

INCH-POUND

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SUPERSEDING

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MILITARY STANDARD

INDUSTRIAL SAFETY BELTS, STRAPS, AND RELATED EQUIPMENT



AMSC N/A

FSC 4240

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FOREWORD

1. This Military Standard is approved for use by all Departments and Agencies of the Department of Defense.
2. Beneficial comments (recommendations, additions, deletions) and any pertinent data which may be of use in improving this document should be addressed to: Commander, U.S. Army Chemical Research, Development and Engineering Center, Attn: SMCCR-SPT-S, Aberdeen Proving Ground, MD 21010-5423, by using the self-addressed Standardization Document Improvement Proposal (DD Form 1426) appearing at the end of this document or by letter.
3. This standard is approved for use by all Departments and Agencies of the Department of Defense in the selection of items for application. It is intended to prevent the entry of unnecessary items (sizes, types, varieties) into the Department of Defense logistics system. This document is not intended to restrict any service in selecting new items resulting from state-of-the-art changes.

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1. SCOPE

1.1 Scope. The purpose of this standard is to present the nomenclature, specification requirements, military uses, and safety information for industrial safety belts, straps, harnesses, lanyards, and related equipment. The standard does not necessarily include all of those items which are commercially available. It does contain items preferred for use in the selection of industrial safety belts, straps, harnesses, lanyards, and related equipment, for application by the Department of Defense.

1.2 Application. Industrial safety belts, straps, harnesses, lanyards, and related equipment are used by linemen, working on poles, by construction workers in elevated positions, and personnel working in fall-hazardous situations aboard ships, submarines, and ashore.

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2. APPLICABLE DOCUMENTS

2.1 Government documents.

2.1.1 Specifications, standards, and handbooks. The following specifications, standards, and handbooks form a part of this document to the extent specified herein. Unless otherwise specified, the issues of these documents are those listed in the issue of the Department of Defense Index of Specifications and Standards (DODISS) and supplement thereto, cited in the solicitation (see 6.2).

SPECIFICATIONS

FEDERAL

- | | |
|-----------|---|
| A-A-1776 | - Strap, Safety, Industrial (Pole) |
| A-A-1977 | - Belt, Safety (Lineman's) |
| KK-B-151 | - Belt, Lineman's; and Strap, Pole, Linemans Type |
| RR-S-1301 | - Safety Equipment, Climbing |

MILITARY

- | | |
|-------------|---|
| MIL-L-18045 | - Life Preservers, Vest, Inherently Buoyant |
| MIL-R-24337 | - Rope, Nylon, Plaited |
| MIL-H-24460 | - Harness, Safety; and Lanyards, Safety and Working |
| MIL-W-83420 | - Wire Rope, Flexible, for Aircraft Control |

STANDARDS

MILITARY

- | | |
|---------|--------------------------------|
| MS22046 | - Ring - Parachute Harness "D" |
|---------|--------------------------------|

(Unless otherwise indicated, copies of federal and military specifications, standards, and handbooks are available from the Naval Publications and Forms Center, (ATTN: NPODS), 5801 Tabor Avenue, Philadelphia, PA 19120-5099.)

2.1.2 Other Government documents, drawings, and publications. The following other Government documents, drawings, and publications form a part of this document to the extent specified herein. Unless otherwise specified, the issues are those cited in the solicitation.

CODE OF FEDERAL REGULATIONS (CFR)

- | | |
|--------------|---|
| Title 29 | - Department Of Labor, Occupational Safety And Health |
| Chapter XVII | Administration |

DEPARTMENT OF DEFENSE (DOD)

- | | |
|---------------|---|
| DOD 4160.21-M | - Defense Utilization And Disposal Manual |
|---------------|---|

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2.2 Non-Government publications. The following document(s) form a part of this document to the extent specified herein. Unless otherwise specified, the issues of the documents which are DOD adopted are those listed in the issue of the DODISS cited in the solicitation. Unless otherwise specified, the issues of documents not listed in the DODISS are the issues of the documents cited in the solicitation (see 6.2).

AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)

ASTM F 887 - Standard Specification for Personal Climbing Equipment.

(Application for copies should be addressed to ASTM, 1916 Race Street, Philadelphia, PA 19103.)

(Non-Government standards and other publications are normally available from the organizations that prepare or distribute the documents. These documents also may be available in or through libraries or other informational services.)

2.3 Order of precedence. In the event of a conflict between the text of this document and the references cited herein, the text of this takes precedence. Nothing in this document, however, supersedes applicable laws and regulations unless a specific exemption has been obtained.

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3. DEFINITIONS

The following definitions are in accordance with ASTM F 887 and part 1926 of 29 CFR where applicable.

3.1 Billet - The free (buckle hole) end of a belt or strap, as opposed to the tongue (buckle) end, which is designed to pass through the buckle for closing.

3.2 "D" ring (dee ring) - A steel forging in a circle configuration, with an integral stirrup to accept the belt, assembled into a body belt for the purpose of accepting the snaphook of a pole strap or lanyard.

3.3 Keeper, snaphook - A component of the snaphook, used as a latching device, and held in a closed position by a spring.

3.4 Lanyard safety - A rope suitable for supporting one person, one end of which is fastened to a safety belt or harness, and the other end is secured to a substantial object or a safety line.

3.5 Lifeline - A rope, suitable for supporting one person, to which a lanyard or safety belt (or harness) is attached.

3.6 Nose, snaphook - The curved end of the snaphook which the keeper rests on. It is rounded and overlaps the keeper latch in such a manner as to prevent the "D" ring (dee ring) from releasing the snaphook.

3.7 Safety belt (body belt) - A device, worn around the waist, which by reason of its attachment to a lanyard and lifeline or a structure will prevent a person from falling.

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4. GENERAL REQUIREMENTS

4.1 Packaging data and labeling. Packaging, packing, labeling and marking shall be as specified in the contract or order.

4.2 Safety. The Occupational Safety and Health Administration (OSHA) regulations applicable to safety belts, straps, lanyards, lifelines, and associated hardware are stated in 29 CFR, Chapter XVII, Parts 1910 and 1926.

4.2.1 Telecommunication lineman's safety equipment. The general and specific requirements for this equipment are stated in 29 CFR 1910.268(g)(2).

4.2.1.1 General requirements. The general requirements for telecommunication lineman's body belts, safety straps, lanyards, and hardware are stated in 29 CFR 1910.268(g)(2)(i). Included are: (A) hardware steel; (B) buckles; (C) "D" rings; and (D) snaphooks.

4.2.1.2 Specific requirements. Specific requirements are stated in 1910.268(g)(2)(ii) for: (A) dielectric test of fabric, and leakage current test of fabric and leather; (B) cushion part of body belt; (C) [Reserved]; (D) "D" ring bar liners; (E) stitching; (F) snaphook keepers spring tension; and (G) safety strap, lanyard, and body belt tests.

4.2.2 Lineman's safety equipment (other than for telecommunications). The general and specific requirements for this equipment are stated in 29 CFR 1926.959.

4.2.2.1 General requirements. The general requirements for lineman's body belts, safety straps, and lanyards are stated in 29 CFR 1926.959(a). Included are: (1) hardware steel; (2) buckles; (3) "D" rings; and (4) snaphooks.

