min (7.6 m/min)
Emergency Retrieval (Hoisting) Performance - When Lowering 220 lbs (100 kg):		
Cranking Force:	14 lbf (0.4 kN)	14 lbf (0.4 kN)
Approximate Lowering Speed:	40 ft./min (7.6 m/min)	40 ft./min (7.6 m/min)

Notes

1. All measured data in this section is approximate.
2. The measured values shown are the average of a series of tests, using a rigid steel weight directly connected to the line and performed in accordance with ANSI Z359.1, section 4.3.7.1. The maximum arrest force which the user experiences during a fall while using a Dynevac II and a full body harness is approximately that 70 percent of the measured test values (reference OSHA 1910.66, Appendix C) due to energy dissipation by the harness and the human body. Therefore, the maximum arrest force on the user will be less than 900 lbf (4 kN).

2.0 TRAINING

It is the responsibility of the purchaser of the Dynevac II to assure that users are familiar with these User Instructions and trained by a competent person in: (1) workplace hazard awareness and hazard identification, evaluation and control; (2) how to properly select, inspect, use, store and maintain the Dynevac II; (3) how to determine and acceptable limit free fall distance, total fall distance and maximum arresting force; (4) proper attachment locations on the Dynevac II, and proper attachment methods, including compatibility of connections to reduce the probability of accidental disengagement (rollout); (5) how to evacuate from a hazardous space; (6) what to do after a fall to protect the user from injury, including emergency rescue planning and execution; and (7) the consequences of improper use of the Dynevac II and associated equipment and of failure to follow instructions and training. If the Dynevac II is to be used for confined space applications, the user must also be trained in accordance with the requirements of OSHA regulation 29 CFR 1910.146 and ANSI Z117.1. Training must be conducted without undue exposure of the trainee to

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hazards. The effectiveness of training should be periodically assessed (at least every two years) and the need for more training or retraining determined. MSA offers training programs. Contact MSA for more information at 1-800-722-1231. This unit can serve as a training unit.

3.0 HAZARDS IDENTIFICATION, EVALUATION & CONTROL

⚠ CAUTION

Do not use the Dynevac II unless a qualified person has inspected the workplace and determined that identified hazards can neither be eliminated nor exposure to them prevented.

Prior to selecting a Dynevac II or other personal protective equipment, the user must make a workplace assessment of hazards and conditions where the equipment is required. Such assessment must, at a minimum, identify the presence of:

- Hot objects
- Chemicals
- Abrasive surfaces
- Climatic factors
- Sparks
- Electrical hazards
- Moving equipment
- Weather factors
- Flames
- Environmental contaminants
- Moving materials
- Unstable/uneven surfaces
- Sharp objects
- Heat producing operations
- Unguarded openings
- Slippery surfaces
- Confined space hazards
- Anchorage availability/location

Foreseeable changes in any of these conditions, taken individually or collectively, must be identified, evaluated and controlled. The materials and construction of the Dynevac II and associated equipment must be considered in the selection process, such that these workplace conditions are suitably addressed and responded to. The equipment must match the work situation and workplace environmental factors.

The workplace assessment must identify all paths of intended user movement and all hazards along such paths. The user must identify the required range of mobility in each hazard zone and note the location and distance to all obstructions in potential fall paths. Lateral obstructions which could be contacted in a pendular fall arrest must be noted. An assembly connecting a harness to the anchorage must be selected which will satisfactorily limit total fall distance and allow for dynamic elongation and activation distance of the assembly. If the Dynevac II is to be used for confined space entry operations, the workplace assessment must comply with the requirements of OSHA regulation 29 CFR 1910.146 and ANSI Z117.1.

Be extremely careful when considering the use of the Dynevac II for fall arrest of a user working on a sloped surface such as a pitched roof or tank bottom. If the user falls and slides on such a surface, the Dynevac II line may not be extracted fast enough to cause the unit's locking mechanism to arrest the sliding fall. The user may, therefore, slide into a hazard zone such as a roof edge or an auger in a tank bottom. The use of a work positioning system or a travel restriction system should be first considered for such applications. See section 6 for a discussion of these systems.

Do not install the Dynevac II for such applications if there is any question whether it will arrest the sliding fall before a hazard is encountered.

Do not use the Dynevac II to arrest falls due to collapse of sliding masses such as grain, sand or liquids. When a sliding mass collapses, it may do so at a rate of speed less than the minimum locking speed of the Dynevac II. Therefore, the user may descend into the sliding mass without the device locking to arrest the fall. Always maintain solid footing when fall hazards exist.

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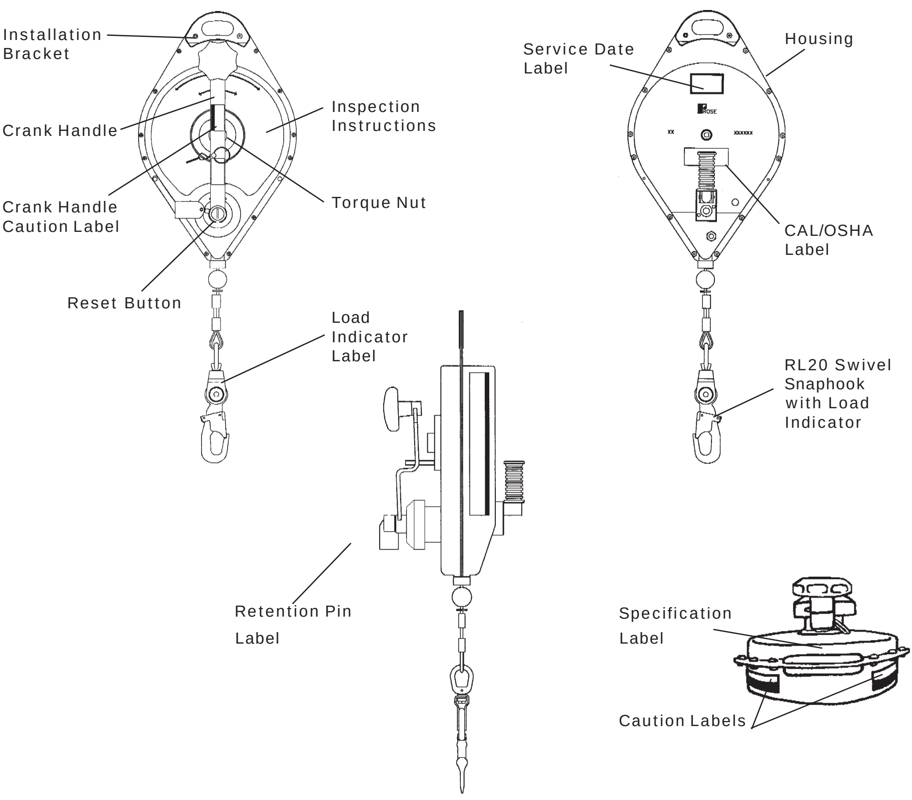
4.0 DESCRIPTION

The MSA Dynevac II Self Retracting Lanyard and Emergency Rescuer consists principally of a steel housing with installation bracket, an internal spring-loaded drum on which wire rope (line) is wound, an internal brake mechanism with a shock absorber, a crank handle and gear mechanism for lifting and lowering a person on the line, a fold out grip to stabilize the Dynevac II when it is freely suspended and being used in the emergency retrieval mode, and a snaphook on the line for attachment to the user's full body harness.

The Dynevac II has two distinct functions, namely: (1) personal fall arrest with shock absorption, and (2) emergency retrieval (rescue) of a fallen person or of several persons, one at a time, who are in peril. These two functions are present in each Dynevac II unit. To provide these two functions in one unit requires two separate modes of operation: (1) fall arrest mode, and (2) emergency retrieval mode. When shipped from the factory, the Dynevac II is in the fall arrest mode and ready for personal fall arrest use. When the rescue function is required, a deliberate procedure must be performed to activate the emergency retrieval mode. Once the unit has been engaged in emergency retrieval mode, it can be reset in fall arrest mode and back again without the use of any tools.

The Dynevac II functions in only one mode at a time. It is either in the fall arrest mode or emergency retrieval mode, but not both at the same time. When in the fall arrest mode, the emergency retrieval function is on "standby" until it is activated by an operator. Once activated, using the procedure described in this manual, the Dynevac II leaves the fall arrest mode and enters the emergency retrieval mode. In this emergency retrieval mode, the Dynevac II operator may raise or lower a person on the line by turning the crank handle in the appropriate direction.



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4.1 DYNEVAC II HOUSING ELEMENTS

4.1.1 INSTALLATION BRACKET

Connection point for anchorage connector attachment of Dynevac II to anchorage. Formed as an integral part of the housing material. Black ABS plastic hand grips on both sides provides for handling during transport.

4.1.2 CRANK HANDLE

Formed steel handle used to turn the internal drum during line extraction and retraction, during lowering and lifting operations.

4.1.3 HANDLE KNOB

Attached to free end of the crank handle, connected to allow the handle knob to rotate as the handle is turned. The handle knob is constructed of black ABS plastic with molded finger recesses.

4.1.4 TORQUE NUT

Element of axle assembly that holds and positions the drum and working line. Preset at the factory. Serviceable by factory only. DO NOT LOOSEN.

4.1.5 RED PAINT SEAL - HEX HEAD BOLT

The hex head bolt is the axle of the internal drum. The red paint seal provides evidence that the unit has been tampered with by unauthorized personnel.

4.1.6 HANDLE RETENTION PINS (2)

Pin #1 is a hairpin cotter-type pin beneath the crank handle, removed when the Dynevac II is first placed in the emergency retrieval mode. Pin #2 is a machined shoulder-type pin above the crank handle that is removed when the Dynevac is placed in emergency retrieval mode.

4.1.7 FIELD RESET PIN

Pin #3 is a ball-lock pin located at the center of the crank handle hub that is removed when the Dynevac II is placed in Emergency Retrieval Mode. It has a button that is pushed to allow its removal. Attached to the pull-ring is a caution label, advising the user to remove the pin only for activating the emergency rescue mode.

4.1.8 FIELD RESET BUTTON

Red button located at the center of the crank handle hub. While in self-retracting lanyard mode, the button is held in place by the field reset pin. The button will pop-up when the field reset pin is removed, and the crank handle is turned clockwise. If the red button extends approximately one inch from the crank hub, this is an indication that the emergency retrieval mode has been activated.

4.1.9 AXLE NUT

Visible from the back side of the unit. This nut retains the axle of the unit and holds the drum in place.

4.1.10 GRIP

Located on the back side of the unit, this folding handle with black rubber grip is a supplemental stabilizer to be used when the Dynevac II is installed hanging freely without a rigid mounting bracket.

4.1.11 HOUSING

Formed steel, zinc-plated and corrosion-resistant cover.

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4.1.12 SECURITY RIVETS (2)

Serve as evidence that the unit has been tampered with by someone other than authorized factory representatives.

4.1.13 LINE COLLAR

The black ABS plastic collar fits into the opening of the housing where the line is extracted and retracted. It prevents contaminants from entering the housing and degrading internal mechanisms.

4.2 DYNEVAC II LINE ELEMENTS

4.2.1 SLEEVES (2)

These swaged ferrules crimp around the loop of the working line and attach the snaphook to the end of the line.

4.2.2 THIMBLE

The thimble is a teardrop-shaped formed steel piece that protects the wire rope from abrasive wear from the eye of the snaphook during normal use.

4.2.3 SNAPHOOK

A self-closing, self-locking snaphook equipped with swivel base and load indicator.

4.2.4 BALL STOPPER

A black rubber ball inserted into the working line that acts as a cushion and reduces impact wear when the line is retracted into the housing. It prevents the line from reeving back through the Split Mount Pulley if used as part of the system.

4.2.5 WASHER

Prevents the ball stopper from excessive wear and abrasion due to contact with the top sleeve (ferrule).

4.2.6 LINE

Stainless steel (see Table 1 for models, and section 1.1 for specifications) with 3/16 in (5 mm) nominal diameter. Available in varying lengths depending upon the unit selected. Connects the snaphook to the drum of the Dynevac II.

4.2.7 LOAD INDICATOR

Located in the bottom of the swivel of the snaphook. Yellow tabs are exposed if the snaphook is exposed to forces in excess of 450 lbs (205 kg). The load indicator provides one means of identification that the unit has been exposed to fall arrest forces and should be submitted to the procedures for inspection and factory service described in sections 11, 12 and 13, respectively.

4.3 LABELS AND MARKINGS

4.3.1 CAUTION LABELS (2)

These two long, narrow labels are located on the flat edge of the Dynevac II housing and indicate important cautionary notices the user should be familiar with during the use of the Dynevac II. This information is also contained within the text of these User Instructions. Reading the product labels is not a substitute for reading and understanding these User Instructions. See sections 7 and 8.

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4.3.2 SPECIFICATION LABEL

This narrow label is located on the edge of the housing near the installation bracket and summarizes the performance specifications that the Dynevac II meets. This information is also given in section 1 of these User Instructions.

4.3.3 INSTRUCTION LABEL

This narrow label is located on the edge of the housing near the installation bracket and summarizes the use instructions and steps necessary to activate the emergency retrieval mode of the Dynevac II. See section 8 for additional information on the uses of the Dynevac II.

4.3.4 INSPECTION AND INSTRUCTIONS LABEL

This round label is located on the front face of the Dynevac II housing. It explains the Inspection procedure required of all users prior to each use of the Dynevac II. Additional instructions for attachment to appropriate anchorage connectors are also included on this label. Details of the user inspection are discussed in sections 11 and 12 of this User Instruction. A complete discussion of installation, use and cautions is given in section 8.

4.3.5 CRANK HANDLE CAUTION LABEL

The small rectangular label is located on the flat side of the crank handle and cautions the user that the Dynevac II is to be used for human fall arrest only, and not for materials hoisting or work positioning. See sections 6 and 7 for details of systems requirements and planning, respectively.

4.3.6 SERVICE DATE LABEL

This rectangular label is completed by the manufacturer and provides the user and competent person with information vital to the inspection and factory service procedures as explained in sections 11, 12 and 13 of these User Instructions.

4.3.7 SERIAL NUMBER

The product serial number is steel stamped onto the edge of the Dynevac II housing and should be noted in the inspection and factory service sections (sections 11, 12 and 13) of these User Instructions immediately and retained for future reference. Refer to this number during correspondence with MSA in regard to this product.

4.3.8 CAL/OSHA APPROVAL LABEL

This small rectangular label indicates the Dynevac II has been certified for compliance with the Occupational Health and Safety regulations of the state of California.

4.4 DYNEVAC OPTIONAL ACCESSORIES

Refer to the individual User Instructions for each of the optional accessories for information regarding integration with the Dynevac II or other system components. Contact MSA for further information on these optional accessories and their use in integrated systems.

4.4.1 INTERMEDIATE ANCHORAGE CONNECTORS

4.4.1.1 Installation Carabiner

Model 506308 is used as an intermediate anchorage connector when linked between an anchorage connector such as an anchorage connector strap and the installation bracket of the Dynevac II. It can also be used as an anchorage connector when placed and locked securely around a suitable anchorage such as a beam or pipe. See separate instructions P/N 622543.

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4.4.1.2 Anchor Shackle

Model 506212 is used as an installation linkage. The MSA anchor shackle is a bolt-type design of weldless forged steel construction complying with U.S. Federal Specification RR-271. See separate instructions P/N 621628.

4.4.1.3 Installation Cable

Model 505325 5/16 in diameter or model 505196 1/4 in diameter installation cables can be used as either an intermediate anchorage connector when connected to an anchorage connector strap or other suitable anchorage connector and used to extend the attachment point of the connection to a user elevation, or it can function as an anchorage connector when wrapped around a suitable anchorage such as a beam or pipe.

4.4.1.4 Anchorage Connector Strap

Model 505282 nylon or model 505298 polyester anchorage connector straps can be used as an anchorage connector when wrapped around a suitable anchorage such as a beam or pipe. The MSA Remote Connect/Disconnect System provides a means for a user to install an anchorage connector strap to a suitable anchorage point from a user location as much as 20 ft. (6.1 m) below the anchorage. A means to elevate the Dynevac II to the anchorage connector location or to further lower the connection point of the anchorage connector by use of an intermediate anchorage connector must be planned in advance of system use. As an intermediate anchorage connector these anchorage connector straps function to lower the connection point to the elevation of the user when joined together by suitable connectors such as an anchor shackle or installation carabiner. See separate instructions P/N 622792.

4.4.1.5 Flat Mounting Bracket

Model 506261 for 95 ft. (30 m) Dynevac II or model 506627 for 50 ft. (16 m) Dynevac II is used to mount the Dynevac II to flat anchorage surfaces such as walls or beams. The Flat Mounting Bracket is installed with four 5/8 in (16 mm) Grade 5 bolts supplied by the customer.

4.4.2 TRIPOD ANCHORAGE CONNECTORS, BRACKETS & DIRECTIONAL PULLEY

4.4.2.1 Tripod Anchorage Connector

Model 506213 (96 in {2.4 m}) or model 506493 (120 in {3.0 m}) are used where a portable anchorage connector is required. The larger model 506493 is suited to applications that require higher head clearance inside the device or where a larger interior diameter is necessary for access to the work situation. See separate instructions P/N 620937.

4.4.2.2 Tripod Mounting Bracket

Model 506216 or model 506232 are used with 95 ft. (30 m) or 50 ft. (16 m) Dynevac II models, respectively. The Tripod mounting bracket secures the Dynevac II to the leg of the Tripod and places the Dynevac II crank handle within easy reach. A MSA Split Mount Pulley, P/N 506222, must also be used in conjunction with the Dynevac II mounting bracket. See section 4.4.2.3.

4.4.2.3 Split Mount Pulley

Model 506222 is used to direct line from the Dynevac II mounted on the Tripod leg down through the center of the Tripod interior space, into the work opening below. The pulley sheave is specifically designed for the 3/16 in (5 mm) diameter line in both the 95 ft. (30 m) and 50 ft. (16 m) Dynevacs. The Split Mount Pulley mounts to the interior of the Tripod head by means of a ball-locking pin supplied with the Tripod. See separate instructions, P/N 622792.

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4.4.3 DAVIT ANCHORAGE CONNECTORS, HARDWARE & DIRECTIONAL PULLEY

4.4.3.1 Column Davit

Model 506568 is a rigid steel arm measuring 77 inches (2.0 m) high with a reach out from its center of 30 inches (0.8 m) that mounts to a suitable anchorage and extends over a work area as the anchorage connector. The Davit arm is portable in that it can be moved between one or more pre-installed Mounting Receptacles as part of a system. See separate instructions P/N 622311.

4.4.3.2 Column Davit Mounting Assembly

Model 506590 is used to install the Dynevac II to the vertical column of the Column Davit. Also required is MSA model 506216 [95 ft. (30 m)] or model 506232 [50 ft. (16 m)] mounting bracket. See separate instructions P/N 622311.

4.4.3.3 Folding Davit

Model 506613 is used in a similar manner to the Column Davit and additionally can be collapsed into a smaller portable size. See separate instructions P/N 622651.

