ARMY TM 10-1670-278-23&P
AIR FORCE TO 13C5-26-2
NAVY NAVAIR 13-1-27
MARINE CORPS TM 01109C-23&P/1

TECHNICAL MANUAL

UNIT AND INTERMEDIATE DIRECT SUPPORT (DS) MAINTENANCE MANUAL (INCLUDING REPAIR PARTS AND SPECIAL TOOLS LIST) FOR

PARACHUTE, CARGO TYPE: 15-FOOT DIAMETER, CARGO EXTRACTION PARACHUTE NSN 1670-01-063-3715 AND NSN 1670-00-052-1548

Approved for public release; distribution is unlimited.

This copy is a reprint which includes current pages from Changes 1 and 2.

The following manuals, TM 10-1670-275-23&P, TM 10-1670-276-23&P, TM 10-1670-277-23&P, TM 10-1670-278-23&P, TM 10-1670-279-23&P, TM 10-1670-280-23&P, TM 10-1670-281-23&P, TM 10-1670-282-23&P, in their entirety, supersede TM 10-1670-215-23, dated 7 December 1973, including all changes.

**HEADQUARTERS DEPARTMENT OF THE ARMY
AIR FORCE, NAVY AND MARINE CORPS
6 NOVEMBER 1989**

ARMY TM 10-1670-278-23&P
AIR FORCE TO 13C5-26-2
NAVY NAVAIR 13-1-27
C2

CHANGE

NO. 2

HEADQUARTERS,
DEPARTMENTS OF THE ARMY, AIR FORCE AND NAVY
WASHINGTON, D.C., 30 June 1993

Unit and Intermediate Direct Support (DS) Maintenance Manual
(Including Repair Parts and Special Tools List)
for
PARACHUTE, CARGO TYPE: 15-FOOT DIAMETER,
CARGO EXTRACTION PARACHUTE
NSN 1670-01-063-3715
AND
NSN 1670-00-052-1548

DISTRIBUTION STATEMENT A: Approved for public release; distribution is unlimited

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1. Remove and insert pages as indicated below. New or changed text material is indicated by a vertical bar in the margin. An illustration change is indicated by a miniature pointing hand.

Remove pages	Insert pages
2-1 and 2-2	2-1 and 2-2
2-45 and 2-46	2-45 and 2-46

2. Retain this sheet in front of manual for reference purposes.

ARMY TM 10-1670-278-23&P
AIR FORCE TO 13C6-26-2
NAVY NAVAIR 13-1-27
C 2

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AIR FORCE TO 13C5-26-2
NAVY NAVAIR 13-1-27
C 1

CHANGE
NO. 1

HEADQUARTERS,
DEPARTMENTS OF THE ARMY, NAVY AND AIR FORCE
WASHINGTON, D.C., 23 July 1991

Unit and Intermediate Direct Support (DS) Maintenance Manual
(Including Repair Parts and Special Tools List)
for

PARACHUTE, CARGO TYPE: 15-FOOT DIAMETER,
CARGO EXTRACTION PARACHUTE
NSN 1670-01-063-3715
AND
NSN 1670-00-052-1548

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Remove pages	Insert pages
iii and iv	iii and iv
2-7 through 2-10	2-7 through 2-10
2-37 through 240	2-37 through 2-40

2. Retain this sheet in front of manual for reference purposes.

ARMY TM 10-1670-278-23&P
AIR FORCE TO 13C5-26-2
NAVY NAVAIR 13-1-27
C 2

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WARNING

DEATH could result if inspections are not performed as specified in this manual. Perform all inspections as specified.

WARNING

DEATH from burns or parachute failure could result if cleaning solvents other than tetrachloroethylene are used in cleaning this equipment. Other solvents shall not be used because of their flammable properties and nylon-damaging substances.

Prolonged Inhalation of tetrachloroethylene vapors can cause respiratory Injury. Provide adequate ventilation when using it. Also avoid skin contact. Repeated exposure can cause injury.

WARNING

Exercise extreme care when using petroleum products to destroy equipment by fire, as severe burns or DEATH could result.

FIRST AID

For First Aid treatment, refer to FM 21-11

TECHNICAL MANUAL 10-1670-278-34&P
TECHNICAL ORDER 13C5-26-2
NAVAIR 13-1-27
TECHNICAL MANUAL 01109C-23&P/1

HEADQUARTERS
DEPARTMENT OF THE ARMY
WASHINGTON, D.C., 6 November 1989

Unit, Intermediate Direct Support (DS) Maintenance Manual (Including Repair Parts and Special Tools List)

for

PARACHUTE, CARGO TYPE: 15-FOOT DIAMETER
CARGO EXTRACTION PARACHUTE ASSEMBLY
NSN 1670-01-063-3715 AND NSN 1670-00-052-1548

REPORTING ERRORS AND RECOMMENDING IMPROVEMENTS

ARMY

You can help improve this manual. If you find any mistakes or if you know of a way to improve the procedures, please let us know. Mail your letter, DA Form 2028 (Recommended Changes to Publications and Blank Forms), or DA Form 2028-2 located in the back of this manual direct to: Commander, U.S. Army Troop Support Command, ATTN: AMSTR-MCTS, 4300 Goodfellow Blvd., St. Louis, MO 63120-1798. A reply will be furnished directly to you.

AIR FORCE

Reports by U.S. Air Force units should be submitted on AFTO Form 22 (Technical Order Publication Improvement Report) and forwarded to the address prescribed above for the Army. An information copy of the prepared AFTO Form 22 shall be furnished to SA-ALC/MMILRA, Kelly AFB, TX 78241-5000.

MARINE CORPS

Marine Corps personnel submit NAVMC 10772, form to Commanding General Marine Corps Logistics Base, Albany, GA 31704-5000.

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CHAPTER 1
INTRODUCTION

OVERVIEW

This chapter Includes the general information common to all parachute manuals and specific Information pertinent to the parachute described in this manual.

Section I. GENERAL

1-1. Scope. The scope of this manual is described in the following subparagraphs.

a. *Type of Manual*. This manual provides unit and intermediate direct support (DS) maintenance Instructions for parachute, NSN 1670-01-063-3715 and NSN 1670-00-052-1548. The two 15 Foot Diameter Cargo Extraction Parachutes are illustrated in figures 1-1 and 1-2. This manual also provides a Repair Parts and Special Tools List located at Appendix C.

b. *Equipment Name*. 15-Foot Diameter, Cargo Extraction Parachute.

c. *Purpose of Equipment*. The parachute provides force to extract an air delivery load from aircraft.

1-1. Scope (cont).

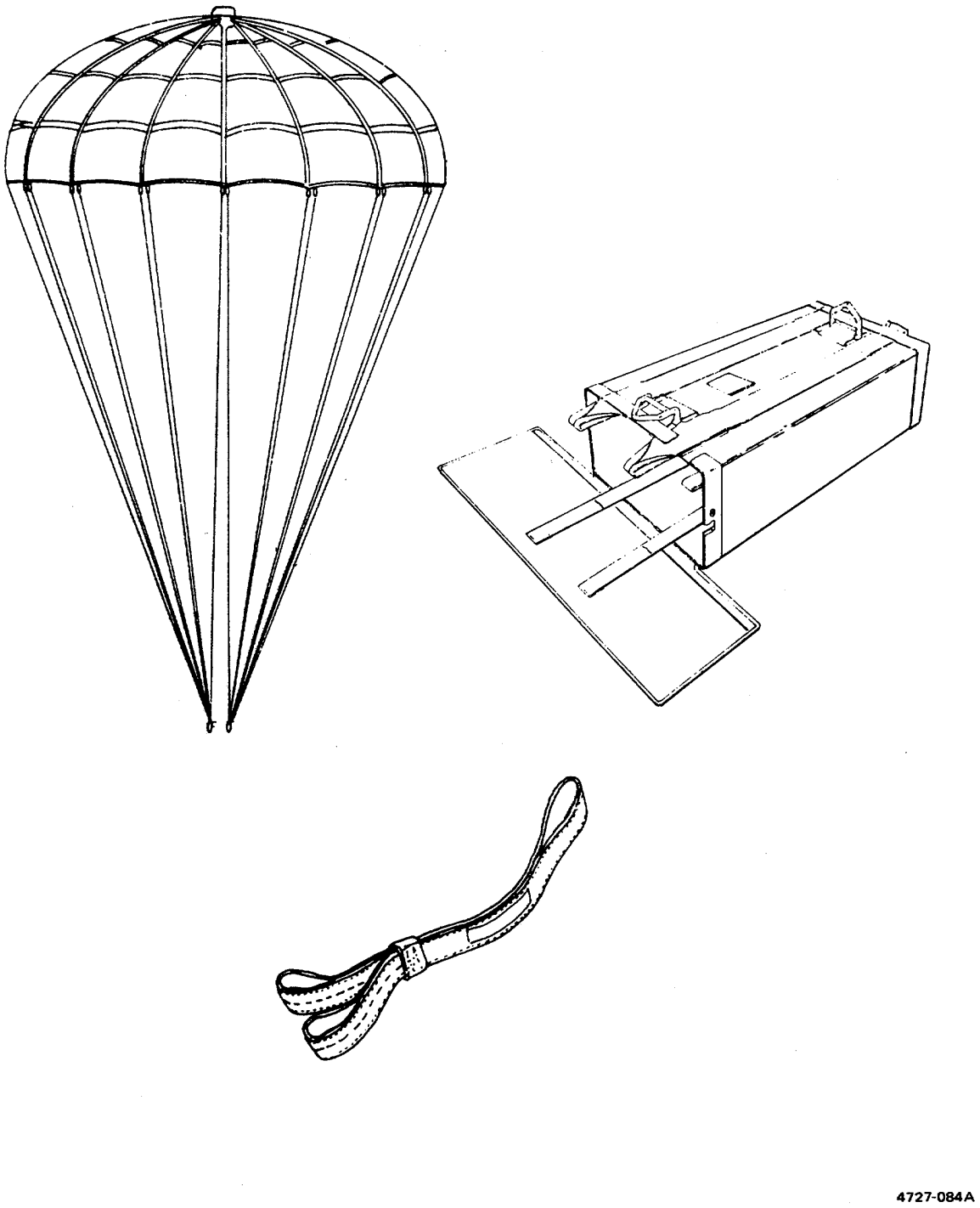


Figure 1-1. 15-Foot Diameter, Cargo Extraction Parachute, NSN 1670-01-063-3715.

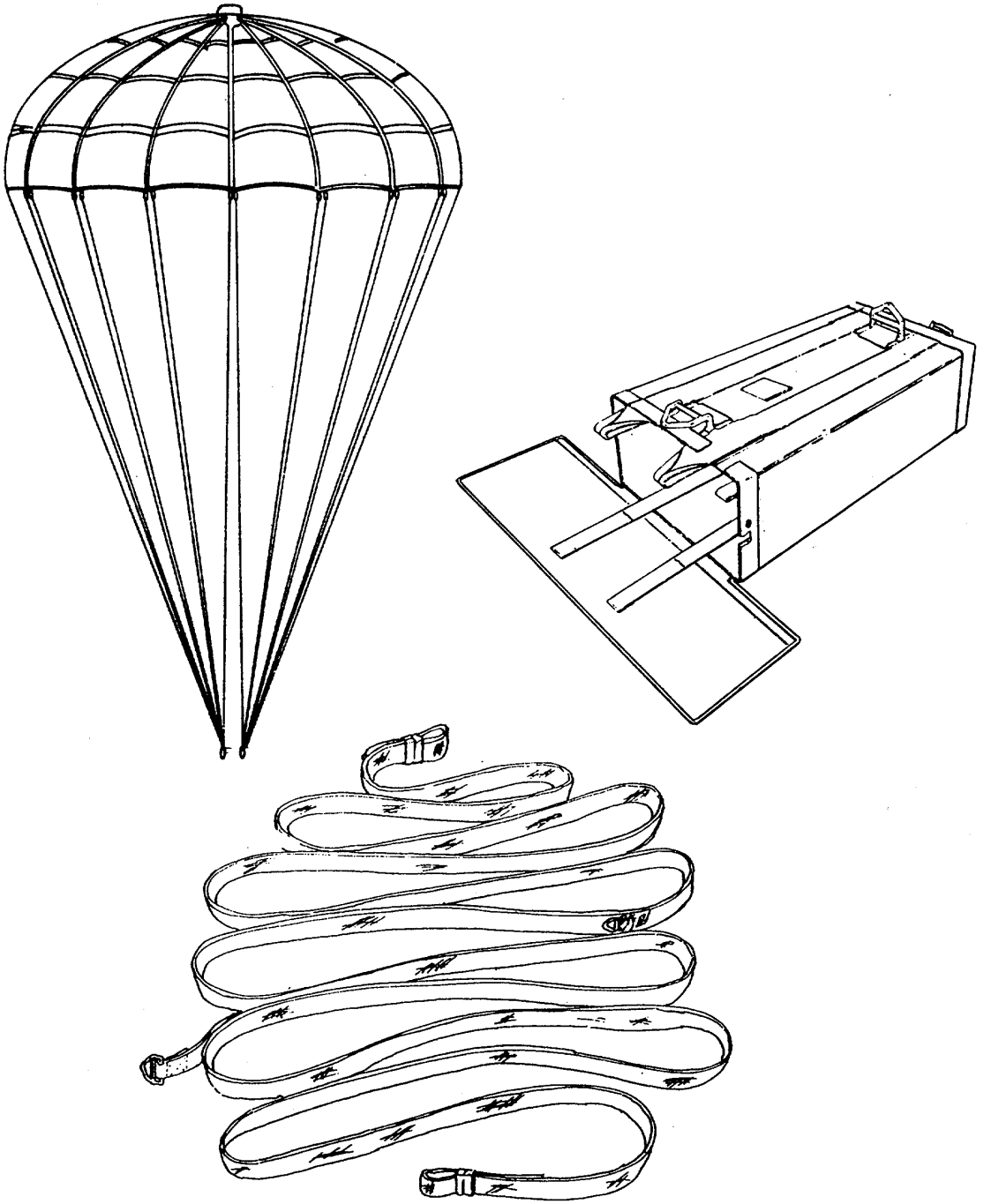


Figure 1-2. 15-Foot Diameter, Cargo Extraction Parachute, NSN 1670-00-052-1548.

1-2. Maintenance Forms and Records. Department of the Army forms and procedures used for equipment maintenance will be those prescribed by DA PAM 738-750, The Army Maintenance Management System, and TB 750-126, Use of Material Condition Tags and Labels on Army Aeronautical and Air Delivery Equipment. Marine Corps personnel will refer to TM 4700-15/1 for equipment maintenance forms and records.

1-3. Destruction of Army Materiel to Prevent Enemy Use. Destruction methods are described in the following subparagraphs.

a. *General.*

(1) *Objective.* Methods of destruction used to inflict damage on airborne platforms should make It impossible to restore equipment to a usable condition in a combat zone by either repair or cannibalization.

(2) *Authority.* Destruction of air delivery equipment that is in imminent danger of capture by an enemy is a command decision that must be made by a battalion or higher commander or the equivalent.

(3) *Implementation plan*. All units which possess air delivery equipment should have a plan for the implementation of destruction procedures.

(4) *Training.* All personnel who use or perform such functions as rigging, packing, maintenance, or storage of air delivery equipment should receive thorough training on air delivery equipment destruction procedures and methods. The destruction methods demonstrated during training should be simulated. Upon completion of training, all applicable personnel should be thoroughly familiar with air delivery equipment destruction methods and be capable of performing destruction without immediate reference to any publication.

(5) *Specific methods.* Specific methods of destroying Army materiel to prevent enemy use shall be by mechanical means, fire or by use of natural surroundings.

b. *Destruction by Mechanical Means*. Air delivery equipment metal assemblies, parts, and packing aids shall be destroyed using hammers, bolt cutters, files, hacksaws, drills, screwdrivers, crowbars, or other similar devices to smash, break, bend or cut.

WARNING

Exercise extreme care when using petroleum products to destroy equipment by fire, as severe burns or DEATH could result.

c. *Destruction By Fire*. Items that can be destroyed by fire shall be burned. The destruction of equipment by use of fire is an effective method of destroying low-melting-point metal items (e.g., side rails, threaded portions of nuts and bolts, and platform panels. However, mechanical destruction should be completed first, whenever possible, before initiating destruction by fire. When Items to be destroyed are made of metal, textile materials (or some comparable low combustible material) should be packed under and around the items, then soaked with a flammable petroleum product and ignited. Proper concentration of equipment which is suitable for burning will provide a hotter and more destructive fire.

d. *Destruction By Use of Natural Surroundings*. Small vital parts of assemblies which are easily accessible may be disposed of as follows: Disposal or denial of equipment to an enemy may be accomplished through use of natural surroundings. Accessible vital parts of assemblies may be removed and scattered through dense foliage, buried in dirt or sand, or thrown into a lake, stream, or other body of water. Total submersion of equipment in a body of water will provide water damage as well as concealment. Salt water will inflict extensive damage to air delivery equipment.

1-4. Preparation for Storage or Shipment. For storage, refer to TM 10-1670-201-23 T.O. 13C1-41/NAVAIR 13-1-17, and Chapter 2, Section VII of this manual.

1-5. Reporting of Equipment Improvement Recommendations (EIR). If your parachute system needs improvement, let us know. Send us an EIR. You, the user, are the only one who can tell us what you don't like about your equipment. Let us know why you don't like the design or performance. Put it on an SF 368 Quality Deficiency Report (QDR). Mail it to us at: Commander, U.S. Army Troop Support Command, ATTN: AMSTR-QP, 4300 Goodfellow Blvd., St. Louis, MO 63120-1798. We will send you a reply. Marine Corps personnel are encouraged to send in EIRs in accordance with MCO 16500.17.

Section II. EQUIPMENT DESCRIPTION AND DATA

Paragraph Page

1-6. Equipment Characteristics, Capabilities and Features. A summary of the characteristics, capabilities and features of the equipment is contained in the following subparagraphs.

a. *Characteristics.* Provides a capability to extract air delivery loads from an aircraft.

b. *Capabilities and Features.*

(1) Used with the C-130 and C-141 aircraft.

(2) Used as a drogue for LAPE air delivery.

1-7. Location and Description of Major Components. The following subparagraphs contain locations and descriptions of major components.

a. *Canopy.* (figure 1-3) The canopy is a 15-foot diameter flat circular ring slot canopy constructed with five concentric rings of nylon fabric which are supported by 16 radial webs. There are 16 suspension lines which are attached on one end to the canopy. The opposite end of the suspension lines are connected to two L-bar connector links which connect to an extraction line or adapter web.

1-6. Equipment Characteristics, Capabilities and Features (cont).

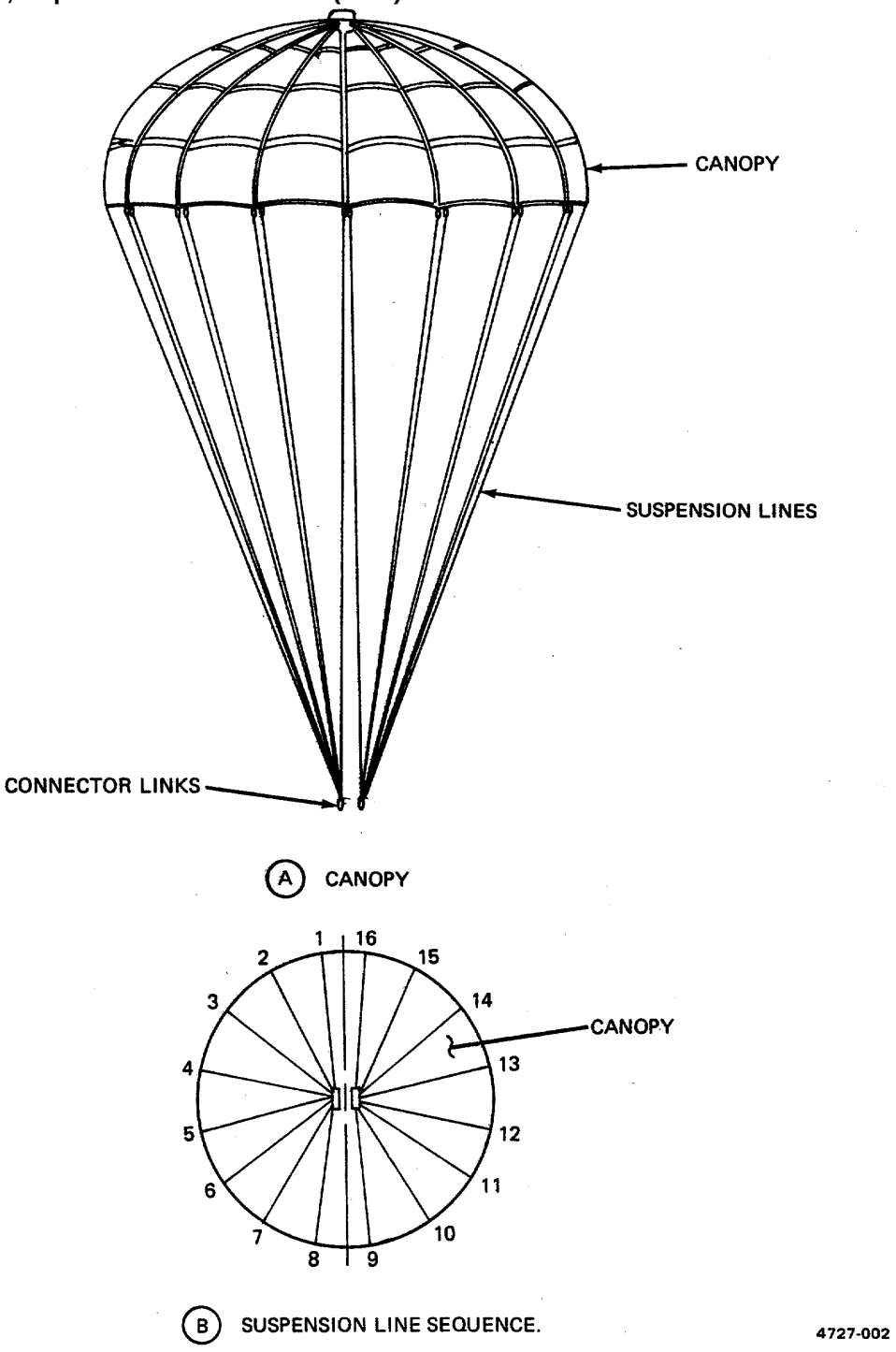


Figure 1-3. Canopy Assembly.

b. *Extraction Line*. (figure 1-4)The extraction line is a 60-foot long nylon web line constructed with one release knife and one V-ring attached.

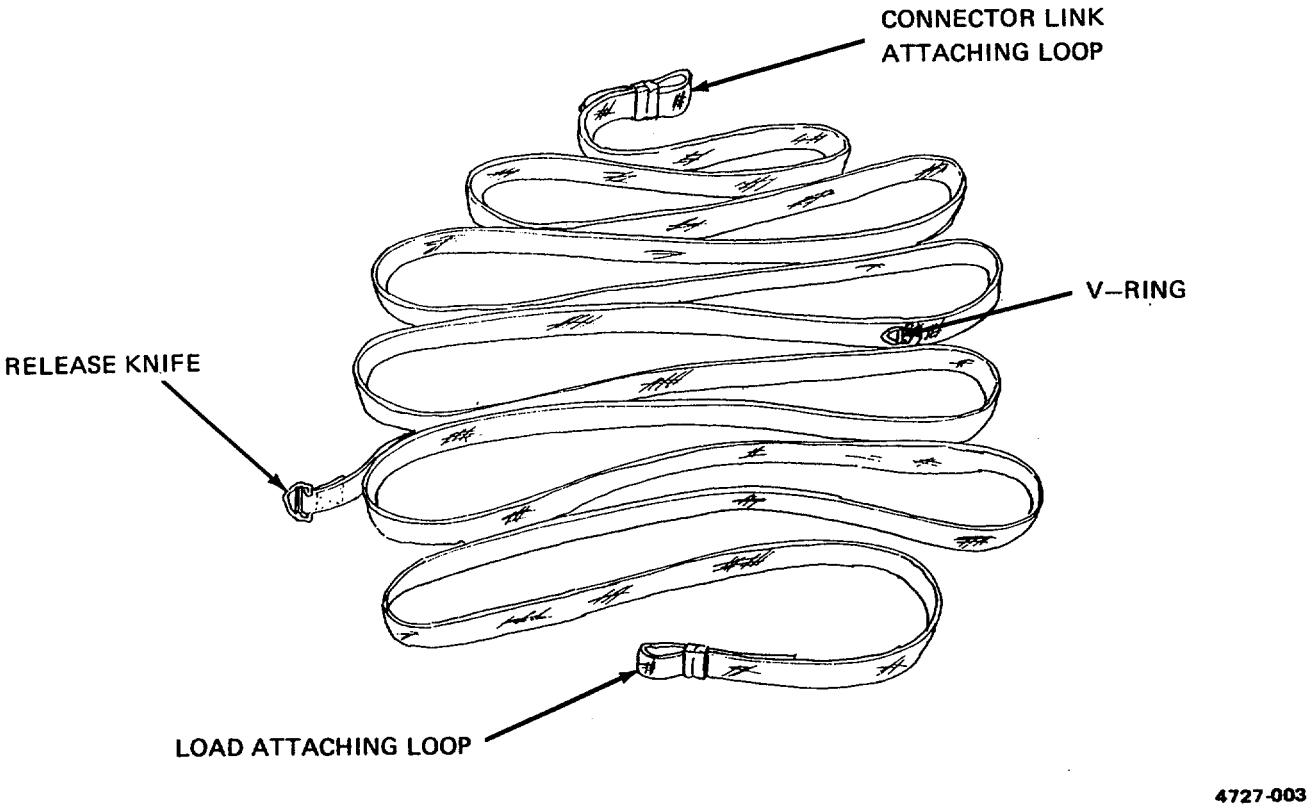


Figure 1-4. Extraction Line.

c. *Adapter Web*. (figure 1-5) The adapter web is constructed of type XXVI nylon webbing and is used for attaching all lengths of extraction lines.

d. *Deployment Bag*. (figure 1-6) The deployment bag is used to stow the parachute and is constructed with one bridle loop, one V-ring, one bent V-ring and a suspension line stowage flap. The deployment bag Is secured to the canopy with a retaining tie.

1-6. Equipment Characteristics, Capabilities and Features (cont).

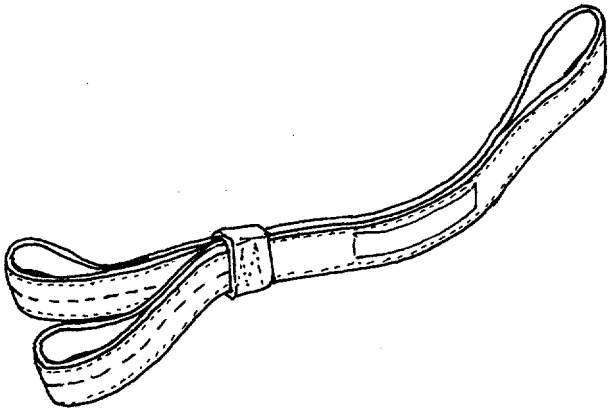


Figure 1-5. Adapter Web.

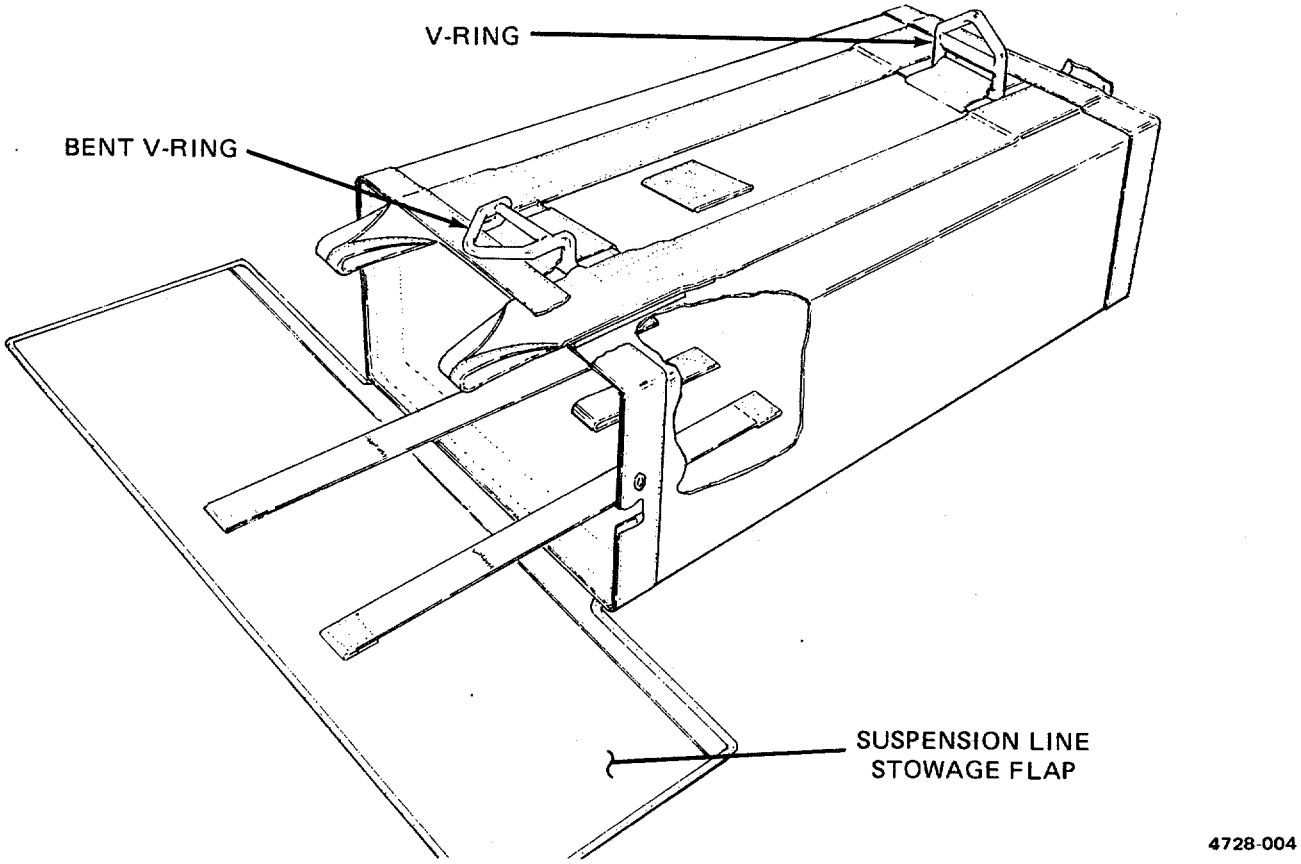


Figure 1-6. Deployment Bag.

1-8. Differences Between Models.

NSN	Difference
1670-00-052-1548	60 Ft. Extraction Line
1670-01-063-3715	3 Ft. Adapter Web

1-9. Equipment Data. The following listing summarizes the specific capabilities and limitations of the equipment and other critical data needed by the organizational and direct support maintenance personnel for maintenance of the 15-Foot Cargo Extraction Parachute Assembly.

a. *General:*

(1)	Total weight (packed for use)	27 pounds
(2)	Dimensions (packed for use)	17-inches long by 10-inches wide by 9-inches high
(3)	Cube	9 cu. ft.

b. *Assembly Specifics:*

(1) Canopy Assembly.

Shape	Flat-circular
Diameter	15 feet
Design	Ring slot
Number of gores	16
Number of section per gore	5
Gore material	Type 1, 2.25 Ounce Nylon
Number of vent lines	4
Number of suspension lines	16
Suspension line material	Type IV coreless nylon cord
Suspension line length (from connector link to lower lateral band)	15 feet
Canopy length (from lower lateral band to upper lateral band)	7 feet
Number of pocket bands	16
Number of connector links	2

(2) Deployment Bag.

Pendulum line material	Type IV coreless nylon cord
Pendulum line length	85 Inches

(3) Extraction Line.

Length	60 feet
Number of plies	2 type X nylon

(4) Adapter Web.

Length	3 feet
Type of Material	Type XXVI nylon

1-10. Safety, Care, and Handling.

a. *Safety*. It Is imperative that you observe all safety precautions specified on the warning page in the front of this manual. You must also observe specific warnings and cautions specified throughout this manual. The warnings are provided to tell you how to protect yourself from death or serious Injury.

b. *Care and Handling*.

(1) Use care in handling packed parachutes as metal parts could cause personal injury.

(2) Remove all jewelry when packing or performing maintenance on the parachute. Damage to the canopy materials could result from watches, rings, bracelets, etc.

(3) Use every effort to protect the parachute from the weather elements, dust, dirt, oil, grease, acids, and direct sunlight.

(4) Cover canopy during periods of inactivity. Avoid exposing canopy to prolonged exposure to sunlight, Inspection lights or fluorescent lights. Nylon material is subject to deterioration under ultraviolet light.

(5) Use a heated building to store parachutes when available. Store parachute in a dry, well ventilated location, protected from pilferage, dampness, fire, dirt, insects, rodents, and direct sunlight.

CHAPTER 2
UNIT AND INTERMEDIATE DIRECT SUPPORT (DS) MAINTENANCE INSTRUCTIONS

OVERVIEW

This chapter contains information necessary to maintain the 15-Foot Diameter Extraction Parachute on the unit and intermediate direct support (DS) maintenance levels in accordance with the Maintenance Allocation Chart for the equipment. It includes the following:

a. Procedures for processing a new or used parachute assembly upon receipt.

b. Assembly of components prior to packing.

c. Preventive maintenance procedures to ensure continued serviceability of all components.

d. As-required inspections and maintenance procedures performed prior to packing such as shakeout and airing, cleaning and drying, and acidity and salt-water contamination tests.

e. Detailed packing procedure.

f. Repair methods and repair or replacement procedures for all components of the parachute assembly.

Section I. REPAIR PARTS, SPECIAL TOOLS, TEST MEASUREMENT AND DIAGNOSTIC EQUIPMENT (TMDE) AND SUPPORT EQUIPMENT

2-1. Common Tools and Equipment. For authorized common tools and equipment, refer to the Modified Table of Organization and Equipment (MTOE) applicable to your unit, and appendix B, Section III of this manual.

2-2. Special Tools, TMDE and Support Equipment. Special Tools, TMDE and Support Equipment are not required.

2-3. Repair Parts. Repair parts are listed and illustrated in Appendix C of this manual.

Section II. SERVICE UPON RECEIPT

2-4. Initial Receipt. The following describes the procedures for processing parachutes upon initial receipt.

a. *General Procedures for 15-Foot Diameter Cargo Extraction Parachute*. When air delivery equipment is initially procured from a supply source and issued to a using unit, the item(s) will be unpacked from the shipping container(s) and inspected by a qualified parachute rigger (MOS 43E). The inspection performed will be a technical/rigger-type which will be conducted as outlined in paragraph 2-9. Upon completion of the inspection, the item(s) will be tagged as prescribed in TB 750-126. Serviceable equipment may then be entered either into storage or into use in air delivery operations, as applicable. An unserviceable item will be held and reported in accordance with DA PAM 738-750. Marine Corps users refer MCO 4855.10.

b. *Inspection Personnel*. Personnel other than parachute rigger personnel may assist in the unpacking process of initially received parachutes as directed by the local airdrop equipment maintenance officer. However, the maintenance officer will insure that the entire unpacking effort is conducted under the direct supervision of a qualified rigger (MOS 43E).

c. *Configuration/Condition*. Acceptance of new equipment from the manufacturer is based upon inspections made of sample lots which have been randomly selected in accordance with military standards. It is incumbent upon the using activity personnel to bear this in mind whenever equipment is first placed in service. Changes will sometimes evolve from the original equipment design and sometimes contractors are authorized deviations in material and construction techniques. Airdrop equipment that has been in the field cannot be expected to meet exacting manufacturing specifications; however, the equipment should closely reflect desired design characteristics. Since repairs, modifications, and/or changes can alter or detract from the configuration originally desired, such equipment shall be airworthy, safe, of the desired configuration, and adequate for intended use.

d. *Parachute Log Record*. The Army Parachute Log Record DA Form 3912 is a history-type maintenance document which accompanies the parachute canopy and deployment bag assemblies through the period of service of the individual assembly. The log record provides a means of recording maintenance actions performed on a parachute canopy assembly. Normally, a log record is initiated and attached to a deployment bag upon receipt by a using unit. However, if the item is subjected to alteration or modification by a maintenance activity during the interim period from date of manufacture to receipt by a using unit, the log record will be prepared by the activity performing the maintenance function. Once initiated, a log record will be attached to and contained in an affixed parachute log record/inspection data pocket until such time as the parachute canopy assembly is destroyed or rendered unfit for further use or repair. Additionally, should an item that requires a log record be transferred from one unit to another, the log record for the parachute assembly will accompany the item in the transfer action. A prepared log record will not be removed or separated from a parachute, and especially a packed parachute, except as directed by the local airdrop equipment maintenance activity officer. A log record which is illegible, lost, damaged, soiled, or precludes further entries due to lack of space will be replaced upon the next repack or inspection, as applicable with a serviceable item from stock.

e. *Installing Attaching Tie*. Install attaching tie as follows:

(1) Cut a 30-inch length of ticket No. 5 waxed cotton thread and double the thread length.

(2) Pass the looped end of the doubled thread length around the centerfold of the log record and form a slip loop on the outside at the log record top (A, figure 2-1).

(3) Pass the thread length running ends through the corner attaching hole from the front cover of the log record (B, figure 2-1) and insure the running ends are routed over that part of the thread length located along the log record centerfold (C, figure 2-1).

(4) Complete the attachment tie by making a half hitch on top of the slip loop made in (2) above.

(5) Thread one running end of the log record attachment tie in a tacking needle and pass the tacking needle with attached thread end through the edge binding of the applicable parachute log record/inspection data pocket.

(6) Remove the thread end from the tacking needle and make a finished 10-inch-long log record attaching loop by securing the two thread ends together with an overhand knot.

(7) Insert the log record into the pocket and secure the record within the pocket using the pocket flap and applicable type flap fastener.

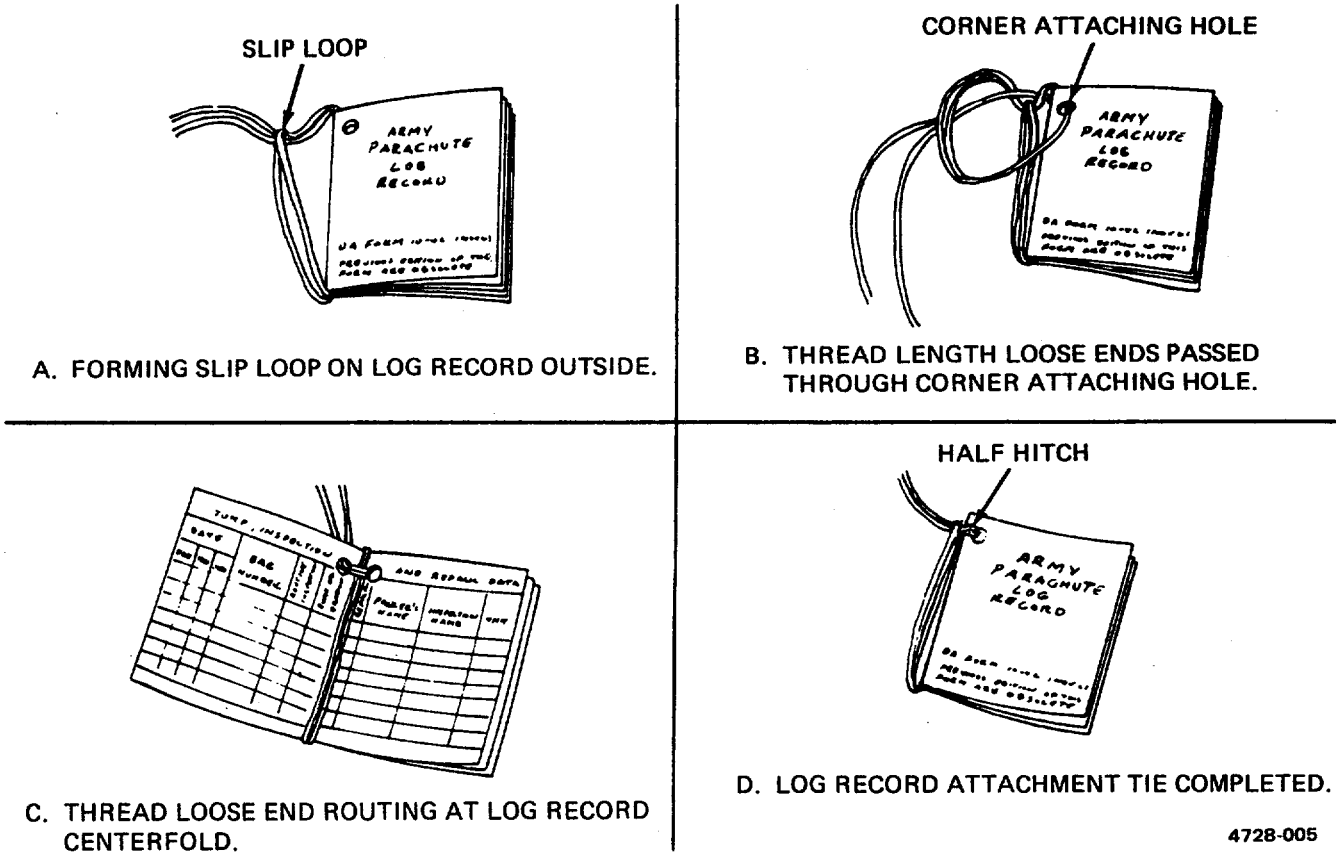


Figure 2-1. Installing Attachment Tie on parachute Log Record.

2-4. Initial Receipt (cont).

f. *Accomplishing a Log Record*. Upon completion of the first technical/rigger-type inspection, the Individual performing the inspection will initially prepare a log record for an individual parachute or applicable type parachute harness and accomplish subsequent record entries using the following procedures:

NOTE

Log record book entries will be made with a suitable type blue or black marking device that cannot be erased.

(1) *Inside front cover*. Using the information provided on the parachute canopy data block, make the following entries on the inside front cover of the log record (figure 2-2). Entries may be continued on the Inside of the back cover, if necessary.

(a) *Serial number*. Enter the parachute canopy assembly serial number.

NOTE

A parachute canopy serial number is recorded in a log record as a method of establishing control for maintenance, EIR documentation, and to insure the correct original record Is reattached should the record become detached. A canopy serial number will not be used for property accountability, except in test projects or other special instances.

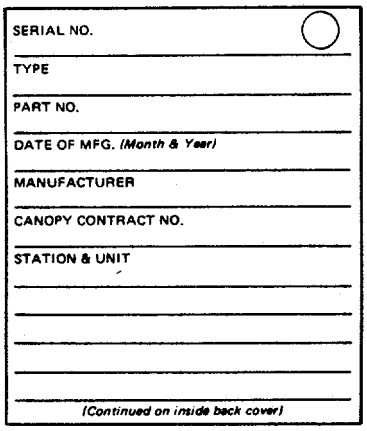


Figure 2-2. Inside Front Cover of Parachute Log Record.

(b) *Type*. Enter the parachute type.

(c) *Part number*. Enter the part number of the parachute canopy.

(d) *Date of manufacture*. Enter the month and year the parachute canopy was manufactured.

(e) *Manufacturer.* Enter the name of the parachute canopy manufacturer.

(f) *Canopy contract number*. Enter the entire contract number specified for the parachute canopy.

(g) *Station and unit*. Enter the name of the station and unit to which the parachute canopy is currently assigned. When a parachute is transferred permanently to another station and/or unit the original entry will be lined out and the name of the receiving station and/or unit will be entered.

(2) *Inside back cover*. Entries may be continued on the inside back cover, if necessary (figure 2-3).