4.2.2.2 Specific requirements. Specific requirements are stated in 1926.959(b) for: (1) dielectric test of fabric, and leakage current test of fabric and leather; (2) cushion part of body belt; (3) tool loops; (4) "D" ring bar liners; (5) stitching; (6) snaphook keepers; and (7) testing of safety straps, body belts, and lanyards.

4.2.3 Safety equipment for construction industry. The requirements for safety belts, lifelines, lanyards, and hardware steel for safety belts and lanyards, used in the construction industry are stated in part 1926 of 29 CFR .

4.3 Storage. Belts, straps, and related equipment covered by this standard shall be stored in their shipping containers in a cool dry place, away from heat sources and direct sunlight. After five years of storage, belts, straps, and related equipment should be subjected to appropriate physical tests in accordance with specification requirements before issuance.

4.4 Disposal of excess or unserviceable material. To minimize disposal problems, it is recommended that no more than a one year's supply of each item listed in this standard be stocked. When stocks have been declared excess or unserviceable, they will be disposed of in accordance with the Defense Utilization and Disposal Manual, DOD 4160.21-M, and applicable DOD Policy Memoranda. Guidance can be obtained from your servicing Defense Reutilization and Marketing Office (DRMO) on procedures required for proper reporting and turn-in.

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4.4.1 DISCLAIMER. RECOMMENDED DISPOSAL INSTRUCTIONS ARE FORMULATED FOR USE BY ELEMENTS OF THE DEPARTMENT OF DEFENSE. THE UNITED STATES OF AMERICA IN NO MANNER WHATSOEVER EITHER EXPLICITLY OR IMPLICITLY WARRANTS, STATES, OR INTENDS SAID INSTRUCTION, TO HAVE ANY APPLICATION, USE OR VIABILITY BY OR TO ANY PERSON OR PERSONS CONTRACTING OUTSIDE THE DEPARTMENT OF DEFENSE OR ANY PERSON OR PERSONS CONTRACTING WITH ANY INSTRUMENTALITY OF THE UNITED STATES OF AMERICA AND DISCLAIMS ALL LIABILITY FOR SUCH USE. ANY PERSON USING THESE INSTRUCTIONS WHO IS NOT A MILITARY OR CIVILIAN EMPLOYEE OF THE UNITED STATES OF AMERICA SHOULD SEEK COMPETENT PROFESSIONAL ADVICE TO VERIFY AND ASSUME RESPONSIBILITY FOR THE SUITABILITY OF THESE INSTRUCTIONS TO THEIR PARTICULAR SITUATION REGARDLESS OF SIMILARITY TO A CORRESPONDING DEPARTMENT OF DEFENSE OR OTHER GOVERNMENT SITUATION.

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5. DETAILED REQUIREMENTS

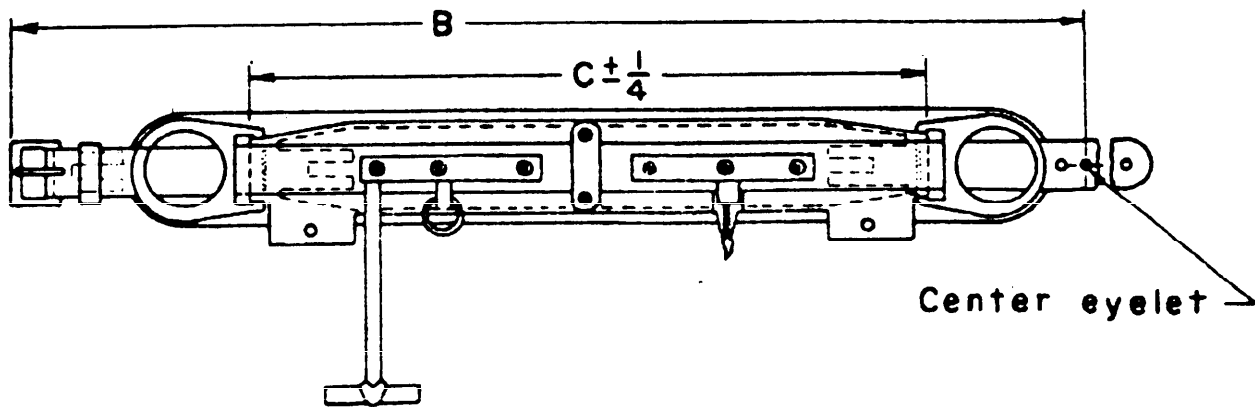
5.1 Name. Belt, Safety, Lineman's5.1.1 Specifications.

A-A-1977, Belt, Safety (Lineman's).

KK-B-151, Belt, Lineman's; and Strap, Pole, Lineman's Type.

ASTM F 887, Personal Climbing Equipment.

5.1.2 Technical description. Lineman's safety belts shall consist primarily of a body pad, "D" ring, strap with two "D" rings, waist strap, and tool loops. An illustration of a typical lineman's safety belt is shown in figure 1.



NOTE: Dimensions: B - body belt (waist) strap size
C - "D" (Dee) size.

FIGURE 1. Typical illustration of belt, safety, industrial, lineman's type.

Belts can be furnished in the following sizes in accordance with A-A-1977 as shown in Table I.

TABLE I. Belt sizes (A-A-1977).

Waist Size, in.	"D" Size, in.
34 + 1/2	18
36 + 1/2	19
38 + 1/2	20
40 + 1/2	21
42 + 1/2	22
44 + 1/2	23
46 + 1/2	24
48 + 1/2	25

Belts can be furnished in the following sizes in accordance with KK-B-151 as shown in Table II.

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TABLE II. Belt sizes (KK-B-151).

Belt Size	Waist Size, in. (approx)	"D" Size, in.
34	34	19
36	36	20
38	38	21
40	40	22
42	42	23
44	44	24
46	46	26
48	48	28

Belts can be furnished in the following sizes in accordance with ASTM F 887 as shown in Table III.

TABLE III. Available belt sizes (ASTM F 887).

"D" Size, in.	Belt Strap Size, in.		Center Hole, in.
	Min	Max	
18	32	40	36
19	33	41	37
20	34	42	38
21	36	44	40
22	37	45	41
23	38	46	42
24	40	48	44
25	41	49	45
26	42	50	46
27	44	52	48
28	45	53	49
29	46	54	50
30	47	55	51

5.1.2.1 Body pad. In accordance with federal specifications, the body pad backing shall be harness leather, nylon fabric, or webbing of plied construction, and of a color furnished commercially by the manufacturer. The nylon fabric or webbing shall be impregnated with neoprene. The body side shall be lined with chrome leather, or a synthetic of proven equal or superior strength and durability, having rolled edges, and no exposed rivets. The body pad shall have a width not less than 4-1/2 inches and a length not less than the "D" size plus the "D" rings. If circle "D" rings are used, the "D" rings may extend beyond the body pad a maximum of 1 inch on each end.