4.4.3.4 Davitruck

Model 506356 is a vehicle mounted davit with boom arm with a boom length of 21.5 inches (0.5 m) and a working height of 72 inches (1.8 m). This davit mounts on a standard Class 3 hitch and hinges from upright to horizontal for over-road travel. See separate instructions P/N 621755.

4.4.3.5 Davitruck Mounting Assemblies

Models 506362 and 506622 are intermediate connectors that are used to attach the Dynevac II to the Davitruck. Model 506362 connects the 95 ft. (30 m) Dynevac II and model 506622 connects the 50 ft. (16 m) Dynevac II. See separate instructions P/N 621755.

4.4.3.6 Davit Adapter Brackets

Model 506362 for the 95 ft. (28.9 m) Dynevac II and model 506622 for the 50 ft. (15.2 m) Dynevac II provide a suitable connection point for mounting the Dynevac II unit to the Davit.

4.4.3.7 Split Mount Pulley

Model 506222 is used in many applications where a pulley is needed to direct the working line of a system component such as the Dynevac II into the work area. It may be mounted to the horizontal arm of the Davit with the utility ring, supplied with the Column Davit.

5.0 DYNEVAC II SELECTION AND APPLICATIONS

5.1 PURPOSE OF MSA DYNEVAC

The Dynevac II is a fall arrester of the retractable lifeline type with a built-in emergency rescue mechanism. As such it is one component of a fall arrest and emergency retrieval system. These two functions in one unit requires two separate modes of operation: 1) fall arrest mode, and 2) emergency retrieval (rescue) mode. See section 5.1.1 and 5.1.2, respectively, for a discussion of these two separate modes of use and operation. It may also be used for ladder climbing, rescue, personnel-riding and confined space entry/exit operations, and training applications, depending on which attachment elements are included. See section 4.4 for a discussion of optional accessories. Other components are required to make up complete systems. See section 6 for a discussion of system types.

Do not use the Dynevac II for other than fall arrest or rescue of one person at a time. The Dynevac II is specifically designed for the arrest and retrieval of an accidental fall of one person whose weight, including person, clothing, tools and other user-borne objects, is between 75 and 310 lbs (34 and 140 kg). Never connect more than one person at a time to the device. Never attempt to use the Dynevac II for protection against falls of equipment or materials.

Use of the Dynevac II must comply with these User Instructions and, further, is subject to approval under the user's safety rules and regulations, safety director, supervisor, or a qualified safety engineer. Be certain the selection of the Dynevac II is suited for the intended use and work environment. If there is any conflict between these User Instructions and other directives or procedures of the user's organization, do not use the Dynevac II until such conflicts are resolved. Consult all local, state, and federal Occupational Health and Safety Administration (OSHA) requirements for personal safety equipment. Also refer to the latest revision of ANSI Z359.1 and ANSI A10.14 standards for more information on anchorages and associated system components. In Canada, refer to provincial and federal regulations and to CSA Z259.10, Z259.11, Z259.1 and Z259.2.

5.1.1 FALL ARREST MODE

When in the fall arrest mode, the Dynevac II functions as a personal fall arrester, for use in conjunction with other components of a personal fall arrest system. It is intended for use by only one person at a time. A complete personal fall arrest system consists of an anchorage, an anchorage connector, the Dynevac II and a full body harness. A properly inspected and maintained Dynevac II, when correctly installed and used within the fall arrest system, will automatically stop a person's descent in a short distance after onset of an accidental fall. Once stopped, the fallen person will remain suspended on the line until rescued. See section 8 for a discussion of the use of the Dynevac II.

5.1.2 EMERGENCY RETRIEVAL (RESCUE) MODE

When placed in the emergency retrieval mode by the operator (rescuer), the Dynevac II functions as a personal rescue mechanism for lifting and lowering the victim being retrieved by the rescuer. It is designed for rescue of only one person at a time and is operable by one rescuer. The Dynevac II is not to be used for material handling. A complete emergency retrieval (rescue) system consists of an anchorage, an anchorage connector, the Dynevac II, a body support component (full body harness, stretcher, etc.) and possibly a load connection adapter (Y-retrieval lanyard with spreader bar, etc.) to facilitate handling of the victim being rescued.

There are two basic situations in which the Dynevac II may be used for emergency retrieval, namely: 1) for retrieval of a fallen person whose fall has been arrested by the Dynevac II and who is suspended from the line; and 2) for retrieval of a person or persons, one at a time, who are in peril and must be lifted or lowered to a place of safety. See section 8 for a discussion of the use of the Dynevac II in these situations.

5.1.3 TRAINING MODE

The field reset feature permits the Dynevac II to be used in training applications by a suitably qualified and trained individual. Field reset following emergency retrieval mode operation can be provided by the same unit. The same unit can be used in both situations and reset in the field. It does not require return to the factory, provided the field reset is performed by a qualified trainer, educated to demonstrate the use of this equipment for fall arrest and rescue.

5.2 TYPICAL APPLICATIONS

The Dynevac II can be used in fall arrest and emergency retrieval systems on buildings, bridges, towers, derricks, ladders, roofs, tank cars, hopper cars, tanks, vessels, mine shafts, elevator shafts, manholes, silos and bins. These are but a few of the many applications. It can be used both above and below ground. It is suitable in most manufacturing, mining, construction, oil field, refinery, maintenance, and industrial settings. The Dynevac II is one component of multicomponent systems, see section 6. The user should always consult with a competent person or qualified engineer to determine if the Dynevac II is suitable for his specific intended application before

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placing it in use. The figures in section 8 show configurations of optional accessories and typical applications of some basic systems.

5.3 USAGE LIMITATIONS

The following applications limitations must be considered and planned for before using the Dynevac II:

5.3.1 PHYSICAL LIMITATIONS

The Dynevac II is designed for use by one person with a combined total weight between 75 and 310 lbs (34 and 140 kg), including clothing, tools, and other user-borne objects. Persons with muscular, skeletal, or other physical disorders should consult a physician before using a personal fall arrest system that includes a Dynevac II. Pregnant women and minors must never use these systems. Increasing age and lowered physical fitness may reduce a person's ability to withstand shock loads during fall arrest or prolonged suspension. Consult a physician if there is any question about physical ability to safely use this product to arrest a fall or suspend.

5.3.2 CHEMICAL HAZARDS

Acidic, alkaline, or other environments with harsh substances may damage the hardware elements of this Dynevac II. If working in a chemically aggressive environment, consult MSA to determine acceptable system components for your specific conditions. When working in the presence of chemicals, more frequent inspection of the system components is required.

5.3.3 HEAT

Do not use the Dynevac II in environments with temperatures greater than 185° F (85° C). Protect the Dynevac II when used near welding, metal cutting, or other heat producing activities. Sparks may damage the hardware and reduce its strength.

5.3.4 CORROSION

Do not expose the Dynevac II to corrosive environments for prolonged periods. Organic substances and salt water are particularly corrosive to metal parts. When working in a corrosive environment, more frequent inspection, cleaning and drying of the Dynevac II is required. See sections 9, 11 and 12 for cleaning and inspection details.

5.3.5 ELECTRICAL HAZARDS

Use extreme caution when working near energized electrical sources. Metal hardware on the Dynevac II and on other components connected to it will conduct electric current. Maintain a safe working distance at least 10 feet (3 m) from electrical hazards.

5.3.6 MOVING MACHINERY

When working near moving machinery parts (e.g. conveyors, rotating shafts, presses, etc.), make sure that there are no loose elements in any part of the system. Maintain a safe working distance from machinery which could entangle such elements as lanyards, harness webbing, carrying straps, etc.

5.3.7 SHARP EDGES AND ABRASIVE SURFACES

Do not expose the Dynevac II line to sharp edges or abrasive surfaces that could cut, fray, abrade or weaken the wire rope. When work around sharp edges or abrasive surfaces is unavoidable, use heavy padding or other protective barriers to prevent direct contact. Refer to section 3 for additional Hazards Identification considerations.

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5.3.8 WEAR AND DETERIORATION

Any Dynevac II which shows signs of excessive wear, deterioration or malfunction must be removed from use and marked "UNUSABLE" until repaired. See sections 11 and 12 for detailed inspection procedures and section 13 for factory service information.

5.3.9 IMPACT FORCES

Any Dynevac II which has been subjected to the forces of arresting a fall must be immediately removed from service and marked as "UNUSABLE" until submitted to, and released from, the Formal Inspection procedures described in section 12. If the load indicator on the snaphook shows that the unit has seen fall arrest loads, the unit should be returned to the factory for inspection of the internal mechanism and repairs, if necessary.

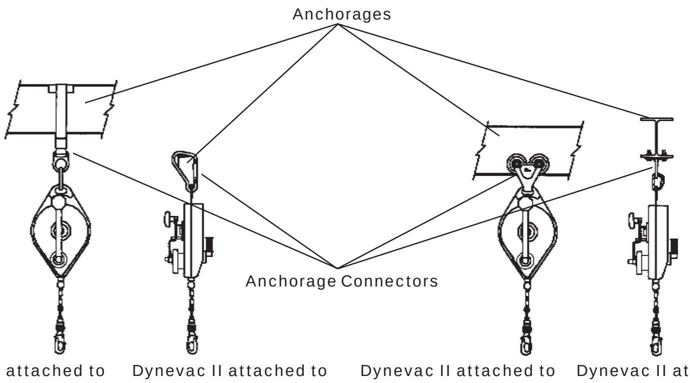
The Dynevac II SRL and Emergency Rescuer is either the fall arrest with shock absorption component of fall arrest systems or it is the personal rescue mechanism in rescue systems. The Dynevac II is also suited for use in other multicomponent systems. Without the other necessary components of a system, the Dynevac II serves no useful purpose. There are several different types of systems for use at heights and in confined spaces.

6.0 SYSTEM REQUIREMENTS

6.1 SYSTEM TYPES

Systems are classified according to their intended purposes. There are six classifications of systems which may be used individually or in combinations. The six basic systems classifications are:

- Fall Arrest
- Personnel Riding
- Climbing Protection
- Rescue
- Restraint
- Evacuation



Dynevac II attached to Anchorage Connector Strap

Dynevac II attached to Installation Snaphook

Dynevac II attached to Beamglide Trolley

Dynevac II attached to D-Plate Anchorage Connector

6.1.1 Fall Arrest Systems

A fall arrest system is an assembly of components and subsystems, including the necessary connectors, used to arrest the user in a fall from a working height and suspend the user until rescue can be effected. A fall arrest system must always include a full body harness and connecting means between the harness and a suitable anchorage or anchorage connector. See section 6.2.3. Such connecting means may consist of a lanyard, energy (shock) absorber, fall arrester (rope grab), lifeline, self-retracting lanyard or suitable combinations of these. The Dynevac II with appropriate mounting brackets is suited for use as a combined self-retracting lanyard and energy absorber. See section 6.1.1.3.

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6.1.1.1 Lanyard Connecting Subsystem

The term applied to an assembly, including the necessary connectors, which is comprised of a lanyard and a shock absorber. The lanyard and shock absorber are usually permanently coupled together along with self-locking snaphooks at each end. The subsystem is attached between the fall arrest attachment (back D-ring) of a harness and a suitable anchorage or anchorage connector.

6.1.1.2 Fall Arrester Connecting Subsystem

The term applied to an assembly, including the necessary connectors, which is comprised of a fall arrester (rope grab) and a vertical lifeline. Sometimes a lanyard or lanyard with integral shock absorber, including the necessary connectors, is connected to the rope grab. The vertical lifeline must have a lifeline tensioner (counterweight), a connector for anchoring it, and may have a shock absorber. A fall arrester such as MSA Fallbloc and a vertical lifeline connector such as MSA Carabiner are intermediate anchorage connectors. The subsystem is attached between the fall arrest attachment (back D-ring) of a full body harness and a suitable anchorage or anchorage connector. Fall arrester connecting subsystems are sometimes suitable for use in climbing protection systems. See section 6.1.2.

6.1.1.3 Self-Retracting Lanyard Connecting Subsystem

The term applied to an assembly, including the necessary connectors, comprised of a self-retracting lanyard only or a self-retracting lanyard and added shock absorber at the point of attachment to the user's full body harness. The MSA Dyna-Lock and Dynevac II with appropriate mounting brackets are self-retracting lanyard connecting subsystems. The subsystem is attached between the fall arrest attachment (back D-ring) of the harness and a suitable anchorage or anchorage connector. These subsystems are sometimes suitable for use in climbing protection systems. See section 6.1.2.

6.1.2 CLIMBING PROTECTION SYSTEMS

A climbing protection system is an assembly of components and subsystems, including the necessary connectors, used to arrest the user in a fall from a working height and suspend the user until rescue can be effected. Such systems are used for climbing ladders and structures that are designed for climbing. They may either be temporary (portable) or permanent. The MSA Tripod is a temporary (portable) anchorage connector suitable for use in some climbing protection systems. A suitable anchorage must be available to permit use of the Tripod as a component of a climbing protection system. Refer to the separate User Instructions of additional system components to determine suitability with specific applications. Temporary climbing protection systems are described in sections 6.1.1.2 and 6.1.1.3. Permanent climbing protection systems are ones of the rigid rail type such as the MSA Dyna-Glide™ systems. In those systems, a rigid rail is permanently attached to the structure to be climbed. A fall arrester device is attached to and glides on the rail to permit ascent and descent. It quickly locks in case of a fall. The Dyna-Glide fall arrester is attached between the front attachment (chest D-ring) of a full body harness and the fall arrester by use of a carabiner. Contact MSA for more information about Dyna-Glide climbing protection systems.

6.1.3 RESTRAINT SYSTEMS

A restraint system is an assembly of components and subsystems, including the necessary connectors, used to:

(a) stabilize and partially support the user at an elevated work location and allow free use of both hands. This type of restraint system is referred to as a work positioning system or, simply, a positioning system.

(b) restrict the user's motion so as to prevent reaching a location where a fall hazard exists. This type of system is referred to as a travel restriction system.

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A positioning system includes a full body harness and connecting means between the harness and an anchorage or anchorage connector. Such connecting means usually consists of a positioning lanyard which is connected to both hip D-rings and wraps around or connects to an anchorage or anchorage connector. A positioning system must always be backed up by a fall arrest system. A travel restriction system consists of a full body harness and a fixed length or adjustable length lanyard connected between any one of the harness D-rings and an anchorage or anchorage connector. The Dynevac II is not suited for use as a lanyard component in restraint systems.

6.1.4 PERSONNEL-RIDING SYSTEMS

A personnel-riding system is an assembly of components and subsystems, including the necessary connectors, used for lifting and lowering a worker to and from a work station which is not accessible by other preferred means, and potentially for positioning the worker while at that work station. Personnel-riding systems are of two general types, namely: (a) the mobile supported aerial platform type (e.g. manually- and self-propelled platforms and vehicle-mounted platforms), and (b) suspended personnel hoisting type (e.g. suspended scaffolds, suspension seats, and suspension harnesses). When working on mobile supported aerial platforms, the user should use a restraint system (see section 6.1.3) anchored to the platform to provide restraint against falling from the platform. When working with the suspended personnel hoisting type of system, the user must employ a fall arrest system of either the self-retracting lanyard type or the fall arrester (rope grab) type. The MSA Tripod may be a suitable anchorage connector for use in personnel-riding systems. A Dyna-Hoist in conjunction with Bosun's Chair with spreader bar are suitable for fully suspended work positioning. It is permissible to use the MSA Pullover harness as a suspension harness for making access to the work station if the access time is of very short duration and the use of a suspension seat is not possible. The MSA Dynevac II is suitable for backup fall arrest and emergency rescue and controlled ascent and descent applications. Contact MSA for separate instructions on the associated equipment used in personnel-riding systems.

6.1.5 RESCUE SYSTEMS

A rescue system is an assembly of components and subsystems, including the necessary connectors, used for moving an incapacitated or isolated person from a hazardous place to a safe place under alert or emergency conditions. An isolated person is one who has no available means of access to a safe place or is physically stranded or trapped. Rescue systems require actions of specially trained rescuers to effect the rescue of the incapacitated or isolated person. The MSA Dynevac II is designed for rescue applications. Conduct the workplace assessment and system planning described in sections 3 and 7 prior to including the Dynevac II in a rescue system. Ensure that all criteria are met and that a suitable anchorage exists. MSA strongly recommends that the user select a full body harness with a chest D-ring to provide for rescue.

6.1.6 EVACUATION SYSTEMS

An evacuation system is an assembly of components and subsystems, including the necessary connectors, employed by the user to move, unassisted by others, from a hazardous place to a safe place under alert or emergency conditions. An evacuation system consists of a full body harness and connecting means between the harness and a suitable anchorage or anchorage connector. Such connecting means may consist of: (a) the MSA Dynescape Automatic Descender, (b) the MSA Dynescape Manual Descender, or (c) the MSA Fallbloc System. See the separate instructions for this equipment. The Dynevac II is not suited to evacuation systems since a second person is required at the unit to effect operation.

6.1.7 COMBINATIONS OF SYSTEMS

Systems for fall arrest, restraint, climbing protection, personnel-riding, rescue and evacuation are often used in various combinations. For example, personnel-riding systems must be backed up by a separate and independent fall arrest system. Hands-on training is required to obtain the necessary

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information and skills needed to work with combinations of systems. Refer to the separate instructions accompanying the several components and subsystems necessary to make up these systems.

6.2 COMPATIBILITY OF SYSTEM PARTS

6.2.1 COMPATIBILITY OF COMPONENTS AND SUBSYSTEMS

The MSA Dynevac II SRL and Emergency Rescuer is designed to be used with MSA approved components and connecting subsystems. Use of the Dynevac II with products made by others that are not approved in writing by MSA may adversely affect the functional compatibility between system parts and the safety and reliability of the complete system. Connecting subsystems must be suitable for use in the application (e.g. fall arrest, climbing protection, rescue or personnel-riding). MSA produces a complete line of connecting subsystems for each application. Contact MSA for further information. Refer to the manufacturer’s instructions supplied with the component or connecting subsystem to determine suitability. For fall arrest applications using the Dynevac II, the maximum fall arrest force must not exceed 1,800 lbf (8 kN). Contact MSA with any questions regarding compatibility of equipment used with the Dynevac II.

6.2.2 COMPATIBILITY OF CONNECTORS

Connectors, such as D-rings, snaphooks, and carabiners, must be rated at 5,000 lbf (22 kN) minimum breaking strength. MSA connectors meet this requirement. Connecting hardware must be compatible in size, shape, and strength. Non-compatible connectors may accidentally disengage (“rollout”). Always verify that the connecting snaphook or carabiner and the D-ring on a full body harness or connection element of the anchorage or anchorage connector are compatible. Use only self-closing, self-locking snaphooks and carabiners (as defined and required by ANSI Z359.1) with the Dynevac II.