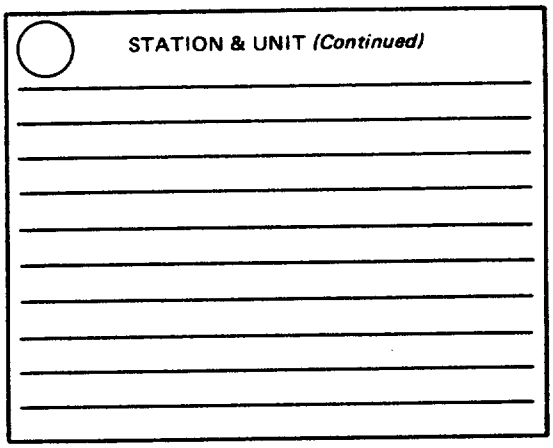


Figure 2-3. Inside Back Cover of Parachute Log Record.

(3) *Modification work order compliance record page*. When a modification is performed on a parachute canopy, the following entries will be made on the "Modification Work Order Compliance Record" pages of the Log Record (figure 2-4).

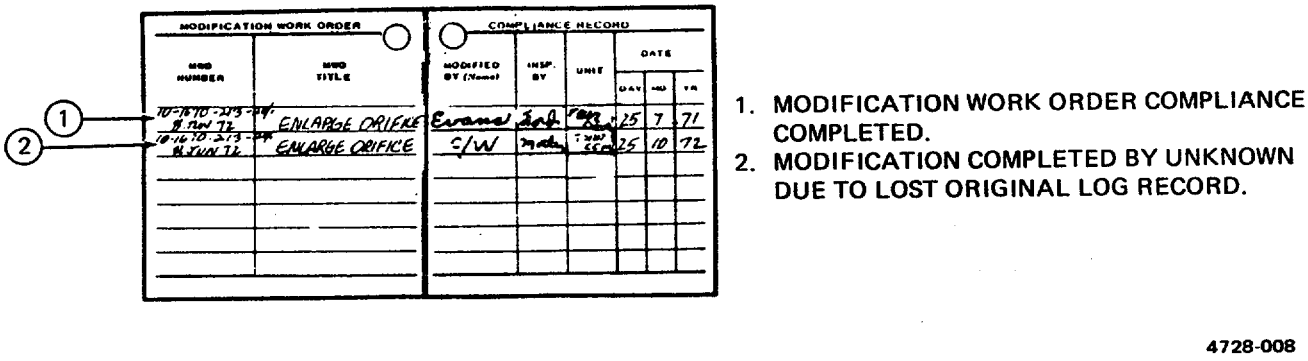


Figure 2-4. Log Record Entries for the Modification Work Order Compliance Record Page.

(a) *MWO number*. Enter the publication number and date of the Modification Work Order (MWO) which describes the MWO (1, figure 24).

(b) *MWO title*. Enter a short, abbreviated title extracted from the MWO prescribing the work.

2-4. Initial Receipt (cont).

(c) Modified by. Enter the last name of the Individual who has performed the modificatlon. If the original log record for the parachute has been lost, and it has been ascertained through inspection that a particular modification has been accomplished, the entry for this column will be C/W "Complied With" (2, figure 2-4), which signifies the applicable MWO has been complied with.

(d) Inspected by. The individual who accomplished the inspection required after modification will sign this entry with his last name only.

(e) Unit. Enter the unit designation responsible for performing the MWO or In the event of a lost Log Record, the unit to which the Inspector is assigned.

(f) Date. Enter the day, month, and year the modification work was completed.

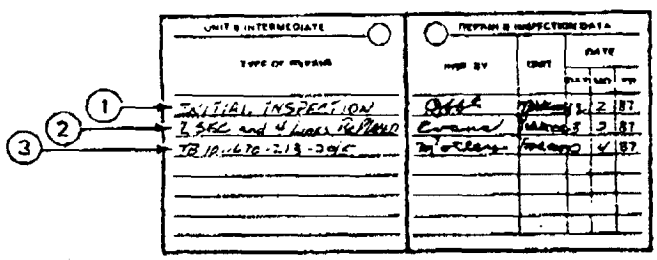
(4) *Unit and intermediate repair and inspection data.* When a parachute assembly is initially received from a supply source and a technical/rigger-type inspection is performed, the inspection accomplishment will be documented on the " Unit and Intermediate Repair and Inspection Data" page of the individual Parachute Log Record (figure 2-5). Additional entries will also be made on this page each time the assembly is repaired or is administered an inspection in compliance with a one-time inspection Technical Bulletin (TB). The page completion criteria is as follows:

(a) Type of repair. Enter the type of repair, completion of initial inspection, repalr accomplishment, Technical Bulletin inspection compliance.

(b) Inspection by. The individual who accomplished the inspection required will sign this entry with last name.

(c) Unit. Enter the unit designation responsible for performing the type of repair.

(d) Date. Enter the day, month and year the repair was performed.



1. COMPLETION OF INITIAL INSPECTION.
2. REPAIR ACCOMPLISHMENT.
3. TECHNICAL BULLETIN INSPECTION COMPLIANCE

Figure 2-5. Log Record Entries for Unit and Intermediate Repair and inspection Data Page.

(5) *Note page*. A page is provided at the back of a parachute log record to accommodate recording of additional data pertinent to the serviceability of a parachute assembly (figure 2-6). This shall also include the month and year the item was placed in service.

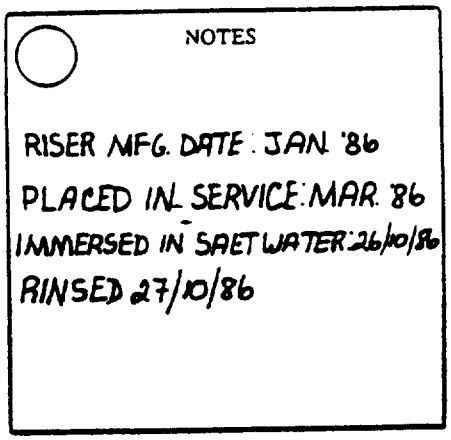


Figure 2-6. Data Entries for a Log Record Note Page.

2-5. Receipt of Used Parachute. Upon initial receipt of used parachute proceed as follows:

a. Follow procedures given in paragraph 2-4a, and check each component for excessive wear and tear.

b. If defects or damages are discovered, process the parachute for maintenance at the maintenance level assigned by the Maintenance Allocation Chart (Appendix B).

2-6. After Use Receipt. When a parachute is received at the maintenance activity following its use during air delivery, it must be given a shakeout and aired (para 2-11), and, if necessary, cleaned (para 2-12) before it can be returned to service. If a parachute is issued but is not used, it does not need to be given a shakeout; however, it must be unpacked and aired if it has been subjected to conditions of dampness.

2-7. Checking Unpacked Equipment After Shipment.

a. Inspect equipment for damage incurred during shipment. If the equipment has been damaged, report the damage on SF 364, Report of Discrepancy (ROD).

b. Check the equipment against the packing slip to see if the shipment is complete. Report all discrepancies in accordance with the instructions in AR 735-11-2, Reporting of Item and Packaging Discrepancies.

c. Check to see whether the equipment has been modified.

Section III. ASSEMBLY

2-8 Assembly of the 15-Foot Diameter Cargo Extraction Parachute

This task covers: Assembly

Personnel Required:

43E (10) Parachute Rigger

Equipment Condition:

Parachute on packing table

NOTE

The procedure for assembling components of the parachute is incorporated in the Packing Procedure, paragraph 2-16.

Figure 2-7. DELETED

Section IV. PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS)

2-9. PMCS Procedures. The following describe PMCS procedures on the unit and direct support (DS) intermediate levels.

a. *General*. Table 2-1 lists preventive maintenance checks and services. The purpose of PMCS is to assure that the 15 Foot Diameter Cargo Extraction parachute is operational.

b. *Frequency of Performing PMCS*. PMCS will be performed before equipment is packed for use, during modification and repair after use, or at any time deemed necessary by the air delivery equipment maintenance officer.

c. *PMCS Columnar Entries Table 2-1.* Enter data in columns as follows:

(1) *Item number*. The item number column shall be used as a source of the item number required for the "TM Numbers column on DA Form 2404 (Equipment Inspection and Maintenance Worksheet) when recording the results of PMCS.

(2) *Interval*. This column identifies the required PMCS interval.

(3) *Item to be inspected*. Contains the common name of the item to be inspected.

(4) *Procedures*. Provides a brief description of the procedure by which the checks are to be performed.

d. *Recording Defects*. All defects discovered during the inspection will be recorded using the applicable specifics in DA Pamphlet 738-750, TB 750-126, and TB 43-0002-4.

e. *Overage Items*. The 15 foot extraction parachute has no age or service life.

f. *Inspection Function Requirement*. Normally, a technical/rigger-type inspection will be performed by airdrop equipment maintenance personnel at a packing, rigging, or repair activity. The inspection of initial receipt items will be performed as a separate function from packing or rigging activity; the item to be inspected will be placed in proper layout on packing table or suitable sized floor area. Should defect or damage be discovered at any point during the inspection, the inspection will be terminated and the applicable item will be processed and forwarded to repair activity. The repair activity, in turn, will conduct a technical/rigger-type inspection that will be performed by only those parachute rigger personnel cited in AR 750-32, Airdrop, Parachute Recovery and Aircraft Personnel Escape Systems. The repair activity inspection of parachutes will be made on a shadow small cargo table. Any defect discovered during a unit level repair activity inspection which exceeds the capability of that activity will require the affected item to be evacuated to an intermediate direct support (DS) maintenance function for further determination of economic repair and repair accomplishment, if applicable.

NOTE

Parachutes which are deemed unserviceable by a packing or rigging activity will be rigger-rolled prior to being sent to a repair activity.

Table 2-1. Unit and Intermediate Direct Support (DS) Preventive Maintenance Checks and Services (PMCS).

B - Before **D - During** **A - After**

ITEM NO.	INTERVAL B	INTERVAL D	INTERVAL A	Item to be Inspected	Procedures
					NOTE Any defective material noted must be repaired prior to use. If the 60-foot extraction line is found defective, replace it with a 3-foot adapter web.
				The 15 Foot-Diameter Cargo Extraction Parachute	
1	•			Parachute Packed for Use	Visually check visible parts for serviceability and completeness without opening pack. Check parachute inspection data record for pack date.
2	•		•	Canopy	As canopy is raised, suspended, and lowered during shakeout, check for dampness, fungus, acid, grease, oil, dirt, foreign material, holes, cuts, tears; broken lines and webbing.
	•		•	Fabric Material	Legibility of marking data; completeness; dampness, fungus, dirt, acid, grease, oil, foreign material, rips, bums, cuts, breaks, frays, tears, holes, thin spots, loose weaving; loose or broken stitching, lines, and webbing.
	•		•	Hardware Components	Corrosion, rough spots, burrs, breaks, cracks, bends; loose or missing screws.
3	•		•	Deployment Bag	Completeness; dampness, fungus, acid, grease, oil, dirt, foreign material, holes, cuts, and breaks.
	•		•	Fabric Materials	Completeness; dampness, fungus, dirt, acid, grease, oil, foreign material, rips, bums, cuts, breaks, frays, tears, holes; loose or broken stitching.
	•		•	Hardware Components	Corrosion rough spots, burrs, breaks, cracks, bends; loose or missing grommets.

Table 2-1. Unit and Intermediate Direct Support (DS) Preventive Maintenance Checks and Services (PMCS).

B - Before D - During A - After

ITEM NO.	INTERVAL B	D	A	Item to be Inspected	Procedures
4	•		•	Extraction Line (60-Foot-Long)	Completeness, dampness, fungus, acid, grease, oil, dirt, foreign material, holes, cuts, or breaks.
	•		•	Fabric Materials	Completeness, dampness, fungus, acid, dirt, grease, oil, foreign material, burns, cuts, breaks, frays, tears; loose or broken stitching.
	•		•	Hardware Components	Corrosion, rough spots, burrs, breaks, cracks, and bends; unused V-rings and release knives taped.
5	•		•	36-Inch Long Extraction Parachute Adapter Web	
				Webbing Length	Dampness, fungus, acid fungus, acid, grease, oil, dirt, foreign material, cuts, burns, frays, missing keeper, loose or broken stitching.
				Attaching Loops	Damaged or missing buffers, loose or broken tacking.

Section V. UNIT AND INTERMEDIATE DIRECT SUPPORT (DS) MAINTENANCE

PROCEDURES

Paragraph Page

2-10. General Information. The following paragraphs contain general information pertinent to unit and intermediate direct support (DS) maintenance procedures:

a. *Scope*. This section contains maintenance procedures which are the responsibility of the specified technician as authorized by the maintenance allocation chart (MAC) and the Source, Maintenance and Recoverability (SMR) coded items that are identified in the repair parts and special tools list (RPSTL).

b. *Maintenance Functions/Procedures*. Each paragraph identifies a maintenance function specified in the MAC. All maintenance procedures required to complete a maintenance function are identified under "This task covers: ", in the order in which the work is most logically accomplished.

2-11. Shakeout and Airing.

This task covers: a. Shakeout b. Airing

Materials/Parts:

Brush, Scrub, Household, Item 3, Appendix D.

Equipment Condition:

Parachute suspended

Personnel Required: (2)

43E(10) Parachute Rigger

a. *Shakeout*. The shakeout will be accomplished by a two-person team, either indoors within a shakeout room or outdoors at a shakeout tower. Each parachute will be suspended by the canopy bridle loop and all debris removed by shaking the canopy thoroughly or by brushing with a dry soft-bristled brush as detailed below:

(1) With assistance from the No. 2 person, the No. 1 person will connect the snap on a pulley rope to the canopy bridle loop (A, figure 2-8).

(2) Through use of the pulley rope, the No. 2 person will raise the canopy to a suitable height which will enable the No. 1 person to perform shakeout on each of the canopy gores. Until the gore shaking process is completed the No. 2 person will maintain a steady pull on the pulley rope to hold the suspended canopy at the working height needed by the No. 1 person.

(3) The No. 1 person will grasp any two consecutive suspension lines, one in each hand (B, figure 2-8), and vigorously shake the first gore. When the gore is free of debris, the No. 1 person passes the line from the right hand to the left hand and grasps the next consecutive suspension line in the right hand. The No. 1 person will shake out each consecutive gore until all suspension lines are held in the left hand and all gores are free of debris.

(4) Once the gore shaking process is completed, the No. 2 person will slowly raise the suspended canopy higher as the No. 1 person clears the suspension lines of debris and removes entanglements (C, figure 2-8) when possible.

(5) After the suspension lines have been cleared, the No. 2 person may hold or temporarily secure the pulley rope while the No. 1 person proceeds to clear debris from other parachute components.

(6) When all components are free of debris, the No. 2 person will slowly lower the canopy while the No. 1 person S-folds the suspension lines into the deployment bag/kit bag (D, figure 2-8). After the suspension lines have been completely folded, the No. 1 person will accordion-fold the canopy length on top of the folded lines.

(7) As the canopy folding is being completed, the No. 1 person disconnects the canopy bridle loop from the pulley rope snap. Secure the folded canopy assembly for further handling.

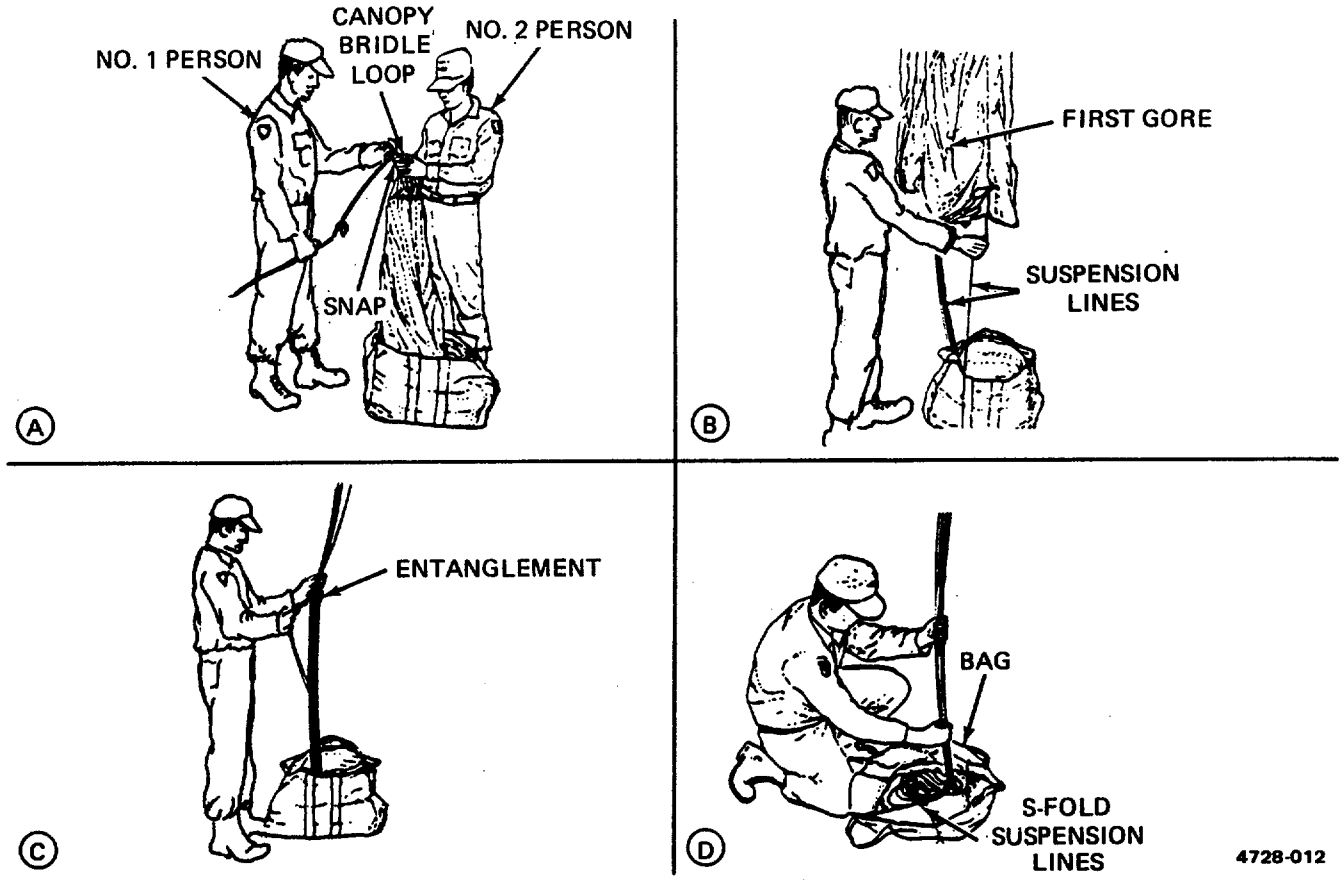


Figure 2-8. Shakeout.

CAUTION

Prolonged exposure to direct sunlight will cause extensive damage to fabric materials.

b. *Airing*. Where dampness and mildew are common, air delivery equipment will be aired at a more frequent interval. Parachutes that have been previously packed or are unpacked, which have been subjected to conditions of dampness or mildew, will be aired for a period of at least 6 hours prior to being repacked. Air delivery items may be aired either indoors or outdoors in dry weather. However, fabric Items will not be aired in direct sunlight. Airing may be accomplished by suspending or elevating the applicable item(s) in a manner which would allow entire exposure to the circulation of air. Outside facilities used for the shakeout of parachutes may be used for the airing of airdrop equipment if weather conditions permit. If the shakeout facilities are inadequate for airing, the applicable item(s) may be suspended or elevated at several points or by draping over suitable type objects which would not cause damage.

2-12. Cleaning and Drying.

This task covers:

a. Cleaning fabric items with cleaning solvent
b. Cleaning fabric items with dishwashing compound
c. Drying fabric items
d. Cleaning metal Items

Materials/Parts:

Tetrachloroethylene, Item 25, Appendix D

Dishwashing Compound, Item 10, Appendix D

Rag, Wiping, Item 19, Appendix D

Lubricant, Solid Film, Item 12, Appendix D

Cloth, Abrasive, Item 5, Appendix D

Equipment Condition:

Layout on packing table or other suitable area.

Special Environmental Condition:

Ventilation required as repeated or prolonged inhalation of cleaning solvent vapors can be detrimental to human health.

Personnel Required:

43E(10) Parachute Rigger

WARNING

Due to flammable properties and nylon-damaging substances, cleaning solvents other than tetrachloroethylene will not be used In the spot-cleaning of air delivery equipment. Tetrachloroethylene will only be used In areas where substantial ventilation is available. Repeated or prolonged inhalation of the solvent vapors can be detrimental to human health. In addition, avoid prolonged or repeated contact of the solvent fluid with areas of the skin. Tetrachloroethylene must not be taken internally.

CAUTION

If during the cleaning there exists a possibility that the substance to be removed contains acid or some other equally destructive ingredient, the item will be evacuated to Intermediate direct support (DS) maintenance activity for determination as to the nature of the substance and item disposition. If the substance cannot be identified or if normal repair procedures will not eliminate all traces of chemical or acid damage, the applicable item will be condemned.

NOTE

Cleaning of parachutes should be held to a minimum and should be performed only when necessary to prevent malfunction or deterioration. When a parachute contains debris, or when it Is soiled by dirt, oil, grease, rust, corrosion, or other foreign substances to such an extent that cleaning is necessary, the cleaning should be performed manually and should be limited to the soiled area only, unless the parachute has been contaminated by water. The methods of cleaning must be determined by the nature of the substance to be removed.

Do not use cleaning solvent to clean item soiling caused by air sickness. Use a solution of hand dishwashing compound to clean this type of soiling.

a. *Cleaning Fabric Items with Cleaning Solvent.* Use cleaning solvent to clean fabric items as follows: (1) Gently brush with a soft bristle brush.

(2) Spot clean with cleaning solvent tetracholoroethylene.

(a) Rub the soiled area with a clean cloth dampened with tetrachloroethylene.

(b) Rinse the cleaned area by repeating the rubbing process with the clean portion of the cloth dampened with the cleaning solvent.

(c) Rub with dry cloth to remove excess solvent and air dry.

NOTE

Do not wring out the rinsed area if an excessive amount of cleaning solvent was applied.

b. *Cleaning Fabric Items with a Solution of Hand Dishwashing Compound.* Use dishwashing compound to clean fabric items as follows:

(1) Gently brush with a soft bristle brush.

(2) Spot clean with a solution of dishwashing compound.

(a) Dissolve one-half cup of dishwashing compound in one gallon of warm water.

(b) Rub the soiled area with a clean cloth dampened with the solution of dishwashing compound.

(c) Rinse the cleaned area with water and air dry.

NOTE

Fabric items will not be dried in direct sunlight or by laying an item on the ground.

2-12. Cleaning and Drying (cont).

c. *Drying Fabric Items.* Dry fabric items as follows:

(1) Suspend or elevate the item in a well-ventilated room or in a heated drying room.
(2) Drying time may be reduced by using electric circulating fans.
(3) When heat is used, the heat temperature shall not exceed 160F (71 °C). The preferred temperature is 1400F (600C).

d. *Cleaning Metal Items.* Clean metal items as follows:

CAUTION
Use care not to damage the adjacent fabric materials.

(1) Remove burrs, rough spots, rust or corrosion from metal items by filing with a metal file or by buffing and polishing with abrasive cloth.

WARNING
Use tetrachloroethylene only In areas where substantial ventilation is provided. Repeated or prolonged Inhalation can be detrimental to human health. Avoid prolonged or repeated contact with skin areas. Tetrachloroethylene must not be taken internally.

(2) Remove all oils and filings by brushing and dipping in tetrachloroethylene. Allow to dry.

NOTE
Shield adjacent fabric material before spraying solid film lubricant.

(3) Spray metal item with a solid film lubricant and allow to air dry for 24 hours.

NOTE
A small amount of lubricant will not damage fabric, but may cause discoloration and make fabric appear soiled.

2-13. Inspection.

This task covers:	a. Routine b. Pack-in-Process	c. Technical-Rigger-Type d. In-storage

Personnel Required:	*Equipment Condition:*
43E(10) Parachute Rigger	Packed

a. *Routine Inspection.* A routine inspection is a visual check performed to ascertain the serviceability of all visible components of a parachute that is packed or rigged for use. The inspection will be made on all components that can be inspected without opening the parachute pack. This inspection will be administered by a parachute rigger prior to issue. Parachutes issued for an air delivery operation and not deployed will receive a routine inspection prior to being placed into ready for-issue storage.

b. *Pack-in-Process Inspection.* A pack-in-process inspection is performed at specified Intervals during the packing of a parachute to insure that only authorized procedures and methods are being used. The inspection will be accomplished by a parachute rigger other than the packer or rigger preparing the applicable equipment for use. The intervals at which the inspection is performed is as follows:

(1) After the parachute Is placed in proper layout.
(2) After the gores are folded and flatfold is completed.
(3) After the canopy is longfolded and deployment bag is attached.
(4) After the canopy Is stowed.
(5) After suspension lines are stowed.
(6) After deployment bag Is closed.
(7) After the extraction line Is stowed (if applicable).

c. *Technical/Rigger-Type Inspection Procedures.* Perform inspection as follows:

(1) *Overall inspection.* An overall inspection will be made on the 15Foot Cargo Extraction parachute to ascertain the following:

(a) Log record/parachute inspection data pocket and form. As applicable, Inspect the assembly log record/parachute inspection data pocket to insure the Army Parachute Log Record (DA Form 10-42 or 3912) is enclosed and properly attached as prescribed in paragraph 2-4e. Further, remove the log record from the pocket and evaluate the recorded entries to insure compliance' with paragraph 2-4f.

2-13. Inspection (cont).

(b) Assembly completeness. Insure that the applicable assembly is complete and no components or parts are missing.

(c) Operational adequacy. Check the item components and parts to insure proper assembly which includes attachment and alinement, and that the assembled product functions in the prescribed manner. Further insure that no stitch formation or sewn seam has been omitted.

(d) Markings and stenciling. Inspect each assembly and components for faded, illegible, obliterated, or missing Informational data, identification numbers.

(e) Foreign material and stains. Inspect each assembly and related components for the presence of dirt or similar type foreign material. Also check for evidence of mildew, moisture, oil, grease, pitch, resin, or contamination by salt water.

(2) *Detailed Inspection.* In addition to the overall inspection performed in (1), above, a detailed inspection will be performed on the materials which constitute the assembly or component construction using the following criteria, as applicable:

(a) Metal. Inspect for rust, corrosion, dents, bends, breaks, burrs, rough spots, sharp edges, wear, deterioration; damaged, loose, or missing grommets, and loose or missing screws.

(b) Cloth. Inspect for breaks, burns,. cuts, frays, holes, rips, snags, tears; loose, missing, or broken stitching or tacking; weak spots, wear, or deterioration.

(c) Fabric tape, webbing, and cordage. Inspect for breaks, burns, cuts, frays, holes, snags, tears, Incorrect weaving, and sharp edges formed from searing; loose, missing, or broken stitching, tacking, whipping, and weaving; weak spots, wear, and deterioration.

(d) Pressure-sensitive (adhesive) tape. Inspect for burns, holes, cuts, tears, weak spots; looseness and deterioration.

d. In-Storage Inspection. An in-storage inspection is a physical check conducted on a random sample of air delivery equipment which is located in storage. The purpose of the inspection Is to Insure that the equipment is ready for issue, that the item is properly identified and segregated from other types of equipment, that no damage or deterioration of equipment has been incurred, and that all modifications or similar action requirements have been completed. The inspection shall also concern the methods and procedures applied to the storage of air delivery items, the adequacy of storage facilities, efforts of pest and rodent control, and protection against unfavorable climatic conditions. Air delivery equipment which is in storage will be inspected at least semiannually and at more frequent Intervals if prescribed by the local parachute maintenance officer. The frequency of inspection may vary according to the type of storage facilities and local climatic conditions. In-storage inspection will be conducted only by parachute rigger personnel designated by local parachute maintenance officer.

2-14. Acidity Test.

This task covers: Acidity test

Tools:

Packing Paddle, Item 7, Appendix B

Personnel Required:

43E(10) Parachute Rigger

Materials/Parts:

Medicine Dropper, Item 14, Appendix D
Three Color pH Paper, Item 15, Appendix D
Spool with Color Chart, Item 20, Appendix D

Equipment Condition:

Unpacked.
Layout on packing table or other suitable area.

a. *Fabric and Webbing Acidity Test.* Components and parts that are constructed from fabric or webbing will be administered an acidity test whenever the material is discolored, stained, or the presence of acid is suspected. The acidity test will be accomplished using approved colorimetric pH paper, strip type, with the color comparison chart on the side of each manufacturer's dispenser, to determine the acidity level in steps of 1 pH on a fabric or webbing item.

b. *Test Procedure.* Perform test as follows:

(1) Using a medicine dropper or equivalent type applicator, place one to two drops of water on the item in the intended test area. If water drops do not penetrate the material, gently rub the moistened area with a flat side of a clean metal packing paddle.
(2) Tear a suitable length of colorimetric pH paper from dispenser, place the piece of pH paper on the wetted area and press the full surface of the paper against the material with a flat side of the packing paddle used in step (1), above. Insure the pH paper becomes thoroughly wet.
(3) Using the color comparison chart enclosed in the dispenser, compare the color of the moistened pH paper strip with the pH 13 color scale. If the color of the pH paper matches the numerical pH 1-3, the acidity present in the material exceeds the acceptable level and the item is to be condemned and processed for disposition In accordance with TM 10-1670-201-23.
(4) After a packing paddle has been used as outlined in steps (1) and (2), above, thoroughly rinse and dry the paddle before using the paddle for any other functions.

2.15. Salt-Water Contamination Test.

This task covers: Inspection

Personnel Required:

43E (10) Parachute Rigger

Equipment Condition:

Layout on packing table or other suitable area.

NOTE

Clean or Condemn equipment known or suspected of salt contamination in accordance with paragraph 2-12e and 2-13e.

Inspection. **Look for a white crystaline residue.**

2-16. Packing the 15-Foot Cargo Extraction Parachute.

This task covers:

a Inspection
b. Orientation
c. Preparing Parachute for Proper Layout
d. Removing Inversion
e. Removing Partial Inversions
f. Locating Suspension Lines
g. Attaching and Stowing Deployment Bag Retaining Tie
h. Folding the Gores
i. Longfolding the Canopy
J. Stowing the Canopy
k. Stowing Suspension Lines
I. Closing the Deployment Bag
m. Attaching the Extraction Line
n. Stowing the 60-Foot Type X Extraction Line
o. Signing DA Form 10-42/3912

Tools:
Packing Weights, Item 8, Appendix B
Line Separator, Item 4, Appendix B
Packing Paddle, Item 7, Appendix B
Knife, Item 1, Appendix B

Materials/Parts:

Retainer Band, Rubber, Item 1, Appendix D
Thread, Cotton, Size 817, Item 26, Appendix D
Webbing, Cotton, Type I, 1/14n., Item 34, Appendix D
Tape, Pressure Sensitive, Item 24, Appendix D

Personnel Required:
43E(10) Parachute Rigger

Equipment Condition:

Parachute cleaned (reference paragraph 2-12) and given a shakeout (reference paragraph 2-11).

References:

TM 10-1670-201-23 T.O. 13C-1-411 NAVAIR 13-1-17
DA PAM 738-751
TB 43-0002-4

WARNING

Failure to detect areas of damage may result In malfunction of the parachute and injury or loss of life to personnel.

2-16. Packing the 15-Foot Cargo Extraction Parachute (cont).

a. *Inspection.* If defects or damages are discovered during inspection of a parachute, the parachute must be rigger-rolled and processed for maintenance in accordance with TM 10-1670201-23 and TB 750-126. A rigger type inspection and a pack-in-process inspection must be performed in conjunction with each packing of a parachute (refer to para 2-13).

(1) *Rigger-type inspection.* Before each parachute is packed for air delivery, it must be given a rigger-type Inspection by the packer in accordance with paragraph 2-13 above.
(2) *Pack-in-process inspection.* A pack-in-process inspection must be performed by a designated supervisory rigger, other than the packer, at seven intervals during the packing procedure. The inspection is performed to assure that the parachute is packed according to authorized packing procedures. (Refer to para 2-13).

b. *Orientation.* Throughout this manual, all directions (right, left, upper, lower, top, bottom, clockwise, and counterclockwise) are given from the rigger's point of view, as the rigger stands at the tension plate end of the packing table facing the apex-hook end of the table (figure 2-9).

(1) Top, that portion of the equipment that is farthest from the packing table surface.
(2) Bottom, that portion of the equipment that is nearest to the packing table surface.

c. *Preparing Parachute for Proper Layout.* Prepare the parachute as follows: (1) If components of the parachute assembly are detached, assemble the parachute during layout in accordance with paragraph 2-8. Place packing tools in convenient locations on the packing table. Lay the canopy assembly lengthwise on the packing table, and attach the canopy to the packing table apex hook (figure 2-10).

(2) Attach the connector links to the tension plate and apply enough tension to keep the canopy on the table. Check vent lines to determine if the canopy is Inverted. If the vent lines do not appear attached to the outside of the upper lateral band, the canopy is inverted.

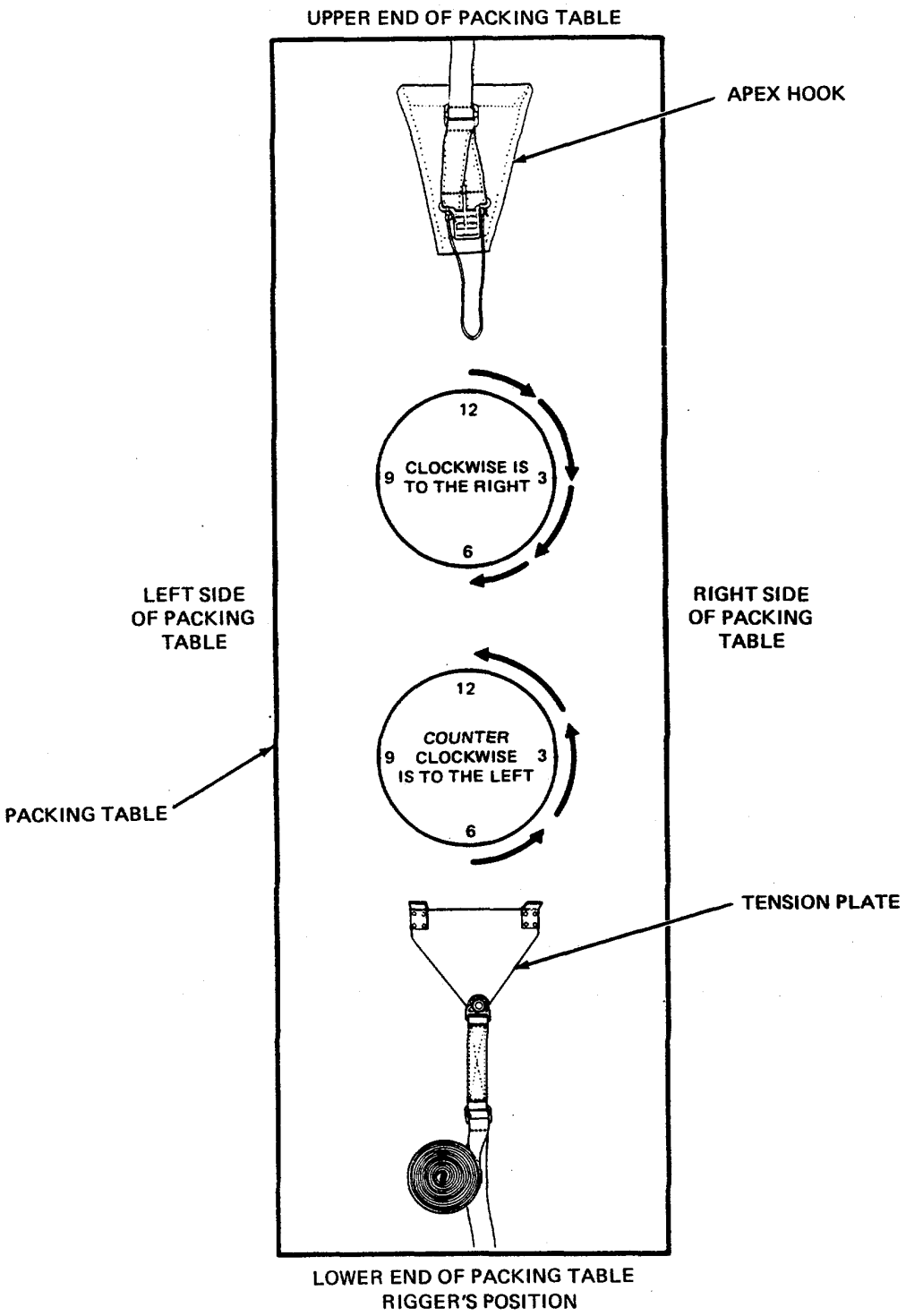


Figure 2-9. Rigger's Orientation.

2-16. Packing the 15-Foot Cargo Extraction Parachute (cont).

NOTE

When Inversion, turns, tangles and twist are present in the canopy assembly, the proper sequence for removal to achieve proper layout is to remove an Inversion first, remove turns secondly, then remove tangles and finally, remove twist.

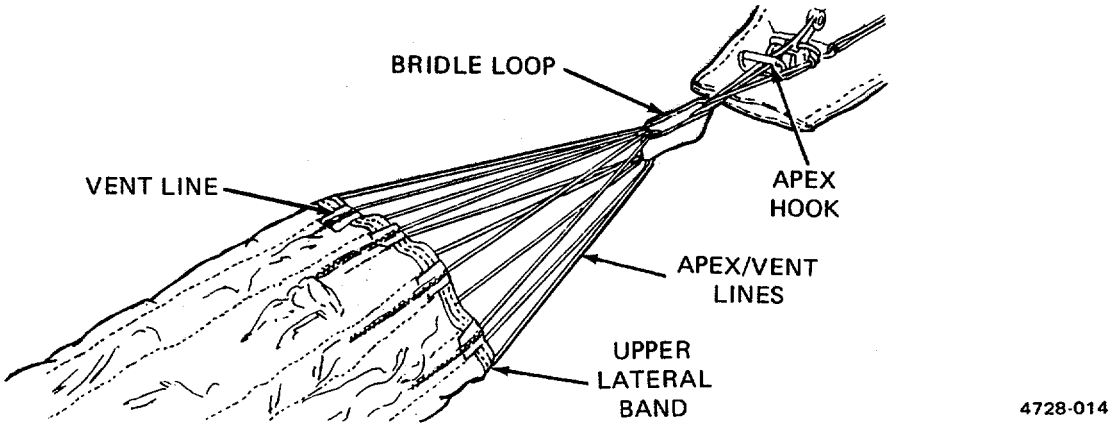


Figure 2-10. Canopy Attached to Packing Table Apex Hook.

d. *Removing Inversion*. The canopy vent lines shall be checked to ascertain if the canopy has been Inverted. Should the vent lines be on the inside of the upper lateral band, the canopy is inverted. To remove an inversion, proceed as follows:

(1) Remove the canopy from apex hook, pass canopy vent down through the canopy.
(2) Bring vent out at skirt between two adjacent suspension lines (figure 2-11-).
(3) Reattach the canopy to apex hook after the inversion is removed.

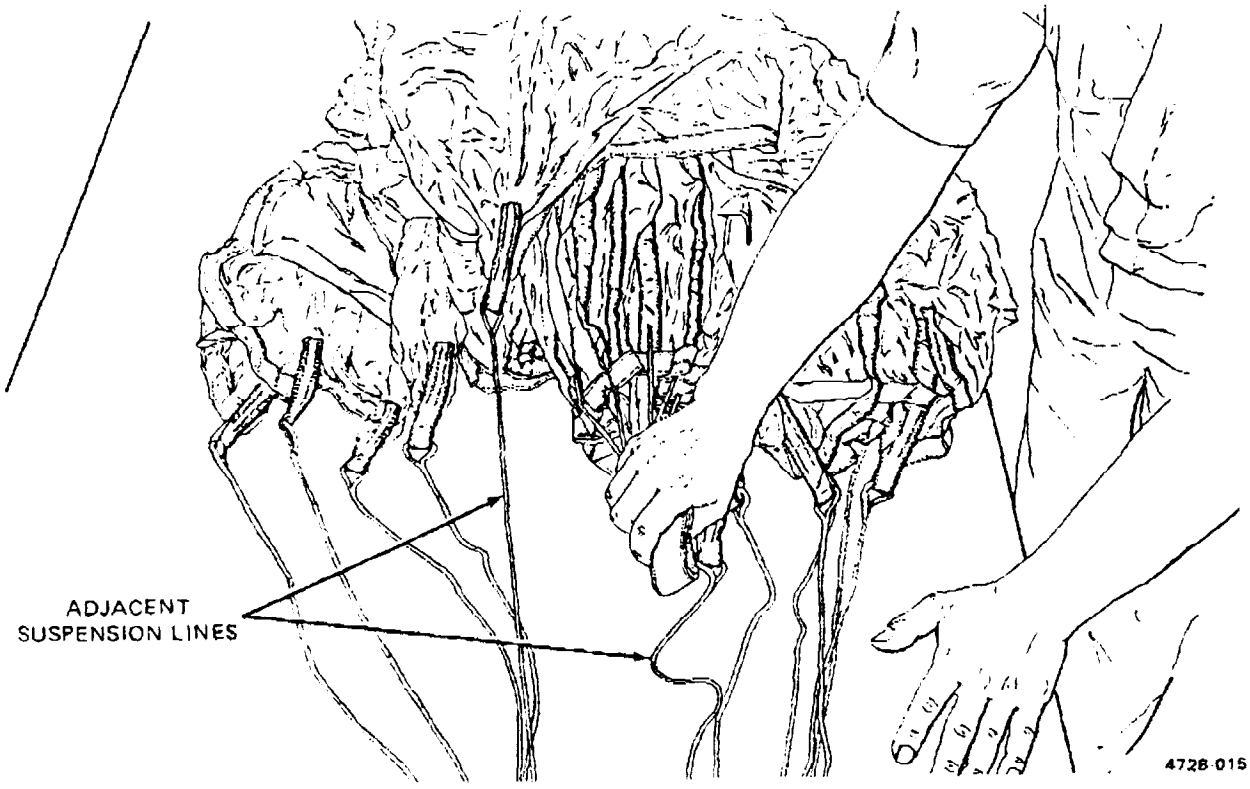


Figure* 2-11. *Removing Inversion.

e. *Removing Partial Inversion.* A partial inversion may occur In an extraction parachute with a ringslot-type canopy. If the vent is on the outside of the canopy and the pocket bands are on the inside, or vice versa, a partial inversion exists. Remove the partial Inversion as follows:

(1) Disconnect bridle loop from apex hook.

(2) Trace radial and vertical tapes to annular ring or ringslot, where tapes turn under to canopy and out through annular ring applicable ringslot (figure 2-12).

(3) Reattach bridle loop to apex hook.

2-16. Packing the 15-Foot Cargo Extraction Parachute (cont).

Figure 2-12. Removing Partial Inversion.

f. *Locating Suspension Lines.* To properly locate suspension lines, proceed as follows:

NOTE

Suspension lines 1 thru 16 are divided into two groups, 1 thru 8 in left group and 9 thru 16 in right group.

(1) Divide the suspension lines into left and right groups.
(2) Place a packing weight around the right group of lines and move weight toward risers, checking for turns, tangles and twists.
(3) When Inversion, turns, tangles, and twists are present in a canopy assembly, the proper sequence for removal to achieve proper layout is to remove an inversion first, remove turns secondly, then remove tangles, and finally, remove twists as follows:

(a) Turns. A turn occurs when one group of suspension lines rotates around other group (figure 2-13).