In accordance with ASTM specifications, the cushion part of the body belt shall contain no exposed rivets on the inside and shall be at least 3 inches (7.6 cm) in width. In accordance with OSHA requirements, the cushion part of the body belt shall be at least five thirty-seconds (5/32) inch (3.97 mm) thick, if made of leather. The belt shall have pocket tabs extending at least 1-1/2 inches (3.8 cm) down, and with the point of attachment at least 3 inches back of inside of the circle of dee rings on each side for attachment of plier or tool pockets. On shifting dee belts, the measurement for pocket tabs shall be taken when the dee ring section is centered. In accordance with OSHA requirements for linemen's body belts, a maximum of four tool loops shall

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be so situated on the body belt that four inches of the body belt in the center of the back, measuring from D ring to D ring shall be free of tool loops.

5.1.2.2 "D" ring strap. In accordance with federal specifications, the "D" ring strap shall be made of plied nylon cloth or webbing and shall be neoprene impregnated. The individual plies shall be folded so that no cut edges are exposed, and shall be impregnated and vulcanized so that the plies are not readily separable except by chemical means. The strap shall have minimum cross-sectional dimensions of 5/32 inch by 1-3/4 inch. The "D" ring strap shall be centrally fastened to the body pad by rivets, stitches, or both.

5.1.2.3 Circle "D" rings. In accordance with federal specification requirements, circle "D" rings shall be made of forged steel, and shall be either cadmium or zinc plated. One "D" ring shall be secured to each end of the "D" ring strap with a suitable metal safety liner used between the "D" ring bar and the fabric enclosing it to prevent wear of the strap fabric. The "D" rings shall have no sharp edges.

In accordance with ASTM specification requirements, circle "D" ring design shall be such so that the "D" ring strap and the body strap do not pass through or attach to that part of the "D" ring to which the pole strap rings are engaged. The "D" rings shall be installed in the body belt in such a manner that vertical travel in the assembly is prevented. Suitable copper, steel, or equivalent liners shall be used around the bar of the "D" rings to prevent wear. "D" rings shall withstand a 5,000 pound force (22 kN) tensile test without cracking or breaking.

5.1.2.4 Waist straps. In accordance with federal specifications, waist straps shall be made of plied neoprene-impregnated nylon cloth, and shall be secured to the body pad "D" ring strap assembly by a loop or loops. Cross-sectional dimensions of waist strap shall be not less than 3/32 inch by 1-1/2 inch. The length from the buckle end to the center adjustment hole of the other end of belt shall equal the waist size designation of the belt specified. Four additional adjustment holes on 1-inch centers on both sides of the center adjustment hole shall be provided to permit a total adjustment of 8 inches. The adjustment holes shall be of a size that will prevent accidental disengagement of the buckle tongue.

In accordance with ASTM specifications, belt straps shall be made of plied fabric impregnated with neoprene or its equivalent, and constructed so that no raw edges are exposed. Buckle holes shall be spaced on 1-inch (2.5 cm) centers, round or oval, to accommodate the tongue of the belt buckle. Buckle holes shall not be in excess of 1/4 inch (6.4 mm) in diameter if round, or 1/4 by 3/8 inch (6.4 by 9.5 mm) if oval shaped, the greater dimension to be in the direction of the length of the strap. For grommet construction, holes shall be no larger than No. 2 grommet. No hole shall be permitted within 4 inches (10 cm) of the end of the strap. The minimum body strap width shall be 1-3/4 inches (4.5 cm)

5.1.2.5 Buckle. In accordance with federal specifications, body strap buckle frames shall be fabricated of a forging quality steel by the forge process. The buckles shall be either cadmium or zinc plated. They shall be reasonably smooth, and no sharp edges shall be permitted.

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In accordance with federal and ASTM specification requirements, buckles shall withstand a 2,000 pound force (8.9 kN) tensile test with a maximum permanent deformation no greater than 1/64 inch (0.4 mm).

5.1.2.6 Keeper. In accordance with federal specifications a suitable keeper shall be affixed to the buckle end of the belt strap to retain the strap overlap extending from the buckle.

5.1.2.7 Tool loops. In accordance with federal specifications, tool loops shall be made of leather or plied, neoprene-impregnated nylon cloth, riveted to the belt strap. The cross-sectional dimensions of the tool loops shall be no less than 1/8 inch by 1 inch. Unless otherwise specified, the length shall be adequate for forming four 1-1/8 inch diameter tool loops with no loops in the center.

5.1.3 Use. The lineman's safety belt is intended for military use by linemen and electricians in conjunction with the lineman's pole strap for the purpose of installing or repairing communication and power transmission lines on poles. Commercial applications are the same.

5.1.4 Packaging data and labeling. (Refer to 4.1)

5.1.5 Safety. (Refer to 4.2)

5.1.6 Storage. (Refer to 4.3)

5.1.7 Disposal of excess or unserviceable material. (Refer to 4.4)

5.2 Name. Strap, Pole, Lineman's

5.2.1 Specifications.

A-A-1776, Strap, Safety, Industrial (Pole)
KK-B-151, Belt, Lineman's; and Strap, Pole, Lineman's Type.
ASTM F 887, Personal Climbing Equipment.

5.2.2 Technical description. Lineman's pole straps shall consist of a strap, two snaphooks at each end, and a buckle. An illustration of a typical lineman's pole strap is shown in figure 2.

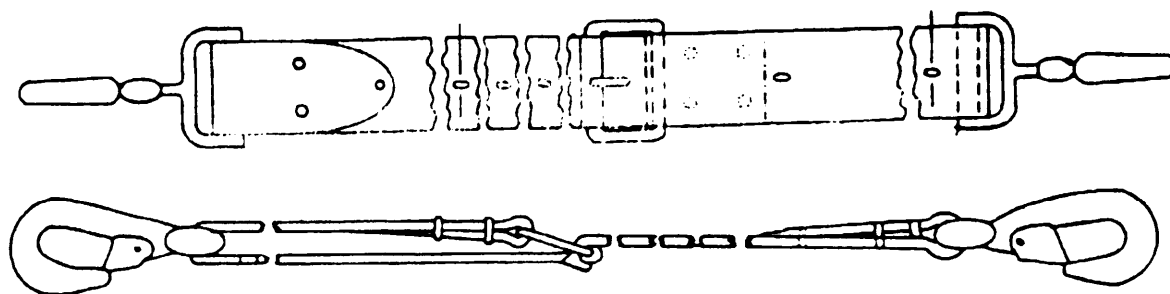


FIGURE 2. Typical illustration of industrial safety strap, lineman's pole type.

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5.2.2.1 Straps. In accordance with federal specifications, the strap shall have a nominal length of 84 inches, measured between snaphook stirrups, when adjusted to its longest length.

The ASTM specification classifies pole straps as three types:

- Type A - Adjustable length, with tongue buckle.
- Type B - Adjustable length, with friction buckle.
- Type C - Non-adjustable length strap.

In accordance with the ASTM specification, pole straps can be made to whatever length specified by the user, with a minimum width of 1-3/4 inches. Standard pole straps shall be so constructed that the snaphooks will be keeper side up when the strap is laid out flat with the buckle tongue side up.

In accordance with federal specifications, the strap shall be made from nylon fabric of not less than six-ply construction, impregnated with neoprene, and with contrasting color inner plies. The plies shall be folded so that no cut edges are exposed and shall be impregnated and vulcanized so that the plies are not readily separable except by chemical means. The straps shall contain not less than eleven adjustment holes on not more than 6-inch centers when a tongue buckle is used. A nonslip friction buckle may be used in lieu of a tongue buckle for strap length adjustment. The minimum cross-sectional dimensions shall be 5/32 inch by 1-3/4 inch.