6.2.3 ANCHORAGES AND ANCHORAGE CONNECTORS

Anchorages for personal fall arrest systems must have a strength capable of supporting a static load, applied in directions permitted by the system, of at least: (a) 3,600 lbf (16 kN) when certification exists, or (b) 5,000 lbf (22.2 kN) in the absence of certification. See ANSI Z359.1 for definition of certification. The MSA Dynevac II is designed for connection by a single personal fall arrest system. See ANSI Z359.1, section 7.2.3. This requirement is consistent with OSHA requirements under 20 CFR 1910, Subpart F, Section 1910.66, Appendix C. In addition, it is recommended that the user of personal fall arrest systems refer to ANSI Z359.1, Section 7, for important considerations in equipment selection, rigging, use, and training. Contact MSA for information regarding custom design applications for the Dynevac II SRL and Emergency Rescuer.

Perform the hazard identification and evaluation described in section 3 of these instructions. Then plan the system(s) before starting work. Consider all possible paths of user movement and all factors that could affect the user’s safety before, during, and after a fall anywhere along these paths. A qualified person must select the components, materials, anchorage and anchorage connectors to match the system application, the work, workplace hazards, and the environment. Consider the following points when planning the system(s).

7.0 SELECTION AND USE

7.1 ANCHORAGE AND ANCHORAGE CONNECTOR SELECTION

Determine the necessary locations of anchorages to assure that the user will be continuously connected when exposed to hazards of falling. Select anchorages that are stable and have the strength required by section 6.2.3 of these instructions. Carefully select the locations of the anchorages to: (a) reduce possible free fall distance, (b) prevent swing fall hazards, and (c) provide clear space in the potential fall paths to avoid striking an object. Do not select anchorage locations

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that will require the user to work above them as this will increase the potential free fall and total fall distances. Plan the types of anchorage connectors that will need to be selected and refer to the instructions for same.

Anchorage connectors may be either fixed or portable. A fixed anchorage connector is a secure point of attachment for the Dynevac II which is immovably fixed in space and is independent of the user's support systems (i.e. fall arrest system, rescue system, etc.). A movable anchorage connector is one which can be moved around (i.e. MSA Tripod or Davit models, see separate User Instructions) or which can deflect substantially when exposed to the forces of arresting a fall. If the Dynevac II is attached to a movable anchorage connector, it is possible that movement of the anchorage connector (either independently or by a person other than the Dynevac II user) may pull the attached Dynevac II user from the work position. In the case of a very flexible anchorage or anchorage connector, the fall arrest forces can cause oscillation of the flexible anchorage or anchorage connector such that the Dynevac II brake mechanism may undergo one or more cycles of locking/unlocking/ locking (ratchet effect) until the anchorage or anchorage connector deflection is dampened. Use of a movable anchorage connector involves critical engineering and safety factors and should only be considered after a fixed anchorage or anchorage connector has been determined to be not feasible. A movable anchorage or anchorage connector must only be used if designed or selected, analyzed and tested by a qualified engineer.

A movable anchorage is different from an anchorage connector which can be moved along a fixed anchorage. MSA strongly recommends against any installation of a Dynevac II which would permit movement of the Dynevac II and its anchorage connector along a fixed anchorage (such as a beam or pipe). If such movability of the Dynevac II is desirable for the purpose of facilitating worker lateral movement while reducing the swing fall hazard, such installation must be done only under the supervision of a qualified safety engineer who has analyzed and tested the installation to assure that all hazards have been considered and eliminated or acceptably controlled. See section 3 for hazards identification considerations.

The following subsections describe considerations that should be made during the design and specification of an anchorage as part of a system (see section 6 for system definitions) that includes the Dynevac II SRL and Emergency Rescuer.

7.1.1 INSTALLATION SNAPHOOK (CARABINER)

MSA model 506308 Installation Snaphook is self-closing, self-locking snaphook meeting ANSI Z359.1. It has a throat opening of 2 inches (50.8 mm) and a nominal body diameter of 0.57 inches (14.5 mm) and should be connected to compatible connectors to avoid accidental disengagement ("rollout"). Contact MSA for information and separate User Instructions for the selection and use of this equipment.

7.1.2 ANCHORAGE CONNECTOR STRAP

Anchorage Connector Straps made of nylon (model 505282) and polyester (model 505298) in standard and custom lengths are available from MSA. The standard models have a sewn loop at one end and a D-ring on the other end. Another anchorage connector strap is available (model 505314) which is specifically designed for use with the MSA Remote Connect/Disconnect (RCD) system. The RCD system allows the anchorage connector strap to be installed on an anchorage while the installer is standing up to 20 feet below the anchorage. The RCD system (model 501443) can also be used to connect and disconnect a lanyard with snaphook to the D-ring of the anchorage connector strap. Contact MSA for information and separate User Instructions for the selection and use of this equipment.

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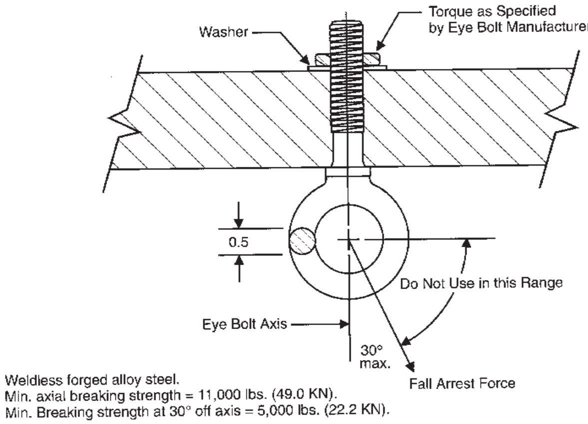
7.1.3 EYE BOLT



Eyebolts will usually require drilling a hole in the anchorage structure to mount the eyebolt. It is absolutely essential that the eyebolt connection is designed under the direct supervision of a qualified engineer to evaluate these effects on the anchorage.

The eyebolt must be of weldless forged alloy steel construction with a shoulder pattern and threaded shank for a nut. A shoulder pattern is necessary because any load applied at an angle to the eyebolt axis subjects the eyebolt to bending, and the load it can carry is thereby severely reduced. This is true for all eyebolts but is less severe for shoulder eyebolts.

Select an eyebolt with a shank length suitable for the installation, allowing for anchorage structure thickness, washers and nut. Eyebolts are sized by the diameter of the cross section of the metal forming the eye. The eyebolt must have a breaking strength of at least 5000 lbf (22.2 kN) with the load applied in any direction permitted by the system. Note that the axial breaking strength of the eyebolt must be much greater than 5000 lbf (22.2 kN) in order to withstand 5000 lbf (22.2 kN) at 30 degrees off-axis (if system use permits loading in that direction). Be sure that intermediate anchorage connectors are compatible to prevent accidental disengagement (“rollout”). Refer to User Instructions for intermediate anchorage connectors that will be used to connect to an eyebolt to ensure compatibility.

When installed, the eyebolt shoulder must be perpendicular to the axis of the receiving hole of the anchorage and the shoulder must be fully and firmly in contact with the anchorage surface. The eyebolt nut must be torqued to the level specified by the eyebolt manufacturer. An appropriate washer should be used under the eyebolt nut and the eyebolt threads must fully engage all threads on the nut. The axis of the eyebolt shaft must be oriented such that no fall arrest forces are ever imposed at an angle greater than 30 degrees from the eyebolt shaft, to avoid excessive bending stresses on the eyebolt.

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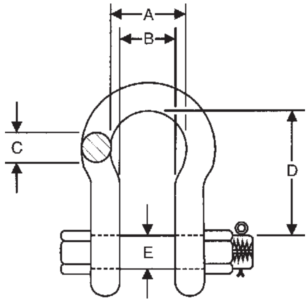
7.1.4 ANCHOR SHACKLE

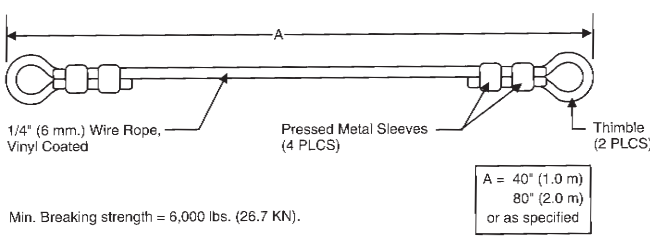


If used, a bolt-type anchor shackle that is of weldless forged alloy steel construction must be selected that meets the requirements of section 6.2.3. These are also referred to as safety anchor shackles because the shackle pin is secured with a nut and a cotter pin to reduce the possibility of the pin coming out. The shackle should comply with U.S. Federal Specification RR-271.

It is recommended that a shackle with a nominal size of 0.5 inches (12 mm) be used. Shackles are sized by the diameter of the cross section of the material forming the bow of the shackle. The shackle must have a breaking strength of not less than 5000 lbf (22.2 kN). MSA model 506212 safety anchor shackle has a 0.5 in (12 mm) diameter and is of the proper size for compatible connection with other MSA components.

The shackle bolt must be straight and the threads in good condition. Never replace an original shackle bolt with a regular bolt. Replace the entire shackle if the original bolt is damaged or lost. Replace any shackle if the dimensions do not conform to those specified by the shackle manufacturer. Always be certain that both the nut and the cotter pin are securely in place on the bolt.

7.1.5 INSTALLATION CABLE



The installation cable can be wrapped around an anchorage without any special adaptation of the anchorage or use of special fittings. It is always used in conjunction with the installation snaphook (model 506308) or the safety anchor shackle (model 506212). Installation cables, either 5/16 inch diameter (model 505325) or 1/4 inch diameter (model 505196), are both available in standard 40 inch (1 m) or 80 inch (2 m) lengths or custom lengths upon request from MSA. These cables have an eye and a thimble at each end, are vinyl coated and meet the strength requirements set forth in section 6.2.3 of these User Instructions. This cable can be used as an anchorage connector where it is necessary to make a wrap around an anchorage in order to suspend the Dynevac II. The installation cable should never be wrapped around a sharp anchorage unless heavy padding is used to cover the sharp areas under the cable. It can also be used in combination with other elements of

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installation hardware. Never stretch the installation cable between two points of attachment so as to form a horizontal anchorage from which to suspend any fall arrest system. This may excessively amplify forces transmitted to the points of cable attachment.

7.1.6 TRIPOD

The Tripod is a versatile anchorage connector as it can adapt and support several compatible MSA system components, including the Dynevac II, Side-Mounted Dyna-Hoist or Boom-mounted Dyna-Hoist and is capable of setup, use, compaction and transport in relatively short time periods. A suitable anchorage that meets the requirements set forth in section 6.2.3 of these User Instructions is required, and additionally the anchorage must meet these requirements: 1) the maximum slope of the anchorage cannot exceed 5.0% (2.8 degrees from horizontal), and, 2) the interior and exterior clearance about the location of the Tripod feet should be sufficient to avoid the Tripod tipping over into the opening. Additionally, care should be taken to plan a system that accounts for the interior height dimension of the model Tripod selected. The Tripod is intended for use by a single person for fall arrest, rescue, evacuation, personnel riding and climbing protection systems. See separate User Instructions P/N 620937 for details in selecting a Tripod as part of a work system.

The Tripod Fall-Rescue Work System (FRWS) is a multicomponent system intended for personnel and materials handling, personal fall arrest and emergency rescue. The components are:

1) Dynevac II fall arrester with emergency retrieval mechanism
2) Tripod, MSA portable tripod [P/N 506213 for 8 ft. (2.3 m) or P/N 506493 for 10 ft. (3.0 m)]
3) Dynevac/Tripod leg-mount bracket [P/N 506216 for 95 ft. (30 m) or 506232 for 30 ft. (16 m)]
4) MSA split mount pulley (P/N 506222)
5) Dyna-Hoist personnel/materials hoist (Several models available)
6) Dyna-Hoist side-mount pulley (P/N 506473)

For illustration of a complete system, see section 8.2.1.

7.1.7 DAVIT

Davits are used when it is necessary to gain access to large openings, from sides of buildings or from a ledge where other anchorage connectors are not suitable.

Column and Folding Davits are mounted on structural anchorages by means of permanent, fixed base receptacles. The Davitruck is a mobile anchorage connector mounted to a suitable vehicle.

The components necessary to make up a complete Column Davit system include:

1) Dynevac II fall arrester with emergency retrieval mechanism
2) Column Davit (P/N 506568)
3) Column Davit mounting receptacle: (a) base receptacle for surface mount (P/N 506487), (b) base receptacle for subsurface mount (P/N 506488), or, (c) base receptacle for vertical mount (P/N 506486).
4) Dynevac Mounting Assembly for Column Davit (P/N 506590)
5) Dynevac Adapter Bracket for 95 ft. (30 m) Dynevac (P/N 506216) or for 50 ft. (16 m) Dynevac (P/N 506232)
6) MSA split mount pulley (P/N 506222), two required
7) Dyna-Hoist personnel/materials Boom mount hoist (Several models available)

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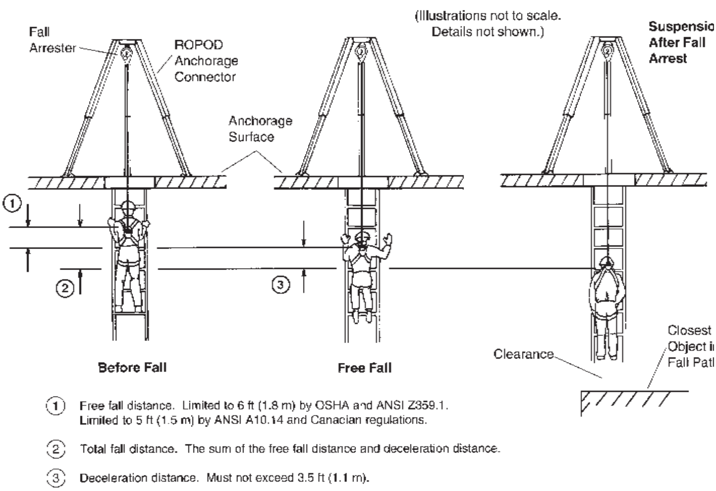
The components necessary to make up a complete Folding Davit system include:

1) Dynevac II fall arrester with emergency retrieval mechanism
2) Folding Davit (P/N 506613)
3) Dynevac Mounting Assembly with Adapter Bracket for Folding Davit for 95 ft. (30 m) Dynevac (P/N 506362) or for 50 ft. (16 m) Dynevac (P/N 506622)
4) MSA split mount pulley (P/N 506222)
5) Dyna-Hoist personnel/materials side-mount hoist (Several models available)

The components necessary to make up a complete Davitruck system include:

1) Dynevac II fall arrester with emergency retrieval mechanism
2) Davitruck (P/N 506356)
3) Dynevac Mounting Assembly with Adapter Bracket for Davitruck for 95 ft. (30 m) Dynevac (P/N 506362) or for 50 ft. (16 m) Dynevac (P/N 506622)
4) Dyna-Hoist personnel/materials boom-mount or socket-mount hoist (Several models available)

7.2 FREE FALL DISTANCE, TOTAL FALL DISTANCE & SYSTEM ELONGATION



Personal fall arrest systems must be selected and rigged to ensure that potential free fall distances will never exceed 6 ft. (1.8 m) as required by OSHA and ANSI Z359.1. [In Canada, free fall distance is limited to 5 ft. (1.5 m) by regulation. ANSI A10.14 also restricts free fall distance to 5 ft. (1.5 m)]. See separate instructions for connecting subsystems to determine the deceleration distance and dynamic elongation which must be allowed for in the space of potential fall paths. Total fall distance is the sum of free fall distance and deceleration distance. Dynamic elongation of the system (temporary elastic stretch of connecting components and subsystems) must be added to total fall distance and clearance allowed.

7.3 USER MOVEMENTS

Identify all necessary movements of the user and the materials and equipment needed to perform the planned work. Plan for avoidance of the crossing or tangling of connecting subsystems of two

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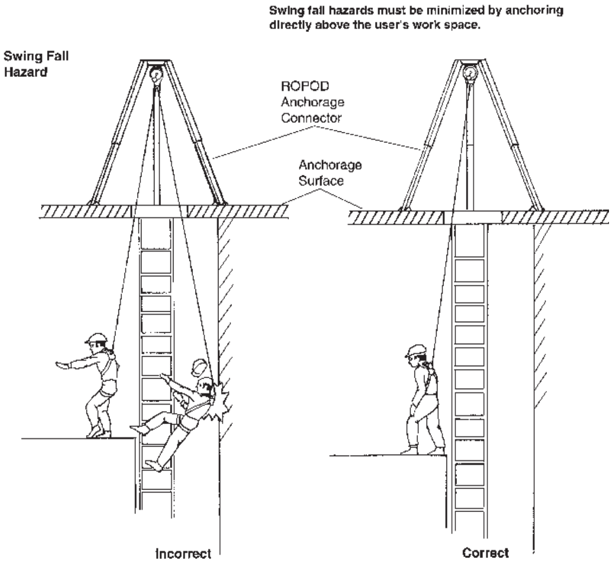
or more workers. Anticipate user movements that might introduce hazards of the connecting subsystem passing under, about or between body parts or invite the user to clamp, knot or otherwise prevent the connecting subsystem from functioning properly. Establish controls to prevent these occurrences.

7.4 PENDULUM (SWING) FALLS



Swing falls can occur when the system is not anchored directly above the user. The force of striking an object in a pendular motion can cause serious injury. Always minimize swing falls by working as directly below the anchorage point as possible. The correct position for working when using the Dynevac II is directly below the connection at the snaphook. See section 7.1 for considerations in selecting a suitable anchorage.

7.5 CLEAR SPACE IN FALL PATH

Make certain that enough clearance is available in all potential fall paths to prevent striking an object. The amount of clearance needed depends upon the type of connecting subsystem used, and the location of the anchorage or anchorage connector. Consult the manufacturer's instructions for the particular connecting subsystem or component for clearance needed.

7.6 HAZARDS IDENTIFIED IN WORKPLACE ASSESSMENT

All hazards of the type set forth in section 3 of these instructions must be addressed and suitable controls planned and implemented. For example, if work must be performed near unavoidable sharp edges, plan to protect against cutting by use of heavy padding or other means of covering the sharp edge.

7.7 RESCUE AND EVACUATION

The user must have a rescue plan and the means at hand to implement it. The plan must take into account the equipment and special training necessary to effect prompt rescue under all foreseeable conditions. If the rescue is from a confined space, the provisions of OSHA regulation 1910.146 and ANSI Z117.1 must be taken into account.

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Although a rescue plan and the means to implement it must always be in place, it is a good idea to provide means for user evacuation without assistance of others. This will usually reduce the time to get to a safe place and reduce or prevent the risk to rescuers. The Dynevac II is not suited for use in evacuation systems, see section 6.1.6.

8.0 INSTALLATION AND INSTRUCTIONS FOR USE

8.1 DYNEVAC INSPECTION BEFORE EACH USE

Inspect the Dynevac II to verify that it is in serviceable condition. Gloves should be worn to prevent injury while handling the Dynevac II and its wire rope. Examine every inch of the Dynevac II working line for severe wear, frays or broken strands, corrosion, cuts, or other damage. Examine the function of the Dynevac II by slowly pulling the line and ensure smooth and even deployment of the line. Pull rapidly on the end of the line to engage the locking mechanism and ensure its function, release the line and allow it to retract into the unit. See section 11 for inspection details. Do not use the Dynevac II if inspection reveals an unsafe condition.