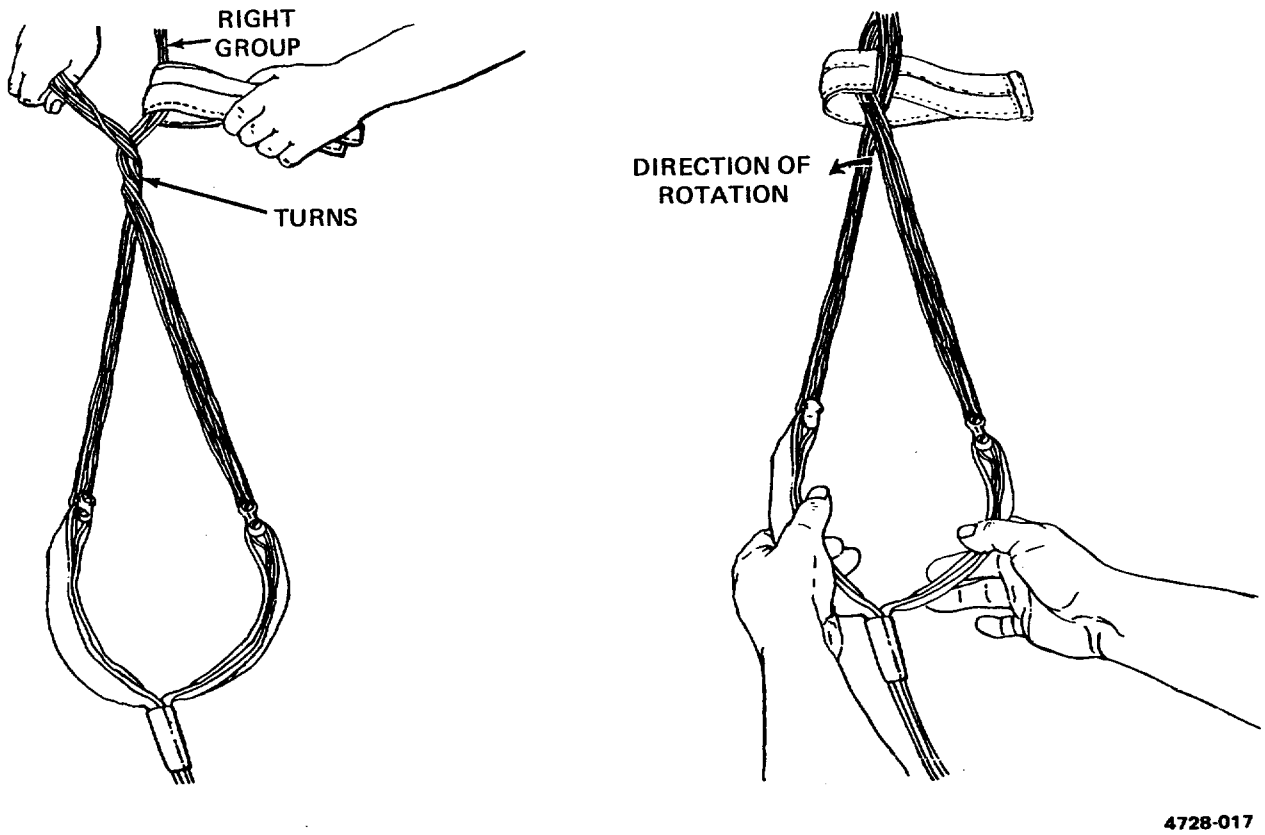


Figure 2-13. Removing Turns from Suspension Lines.

1 Remove connector links from tension plate and remove a turn by rotating risers in direction opposite to direction of turn.

2 Reposition connector links on tension plate.

(b) Tangles. To remove a tangle, or tangles, keep the two groups of lines separated and work the tangle, or tangles, as close to the connector links as possible. Detach connector links from the tension plate.

1 Select top line, or lines that form the tangle and, with left hand, lift line, or lines, away from other lines (figure 2-14).

2 Reach through opening, created by lifting the suspension lines, with right hand (figure 2-14) and pull adapter web or extraction line through opening (figure 2-14). Do not permit risers to turn.

3 Replace connector links on tension plate.

2-16. Packing the 15-Foot Cargo Extraction Parachute (cont).

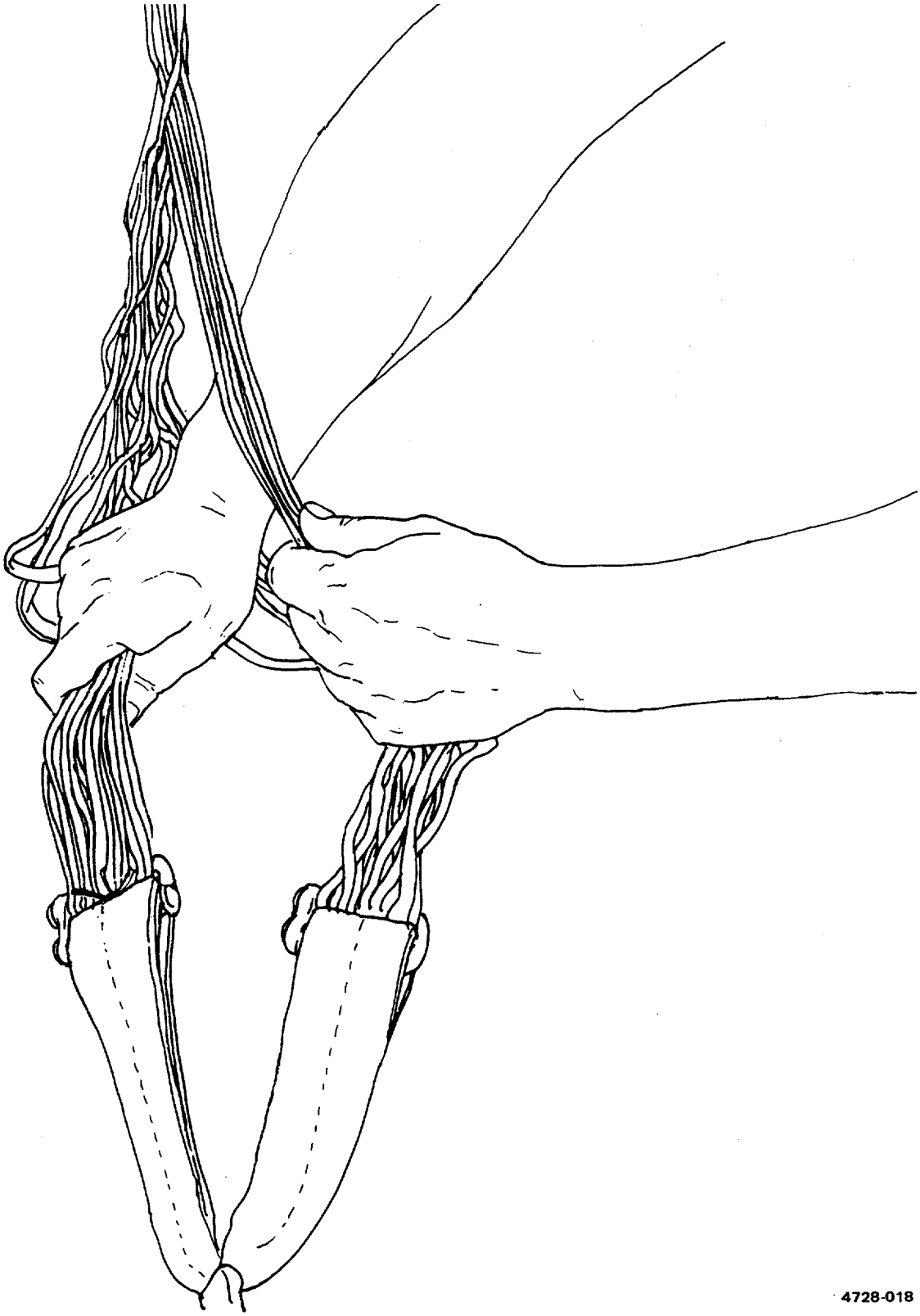


Figure 2-14. Removing Tangles from Suspension Lines.

(c) Twists. A twist occurs when the suspension lines within one group become Improperly crossed (figure 2-15).

1 To remove twists, grasp inside lines (lines 1 and 16) at skirt of canopy and trace them to connector links (figure 2-15).

2 Remove twists by rotating adapter web or extraction lines until lines are in proper location on connector links.

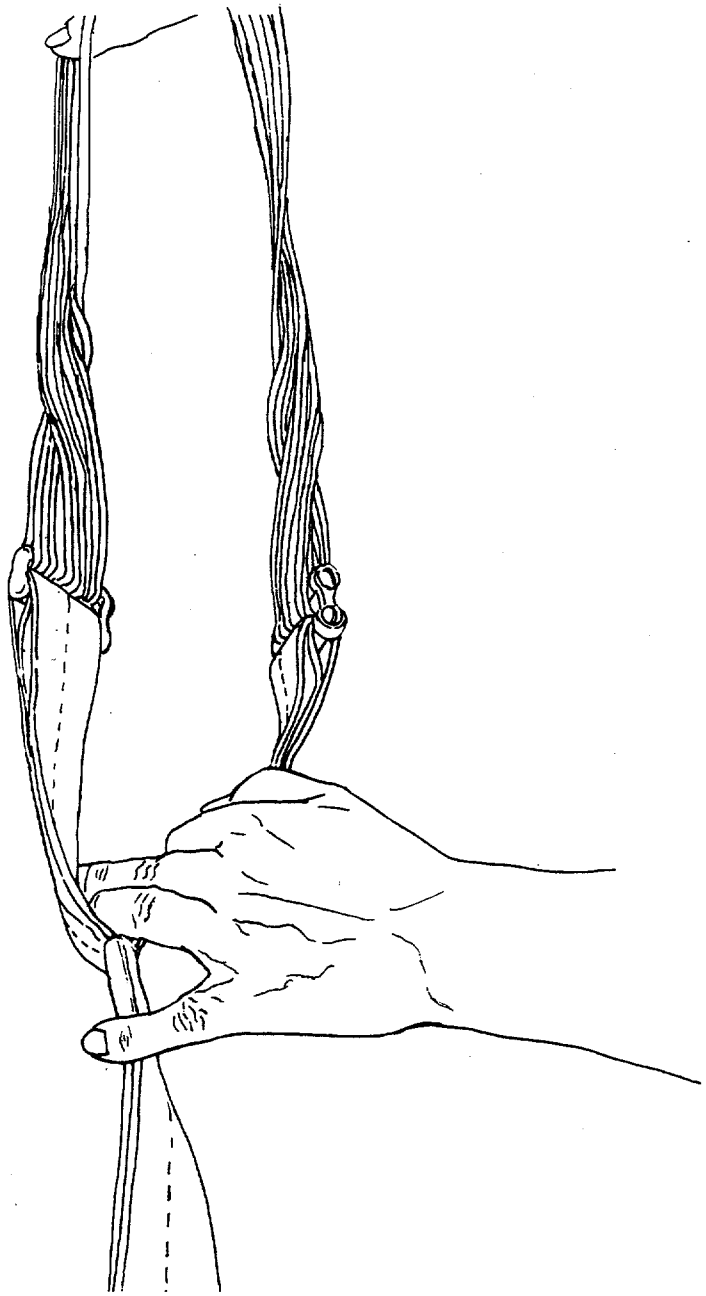
(4) Check suspension lines for proper layout (figure 2-16). Left group should have line 1 on top of connector link. Right group will have line 16 on top of connector link.
(5) Parachute is now in proper layout.

NOTE

When the 60 foot extraction line is damaged beyond repair, it will be removed and a 3-foot type XXVI nylon adapter web will be installed. When this is accomplished, the NSN for the 15-foot-diameter cargo extraction parachute will be changed to 1670-01-063-3715.

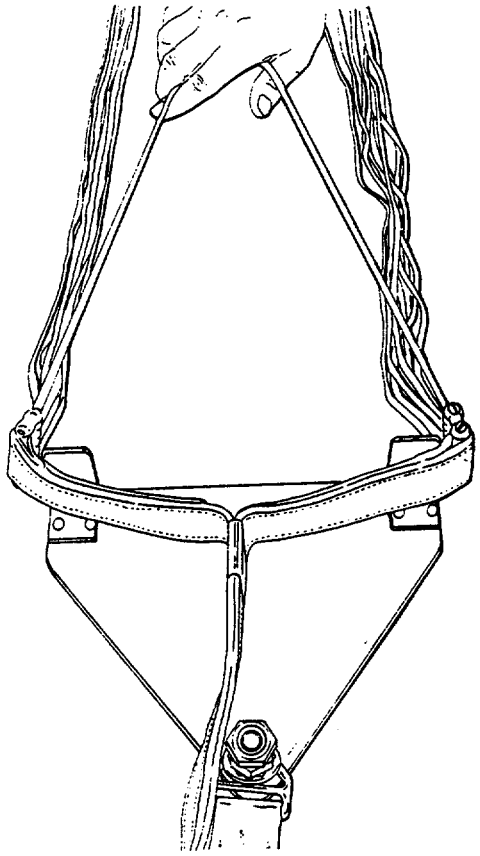
g. Attaching and Stowing Deployment Bag Retaining Tie. Attach and stow deployment bag retaining tie following the procedures in paragraph 2-8.

2-16. Packing the 15-Foot Cargo Extraction Parachute (cont).



4728-019

Figure 2-15. Removing Twists from Suspension Lines.



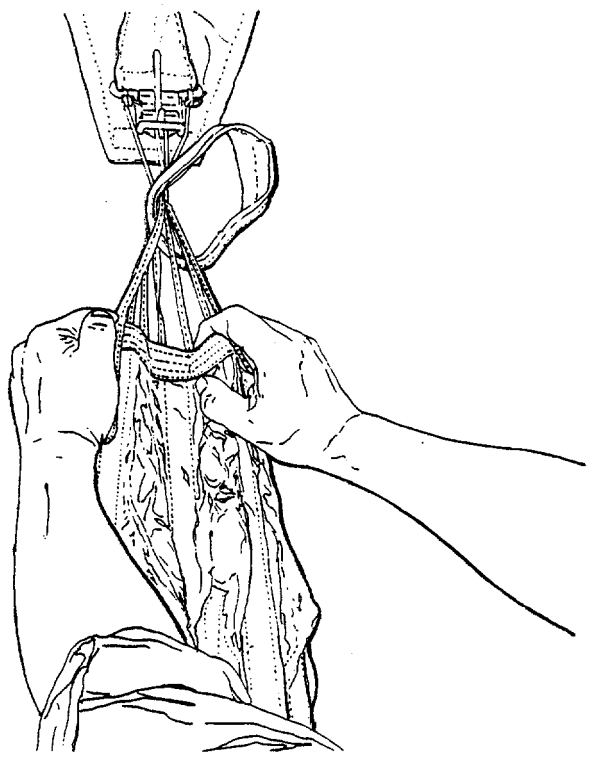
4727-020

Figure 2-16. Line 1 and 16 Checked at Connector Link.

h. *Folding the Gores.* Fold canopy gores as follows:

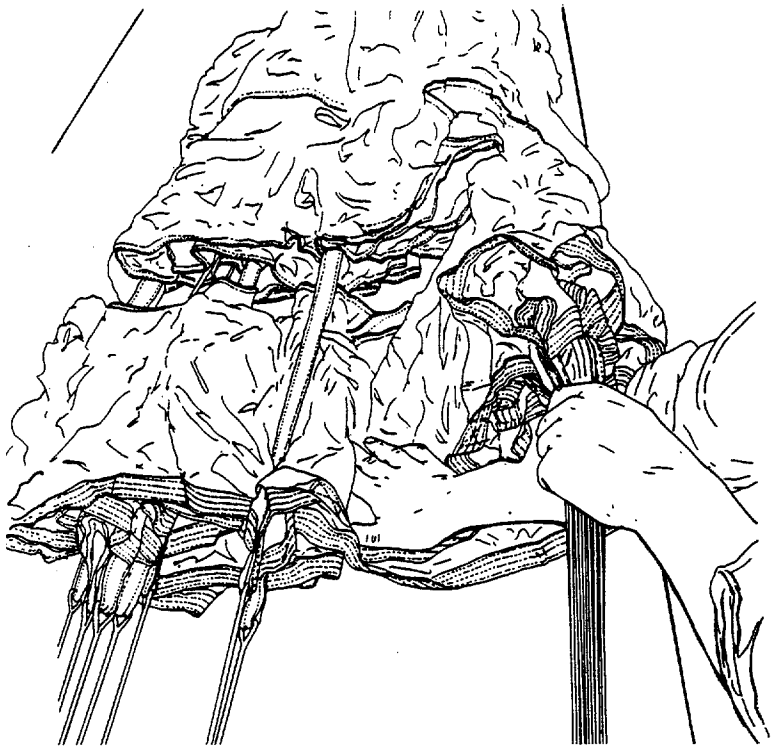
(1) Dress apex (figure 2-17), apply tension to canopy.
(2) Pick up right group of suspension lines with left hand. Using right hand to hold top center gore in position, flip right group of gores over left group of gores (figure 2-18).
(3) Using left hand, pick up line 9 at canopy skirt and place line between thumb and forefinger of right hand. Move line to right edge of table, and fold right group of gores (A, figure 2-19).
(4) Using the right hand, scissor right group of suspension lines between middle and forefingers. Rotate right hand one-quarter turn clockwise (B, figure 2-19).
(5) Beginning with line 1, fold left group of gores, do not fold last two gores in this group.

2-16. Packing the 15-Foot Cargo Extraction Parachute (cont).



4728-021

Figure 2-17. Dressing the Apex.



4728-022

Figure 2-18. Flipping right Group of Gores.

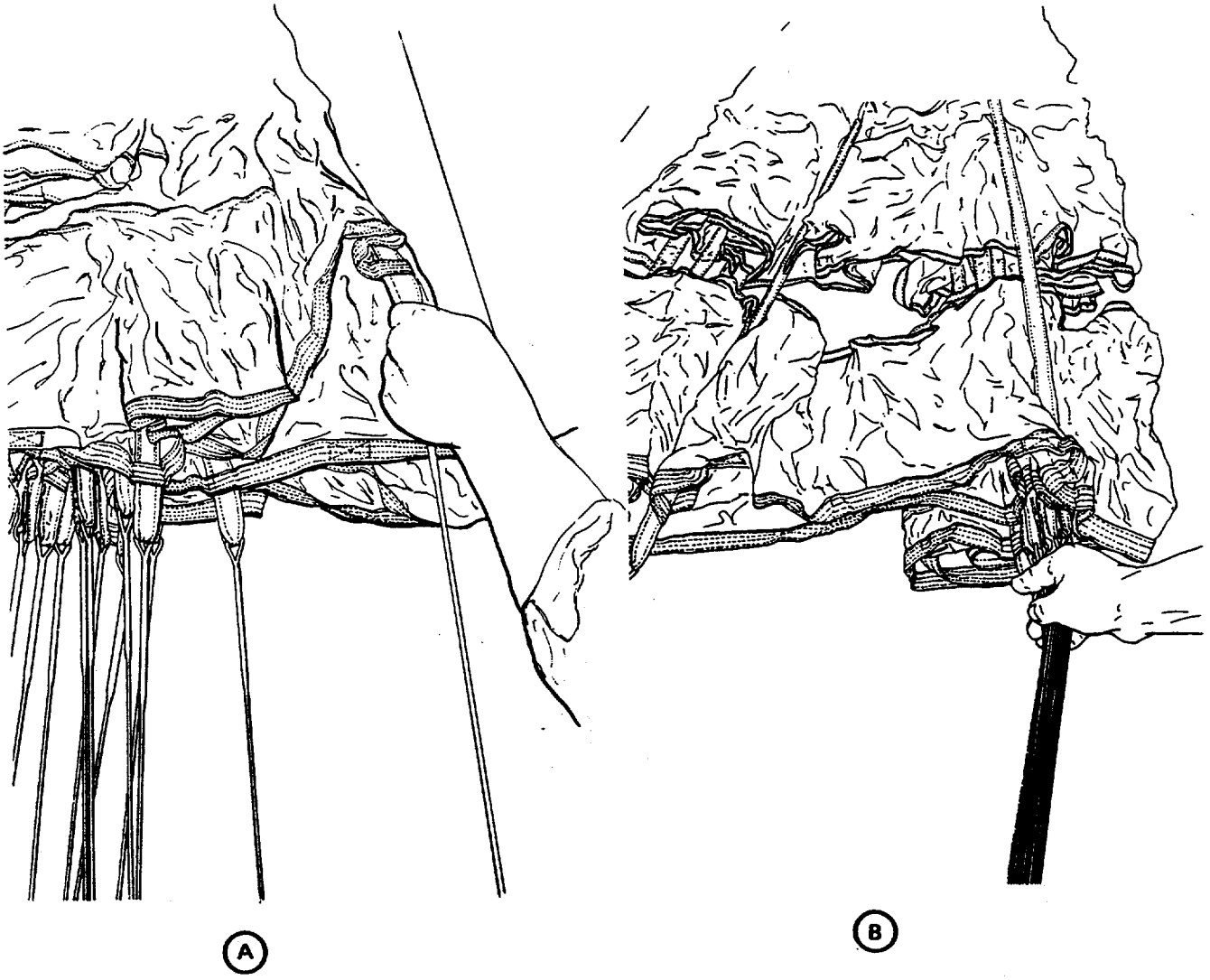


Figure 2-19. Folding Right Group of Gores

(6) Raise last suspension line of left gore group and drape last gore on left. Next to last gore shall be draped on right. After draping last two gores, place last suspension line on top of other lines in last group (figure 2-20).

(7) Place two suspension line groups into a line separator at a point just below canopy skirt.

2-16. Packing the 15-Foot Cargo Extraction Parachute (cont).

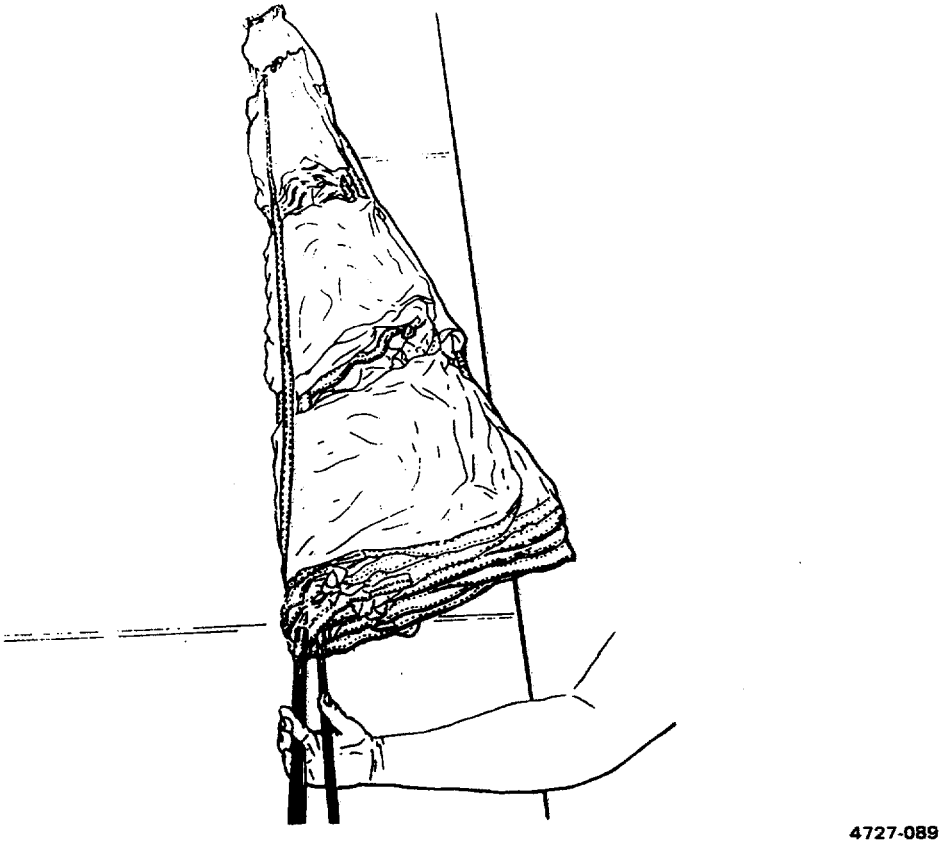


Figure 2-20. Left Gore Group Fold Complete.

(8) Using left hand, hold line separator and separated lines. Grasp canopy with right hand and pull canopy off right side of pack table, allowing all folded gores to drape downward to side of table (figure 2-21).
(9) Slide canopy back onto table and rotate suspension lines and line separator one-half turn counterclockwise which will allow the separator base to rest on the table.
(10) Flip left group of gores to left side of table top and apply additional tension (figure 2-22).
(11) To complete the canopy flatfold, dress the gores and the skirt reinforcement (lower lateral band). Insure that eight gores are in each gore group and that a clear air channel exists between the two gore groups. Lay a packing weight across the suspension lines just below the line separator (figure 2-22).

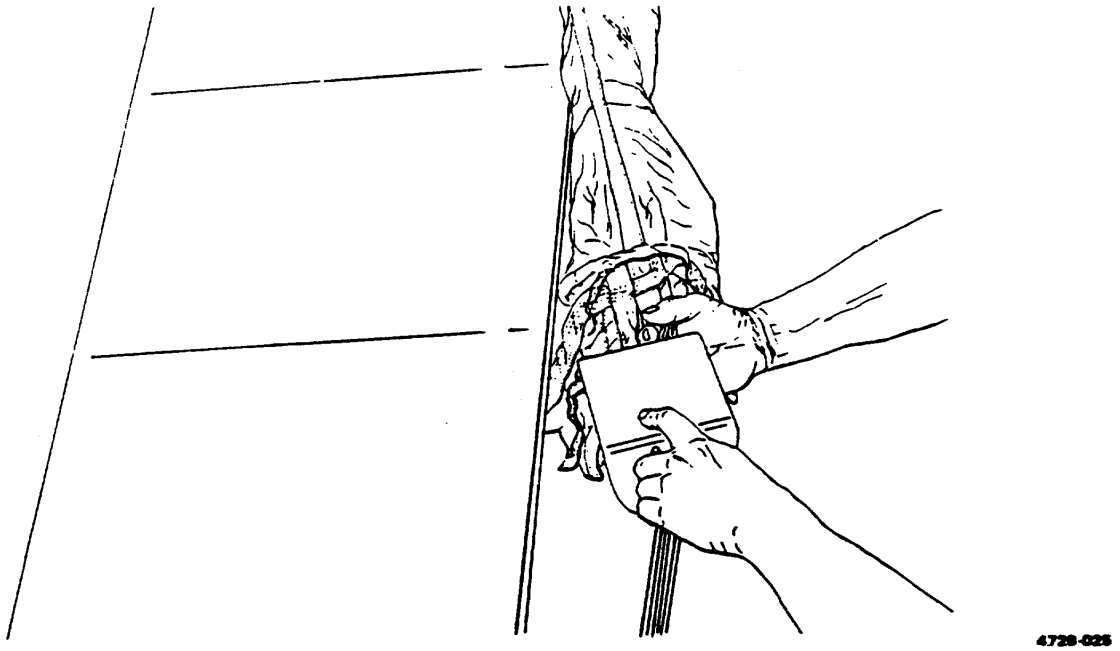


Figure 2-21. Draping Folded Gores.

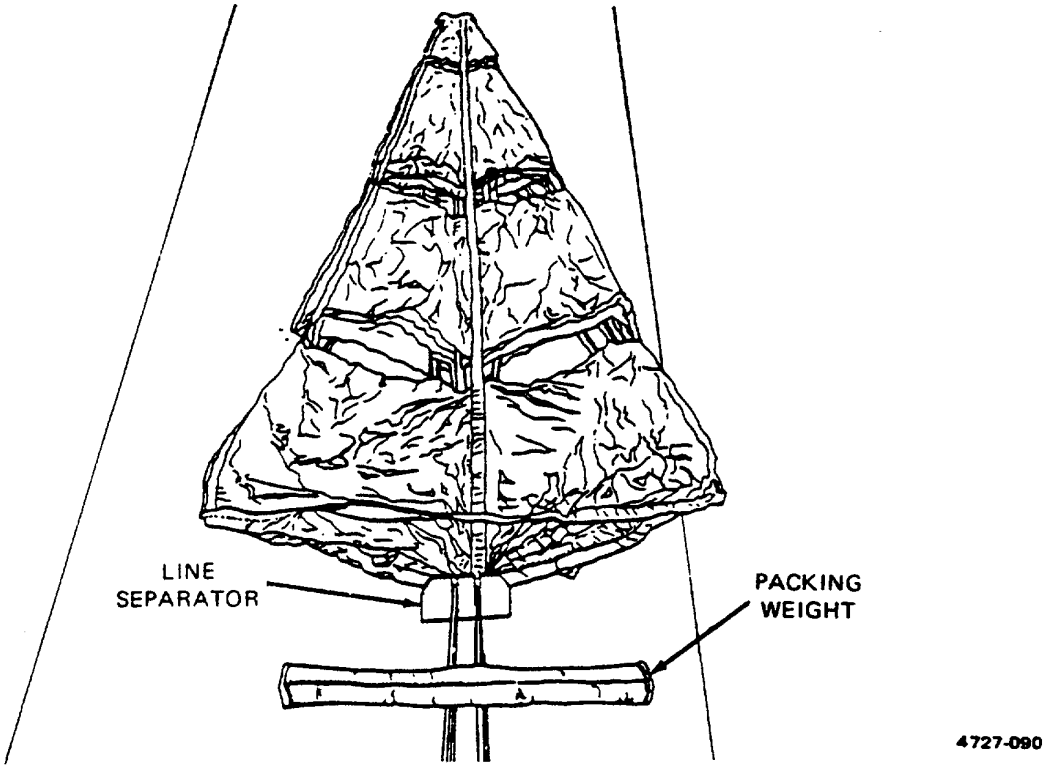


Figure 2-22. Flat Fold Complete.

2-16. Packing the 15-Foot Cargo Extraction Parachute (cont).

l. Long Fold. Beginning with panel/section number 1, fold first three sections of right group of gores from 'he center of each section. Repeat same procedure for left group of gores Place packing weights on folded panel sections to hold the folds in position. Insure longfold does not exceed width of deployment bag (figure 2-23)

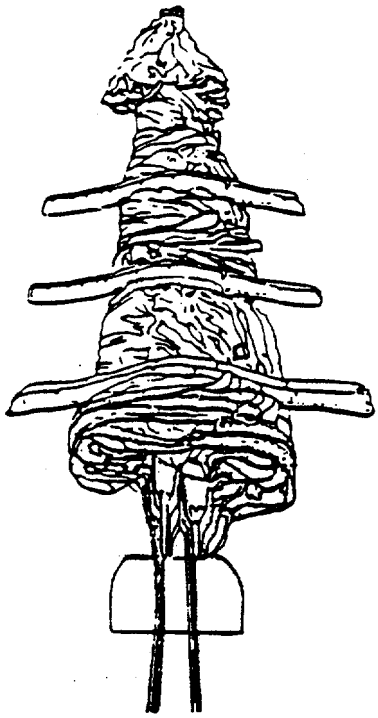


Figure 2-23. Long Fold Complete

i. (a) Attaching Deployment Bag.

(1) Pull deployment bag retaining line loop from bag inside and insert canopy bridle loop into retaining line loop (A, figure 2-24).

(2) Holding bag retaining line loop and canopy bridle loop in place, pull deployment bag through bridle loop and draw retaining line taut to secure bag retaining line to bridle loop (B, figure 2-24).

(3) S-fold excess bag retaining line length to form 4-inch folds. Secure told with a rubber retaining band (C, figure 2-24).

j. Stowing the Canopy.

(1) Before stowing the canopy, install rubber retainer bands at equal intervals along the suspension line stowage flap stow loops. Release canopy from apex hook.

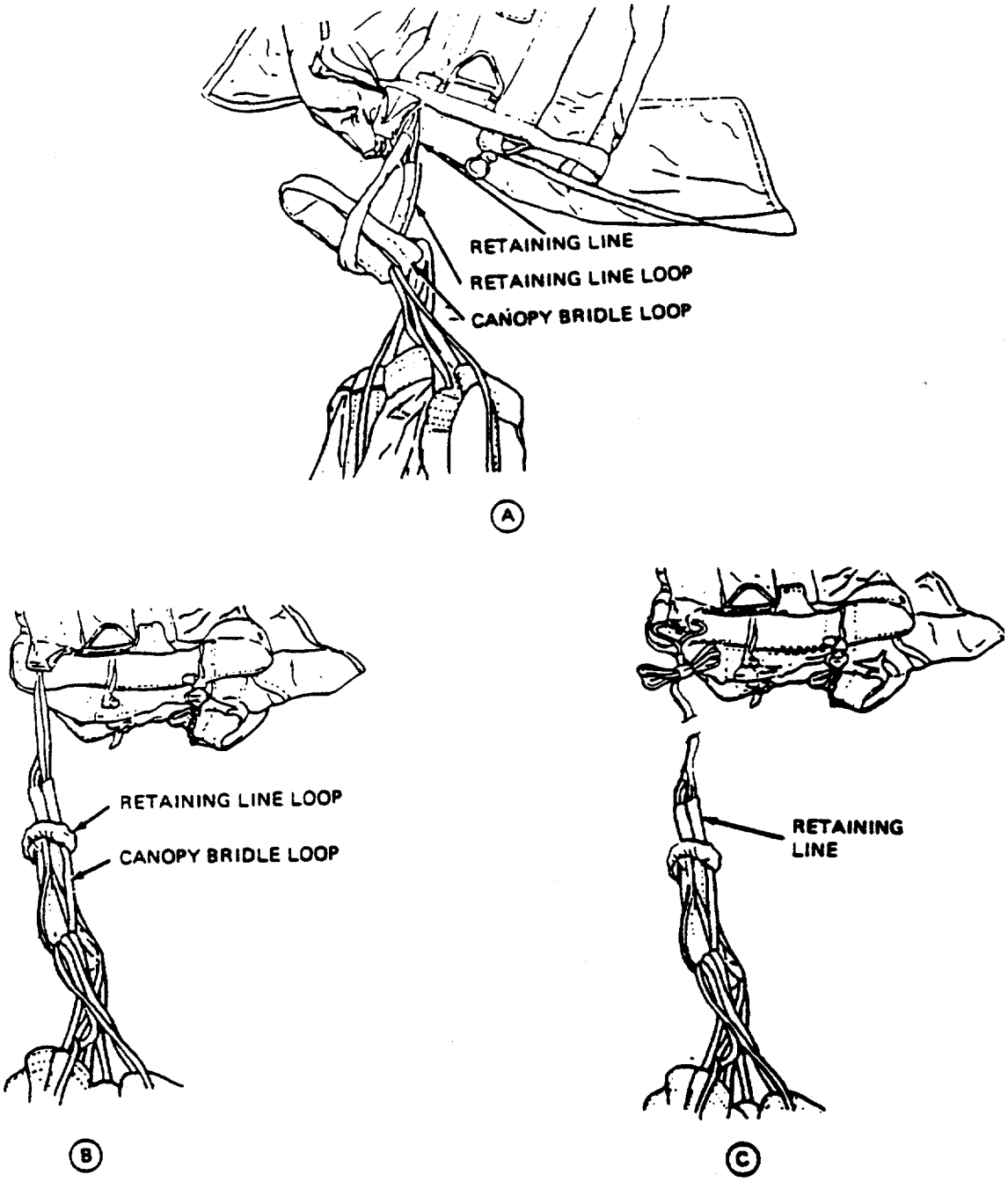
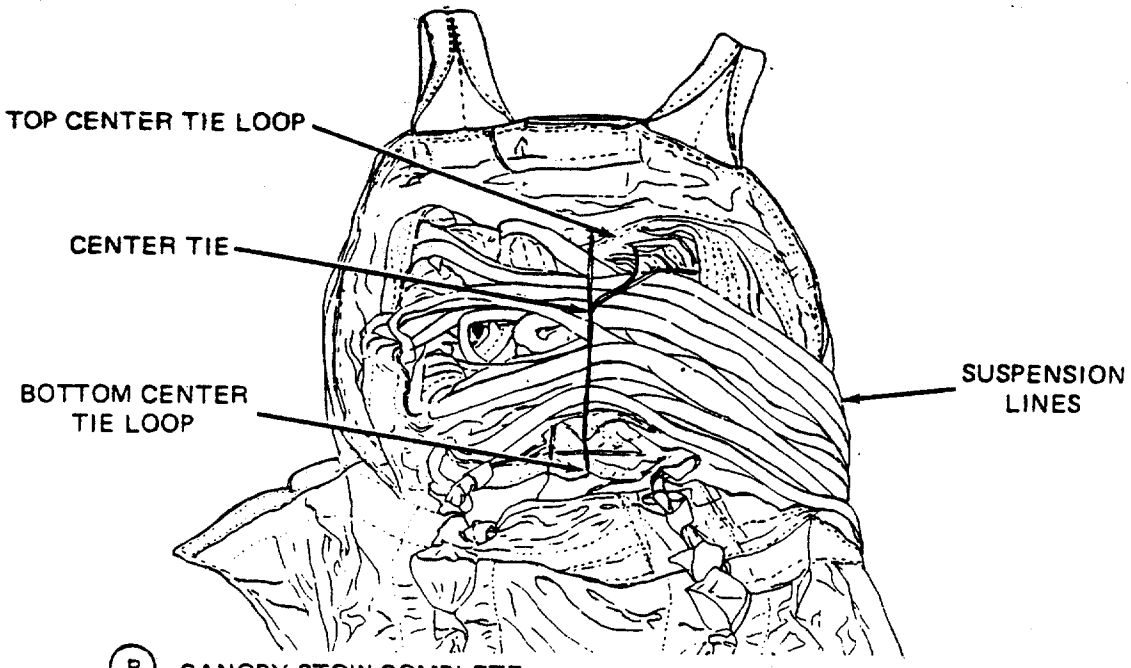


Figure 2-24. Attaching Bridle Loop to Deployment Bag.

(2) Beginning at upper right inside corner of deployment bag, stow canopy in the bag with 5-fold (A, figure 2-25). Upon completion of canopy stowage, suspension lines should extend from left side of the bag open end (B, figure 2-25).
(3) Stand deployment bag upright with suspension lines routed from bag left side.
(4) Using one turn single, thread, cotton, ticket no. 8/7 route thread through top and bottom center bag, tie loops by passing thread ends through tie loop from right to left. Fold suspension lines from left to right over skirt of canopy and routed thread. Secure tie over the folded suspension lines with a surgeon's knot and a locking knot. Trim tie ends to 2 inches (B, figure 2-25).

2-16. Packing the 15-Foot Cargo Extraction Parachute (cont).

(A) S-FOLDING CANOPY



(B) CANOPY STOW COMPLETE

4728-029

Figure 2-25. Stowing Canopy.

k. *Stowing the Suspension Lines.*

NOTE

When making suspension line stows insure stows do not exceed the width of the deployment bag.

(1) Right of secured center bag tie loops, form a loop in suspension lines and make first suspension line stow at upper right corner of deployment bag suspension line stowage flap. Secure stow with the previously installed retainer band (A, figure 2-26).
(2) Extend suspension lines to upper left corner of stowage flap, form a loop in the suspension line and secure stow with previously installed retainer band.
(3) Using procedures in (1) and (2) above, continue stowing suspension lines on stowage flap to a point within six inches of suspension line connector link assemblies. Make last stow at the lower right side of the stowage flap (B, figure 2-26).

l. *Closing the Deployment Bag.*

(1) Position suspension line connector link assemblies back on top of stowed suspension lines and extend extraction line or adapter web, as applicable, across stowed suspension lines to upper left comer of deployment bag (A, figure 2-27).
(2) Fold right side of suspension line stowage flap over stowed suspension lines, fold left flap over right flap (B, figure 2-27).
(3) Beginning at lower end of suspension line stowage flap, tightly roll flap into open end of deployment bag. Insure extraction line or adapter web extends from left side of deployment bag (figure 2-28).
(4) Fold extended extraction line or adapter web from left to right across rolled suspension line stowage flap (figure 2-29).
(5) Using a doubled length of thread, size 8/7 make left bag closing tie by passing one end of thread through left bottom bag closing loop from right to left, under extraction line or adapter web, as applicable, through top bag closing loop from left to right, secure ends together over extraction line or adapter web, as applicable, with a surgeon's knot and a locking knot. Trim tie ends to 2-inches.

2-16. Packing the 15-Foot Cargo Extraction Parachute (cont).