In accordance with ASTM specification requirements, all fabric used in the manufacture of pole straps shall consist of a minimum of six-ply folded nylon or of woven nylon, or equivalent material, and constructed so that no raw edges are exposed. Folded fabric shall be impregnated with neoprene or its equivalent so that the plies are not readily separable. Folded material shall have two center plies of contrasting color. Woven material shall have center threads of contrasting color. Top grain leather or leather substitute shall be used in the manufacture of straps, but shall not be used alone as a load bearing component of the assembly.

5.2.2.2 Strap buckle. In accordance with federal specifications, strap buckle frames shall be fabricated of a forging quality steel by the forge process. A galvanized or cadmium coating shall be applied to the buckles, and they shall be reasonably smooth without sharp edges.

In accordance with federal and ASTM specification requirements, buckles shall withstand a 2,000 pound force (8.9 kN) tensile test with a maximum permanent deformation of 1/64 inch (0.4 mm).

5.2.2.3 Snaphooks. In accordance with federal specification, snaphooks, as assembled, will consist of body, keeper, spring, and roller. The nose shall be round and overlap the keeper latch by 3/16 inch minimum. The body shall be forged of a forging quality steel. A galvanized or cadmium coating shall be applied to the snaphooks. Parts shall be reasonably smooth and without sharp edges. Spring tension for the keeper shall be such that the keeper will not begin to open with a weight of 2.5 pound and will begin to open with a weight of 4 pounds. Finished snaphooks shall be capable of supporting a load of 5,000 pounds without failure. The keeper shall be capable of withstanding 750 pounds of applied side pressure.

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In accordance with ASTM specification requirements, the snaphooks as assembled will consist of body, keeper, spring, rivet and roller. The nose of the strap shall be round and overlap the keeper latch by 3/10 inch minimum. The spring tension of the keeper shall be such that the keeper shall not begin to open with a force of 2.5 pounds, and begin to open with a maximum force of 4 pounds, with the force applied on the keeper against the face of the nose. Snaphooks shall withstand either a 5,000 pound force (22 kN) tensile test, without distortion sufficient to release the keeper; or shall withstand a 3,000 pound force (13 kN) tensile test, and a 180° bend test without cracking of the snaphook.

5.2.2.4 Clips. In accordance with federal specification requirements, two metal clips shall be used to envelop and secure the strap ends around the snap roller and buckle frame. The metal clips be assembled over the fabric with rivets.

In accordance with ASTM specification requirements, metal clips shall be used to reinforce the snap and buckle ends of the straps. Clips shall be a minimum of 20 gage (0.0375 inch), and be attached by riveting through the folded double thickness of the strap material.

5.2.3 Use. The lineman's pole strap is intended for military use in conjunction with the lineman's safety belt for the purpose of installing or repairing communication and power transmission lines on poles. Commercial applications are the same.

5.2.4 Packaging data and labeling. (Refer to 4.1)

5.2.5 Safety. (Refer to 4.2)

5.2.6 Storage. (Refer to 4.3)

5.2.7 Disposal of excess or unserviceable material. (Refer to 4.4)

5.3 Name. Belt, Safety, Industrial (Adjustable), With Lanyard

5.3.1 Specification. Manufacturer's requirements. (No Government specification).

5.3.2 Technical description.

5.3.2.1 Belt. Industrial safety belts (adjustable) shall consist of a 1-3/4 inch minimum width waist band, a 3 inch width body pad cushion, and a fully adjustable buckle. An illustration of a typical adjustable safety belt with lanyard is shown in figure 3.

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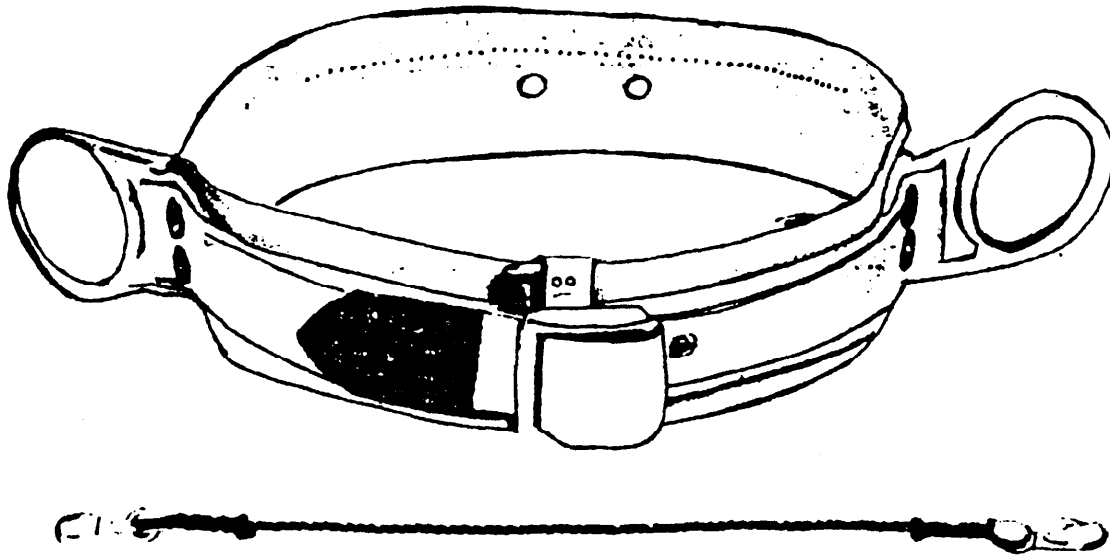


FIGURE 3. Typical illustration of industrial safety belt, adjustable, with lanyard.

Belts shall be available in the following approximate waist size ranges.

Small	- 30 to 38 inches
Medium	- 34 to 42 inches
Large	- 40 to 48 inches
Extra large	- 48 to 56 inches
Universal	- 48 to 56 inches

Belt material shall be woven nylon or nylon webbing. The body pad cushion shall be nylon webbing. The strap and cushion can be latex coated or neoprene impregnated to improve durability. The body cushion can be lined with leather or similar synthetic material. The buckle can be a friction type, tongue type, or a quick release type. The belt shall be equipped with one or two "D" rings as required. The "D" ring attachment can be the stationary or a sliding type as required.

5.3.2.2 Lanyard. The lanyard shall consist of a 1/2 inch minimum diameter spun nylon rope or one inch nylon web of specified length, or adjustable length. Lanyards are available in fixed lengths of 3, 4, 5, and 6 feet. Adjustable length lanyards are available in 6 and 7 feet sizes. Lanyards are available with snaphooks at both ends, or a snaphook on one end and a loop at the other end.

5.3.3 Use. The industrial safety belt with lanyard is intended for military use by personnel in elevated positions for protection from a fall. Commercial applications are the same.