Never attempt to use the Dynevac II as a fall arrester if the emergency retrieval mode has been activated. This is indicated by the loss of cable retraction, engagement of the rescue handle, or the red reset button protruding from the crank hub. Once the emergency retrieval mode has been completed, the unit may be reset to fall arrest mode. Refer to section 11 for inspection details.

8.2 INSTALLATION

Refer to section 3 of this User instruction for considerations in selecting a suitable location for the Dynevac II installation. Unless the Dynevac II is installed in conjunction with a special mounting bracket and pulley arrangement, it must be installed above the work space of a rescuer who would have to operate the Dynevac II in the emergency retrieval mode. When installed over the work space of the person attached to the cable, it must be vertically suspended with the snap hook down. All labels must be visible and the emergency retrieval handle and grip on the back side must be accessible to a rescuer. Evaluate the expected vertical and horizontal travel of the user. Install where the cable can easily extend vertically downward to the lowest expected work elevation. Plan for working well within the applicable cable length limitation of the Dynevac II. The Dynevac II should not be stored with its cable extended, as this will shorten the spring life and will eliminate the device's shock absorption function. Pay careful attention to all directions of possible horizontal movement of the user at differing elevations. It is this horizontal movement of the user which introduce swing fall hazards, which must be minimized. See section 7.4.

Carefully consider the potential location of the entire length of the extended cable as the prospective user moves around. It should not pass over, under, around, or in the path of other workers, equipment or materials. If necessary, incorporate into the installation plan the use of safety barriers and signs to prevent equipment, materials and others from interfering with the Dynevac II or its working line. The line should not contact sharp edges or pass too close to objects where it can become lodged. Avoid installation sites where debris, contaminants and objects falling from above can contact the Dynevac II or its working line. NEVER install where the device or the line can encounter an electrical hazard. See section 5.3 for application limitations.

The installation plan is not complete until a method is devised for transporting the Dynevac II and anchorage connector to the anchorage. Because of the weight and bulk of the unit, it is recommended that material handling equipment be used to move the device to the installation point and support it until it is secured to the anchorage. It is preferable to use two persons to effect the installation - one to steady the device and the other to make the couplings. The installers must always use an appropriate fall arrest system, work positioning system or travel restriction system when installing the Dynevac II near a fall hazard zone. The Dynevac II, the anchorage connector and all installation tools should be secured against falling while the installation is being performed.

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Couple the Dynevac II to the anchorage so it cannot work loose. Be sure it is free from any obstructions which could affect its fall arrest or emergency retrieval functions. Don't rigidly install the device solely by the installation bracket on the housing and don't install the device where it can disengage from the anchorage or anchorage connector. If the Dynevac II is rigidly fastened to an anchorage or anchorage connector solely at the installation bracket on the housing such that it cannot pivot, any displacement forces transmitted from the structure to which the anchorage is made will pass into the Dynevac II. Because of the Dynevac II weight, such force, if severe and recurring, can cause metal fatigue around the installation bracket if the device is rigidly anchored. For example, pile driving equipment transmits severe vibratory forces through the pile driving structure which can damage the Dynevac II where it is rigidly anchored to such a structure only at its installation bracket on the housing. Rigid anchorage can also inhibit the device's line extension and retraction as the user moves from side to side below the device. It is extremely important that the Dynevac II is linked to an anchorage or anchorage as defined in section 6.2.3 of this User Instruction, and of a design which secures the coupling against accidental disengagement. Mounting brackets of this type are available from MSA.

There are many elements of installation hardware (see section 4) which are suitable for Dynevac II installation. The section which follows discusses a few which are in general use and readily available. Most Dynevac II installations can be accomplished using these hardware elements individually or in combination as described. All installation hardware must meet the minimum requirements set forth by these instructions and by the applicable standards and regulations. Never use installation hardware and installation methods other than those recommended by MSA unless such other hardware and methods have been determined to be suitable by a qualified engineer or competent person.

It is possible to interconnect in many ways the different elements of installation hardware described in section 4, and only those combinations discussed herein are recommended. These methods span a wide range of installation situations. It is impossible to describe all installation methods due to the widely differing geometries, materials and construction in the many workplaces into which the Dynevac II may be placed. It is, therefore, absolutely essential that the installation be performed only by or under the direct supervision of a competent person or qualified safety engineer at the workplace. Only a competent person or qualified engineer can properly evaluate factors such as anchorage strength and location, movement range of the user, location and nature of hazards, presence of physical obstacles, etc.

It is possible that special means of anchorage may need to be fabricated and installed at the workplace. It is also possible that special installation hardware and anchorage connectors may be necessary. Furthermore, special precautionary measures may need to be developed and implemented in differing situations in order to properly install and use the Dynevac II. These special measures may include use of barriers, warning devices, work procedures, tests and special instructions to work supervisors and users, to mention only a few considerations. Any specialized installation of a Dynevac II unit, as well as development of specialized precautionary measures, must only be carried out under supervision of a qualified engineer.

8.2.1 INSTALLATION WITH THE MSA TRIPOD

The Dynevac II may be used in many different system arrangements for fall arrest and emergency retrieval. Most of these systems require special engineering design, testing, controlled installation and supervised training and use in order to be safe. MSA has developed a system offered as part of its product line which does not require special engineering to be put into use. This is the FRWS (Fall-Rescue Work System) utilizing the MSA Tripod (portable tripod). This system, nevertheless, must be cautiously applied under the supervision of a competent person. See separate instructions P/N 620937.

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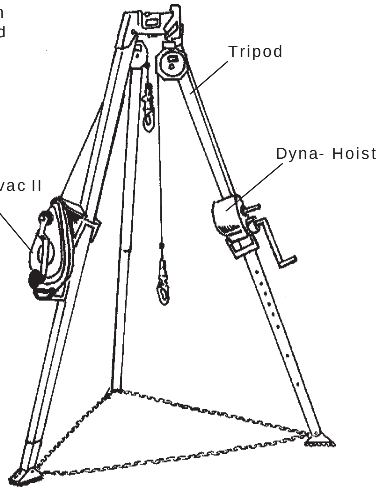
Installation with Tripod



The Tripod portable anchorage connector system facilitates access to confined spaces with topside openings such as manholes. The Dyna-Hoist provides personnel and materials lifting and lowering while the Dynevac II provides backup fall arrest, which is further backed-up by the Dynevac's built-in emergency rescue mechanism. Use of leg mounting of both the Dynevac II and Dyna-Hoist lowers the system's center of gravity by adding their weights to lower sections of the Tripod, which reduces the Tripod toppling hazard. Leg mounting also permits topside workers and rescuers to operate the Dynevac II and Dyna-Hoist at waist level and away from the hatch opening.

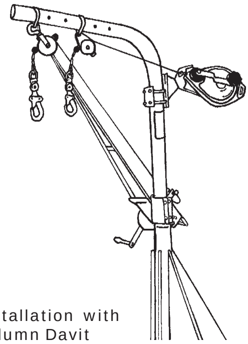
In the complete FRWS, a worker in a full body harness can be attached to the Dynevac II for fall protection. The Dynevac II is mounted on a Tripod leg and the Dynevac II working line is reeved over the Split-Mount pulley attached at the Tripod head. The user can then be seated and strapped into a suspension seat which is attached to the Dyna-Hoist snap hook. Dyna-Hoist is mounted on another Tripod leg and its extension tube with hook end is connected at the Tripod head. With Tripod positioned over a hatch opening, the worker seated in the suspension seat can be lowered by the Dyna-Hoist. See separate User Instructions for information regarding the Dyna-Hoist.

If the suspended worker intentionally leaves the suspension seat at the floor of the confined space, he will remain connected to the Dynevac II at the fall arrest D-ring on the harness. The Dyna-Hoist is therefore free to lower and lift materials and equipment to and from the downside worker's elevation. When not in use for materials handling and personnel transport, the Dyna-Hoist is available for rescue of downside workers (one at a time). If the downside worker falls (or is overcome) while connected to the Dynevac II, his fall is arrested and the Dynevac's emergency rescue mechanism can be activated topside for retrieval. Refer to separate User Instructions for the Lynx Tripod.

8.2.2 INSTALLATION WITH COLUMN MSA DAVIT

The Davit anchorage connector system facilitates access to a lower working level where a single edge is available for anchorage support. Examples of such conditions include: reaching over the edge of a building parapet, over the side of a concrete ledge or embankment or over a balcony or mezzanine.

The Column Davit An anchorage connector that requires a permanently mounted base receptacle for installation. The Column Davit with Dynevac II Mounting Assembly and Adapter Bracket is assembled to the base receptacle. The Dynevac II is seated into the Adapter Bracket and held securely by a hairpin type cotter. The Dynevac II line is reaved through a separate Split-Mount Pulley. The pulley is connected to the accessory ring of the Davit arm with a 3/8 in anchor shackle. The snaphook at the end of the working line of the Dynevac II is connected to the compatible fall arrest attachment element of the user's full body harness. Refer to separate User Instructions P/N 622311 for the Column Davit.



Installation with Column Davit

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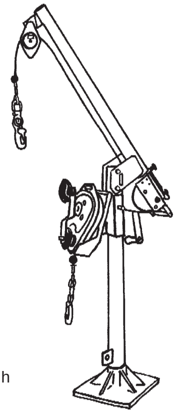
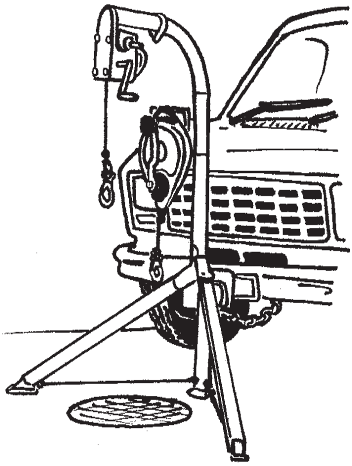
The Folding Davit An anchorage connector that requires a permanently mounted base receptacle for installation. The Folding Davit with Dynevac II Mounting Assembly and Adapter Bracket is assembled to the base receptacle. The Dynevac II is seated into the Adapter Bracket and held securely by a hairpin type cotter. The snaphook at the end of the working line of the Dynevac II is connected to the compatible fall arrest attachment element of the user's full body harness. Refer to separate User Instructions P/N 622651 for the Folding Davit.



Installation with Folding Davit

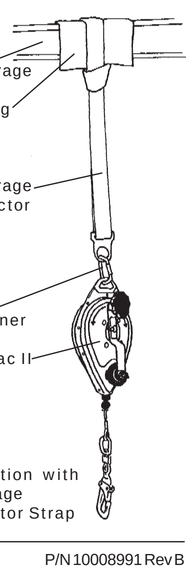


Installation with Davitruck

The Davitruck A semipermanent vehicle-mounted intermediate anchorage connector. Prior to installation of the Davitruck, the vehicle must be fitted with a Class 3 hitch with a 5/8 in (16 mm) hitch pin. The Class 3 hitch must comply with the provisions of SAE Standard J684, "Trailer Couplings, Hitches And Safety Chains - Automotive Type". The Davitruck with Dynevac Mounting Assembly is assembled to the Class 3 hitch with 5/8 in (16 mm) hitch pin. The Dynevac II is seated into the Mounting Assembly and held securely by a quick release pin and hairpin type cotter. The snaphook at the end of the working line of the Dynevac II is connected to the compatible fall arrest attachment element of the user's full body harness. Refer to separate User Instructions P/N 621755 for the Davitruck.

8.2.3 INSTALLATION WITH ANCHORAGE CONNECTOR STRAP

The Dynevac II may be installed to a suitable anchorage by means of an anchorage connector strap, of appropriate material and length, with an additional intermediate connector such as the MSA installation snaphook or carabiner. The anchorage connector strap must be installed without risk of exposure to an unprotected fall from height and provision made for installation of each element of the system to be installed without exposure to a hazard. The MSA Remote Connect/Disconnect (RCD) System is a means by which an anchorage connector strap may be installed while the user is up to 20 ft. (6.1 m) below the chosen anchorage. Provision must be made to install the other system components to the connection point of the anchorage connector strap without exposing the user to a hazard. An installation cable may be installed (also using the RCD System) at the connection point of the anchorage connector strap and thereby lowering the connection point to which the Dynevac II may be attached. Care should be taken to limit other hazards associated with combinations of systems, including the increased potential for swing fall hazards. If the anchorage is within reach the procedure to install first the anchorage connector strap, the intermediate



Installation with Anchorage Connector Strap linkage (carabiner) and Dynevac II is straightforward. It is usually easier to attach the carabiner to the Dynevac II installation bracket and then lift the device up to the connection point (D-ring) of the anchorage connector strap. Heavy padding may be necessary to protect the anchorage connector strap if the anchorage has exposed sharp edges. See separate User Instructions for specific details regarding the selection of a MSA anchorage connector strap as part of a work system. Selection, installation, use and maintenance of system components must be made by a qualified safety engineer.

8.2.4 INSTALLATION WITH INSTALLATION SNAPHOOK ONLY

The installation snaphook is very versatile on its own as an anchorage connector since it can be coupled to virtually any suitable anchorage made of bar or pipe that will fit through its 2 in (51 mm) gate opening. It can also be snapped through slots or holes in structural members that are suitable for anchorages.

Whenever installing the snaphook over a bar or pipe anchorage, be certain the anchorage is horizontal to prevent the snaphook (and Dynevac II) from sliding downward. The anchorage must meet the requirements of section 6.2.3. Be sure the bar or pipe does not have a free end, such as a cantilever, which would allow the snaphook to slide off the end. It is proper practice to keep the installation fixed at one point on the bar or pipe in keeping with the principle of a fixed anchorage. This will prevent unanticipated shifting of the device. To prevent this horizontal sliding of the snaphook, the competent person can devise collars to be securely mounted to the bar or pipe, by clamps or other means, on both sides of the snaphook. However, never attempt to use this method if the anchorage is not horizontal.

Always couple the installation snaphook to the Dynevac II installation bracket before coupling the snaphook to any other object. This is necessary to assure proper seating of the Dynevac II in the narrow end of the snaphook and is usually easier than attempting to couple the Dynevac II after the snaphook has been coupled to the anchorage. After completing the linkage, check the installation snaphook to be certain it is closed and locked. Refer to separate User Instruction for the Installation Snaphook. When the gate is closed and locked the anchorage must bear only on the anchorage set and must not bind against the gate. If there is binding against the gate, use a different installation method.

8.2.5 INSTALLATION WITH SHACKLE ONLY

The shackle discussed in section 7.1.4 is a suitable substitute for the installation snaphook in some installation situations. It is appropriate for linking the Dynevac II to an anchorage that has a slot or hole which will accept the shackle pin or shackle body without binding and permit flexible coupling to the Dynevac II installation bracket.

The shackle may also be used over anchorages of bar or pipe. However, it is necessary to use a much larger shackle than previously discussed in order to have a sufficient opening between the shackle eyes to fit over anchorages of bar or pipe that have sufficient strength, as described in section 6.2.3. When coupling to a bar or pipe, ensure that it is horizontal and that it does not have a free end. To prevent sliding, clamp collars on each side of the shackle.

The Dynevac II installation bracket may bear on either the pin or the bow of the shackle. Packing washers should always be used on the pin to center the load of the bracket or anchorage bearing on it.

8.2.6 INSTALLATION WITH EYEBOLT AND INSTALLATION SNAPHOOK

This type of installation may appear quite obvious, however, there are some major pitfalls which must be carefully avoided. First, the axis formed by the shank of the eyebolt must be as closely aligned with the direction of expected loading of the Dynevac II as possible. The competent person must not use the eyebolt discussed in section 7.1.3 if the expected force applied to the Dynevac II can make an angle greater than 30 degrees with the eyebolt axis. Eyebolts are commonly found on columns and other vertical structures. In these instances, the eyebolt often is oriented

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with its axis in the horizontal plane. Do not link the Dynevac II to such an eyebolt because the forces on the eyebolt could be applied at an angle of up to 90 degrees with respect to the eyebolt axis. Most eyebolts are not designed to take such severe bending loads.

A second pitfall to avoid is the use of just any eyebolt that happens to be available on a structure in the workplace. Even if the eyebolt axis seems suitably aligned, many other factors must be analyzed. Determine if the eyebolt meets the requirements of section 6.2.3. Determine if it has a suitable collar and is properly seated and the eye nut is properly torqued. Eyebolts with screw-type shanks (without a nut) are not recommended because they can work loose. Finally, determine if the anchorage to which the eyebolt is coupled is of sufficient strength and in sound condition. This is particularly important in older structures.

Once the competent person determines that the eyebolt and anchorage are suitable for Dynevac II installation, couple the installation snaphook to the Dynevac II installation bracket and then open the snap gate and make the final linkage to the eyebolt. Be sure the snaphook is closed and locked and that there is no binding of the snaphook gate by either the eyebolt or the Dynevac II. Refer to separate User Instructions for use of the installation snaphook.

8.2.7 INSTALLATION WITH EYEBOLT AND SHACKLE

This linkage method is very similar to the method described in section 8.2.5 using the eyebolt and installation snaphook. Read and observe the precautionary measures described in section 8.2.5. Once these precautionary measures have been met, proceed with installation. The Dynevac II installation bracket should bear on the shackle bow. Use packing washers to center the eyebolt loading on the shackle pin. Use the shackle described in section 7.1.4 or one of greater strength. Always use a safety anchor shackle and be certain the nut and cotter pin are secured in the shackle pin.

8.2.8 INSTALLATION WITH INSTALLATION CABLE & INSTALLATION SNAPHOOK

This is versatile method of installation over horizontal anchorages because, unlike the shackle and installation snaphook, it is not limited to bars or pipes with relatively small cross-sectional dimensions. Because the installation cable is flexible (within limits) it can be wrapped around horizontal anchorages and then be coupled to the Dynevac II via an installation snaphook. First couple the installation snaphook to the Dynevac II and seat the Dynevac II in the narrow end of the installation snaphook. Next, wrap the installation cable around the anchorage with the thimbles down. Finally, connect the installation snaphook through both thimbles and lock the installation snaphook gate.

Note that heavy padding must be placed between the anchorage and the installation cable at all points where the cable can contact a sharp radius or edge. Do not use the installation cable unless the anchorage is horizontal and has no free end. To prevent lateral movement of the installation cable and Dynevac II, securely clamp suitable collars to the anchorage on each side of the installation cable. See section 7.1.5 for a description of a suitable installation cable.

8.2.9 INSTALLATION WITH INSTALLATION CABLE AND SHACKLE

This installation method is the same as that described in section 8.2.7 except that the shackle is used in place of the installation snaphook. Read and observe the precautionary measures described in section 8.2.7. If the shackle described in section 7.1.4 is used, the Dynevac II must be seated on the shackle bolt because the two thimbles of the cable ends will not fit in the space between the bolt and the bearing points. However, if a larger shackle is used, the Dynevac II may bear either on the shackle bow or bolt. Be sure the nut and cotter pin of the safety shackle are securely in place.

8.3 INSTRUCTIONS FOR USE

Understand and inspect the Dynevac II before each use. Follow the inspection before use instructions in section 11. Read this User Instruction and the product labels and understand them prior to using the Dynevac II. Read and understand all User Instructions for other system components prior to using them. In particular, inspect the line retraction and locking mechanism.