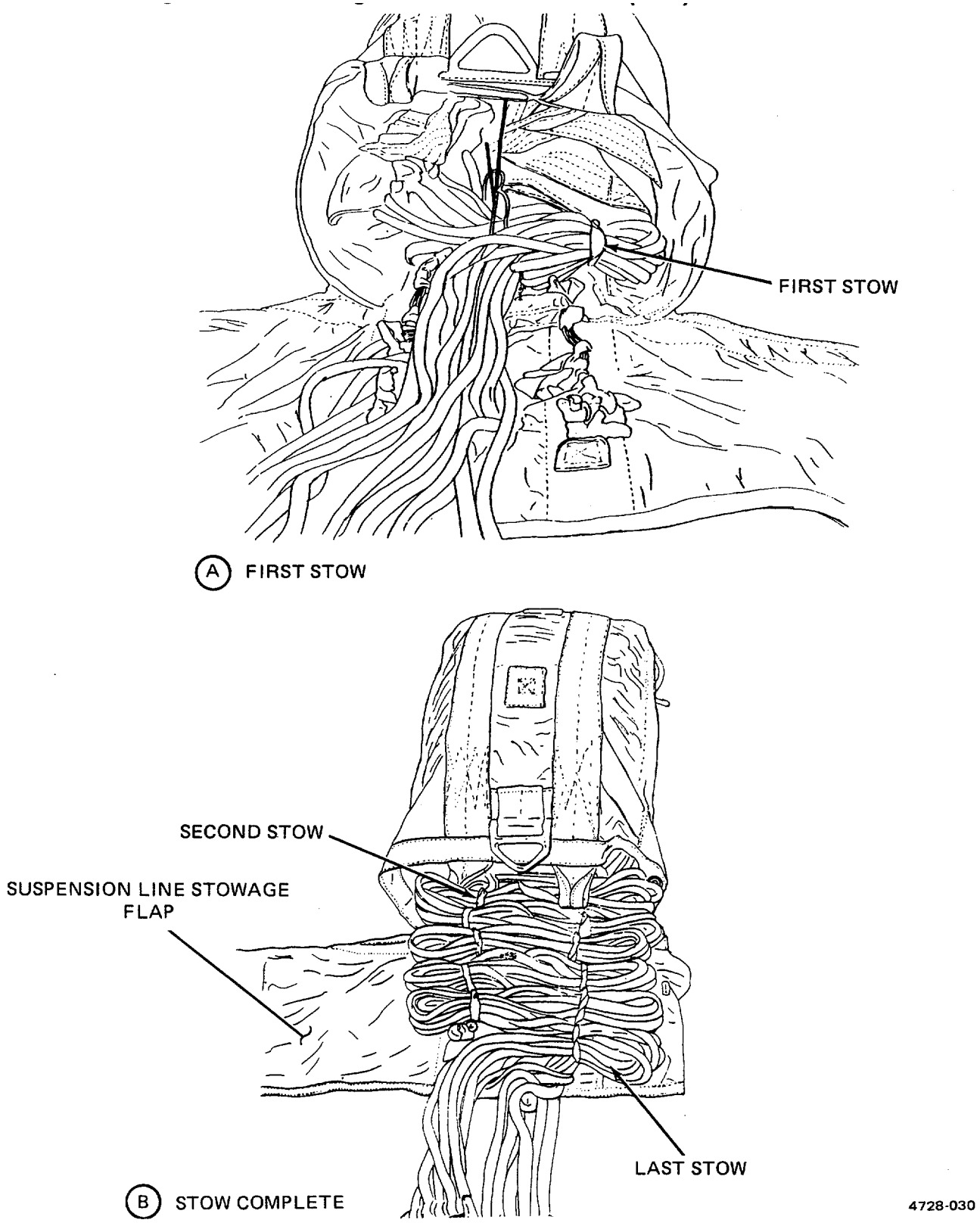
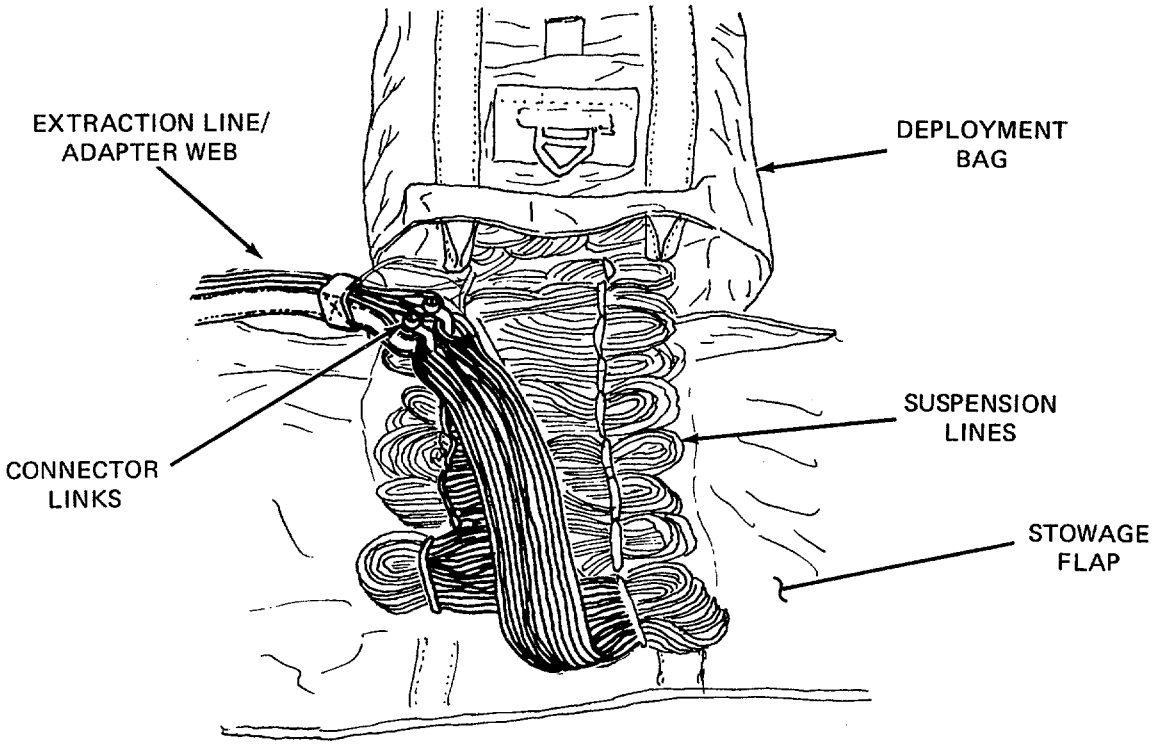
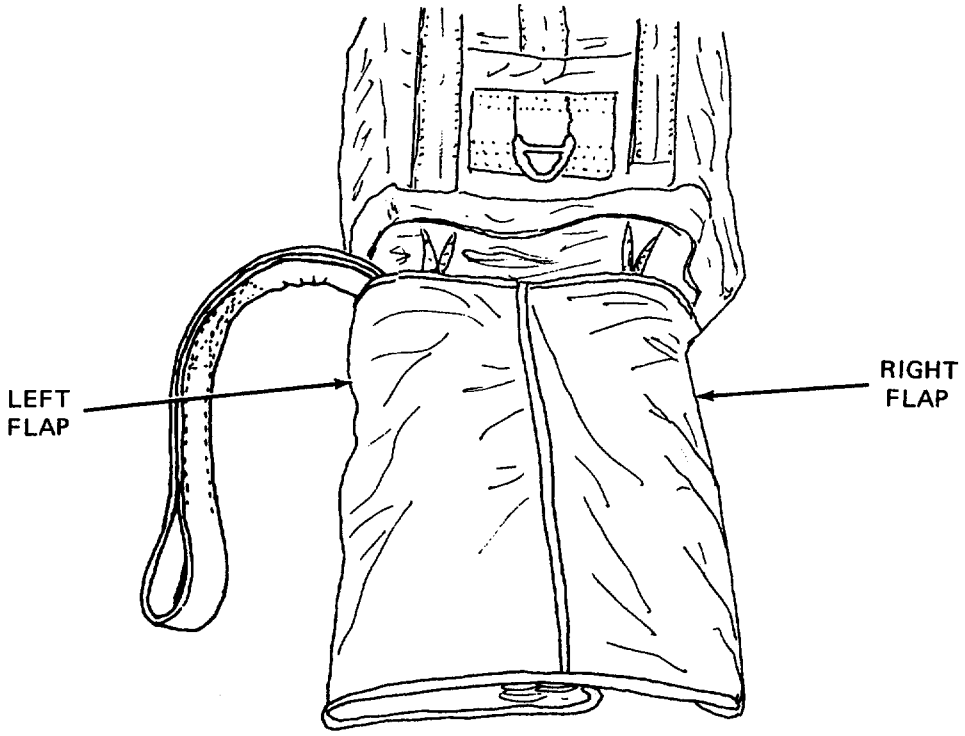


Figure 2-26. Stowing Suspension Lines.

2.16. Packing the 15-Foot Cargo Extraction Parachute (cont).



(A) THE CONNECTOR LINK ASSEMBLIES AND EXTRACTION LINE/ADAPTER WEB POSITIONED.



(B) SUSPENSION LINE STOWAGE FLAP CLOSED.

4727-092

Figure 2-27. Suspension Line Connector Link Assemblies in Position with Extraction Line.

2-26. Packing the 15-Foot Cargo Extraction Parachute (cont).

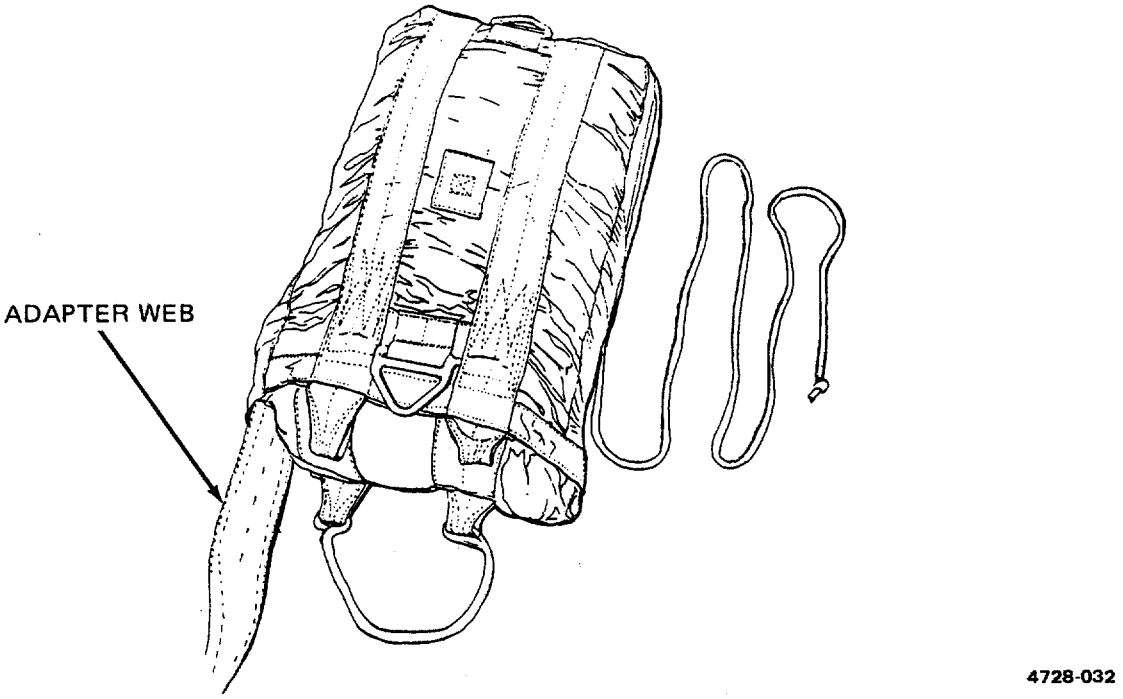


Figure 2-28. Suspension Line Stowage Flap, Rolled into Open End of Deployment Bag.

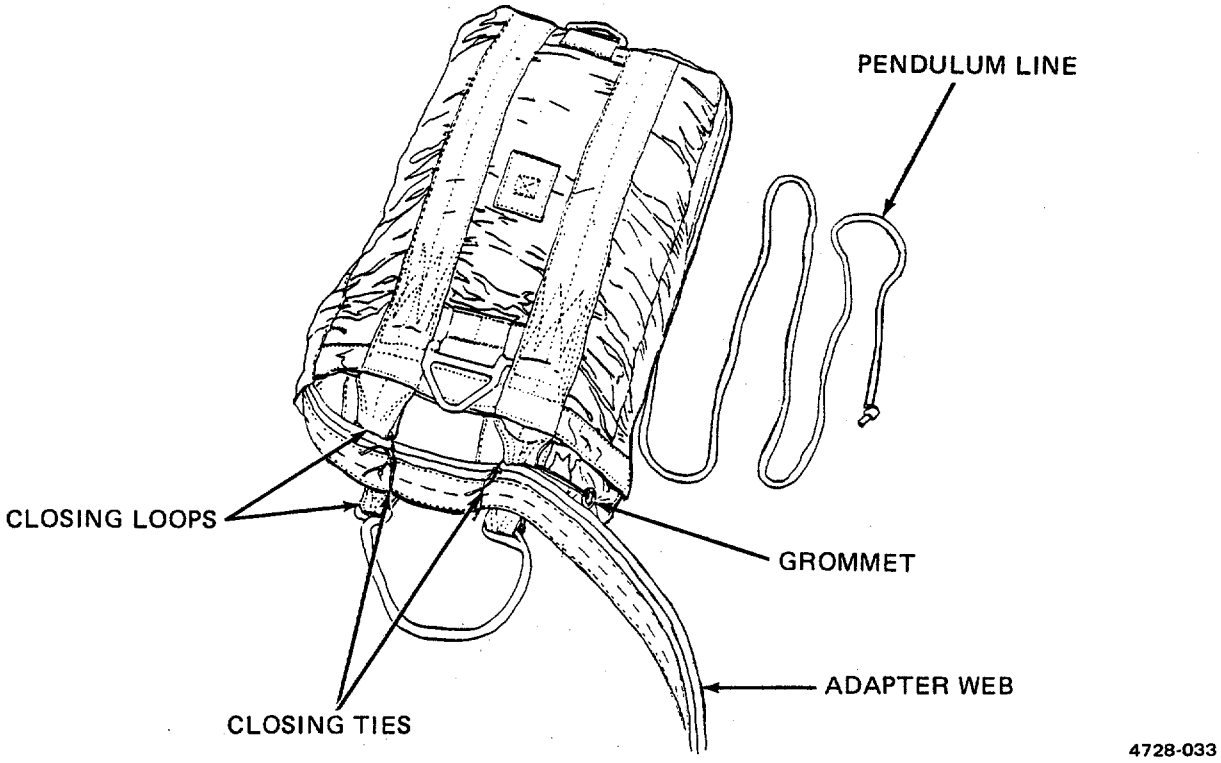


Figure 2-29. Left and Right Deployment Bag Closing Ties.

(6) Using a doubled length of thread, size 8/7 make right bag dosing tie by passing one end of thread through right bottom bag dosing loop from left to right, under extraction line or adapter web, as applicable, through right side bag grommet, inside to out, through right bag closing loop from right to left, secure ends together over extraction line or adapter web, as applicable, with a surgeon's knot and a locking knot.

(7) Pull bag opening safety loop up over bent V-ring. Secure safety loop by passing the pendulum line running end through the V of bent V-ring, draw the pendulum line tight, make additional loops between V-rings as required and secure pendulum line with a half-hitch (figure 2-30).

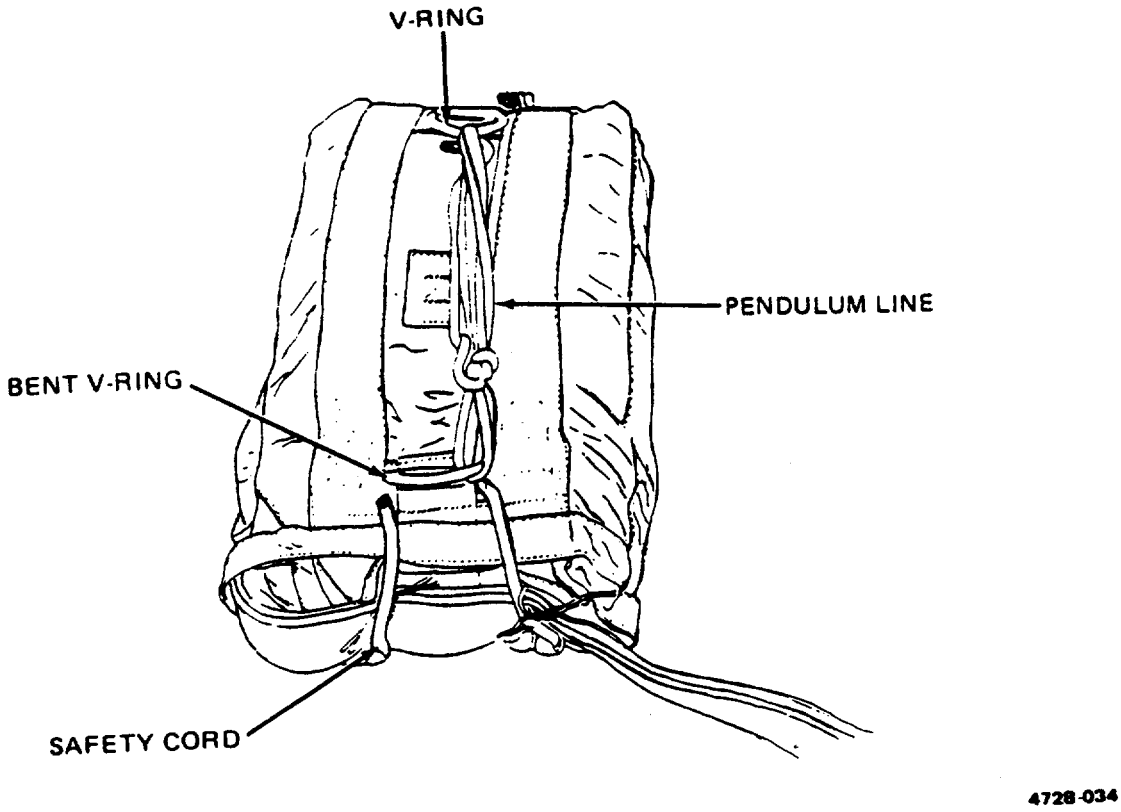


Figure 2-30. Bag Opening Safety Loop and Pendulum Line Secure.

m. *Attaching the Extraction Line.*

(1) Prior to attaching an extraction line to adapter web of a 15-foot diameter extraction parachute, it must be determined what extraction line is required for operational commitments.

(2) Attaching the extraction line will be accomplished in accordance with procedures outlined in FM 10-500-2.

2-16. Packing the 15-Foot Cargo Extraction Parachute (cont.)

n. Stowing the 60-Foot Type X Extraction Line.

(1) Position packed deployment bag on a packing table with bottom facing up.
(2) If applicable, secure V-knife, located on the extraction line 30 feet from load attaching loop t6 extraction line webbing using pressure-sensitive tape.
(3) Stow extraction line by S-folding along length of deployment bag, making layers of folds, as required. Using deployment bag Tie down loops, secure each layer of S-folded extraction line at a minimum of two points. Make each tie with a suitable length of one turn single, 1/4-inch wide, Type I Cotton webbing. (figure 2-31).

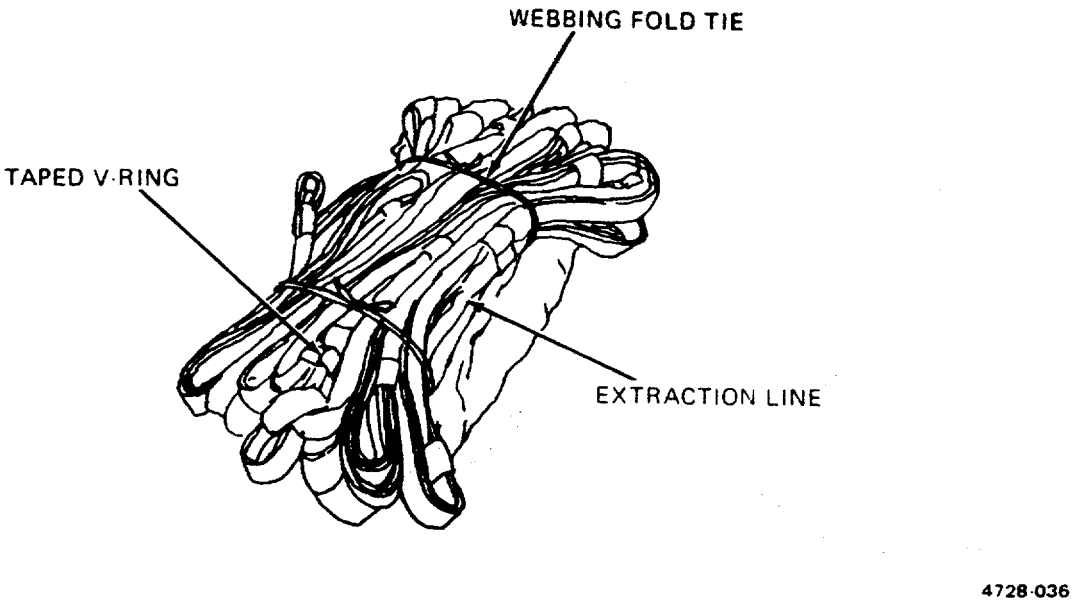


Figure 2-31. Stowing the Extraction Line.

o. Signing DA Form 3912.

(1) Remove parachute log record book from parachute inspection data pocket (log record pocket) on upper end of the deployment and record pack data as prescribed in para 24.
(2) After completion of entries. Return log record book to inspection data pocket.

Section VI. REPAIR

NOTE

Repair and replacement of parachute components is performed in accordance with the general repair instructions in this section, and in specific paragraphs applicable to the item being repaired.

2-17. Maintenance Limitations. Only those maintenance functions specified in the Maintenance Allocation Chart (Appendix B) are authorized to be performed on cargo parachutes. Repair cost limitations to preclude uneconomical repair of cargo parachutes shall conform to the requirements of AR 750-1 and TB 750-99-16.

2-18. Repair - Sewing Procedures.

This task covers:
a. Basting and Temporary Tacking
b. Stitching and Restitching
c. Darning
d. Zig-Zag Sewing

Tools:

Specified In paragraph applicable to the Item being repaired.

Personnel Required:

43E(10) Parachute Rigger

Materials/Parts:
Specified in paragraph applicable to the Item being repaired.

Equipment Condition:
Unpacked. Canopy with defects recorded and clean.

NOTE

Sewing requirements will vary according to the type of item being repaired and the type of repair being made. The type of sewing machine, type of thread, the stitch range, and the stitch pattern, if applicable, required to accomplish a sewing procedure will be specified in the paragraph applicable to the item being repaired. All original stitching that is cut during the performance of a sewing procedure will be removed from the applicable item. Immediately after the accomplishment of a machine sewing procedure, trim thread ends to a point as close as possible to the material which has been sewn.

a. *Basting and Temporary Tacking.* Basting and temporary tacking are hand-sewing methods used to temporarily hold layers of cloth fabric together while a repair is being performed. The following is a list of procedures which apply to basting and temporary tacking actions:

(1) Basting and temporary tacking should be made using thread which is of a contrasting color to the material being worked.
(2) On small cargo parachute canopies, basting will be made using a single strand of size A nylon thread or ticket no. 24 cotton thread.
(3) When basting, do not tie knots at any point in the thread length. Also, the sewing should be made with two stitches per inch.
(4) Temporary tacking will usually be made using a length of size E nylon thread (item 29, appendix D). However, an alternate type thread may be specified within-the paragraph applicable to the item.
(5) Immediately upon completion of a repair, remove previously made basting or temporary tacking stitches.

b. *Stitching and Restitching.* Perform stitching and restitching as follows, referring to tables 2-2 and 2-3:

(1) *Parachute canopy assemblies.* The stitching and restitching made on parachute canopies should be accomplished with thread that is contrasting in color to the fabric being restitched. If contrasting color thread is not available, thread of matching color may be used, providing all other specifications are met. Straight stitching and restitching on parachute canopy assemblies should be locked by at least 2 inches at each end of a stitch row, when possible. Zig-zag stitching does not require locking; however, zig-zag restitching should extend at least 1/4-inch into undamaged stitching at each end, when possible. When restitching parachute canopy assemblies, stitch directly over the original stitching and follow the original stitch pattern as closely as possible.

Table 2-2. Sewing Machine Code Symbols.

Code symbol	Sewing machine
LD	SEWING MACHINE, INDUSTRIAL: General sewing; 301 stitch; light duty; NSN 3530-01-177-8590.
MD ZZ	SEWING MACHINE, INDUSTRIAL: Zig-zag; 308 stitch; medium duty; NSN 3530-01-181-1421.
LD ZZ	SEWING MACHINE, INDUSTRIAL: Zig-zag; 308 stitch, light duty; NSN 3530-01-181-1420.
HD	SEWING MACHINE, INDUSTRIAL: General sewing; 301 stitch; heavy duty; NSN 3530-01-177-8588.
MD	SEWING MACHINE, INDUSTRIAL: General sewing; 301 stitch; medium duty, NSN 3530-01-177-8591.
DN	SEWING MACHINE, INDUSTRIAL: Darning; lock stitch; NSN 3530-01-177-8589.
LHD	SEWING MACHINE, INDUSTRIAL: 301 stitch; light heavy duty; NSN 3530-01-186-3079.
ND	SEWING MACHINE, INDUSTRIAL: 301 stitch; double-needle; NSN 3530-01-182-2873.

Table 2-3. Stitching and Restitching Specifications.

Component	Recommended sewing machine (code symbol)	Stitches per inch	Thread size
Canopy			
Gore panel	LD	7-11	E
	DN	Darn	E
Panel edge reinforcement	LD	7-11	E

Table 2-3. Stitching and Restitching Specifications (cont).

Component	Recommended sewing machine (code symbol)	Stitches per inch	Thread size
Bridle centering line	ZZ	7-11	E
Suspension line	ZZ	7-11	E
Vent line	ZZ	7-11	E
Attachment loop (bridle loop)	HD	5-8	3
Suspension line attaching loop	MD	7-11	E
Pocket band	LD	7-11	E
Lateral band (upper and lower)	LD	7-11	E
Radial webbing	LD	7-11	E
	ZZ	7-11	FF
Deployment Bag	MD	5-8	FF
Retainer band keeper	VHD	5-8	3
V-ring keeper	VHD	5-8	3
Bent V-ring keeper	ZZ	7-11	FF
Bag retaining line	LD	7-11	FF
Retaining line buffer			
Bridle loop strap	MD	5-8	FF
	HD	5-8	3
Bag closing loop	HD	7-11	FF
	HD	5-8	3
Parachute Inspection data pocket	MD	7-11	E
Tie cord loop	ZZ	7-11	E
Tie cord	ZZ	7-11	E
End slot reinforcement	MD	5-8	FF
Retainer band keeper-reinforcement	MD	5-8	FF
Tie loop reinforcement	MD	5-8	FF
Safety cord	ZZ	7-11	FF
Tie loop	MD	5-8	FF
Edge binding	MD	5-8	FF
Suspension line	DN	Darn	E
stowage flap	MD	5-8	FF
Stowage flap edge reinforcement	MD	5-8	FF
Main strap	MD	5-8	FF
Bag panel	DN	Darn	E
Extraction Line (60-Foot-Long)			
Line webbing	VHD	5-8	6
Connector link attaching loop buffer	MD	7-11	E
Load attaching loop buffer	MD	7-11	E
Adapter Web (9 1/2-inch-Long)			
Web body	VHD	7-11	6
End loop buffer	LD	7-11	E
Buffer (3 112-inch-Long)	LD	7-11	E

Table 2-3. Stitching and Restitching Specifications (cont).

Component	Recommended sewing machine (code symbol)	Stitches per inch	Thread size
Adapter Web (36 Inches Long)			
Long Buffer	LD	7-11	E
Short Buffer	LD	7-11	E
Webbing Length	HD	4-6	5

(2) Other parachute items. Stitching and restitching on other parachute items constructed from cloth, canvas, and webbing should be accomplished with thread which matches the color of the original stitching, when possible. All straight stitching should be locked by backstitching at least 1/2 Inch. Restitching should be locked by overstitching each end of the stitch formation by 1/2 inch. Zigzag stitching does not require locking; however, zig-zag restitching should extend at least 114 inch into undamaged stitching at each end, when possible. Restitching should be made directly over the original stitching, following the original stitch pattern as closely as possible:

c. Darning. (Refer to Tables 2-2 and 2-3). Darning is a sewing procedure used to repair limited size holes, rips, and tears in assorted airdrop items constructed from textile material such as parachute canopy gore sections and the cloth and reinforcement webbing of packs. A darning repair may be made either by hand or sewing machine, depending upon the method preferred and the availability of equipment. However, a darning machine should be used to darn small holes and tears where fabric is missing. Darning of previously patched material can be performed provided darning size limitations prescribed in the paragraph applicable to the item are not exceeded. A darning repair will be performed using the following procedures, as appropriate:

(1) *Machine darning.* Proceed as follows:

(a) Using an authorized marking aid of contrasting color, mark a square around the damaged area and ensure that the marking is at least 1/4-inch back from each edge of the damaged area. The marking will be made with the warp and the filling of the material.

(b) Darn the damaged area by sewing the material in a back-and-forth manner, using size A or E nylon thread, allowing the stitching to run with the warp or filling of the fabric (A, figure 2-32).

(c) Turn the material and stitch back and forth across the stitching made in (b) above until the hole or tear is completely darned (B, figure 2-32).

(d) If applicable, restencil informational data, gore number(s), or identification marks using the criteria in paragraph 2-20.

2-18. Repair-Sewing Procedures (cont).

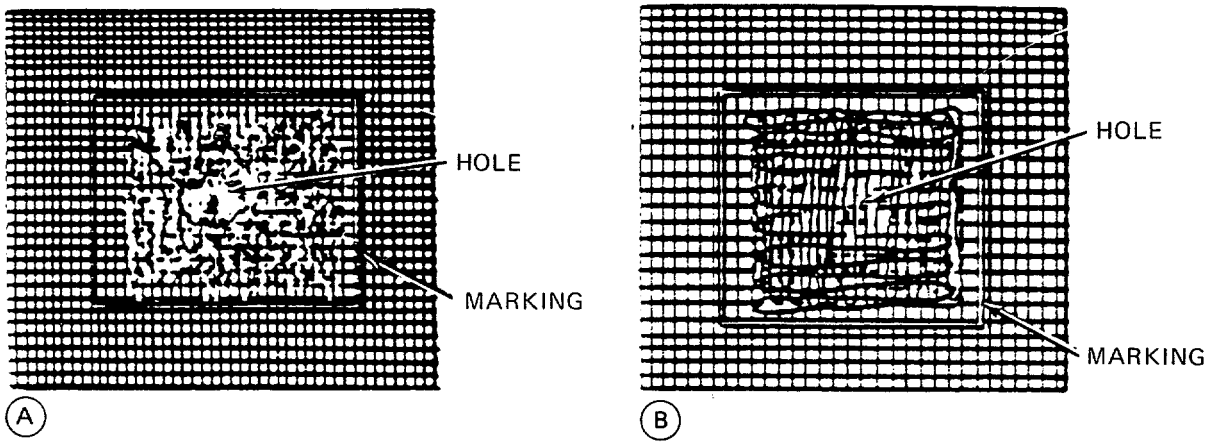


Figure 2-32. Darning Method Using a Darning Sewing Machine.

(2) *Hand darning.* When repair of a hole or tear is made by hand darning, the darn should match the original weave of the damaged material as closely as possible. Hand darning will be performed as follows:

(a) Using an authorized marking aid of contrasting color, mark a square around the damaged area and insure that the marking is at least 1/4 inch back from each edge of the damaged area. The marking will be made with the warp and the filling of the material.

(b) Using a darning needle and a length of size A or E nylon thread, begin darning at one corner of the marked area. Working in the direction of the fabric warp or filling, pass the needle and thread back and forth through the material until the opposite diagonal corner of the marked area is reached. (A, figure 2-33).

(c) Turn the material and weave the needle and thread back and forth across the stitching made in (b) above until the hole is completely darned (B, figure 2-33).

(d) If applicable, restencil informational data or identification marks as outlined in paragraph 2-20.

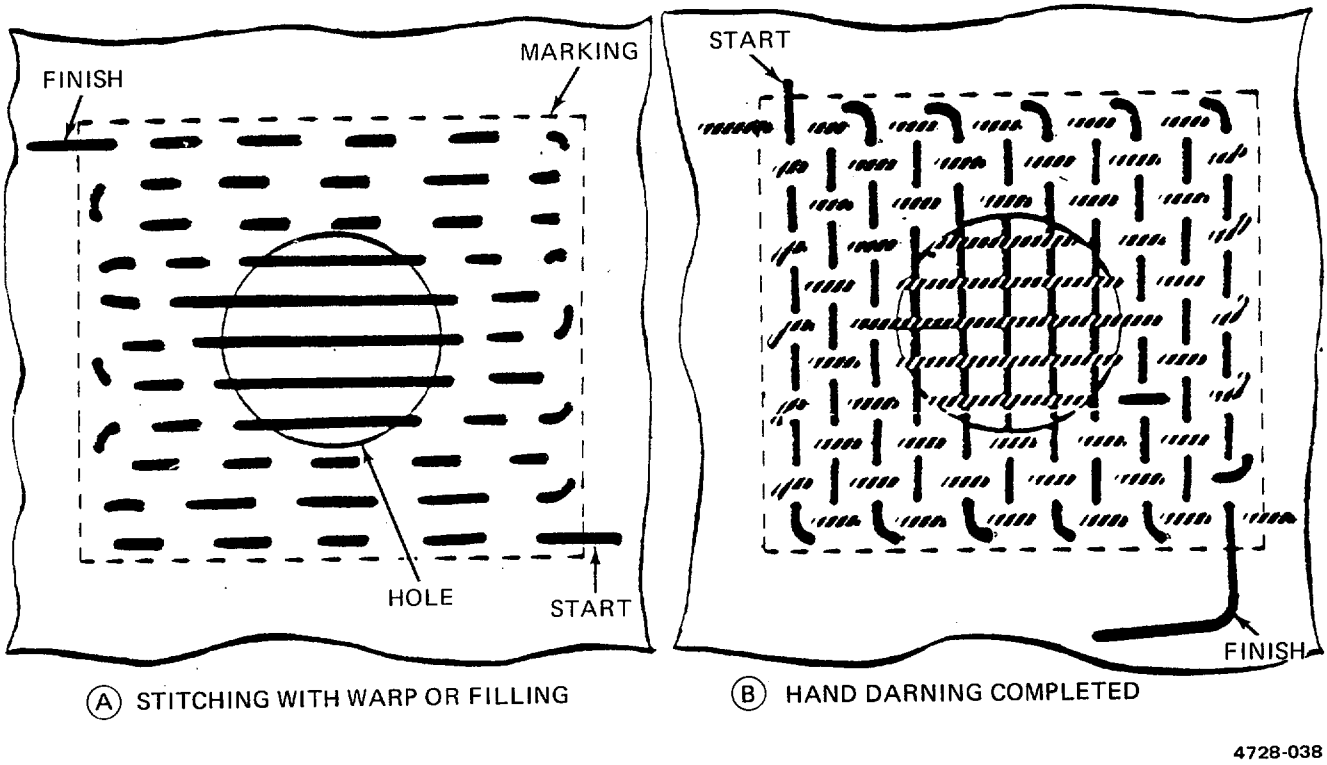


Figure 2-33. Hand Darning Method.

d. Zig-Zag Sewing. (Refer to Tables 2-2 and 2-3). Air delivery items, except parachute canopies, made from textile materials that have sustained cut or tear damage may be repaired by zigzag sewing provided the applicable damaged area does not have any material missing and the cut or tear is straight or L-shaped. Should the damaged area be irregular shaped or have material missing, the repair will be achieved by either darning or patching, as required. A zig-zag sewing repair will be accomplished using a zig-zag sewing machine, using the following procedures:

(1) Set the sewing machine to the maximum stitch width.

(2) Beginning at a point 114-inch beyond one end of the cut or tear, stitch lengthwise along the damaged area to a point 114-inch beyond the opposite end of the cut or tear (A, figure 2-34). The cited stitching procedure will also apply to an L-shaped cut or tear (B, figure 2-34).

(3) If applicable, restencil informational data or identification marks as prescribed in paragraph 2-20.

2-18. Repair-Sewing Procedures (cont).

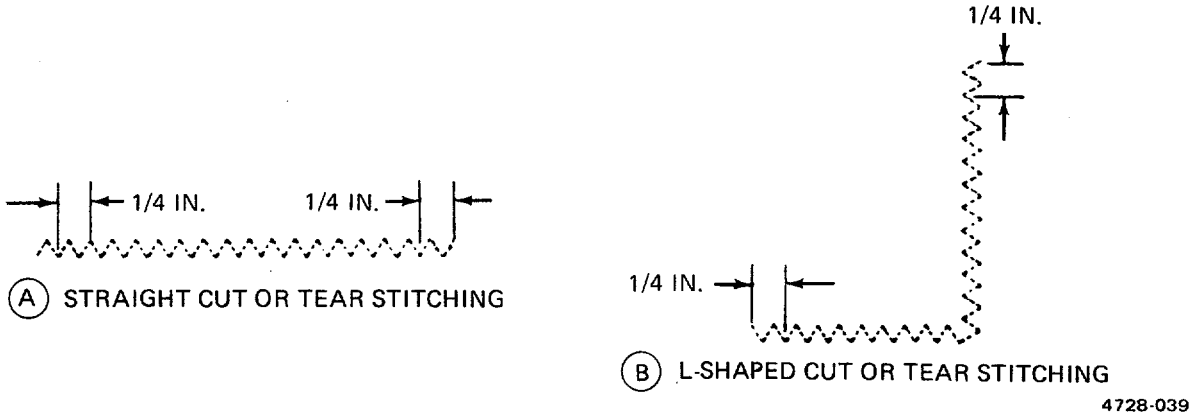


Figure 2-34. Repair Method Using a Zig-Zag Sewing Machine

2-19. Searing and Waxing.

This task covers: a. Searing b. Waxing

Tools:

Knife, Hot Metal, Item 2, Appendix B
Pot, Melting, Electric, Item 9, Appendix B

Materials/Parts:

Beeswax, Item 2, Appendix D
Wax, Paraffin, Item 33, Appendix D

Personnel Required:

43E(10) Parachute Rigger

Equipment Condition:

Unpacked

CAUTION

Cotton tape, webbing, or cord will not be seared.

NOTE

Fabric materials such as cord, tape, and webbing that are cut for use in the maintenance of back parachutes will normally be heat-seared or dipped in a melted wax mixture, as applicable, to prevent the material from fraying or unraveling. However, in some instances the preparation of the material may not be necessary and will be specified accordingly.

a. Searing. The cut ends of nylon tape, webbing, and cord lengths may be prepared by heatsearing which is performed by pressing the raw end of the material against a hot metal surface (knife) until the nylon has melted sufficiently. Avoid forming a sharp edge or lumped effect on the melted end.

b. Waxing. The fraying or unraveling of cotton or nylon tape, webbing, and cord length ends may be prevented by dipping 1/2-inch of the raw end of the material into a thoroughly melted mixture of half beeswax and half paraffin in an electric melting pot. The wax temperature should be substantial enough to insure the wax completely penetrates the material rather than just coating the exterior fabric.

2-20. Marking and Restenciling.

This task covers: a. Marking b. Restenciling

Materials/Parts:

Brush, Stenciling, Item 4, Appendix D
Ink, Marking, Item 10, Appendix D
Marker, Felt Tip, Black, Item 12, Appendix D
Pen, Ballpoint, Item 15, Appendix D
Stencil Board, Oiled, Item 20, Appendix D

Personnel Required:

43E(10) Parachute Rigger

Equipment Condition:

Layout on packing table or other suitable area.

NOTE

Stenciling should be used whenever possible. A ballpoint pen or felt tip marker should be used only where stenciling is not possible, or when stenciling devices are not available. However, only felt tip markers that contain parachute marking ink and marked "FOR PARACHUTE MARKING" is authorized for use in marking airdrop items. Any type ball point pen using black or blue ink may be used for marking on labels only.

Original stenciled data or marking that becomes faded, illegible, obliterated, or are removed as a result of performing a repair procedure will be remarked with a ballpoint pen, felt tip marker, or restenciled. All marking or restenciling will be done on or as near as possible to the original location and should conform to the original lettering type and size.

a. *Marking.* Using marking devices such as ballpoint pen or felt tip marker mark on, or as near as possible to, original location and conform to original lettering type and size.

b. Restenciling. Proceed as follows:

(1) Cut oiled stencilboard to original lettering type and size of data to be restenciled.

(2) Place cut stencilboard over, or as near as possible to, original marking to be restenciled.

(3) Place additional sheet of stencilboard beneath the area to be restenciled to prevent the marking ink from penetrating to other areas.

(4) Hold stencilboard in place and, using stenciling brush filled with parachute marking ink, restencil original marking.

c. *Remarking and Restenciling.* Remark or restencil original stenciled data or markings that become faded, illegible, obliterated or have been removed as a result of performing a repair procedure. Ensure all marking or restenciling is on, or as near as possible to, the original location and conforms to the original lettering type and size.

2-21. Parachute Canopy.

This task covers: a. Repair b. Replace

Personnel Required:

43E(10) Parachute Rigger

Equipment Condition:

Inspected, Paragraphs 2-9, 2-13
Cleaned, Paragraph 2-12
Unpacked, canopy laid flat

Reference:

Group 01, MAC, Section II,
Appendix B

a. *Repair.* Refer to individual component/assembly repairs and replacement procedures.

b. *Replace.* Replace an unserviceable/unrepairable parachute with a serviceable parachute canopy from stock.

2-22. Attachment Loop (Bridle Loop).

This task covers: a. Repair b. Replace

Tools:

Knife, Item 1, Appendix B
Pot, Melting, Electric, Item 9, Appendix B
Shears, Item 10, Appendix B
Sewing Machine, Heavy Duty, Item 14, Appendix B
Yardstick, Item 20, Appendix B

Materials/Parts:

Marking Aid, Item 17118, Appendix D
Thread, Nylon, Size 3, Item 31132, Appendix D

Personnel Required:

43E(10) Parachute Rigger

Equipment Condition:

Inspected, Paragraph 2-9, 2-13
Cleaned, Paragraph 2-12
Unpacked, canopy laid flat

Reference:

Group No. 01, MAC, Section II, Appendix B

a. *Repair.* Repair an attachment loop requiring restitching as follows:

(1) Use a heavy-duty sewing machine to restitch any loose or broken stitches.

(2) Restitch over original stitch pattern using nylon thread, size 3. Overstitch 112inch to lock stitches.

b. *Replacement.* Replace a damaged or missing attachment loop as follows:

(1) Cut a 20-inch length of 1 314-inch wide type VIII, cotton webbing, and wax ends.

(2) Using a marking aid, mark webbing length at a point 5 inches from each end (figure 2-35), and 6 1/2 inches from each end on opposite side.

(3) Between two 5-inch marks made in (2) above, roll 1/2-inch of each webbing edge in to center of webbing width and allow webbing edges to overlap. Using a heavy duty sewing machine with size 3 nylon thread, secure overlapped webbing edges to webbing length by stitching a single row of stitching along the center of webbing overlap and 1 1/2-inches along each rolled edge beyond point of edge overlap (A, figure 2-35). Stitching will be 5 to 8 stitches per inch, using the specifics in Table 2-3.

(4) Pass one webbing end through vent lines and join webbing ends together above vent lines with a 5 inch-long overlap (B, figure 2-35). Insure the webbing length encircles all vent lines.

(5) Using a heavy-duty sewing machine with size 3 nylon thread, secure overlapped webbing ends together by stitching a 5 inch-long three-point-WW-stitch formation, with a 1/8-inch overstitch on each webbing end. Stitching will be 5 to 8 stitches per inch, using the specifics in table 2-3.

(6) Remove original attachment loop (bridle loop) by cutting loop webbing as required.

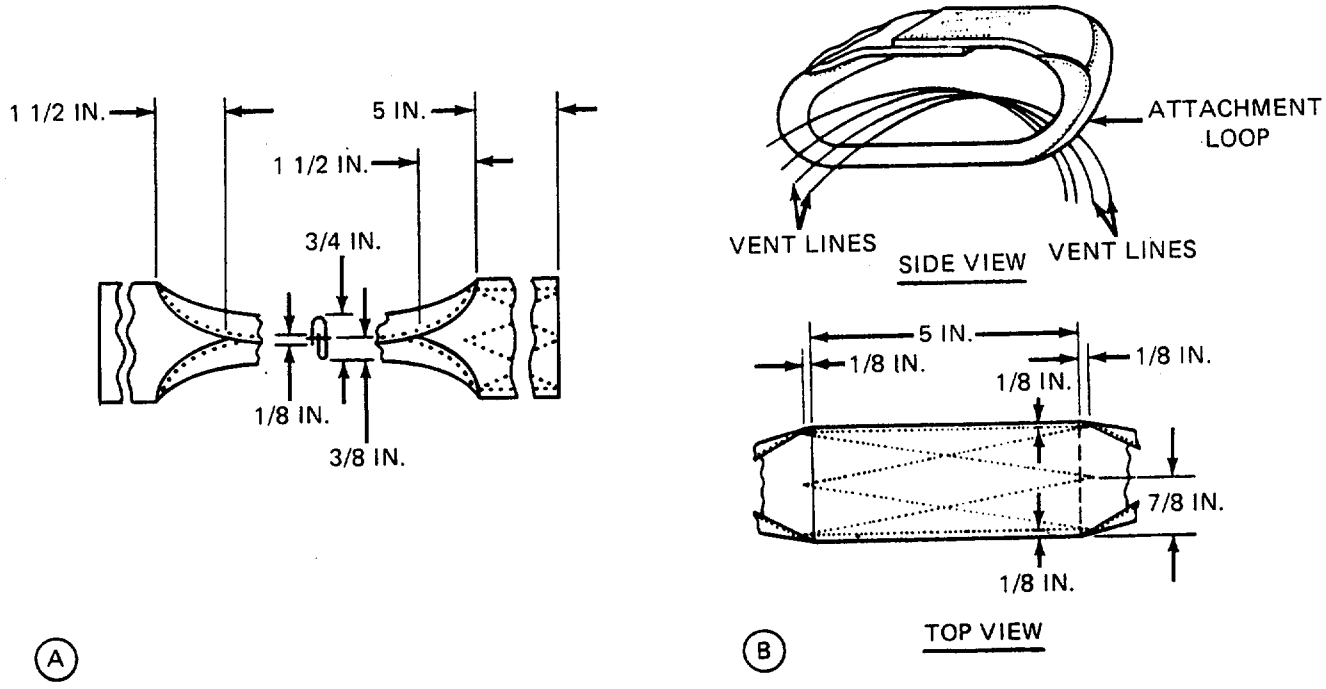


Figure 2-35. Attachment Loop Replacement Details.

2-23. Vent Lines.

This task covers: a. Repair b. Replace

Tools:

Knife, Item 1, Appendix B
Pot, Melting, Electric, Item 9, Appendix B
Shears, Item 10, Appendix B
Sewing Machine, Zig-Zag, Item 13, Appendix B
Yardstick, Item 20, Appendix B

Materials/Parts:

Cord, Nylon, Type IV, Item 9, Appendix D
Marker, Black, Item 13, Appendix D
Thread, Nylon, Size E, Items 27128, Appendix D

Personnel Required:

43E(10) Parachute Rigger

Equipment Condition:

Inspected, Paragraphs 2-9, 2-13
Cleaned, Paragraph 2-12
Unpacked, canopy in proper layout

Reference:

Group No. 01, MAC, Section II, Appendix B

a. *Repair.* Repair vent lines requiring restitching as follows:

(1) Use a zig-zag sewing machine to restitch any loose or broken stitches.