5.3.4 Packaging data and labeling. (Refer to 4.1)

5.3.5 Safety. (Refer to 4.2)

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5.3.6 Storage. (Refer to 4.3)

5.3.7 Disposal of excess or unserviceable material. (Refer to 4.4)

5.4 Name. Belt, Safety, Industrial (With Locking Sleeves)

5.4.1 Specification. RR-S-C01301, Safety Equipment, Climbing.

5.4.2 Technical description.

5.4.2.1 Safety belt. In accordance with federal specification requirements the safety belt shall consist of a body strap with body pad. The body pad shall be fastened to the body strap by riveting and stitching. No part of the load carrying components shall be made of leather. The body strap shall be fabricated of woven nylon webbing as specified. The safety belt shall be fitted with the following hardware:

- a. Connector. The safety belt shall be equipped with a connector by means of which the slide or safety sleeve can be attached to the belt. Unless a special connector is necessary, a D-ring shall be used for this purpose. The D-ring shall accommodate the snaphook of the safety lanyard or safety clamp. The D-ring should preferably be located behind the hip of the wearer. (Refer to 5.1.2.3)
- b. Buckle. The buckle shall be of the tongue-type. (Refer to 5.1.2.5)

5.4.2.2 Locking safety sleeves. Safety sleeves shall be for attachment to a rigid carrier or a flexible carrier (steel wire rope). In accordance with federal specification requirements the safety sleeve body shall be made from a noncorrosive material such as stainless steel, manganese bronze, aluminum alloy, or other suitable material capable of withstanding the imposed load without detrimental deflections. The locking mechanism shall be connected to the safety sleeve by means of a corrosion-resistant steel pin, and shall be spring actuated. The locking mechanism shall positively lock the safety sleeve to the carrier when load is applied to any but a normal ladder climbing position. The construction of the sleeve and locking mechanism shall be such that the sleeve will not move down the carrier more than 6 inches (152 mm) when the user disconnects from it at any point along the carrier. The sleeve shall be permanently marked to indicate the direction of installation. The sleeve shall be removable at the top and bottom of the carrier. The safety snap or snaps and any connecting links used to connect the safety belt to the sleeve shall be of drop-forged steel. The sleeve mechanism shall be simple in mechanical operation with all levers, cams, hooks, and brakes easily viewable for inspection. The assembly shall be designed as to prevent any parts being frozen in such a position as to be ineffective. The equipment shall have the following performance features.

- a. Operation. The equipment shall be of a type that can be operated entirely by the user.

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- b. Length of fall. The maximum possible length of fall that may be sustained by a user shall be limited to not more than six inches (152 mm) of movement of the slide or safety sleeve.
- c. Static load. The equipment shall be strong enough to support a minimum static load of 1000 pounds (454 kg).
- d. Impact load. The equipment shall be strong enough to absorb the impact load of a solid object weighing at least 500 pounds (227 kg) in a free fall of 12 inches (305 mm). When a lanyard is used, the equipment shall also be strong enough to absorb an impact load of a solid object weighing at least 250 pounds (113.5 kg) in a free fall of six feet (1.8 m).

5.4.3 Use. The industrial safety belt with locking sleeve is intended for military use to prevent falls by personnel from an elevated position on a ladder.

5.4.4 Packaging data and labeling. (Refer to 4.1)

5.4.5 Safety. (Refer to 4.2)

5.4.6 Storage. (Refer to 4.3)

5.4.7 Disposal of excess or unserviceable material. (Refer to 4.4)

5.5 Name. Harness, Safety

5.5.1 Specification. MIL-H-24460, Harness, Safety; and Lanyards, Safety and Working.

5.5.2 Technical description.

5.5.2.1 Design. The safety harness shall be of the parachute (full body) type, and shall be designed so that the load will be distributed over the wearer's skeletal structure. Stresses developed during a fall shall be distributed within the structural configuration of the safety harness with a major share of the stresses being absorbed by the thigh-buttock area of the wearer and the remainder being absorbed by the chest, waist, and shoulder areas. The configuration of a safety harness is shown in figure 4 (for example only).

5.5.2.2 Materials. Unless otherwise specified, the materials used in the construction of the safety harness are optional, provided the completed harness conforms to the requirements of the specification. The material shall have a maximum of 10 percent by weight absorption of moisture and oils during prolonged exposure for one year or more. The materials shall neither initiate nor support combustion, and shall be odorless and non-allergenic to human skin or the respiratory system.

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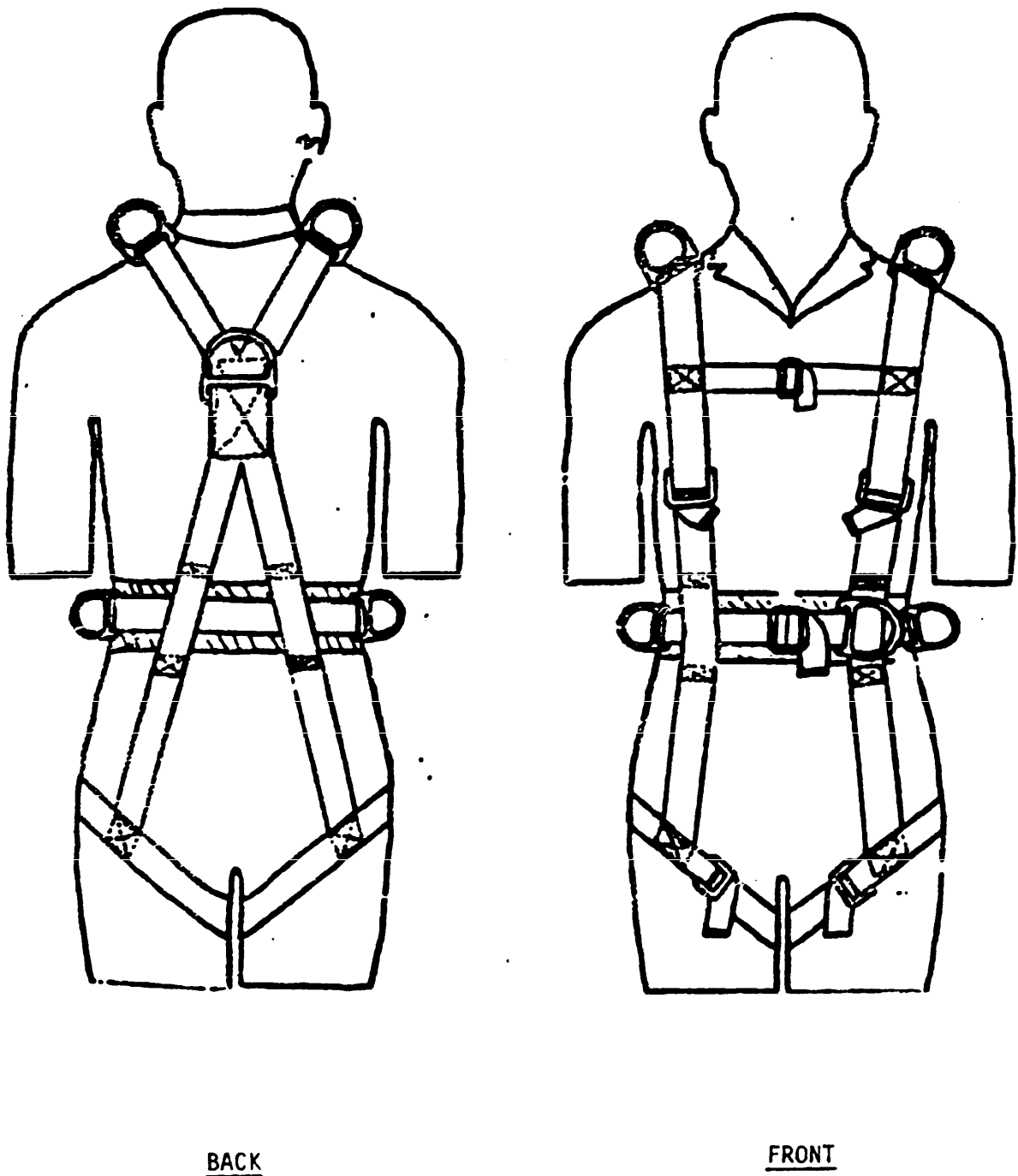


FIGURE 4. Configuration of safety harness.