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Move about carefully in the work area to prevent loss of balance from line tension or locking. The Dynevac II maintains normal line tension of approximately 5 to 15 lbs (22 to 67 N) when working line is being steadily extracted and retracted. The tension is smallest when the least line is extended and increases gradually to its maximum as the line approaches full extension. This increase in cable tension is due to tightening of the coil spring which loads the drum. When line is being extracted, the brake will lock at a rate of about 4.5 ft./sec (1.4 m/sec). The user should practice using the device on a flat surface where no fall hazard exists. This will familiarize the user with the tension and locking actions and make him aware of the forces applied to the body by the Dynevac II during movement. When moving toward the device, move at a rate which does not permit line slack to build up as this will cause the spring-loaded drum to accelerate line retraction and apply a higher than normal jerking force on the body. When moving away from the device, move at a rate that is less than the locking speed. Avoid quick or sudden movements in any direction.

Do not use the Dynevac II as a positioning device, see section 6.1.3. If the user locks the Dynevac II brake, it will remain locked only as long as the brake locking force is continuously applied. However, when the brake locking force is relaxed, the device automatically unlocks. Then, if the user gradually applies weight to the line, it will extend from the Dynevac II until brake locking speed is reached. Normal user movement at a work position can cause unlocking if the brake has been intentionally pre-locked. If the user then, incorrectly, expects the line to provide restraint at the work position, the user will lose balance and could fall. When a work positioning or travel restriction system is required, consult a competent person or qualified safety engineer, see section 6 for system definitions.

Be extremely careful when considering the use of the Dynevac II for fall arrest of a user working on a sloped surface such as a pitched roof or tank bottom. If the user falls and slides on such a surface, the Dynevac II line may not be extracted fast enough to cause the units' locking mechanism to arrest the sliding fall. The user may, therefore, slide into a hazard zone such as a roof edge or an auger in a tank bottom. The use of a work positioning system or a travel restriction system should be first considered for such applications. See section 6 for a discussion of these systems. Do not install the Dynevac II for such applications if there is any question whether it will arrest the sliding fall before a hazard is encountered.

Do not use the Dynevac II to arrest falls due to collapse of sliding masses such as grain, sand or liquids. When a sliding mass collapses, it may do so at a rate of speed lees than the minimum locking speed of the Dynevac II. Therefore, the user may descend into the sliding mass or other hazard without the device locking to arrest the fall. Suffocation may result. Always maintain solid footing when fall hazards exist.

8.3.1 FALL ARREST MODE

The Dynevac II is a fall arrester of the retractable lifeline type with a built-in emergency rescue mechanism. As such it is one component of a fall arrest and emergency retrieval system. Other components are required to make up complete systems, see sections 4, 6 and 7. DO NOT use the Dynevac II for other than fall arrest or rescue of one person at a time. The Dynevac II is specifically designed for the arrest and retrieval after an accidental fall of one person whose total combined weight including clothing, tools and other user-borne objects is between 75 and 310 lbs (34 and 140 kg). Never connect more than one person at a time to the device. Never attempt to use the Dynevac II for protection against falls of materials or equipment.

Always have a rescue plan in case of an accidental fall. When used properly the Dynevac II will arrest an accidental fall within 40 inches (1 m). It can then be activated by a rescuer to retrieve the fallen suspended person. The user and the user's organization must therefore plan ahead for rescue, including having the necessary rescue equipment and personnel available to put a rescue plan into effect. The user should always have a co-worker in the vicinity to assist with the rescue and get help. Refer to sections 3, 6 and 7 to ensure that adequate planning is done to effect a timely rescue.

Once the user's fall is arrested, he must turn his attention to rescue. It is extremely important that the user not make rapid movements to attract attention or struggle for a hold on a nearby structure.

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If a nearby structure is within reach without inducing significant motion into the fall arrest system the user should secure himself in that way. If not, he should carefully and slowly use his hands to improve, if possible, his position in the harness and reduce any discomfort from tension in the harness straps. The user should keep calm and look for someone whose attention may be attracted. Call for help but avoid waving of arms. See section 8.3.2 for instructions to the rescuer in operating the emergency retrieval mode of the Dynevac II.

A full body harness should be used as part of the working system to distribute the forces involved in arresting a fall over shoulders, chest and thighs. The full body harness will reduce jackknifing of the body and will maintain the body in an upright position with the head elevated after fall arrest. This will allow breathing and circulation and make rescue easier. A harness with shoulder D-rings should be considered in conjunction with a Y-retrieval lanyard with spreader bar to facilitate rescue. See separate User Instructions for applications of full body harnesses and lanyards as part of these systems.

For fall arrest, connect the Dynevac II snaphook to the fall arrest attachment (back D-ring) of the harness. Be certain the snaphook gate is completely closed and locked securely.

When impact force is applied to the harness back D-ring, the human body can tolerate greater impact forces during fall arrest and can endure suspension longer after fall arrest. If the Dynevac II snaphook is (improperly) attached to a D-ring elsewhere on the full body harness, injury can occur during arrest of falls where the center of gravity of the body is not nearly aligned with the arresting force of the working line. The human body is more tolerant of stopping and suspension forces applied to the back D-ring of the full body harness than to forces applied to the body from the side D-ring or chest D-ring.

It is permissible to use a front (chest) D-ring for connection to the Dynevac II for the special case of vertical fixed ladder climbing provided the Dynevac II line extends straight up (as opposed to angularly up). In this special case the body is nearly vertical and the direction of the fall arrest forces will have a minimal backward-bending action on the body. Because the worker is facing the ladder while ascending and descending, the means of rescue are at hand. These factors, together with the short free fall distance and shock absorption features of the Dynevac II, permit attachment to the chest D-ring of the full body harness.

8.3.2 EMERGENCY RETRIEVAL MODE

To activate the Dynevac II emergency retrieval mechanism it is first necessary to unlock (unpin) the handle from its fixed position. This is accomplished by performing the following steps in sequence:

Step 1 Pull pin #1 (side pin, hair pin cotter type) completely out and retain it, as it will be used again.

Step 2 Pull pin #2 (top pin, machined shoulder type) completely out and retain it, as it will be used again.

Step 3 Pull out the ball lock pin from the hub (located in the center of the handle) by depressing the pin button at the end of the pin with a ring attached. Rotate the handle clockwise in order to engage the reset pin that will then protrude outward from the handle.

If the Dynevac II is freely suspended from its anchorage, lower the grip (handle) on the back of the unit into the position and grasp the grip firmly in one hand. This will assist in stabilizing the Dynevac II during lifting and lowering operations. If the Dynevac II is mounted in a custom installation mounting bracket (e.g. the Dynevac/Tripod leg mounting bracket), the grip will be inaccessible and unnecessary.

Step 4 Continue turning the handle clockwise to take in line (raise load). Turning the handle counterclockwise will let out line (lower load). Release of the handle knob will stop and hold the load.

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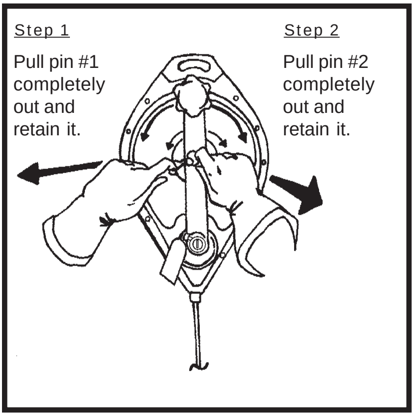
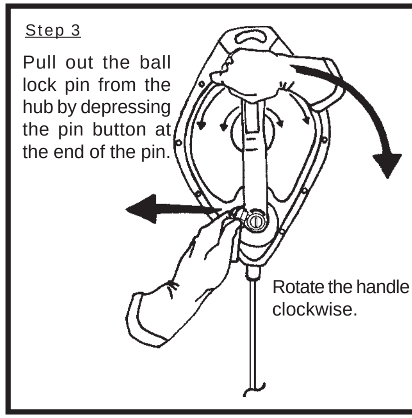
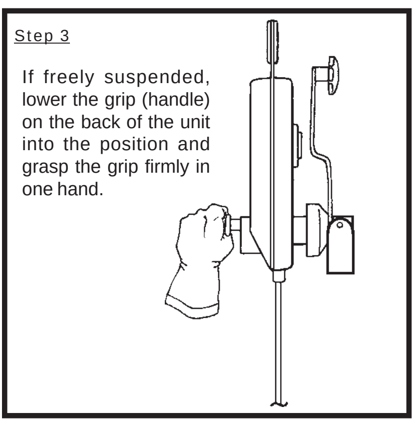
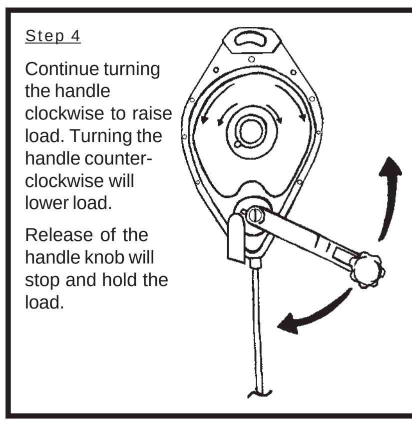
A fall experienced by a person attached to the line when the Dynevac II is in the emergency retrieval mode could result in severe injury to the person due to absence of Dynevac II shock-absorption capability when the emergency retrieval mechanism is activated. It is important to note the Dynevac II shock absorber is overridden when the unit is in the emergency retrieval mode.









8.3.3 LIFTING AND LOWERING DURING RESCUE

Carefully follow the procedure to engage the emergency retrieval mode described in section 8.3.2. The rescuer must take precautions to be secure from falling while operating the Dynevac II in the emergency retrieval mode, or at any time while exposed to a fall hazard.

When the suspended person is being lifted or lowered, care must be taken by the rescuer not to allow slack to develop in the line which would permit a fall of the suspended person. This could occur if the suspended person is conscious and can grab a nearby structural member and climbs faster than the rate of line intake by the rescuer, or, if the suspended person remains stationary while the rescuer lets out the line.

When taking in line, if the rescuer notices a suddenly increased handle lifting force, the suspended person or the line may have become lodged on a structural member. If this occurs, immediately take in line until the slack is gone, check out the situation and, if lodged, let out line until the person

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or line is freed and then resume retrieval. The rescuer must always be protected from fall hazards when checking out the suspended person's situation.

When letting out line (lowering), if the rescuer notices slack developing in the line, the suspended person or the line may have become hung up on a structural member. If this occurs, immediately stop taking in line, check out the situation and, if hung up, take appropriate action to lift or lower the suspended person to avert the obstruction. The rescuer must always be protected from fall hazards when checking out the suspended person's situation.

When the suspended person reaches the level at which the rescuer or others can detach him from the line, extreme caution must be taken to remove the person from the fall hazard and administer appropriate first aid or medical measures. Once the person has been raised or lowered to the recovery level, pull on the body support (full body harness, stretcher, etc.) or on the line, to bring the person's body over (above) the surface on which he is intended to be placed. Holding the body support or line in such position, simultaneously let out Dynevac II line by turning the handle counterclockwise until the person is at rest on the recovery surface and is a safe distance from fall hazards. Then detach the Dynevac II snaphook from the attachment point of the body support. If the Dynevac II is mounted to a portable anchorage connector (such as the Tripod) great care must be taken to avoid toppling the anchorage connector in the process of pulling the person to a lateral position above the recovery surface. Pull the person toward one of the three legs of the anchorage connector.

If the Dynevac II is in the emergency retrieval mode and it is necessary to lift or lower a rescuer to the person to be rescued, that may be accomplished in the same manner as described in this section. It is apparent that several persons, one at a time, may be retrieved by the Dynevac II in an emergency situation. In some instances, additional rescuers may be needed to assist in the process of attachment to and care for the fallen person.

When the Dynevac II has been subjected to the forces of arresting a fall or equivalent forces, it should be removed from use and returned to the factory for inspection and service.

8.3.3.1 USE OF THE DYNEVAC II TO RETRIEVE (LIFT OR LOWER) A PERSON NOT INITIALLY SUSPENDED ON THE LINE

This situation may arise when a person who is not attached to the line must be retrieved. This may require special procedures which necessitate more than one rescuer in order to make the appropriate connection of the snaphook on the line directly to the user's body support (full body harness, stretcher, etc.) or to an intermediate connector such as a Y-retrieval lanyard with spreader bar. If the person is not injured, is conscious, and is able to make connection without assistance, then additional rescuers may not be needed. The exact procedure also depends on whether the Dynevac II is in the fall arrest mode or the emergency retrieval mode. See sections 8.3.1 and 8.3.2.

If the Dynevac II is in the fall arrest mode, line may be pulled out in a hand-over-hand manner by the rescuer until the snaphook is within reach of the fallen person and is attached to the body support. If a second rescuer is needed to make attachment to the fallen person, that rescuer can hook the Dynevac II snaphook to his full body harness and move to the fallen person with the Dynevac's fall arrest capability in effect for him. Once reaching the fallen person, the rescuer can restrain himself by a separate means (such as a lanyard), detach the Dynevac II snaphook from his body support and reattach it appropriately to the body support of the fallen person. The rescuer can signal the topside rescuer, who, in turn, can activate the emergency retrieval mode (see section 8.3.2) and proceed to lift or lower the fallen person to the recovery surface.

Once the fallen person is recovered, the downside rescuer who made the attachment to the fallen person can be retrieved in the following manner: The topside rescuer (at the Dynevac II anchorage connector) can let out line when there is no load on the line by simultaneously pulling on the line and turning the handle counterclockwise. Working line will not automatically reel off the internal drum without some load applied to it. In this manner, line of the Dynevac II in the emergency retrieval mode can be let out until the snaphook reaches the level of the next person to be

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retrieved. The snaphook is then appropriately attached to the body support of that person and the topside rescuer can proceed to raise or lower the attached person.

8.3.4 RESETTING THE DYNEVAC TO FALL ARREST MODE IN THE FIELD

In order to return the Dynevac II to fall arrest mode once it has been activated in emergency retrieval mode, perform the following steps in sequence:

Step 1 Remove any load attached to the line and crank any remaining excess cable back into the unit.

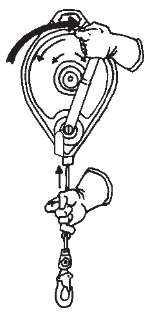
Step 2 Depress the red reset button into the handle hub, aligning the hole in the reset pin with the matching hole through the hub.

Step 3 Insert the ball lock pin through the handle hub, while depressing the pin's end button. This will restrain the reset pin.

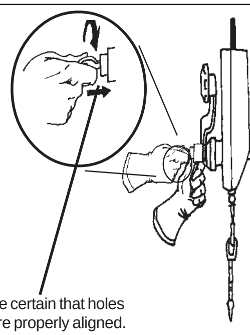
Step 4 Rotate the Dynevac II crank handle to the upright (12 o'clock) position and insert pin #1 (machine shoulder type) into its opening. Following this, insert pin #2 (hairpin cotter type) into its opening.

The unit is now engaged in fall arrest mode and ready for use.

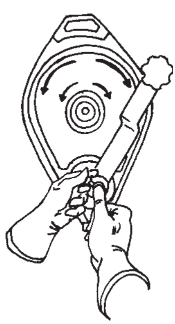
Step 1:
Remove any load attached to the line and crank any remaining excess cable back into the unit.



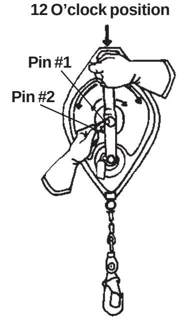
Step 2:
Depress the red reset button into the handle hub, aligning the hole in the reset pin with the matching hole through the hub.



Step 3:
Insert the ball lock pin through the handle hub, while depressing the pin's end button. This will restrain the reset pin.



Step 4:
Rotate the Dynevac II crank handle to the upright (12 O'clock) position and insert pin #1 (machine shoulder type) into its opening. Following this, insert pin #2 (hairpin cotter type) into its opening.



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8.4 GENERAL PRECAUTIONS

8.4.1

When engaging the Dynevac II in emergency retrieval mode immediately after a fall, turn the handle one quarter turn in the clockwise direction (raise load) before lowering or turning the handle counter clockwise.

8.4.2

DO NOT permit slack line and do not lengthen the line by connecting to another line. Slack line will cause increased free fall distance, increased deceleration distance and increased decelerative forces on the body. Slack line can also present a trip hazard to the user and can allow the line to become snagged or tangled on objects in the work area which, in turn, can cause working line damage or eliminate the shock absorbing action of the device. Lengthening the line by attachment of another line will cause slack line when the Dynevac II working line is fully retracted, since no automatic line tension will be transmitted to the added line.

8.4.3

DO NOT work with the line at full extension. Always keep at least 2 ft. (0.6 m) of line inside the device for shock absorption. The Dynevac II shock absorber works on the principle of compression disks which retard the rate of drum rotation (line extension) after the brake is locked. If there is insufficient or no line wound on the drum at the time of an accidental fall, there will be insufficient shock absorption. To check how much line is remaining on the drum, the user should grasp the line at a point above his head and slowly extend the line downward. After noting the length of such extension, control the retraction of the line back into the device until the line is again taut.

8.4.4

DO NOT pass the working line over sharp edges. This can cause cutting and bending of cable strands. In the event of a fall it can also increase the shock loads on the body. If the line can come in contact with corners and sharp edges, protect the line by using heavy padding on such corners or edges.

8.4.5

DO NOT cross over the lifeline of another worker. This can create a hazard because movement of one person can unbalance the other. In the event of a fall by one person, there is a likelihood that the other person will be caused to fall as well. Entanglement of lifelines or lifeline interference with the work of other persons are additional hazards which are caused by the crossing of lifelines.

8.4.6

DO NOT clamp off or stand on the line. Clamping or standing on the line for the purpose of removing line tension or other reasons can cause line slack, loss of balance, swing falls and line damage.

8.4.7

DO NOT allow the line to pass beneath the neck or arms, between the legs or to wrap around the body or limbs. Keep the line taut and behind the back at all times to prevent interference with work operations and looping of line which could produce bodily injury in a fall.

8.4.8

DO NOT allow foreign matter to enter the housing of the Dynevac II. DO NOT obstruct the line orifice. If contamination enters the housing it can cause excessive wear and damage to the device

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and could impair its operation. Obstructing the line orifice can defeat the device's shock absorption function, produce line slack and damage and adversely affect cable extraction and retraction.

8.4.9

DO NOT release line and allow it to re-reel freely back into the device. This can cause damage to the internal spring, uneven coiling of line on the drum and possible line damage. It can also cause the user to lose balance when the line suddenly becomes taut after building momentum. Do not allow the line to slide through the hands without wearing gloves. A better method is to control re-reeling by gripping the line in a hand-over-hand fashion. If the user disconnects from the Dynevac II when the line is extended, he should not snap off the cable and leave it in the extended condition for a prolonged time as this will fatigue the internal spring and result in future poor line retraction. Instead, the user should tie a sufficiently long piece of light rope to the snaphook and control the complete retraction of the line. The light rope should then be tied to a nearby point where it is out of the way of activity in the area. The Dynevac II is then accessible for the next ascent by pulling the light rope to extend the line until the snaphook is within reach.