(2) Restitch over original stitch pattern using nylon thread, size E. Overstitch 1/4inch to lock stitches.

NOTE

Replacement of vent lines is accomplished at intermediate (DS) maintenance level only, in accordance with the Maintenance Allocation Chart (MAC), Appendix B.

b. *Replacement.* Replace missing or damaged vent lines as follows:

(1) Place canopy in proper layout on table and trace damaged vent line from end to end. Using marker, mark canopy at each end of vent line.

(2) Remove damaged vent line by cutting stitching that holds line to canopy at both sides of vent.

(3) Cut a 20-inch length of type IV, coreless nylon cord. Sear or dip ends of cord (para 2-19).

(4) Position one end of new vent line in exact location formerly occupied by end of old line (figure 2-36).

NOTE

Measuring from the outside edge of the upper lateral band, the vent line should extend 4 inches into radial webbing.

(5) Using a zig-zag sewing machine and nylon thread, size E, stitch new line in place. Begin stitching on line 1/4-inch above upper edge of vent reinforcement tape and sew to 1/4 inch beyond end of line, 7 to 11 stitches per inch and 118 inch wide (figure 2-36).

(6) Pass remaining end of line under other vent lines, and through bridle loop and bridle centering loop as required.

(7) Position and sew remaining end of line to opposite side of canopy as in steps (4) and (5) above.

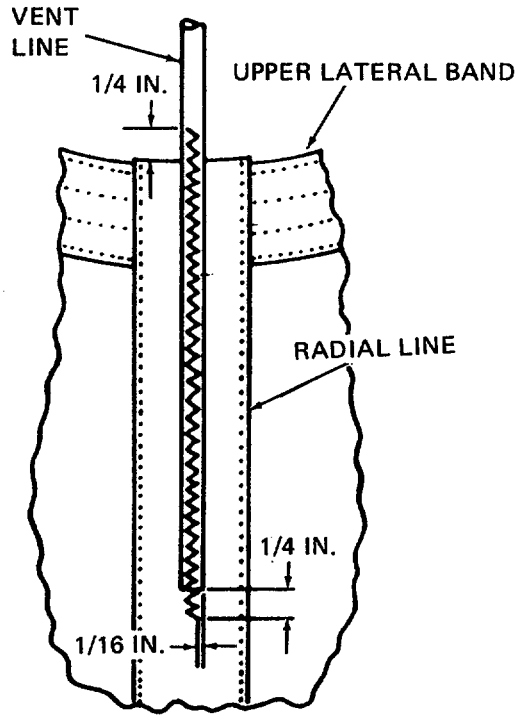


Figure 2-36. Vent Line Replacement Details.

2-24. Bridle Centering Line.

This task covers: a. Repair b. Replace

Tools:

Pot, Melting, Electric, Item 9, Appendix B
Sewing Machine, Zig-Zag, Item 13, Appendix B
Yardstick, Item 20, Appendix B

Materials/Parts

Cord, Nylon, Type IV, Item 9, Appendix D
Thread, Nylon, Size E, Items 27/28, Appendix D

Personnel Required:

43E(10) Parachute Rigger

Equipment Condition:

Inspected, Paragraph 2-9, 2-13
Cleaned, Paragraph 2-12
Unpacked, canopy laid flat

Reference:

Group No. 01, MAC, Section II, Appendix B

a. *Repair*. Restitch broken or loose thread using a zig-zag sewing machine and size E nylon thread (reference table 2-3). Stitch over original stitch pattern. Overstitch 118 inch to lock stitches.

b. Replace. Replace a damaged bridle centering line by fabricating as follows:

(1) Remove original bridle centering line by cutting stitching which secures each end of line to an attaching vent line.

(2) Cut a 7 314-inch of type IV coreless nylon cord and sear ends (paragraph 2-19).

(3) Using a suitable marking aid, mark cord length at center and at a point 1 3/8inches on each side of center mark (figure 2-37).

(4) Position cord length in original centering line location and temporarily hand tack the cord ends to attaching vent line, using temporary tacking procedures outlined in paragraph 2-18a. Insure all vent lines pass freely through loop formed at center of tacked line.

(5) Using zig-zag sewing machine and size E nylon thread, secure each end of bridle centering line to attaching vent line by stitching a 3/16-inch-wide by 2 518-inch-long row of double-throw zig-zag stitching from 1 3/8-inch mark made in (3) above to a point 1/8Inch beyond cord end (fig. 2-41). Stitching will be 7 to 11 stitches per inch using specifics in table 2-3. Remove the tacking made in (4) above.

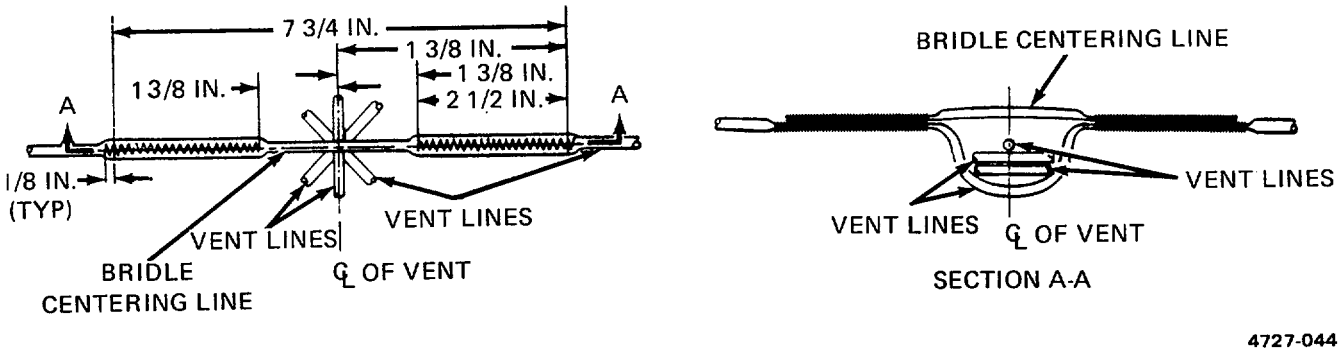


Figure 2-37. Bridle Centering Line Details.

2-25. Upper Lateral Band.

This task covers: Repair

Tools:

Knife, Item 1, Appendix B
Pot, Melting, Electric, Item 9, Appendix B
Shears, Item 10, Appendix B
Sewing Machine, Light Duty, Item 12, Appendix B

Materials/Parts:

Thread, Nylon, Size E, Items 27128, Appendix D
Webbing, Nylon, Type 11, 1-inch, Item 38, Appendix D

Personnel Required:

43E(10) Parachute Rigger

Equipment Condition:

Inspected, Paragraph 2-9, 2-13
Cleaned, Paragraph 2-12
Unpacked, canopy laid flat

Reference:

Group No. 01, MAC, Section II, Appendix B

a. <u>*Resitching*</u>*.* Restitching of vent reinforcement tape is authorized. Use a light duty sewing machine and size E, nylon thread of contrasting color. Stitch over the original stitch pattern. Lock each row of stitches two inches at each end.

NOTE

Vent reinforcement bands may be spliced only once and will not be replaced.

The vent reinforcement on the 15-foot extraction parachute is constructed using two plies of webbing. The splice may be placed on the inside or outside of the canopy, depending on the location of the damage. If both the inside and the outside plies are damaged, apply a splice to both sides of the canopy.

b. <u>*Damage Between Radial Seams*</u>*.* Repair as follows:

(1) Mark vent line position and cut stitching of two vent lines on each side of damaged area, and move lines to one side.

(2) Smooth canopy around damaged area.

(3) Cut a piece of 1-inch nylon tape, long enough to extend 1-inch beyond outside edge of second radial seam on each side of damaged area. Wax ends of webbing (para 2-19).

(4) Center webbing over damaged area. Use a light duty sewing machine and size E, nylon thread to stitch. Sew webbing in place with four continuous rows of stitching 118-inch from edge of tape, 7 to 11 stitches per inch. Overstitch ends of webbing 2-inches (A, figure 2-38).

(5) Reposition vent lines and sew them in place according to original construction.

c. Damage Extending Into Radial Seam. Repair as follows:

(1) Mark vent line position and cut stitching of vent line attached to damaged radial seam and the stitching of two vent lines on each side of damaged seam. Move lines to one side.

(2) Smooth canopy around damaged area.

(3) Cut a piece of 1-inch nylon webbing long enough to extend 1-inch beyond outside edge of second radial seam on each side of damaged area. Wax ends of webbing (para 2-19).

(4) Center webbing over damaged area. Use a light duty sewing machine and size E, nylon thread to stitch. Sew webbing in place with four continuous rows of stitching 118-inch from edge of tape, 7 to 11 stitches per inch. Overstitch ends of webbing 2-inches (A, figure 2-38).

(5) Reposition vent lines and sew them in place according to original construction.

2.25. Upper Lateral Band (cont).

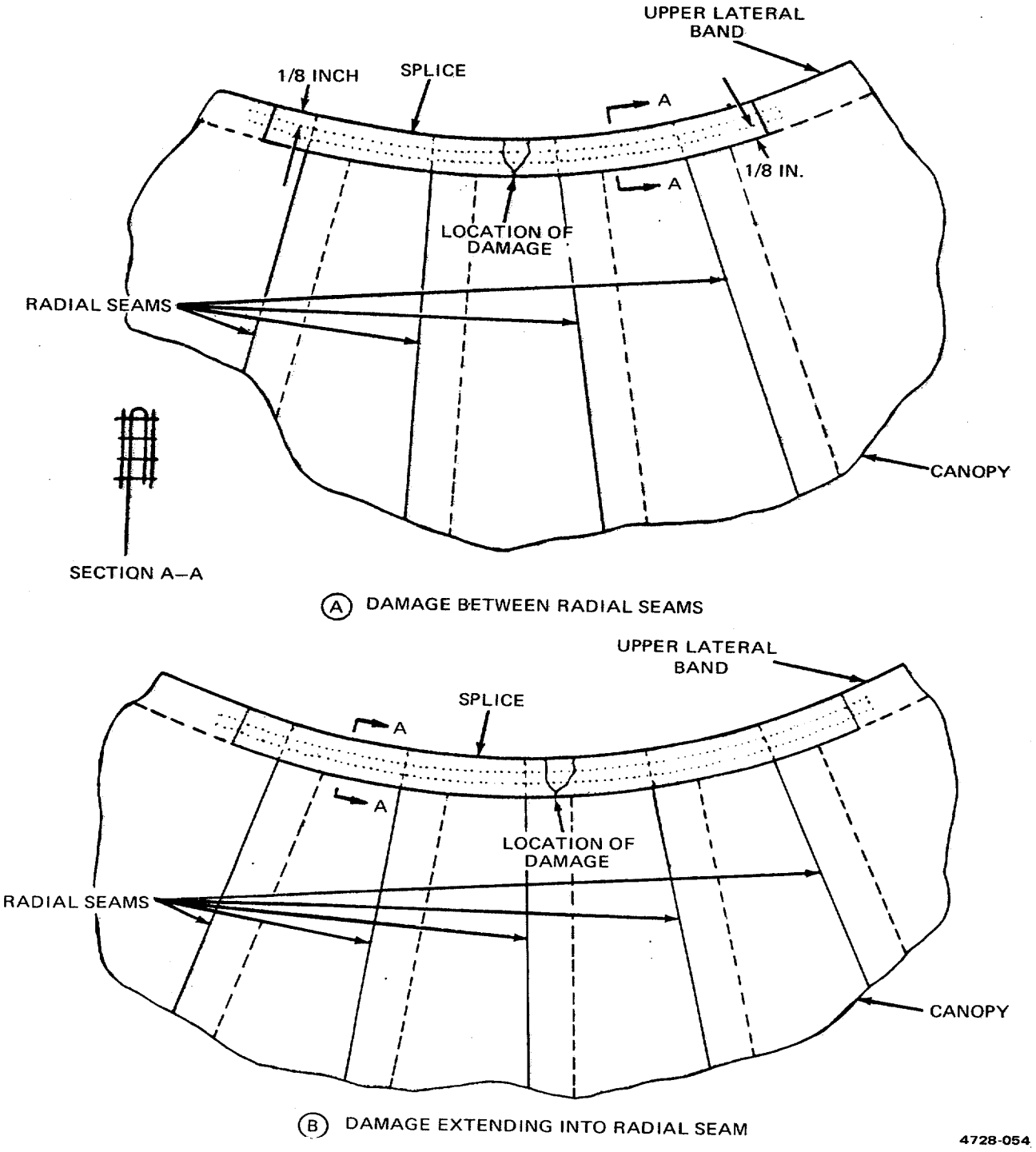


Figure 2-38. Upper Lateral Band Splicing Details.

2-26. Gore Section.

This task covers: a. Repair b. Replace

Tools:

Knife, Item 1, Appendix B
Needle, Tacking, Item 6, Appendix B
Shears, Item 10, Appendix B
Sewing Machine, Light Duty, Item 12 Appendix B
Sewing Machine, Darning, Item 16, Appendix B
Push Pins

Materials/Parts:

Brush, Stenciling, Item 4, Appendix D
Thread, Size E, Items 27128, Appendix D
Cloth, Nylon, Parachute, 2.25 Ounce, Item 7, Appendix D

Personnel Required:

43E(10) Parachute Rigger

Equipment Condition:

Inspected, Paragraph 2-9, 2-13
Cleaned, Paragraph 2-12
Parachute laid out on table

Reference:

Group No. 01, MAC, Section II, Appendix B

NOTE

Replacement of a gore section is accomplished at the Intermediate (DS) maintenance level only, in accordance with the Maintenance Allocation Chart (MAC), Appendix B.

a. Repair.

(1) *Restitching.* Stitching and restitching made on parachute canopies should be accomplished with size E nylon thread that is contrasting in color to the fabric being stitched or the original thread being restitched. If contrasting color thread is not available, thread of matching color may be used, providing all other specifications are met. Straight stitching and restitching should be locked by at least two inches at each end of a stitch row, when possible. Restitch directly over the original stitching and follow the original stitch pattern as closely as possible.

(2) *Darning.* Darn a hole or tear in a gore section which does not exceed 314 inch in length or diameter as prescribed in para 2-18, using size E nylon thread. Each gore section may be darned three times.

2-26. Gore Section (cont).

(3) *Patching.* Use a patch to repair holes which exceed 314-inch in length or diameter using the sewn patch.

(a) Limitations. The following limitations apply to the 15-foot cargo parachute.

WARNING

The limitations prescribed for parachute canopy patching will be stringently adhered to under all circumstances and without any deviations.

- A patch will not be applied to a damaged area that has been previously patched.
- Each gore section is limited to two patches. However, determination should be made as to the most economical method to be used, i. e. , two patches versus one large patch or one large patch versus a section replacement. A patch applied to a parachute canopy may extend from radial seam to radial seam.

(b) Sewn patches. There are two types of sewn patches authorized, the basic and miscellaneous. A basic patch is used to repair damaged cloth when the affected area is no closer than 1 inch -from a radial webbing upper lateral band or lower lateral band. Should a damaged area be closer than 1 inch to the cited areas, a miscellaneous patch will be made.

NOTE

Sewn patches on the canopy will be applied to the inside and may be square or rectangular or triangular in shape.

When a miscellaneous canopy patch is used, cut stitching and remove or lay aside items which may interfere with patch application. Refer to applicable item repair paragraph for proper procedures.

1 Using a marking aid of contrasting color, mark a square or rectangle around area to be patched and insure one side of marked square or rectangle is parallel to warp or filling of fabric.

2 Cut damaged area fabric along lines made in 1 above. Further cut fabric diagonally at each corner to allow a 1/2-inch foldback in raw edges. Cut stitching and lay aside or remove any item which will interfere with miscellaneous patch application.

3 Make 1/2-inch foldback on each raw edge. Pin and baste each foldback to complete prepared hole. Basting will be performed using procedures in paragraph 2-18a.

4 Using 2.25 ounce nylon cloth, mark and cut a patch 2 1/2-inches wider and longer than inside measurements of prepared hole. Insure patch material is marked and cut along warp or filling of fabric.

5 Center patch material over prepared hole and insure warp or filling of patch material matches warp or filling of fabric being patched. Pin patch material in position.

6 Make 1/2 inch foldunder on each edge of patch material and baste patch to prepared area. Basting will be performed using procedures in paragraph 2-18a.

7 Remove pushpins securing item to the repair table and secure patch by stitching, using a light duty sewing machine and size E nylon thread, and the applicable details in figure 2-39. Make first row of stitching completely around patch. Invert canopy and make a second row of stitching around prepared hole. Stitching will be 7 to 11 stitches per inch.

8 Replace items removed for miscellaneous patch, as required, in accordance with applicable item procedures.

(4) *Restenciling.* As required, restencil identification markings using procedures in paragraph 2-20.

NOTE

Replacement of gore panels can be accomplished only at the intermediate maintenance level, in accordance with the Maintenance Allocation Chart (MAC), Appendix B.

b. Replacement. When replacing gore sections, use 2. 25 ounce nylon parachute cloth of same color as that being replaced. If the same color cloth is not available, another color may be used. When replacing section 1 of gore 1, restencil gore number and information data block on replacement section. For other gores, stencil gore numbers as necessary using procedures in paragraph 2-20. A gore section which is damaged beyond repair will be replaced as follows:

(1) *Gore panel replacement.*

(*a*) Invert canopy and locate damaged gore.

(b) Remove items which may interfere with gore panel replacement by cutting stitching, lay items aside.

2-26. Gore Section (cont).

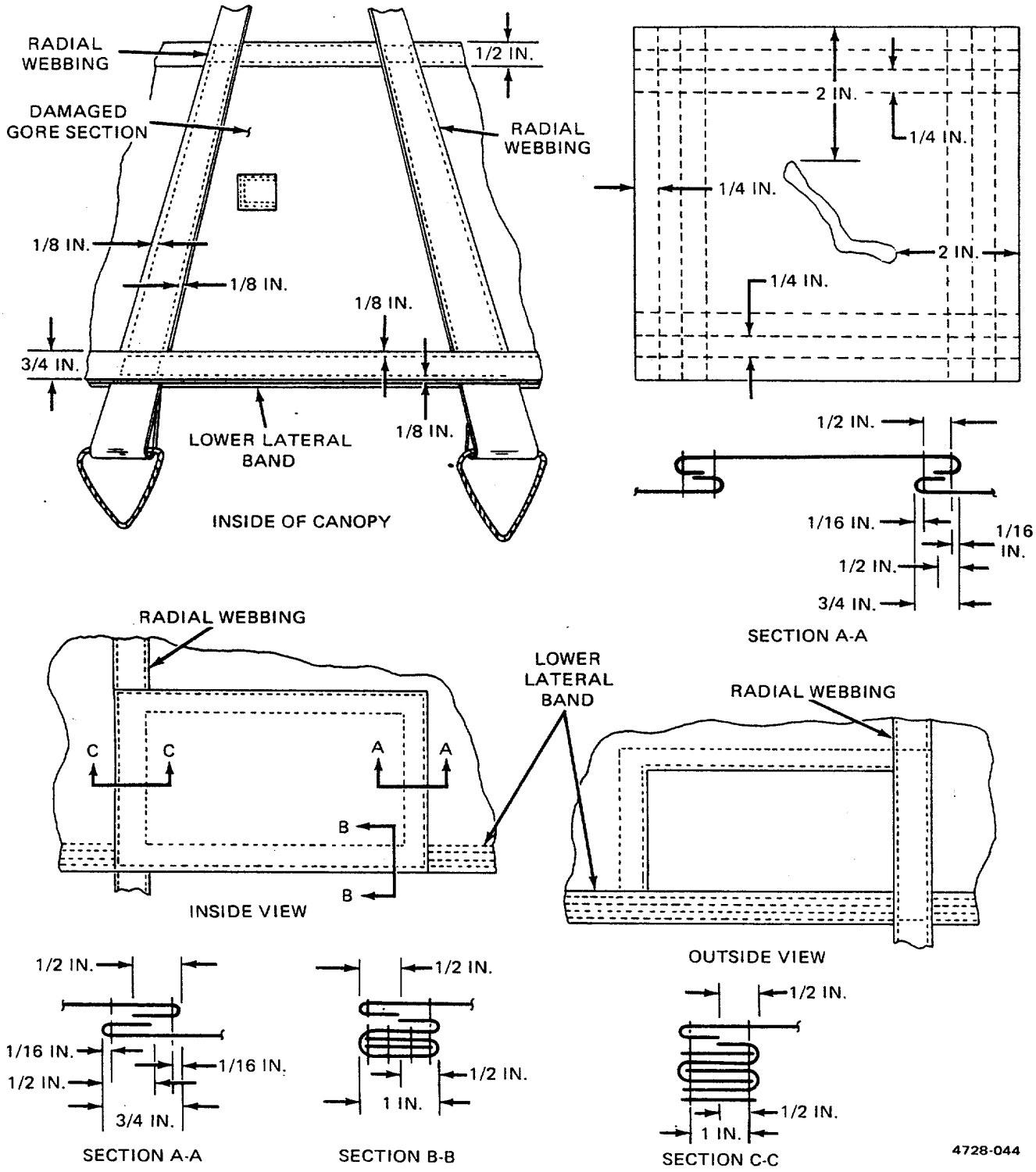


Figure 2-39. Basic and Miscellaneous Patch Application.

(c) Smooth out and secure surrounding canopy material to table with pushpins. Insure adjacent lateral and radial webbings are straight and damaged gore panel is not distorted.

(d) Remove damaged gore panel by cutting material at a point 112-inch in from adjacent webbing or edge (figure 2-40).

(*e*) Cut remaining material diagonally at each corner. Fold each raw edge back by ½ inch. Pin and baste (para 2-18) to complete area preparation.

(f) Cut a piece of 2.25 ounce nylon cloth to a size that will cover the entire prepared area. Maintain the selvaged edge of the cloth piece, if possible. Allow at least 3 inches of extra fabric to remain on each raw edge.

(g) Fold under selvaged edge of the cloth piece to a width equal to the width of adjacent seam and aline the cloth folded edge with the outside edge of adjacent seam or lateral band. Secure the folded edge with push pins.

(h) Fold the raw edges of the cloth piece as follows:

1 Fold under the raw edges located adjacent to edge reinforcements and a lateral band, as applicable, and aline the folded edges with the outside edges of the reinforcements on band. Secure these folds with push pins.

2 Fold under the raw edges located along the radial seams and aline the folded edges with the outside edges of the radial seams. Secure this fold with push pins.

(i) Secure the replacement section cloth to the canopy material by basting along each of the folded edges. Basting will be made in accordance with para. 2-18.

(j) Remove the push pins from the edges of the replacement section and secure the section material to the canopy inside using a light duty sewing machine and size E, nylon thread. Stitching will be 7 to 11 stitches per inch.

(k) Turn the canopy right side out and trim the raw edges of the section material to a point 1/2 inch from the stitching made in (j) above.

(l) On the canopy outside, using a light duty sewing machine and size E, nylon thread, stitch completely around the prepared area. Stitching will be 7 to 11 stitches per inch.

(m) Remove basting, reinvert canopy to outside.

(n) Restore Items removed in (b) above. Refer to applicable paragraph for detailed instruction.

2-26. Gore Section (cont).

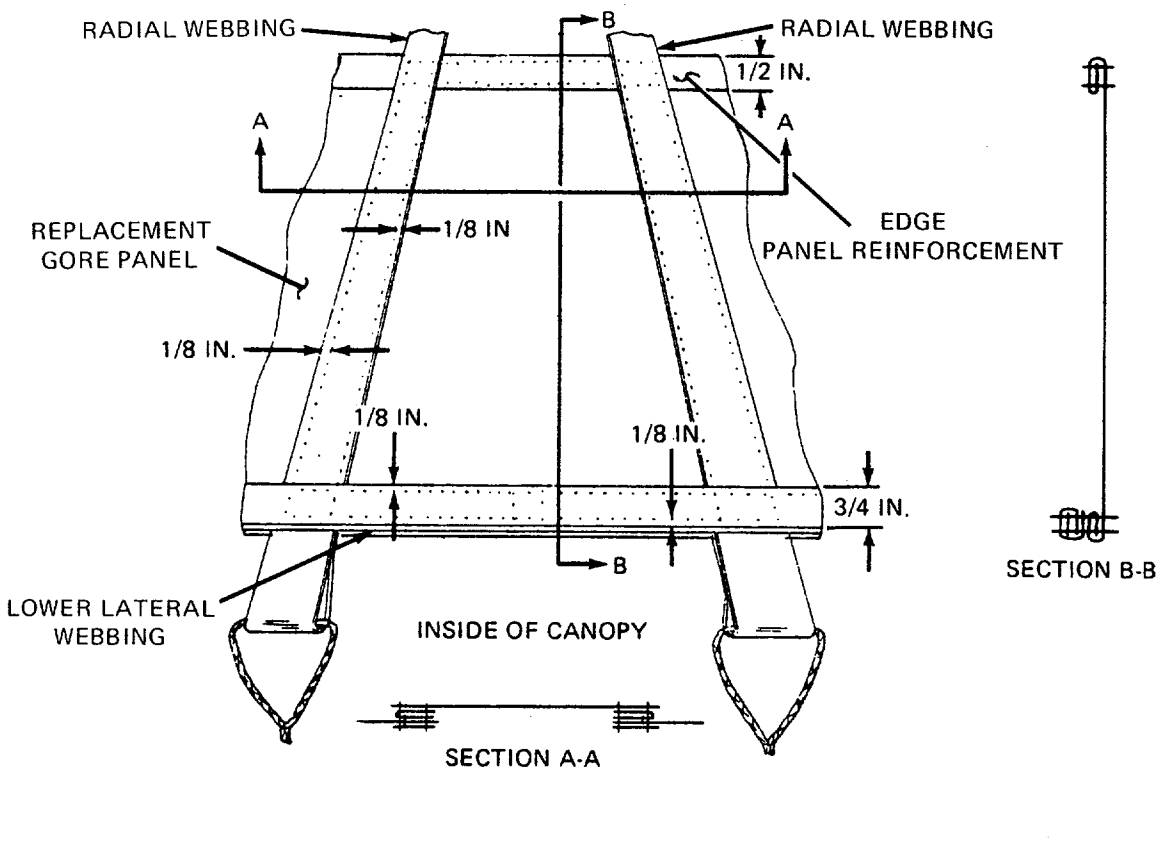


Figure 2-40. Gore Panel Replacement.

2-27. Radial Webbing.

This task covers: Repair

Tools:

Sewing Machine, Light Duty, Item 12, Appendix B
Sewing Machine, Zig-Zag, Item 13, Appendix B
Push Pins

Materials/Parts:

Thread, Nylon, Size E, Items 27128, Appendix D
Webbing, Nylon, Type 11, 1-Inch-Wide, Item 38, Appendix D

Personnel Required:

43E(10) Parachute Rigger

Equipment Condition:

Inspected, Paragraph 2-9, 2-13
Cleaned, Paragraph 2-12
Unpacked, laid flat

Reference:

Group No. 01, MAC, Section II, Appendix B

a. *Restitching*. Restitch radial tape. Using a light duty sewing machine and size E nylon thread of contrasting color. Stitch over original pattern, 7 to 11 stitches per inch. Lock each row of stitches two inches at each end. When radial webbing stitching has failed and section separation from radial webbing has occurred at the leading or trailing edge of ringslots, the repair will be accomplished as follows:

(1) Restitch failure in accordance with original construction. Sew a double throw zig-zag stitching across the width of radial webbing at leading/trailing edge of ringslot. Zig-zag Stitching will be 1/4-3/16 inch wide and centered on width of reinforced hem of leading/ trailing edge and will extend 1/2 inch beyond radial tape (A, figure 2-41).

(2) As an option, if a zig-zag sewing machine is not available, an hour glass stitch pattern 1 114-inches in length may be used. Stitching should start on reinforced hem of leading/ trailing edge, approximately 1/8inches from edge of ring, and proceed in length along radial seam of ring (B, figure 2-41).

2-27. Radial Webbing (cont).

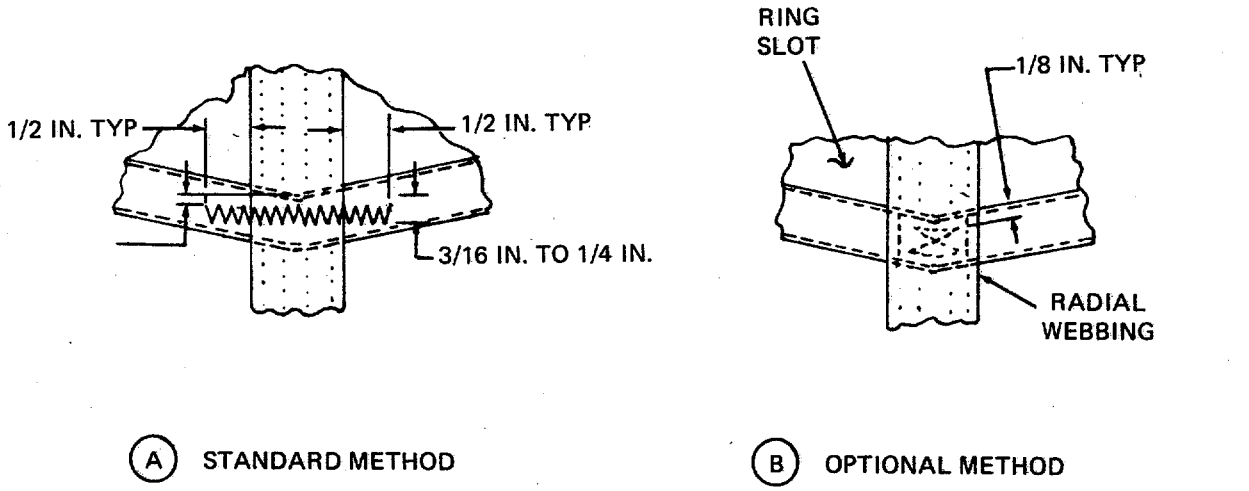


Figure 2-41. Radial Webbing Restitching Details.

b. Splicing. Splice damaged radial tape as follows:

(1) Place canopy on a repair table with damaged side of radial tape facing up and smooth out canopy material in affected area.

NOTE

Radial webbing may be spliced one time, providing the damaged area does not exceed 12-inches in length. Webbing splices may be applied to either or both sides of radial seam.

(2) Cut a length 1-inch wide nylon tape, long enough to extend 12-inches beyond each side of damaged area and sear ends as specified in paragraph 2-18.

(3) Center webbing length over damaged area. Using a light duty sewing machine and size E thread, secure splice by stitching 7 to 11 stitches per inch the full length of splice (figure 2-42).

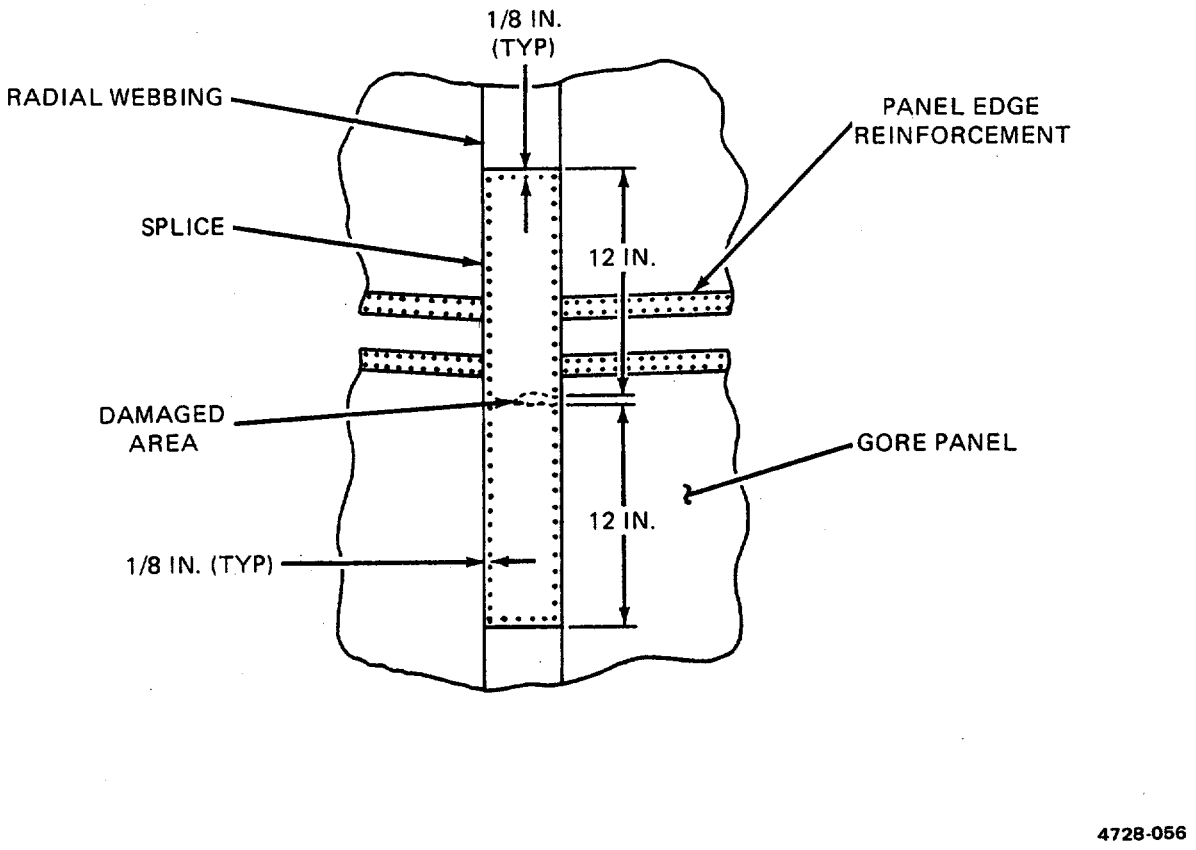


Figure 2-42. Radial Webbing Splice Details.

2-28. Panel Edge Reinforcement.

This task covers: Repair

Tools:

Knife, Hot Metal, Item 2, Appendix B
Shears, Item 10, Appendix B
Sewing Machine, Light Duty, Item 12, Appendix B

Materials/Parts:

Thread, Nylon, Size E, Items 27/28, Appendix D
Webbing, Nylon, Type 1, 9/16 Inch Wide, Item 37, Appendix D

Personnel Required:

43E(10) Parachute Rigger

Equipment Condition:

Inspected, Paragraphs 2-9, 2-13
Cleaned, Paragraph 2-12
Canopy laid flat on repair table

Reference:

Group No. 01, MAC, Section II, Appendix B

a. *Restitching.* Restitching of panel edge reinforcement is authorized. Use a light duty sewing machine and size =, nylon thread of contrasting color. Stitch over the original stitch pattern, 7 to 11 stitches per inch. Lock each row of stitches two inches at each end.

NOTE

The panel edges may be spliced only once and will not be replaced.

b. *Splicing.* A panel edge reinforcement may be spliced one time as follows.

(1) Cut a length of 9/16-inch-wide, type I nylon webbing long enough to extend 6 inches beyond each side of damaged area and sear ends (para 2-19).

(2) Center webbing length over damaged area and secure splice by stitching a box-stitch formation, 1/16-inch in from each edge, full length of splice material (figure 2-43). Use light duty sewing machine, with size E nylon thread, 7 to 11 stitches per inch.

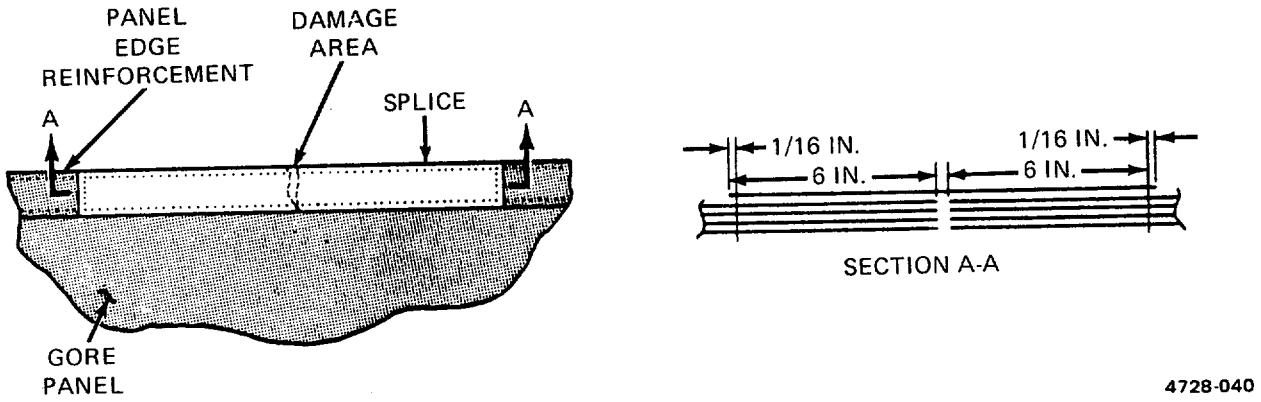


Figure 2-43. Panel Edge Reinforcement Splice Details.

2.29. Lower Lateral Band.

This task covers: Repair

Tools:

Sewing Machine, Light Duty, Item 12, Appendix B
Sewing Machine, Zig-Zag, Item 13, Appendix B

Materials/Parts:

Thread, Nylon, Size E, Item 27/28, Appendix D
Webbing, Nylon, 1 Inch Wide, Type II Item 38, Appendix D

Personnel Required:

43E(10) Parachute Rigger

Equipment Condition:

Inspected, Paragraph 2-9, 2-13
Cleaned, Paragraph 2-12
Unpacked, laying flat on repair table

Reference:

Group No. 01, MAC, Section II, Appendix B

NOTE

The skirt reinforcement tape may have one splice between any two suspension lines and can not be replaced.

If the damage is located in a previously spliced area between two suspension lines, the earlier made splice material will be removed before attempting a second splice repair.

a. Stitching and Restitching. Stitch and restitch (para 2-18) using a light-duty sewing machine with nylon thread, size E, of contrasting color to the original stitching and material when possible. Lock all straight stitching by back stitching at least 2-inches. Zig-zag restitching should extend at 1/4inch into undamaged stitching at each end. Restitch directly over the original stitching. Follow the original stitch pattern as closely as possible.

b. Splicing. Splice lower lateral band as follows:

(1) With damaged side of lower lateral band facing up and affected area of canopy smoothed out, remove previous splice, if required.

(2) As required, cut and remove original stitching which secures pocket band end to lower lateral band. Fold pocket band loose end away from repair area.

(3) Cut a length of 1-inch wide nylon tape long enough to extend 12 inches beyond each end of damaged area. Wax each end of tape (para 2-18).

(4) Center tape length over damaged area (figure 2-44) and secure splice by making four rows of continuous stitching using a light duty sewing machine and size E thread. Overstitch each webbing end by 1/2-inch. Stitching will be 7 to 11 stitches per inch.

2-29. Lower Lateral Band (cont).

(5) Reattach pocket band, if required. Using a zig-zag sewing machine and size E nylon thread, reinstall pocket band loose end in original location using original construction.

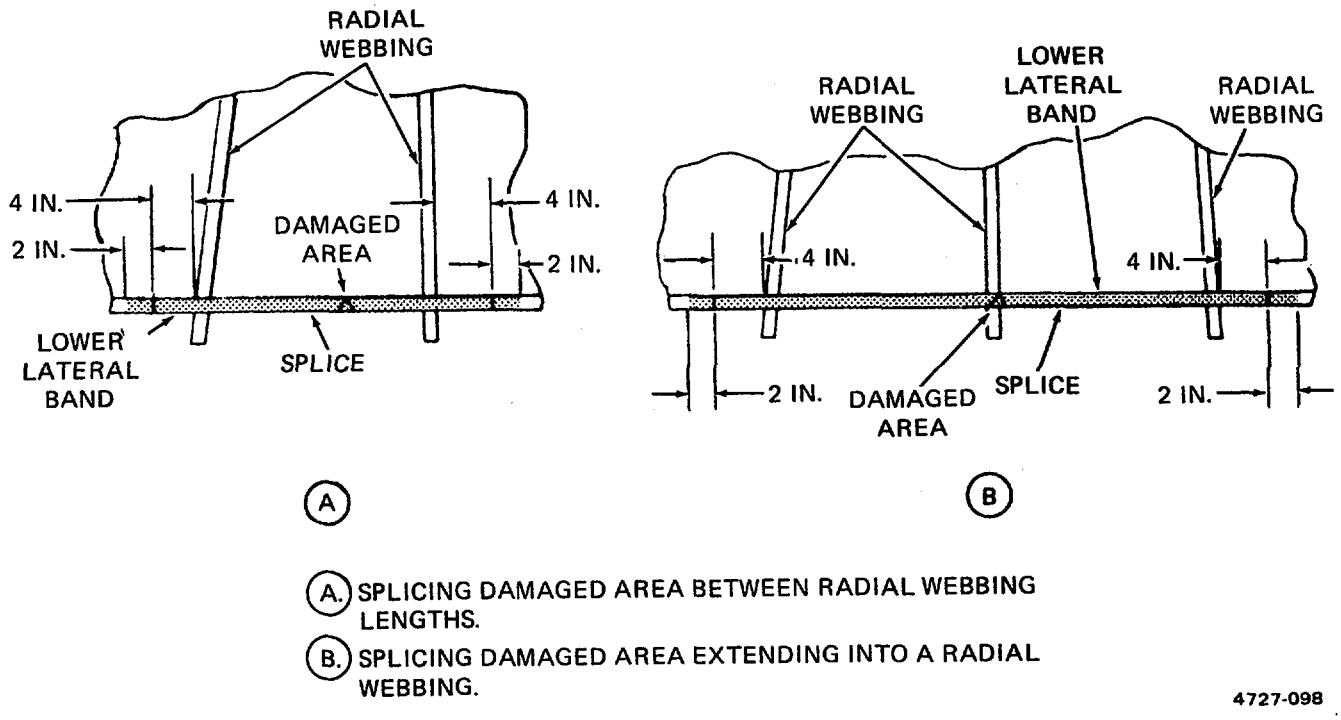


FIGURE 2-44. LOWER LATERAL BAND SPLICE DETAILS

2.30. Pocket Band.

This task covers: a. Repair b. Replace

Tools:

Knife, Item 1, Appendix B
Pot, Melting, Electric, Item 9, Appendix B
Shears, Item 10, Appendix B
Sewing Machine, Light Duty, Item 12, Appendix B

Materials/Parts:

Tape, Nylon, Type 111I, 3/4 inch, Item 23, Appendix D
Thread, size E, Item 27128, Appendix D
Marker, Black Ink, Item 13, Appendix D

Personnel Required:

43E(10) Parachute Rigger

Equipment Condition:

Inspected, Paragraphs 2-9, 2-13
Cleaned, Paragraph 2-12
Unpacked, laid flat on repair table

Reference:

Group No. 01, MAC, Section II, Appendix B

a. Repair. Stitch and restitch (para 2-18) with size E thread which matches the color of original stitching, when possible. Lock all zig-zag stitching by overstitching at least 1/2-inch. Restitch directly over the original stitching, following the original stitch pattern as closely as possible.

b. Replacement. Replace an unserviceable pocket band by fabricating as follows:

(1) Using a marking aid, mark canopy at each end of original pocket band.

(2) Cut stitching on both ends of the original pocket band and remove pocket band from canopy skirt.

(3) Cut an 8 112-inch length of 314-inch wide nylon tape, sear ends (para 2-19).

(4) Position tape length in original pocket band location.

(5) Using a light-duty sewing machine and size E nylon thread, secure each end of the replacement pocket band by stitching a 2-inch long, single-x box stitch formation with two double ends, 1/8-inch in from each edge according to details in figure 2-45. Stitching will be 7 to 11 stitches per inch.