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5.5.2.3 Component parts. The harness shall incorporate shoulder straps, leg straps, a connecting crosspiece between the shoulder straps, and a waist belt with associated hardware. The shoulder straps, leg straps, and waist belt shall be made of webbing $2 \pm 1/8$ inches (50.8 ± 3.2 mm) wide. The waist belt shall be lined or padded with energy absorbing materials $3 \pm 1/8$ inch (76.2 ± 3.2 mm) wide in order to distribute the load over a maximum area. The harness shall be capable of being readily adjusted to fit all sizes of wearers, between 100 and 250 pounds (45.5 and 113.5 kg) in weight, between 5 feet (1.52 m) and 6 feet 4 inch (1.93 m) in height, having waist sizes from 24 to 44 inches (61 to 112 cm), and clothed in any extreme of dress from light summer work clothing to cold or foul weather gear. In addition the harness shall be compatible with and be capable of being worn under a standard life preserver conforming to type I of MIL-L-18045.

5.5.2.4 Hardware. Hardware shall be made of corrosion-resistant steel conforming to ASTM class 304, 316 or 321, or steel coated with zinc as specified. The safety harness hardware shall include the following:

- a. Four circular D-rings with an inside diameter of 2-3/16 to 2-1/2 inches (55.6 to 63.5 mm) located as follows:
 1. One outside of the harness between the wearer's shoulder blades to permit attachment of the safety or working lanyard.
 2. One on the front of the waist belt near the buckle to allow connection to a climber's fall prevention device which shall not interfere with fastening of the belt.
 3. Two at the waist belt at the wearer's hip for attachment of lanyards.
- b. Two identical D-rings, in accordance with MS22046 (except the coating), shall be secured near the top of the wearer's shoulders for attachment of lanyards or lines to suspend the wearer in a vertical position.
- c. One waist belt buckle which shall mate, lock, and interlock with ease.
- d. Two leg strap adjusting buckles (see 5.5.2.3).
- e. Two shoulder strap adjusting buckles (see 5.5.2.3).
- f. One adjusting buckle for the connecting crosspiece between the shoulder straps (see figure 4)

5.5.2.5 Physical characteristics.

- a. Weight. The maximum weight of the safety harness shall be 5.5 pounds (2.5 kg).

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- b. Static load. The minimum strength under static load shall be 1500 pounds (680.4 kg) for the harness and 2000 pounds (907.2 kg) for the belt buckle.
- c. Tensile strength. The minimum tensile strength of D-rings, adjusting buckles, harness webbing adjusters, and webbing shall be 4,000 pounds (1814 kg).
- d. Color. Unless otherwise specified, the color of the webbing in the safety harness shall be blue, orange, green, or white. The lining or padding of the waist belt shall be of a contrasting color to facilitate assembly in reduced visibility. All colors shall be of an even shade.
- e. Stitches and stitching. Stitches and stitching shall be evenly spaced and firmly held in place. The number of stitches shall be a minimum of 5 per inch (5 per 25.4 mm). There shall be no intertwined, tangled, bunched, or broken threads in the seams of the stitching. The ends of the threads shall be snipped.
- f. Salt spray (fog). The harness shall be capable of withstanding a specified 96-hour salt spray (fog) test. After completion of the test, the hardware shall show no evidence of excessive corrosion; and shall pass all static load and tensile strength tests. In the case of plated metals, excessive corrosion is defined as corrosion which has passed through the plating and attacked the base metal. The harness material shall show no signs of loosening, fraying, or separation of fiber.

5.5.2.6 Marking. Marking of safety harnesses shall be permanent, and shall consist of a water-resistant label sewn on the inside of the shoulder strap with information as specified in applicable procurement documents. Information included on wearing instructions and pictorial display shall be similar to figure 5.

5.5.3 Use. Safety harnesses, with attached lanyards, are intended for use by personnel working in situations aboard ships, submarines, and ashore where falls can occur.

5.5.4 Packaging data and labeling. (Refer to 4.1)

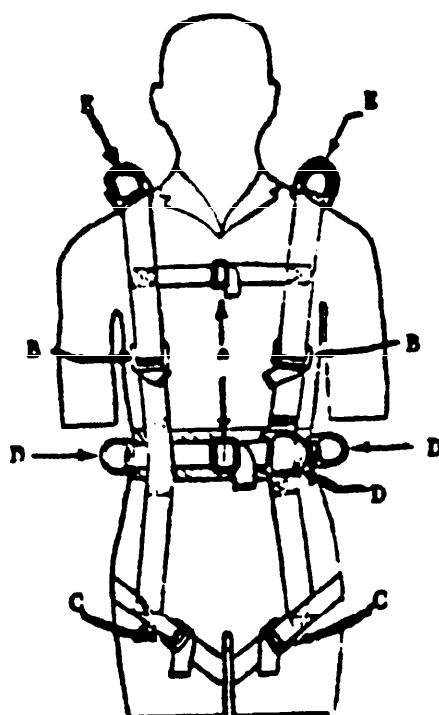
5.5.5 Safety. (Refer to 4.2)

5.5.6 Storage. (Refer to 4.3)

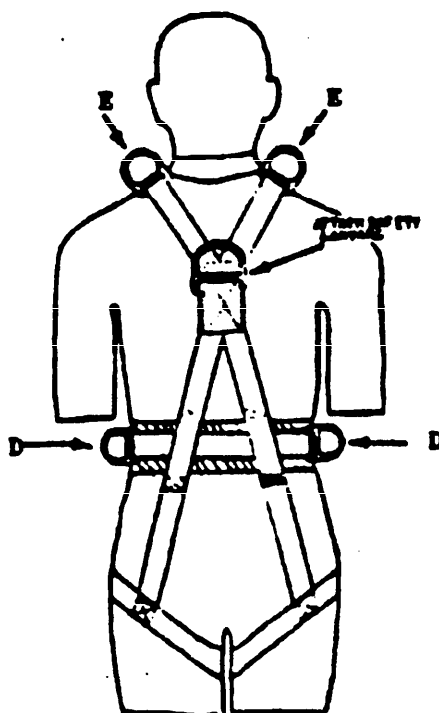
5.5.7 Disposal of excess or unserviceable material. (Refer to 4.4)

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FRONT



REAR



WEARING INSTRUCTIONS
 ADJUST HARNESS TO SNUG FIT AT POINTS A, B, & C
 ATTACH TO E ONLY FOR VERTICAL SUSPENSION
 ATTACH WORKING LANYARD OR TOOLS TO POINT D

FIGURE 5. Wearing instructions label for safety harness.