8.4.10

DO NOT attempt to alter or repair the device in the field. Contact MSA. The Dynevac II housing must never be opened by other than MSA. Special tools are required and nothing internal to it can be repaired or replaced by the user. Do not attempt to substitute parts. A powerful, high-tension spring is housed in the device. Attempts to open the device could result in serious injury.

8.4.11

DO wear gloves when handling and inspecting the line or controlling re-reeling with the hands. This will prevent cuts, abrasion and wire slivers.

Proper functioning and length of useful life of the Dynevac II depends on the user's proper care, maintenance and storage of the product. Proper care and maintenance of the product by the user is essential to keep the product in good working condition and will prolong its useful life.

Inspect the Dynevac II in accordance with sections 11 and 12 of these User Instructions. Prevent denting or deformation of the housing. Never drop the unit from any height. Always set it down carefully. When in use, protect the cable from contacting sharp corners and edges. Use a thick padding for this purpose. Prevent loops from forming in a slack line and being pulled tight causing cable kinking. DO NOT allow foreign matter to enter the housing. DO NOT permit the cable to snag or be crushed and NEVER permit the cable to re-reel uncontrollably back into the device. Heed all caution labels and instructions as these are intended to prevent damage to the product as well as guide the user in correctly operating the Dynevac II.

9.0 CARE, MAINTENANCE AND STORAGE

9.1 CLEANING INSTRUCTIONS

To clean the housing, periodically use a clean, damp (not wet) cloth to remove dirt or contamination which may cause corrosion or hamper readability of labels. Wipe off any moisture before returning the Dynevac II to service. The frequency of cleaning should be determined by inspection and by severity of the environment. In highly corrosive environs, cleaning will be required more often. Never use solvents to clean the housing as they may break down the label adhesive. DO NOT use abrasives to scour the housing as they may damage the plating and the labels. To remove oil or grease use a mild dishwater detergent on a damp cloth or sponge and follow by repeated swabbing with a clean damp cloth to remove all soap residue. Never immerse the product in water or other liquid. If water gets into the housing hang the device from the installation bracket

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and slowly extract all the cable allowing the water to run out of the cable orifice. Use a clean dry cloth to wipe the cable dry as it is slowly re-reeled back into the device. Leave the device hanging in a warm dry room with the cable slightly extended to keep the ball stopper from plugging the orifice. Repeat the cable extraction and drying operation after a few hours and return to use when the internal drying is complete. If necessary, lubricate the cable after this operation (see section 9.2). Questions concerning Dynevac II condition and cleaning should be directed to MSA.

9.2 MAINTENANCE AND SERVICE

Proper maintenance is both preventive and corrective in nature. Major maintenance can only be performed at the factory. Routine maintenance, including cleaning, wire rope lubrication and removal of broken wire ends is all that is permissible for the user to perform. Lubrication must only be applied to a clean, dry line because it is effective only when the dressing comes in contact with metal. If inspection reveals buildup of contaminants, use a densely bristled fiber brush (NOT wire) to remove the contaminants. Never use gasoline or kerosene as a solvent. Pay particular attention to cleaning the gaps between the wire rope strands so lubricant can penetrate into the core and fill these gaps to seal out moisture and foreign particles.

Use a low viscosity lubricant having moisture resistant, noncorrosive properties. It may be applied by brushing on or swabbing with a cloth saturated with the lubricant. Wipe off excess lubricant with a clean dry cloth. It is impossible to specify the time intervals between lubrications. The working line should be properly lubricated at all times and thorough periodic inspections will indicate when it must be done. In corrosive environs the line should be cleaned and lubricated more frequently. If the Dynevac II is taken out of service for an appreciable length of time, the line should be cleaned and lubricated before storage.

Refer to separate User Instructions provided with other system components for care, maintenance and storage of these additional components. Equipment which is damaged or in need of maintenance must be tagged as "UNUSABLE" and removed from service. Corrective maintenance (other than cleaning) and repair, such as replacement of elements, must be performed by the MSA Rose factory (see section 13). Do not attempt field repairs.

9.2.1 LUBRICATION OF SNAPHOOK

The moving parts of the snaphook at the end of the Dynevac II working line require periodic lubrication. Use a lightweight (low viscosity) penetrant oil that has good resistance to temperature extremes, moisture and corrosion. Apply the lubricant to the points of the snaphook as shown in the figure in section 11.2.2. DO NOT over-lubricate. Wipe off excess with a clean dry cloth. Follow the lubricant manufacturer's instructions.

9.3 STORAGE

Store the Dynevac II in a cool, dry and clean place. Avoid areas where heat, moisture, oil and chemicals or their vapors or other degrading elements may be present. Equipment which is damaged or in need of maintenance should not be stored in the same area as usable equipment. Heavily soiled, wet, or otherwise contaminated equipment should be properly maintained (e.g. dried and cleaned) prior to storage. Never allow the Dynevac II to rest for lengthy periods of time on concrete or such floors as the lime sulfur and ash can cause corrosion. Store the device with the cable fully retracted. Prior to using equipment which has been stored for long periods of time, a Formal Inspection should be performed by a competent person. See section 12.

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10.0 LABELS AND MARKINGS

10.1

The following labels must be present, legible and securely attached to the Dynevac II. The Formal Inspection Grid must be punched with a date (month/year) within the last six months. If not, remove the Dynevac II from use and mark it as "UNUSABLE" until a Formal Inspection is performed in accordance with section 12. See section 4 for location of labels.

CAUTION LABEL

⚠CAUTION ⚠CAUTION ⚠CAUTION ⚠CAUTION

- Read User Manual before use. Read and heed all labels.
- Before each use inspect entire device.
- Failure to observe instructions may result in serious or fatal injury.
- **DO NOT** use for other than fall arrest of one person.
- **DO NOT** use to arrest falls due to collapse of sliding masses, e.g. grain, sand and liquids.
- Install under direction of competent person or qualified engineer.
- **DO NOT** rigidly install or install where device can disengage from anchorage.
- **DO NOT** install or use where device may encounter electrical hazard.
- Install and use device vertically overhead to minimize swing falls. **DO NOT** work above device. **DO NOT** use where line makes greater than 15° angle with vertical or where swing fall may cause injury.
- Observe hazardous obstructions about and below work area. Always maintain at least 40 inches (1 m.) of unobstructed space below lowest point of body.
- Use with installation hardware and body harness recommended by manufacturer.
- Always connect to harness at D-ring in center of back.

CAUTION LABEL

⚠CAUTION ⚠CAUTION ⚠CAUTION ⚠CAUTION

- **DO NOT** permit line slack. **DO NOT** lengthen line by connection to another line.
- **DO NOT** clamp off or stand on line. **DO NOT** permit line kinks.
- **DO NOT** allow line to pass beneath neck or arms, between legs or wrap about body or limbs.
- **DO NOT** pass line over sharp edges.
- **DO NOT** cross over line of another worker.
- Move about carefully to prevent loss of balance from line tension or locking.
- **DO NOT** allow foreign matter to enter housing. **DO NOT** obstruct line orifice.
- **DO NOT** attempt to alter or repair device in field. Contact manufacturer.
- Remove device from service if yellow line is exposed at end of line extraction.
- Wear gloves when inspecting line or controlling re-reeling with hands.

INSPECTION INSTRUCTIONS - 30 M

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SPECIFICATION LABEL - 30 M

SPECIFICATIONS

- Working load: Human …75 to 310 lbs. (34.1 - 140.6 kg).
- Stopping distance (no free fall): less than 40 in (1 m)
- Line breaking strength: 3100 lbf. (13.8 kN).
- Approx. weight: 53 lbs. (24 kg).
- Approx. line length: 95 ft. (30 m)
- Max. arrest force: 900 lbf. (4.0 kN).
- Line: wire rope 3/16 inches (5 mm) diameter
- Line Material ☐ Galvanized ☐ Stainless Steel
- Meets ANSI Z359.1, EN 360, and OSHA regulations
- With 220 lbs. (100 kg) suspended load:
  Approx. lifting speed: 25 ft./min. (7.6 m/min)
  Approx. crank force: 18 lbf. (80 N)
  Approx. lowering speed. 40 ft./min (12 m/min)
- U.S. Patent Nos. 4,434,536, 4,528,728; 4,589,523, 5,090,507. Other U.S.A. patents applied for. Foreign patents issued and applied for

INSPECTION INSTRUCTIONS - 16 M

SPECIFICATION LABEL - 16 M

SPECIFICATIONS

- Working load: Human —75 to 310 lbs. (34.1 - 140.6 kg).
- Stopping distance (no free fall): less than 40 in (1 m).
- Cable breaking strength: 3100 lbf. (13.8 kN).
- Approx. weight: 38 lbs. (17 kg).
- Approx. line length: 50 ft. (16 m).
- Max. arrest force: 900 lbf. (4.0 kN).
- Line: wire rope 3/16 inches (5 mm) diameter.
- Line Material ☐ Galvanized ☐ Stainless Steel
- Meets ANSI Z359.1, EN 360, and OSHA regulations.
- With 220 lbs. (100 kg) suspended load:
  Approx. lifting speed: 25 ft./min. (7.6 m/min)
  Approx. crank force: 23 lbf. (102.3 N)
  Approx. lowering speed: 40 ft./min (12 m/min)
- U.S. Patent Nos. 4,434,536; 4,528,728; 4,589,523; 5,090,507. Other U.S.A. patents applied for. Foreign patents issued and applied for.

USER INSTRUCTIONS - 16 M

TO USE SELF-RETRACTING LANYARD IN FALL ARREST MODE: Read and follow User Instructions and all labels. **NEVER USE DEVICE FOR FALL ARREST WHILE EMERGENCY CRANK IS ACTIVATED OR IF INSPECTION REVEALS DEFECT.** Also inspect anchorage connection and harness before use. Connect snaphook to fall arrest D-ring of harness and be sure snaphook is securely locked. User movement at slow walking speed causes line extension and retraction. Faster movement or a fall causes device to lock. After locking, removal of load on line causes unlocking. Do not allow uncontrolled line re-reeling. When not in use, store device in clean dry place with line fully retracted.
TO USE EMERGENCY RESCUER: Activate Emergency Rescuer Crank for rescue only. In sequence, using rings, pull out pin beneath crank arm, then pull out pin above crank arm. Pull third pin from handle hub. Grasp crank knob and turn crank firmly in clockwise direction at least 1/4 turn and until gears engage and load is felt on the emergency rescuer crank. To stabilize freely suspended unit, fold out and hold grip on back of housing while turning rescuer crank. Continued clockwise rotation takes line in (raises load). Release of crank brakes and holds load. Counter clockwise rotation lets line out (lowers load). To reset from rescue mode to fall arrest mode: (a) remove load from line, (b) depress red pin, (c) insert ball-lock pin in handle hub, (d) extract line to verify correct operation. **DYNEVAC WILL NOT FUNCTION AS A SELF-RETRACTING LANYARD UNTIL RESET.** The emergency rescuer is intended for retrieving an incapacitated worker, not for lifting and lowering tools or heavy objects.
P/N 10008812

SERVICE DATE LABEL

PART NUMBER: ____________

SERIAL NUMBER: ____________

DATE OF MANUFACTURE: ____________

LAST FACTORY SERVICE: ____________

LOAD INDICATOR LABEL

⚠ CAUTION

DO NOT USE IF YELLOW LOAD INDICATOR TABS ARE EXPOSED. P/N 622451

CAL/OSHA APPROVAL LABEL

APPROVED CAL/OSHA C-4511

P/N 621042

RETENTION PIN LABEL

STOP!

DO NOT PULL PINS <u>EXCEPT</u> TO ENGAGE EMERGENCY RESCUER.

P/N 622424

CAUTION LABEL ON CRANK LABEL

⚠ CAUTION

FOR HUMAN FALL ARREST AND EMERGENCY RESCUE ONLY. NOT A MATERIALS HOIST AND NOT FOR WORK POSITIONING.

P/N 620970

EMERGENCY RESCUE ACTIVATION INSTRUCTION LABEL

TO ACTIVATE EMERGENCY RESCUE HANDLE, PULL BOTTOM PIN FIRST THEN TOP PIN AND ROTATE HANDLE CLOCKWISE UNTIL GUARD SPRINGS FREE.

P/N 620971

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11.0 INSPECTION

11.1 INSPECTION FREQUENCY

The Dynevac II must be inspected by the user before each use. Additionally, the Dynevac II must be inspected by a competent person other than the user at intervals of no more than six months. The competent person inspection is referred to as Formal Inspection. See section 12 for Formal Inspection procedures.

Each Dynevac II is inspected and tested under controlled conditions at the factory before shipment. However, user inspection, maintenance and storage of the equipment takes on added importance once the device is subjected to potentially severe environmental and workplace conditions.

⚠ CAUTION

If the Dynevac II has been subjected to fall arrest forces, it must be immediately removed from use and marked as "UNUSABLE" until subjected to a Formal Inspection and approved for use by a competent person inspector.

11.2 PROCEDURE FOR INSPECTION BEFORE EACH USE

Inspect the entire Dynevac II in accordance with the steps as described in section 11.2.1. Additional inspection requirements specifically for the snaphook and wire rope are described in sections 11.2.2 and 11.2.3, respectively. Refer to sections 4 and 12 for diagrams indicating the location of the elements of the Dynevac II.

11.2.1 INSPECTION OF DYNEVAC II

Step 1 Inspect the Dynevac II labels to verify that they are present and legible. See section 4 for location of labels. See section 10 for the specific labels that should be present and the information contained on them. Check the Formal Inspection Grid to be sure a Formal Inspection has been performed within the last six months. If the Grid does not indicate that a Formal Inspection has been performed within the last six months (by being punched), or if any labels are missing or illegible, remove the Dynevac II from use and mark it as "UNUSABLE" until a Formal Inspection is performed by a competent person.

Step 2 Check extraction by pulling out the entire working line in a hand-over-hand manner. WEAR GLOVES. If the line does not easily extract or retract, remove the Dynevac II from use. When extracting the line, coil the extracted line onto a clean, dry surface in loose coils of about 40 inches (1 m) diameter, avoid kinking. When retracting the line, control the re-reeling by releasing the line into the device in a hand-over-hand manner. Never allow the line to re-reel uncontrollably into the device.

Step 3 Check retraction over the full length of the working line by first extending the line as in step 2, above. WEAR GLOVES. If the line "stalls" temporarily, pull out a section of line and then resume retraction but at a slightly higher speed. If the line does not retract completely or if the spring appears weak, remove the Dynevac II from use. Note that tension applied on the line by the spring-loaded drum should be in the approximate range of 5 to 15 lbs (22 to 66 N) with the low end of the range applying to a fully retracted line and the high end applying to full extraction. The spring will experience some fatigue if the line is extended for a prolonged time or if the line is repeatedly extracted and then retracted through several cycles in rapid succession. However, the spring will recover its strength if left dormant for a period of time with the line fully retracted.

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Step 4 Check Dynevac II locking by tugging the working line very sharply with a gloved hand. When the device locks it should maintain its lock until the line tension is relaxed. It should then permit normal line extraction and retraction. Repeat locking tests three times. If the Dynevac II does not always lock properly, remove from use.

Step 5 Follow steps in Section 8.3.2 and Section 8.3.3 to set the Dynevac II into Emergency Retrieval Mode. Crank the handle to verify that line will deploy and return. Reset the Dynevac II into Fall Arrest Mode, following directions in Section 8.3.4. If any defects are found during this procedure, remove the Dynevac II from use.

Step 6 Using fingers, check all bolts and nuts on the housing to be sure they are tight. Check to see if any bolts, nuts or other parts are missing or have been improperly substituted or altered in any way. If any parts are loose, missing, altered, damaged or substituted, remove the Dynevac II from use.

Step 7 Check to see that the two security rivets (one on each side of the housing, see section 4) are in place and bear the stamp “R”. If these are absent it is evidence that the Dynevac II has been tampered with outside the factory. If missing, remove the product from use and submit for factory service according to section 13.

Step 8 Check for the presence of the red paint seal in the recessed hex head bolt centered on the torque nut on the front of the unit beneath the handle (see section 4). Absence of the paint is evidence that the device has been tampered outside the factory. If missing, remove the Dynevac II from use and submit for factory service according to section 13.

Step 9 Inspect all metallic parts (i.e. housing, snaphook, wire rope, handle, pins, rivets, etc.) for deformation, fractures, cracks, corrosion, deep pitting, burrs, sharp edges, cuts, deep nicks, missing or loose parts, improper function, and evidence of excessive heat or chemical exposures. If any of these conditions exist, remove the Dynevac II from use and submit for factory service according to section 13. In addition, inspect snaphook and wire rope in accordance with section 11.2.1.

Step 10 Inspect all nonmetallic parts (i.e. handle knob, grip handle, installation bracket handle, ball stopper, working line collar and labels) for cut, broken, excessively worn, missing and loose parts. (Labels are to be additionally checked in accordance with Step 1 above.) Inspect for evidence of burns and excessive heat and chemical exposures. If the inside of the line collar has grooves of more than 0.1 inches (2.5 mm) that may hamper line extraction and retraction, remove the Dynevac II from use and submit for factory service according to section 13.

Step 11 Carefully inspect for presence of the two retainer pins coupled to the emergency retrieval handle. The two pins must be fully inserted into their receiving holes. Verify that the pin is in place in the center of the handle hub.

Step 12 Check to see that the emergency retrieval handle is not bent or damaged and that the handle knob is intact and rotates. Remove the Dynevac II from use if any part of the handle is damaged.

Step 13 Inspect the snap-ring located on the crank hub for any signs of cracking or breaking. If the snap-ring is missing or damaged, remove the Dynevac II from use.

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Step 14 Check the grip on the back of the housing to be sure it is not bent, loose or unable to fold down perpendicular to the housing. If the grip does not function properly, remove the Dynevac II from use and submit for factory service according to section 13.

11.2.2 INSPECTION OF SNAPHOOK

Step 1 Check all parts of the snaphook for signs of alteration, distortions, cracks, deep nicks, dents or cuts. Also check for indications that the snaphook has been subjected to intense heat, corrosion or excessive wear which could affect its strength. If there is evidence of these conditions, remove the snaphook from use.

Step 2 Examine snaphook in open position to be sure the locking mechanism spring is free from dirt, sand, grease, paint, ice or any foreign material that might hamper gate freedom of operation. When the gate is released the spring should automatically close the gate. Once the gate is closed, examine the snaphook to be sure the trigger moves forward under the gate to lock gate in closed position. If the trigger fails to lock the gate, remove the Dynevac II from service.