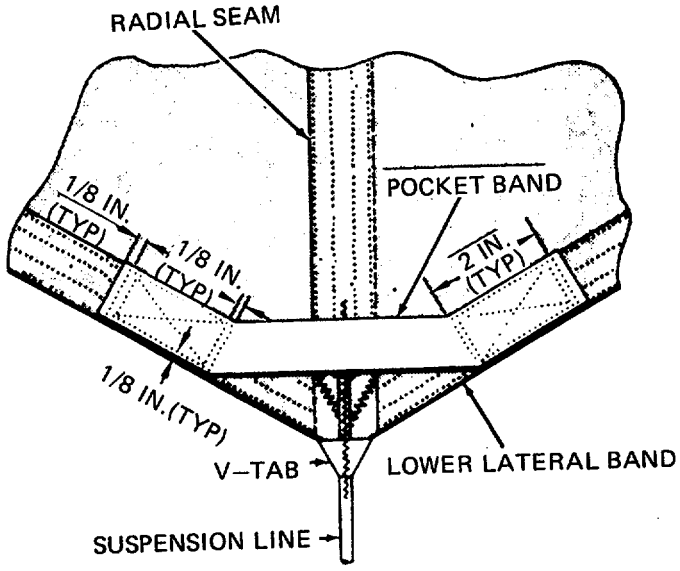


Figure 2-45. Pocket Band Replacement Details.

2-31. Suspension Line.

This task covers: a. Repair b. Replace

Tools:

Knife, Item 1, Appendix B
Shears, Item 10, Appendix B
Sewing Machine, Zig-Zag, Item 13, Appendix B
Splicing Aid (See Appendix E)

Materials/Parts:

Cord, Nylon, Type IV, Coreless, Item 9, Appendix D
Marker, Felt-Tip, Black, Item 13, Appendix D
Thread, Nylon, Size E, Item 27/28, Appendix D

Personnel Required:

43E(10) Parachute Rigger

Equipment Condition:

Inspected, Paragraphs 2-9, 2-13
Cleaned, Paragraph 2-12
Canopy laid flat on repair table

Reference:

Group 01, MAC, Section II
Appendix B

a. Repair.

Restitching. Stitch and restitch with thread, nylon, size E, that is contrasting in color to the fabric being stitched or original thread being restitched. If contrasting color thread is not available, thread of matching color may be used, providing all other specifications are met. Straight stitching and restitching should be locked by at least two inches at each end of a stitch row when possible. Zigzag restitching should extend at least 114-inch into undamaged stitching at each end, when possible. Restitch directly over the original stitching and follow the original stitch pattern as closely as possible.

NOTE

Replacement of suspension lines is accomplished at the Intermediate Maintenance level only, in accordance with the Maintenance Allocation Chart (MAC), Appendix B.

b. Replacement. Replace unserviceable suspension line by fabricating as follows:

(1) Place canopy assembly in proper layout on an inspection table.

(2) Apply partial tension to suspension lines and trace defective suspension line from connector link to suspension line attaching loop at canopy skirt. Upon completion of line tracing, release line tension.

(3) Remove original suspension line from canopy by cutting formed loop located at upper end of suspension line.

(4) Cut a length of coreless nylon cord 24-inches longer than distance from canopy to connector link. Taper-cut one end (figure 2-46).

(5) Using a suitable marking aid, mark cord at points 6-, 9-, and 15-inches from tapered end (figure 246).

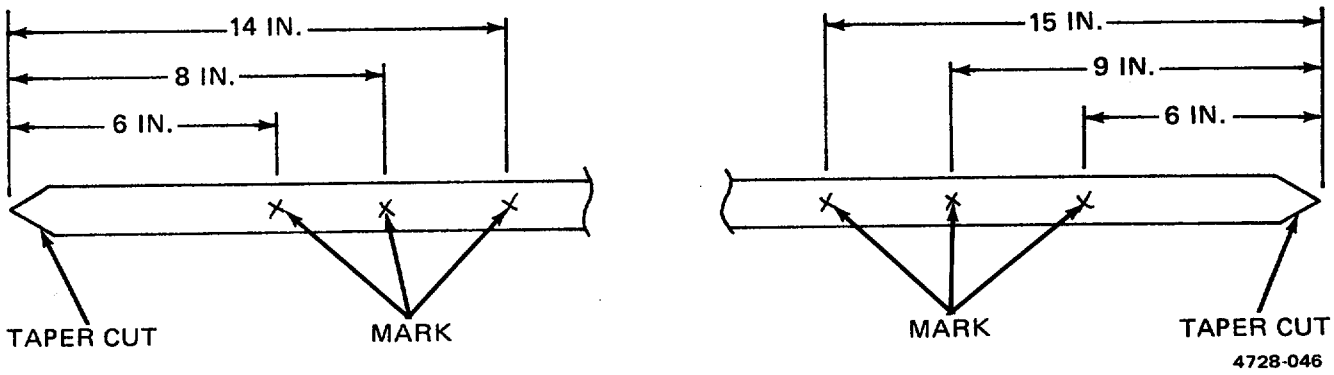


Figure 2-46. Replacement Suspension Line Construction Details.

(6) Pass 7 1/2 Inches of tapered cord end through original suspension line attaching loop**.**

(7) Insert a splicing aid through cord casing at 15-inch mark and pass inserted aid up through cord casing and to outside at the 9-inch mark.

(8) Insert cord tapered end into eye of splicing aid.

(9) Pull splicing aid and cord tapered end down inside cord casing until 6 and 9-inch marks are alined (figure 2-47).

(10) Hold alined marks together, pull splicing aid and cord tapered end down and to outside at 15-inch mark.

(11) Remove cord tapered end from splicing aid and while holding 6 and 9-inch marks together, pull cord at a point below 11-inch mark to allow cord tapered end to withdraw into cord casing.

(12) Beginning at a point as close as possible to alined 6 and 9-inch marks. Use a zig-zag sewing machine and size E thread, secure formed loop by stitching a 1/8-inch wide, 3 inch long row of stitching. Stitching will be 7 to 11 stitches per inch.

(13) Hold attaching loop of an adjacent suspension line and attaching loop of replacement line together tightly at canopy skirt and while lines are under equal tension, trace the length of both lines from attaching loops to the applicable connector link assembly.

(14) Using a marking aid of contrasting color, mark replacement line length at a point alined with inside edge of link assembly. Reapply equal tension to both line lengths and check to insure replacement line length is marked correctly. Release tension.

2-31. Suspension Line (cont).

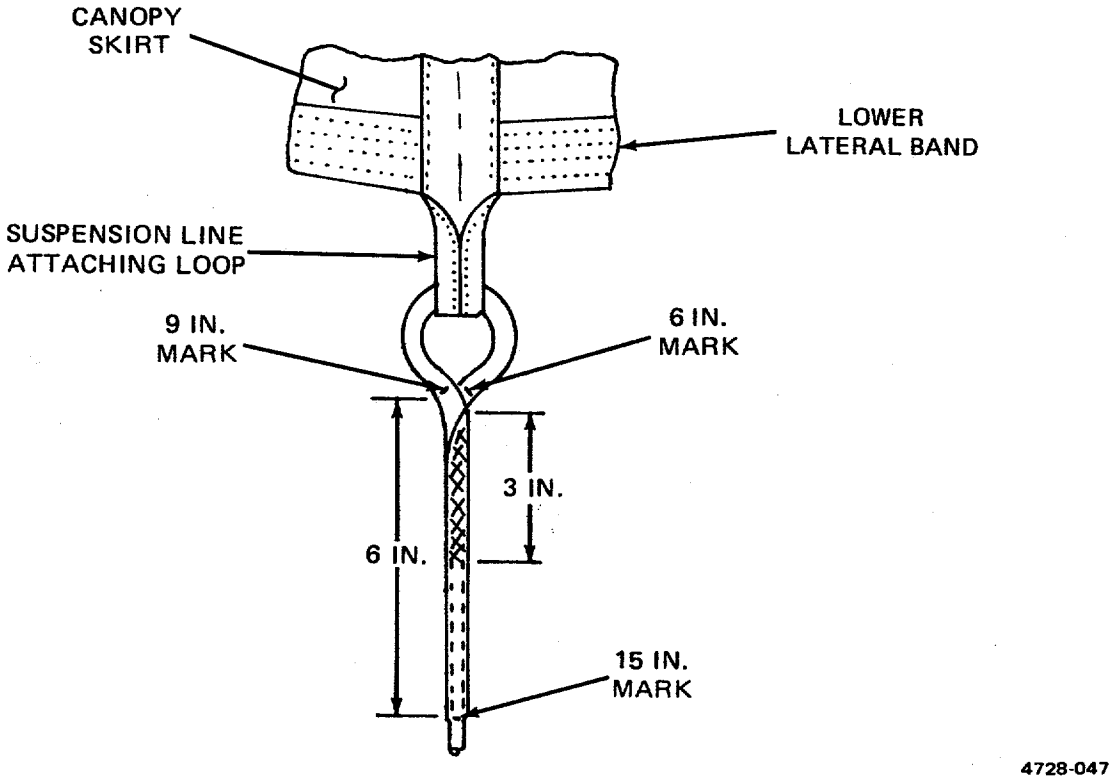


Figure 2-47. Securing Suspension Line at Suspension Line Attaching Loop.

(15) Cut and remove lower end of original suspension line from connector link assembly and note original location.

(16) Cut running end of replacement line at a point 7-inches beyond 6-inch mark made in (14) above. Taper-cut 1/2-inch of remaining line end.

(17) Using an authorized marking aid of contrasting color, mark line length at points 6**-,** 8-, and 14-inches from the tapered running end (figure 2-46).

(18) Pass 7-inches of line through connector link in original line location. Suspension lines shall be attached to riser in numerical sequence (figure 2-48).

(19) Insert a splicing aid through cord casing at the 14-inch mark and pass inserted aid down through cord casing and to outside at the 8-inch mark.

(20) Insert cord tapered end into eye of splicing aid.

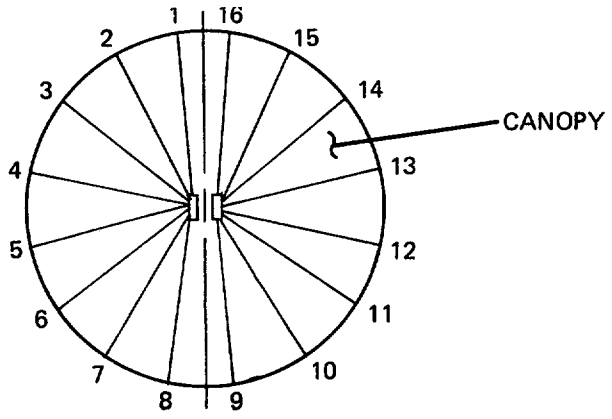


Figure 2-48. Suspension Line Numerical Sequence.

(21) Pull splicing aid and cord tapered end up inside cord casing until the 6and 8-inch marks are alined (see figure 2-49).

(22) Hold alined marks together and pull splicing aid and cord tapered end up and to outside at 14-inch mark.

(23) Remove line tapered end from splicing aid and while holding 6and 8-inch marks together, pull cord at a point above the 14-inch mark to allow line tapered end to withdraw into cord casing.

(24) Beginning at 6and 8-inch marks working toward canopy, using a zig-zag sewing machine and size E thread, secure formed loop by stitching a 1/8-inch wide, 3-inch-lonig row of double throw zig-7ag stitching. stitching will be 7 to 11 stitches per inch.

(25) Trace replacement line from connector link to suspension line attaching loop to insure proper attachment, position, and sequence.

2-31. Suspension Line (cont).

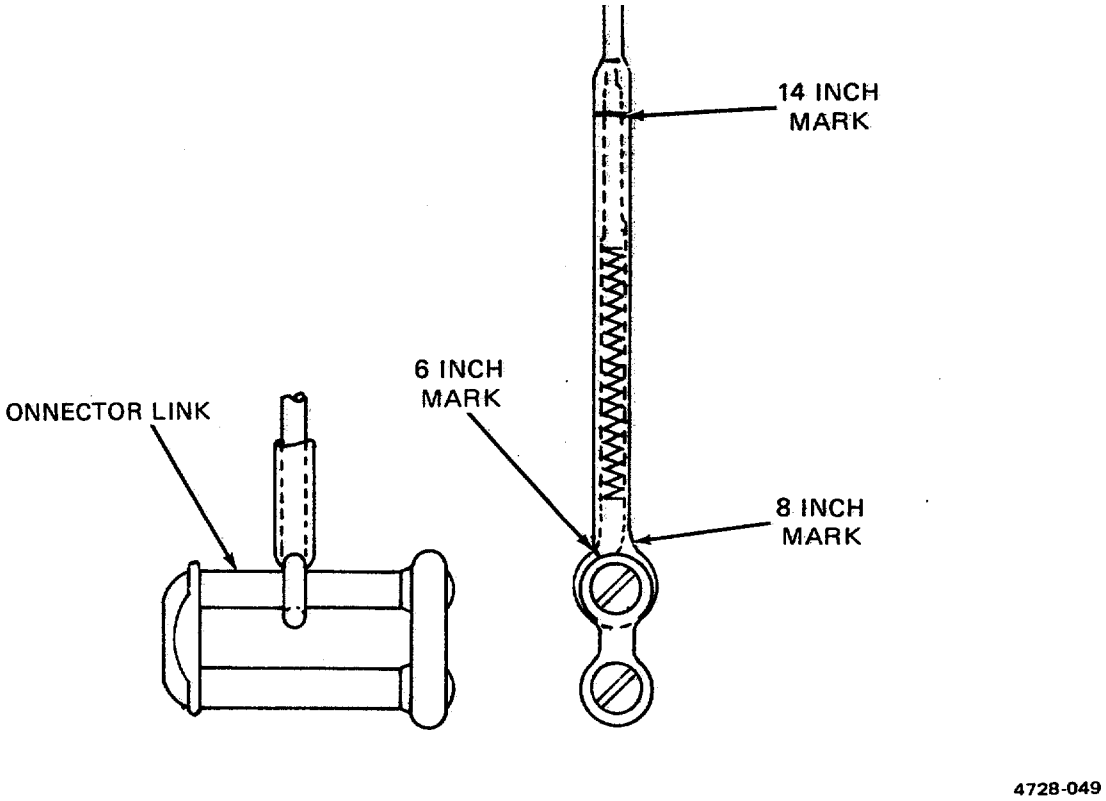


Figure 2-49. Securing Line to Connector Link.

2-32. Connector Link.

This task covers: a. Repair b. Replace

Tools:

Mallet, Rawhide, Item 5, Appendix B
Screwdriver, Flat-Tip, Item 18, Appendix B
Separator, Connector Link, Item 19, Appendix B

Materials/Parts:

Cloth, Abrasive, Item 5, Appendix D

Personnel Required:

43E(10) Parachute Rigger

Equipment Condition:

Connector link laid out on table

Reference:

Group No. 01, MAC, Section II
Appendix B

a. <u>*Repair.*</u> Repair connector link assembly as follows:

(1) *Cleaning.* Remove burrs, rough spots, rust, or corrosion from a parachute connector link assembly by either filing with a metal file or buffing with abrasive cloth.

(2) *Replacing a locking screw.* Replace a damaged or missing locking screw on a parachute connector link with a serviceable item from stock.

b. <u>*Replacement.*</u> A parachute connector link assembly, regardless of type, which is damaged beyond repair will be replaced with a serviceable L-bar parachute connector link assembly from stock. Use the following procedures:

(1) Using a flat-tip (slotted-head) screwdriver, remove two locking screws from ends of a replacement parachute connector link assembly and disassemble link (see figure 2-50).

(2) Using a flat-tip (slotted-head) screwdriver, remove two locking screws from damaged original parachute connector link assembly. Disassemble link assembly, using a link separator, as required. If connector link contains suspension lines, ensure lines are not allowed to slide off damaged link during disassembly process.

(3) As applicable, position an L-bar of replacement link assembly adjacent to disassembled original link assembly and slide suspension lines from damaged link onto replacement link**.**

2-32. Connector Link (cont).

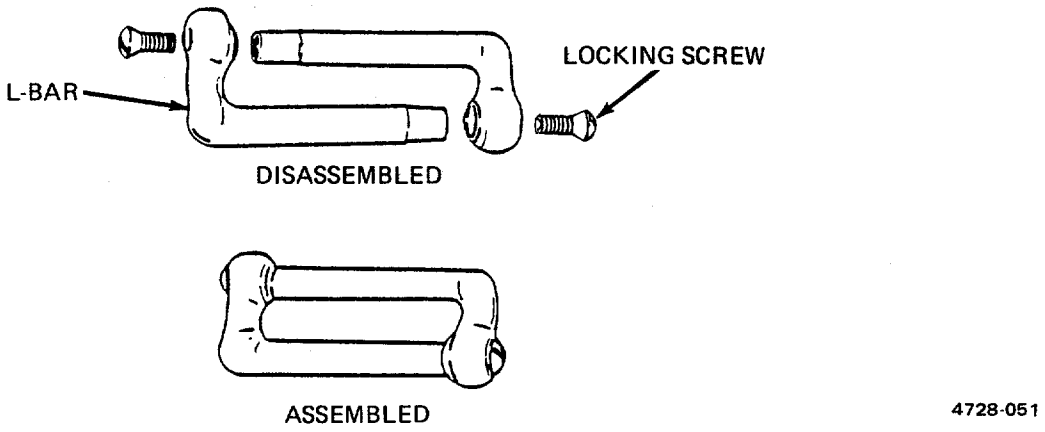


Figure 2-50. Connector Link Assembly.

(4) If required, pass remaining L-bar of replacement link through attaching loop of adjoining component.

(5) Fit replacement link L-bars together and ensure L-bar leg engagement by tapping end of each L-bar with a phenolic mallet.

(6) As applicable, trace suspension lines from connector link assembly to canopy to ensure lines are properly installed and in correct sequence.

(7) Replace locking screws and tighten with a flat screw driver.

2-33. Deployment Bag.

This task covers: a. Inspect b. Service c. Repair d. Replace

Personnel Required:

43E(10) Parachute Rigger

Appendix B

Equipment Condition:

Detached from canopy

Reference:

Group 02, MAC, Section II,

a. *Inspect.* Refer to paragraphs 2-9 and 2-13 for inspection procedures.

b. *Service.* Refer to paragraph 2-12 for cleaning procedures.

c. *Repair.* Refer to individual repair procedures.

CAUTION

When performing a repair on a 15-foot-diameter cargo extraction parachute deployment bag which requires the cutting of stitching or an original part, insure that adjacent bag material is not damaged during the cutting process.

d. *Replacement.* An unrepairable deployment bag will be replaced with a serviceable bag from stock (figure **2-51).**

2-33. Deployment Bag (cont).

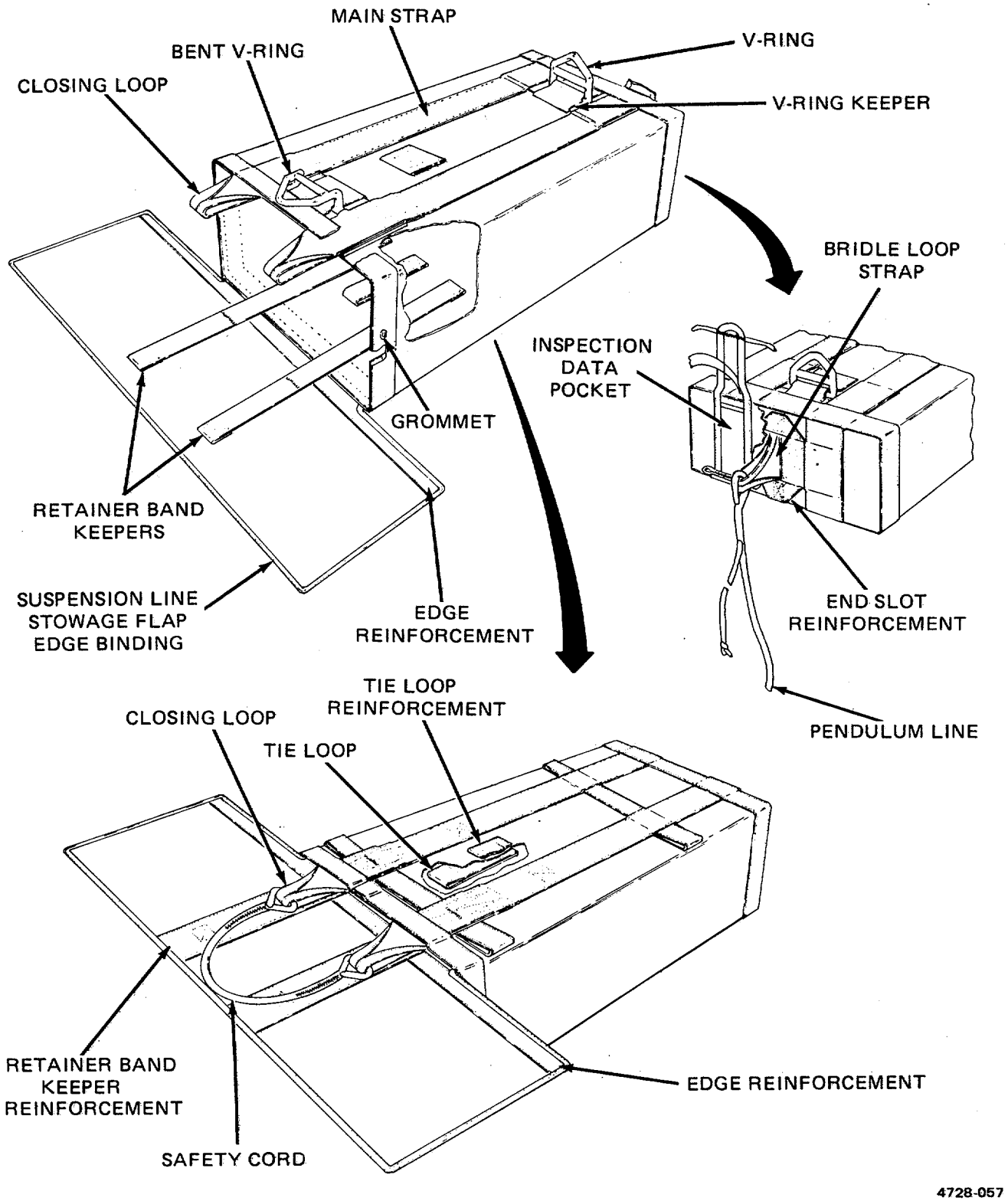


Figure 2-51. Deployment Bag.

2.34. Deployment Bag Grommet.

This task covers: a. Repair b. Replace

Tools:

Cutter, Single Bow, Item 22, Appendix B
Mallet, Rawhide, Item 5, Appendix B
Set Chuck and Die, Item 11, Appendix B
Sewing Machine, Medium Duty, Item 15 Appendix B

Materials/Parts:

Cloth, Nylon, Duck, 7.2 Oz, Item 6, Appendix D
Thread, Nylon, Size E, Item 27, 29, Appendix D

Personnel Required:

43E(10) Parachute Rigger.

Equipment Condition:

Inspected, Paragraphs **2-9** and **2-13**
Cleaned, Paragraph 2-12

Reference:

Group No. 02, MAC, Section II, Appendix B

a. *Repair*. Repair grommet as follows:

(1) Remove burrs, rough spots, rust, or corrosion from an Installed grommet by filing with a file or by buffing with a crocus cloth.

(2) Reseat a loose grommet using the procedures listed in paragraph b.

(3) If fabric area around original grommet has been damaged, repair area by darning using procedures in paragraph 2-18. If darning does not provide an adequate repair, construct a 2 3/4- by 2 3/4-inch sized reinforcement cloth and fold under 1/2-inch on all sides. After removing original grommet (paragraph b., step 1) sew cloth to inside with size E nylon thread, 7 to 11 stitches per inch, one row of stitches 1/8-inch from outside edge and the second row 3/8-inch from outside edge (figure 2-52). After reinforcing damaged area cut new hole for grommet installation.

2-34. Deployment Bag Grommet (cont).

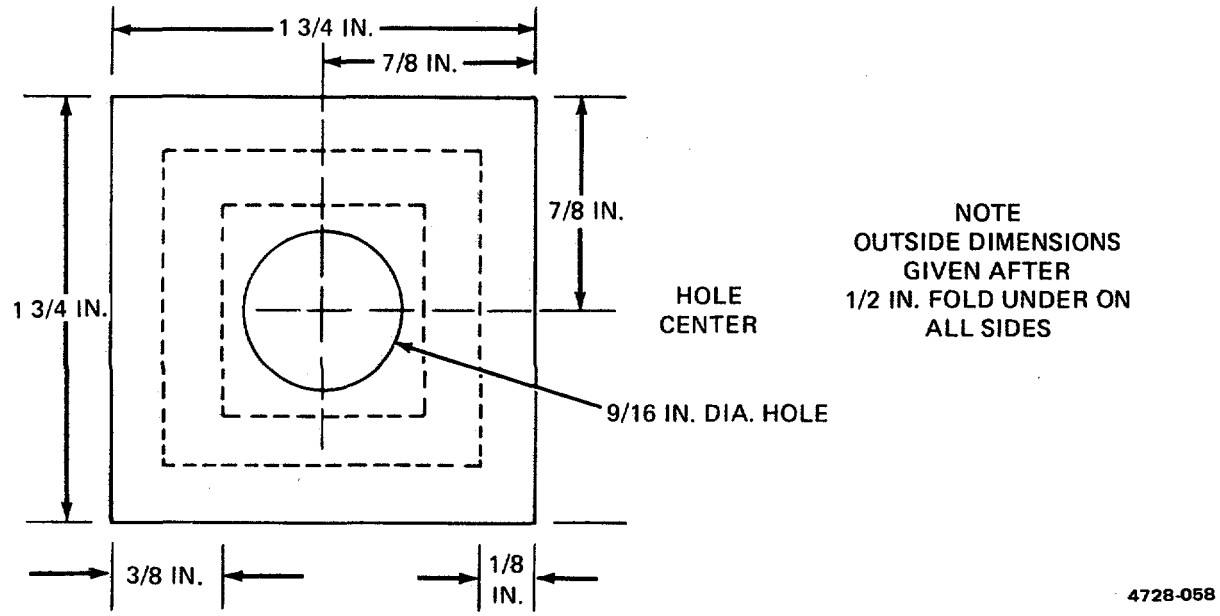


Figure 2-52. Fabricating Grommet Reinforcement.

b. *Replacement.* Proceed as follows:

(1) Remove original grommet as follows:

(a) Using a suitable type tool, lift edge of original washer at one point.

(b) Grip lifted washer edge with diagonal cutters and roll washer edge back to lift washer from original grommet. Remove original grommet from material.

(2) Grommet installation by hand-held method (figure 2-53).

(a) Insert barrel of replacement grommet through accommodating hole in material and ensure grommet flange is located on same side of material as original grommet.

(b) Position grommet on die with barrel facing up and place the washer over grommet barrel.

NOTE

When installing a flat grommet by the hand-held method, ensure the grommet barrel and washer are alined to preclude off-center setting of the grommet.

(c) Using a punch and a rawhide mallet or other non-steel impact device, spread grommet barrel by hammering until barrel collar is rolled down smooth on washer. If grommet barrel splits during hammering process, remove and replace installed grommet with a serviceable item from stock, repeating procedures in steps (2) and (3), above.

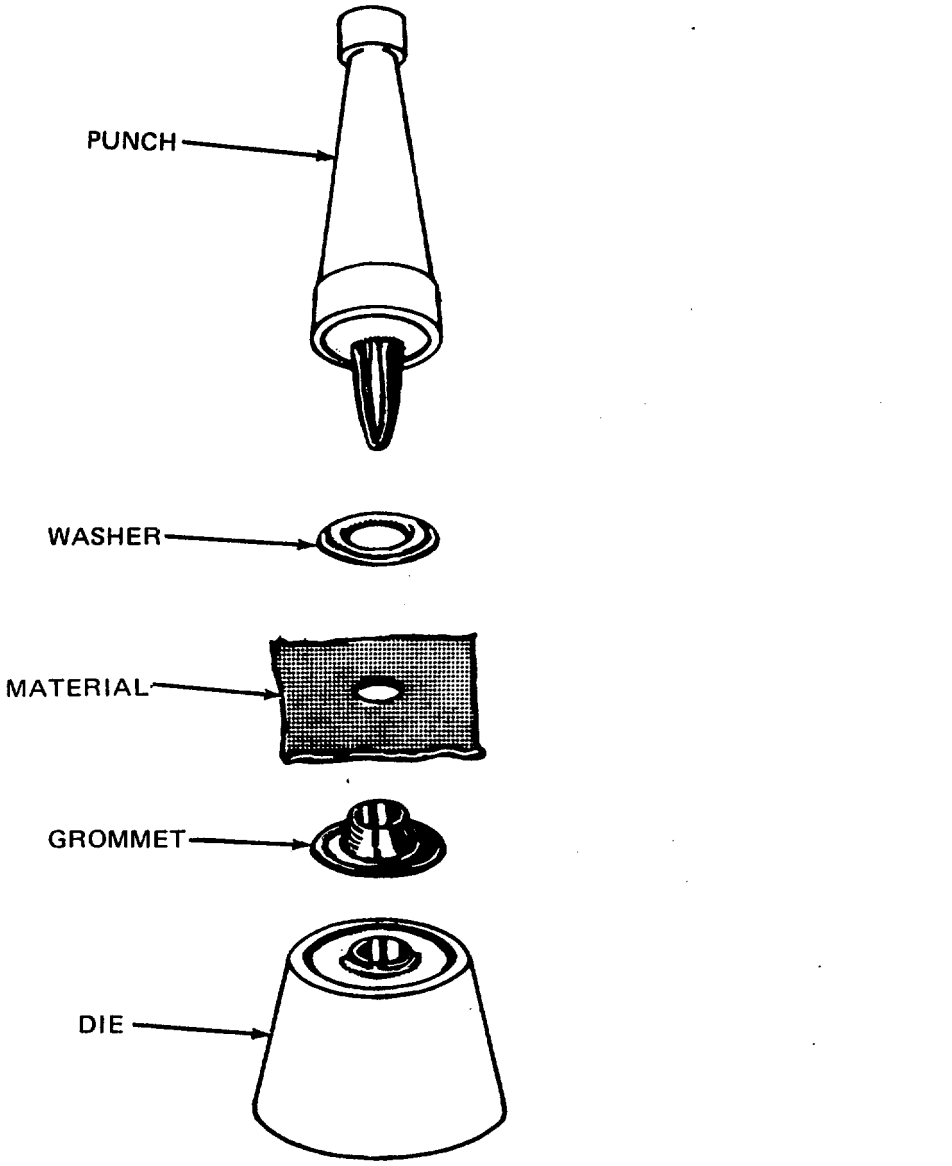


Figure 2-53. Grommet Installation by Hand-Held Method.

(d) Check seating of grommet. If grommet can be turned by hand, repeat step (4) until grommet is firmly seated.

(3) Grommet installation by hand-operated press.

(a) Install 1/4-inch chuck and die in hand-operated press, secure locking screws with hex wrench (figure 2-54).

2-34. Deployment Bag Grommet (cont).

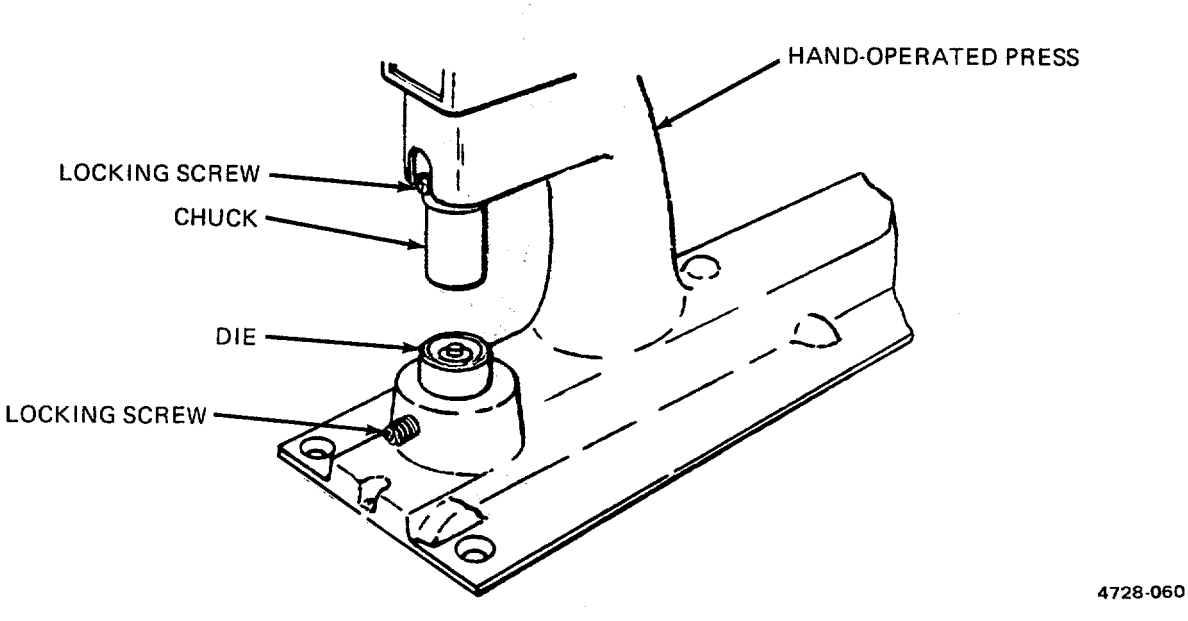


Figure 2-54. Chuck and Die Installed in Hand-Operated Press.

(b) Insert barrel of replacement grommet through hole in material. Insure grommet flange is on same side of material as original grommet (figure 2-55a).

(c) Position grommet on die in press with barrel facing up, place replacement washer over barrel (figure 2-55b).

(d) Depress handle or foot pedal, spreading grommet barrel until collar is rolled down smoothly on washer (figure 2-55c and 2-55d).

(e) Check grommet for firm seating. If grommet can be turned by hand, repeat step (d) above, until a firm seat is achieved.

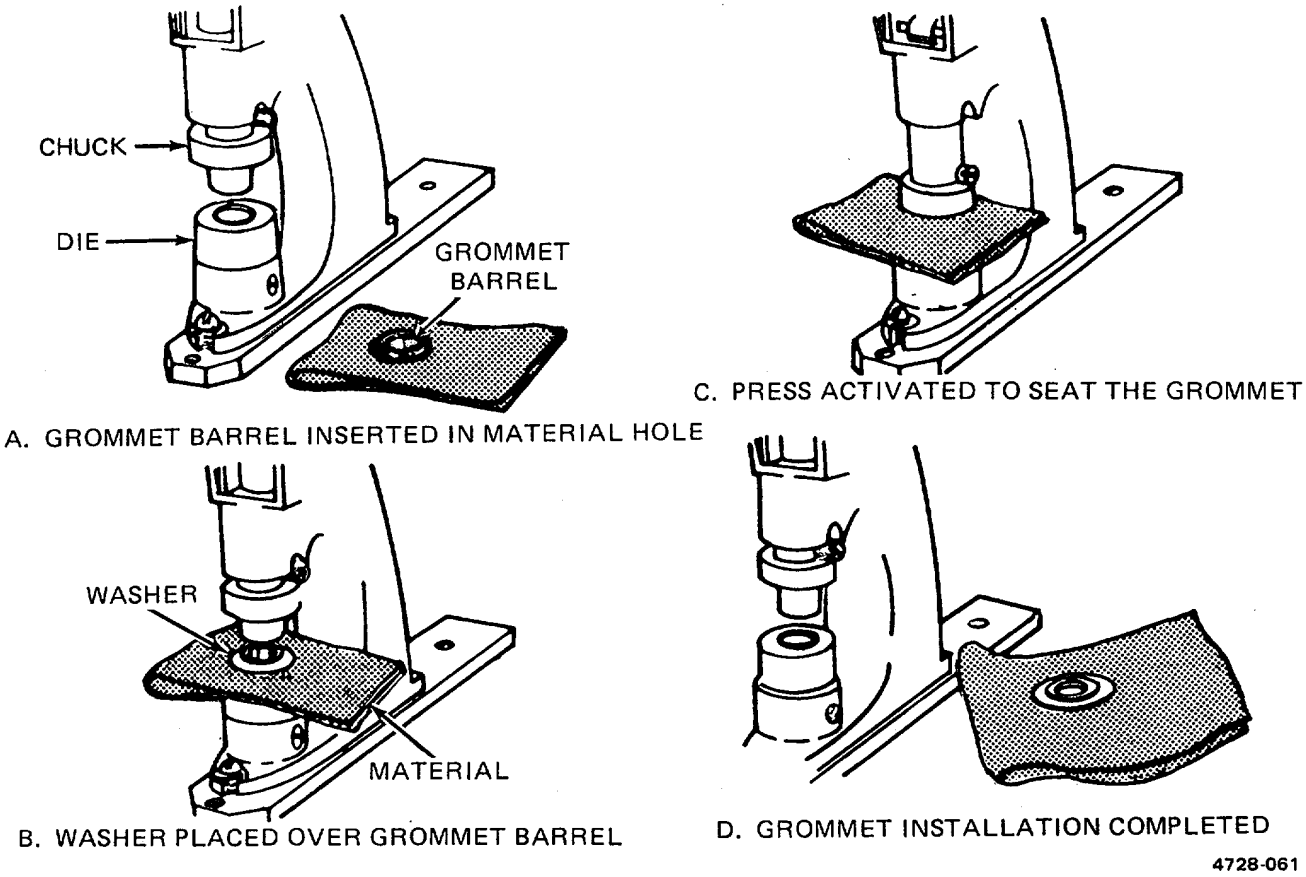


Figure 2-55. Flat Grommet Installation by Hand- or Foot-Operated, Typical.

2-35. Deployment Bag Retainer Band Keeper.

This task covers: a. Repair b. Replace

Tools:

Knife, Item 1, Appendix B
Knife, Hot Metal, Item 2, Appendix B
Shears, Item 10, Appendix B
Sewing Machine, Heavy Duty, Item 14, Appendix B
Yardstick, Item 20, Appendix B

Materials/Parts:

Marking Aid, Item 17118, Appendix D
Thread, Size 3, Item 31/32, Appendix B

Personnel Required:

43E(10) Parachute Rigger

Equipment Condition:

Inspected, Paragraphs 2-9, 2-13
Cleaned, Paragraph 2-12
Laid Out on work table

Reference:

Group No. 02, MAC, Section II, Appendix B

a. *Repair.*

Stitching. Stitch and restitch with size 3 thread which matches the color of the original stitching, when possible. Lock all straight stitching by backstitching at least 1/2 inch. Restitch by overstitching each end of the stitch formation by 112 inch. Restitch directly over the original stitching, following the original stitch pattern as closely as possible. Stitching will be in accordance with paragraph 2-18 and table 2-3.

b. *Replacement.* Replace a damaged retainer band keeper by fabricating as follows:

(1) Remove original retainer band keeper by cutting stitching securing keeper webbing to suspension line stowage flap and inside of bag bottom panel (figure 2-56).

(2) Cut a 16-inch length of 1-inch-wide type IV nylon webbing, sear ends (para. 2-19).

(3) Make a 1-Inch-long turnunder on each end of webbing length and position webbing in original keeper location with turnunders facing down.

(4) Using criteria in figure 2-56, secure each end of webbing length to deployment bag by stitching a single-X-box stitch formation with one double end. Stitch four lateral rows of stitching across webbing width at two points to form three equal sized loops in webbing length.

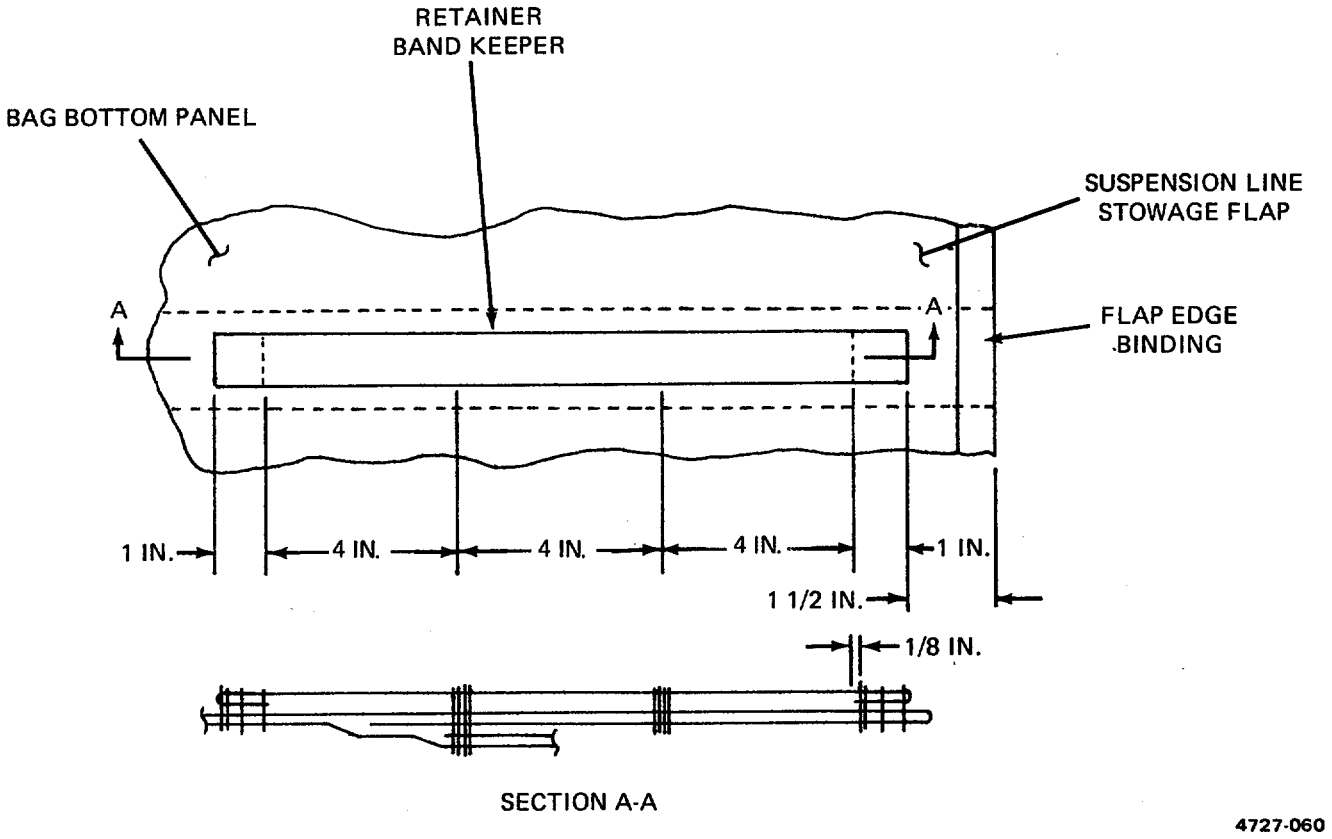


Figure 2-56. Retainer Band Keeper Replacement.

2-36. Deployment Bag Retainer Tie.

This task covers: a. Repair b. Replace

Tools:

Sewing Machine, Light Duty, Item 12, Appendix B
Sewing Machine, Zig-Zag, Item 13, Appendix B
Splicing Aid (See Appendix E)

Materials/Parts:

Cord, Nylon, Type IV, Item 9, Appendix D
Thread, Nylon, Size FF, Item 29/30, Appendix D
Marking Aid, Item 17118, Appendix D
Tape, Cotton, Type I, Item 22, Appendix D

Personnel Required:

43E(10) Parachute Rigger

Equipment Condition:

Inspected, Paragraphs 2-9, 2-13
Cleaned, Paragraph 2-12
Laid out on work table

Reference:

Group No. 02, MAC, Section II, Appendix B

a. *Repair.*

Stitching. Stitch and restitch with size FF thread which matches the color of the original stitching, when possible. Lock all straight stitching by backstitching at least 112-inch. Restitch by overstitching each end of the stitch formation by 112-inch. Restitch directly over the original stitching, following the original stitch pattern as closely as possible. Stitching will be in accordance with paragraph 2-18 and table 2-3.

b. *Replacement.* Replace a damaged retainer line by fabricating as follows:

(1) Remove original retainer bag retaining line by cutting line at retaining line attaching loop on bag inside.

CAUTION

Do not cut or break the threads in the type IV coreless nylon cord casing while fabricating a bag retaining line.