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5.6 Name. Lanyards, Safety and Working

5.6.1 Specification. MIL-H-24460, Harness, Safety; and Lanyards, Safety and Working.

5.6.2 Technical description.

5.6.2.1 Design. The lanyards shall be of the following types and classes.

Type I - Safety

Class 1 - Nylon (adjustable)

Class 2 - Wire (non-adjustable)

Type II - Working

Class 1 - Nylon (adjustable)

Class 2 - Wire (non-adjustable)

5.6.2.2 Component parts.

- a. Type I - Safety lanyard. The type I lanyard shall be nylon (class 1) or wire (class 2). The lanyard shall have a double locking snaphook at each end. It shall be $6\text{ ft} \pm 2\text{ in}$ ($1.83 \pm 0.05\text{ m}$) long, including the energy absorber device, from bearing surface to bearing surface of the snaphooks (see figure 6). The lanyard shall incorporate an energy absorber device which shall be an integral part of the lanyard, and shall provide protection to safely decelerate the fall of the wearer. The device shall come into action at 400 pounds plus 40 pounds, minus 60 pounds (1,779 N, plus 178 N, minus 267 N), and shall bring a falling body to a stop without requiring more than 3 feet 6 inches (1.07 m) of elongation of the safety lanyard. The device shall prevent the force experienced by the wearer from exceeding a maximum of 700 pounds (3,114 N), except for a one time spike. The spike shall not exceed 1,200 pounds (5,338 N) force, and the elapsed time when the force is above 700 pounds shall not exceed 100 milliseconds.

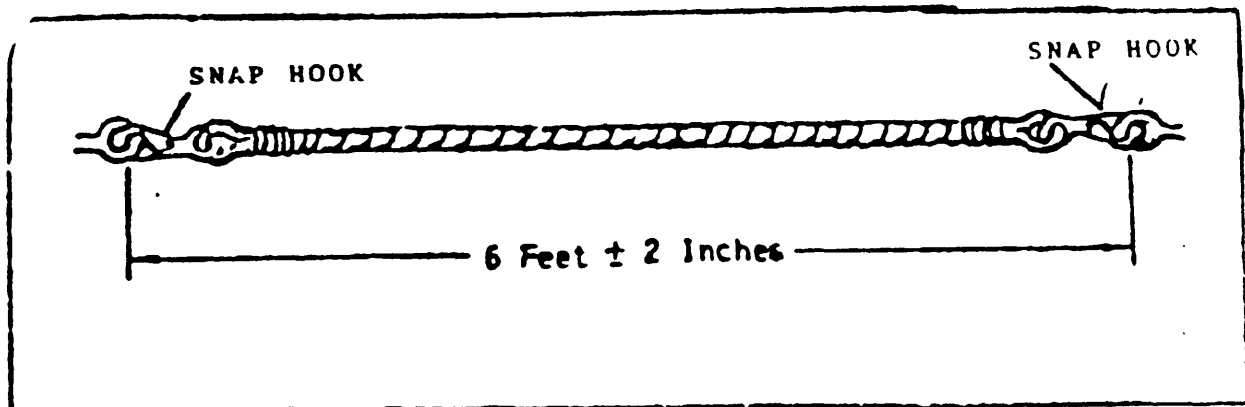


FIGURE 6. Measured length of lanyard.

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- (1) Class 1 - Nylon (adjustable). The class 1 lanyard shall be made of nylon rope conforming to MIL-R-24337, except heat setting is permitted, and shall be torque-free (shall not produce a twist when in a free-state condition). One end of the lanyard shall incorporate an adjustment device to permit shortening the length by 28 ± 5 percent of the fully extended length.
- (2) Class 2 - Wire (non-adjustable). The class 2 lanyard shall be made of corrosion-resistant wire rope conforming to type II, composition B of MIL-W-83420, and shall be non-adjustable.

b. Type II - Working lanyard. The type II lanyard shall be nylon (class 1) or wire (class 2). The lanyards shall have a double locking snaphook at each end, and shall be 6 feet \pm 2 inches (1.83 ± 0.05 m) long from bearing surface to bearing surface of the snaphooks (see figure 6)

(1) Class 1 - Nylon (adjustable). The class 1 lanyard shall be made of nylon rope conforming to MIL-R-24337, except heat setting is permitted, and shall be torque-free (shall not produce a twist when in a free-state condition). One end of the lanyard shall incorporate an adjustment device to permit shortening the length by 35 ± 5 percent of the fully extended length.

(2) Class 2 - Wire (non-adjustable). The class 2 lanyard shall be made of corrosion-resistant wire rope conforming to type II, composition B of MIL-W-83420, and shall be non-adjustable.

5.6.2.3 Hardware. Hardware shall be made of corrosion-resistant steel conforming to ASTM class 304, 316, or 321, or steel coated with zinc as specified. The lanyard hardware shall include the following:

- a. A snaphook (double-locking) shall be an integral part of each end of the class 1 and class 2 lanyard (see figure 7). The snaphook shall have a keeper and an integral locking device such that the keeper will not open unless the locking device is in an open position. The locking device shall be such that a semi-rigid rod cannot open both locking device and keeper simultaneously. The term semi-rigid means that the rod shall have a degree of flexibility to allow a minimum bend radius of six inches (152 mm) without permanent deflection. The keeper shall not open when a static force of 3.5 pounds, plus 0.25 pounds, minus 0 pound (15.6 N plus 1.1 N, minus 0 N) is applied at any point of the keeper. The keeper and locking device shall be capable of being opened by the thumb and forefinger action of only one gloved hand to admit or release an anchor support. The time required to open the keeper shall not exceed 5 seconds. The keeper and locking device shall return to the locked closed position when the opening pressure is released. The force required to open the locking device shall be not less than 4 pounds (17.8 N) and not greater than 9 pounds (40.0 N). The keeper shall be capable of withstanding a minimum side force of

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350 pounds (1,557 N) applied at a point midway between the nose and rivet hole without permanent deformation greater than a maximum of 1/6 inch (4.2 mm).