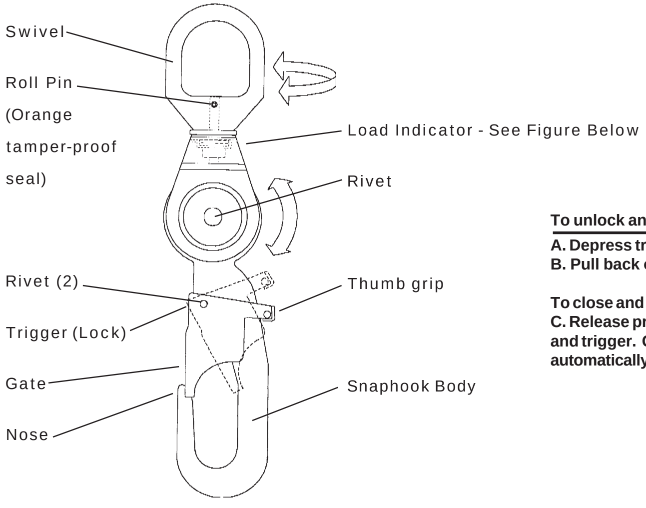
Step 3 Check the load indicator tabs. If the yellow tabs are visible, the snaphook has experienced an impact force such as that incurred in arresting a fall. The tabs deploy when the snaphook experiences a dynamic load exceeding 450 lbs (204 kg). Remove the Dynevac II from use if the yellow tabs of the load indicator on the snaphook are exposed.

⚠ CAUTION

The gate should not open under any circumstances unless it is unlocked. If the locking mechanism fails or any other inspection step fails, remove the Dynevac II from use.

Step 4 Check for presence of roll pin and washer. If either is absent, remove the product form use.

Step 5 Check to see that the snaphook body swivels freely around the bolt connecting it to the snaphook eye. If it does not, lubricate with light machine oil. If swiveling is not free after lubrication, remove the product from use.



To unlock and open gate

A. Depress trigger (unlock)
B. Pull back on thumb grip (open)

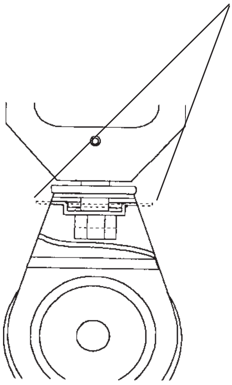
To close and lock gate

C. Release pressure on thumb grip and trigger. Gate will close and automatically lock.

CAUTION

The gate should not open under any circumstances unless it is unlocked. If the locking mechanism fails or any other inspection step fails, remove the snaphook from use.

<u>Load Indicator:</u> Yellow painted surface is exposed when the snaphook has been subjected to fall arrest forces.



Check the load indicator tabs. If the yellow tabs are exposed, the device has experienced an impact force such as that incurred in arresting a fall. The tabs deploy when the device experiences a dynamic load exceeding 450 lbs (204 kg). Remove from service if the yellow tabs are exposed.

11.2.3 INSPECTION OF WIRE ROPE AND FITTINGS

Step 1 Check the two pressed metal sleeves (ferrules) and the metal thimble. Remove the Dynevac II from use if there is any evidence of cracks, distortion, excessive corrosion, wear, loosening or biting into the wire rope.

Step 2 Check for the presence of the ball stopper and washer and remove the product from use if either is absent.

Step 3 Wear gloves during inspection to prevent cuts and slivers when running hands over the wire rope. Over the entire length of the line: Check for broken wire strands. Flexing the line can reveal hidden breaks. Remove broken wire ends as soon as possible by bending them back and forth (with fingers if possible) in the direction of the line length. In this way the wire strand will usually break inside the line and not leave a sharp end jutting out. DO NOT tug on the broken wire ends with pliers as this will leave jagged ends and can cause damage elsewhere to the strand. Record the location of the broken wire strand in the Inspection Log.

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Step 4 Carefully review the Dynevac II Inspection Log for the location of previously detected broken wire strands which, cumulatively, may require removing the product from use. Remove from use if there are six or more randomly distributed broken wire strands in one wire lay, or three or more broken wire strands in one strand in one lay. [A wire lay is the length along the line in which one strand makes a complete revolution around the wire rope. This is about 1.5 inches (38 mm) for the Dynevac II line.] Remove from use if there are any broken wire strands within 1 inch (25 mm) of the two ferrules or the thimble.

Step 5 Check for worn or abraded wire strands. These areas are caused by friction and are usually brighter in appearance. Remove the Dynevac II from use if any of the surface strands in one area are worn by a third or more of their diameter.

Step 6 Check for bulges or reduction wire rope diameter. This is an indication of serious internal line damage. An increase or decrease in diameter of 0.05 inches (1.3 mm) in any area is cause for removing the product from use.

Step 7 Check for corrosion characterized by discoloration of the wire strands. There is no simple way to tell when corrosion has excessively weakened the line. The user inspector must keep in mind that corrosion will usually develop inside the line before evidence is visible on the surface. The judgment of a competent person should be sought when signs of corrosion are evident. Pitting is a particularly serious sign of advanced corrosion. The presence of rust along with broken wires in a given area (particularly in the vicinity of end fittings) is cause for removal of the product from use.

Step 8 Check for insufficient lubrication and excessive contamination in the grooves between strands of the line. Packed grease, dirt, paint or other contaminants in these grooves keeps the lubricant from penetrating to prevent internal friction and corrosion.

Step 9 Check for snagged wires and crushed or flattened strands. Remove from use if any of these conditions exists.

Step 10 Check for unlaying and bird-caging of strands. This condition is characterized by the formation of gaps, loops and excessive clearance between strands. Remove from use if any of these conditions are detected.

Step 11 Check for kinks or bends in the line. Once a kink has been made by improper handling (allowing slack), the damage is permanent. A bend is evidence that a kink was once formed. Remove from use if this is detected.

Step 12 Check for heat damage, torch burns and electric arc strikes. If any evidence of these conditions exists, remove the Dynevac II from use.

11.3 CORRECTIVE ACTION

When inspection in accordance with section 11.2 reveals signs of inadequate maintenance, the Dynevac II must be immediately removed from service and marked as “UNUSABLE” until destroyed or subjected to maintenance by the user’s organization in accordance with section 9. Defects, damage, excessive wear and/or aging are generally not repairable. If detected, immediately remove the Dynevac II from use and mark it as “UNUSABLE” until destroyed. For final disposition, submit the Dynevac II to a competent person who is authorized to perform Formal Inspection. If there is any question as to repairability, contact MSA or a service center authorized in writing by MSA before further use of the Dynevac II.

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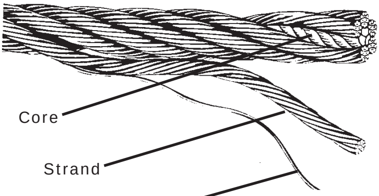
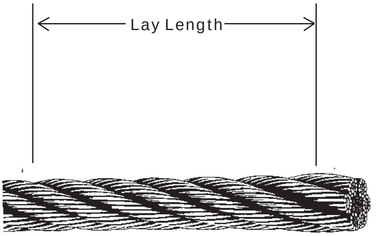
Composition of Wire Rope (Lifeline)



Measurement of Lay Length

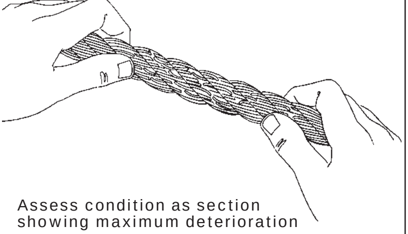


One revolution of a strand about the core

Correct Way to Remove Broken Wires

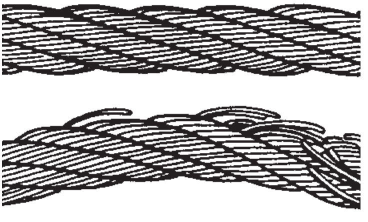
Assessment of Broken Wires

Replace wire rope if there are:
- 6 or more broken wires in one lay
- 3 or more broken wires in one strand in one lay



Assess condition as section showing maximum deterioration

Flex Wire Rope During Inspection



Flexing can reveal hidden breaks

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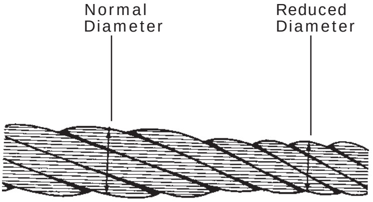
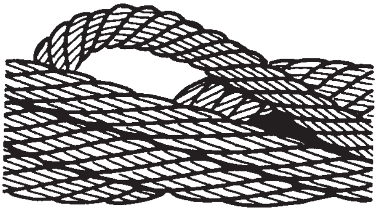
Change in Wire Rope Diameter



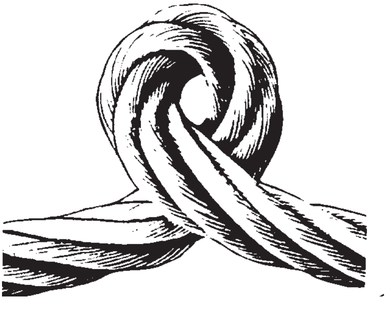
Crushed Wire Rope

Unlaying of Wire Rope

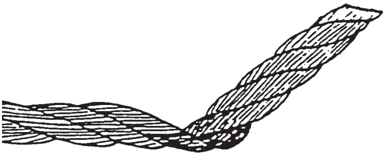


Bird-caging of Wire Rope

Kinked Wire Rope



Bent Wire Rope



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12.0 FORMAL INSPECTION

⚠ CAUTION

Only MSA or parties with written authorization from MSA may make repairs to the Dynevac II.

12.1 FORMAL INSPECTION FREQUENCY

The Dynevac II must be formally inspected by a competent person other than the user at intervals of no more than six months. (The qualifications of a competent person are established by OSHA.) If the Dynevac II is exposed to severe working conditions, more frequent formal inspections may be required. The frequency of inspection by a competent person should be established by the user's organization based on such factors as the nature and severity of workplace conditions, modes of use, and exposure time of the equipment. The competent person should perform a methodical and thorough visual and tactile inspection by following the inspection procedure in section 12.3. The inspection results should be recorded in the Formal Inspection Log and retained for reference. In addition, if the Dynevac II passes Formal Inspection, the competent person should mark the date (month/year) of Formal Inspection on the grid supplied with the labels on each Dynevac II. The user should never punch this grid; however, the user should check it before each use to be sure a Formal Inspection has been performed within the last six months.

12.2 CONTROL OF EQUIPMENT

The user's organization should establish and enforce a policy and procedure whereby any Dynevac II that is found to be defective, damaged, or in need of maintenance be immediately removed from use, marked as "UNUSABLE" and immediately thereafter submitted to custody of the competent person responsible for Formal Inspection. This has the benefits that: 1) defective equipment is secured from further use until proper action is taken; 2) uniform standards are applied for determining whether the equipment is acceptable or not acceptable for further use; 3) uniform methods of cleaning and other maintenance are applied; and 4) there is a central point for evaluation of conditions that may be recurring and require preventive measures such as coordination with the equipment manufacturer, selection of alternate equipment, additional training of equipment users, or changes to the workplace conditions.

12.3 FORMAL INSPECTION PROCEDURE

The Formal Inspection Procedure is similar to the user's inspection before each use described in section 11. However, it differs in three important respects, namely: 1) it is performed by a competent person other than the user who is trained and authorized to perform Formal Inspection for the user's organization; 2) it is more detailed and is methodically recorded on a Formal Inspection Log that is kept on file for future reference; and 3) it results in final disposition of the equipment as either "acceptable" (indicated by the formal inspector marking the current month/year in the Formal Inspection Grid on one of the product labels) or as "not acceptable" followed by destruction of the product. The described detailed inspection record keeping is needed in order to trace detected defects to their causes. A simplified alternative procedure is also explained below.

There are three forms that are important to the Formal Inspection Procedure. They are the Formal Inspection Diagram ("DIAGRAM"), the Formal Inspection Log ("LOG"), and the Formal Inspection Checklist ("CHECKLIST"). These forms relate and refer to each other so it is necessary to understand their purposes and uses before discussing the inspection procedure.

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12.3.1 DIAGRAM

This is a line drawing of the Dynevac II with numbered callouts of the parts. The numbers called out in the diagram correspond to those shown on the column titled "INSP. POINT" on the LOG.

12.3.2 LOG

This is the form to be used to record observations made during the Formal Inspection. The Model No., Serial No. and Date Made are recorded by the inspector from the information on the cover of this User Instruction and from the product label. The formal inspector's name and the inspection date are entered by the inspector. The "Disposition" entry is the last entry made on this form after all observations have been recorded. The entry is either "Acceptable" (A) or "Not Acceptable" (N). The columns on the LOG are as follows:

INSP. POINT

Inspection point. The Dynevac II part designated in the callouts on the DIAGRAM.

DESCRIPTION

Name of the Dynevac II inspection point. There are two broad categories of inspection points, namely, metallic parts and nonmetallic parts.

QTY/D

Quantity per Dynevac II. The quantity of each Dynevac II inspection point that must be inspected.

PTY

Priority. A Priority "1" indicates a critical part. If one or more not acceptable conditions are found by inspection of Priority 1 parts, the Dynevac II is not acceptable for use. A Priority "2" indicates a noncritical part. If three or more not acceptable conditions are found by inspection of Priority 2 parts, the Dynevac II is not acceptable for use.

COND.

Condition. The condition of the Dynevac II part is indicated here by entry of the appropriate Condition Code shown on the CHECKLIST (e.g. M0, N0 etc.). Alternatively, the inspector may simply enter "FAIL" if a defective condition exists and make no entry if no defect exists.

OVERALL ASSESS.

Overall assessment. The inspector's evaluation of the overall acceptability or non-acceptability of the part category (i.e. metallic, nonmetallic). The appropriate Overall Assessment Code defined on the CHECKLIST is entered here (e.g. MA, NA). Alternatively, the inspector may simply enter "FAIL" if a defective condition exists and make no entry if no defect exists.

COMMENTS

Indicate pertinent inspector observations here.

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12.3.3 CHECKLIST AND CODES

This is a table which categorizes the different types of Dynevac II parts into two broad categories (i.e. metallic, nonmetallic). For each of these categories, the formal inspector checks the Dynevac II parts for each of the associated conditions (e.g. deformed, fractured, missing, loose, etc.). The codes for the detected conditions are entered in the Condition column on the LOG (e.g. M0, N2, etc.). Overall assessment codes are given, along with the criteria for assigning them, so the inspector can decide if the Dynevac II is acceptable or not acceptable for further use (e.g. MA, NN). Alternatively, instead of using these codes, the inspector may simply enter "FAIL" if a defective condition exists and make no entry if no defect exists.

12.3.4 FORMAL INSPECTION PROCEDURAL STEPS

Step 1 Record on the LOG the Model No., Serial No. and Date Made information shown on this User Instruction and from the product labels. Record the inspector's name and inspection date.

Step 2 Arrange the Dynevac II so the parts to be inspected are readily visible.

Step 3 Starting with the metallic category of parts shown on the LOG, inspect each part (inspection point) one at a time. Refer to the DIAGRAM for identification of each Inspection Point. Each part must be inspected for the possible presence of the conditions shown on the CHECKLIST. Enter in the Condition column on the LOG the proper Condition Code (listed on the CHECKLIST) or "FAIL" if a defect exists. If there is any question whether the Dynevac II condition has materially changed since the last Formal Inspection, retrieve and review the prior Formal Inspection records for the specific Dynevac II.

Step 4 Repeat steps 2 and 3 for the nonmetallic categories of part types.

Step 5 Perform a functional test of the Dynevac II in the Fall Arrest Mode, including line extraction, retraction and lockup features. Upon completion of these functional tests, note the performance for extraction, retraction and lookup in the comments section on the Inspection Log in items 24, 25 and 26, respectively. The extraction functional test is performed by slowly pulling the line, with gloved hands, completely out of the Dynevac II housing. Note as the line is reeled from the drum if there is any sticking, hesitation, grinding, or other hindrances to the smooth deployment of the line. The retraction functional test is performed by slowly feeding the line back into the Dynevac II. The tension of the drum on the line as it draws the line into the Dynevac II should be constant, the line should not snag or catch and there should not be any grinding noise throughout the entire retraction of the line. The lock up test is performed by pulling rapidly on the line and observing that the internal locking mechanism of the Dynevac II immediately stops the deployment of the line. Attach the installation bracket of the Dynevac II to an anchorage connector that is within reach of the competent person inspector and does not expose the inspector to any risk of fall or injury. With gloved hands, grasp the snaphook on the end of the line and slowly pull to deploy several inches of the line. While the line is feeding out slowly, and with a sudden and forceful motion, pull the line tight. The internal locking mechanism should immediately stop the line from further deployment. Continue to hold tension on the line and note that the line should not extract any further. Release tension on the line and note that the line should now continue to extract (or retract) as tension is slowly increased (decreased). Repeat the lookup test several times and at different points along the extracted length of the line. Record the results of the functional tests in the appropriate sections of the Inspection Log.

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Step 6 Perform a functional test of the Dynevac II in Emergency Retrieval Mode, including lifting and lowering functions. Record the results of the functional tests in the appropriate sections of the Inspection Log.

Step 7 Perform a functional test of the Dynevac's Field Reset Capability by securing the unit and applying a load.. With gloved hands, grasp the snaphook on the end of the line and attach a weight to provide constant load force, or apply constant hand tension. Pull all pins and crank the handle in the counter clockwise direction to lower line, while still applying load tension. Next, crank the handle in the clockwise direction to raise the line, still keeping load tension steady. Record the results of these functional tests in the appropriate sections of the Inspection Log.

⚠ CAUTION

Return the Dynevac II to Fall Arrest Mode, following the steps in section 8.3.4, before proceeding with the inspection process.

Step 8 Determine whether the part (inspection point) is acceptable or not acceptable. If a Priority 1 inspection point has a defective condition, enter in the Overall Assessment column of the LOG the proper code taken from the CHECKLIST (e.g. MN, NN) or simply "FAIL." For Priority 2 inspection points, count the number of defective conditions identified in the Condition column of the LOG. If there is a total of three or more defective conditions for Priority 2 inspection points the Dynevac II is not acceptable for further use.

Step 9 Determine disposition of the Dynevac II. If it has been determined that the Dynevac II is not acceptable, enter "N" or "FAIL" in the Disposition space on the LOG. In addition, a notation should be made in this space as to whether the Dynevac II is to be destroyed, returned to manufacturer/distributor, etc.

Step 10 If it has been determined that the Dynevac II is acceptable for further use, enter "A" or "PASS" in the Disposition space on the LOG. Mark the Formal Inspection Grid on the appropriate Dynevac II label with the date (month/year) corresponding to the inspection date to indicate to Dynevac II users that the product has passed inspection as of that date.

Step 11 File the LOG for future reference.