(2) Cut a 37-inch length of type IV coreless nylon cord and taper-cut each end by 1/2-inch.

(3) Using a marking aid, mark one end of cord length at points 4-, 9, and 13 112-inches from one end, and 4-, 17-, and 21 112-inches from the other end (figure 2-57).

(4) Pass the cord end marked at 4-, 9, and 13 1/2-inches through retaining line attaching loop on bag inside and center loop between 4- and 9inch marks (figure 2-58).

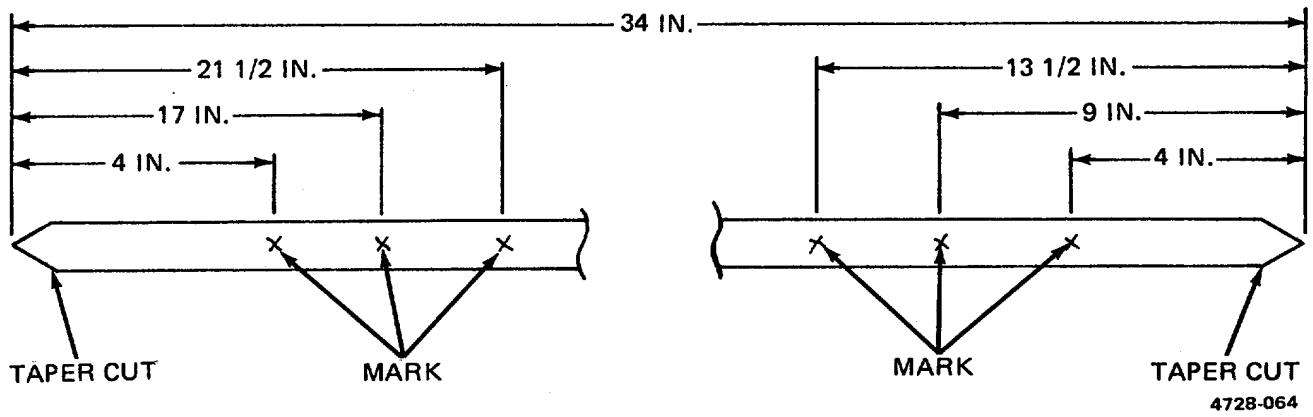


Figure 2-57. Replacement Retaining Line Fabrication Details.

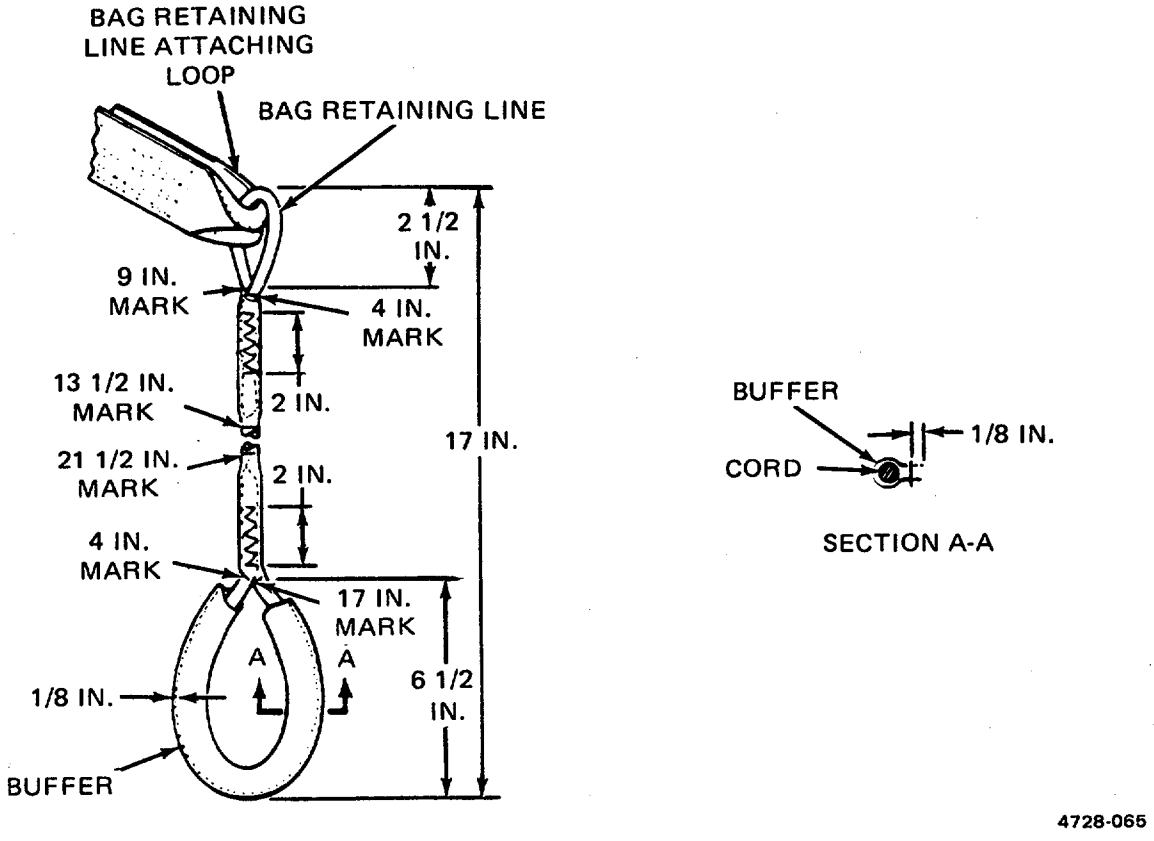


Figure 2-58. Deployment Bag Retaining Line Replacement Details.

2-36. Deployment Bag Retainer Tie (cont).

(5) Insert a splicing aid into cord casing at the 13 1/2-inch mark and work splicing aid through cord casing to outside at 9-inch mark.

(6) Attach tapered cord end nearest 4-inch mark to splicing aid and work aid back through cord casing until 4- and 9-inch marks are alined.

(7) Hold alined marks together and work splicing aid and tapered cord end to outside of 13 1/2-inch mark.

(8) Remove tapered cord end from splicing aid. While holding alined 4- and 9-inch marks together, stretch cord length allowing tapered cord end to recede inside cord casing.

(9) Secure formed line loop by stitching a 3116-inch-wide by 2-inch-long row of double-throw zig-zag stitching according to details in figure 2-58, using specifics in table 2-3.

(10) Cut a 12-inch length of 1 112-inch-wide, type I cotton tape and wax the ends in accordance with paragraph 2-18.

(11) Fold tape length in half lengthwise and aline edges. Using a light duty sewing machine and size FF nylon thread, secure alined edges by stitching a 12-inch-long row of stitching, 1/8-inch in from alined edges. Stitching will be 7 to 11 stitches per inch.

(12) Pass cord length free end through buffer made in (12) above and locate buffer between 4- and 17-inch marks.

(13) Insert a splicing aid into cord casing at 21 112-inch mark and work splicing aid through cord casing to outside at 17-inch mark.

(14) Attach cord tapered free end to splicing aid and work aid back through cord casing until 4- and 17-inch marks are alined.

(15) Hold alined marks together and work splicing aid with attached cord end to outside at 21 1/2-inch mark.

(16) Remove tapered cord end from splicing aid. While holding alined 4- and 17-inch marks together, stretch cord length to allow tapered cord end to recede into cord casing.

(17) Secure second line loop using procedure in (9) above and specifics in table 2-3.

2-37. Deployment Bag Pendulum Line.

This task covers: Replace

Tools:

Knife, Hot Metal, Item 2, Appendix B
Yardstick, Item 20, Appendix B
Splicing Aid (See Appendix E)

Equipment Condition:

Inspected, Paragraphs 2-9, 2-13
Cleaned, Paragraph 2-12
Laid out on work table

Materials/Parts:

Cord, Nylon, Type IV, Item 9, Appendix D
Marking Aid, Item 17118, Appendix D

Reference:

Group No. 02, MAC, Section II, Appendix B

Personnel Required:

43E(10) Parachute Rigger

Replace. A pendulum line which is damaged or does not conform to the length criteria prescribed in this paragraph will be replaced by fabricating as follows:

a. Remove original pendulum line by cutting loop formed in line at the deployment bag pendulum line attaching loop.

CAUTION

Do not cut or break the threads in the type IV coreless nylon cord casing while fabricating a pendulum line.

b. Cut an 85-nch length of type IV coreless nylon cord. Taper-cut 112-inch of one cord end and sear opposite cord end, in accordance with paragraph 2-19.

c. Using a marking aid, mark cord length at points 6 112- and 8-inches from cord tapered end (figure 2-59).

d. Insert splicing aid into cord casing at 8-inch mark and work aid through cord to outside at 6 112-inch mark.

e. Pass tapered cord end through deployment bag pendulum line attaching loop and attach tapered end to splicing aid.

f. Pull splicing aid back into cord casing at 6 112-inch mark and work aid back through cord casing to outside at 8-inch mark (figure 2-60).

g. Remove tapered cord end from splicing aid. Sear tapered end and make an overhand knot in cord running end at a point 1-inch back from seared tapered end. Stretch cord loop to draw knot against cord casing.

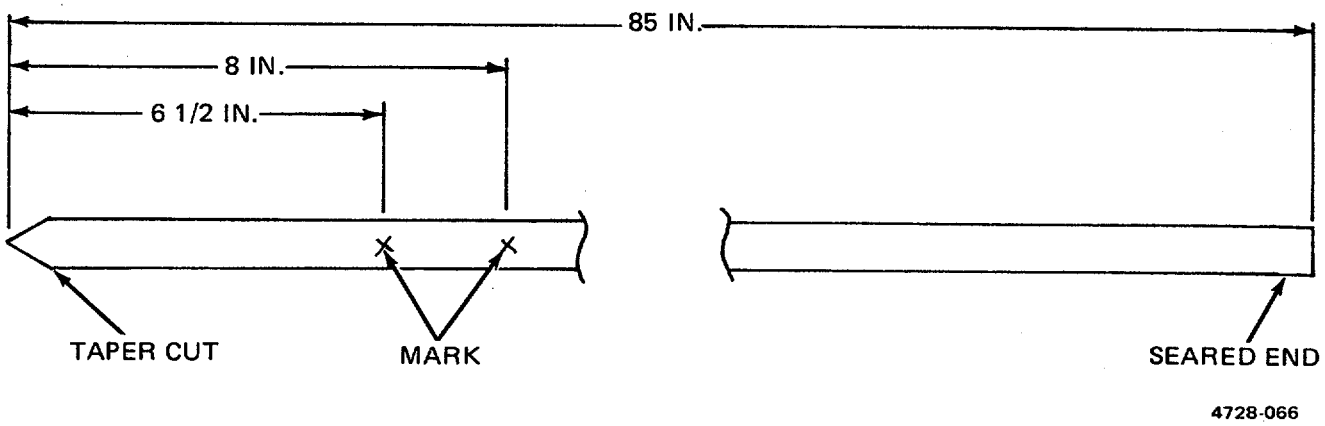


Figure 2-59. Replacement Pendulum Line Fabrication Details.

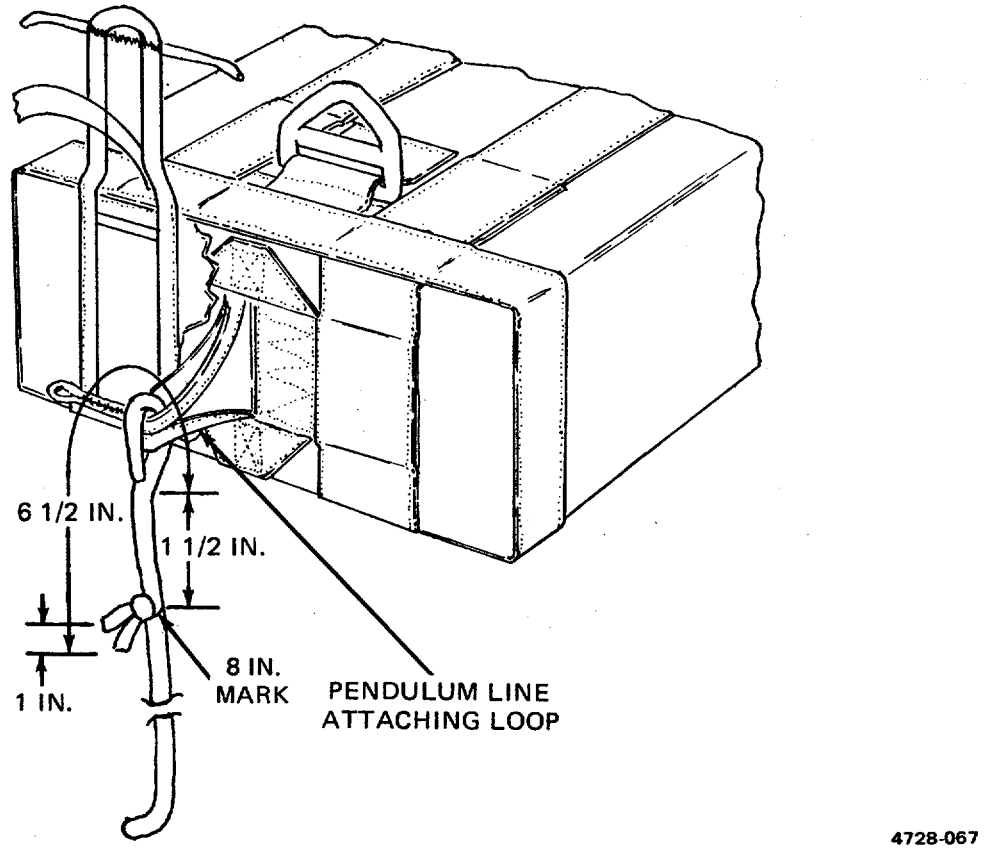


Figure 2-60. Pendulum Line Replacement Details.

2-38. Deployment Bag Closing Loop (Bottom).

This task covers: a. Repair b. Replace

Tools:

Sewing Machine, Heavy Duty, Item 14, Appendix B

Material/Parts:

Marking Aid, Item 17118, Appendix D
Thread, Size FF, Item 29/30, Appendix D
Webbing, Nylon, Type VIII, Item 40, Appendix D

Personnel Required:

43E(10) Parachute Rigger

Equipment Condition:

Inspected, Paragraphs 2-9, 2-13
Cleaned, Paragraph 2-12
Laid out on work table

Reference:

Group No. 02, MAC, Section II, Appendix B

NOTE

Only the bottom closing loops may be replaced.

a. *Repair.*

Stitching. Stitch and restitch with size FF thread which matches the color of the original stitching, when possible. Lock all straight stitching by backstitching at least 1/2-inch. Restitch by overstitching each end of the stitch formation by 112-inch. Restitch directly over the original stitching, following the original stitch pattern as closely as possible. Stitch according to paragraph 2-18 and table 2-3.

b. *Replacement.* Replace a damaged bag closing loop by fabricating as follows:

(1) Remove original closing loop by cutting loop webbing flush along edge of bag end reinforcement.

(2) Cut a 13-inch length of 1 23/32-inch-wide, type VIII nylon webbing, sear ends according to paragraph 2-18.

(3) Mark webbing length at a point 4 114-inches from each end (figure 2-61a).

(4) Between two marks made in (3) above, roll webbing edges in to center of webbing width and secure each rolled edge by stitching a 4-inch-long row of stitching according to the details in figure 2-61b. Stitching will be 7 to 11 stitches per inch, using a heavy-duty sewing machine with size FF nylon thread.

(5) Double webbing length with rolled edges facing out and aline webbing ends.

2-38. Deployment Bag Closing Loop (Bottom).

(6) Position formed loop in original closing loop location with alined webbing end placed over applicable main strap and bag end reinforcement. Secure webbing ends bag end reinforcement and main strap by stitching a 4 1/4-inch-long single-X-box-stitch formation, with two double ends, according to the details in figure 2-61b. Stitching will be 7 to 11 stitches per inch, using a heavy-duty sewing machine with size FF nylon thread.

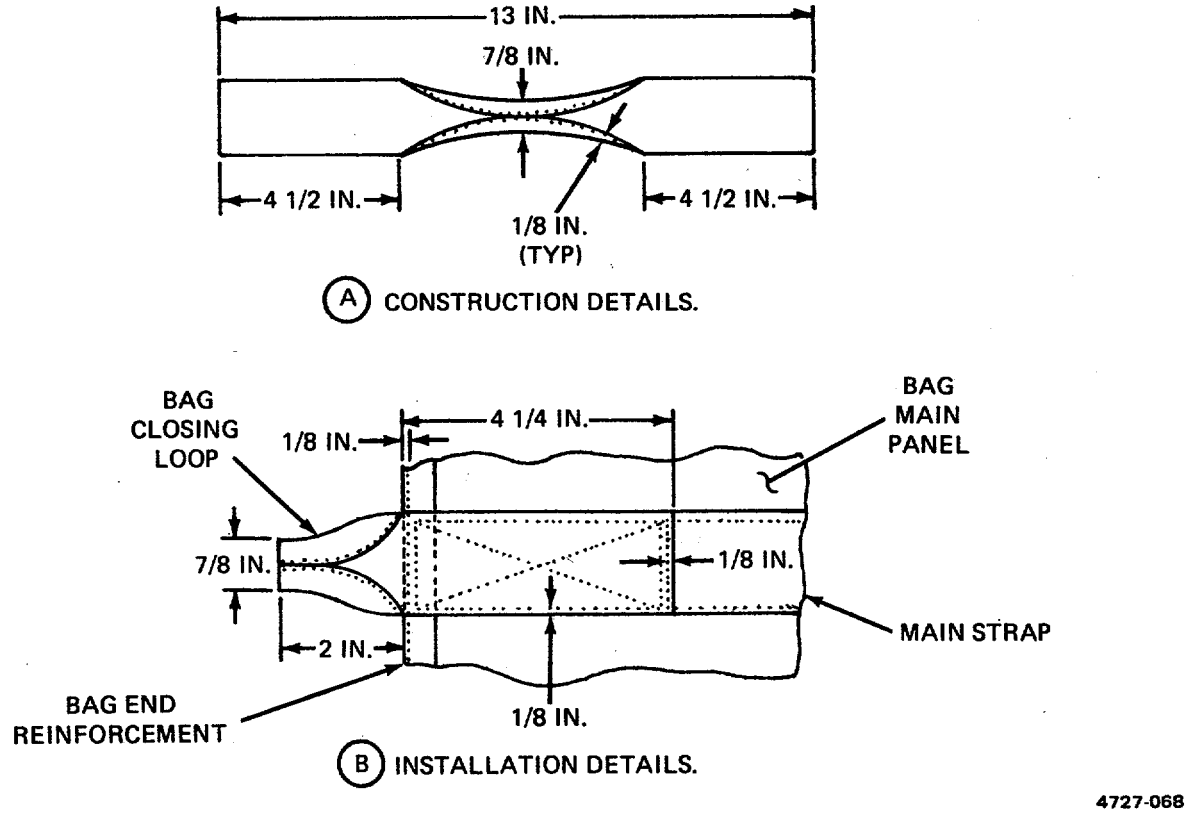


Figure 2-61. Closing Loop Replacement Details.

2-39. Deployment Bag Inspection Data Pocket.

This task covers: a. Repair b. Replace

Tools:

Knife, Item 1, Appendix B
Sewing Machine, Medium Duty, Item 15, Appendix B
Sewing Machine, Zig-Zag, Item 13, Appendix B

Equipment Condition:

Inspected, Paragraphs 2-9, 2-13
Cleaned, Paragraph 2-12
Laid out on work table

Materials/Parts:

Thread, Nylon, Size E, Items 27128, Appendix D

Reference:

Group No. 02, MAC, Section II, Appendix B

Personnel Required:

43E(10) Parachute Rigger

a. <u>*Repair*</u>. Repair an inspection data pocket as follows:

Stitch and restitch with size E nylon thread which matches the color of original stitching, when possible. Lock all straight stitching by backstitching at least 112-inch. Restitch directly over the original stitching, following original stitch pattern as closely as possible.

b. <u>*Replacement*</u>. Replace a missing or unserviceable parachute inspection data pocket (log record pocket) as follows (figure 2-62):

(1) Position parachute inspection data pocket on bottom of deployment bag with pocket bottom edge squared with end slot reinforcement.

(2) Secure pocket along the two sides and the bottom with a medium-duty sewing machine. Stitching will be 7 to 11 stitches per inch using size E nylon thread.

2-39. Deployment Bag Inspection Data Pocket (cont).

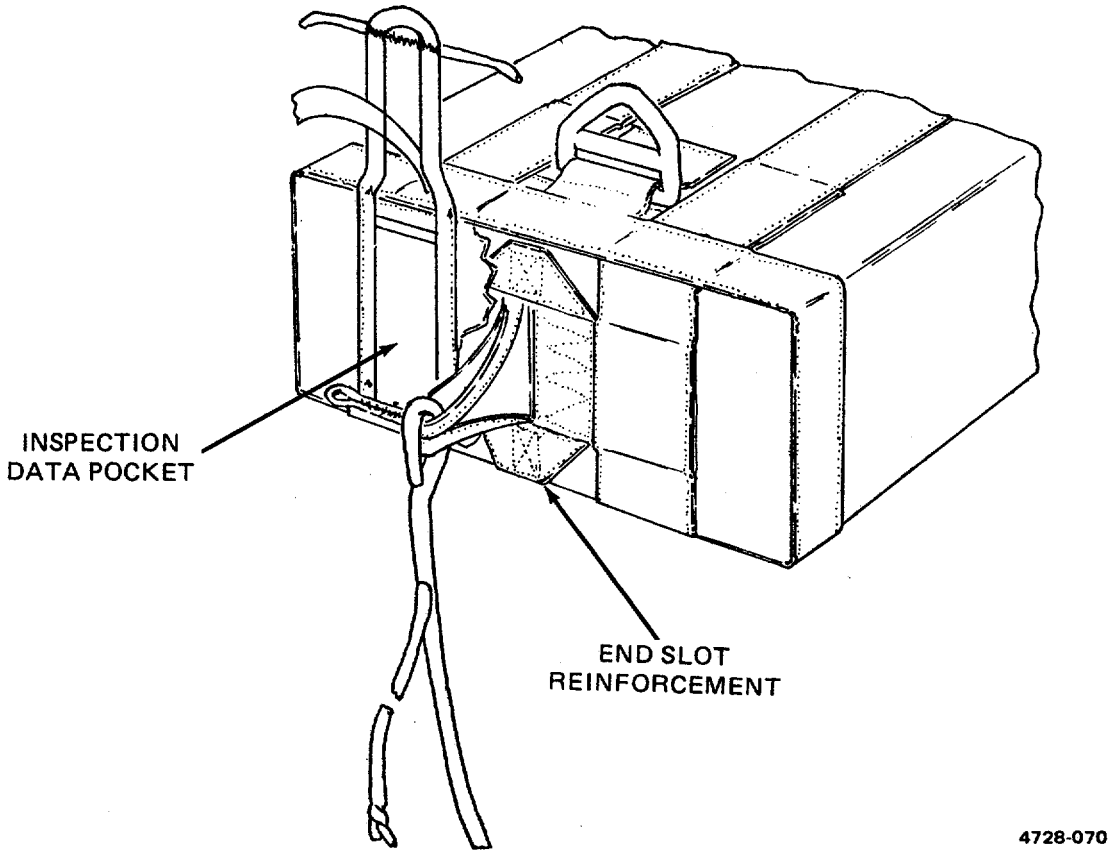


Figure 2-62. Attaching Parachute Inspection Data Pocket.

2-40. Deployment Bag Retainer Band Keeper Reinforcement.

This task covers: a. Repair b. Replace

Tools:

Knife, Item 1, Appendix B
Knife, Hot Metal, Item 2, Appendix B
Shears, Item 10, Appendix B
Sewing Machine, Medium Duty, Item 15, Appendix B
Yardstick, Item 20, Appendix B

Material/Parts:

Marking Aid, Item 17118, Appendix D
Thread, Size FF, Item 29/30, Appendix D
Webbing, Nylon, Type VIII, Item 40, Appendix D

Personnel Required:

43E(10) Parachute Rigger

Equipment Condition:

Inspected, Paragraphs 2-9, 2-13
Cleaned, Paragraph 2-12
Laid out on work table

Reference:

Group No. 02, MAC, Section II, Appendix B

a. *Repair.*

Stitching. Stitch and restitch with size FF thread which matches the color of the original stitching, when possible. Lock all straight stitching by backstitching at least 112-inch. Restitch by overstitching each end of the stitch formation by 112-inch. Restitch directly over the original stitching, following the original stitch pattern as closely as possible. Stitch according to paragraph 2-18 and table 2-3.

b. *Replacement.* Replace a damaged retainer band keeper reinforcement by fabricating as follows (figure 2-63):

(1) Remove portion of retainer band keeper which is secured to inside of suspension line stowage flap by cutting applicable stitching.

(2) Turn flap to locate flap outside facing up and cut stitching securing edge binding tape over end of applicable damaged reinforcement. Cut stitching to a point 2 inches beyond each edge of reinforcement.

(3) Cut an 8-inch length of 1 23/32-inch-wide, type VIII nylon webbing and sear ends in accordance with paragraph 2-19.

(4) Position webbing length over damaged reinforcement on outside suspension line stowage flap, insure one webbing end is alined with original reinforcement end at outer edge of suspension line stowage panel.

2-40. Deployment Bag Retainer Band Keeper Reinforcement.

(5) Fold loose edge binding back and secure webbing length over original reinforcement by stitching a box-stitch formation, 118-inch in from each edge, full length of webbing, using a medium-duty sewing machine. Stitching will be 7 to 11 stitches per inch, with size FF nylon thread.

(6) Reposition flap edge binding in original location, restitch binding according to paragraph 2-18, using the specifics in table 2-3. Lock stitching ends by 3/4-inch.

(7) Turn flap to locate flap inside facing up and reposition retainer band keeper in original location. Secure keeper by restitching according to original construction details and using the specifics in table 2-3.

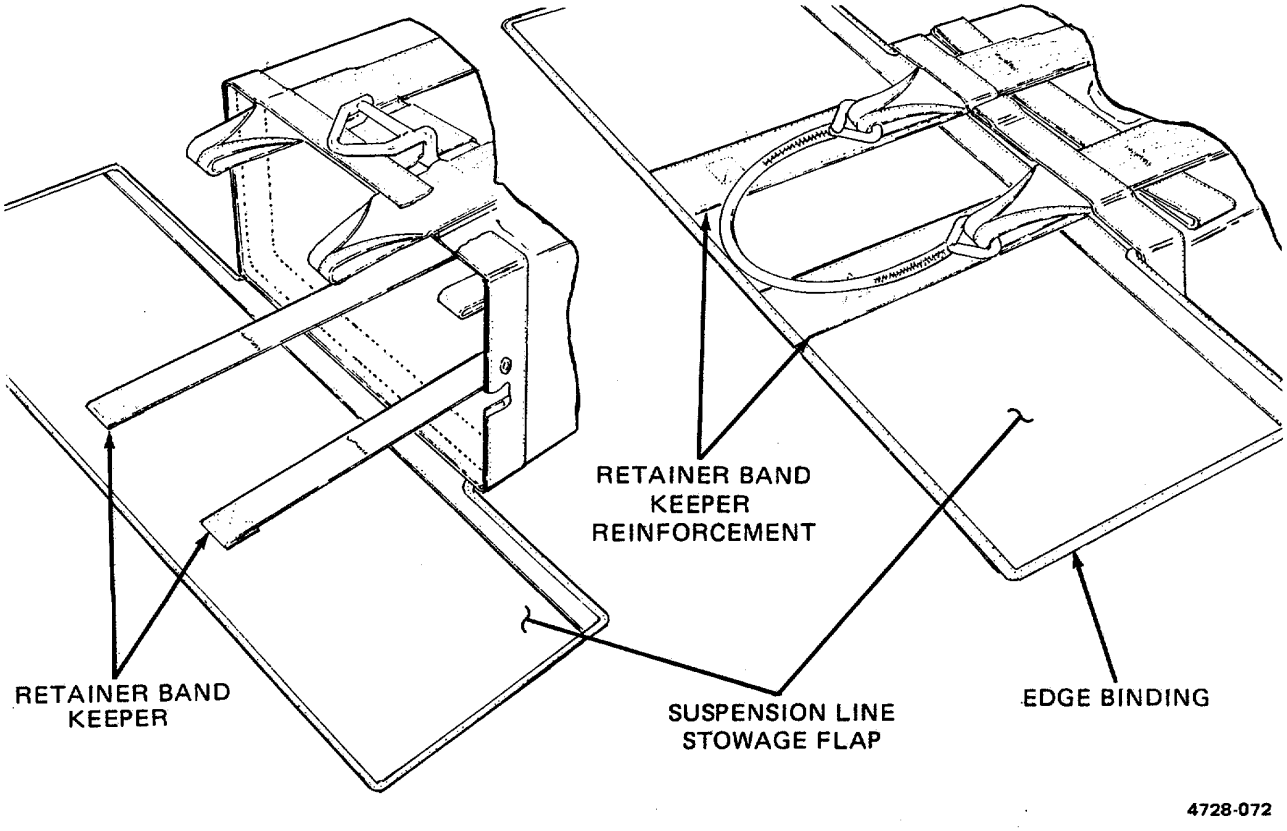


Figure 2-63. Retainer Band Keeper Reinforcement Replacement Details.

2-41. Deployment Bag Tie Loop and Tie Loop Reinforcement.

This task covers: a. Repair b. Replace

Tools:

Knife, Item 1, Appendix B
Knife, Hot Metal, Item 2, Appendix B
Sewing Machine, Medium Duty, Item 15, Appendix B
Yardstick, Item 20, Appendix B

Material/Parts:

Marking Aid, Item 17118, Appendix D
Thread, Size FF, Item 29130, Appendix D
Webbing, Nylon, Type IV, 1-inch, Item 39, Appendix D
Webbing, Nylon, Type IV, 1 112-inch, Item 41, Appendix D

Personnel Required:

43E(10) Parachute Rigger

Equipment Condition:

Inspected, Paragraphs 2-9, 2-13
Cleaned, Paragraph 2-12
Laid out on work table

Reference:

Group No. 02, MAC, Section II, Appendix B

a. *Repair.*

Stitching. Stitch and restitch with size FF thread which matches the color of the original stitching, when possible. Lock all straight stitching by backstitching at least 112-inch. Restitch by overstitching each end of the stitch formation by 112-inch. Restitch directly over the original stitching, following the original stitch pattern as closely as possible. Stitch according to paragraph 2-18 and table 2-3.

b. *Replacement.* When either a tie loop on bag inside or a tie loop reinforcement on bag outside is damaged, the replacement action will include both items. Replace a tie loop and tie loop reinforcement by fabricating as follows (figure 2-64):

(1) Remove applicable original tie loop and tie loop reinforcement by cutting stitching that secures both items to deployment bag.

(2) Cut a 8-inch length of 1-inch-wide, type IV nylon webbing and a 3-inch length of 1 112- inch-wide, type IV nylon webbing. Sear ends of both webbing lengths according to paragraph 2-19.

(3) Make a 1/2-inch-long turnunder on each end of 3-inch webbing length and position folded webbing in original tie loop reinforcement location on deployment bag outside with turnunder ends facing down. Secure replacement reinforcement to deployment bag outside by making a single row of stitching, 118-inch along each outside edge (A, figure 2-64) using a medium-duty sewing machine. Stitching will be 7 to 11 stitches per inch, using size FF nylon thread.

2-41. Deployment Bag Tie Loop and Tie Loop Reinforcement (cont).

(4) Double 8inch webbing length, aline ends, and position folded webbing in original tie loop location on inside of deployment bag. Secure replacement tie loop to deployment bag and tie loop reinforcement by stitching a 3/4-inch-wide by 1-inch-long single-X-box-stitch formation with one double end (B, figure 2-64) using a medium-duty sewing machine. Stitching will be 7 to 11 stitches per inch, using size FF nylon thread.

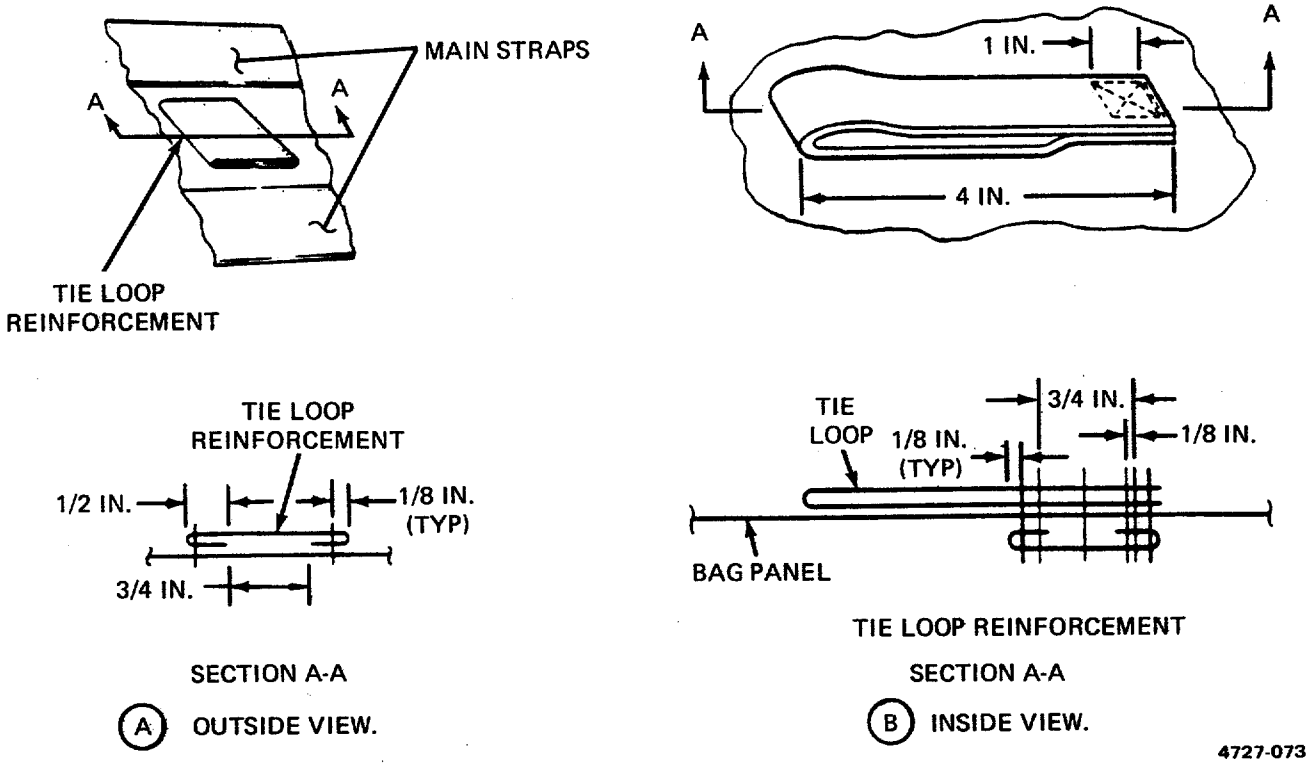


Figure 2-64. Tie Loop and Tie Loop Reinforcement Replacement Details.

2-42. Deployment Bag Safety Cord.

This task covers: a. Repair b. Replace

Tools:

Knife, Item 1, Appendix B
Shears, Item 10, Appendix B
Sewing Machine, Zig-Zag, Item 13, Appendix B
Splicing Aid (See Appendix E)
Yardstick, Item 20, Appendix B

Materials/Parts:

Cord, Nylon, Type IV, Item 9, Appendix D
Marking Aid, Item 17118, Appendix D
Thread, Size FF, Item 29130, Appendix D

Personnel Required:

43E(10) Parachute Rigger

Equipment Condition:

Inspected, Paragraphs 2-9, 2-13
Cleaned, Paragraph 2-12
Laid out on work table

Reference:

Group No. 02, MAC, Section II, Appendix B

a. *Repair.*

Stitching. Stitch and restitch with size FF thread which matches the color of the original stitching, when possible. Lock all straight stitching by backstitching at least 1/2-inch. Restitch by overstitching each end of the stitch formation by 112-inch. Restitch directly over the original stitching, following the original stitch pattern as closely as possible. Stitch according to paragraph 2-18 and table 2-3.

b. *Replacement.* Replace a damaged safety cord by fabricating as follows:

(1) Remove original safety cord from bottom bag closing loops by cutting cord end loops.

(2) Cut a 21-inch length of type IV coreless nylon cord and taper-cut each end by 1/2-inch.

(3) Using marking aid, mark the cord length at points 3-, 5-, and 8-inches from tapered ends (figure 2-65).

(4) Insert a suitable splicing aid into cord casing at 8inch mark and work aid through cord to outside at 5-inch mark.

(5) Pass 3-inches of marked cord end through one bottom bag closing loop and attach tapered end to splicing aid.

(6) Pull splicing aid with attached cord end back into cord casing at 5-inch mark and work aid back through cord casing until 3- and 5-inch marks are alined.

(7) Hold alined marks together and work splicing aid and tapered cord end to outside at 8-inch mark.

2-42. Deployment Bag Safety Cord (cont).

(8) Remove tapered cord end from splicing aid and while holding alined 3- and 5-inch marks together, stretch cord length to allow tapered cord end to recede inside cord casing.

(9) Secure formed safety cord end loop by stitching a 3116-inch-wide by 3-inch-long row of double-throw zigzag stitching 7 to 11 stitches per inch using size E nylon thread (figure 2-66).

(10) Mark and attach cord running end to opposite bottom bag closing loop using procedures In (3) through (9) above.

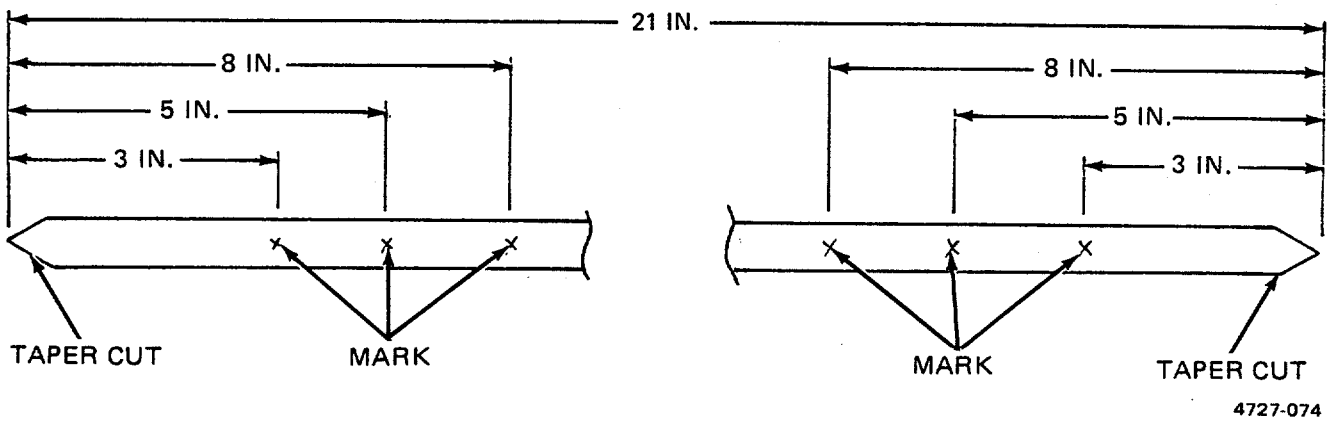


Figure 2-65. Safety Cord Fabrication Details.

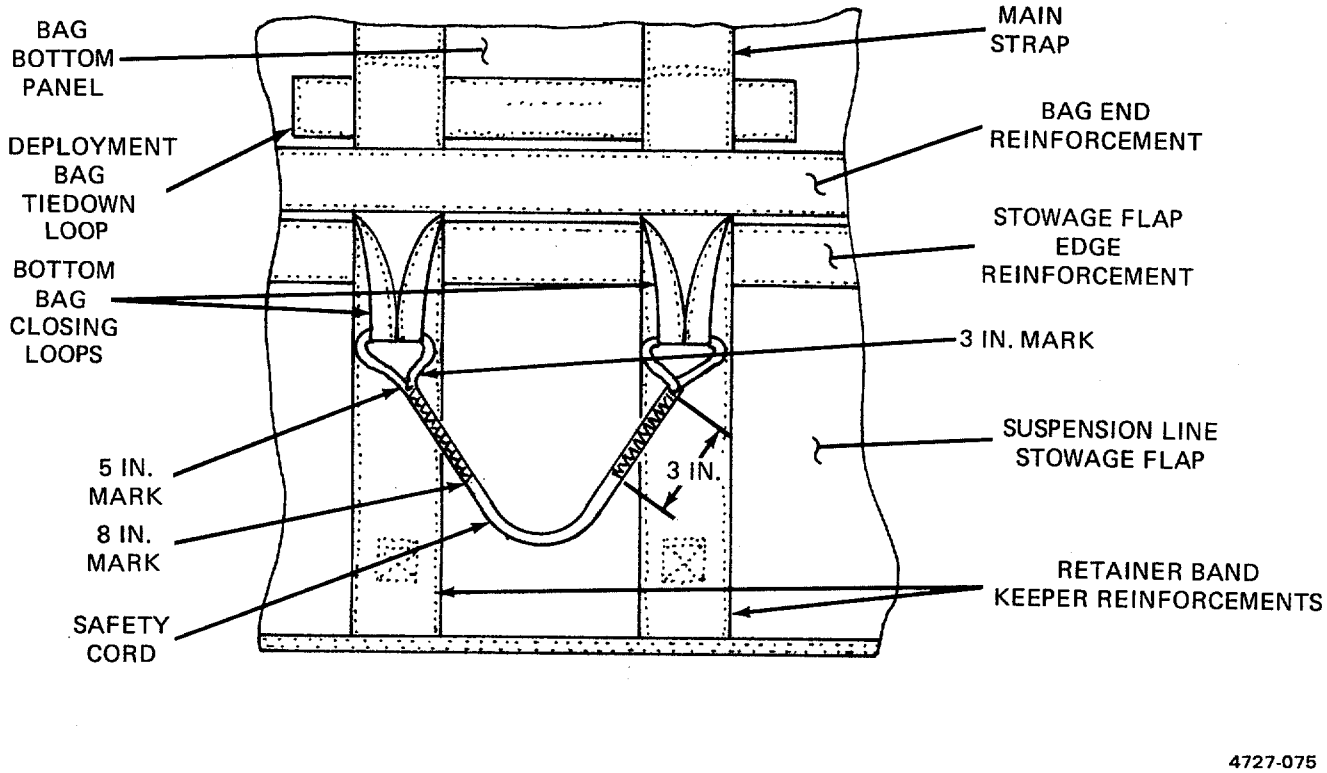


Figure 2-66. Safety Cord Replacement.

2.43. Deployment Bag Stowage Flap Edge Binding.

This task covers: Repair

Tools:

Knife, Item 1, Appendix B
Shears, Item 10, Appendix B
Sewing Machine, Medium Duty, Item 15, Appendix B
Yardstick, Item 20, Appendix B

Material/Parts:

Marking Aid, Item 17/18, Appendix D
Tape, Nylon, Type III, Item 23, Appendix D
Thread, Size FF, Item 29130, Appendix D

Personnel Required:

43E(10) Parachute Rigger

Equipment Condition:

Inspected, Paragraphs 2-9, 2-13
Cleaned, Paragraph 2-12
Laid out on work table

Reference:

Group No. 02, MAC, Section II, Appendix D

Repair.

a. *Stitching.* Stitch and restitch with size FF thread which matches the color of the original stitching, when possible. Lock all straight stitching by backstitching at least 1/2-inch. Restitch by overstitching each end of the stitch formation by 112-inch. Restitch directly over the original stitching, following the original stitch pattern as closely as possible. Stitch according to paragraph 2-18 and table 2-3.

b. *Splicing.* Splice an edge binding an unlimited number of times as follows (figure 2-67):

(1) Cut a length of 3/4-inch-wide nylon tape 2-inches longer than damaged area.

(2) Make a 1/2-inch foldunder on each end of tape length.