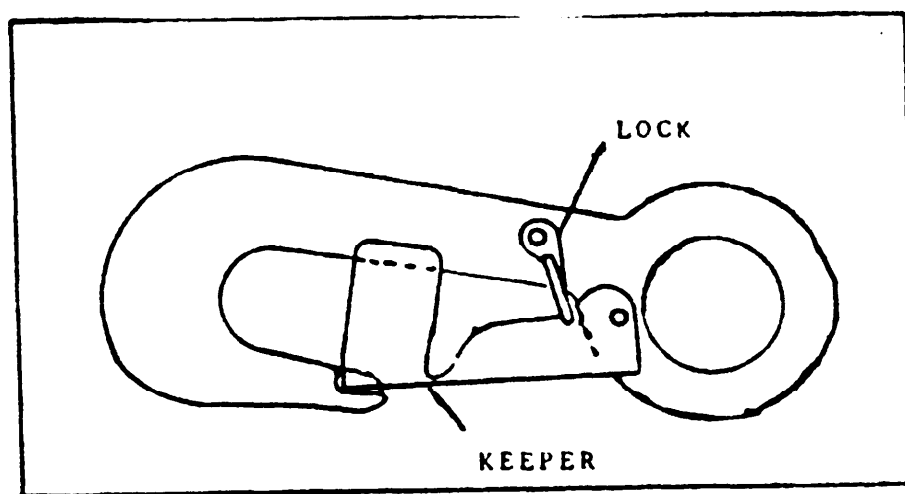
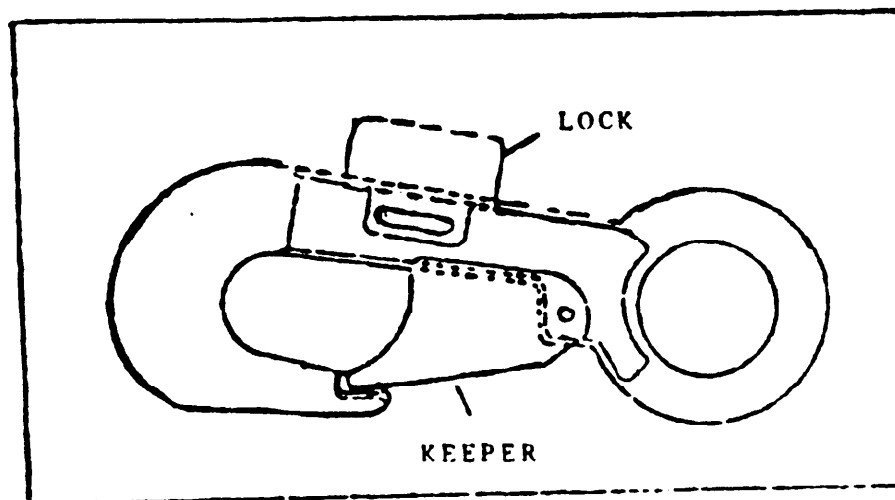
**A****B**

FIGURE 7. Double-locking snaphooks.

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- b. A lanyard length adjustment device shall be an integral part of the class 1 lanyard, and shall be capable of being easily manipulated by a person wearing gloves. Hardware attached to the class 1 lanyard shall be spliced with a minimum of six tucks. Spliced ends shall be sealed by wrapping three turns of tape around the rope, cutting at center of taped width, and sealing the ends by application of heat. Fixed attachments to hardware shall incorporate a round thimble. (A tear drop shaped thimble is not acceptable.) A thimble is not required at the adjustable end of the class 1 (nylon) lanyards.

5.6.2.4 Physical characteristics.

- a. Weight. The maximum weight of the lanyards shall be as follows:

Type I (safety lanyard with energy absorber device) - 3.0 pounds (1.36 kg).

Type II (working lanyard) - 2.5 pounds (1.13 kg).

- b. Static load. The lanyard adjustment devices of class 1 and attachments shall have a minimum strength of 1,500 pound (680.4 kg).
- c. Tensile strength. The minimum tensile strength of snaphooks, nylon rope, wire rope, and working and safety lanyard length adjustment devices of class 1 shall be 4,000 pounds (1,814 kg).
- d. Stitches and stitching. Stitches shall be evenly spaced and firmly held in place. The number of stitches shall be a minimum of five per inch. There shall be no intertwined, tangled, bunched, or broken threads in the seams or stitching. The ends of the threads shall be snipped.
- e. Salt spray (fog). The lanyards shall be capable of withstanding a specified 96-hour salt spray (fog) test. After completion of the test, the hardware shall show no evidence of excessive corrosion, and shall pass all static load and tensile strength tests. In the case of plated metals, excessive corrosion is defined as corrosion which has passed through the plating and attacked the base metal. In addition, the snaphooks shall conform to the hardware requirements of 5.6.2.3.a.

5.6.2.5 Marking. Marking of lanyards shall be permanent, and shall consist of a water-resistant label attached to the lanyard with information as specified in applicable procurement documents. If the type I - safety lanyard energy absorber device is a resettable device, a caution label shall be attached indicating that after use, the device shall be reset prior to stowing.

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5.6.3 Use. The working lanyards and safety lanyards, with safety harnesses, are intended for use by personnel working in situations aboard ships, submarines, and ashore where falls can occur. The type II working lanyard will be used to secure the wearer of the harness to a tending line or a fixed anchorage (for positioning only). The type I safety lanyard, attached to a fixed surface, will be used to break a fall.

5.6.4 Packaging data and labeling. (Refer to 4.1)

5.6.5 Safety. (Refer to 4.2)

5.6.6 Storage. (Refer to 4.3)

5.6.7 Disposal of excess or unserviceable material. (Refer to 4.4)

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6. NOTES

(This section contains information of a general or explanatory nature that may be helpful, but is not mandatory.)

6.1 Intended use. This standard is intended for use by military personnel in the selection of preferred industrial safety belts, harnesses, lanyards, and related equipment, for use by linemen and construction workers.

6.2 Issue of DODISS. When this standard is used in acquisition, the applicable issue of the DODISS must be cited in the solicitation (see 2.1.1, and 2.2).

6.3 Subject term (key word) listing.

Belt, safety, industrial
 Belt, safety, lineman's
 Billet, safety belt
 Buckle, safety belt
 "D" ring (dee ring)
 Harness, safety
 Keeper, snaphook
 Lanyard, safety
 Lanyard, working
 Lifeline
 Lineman's pole strap
 Lineman's safety belt
 Locking sleeve (for safety belt)
 Nose, snaphook
 Safety belt, industrial
 Safety strap
 Sleeve, locking (for safety belt)
 Snaphook (snap)
 Strap, pole, lineman's
 Strap, safety

6.4 Changes from previous issue. Marginal notations are not used in this revision to identify changes with respect to the previous issue due to the extensiveness of the changes.

6.5 Abbreviations. The use of abbreviations are in accordance with MIL-STD-12 where applicable. Metric system abbreviations and symbols are in accordance with ASTM E 380.

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Custodians:

Army - EA
Navy - YD
Air Force - 99

Preparing activity: Army - EA

(Project Number 4240-0551)

Review activities:

DLA - GS
Army - CR
Navy - AS, MC, SH
Air Force - 11

User activities:

Army - ME
Navy - CG

STANDARDIZATION DOCUMENT IMPROVEMENT PROPOSAL

(See Instructions - Reverse Side)

1. DOCUMENT NUMBER

MIL-STD-1212A

2. DOCUMENT TITLE

INDUSTRIAL SAFETY BELTS, STRAPS, AND RELATED EQUIPMENT

3a. NAME OF SUBMITTING ORGANIZATION

4. TYPE OF ORGANIZATION (Mark one)

☐ VENDOR☐ USER☐ MANUFACTURER☐ OTHER (Specify): _____

b. ADDRESS (Street, City, State, ZIP Code)

5. PROBLEM AREAS

a. Paragraph Number and Wording:

b. Recommended Wording:

c. Reason/Rationale for Recommendation:

6. REMARKS

7a. NAME OF SUBMITTER (Last, First, MI - Optional)

b. WORK TELEPHONE NUMBER (Include Area Code) - Optional

c. MAILING ADDRESS (Street, City, State, ZIP Code) - Optional

8. DATE OF SUBMISSION (YY.MM.DD)

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