12.4 FORMAL INSPECTION CHECKLIST AND CODES

TYPE OF PART INSPECTED	CONDITION	COND. CODE	OVERALL ASSESSMENT CODE
Metallic	Deformed/fractured Corroded/deep pits Missing/loose Heat exposure Chemical exposure Burrs/sharp edges Cuts/deep nicks Malfunction Other No visible change	M1 M2 M3 M4 M5 M6 M7 M8 M9 M0	MA- (Metallic acceptable) MN- (Metallic not acceptable)
Non-Metallic	Cut/broken Wear damage Missing/loose Burns/heat exposure Chemical exposure Cracked/Split No visible change	N1 N2 N3 N4 N5 N6 N0	NA- (Non-Metallic acceptable) NN- (Non-Metallic not acceptable)
Snaphook	Deformed/fractured Corroded/deep pits Missing/loose Heat exposure Chemical exposure Burrs/sharp edges Cuts/deep nicks Malfunction Other No visible change	S1 S2 S3 S4 S5 S6 S7 S8 S9 S0	SA- (Snaphook acceptable) SN- (Snaphook not acceptable)
Wire rope (cable)	Cut/broken wire Abrasion/wear/corrosion Partially missing/altered Burns/heat exposure Chemical exposure Kinked/unlayed strands Reduced diameter Malfunction Other No visible change	C1 C2 C3 C4 C5 C6 C7 C8 C9 C0	CA- (Cable acceptable) CN- (Cable not acceptable)
Functional Test	Fall Arrest Mode Emergency Retrieval Mode Field Reset Capability	Blank Blank Blank	FA- (Functional Acceptable) FN- (Functional Not Acceptable)

LEGEND

Disposition: A - (Acceptable) N - (Not acceptable) Other N7
Enter "A" (or "PASS") or "N" (or "FAIL") in "Disposition" blank on Formal Inspection Log.

Criteria for disposition of "N" (Not acceptable) :

(1) If there is one or more Overall Assessment Code of "N" type (e.g. MN, PN, SN or CN) on a Priority 1 item.

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12.5 FORMAL INSPECTION LOG, EXAMPLE

Model No.: ***10007782***
Serial No.: ***V01234A***
Date Made: ***10/12/98***

Inspector: ***J.W. Doe***
Inspection Date: ***11/13/98***
Disposition: ***N - See item 24. Return for factory repair.***

INSP. POINT	DESCRIPTION	QTY / D	PTY	COND. (a)	OVERALL ASSESS. (a)	COMMENTS
Dynevac II Body						
METALLIC PARTS						
1	Housing, front	1	1	M6	MA	Scratches - no damage
2	Housing, back	1	1	M0	MA	
3	Security rivets	2	1	M0	MA	
4	Housing fasteners (c)	8	1	M0	MA	
5	Torque nut	1	1	M0	MA	
6	Axle nut	1	1	M0	MA	
7	Grip	1	1	M0	MA	
8	Crank Handle	1	1	M0	MA	
9	Split Ring	1	1	M0	MA	
10	Handle rention pin/ring	2	1	M0	MA	
11	Reset Pin	1	1	M0	MA	
12	Hex hd bolt w/red paint seal	1	1	M0	MA	
13	Installation bracket	1	1	M1	MA	Bracket bent
14	Serial number tag	1	1	M0	MA	
NON-METALLIC PARTS						
15	Handle knob	1	1	N0	NA	
16	Cover, Handle Hub	1	1	N0	NA	
17	Label	1	1	N2	NA	Scuffed, still legible
18	Cable collar	1	1	N0	NA	
Wire Rope						
19	Wire rope (lifeline)	1	1	C0	CA	
20	Ball stopper	1	1	C0	CA	
21	Washer	1	1	C0	CA	
22	Thimble	1	1	C0	CA	
23	Sleeves	2	1	C0	CA	
24	Extraction, functional test	-	1	C0	CA	
25	Retraction, functional test	-	1	C8	CA	Doesn't retract smoothly, sticks
26	Lock up, functional test	-	1	C0	CA	
27	Field Reset, functional test	-	1	C0	CA	
Swivel Snaphook						
28	Hook body	1	1	S0	SA	
29	Side plates	2	1	S0	SA	
30	Swivel eye	1	1	S0	SA	
31	Load indicator	1	1	S0	SA	
32	Gate	1	1	S0	SA	
33	Trigger	1	1	S0	SA	
34	Rivets	3	1	S0	SA	
35	Large rivet	1	1	S0	SA	
36	Label	1	1	S0	SA	

(a) Optional simplified PASS/FAIL inspection format: When an acceptable condition is found, the entry in the COND. and OVERALL ASSESS. columns may be left blank. When a defective condition is found, enter "FAIL." The inspection may end upon detection of a single Priority 1 defect or three Priority 2 defects.

(b) Blank copies of the LOG, with associated CHECKLIST and DIAGRAM, are available from MSA Rose. Call toll-free at 1-800-722-1231.

(c) Qty of 12 on 95 ft. (30 m) models. Qty of 8 on 50 ft. (16 m) models.

EXAMPLE

12.5 FORMAL INSPECTION LOG

Model No.:____________ Inspector:____________
Serial No.:____________ Inspection Date:____________
Date Made:____________ Disposition:____________

INSP. POINT	DESCRIPTION	QTY / D	PTY	COND. (a)	OVERALL ASSESS. (a)	COMMENTS
Dynevac II Body						
METALLIC PARTS						
1	Housing, front	1	1			
2	Housing, back	1	1			
3	Security rivets	2	1			
4	Housing fasteners (c)	8	1			
5	Torque nut	1	1			
6	Axle nut	1	1			
7	Grip	1	1			
8	Crank Handle	1	1			
9	Split Ring	1	1			
10	Handle rention pin/ring	2	1			
11	Reset Pin	1	1			
12	Hex hd bolt w/red paint seal	1	1			
13	Installation bracket	1	1			
14	Serial number tag	1	1			
NON-METALLIC PARTS						
15	Handle knob	1	1			
16	Cover, Handle Hub	1	1			
17	Label	1	1			
18	Cable collar	1	1			
Wire Rope						
19	Wire rope (lifeline)	1	1			
20	Ball stopper	1	1			
21	Washer	1	1			
22	Thimble	1	1			
23	Sleeves	2	1			
24	Extraction, functional test	-	1			
25	Retraction, functional test	-	1			
26	Lock up, functional test	-	1			
27	Field Reset, functional test	-	1			
Swivel Snaphook						
28	Hook body	1	1			
29	Side plates	2	1			
30	Swivel eye	1	1			
31	Load indicator	1	1			
32	Gate	1	1			
33	Trigger	1	1			
34	Rivets	3	1			
35	Large rivet	1	1			
36	Label	1	1			

(a) Optional simplified PASS/FAIL inspection format: When an acceptable condition is found, the entry in the COND. and OVERALL ASSESS. columns may be left blank. When a defective condition is found, enter “FAIL.” The inspection may end upon detection of a single Priority 1 defect or three Priority 2 defects.

(b) Blank copies of the LOG, with associated CHECKLIST and DIAGRAM, are available from MSA Rose. Call toll-free at 1-800-722-1231.

(c) Qty of 12 on 95 ft (30 m) models. Qty of 8 on 50 ft (16 m) models.

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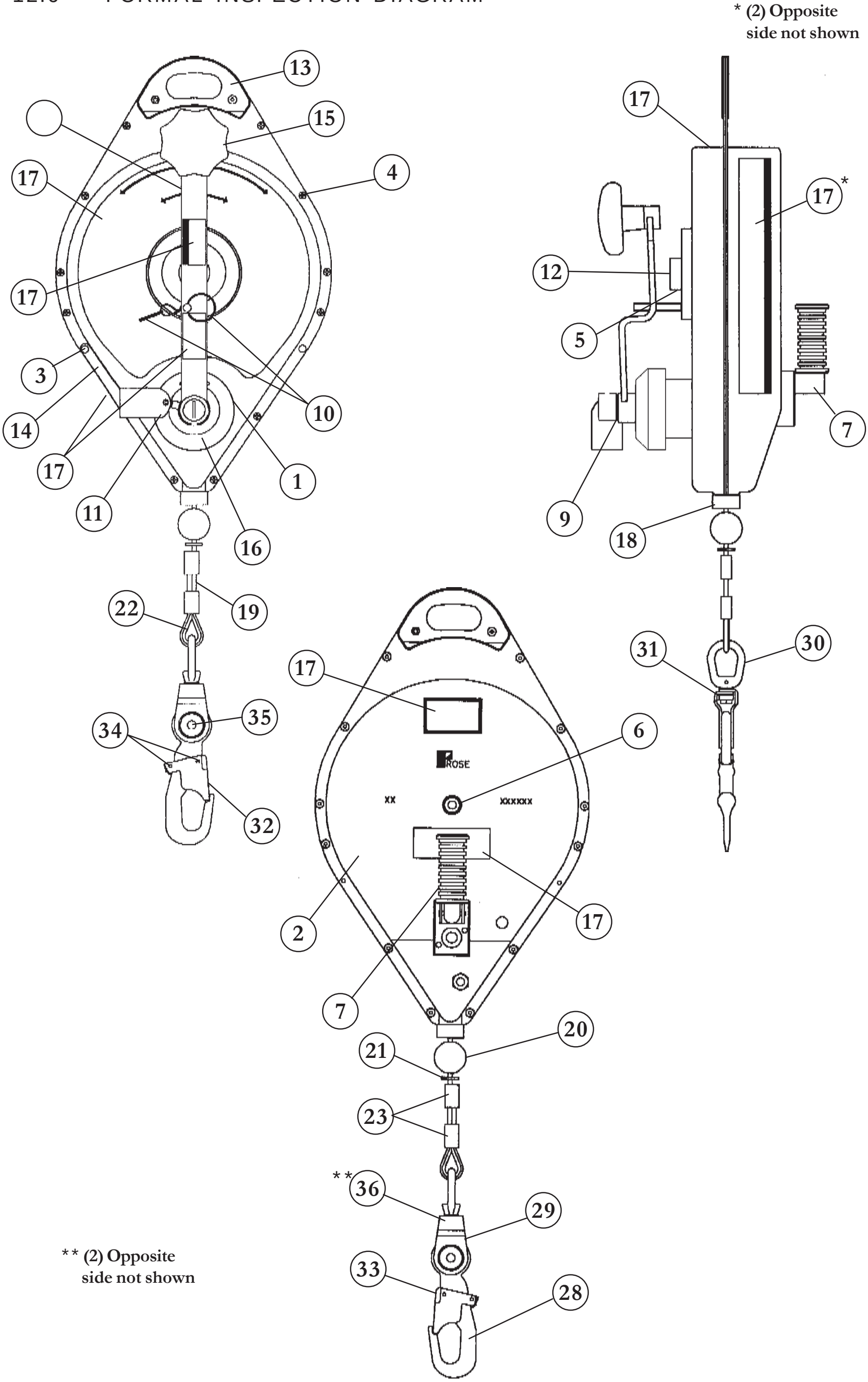
12.6 FORMAL INSPECTION DIAGRAM



13.0 SERVICE

13.1 FACTORY SERVICE

Proper maintenance and repair of the Dynevac II requires return of the unit to MSA Rose, (or to a person authorized in writing by MSA Rose) every two years or at any time that competent person inspection suggests the need to remove the unit from use. See sections 11 and 12 for inspection details. The only maintenance that may be performed by the user is cleaning, working line lubrication and removal of broken wire strands from the line. All other maintenance must be performed by MSA Rose. The user must never attempt to repair or alter the unit. There are no internal parts which are serviceable or replaceable by the user.

13.2 OWNER REGISTRATION

When the Dynevac II is purchased, the first thing the owner (user) must do is read this User Instruction and then return the Owner Registration card packed with the device. Each unit has a unique serial number which identifies all information associated with the unit. The serial number enables MSA Rose to identify when the product was made; related engineering, manufacturing, testing and quality control records; related service records; and date it was sold and shipped to the user or a MSA Rose distributor. The owner registration card contains information which is vital to the maintenance of the device. It must be completely and accurately filled out and returned to MSA Rose immediately after purchase.

Be sure to enter the permanent address and telephone number of the owner. Do not enter the address and phone number of a temporary job site or temporary office. Type or print legibly in ink. This is a permanent record.

13.3 WHEN FACTORY SERVICE IS NECESSARY

The Dynevac II must be returned to MSA Rose or an authorized factory service center upon discovery during competent person inspection of any condition which requires removing the device from use. See sections 11 and 12.

When the user inspects the product, the Service Date Label must always be present and legible. If it is not, remove the product from use and contact MSA Rose.

13.4 HOW TO OBTAIN FACTORY SERVICE

When factory service for the Dynevac II is required for any reason, the steps below must be carefully followed:

Step 1 Prepare and mail a purchase order for the requested service to:

MSA Rose
2250 South Tejon Street
Englewood, Colorado 80110-1000

Step 2 The purchase order must contain:

a) Owner's (company) name, address, telephone and fax number;

b) Name of owner's employee who can be contacted to authorize repair charges, if any;

c) Dynevac II serial number, type number and last factory service date;

d) Brief explanation of service and known repairs to be performed (e.g. kinked line, broken snaphook, etc.);

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e) The Statement: "Basic service charge authorized - advise price of repairs." Please note that any unit sent to MSA Rose for service must be disassembled, inspected and reassembled by MSA Rose in order to determine if service is required. Therefore, the minimum service charge must always be made;

f) Billing address if the owner already has an account with MSA Rose. Otherwise, MSA Rose terms are C.O.D. in the continental USA and cash in advance, including freight charges elsewhere.

g) Return shipment address. MSA Rose freight terms are prepaid and add if the owner has an account; otherwise the terms are freight collect.

Step 3 Ship the unit, freight prepaid, to MSA Rose or an authorized service center designated in writing by MSA Rose. If a unit is received with freight due it will not be accepted. The User Instructions and Service Log must be securely enclosed in the shipping container with the unit. If it is not, a new one will be sent back with the return of the serviced unit and a charge will be assessed. Use the original Dynevac II shipping container for shipment. Otherwise, pack the unit very securely to prevent shipping damage.

Step 4 Upon receipt of the unit and purchase order, MSA Rose will inspect the Dynevac II and contact the company's competent person to advise of required service and charges, if any, which are in excess of the minimum service charges. If the service charge are within the minimum for service, the work will be performed by MSA Rose and return shipped without further contact.

Step 5 Upon completing the authorized service work, MSA Rose will record the service in the Factory Service Log in Section 13.0. of this instructions and return the instructions with the unit to the owner.

13.5 SERVICE AND INSPECTION LOGS

It is a requirement of section 11 and 12 that the Dynevac II be formally inspected at least every six months or immediately after it has been subjected to the forces of arresting a fall. The Dynevac II must be reset (if used in the emergency retrieval mode) at the MSA Rose factory or an authorized factory service center. It is the responsibility of the user and the user's management to perform timely formal inspections and log such inspections.

13.6 FACTORY SERVICE LOG

This Factory Service Log is to be filled in only by MSA Rose or an authorized factory service center. At the time the unit is initially shipped from MSA Rose, the date of manufacture, MSA Rose part number, serial number and type number will be entered on the Log. When this manual is returned with the unit at the time of factory service, MSA Rose personnel will enter the printed name and written initials of the service man, printed name and initials of the quality control inspector, the Inspection/Service Report number. The Inspection/Service Report is a detailed report of factory service retained permanently by MSA Rose. It is available for examination upon request.

13.7 INSPECTION LOG

This log must be filled out by a competent person or qualified engineer at each inspection or immediately after the device experiences an impact force. MSA Rose, will make the appropriate entries at the time of factory service. When the unit is initially shipped from MSA Rose, part number and date of manufacture will have been entered in all places.

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Side one of the Inspection Log must be filled out column-wise. Use a ball point pen. Enter the date of inspection and the inspector's name (printed clearly) in the leftmost blank column. Proceed down the column using the inspection categories and steps shown on the left as a checklist in conjunction with the inspection procedures in section 12 of this user instruction. If the unit passes the inspection step, enter "OK" in the adjacent space of the column for this particular inspection. If at any point in the inspection procedure the unit fails to pass an inspection step, take the action specified in the appropriate subsection of section 11 and make a notation in the Inspection Log. Always consider the question of whether the unit will be safe until the next inspection.

Side two of the Inspection Log deals only with the detailed line inspection in accordance with section 11 of this manual. It must be filled out row-wise. Inspection of the cable should be carried out beginning from the snaphook and going to the extreme opposite end of the extended working line. Observations along the length of the line must be entered by location on the line relative to the thimble. If at any point in the inspection process the line fails to pass inspection, take the action specified in the appropriate subsection of section 11. Always remember to refer back to previous inspections to see if there has been a cumulative deterioration that requires action. Always consider the question of whether the cable will be safe until the next inspection.

This User Instruction is the property of:

Owner's Name: ____________________

Competent Person's Name: ____________________

Permanent Address: ____________________

Telephone: ____________________

Fax: ____________________

This User Instruction contains original information of importance to the owner. Please return it to the owner/competent person or contact same without delay. If the above owner cannot be reached, please return this User Instruction to MSA Rose or contact same.

THANK YOU.

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FACTORY SERVICE LOG

(Print clearly using ball point pen. To be filled in by MSA Rose only.)

Serial No.____________________ Part No.______________________ Date of Mfg.___________

Date of Factory Service	Serviceman's Name (print)	Serviceman's Initials	Inspector's Name (print)	Inspector's Initials	Inspection/Service Report No.	Next Factory Service Date

DYNEVAC II SELF-RETRACTING LANYARD (SRL)
AND EMERGENCY RESCUER

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OWNER REGISTRATION

IMPORTANT: Fill out this form at the time of purchase. A duplicate is provided with each new unit which must be filled out and returned to MSA Rose. If ownership changes, the new owner must contact MSA Rose to reregister the unit.

Cable: Galvanized Stainless Steel

Serial Number: ________________ Model Number: ________________

OWNER:

Name:

Permanent Address:

Telephone:

Dynevac II Self-Retracting Lanyard (SRL) and Emergency Rescuer

Custodian and Title:

PURCHASED FROM:

Name:

Address:

DATE OF PURCHASE:

Month Day Year

________ ________ ________

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WARRANTY

Express Warranty – MSA warrants that the product furnished is free from mechanical defects or faulty workmanship for a period of one (1) year from first use or eighteen (18) months from date of shipment, whichever occurs first, provided it is maintained and used in accordance with MSA's instructions and/or recommendations. Replacement parts and repairs are warranted for ninety (90) days from the date of repair of the product or sale of the replacement part, whichever occurs first. MSA shall be released from all obligations under this warranty in the event repairs or modifications are made by persons other than its own authorized service personnel or if the warranty claim results from misuse of the product. No agent, employee or representative of MSA may bind MSA to any affirmation, representation or modification of the warranty concerning the goods sold under this contract. MSA makes no warranty concerning components or accessories not manufactured by MSA, but will pass on to the Purchaser all warranties of manufacturers of such components. THIS WARRANTY IS IN LIEU OF ALL OTHER WARRANTIES, EXPRESS, IMPLIED OR STATUTORY, AND IS STRICTLY LIMITED TO THE TERMS HEREOF. MSA SPECIFICALLY DISCLAIMS ANY WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE. For additional information please contact the Customer Service Department at 1-800-MSA-2222 (1-800-672-2222).

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Note: While uses and performance capabilities are described, under no circumstances shall the product 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 the user instructions contain the complete and detailed information concerning proper use and care of the product.

Offices and representatives in principal cities worldwide.
In U.S. call the Customer Service center at (800) 672-2222
or fax at (800) 967-0398
Technical Support Line 1-888-421-8324
In Canada 1-888-396-1067
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