(3) Center and fold tape lengthwise over edge of the damaged area. Secure splice by stitching a boxstitch formation, 1l16-inch in from each edge, along full length of splice material, using a medium-duty sewing machine. Stitching will be 7 to 11 stitches per inch, using size FF nylon thread.

2-43. Deployment Bag Stowage Flap Edge Binding (cont).

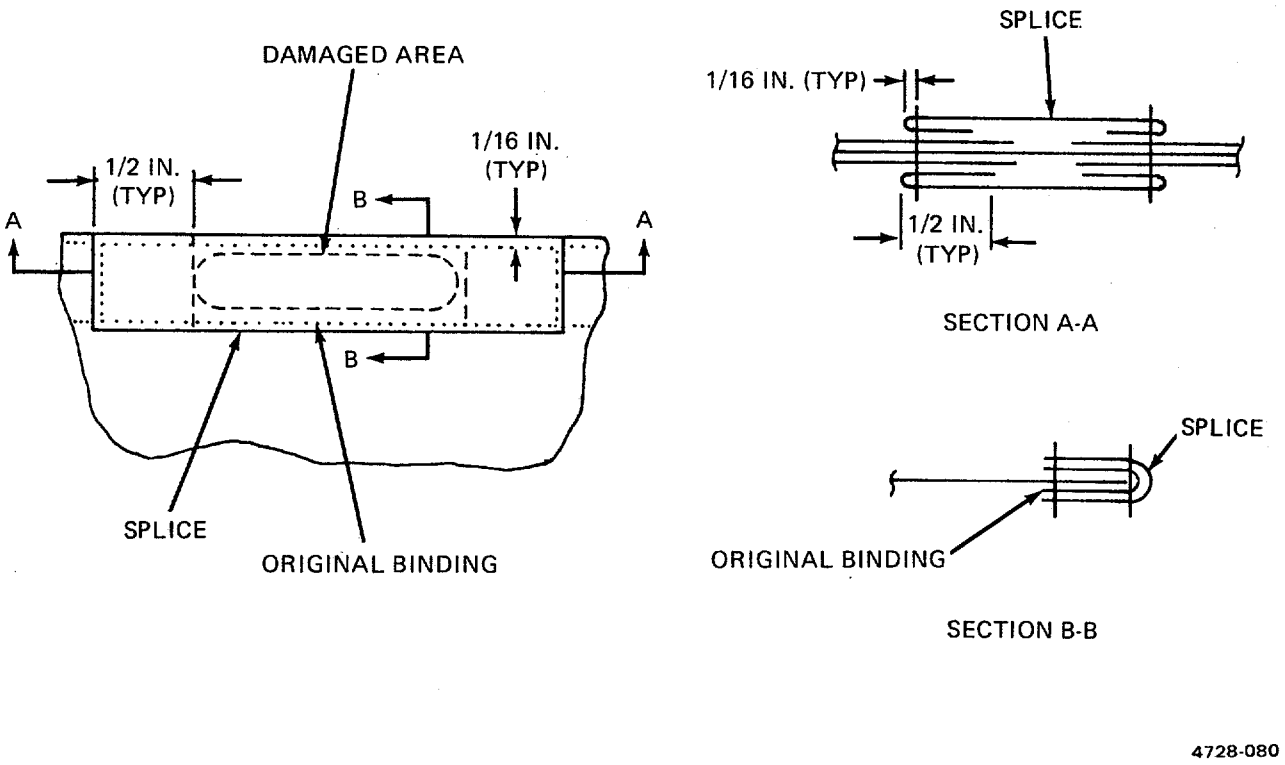


Figure 2-67. Edge Binding Splicing Details.

244. Deployment Bag Panels and Flaps.

This task covers: a. Repair b. Replace

Tools:

Push Pins
Sewing Machine, Light Duty, Item 12, Appendix B
Sewing Machine,, Darning, Item 16, Appendix B
Shears, Item 10, Appendix B

Materials/Parts:

Cloth, Nylon, Duck, Item 6, Appendix D
Marking Aid, Item 17118, Appendix D
Thread, Nylon, Size E, Item 27128, Appendix D

Personnel Required:

43E(10) Parachute Rigger

Equipment Condition:

Inspected, Paragraphs 2-9, 2-13
Cleaned, Paragraph 2-13
Laid out on work table

Reference:

Group No. 02, MAC, Section II, Appendix B

a. Repair.

(1) *Stitching.* Stitch and restitch with thread which matches the color of the original stitching, when possible. Lock all straight stitching by backstitching at least 1/2-inch. Restitch by overstitching each end of the stitch formation by 112-inch. Restitch directly over the original stitching, following the original stitch pattern as closely as possible, in accordance with paragraph 2-18b.

(2) *Darning.* Darn a hole or tear which does not exceed 3/4-inch in length or diameter according to procedures in paragraph 2-18c, using a darning sewing machine with size E nylon thread. There is no limit to the number of darns which may be made on the bag panels and flaps.

(3) *Patching.* Patch a hole or tear which exceeds 3/4-inch in length or diameter using 7.25 ounce nylon duck cloth and specifics in table 2-3. There is no limit to the number of patches which may be made on the bag panels and flaps as follows:

NOTE

Patches may be applied to the inside or outside of Deployment Bag.

The damaged area must be accessible and there must be at least 1 1/4-nches of undamaged material remaining on all sides of the affected area.

(a) Smooth fabric around the damaged area, and secure with pushpins. Do not pin damaged area.

(b) Using a marking aid of contrasting color, mark a square or rectangle around the area to be patched and insure one side of marked square or rectangle is parallel to warp or filling of fabric.

2-44. Deployment Bag Panels and Flaps (cont).

(c) Cut damaged area fabric along lines made in (b) above. Further cut fabric diagonally at each corner to allow a 1/2-inch foldback in raw edges.

(d) Make a 112-inch foldback on each raw edge. Pin and baste each foldback to complete prepared hole. Basting will be performed using procedures in paragraph 2-18a.

(e) Using nylon cloth, mark and cut a patch 2 1/2-inches wider and longer than inside measurements of the prepared hole. Insure that patch material is marked and cut along the warp or filling of fabric.

(f) Center patch material over prepared hole. Pin patch material in position.

(g) Make a 1/2-inch foldunder on each edge of patch material and baste patch to prepared area. Basting will be performed using procedures in paragraph 2-18a.

(h) Remove pushpins securing the item to repair table and secure the patch by stitching. Use a medium-duty sewing machine and stitch 7 to 11 stitches per inch using size FF nylon thread (figure 2-68). Make first row of stitching completely around patch. Turn deployment bag inside out and make a second row of stitching around prepared hole.

(4) *Restenciling.* As required, restencil identification markings using procedures in paragraph 2-20.

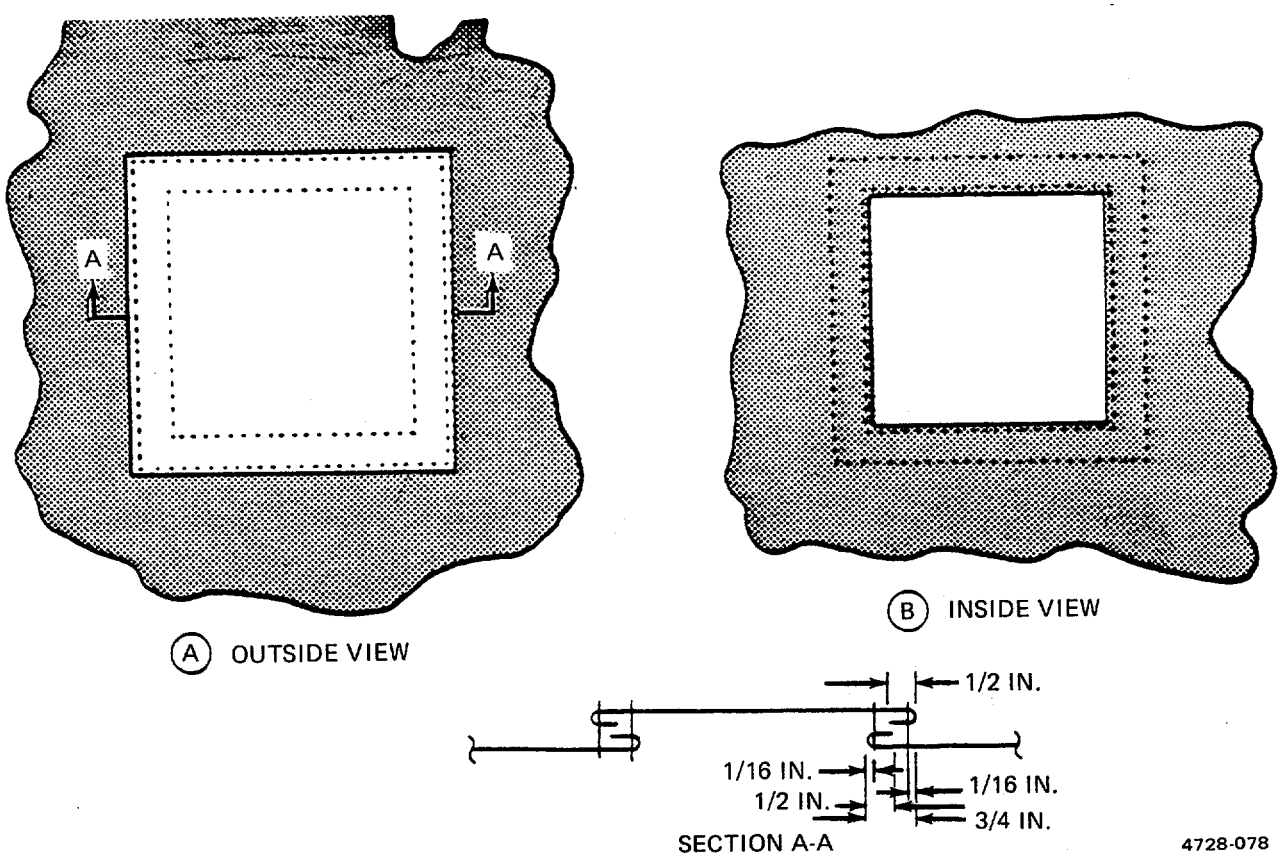


Figure 2-68. Patching Deployment Bag Panels and Flaps.

2-45. Deployment Bag Stowage Flap Edge Reinforcement.

This task covers: Repair

Tools:

Knife, Item 1, Appendix B
Knife, Hot Metal, Item 2, Appendix B
Shears, Item 10, Appendix B
Sewing Machine, Medium Duty, Item 15, Appendix B
Yardstick, Item 20, Appendix B

Material/Parts:

Marking Aid, Item 17/18, Appendix D
Thread, Size FF, Item 29130, Appendix D
Webbing, Nylon, Type IV, Item 39, Appendix D

Personnel Required:

43E(10) Parachute Rigger

Equipment Condition:

Inspected, Paragraphs 2-9, 2-13
Cleaned, Paragraph 2-12
Laid out on work table

Reference:

Group No. 02, MAC, Section II, Appendix B

Repair.

a. *Stitching.* Stitch and restitch with size FF thread which matches the color of the original stitching, when possible. Lock all straight stitching by backstitching at least 112-inch. Restitch by overstitching each end of the stitch formation by 112-inch. Restitch directly over the original stitching, following the original stitch pattern as closely as possible. Stitch according to paragraph 2-18 and table 2-3.

b. *Splicing.* A stowage flap edge reinforcement may be spliced an unlimited number of times as follows (figure 269):

(1) Cut a length of 1-inch-wide, type IV nylon webbing long enough to extend 2-inches beyond each side of damaged area and sear ends according to paragraph 2-19.

(2) Center webbing length lengthwise over damaged area including edge binding, and secure the splice by stitching a box-stitch formation, 1/8-inch in from each edge, along full length of splice material using a medium-duty sewing machine. Stitching will be 7 to 11 stitches per inch using size FF nylon thread.

2-45. Deployment Bag Stowage Flap Edge Reinforcement (cont).

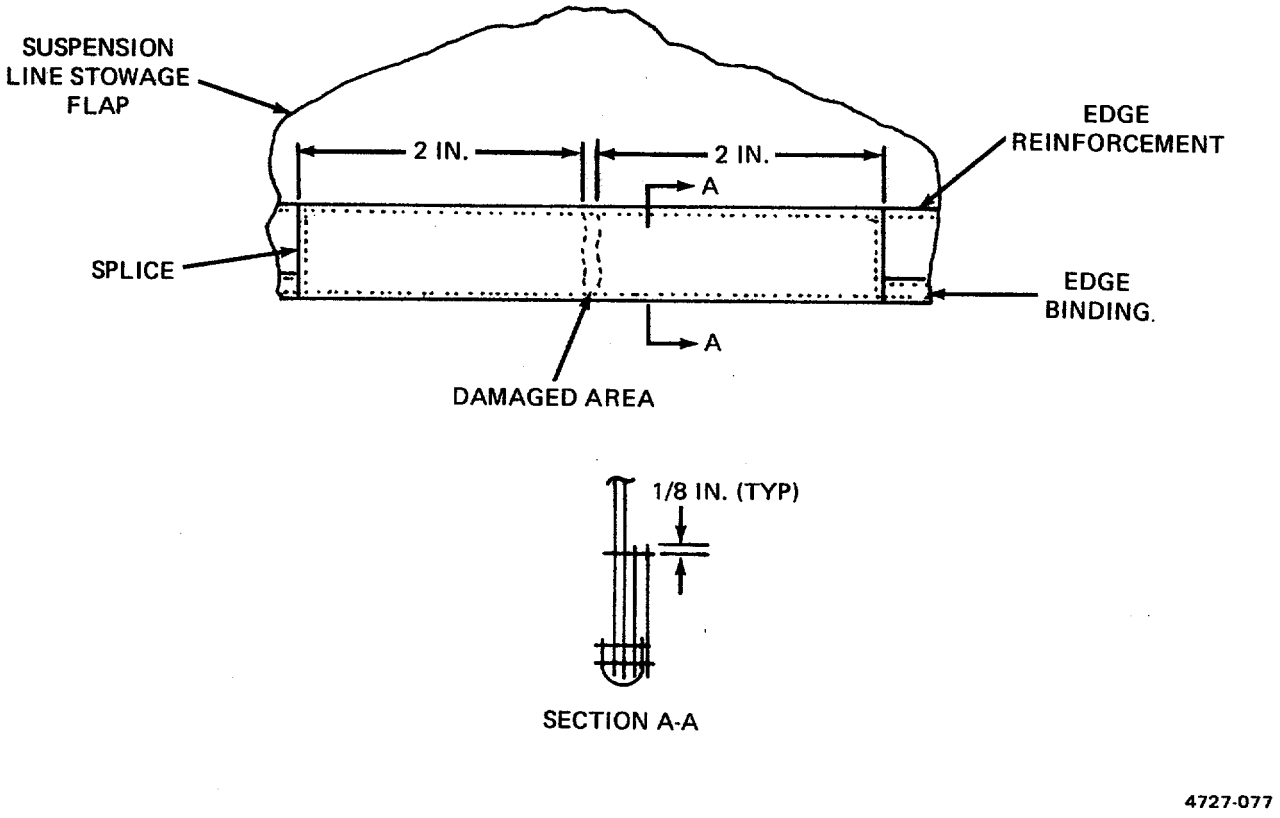


Figure 2-69. Stowage Flap Edge Reinforcement Splicing Details.

2-46. 36-Inch-Long Adapter Web.

This task covers: a. Inspect b. Service c. Repair d. Replace

Personnel Required:

43E(10) Parachute Rigger

Equipment Condition:

Inspected, Paragraphs **2-9,** 2-13
Cleaned, Paragraph 2-12
Laid out on work table

Reference:

Group No. 04, MAC, Section II, Appendix B

NOTE

When a 60-foot 2-ply type X extraction line is damaged beyond repair or a type XXVI extraction line is required, the type XXVI, 36-inch adapter web will be installed on the 15-foot extraction parachute. The complete parachute assembly will then consist of a deployment bag, the canopy, and the adapter web. At this time the assembly will be reidentified to NSN 1670-01-063-3715 with a part number of 11-1-2583. The type X, 60-foot extraction line will then no longer be a component of the 15-foot extraction parachute. The NSN for the type XXVI, 36-inch adapter web is 1670-00-048-8215.

a. *Inspection.* Inspect adapter web in accordance with paragraphs 2-9 and 2-13.

b. *Service.* Service adapter web by cleaning in accordance with paragraph 2-12.

CAUTION

When performing a repair on the 36-inch-long adapter web which requires the cutting of stitching or tacking, insure that adjacent webbing material is not damaged during the cutting process.

c. *Repair.* Refer to individual component procedures for repair of adapter web.

d. *Replace.* Replace an unserviceable/unrepairable adapter web with a serviceable one from stock.

2-47. 36-Inch-Long Adapter Web Long Buffer.

This task covers: a. Repair b. Replace

Tools:

Needle, Tacking, Item 6, Appendix B
Pot, Melting, Electric, Item 9, Appendix B
Sewing Machine, Light Duty, Item 12, Appendix B
Yardstick, Item 20, Appendix B

Thread, Waxed, Cotton, Size 8/7, Item 26, Appendix D
Thread, Nylon, Size E, Item 27/28, Appendix D
Webbing, Cotton, Type X, Item 36, Appendix D

Personnel Required:

43E(10) Parachute Rigger

Equipment Condition:

Inspected, Paragraphs 2-9, 2-13
Cleaned, Paragraph 2-12
Laid out on work table

Reference:

Group No. 04, MAC, Section II, Appendix B

a. *Repair.* Replace broken or loose tacking securing the long buffer in the 5-inch-long single attaching loop by retacking according to original tacking details using one turn double, ticket No. 8/7 waxed cotton thread at each tacking point. Secure the tacking with a square knot and locking knot. Trim ends to 112 inch.

b. *Replacement.* Replace a damaged or missing long buffer in 5-inch-long single attaching loop by fabricating as follows (figure 2-70):

(1) As required, remove original long buffer by cutting tacking securing buffer within loop.

(2) Cut a 7 314-inch length of 1 3/4-inch-wide, type X cotton webbing and wax ends.

(3) Double webbing length and align ends. Secure aligned ends by stitching two rows of stitching across webbing width according to details in figure 2-70, using a light duty sewing machine. Stitching will be 7 to 11 stitches per inch using size E nylon thread.

(4) Position formed buffer in original long buffer location and secure buffer to attaching loop webbing by hand tacking at three points using one turn double, size 8/7 waxed cotton thread at each point. Secure tacking ends at each tacking point with a square knot and locking knot and trim ends to 112-inch.

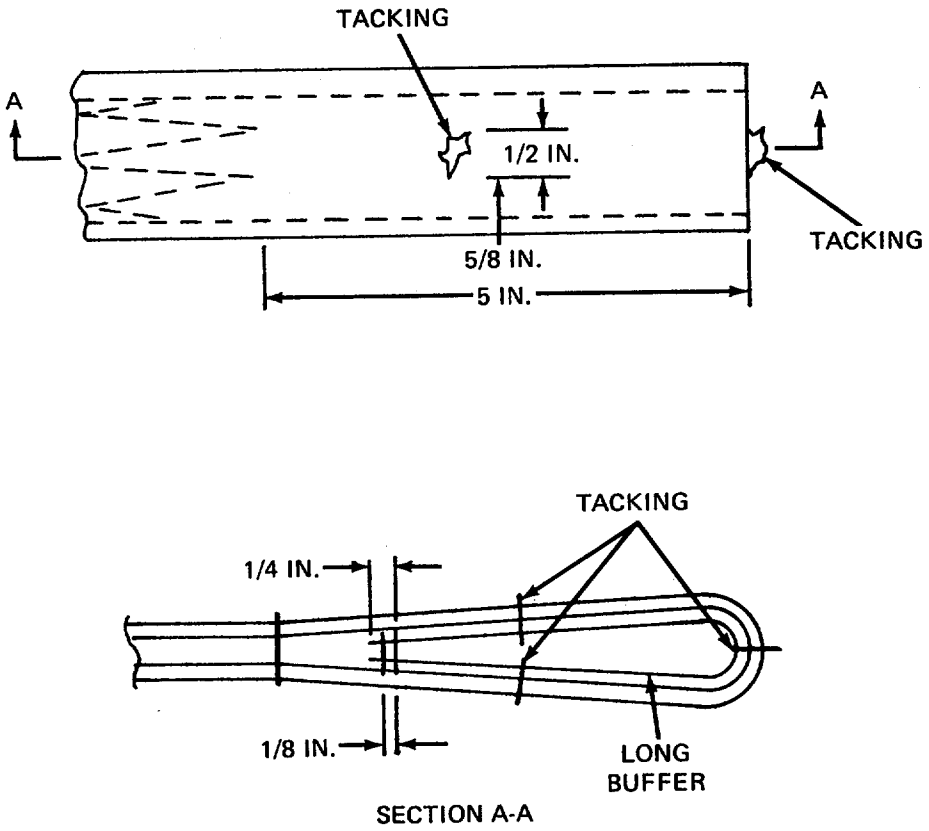


Figure 2-70. Long Buffer Replacement Detail.

2-48. 36-Inch-Long Adapter Web Short Buffer.

This task covers: a. Repair b. Replace

Tools:

Knife, Item 1, Appendix B
Needle, Tacking, Item 6, Appendix B
Pot, Melting, Electric, Item 9, Appendix B
Sewing Machine, Light Duty, Item 12, Appendix B
Yardstick, Item 20, Appendix B

Materials/Parts:

Marking Aid, Item 17/18, Appendix D
Thread, Waxed, Cotton, Size 8/7, Item 26, Appendix D
Thread, Nylon, Size E, Item 27/28, Appendix D
Webbing, Cotton, Type VIII, Item 35, Appendix D

Personnel Required:

43E(10) Parachute Rigger

Equipment Condition:

Inspected, Paragraphs 2-9, 2-13
Cleaned, Paragraph 2-12
Laid out on work table

Reference:

Group No. 04, MAC, Section II, Appendix B

a. <u>*Repair*</u>. Replace broken or loose tacking securing the short buffer in the 5-inch-long single attaching loop by retacking according to original tacking details using one turn double, size 8/7 waxed cotton thread at each tacking point. Secure the tacking with a square knot and locking knot, trim ends to 112-inch.

b. <u>*Replacement*</u>. Replace a damaged or missing short buffer in a 2-inch-long single attaching loop by fabricating as follows (figure 2-71):

(1) If applicable, remove original short buffer by cutting the tacking securing buffer within loop.

(2) Cut a 3 1/4-Inch length of 1 3/4-inch wide, type VIII cotton webbing and wax ends in accordance with paragraph 2-19.

(3) Double webbing length and align ends. Secure aligned ends by stitching two rows of stitching across webbing width according to details in figure 2-71, using a light-duty sewing machine. Stitching will be 7 to 11 stitches per inch, using size E nylon thread.

(4) Position formed buffer in original short buffer location and secure buffer to attaching loop by hand tacking at one point (figure 2-83) using one turn double, size 8/7 waxed cotton thread. Secure tacking ends with a square knot and locking knot and trim ends to 1/2-inch.

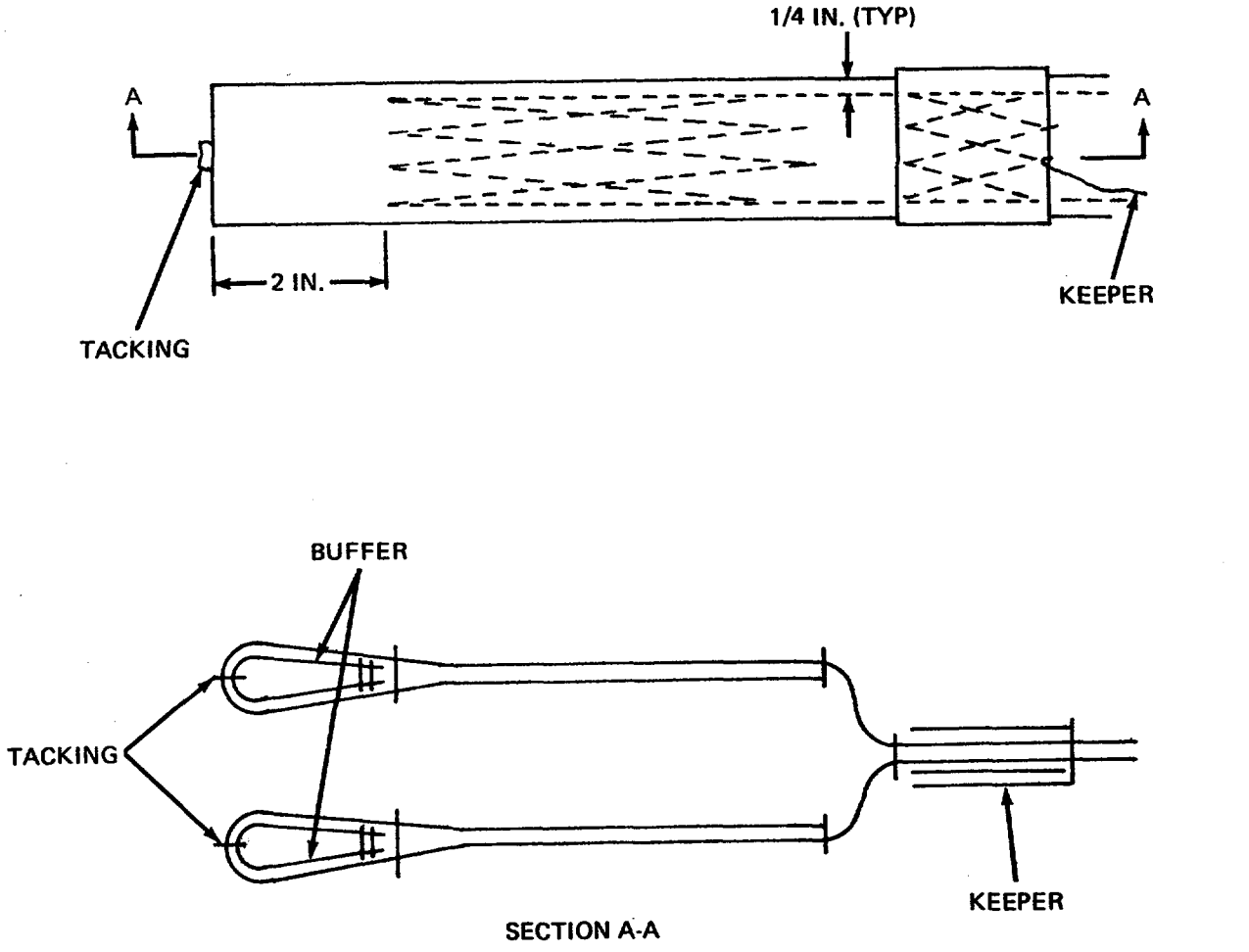


Figure 2-71. Short Buffer Replacement.

2-49. Extraction. Line (60-Foot-Long).

This-task covers: a. Inspect b.. Service c. Replace

Personnel Required:

43E(10) Parachute Rigger

Equipment Condition:

Cleaned, Paragraphs2-1 2
Laid:. out on- work table

Reference:

Group No.. 04, MAC, Section II1, Appendix B

a. *Inspect.* Inspect a 60-foot-long extraction line according to paragraph 2-9 and 2-13.

b.. *Service.* Clean a 60-foot-long extraction line according to paragraph 2-12.

c. *Replace.*

NOTE

When a 60-foot 2-ply type X extraction line is damaged beyond repair or a type XXVI extraction line is required, the type XXVI, 36-inch adapter web will be installed on the 15-foot extraction parachute. The complete parachute assembly will then consist of a deployment bag, the canopy, and the adapter web. At this time the assembly will be reidentified to NSN 1670-01-063-3715 with a part number of 11-1-2583. The type X, 60-foot extraction line will then no longer be a component of the 15-foot extraction parachute. The NSN for the type XXVI, 36-inch adapter web is 1670-00-048-8215.

Section VII. PREPARATION FOR STORAGE OR SHIPMENT

CAUTION

Prolonged exposure to direct sunlight will cause extensive damage to fabric materials.

2-50. Storage.

a. *Storage Criteria.* Administrative storage of air delivery equipment will be accomplished in accordance with AR 750-1 and the instructions furnished below.

b. *General Storage Requirements.* To insure that serviceability standards of stored air delivery equipment are maintained, every effort will be exerted to adhere to the following storage requirements:

(1) When available, a heated building should be used to store parachutes and other air delivery items.

(2) Air delivery equipment will be stored in a dry, well-ventilated location and protected from pilferage, dampness, fire, dirt, insects, rodents, and direct sunlight.

(3) Air delivery equipment will not be stored in a manner which would prevent ventilation or interfere with light fixtures, heating vents, fire fighting devices, cooling units, exits, or fire doors.

(4) Air delivery items will not be stored in a damaged, dirty, or damp condition.

(5) All stored air delivery items will be marked, segregated, and located for accessibility and easy identification.

(6) Air delivery equipment will not be stored in direct contact with any building floor or wall. Storage will be accomplished using bins, shelves, pallets, racks, or dunnage to provide airspace between the storage area floor and the equipment. If preconstructed shelving or similar storage accommodations are not available, locally fabricate storage provisions using suitable lumber or wooden boxes.

(7) All available materials handling equipment should be used as much as possible in the handling of air delivery items.

(8) Periodic rotation of stock, conversion of available space, proper housekeeping policies, and strict adherence to all safety regulations will be practiced at all times.

c. *Storage Specifics for Parachutes.* In addition to the storage requirements stipulated in subparagraph b. above, the following is a list of specifics which must be enforced when storing parachutes:

(1) Except for those assemblies required for contingency operation, parachutes will not be stored in a packed configuration.

(2) Stored parachute assemblies will be secured from access by unauthorized personnel.

(3) A parachute which is in storage, and is administered a cyclic repack and inspection, will not be exposed to incandescent light or indirect sunlight for a period of more than 36 hours. In addition, exposure to direct sunlight should be avoided entirely.

2.51. In-Storage Inspection.

a. *General Information.* An in-storage inspection is a physical check conducted on a random sample of air delivery equipment which is located in storage.

b. *Intervals.* *Parachutes* in storage will be inspected at least semiannually and at more frequent Intervals if prescribed by the local parachute maintenance officer.

c. *Inspection.* Inspect to insure that the parachute is ready for issue.

(1) Check the parachute for proper identification.

(2) Check that no damage or deterioration has been incurred.

(3) Ensure that all modifications or similar requirements have been completed.

(4) Check the adequacy of the storage facilities; efforts taken to control pests and rodents; and protection against unfavorable climatic conditions.

2-52. Shipment.

a. *Initial Shipment.* The initial packaging and shipping of air delivery equipment is the responsibility of item manufacturers who are required to comply with federal and military packaging specifications as stipulated in contractual agreements. Air delivery equipment is normally shipped to depot activities by domestic freight or parcel post, packaged to comply with overseas shipping requirements. Except for those air delivery items which are unpackaged and subjected to random inspections or testing by a depot activity, air delivery equipment received by a using unit will be contained in original packaging materials.

b. *Shipping Between Maintenance Activities.* The shipping of air delivery equipment between organizational and intermediate direct support (DS) maintenance activities will be accomplished on a signature verification basis using whatever means of transportation are available. Used parachutes and other fabric items will be tagged in accordance with TB 750-126, and rolled, folded, or placed loosely in a deployment bag, or other suitable container, as required. Used wood and metal air delivery items will be tagged as prescribed in TB 750-126 and placed in a suitable type container, if necessary. Unused air delivery equipment will be transported in original shipping containers. During shipment, every effort will be made to protect air delivery items from weather elements, dust, dirt, oil, grease, and acids. Vehicles used to transport parachutes will be inspected to ensure the items are protected from the previously cited material damaging conditions.

c. *Other Shipping Instructions.* Air delivery equipment destined for domestic or overseas shipment will be packaged and marked in accordance with AR 700-15, TM 38230-1, and TM 38-230-2. Shipment of air delivery items will be accomplished in accordance with TM 10-1670-201-23 T.O. 13C-1-41/NAVAIR 13-1-17.

APPENDIX A

REFERENCES

A-1. Scope. This appendix lists all forms, technical manuals, and miscellaneous publications referenced in this manual.

A-2. Publication Indexes. The following publication indexes should be consulted frequently for the latest changes or revisions of references given in this appendix and for new publications relating to the material covered in this manual:

Consolidated Index of Army Publications and Blank Forms	DA PAM 25-30
The Army Maintenance Management System (TAMMS)	DA PAM 738-750
The Army Maintenance Management System Aviation (TAMMS-A)	DA PAM 738-751

A-3. Technical Manuals.

General Maintenance of Parachutes and Other Airdrop Equipment	TM 10-1670-201-23 T.O. 13C-1-411 NAVAIR 13-1-17
Equipment Record Procedures	TM 4700-15/1
Miscellaneous Airdrop Canvas, Webbing, Metal, and Wood Items	TM 10-1670-240-201 T.O. 13C7-4911
Preservation, Packaging, Packing of Military Supplies and Equipment (Vols 1 and 2)	TM 38-230-1 and TM 38-230-2
Procedures for the Destruction of Air Delivery Equipment to Prevent Enemy Use	TM 43-0002-1

A-4. Field Manuals.

Airdrop of Supplies and Equipment: General Information for Rigging Airdrop Platform	FM 10-500
First Aid for Soldiers	FM 21-11

A-5. Army Regulations.

Dictionary of United States Army Terms	AR 310-25
Authorized Abbreviation and Brevity Codes	AR 310-50
Packaging of Material	AR 700-15
Army Materiel Maintenance Concepts and Policies	AR 750-1
Airdrop, Parachute Recovery and Aircraft Personnel Escape Systems	AR 750-32
Reporting of Item and Packaging Discrepancies	AR 735-11-2

A-6. Technical Bulletins.

Maintenance Expenditure Limits for FSC Group 16	TB 43-0002-4*
Use of Material Condition Tags and Labels on Army Aeronautical and Air Delivery Equipment	TB 750-126

*To be superseded in part by TB 43-0002-43.

A-7. Forms

The Army Parachute Log Record	DA Form 10-42 DA Form 3912
Equipment Inspection and Maintenance Worksheet	DA Form 2404
Report of Discrepancy	SF 364

A-8. Marine Corps Orders.

MC Military Incentive Award Program	MCO 1650.17
Report of Item and Packaging Discrepancies	MCO 2430.3
Quality Deficiency Report	MCO 4855.10

APPENDIX B

MAINTENANCE ALLOCATION CHART

Section I. INTRODUCTION

B-1. General.

a. This section provides a general explanation of all maintenance and repair functions authorized at various maintenance levels.

b. The Maintenance Allocation Chart (MAC) in Section II designates overall authority and responsibility for the performance of maintenance functions on the identified end item or component. The application of the maintenance functions to the end item or component will be consistent with the capacities and capabilities of the designated maintenance levels.

c. Section III lists the tools and test equipment (both special tools and common tool sets) required for each maintenance function as referenced from Section II.

d. Section IV contains supplemental instructions and explanatory notes for a particular maintenance function.

B-2. Maintenance Functions. Maintenance functions will be limited to and defined as follows:

a. Inspect. To determine the serviceability of an item by comparing its physical, mechanical, and/or electrical characteristics with established standards through examination (e.g. by sight, sound, or feel).

b. Test. To verify serviceability by measuring the mechanical, pneumatic, hydraulic, or electrical characteristics of an item and comparing those characteristics with prescribed standards.

c. Service. Operations required periodically to keep an item in proper operating condition, i.e., to clean (includes decontaminate, when required), to preserve, to drain, to paint, or to replenish fuel, lubricants, chemical fluids, or gases.

d. Adjust. To maintain or regulate, within prescribed limits, by bringing into proper or exact position, or by setting the operating characteristics to specified parameters.

e. Aline. To adjust specified variable elements of an item to bring about optimum or desired performance.

f. Calibrate. To determine and cause corrections to be made or to be adjusted on instruments or test, measuring, and diagnostic equipments used in precision measurement. Consists of comparisons of two instruments, one of which is a certified standard of known accuracy, to detect and adjust any discrepancy in the accuracy of the instrument being compared.

g. Remove/Install. To remove and install the same item when required to perform service or other maintenance functions. Install may be the act of emplacing, seating, or fixing into position a spare, repair part, or module (component or assembly) in a manner to allow the proper functioning of an equipment or system.

h. Replace. To remove an unserviceable item and install a serviceable counterpart in its place. 'Replace" is authorized by the MAC and is shown as the 3d position code of the SMR code.

B-2. Maintenance Functions (cont).

i. Repair. The application of maintenance services, including fault location/troubleshooting, removal/installation, and disassembly/assembly procedures, and maintenance actions to identify troubles and restore serviceability to an item by correcting specific damage, fault, malfunction, or failure in a part, subassembly, module (component or assembly), end item, or system.

j. Overhaul. That maintenance effort (service/action) prescribed to restore an item to a completely serviceable/operational condition as required by maintenance standards in appropriate technical publications (i.e., DMWR). Overhaul is normally the highest degree of maintenance performed by the Army. Overhaul does not normally return an item to like new condition.

k. Rebuild. Consists of those services/actions necessary for the restoration of unserviceable equipment to a like new condition in accordance with original manufacturing standards. Rebuild is the highest degree of materiel maintenance applied to Army equipment. The rebuild operation includes the act of returning to zero those age measurements (hours/miles, etc.) considered in classifying Army equipment/components.

B-3. Explanation of Columns in the MAC, Section II.

a. Column 1, Group Number. Column 1 lists functional group code numbers the purpose of which is to identify maintenance significant components, assemblies, subassemblies, and modules with the next higher assembly. End item group number shall be "00".

b. Column 2, Component/Assembly. Column 2 contains the names of components, assemblies, subassemblies, and modules for which maintenance is authorized.

c. Column 3, Maintenance Function. Column 3 lists the functions to be performed on the item listed in Column 2. (For detailed explanation of these functions, see paragraph B-2).

d. Column 4, Maintenance Level. Column 4 specifies, by the listing of work time figure in the appropriate subcolumn(s), the level of maintenance authorized to perform the function listed in Column 3. This figure represents the active time required to perform that maintenance function at the indicated level of maintenance. If the number or complexity of the tasks within the listed maintenance function vary at different maintenance levels, appropriate work time figures will be shown for each level. The work time figure represents the average time required to restore an item (assembly, subassembly, component, module, end item, or system) to a serviceable condition under typical field operating conditions. This time includes preparation time (including any necessary disassembly/assembly time), troubleshooting/fault location time, and quality assurance/quality control time in addition to the time required to perform the specific tasks identified for the maintenance functions authorized in the maintenance allocation chart. The symbol designations for the various maintenance levels are as follows:

C - Operator or crew
O - Unit Maintenance
F - Intermediate Direct Support Maintenance

e. Column 5, Tools and Equipment. Column 5 specifies by code, those common tool sets (not individual tools) and special tools, TMDE, and support equipment required to perform the designated function.

f. Column 6, Remarks. This column shall, when applicable, contain a letter code, in alphabetic order, which shall be keyed to the remarks contained in Section IV.

B-4. Explanation of Columns in Tool and Test Equipment Requirements, Section III.

a. Column 1, Reference Code. The tool and test equipment reference code correlates with a code used in the MAC, Section II, Column 5.

b. Column 2 Maintenance Category. The lowest category of maintenance authorized to use the tool or test equipment.

c. Column 3, Nomenclature. Name or identification of the tool or test equipment.

d. Column 4, National Stock Number. The National stock number of the tool or test equipment.

e. Column 5, Tool Number. The manufacturer's part number.

B-5. Explanation of Columns in Remarks, Section IV.

a. Column 1, Reference Code. The code recorded in column 6, Section II.

b. Column 2, Remarks. This column lists information pertinent to the maintenance function being performed as indicated in the MAC, Section II.

Section II. MAINTENANCE ALLOCATION CHART FOR 15-FOOT-DIAMETER CARGO EXTRACTION PARACHUTE ASSEMBLY

(1)	(2)	(3)	(4) MAINTENANCE LEVEL					(5)	(6)
			Unit		Intermediate		Depot		
GROUP NUMBER	COMPONENT/ ASSEMBLY	MAINTENANCE FUNCTION	C	O	F	H	D	TOOLS AND EQUIPMENT	REMARKS
01	Canopy	Inspect		0.7					A
		Service		1.0				1,4,8,9	C, D
		Repair		0.4				1 through 16	D
	Attachment Loop	Repair		0.2				14	
		Replace		0.3				1,9,10,14, 20	
	Vent Line	Repair		0.3				13	
		Replace			0.5			1,9,10,13, 20	
	Bridle Centering Line	Repair		0.3				13	
		Replace			0.5			9,13,20	

MAINTENANCE ALLOCATION CHART FOR 15-FOOT-DIAMETER CARGO EXTRACTION PARACHUTE ASSEMBLY (cont)

(1)	(2)	(3)	(4) MAINTENANCE LEVEL					(5)	(6)
			Unit		Intermediate		Depot		
GROUP NUMBER	COMPONENT/ ASSEMBLY	MAINTENANCE FUNCTION	C	O	F	H	D	TOOLS AND EQUIPMENT	REMARKS
	Upper Lateral Band	Repair		0.5				1,9,10,12	
	Gore Section	Repair		0.4				1,6,10,12,16	
		Replace			0.8			1,6,10,12,16	E
	Radial Webbing	Repair		0.3				12,13	
	Panel Edge Reinforcement	Repair		0.4				2,10,12	
	Lower Lateral Band	Repair		0.5				12,13	
	Pocket Band	Repair		0.3				12	
		Replace		0.4				1,10,11,13	
	Suspension Line	Repair		0.3				13	
		Replace			0.6			1,10,13	
	Connector Link	Repair		0.1				1	
		Replace			0.1			5,18,19	
02	Deployment Bag	Inspect		0.3				1	A
		Service		0.1					
		Repair		0.4				1,2,3,5,6, 10 through 17	
		Replace		0.1					
	Grommet	Repair		0.1				5,11,15	F
		Replace		0.2				12	

MAINTENANCE ALLOCATION CHART FOR 15-FOOT-DIAMETER CARGO EXTRACTION PARACHUTE ASSEMBLY (cont)

(1)	(2)	(3)	(4) MAINTENANCE LEVEL					(5)	(6)
			Unit		Intermediate		Depot		
GROUP NUMBER	COMPONENT/ ASSEMBLY	MAINTENANCE FUNCTION	C	O	F	H	D	TOOLS AND EQUIPMENT	REMARKS
	Retainer Band	Repair		0.2				14	
	Keeper	Replace		0.4				14	
	Bag Retainer	Repair		0.2				12,13	
	Line	Replace		0.5				12,13	
	Bag Closing	Repair		0.2				14	
	Loop	Replace		0.4				14	
	Inspection Data	Repair		0.1				15	
	Pocket	Replace		0.2				15	
	Retainer Band	Repair		0.2				15	
	Keeper	Replace		0.3				15	
	Reinforcement								
	Tie Loop	Repair		0.2				15	
	Reinforcement	Replace		0.3				15	
	Safety Cord	Repair		0.2				13	
	Replace	0.4		13					
	Tie Loop	Repair		0.2				15	
	Replace	0.3		15					
	Edge Binding	Repair		0.3				15	
	Suspension Line	Repair		0.4				15,16	
	Stowage Flap								
	Bag Panels	Repair		0.1					
03	Adapter Web	Inspect		0.1					A
		Service		0.1					B, C
		Repair		0.1				6	
		Replace		0.1				1	
04	Extraction Line	Inspect		0.3				A	
		Replace		0.3				1	

Section III. TOOL AND TEST EQUIPMENT REQUIREMENTS

Tool or test equipment ref. code (1)	Maintenance category (2)	Nomenclature (3)	National NATO stock number (4)	PN Tool number (5)
1	0	Knife	5110-00-162-2205	MIL-K-818C
2	0	Knife, Hot Metal	3439-01-197-7656	4025
3	0	Lead, Pig, 5-pounds	9650-02-264-5050	QQ-C-40
4	0	Line Separator	1670-00-092-8661	11-1-17-1
5	0	Mallett, Rawhide	5120-00-293-3397	GGG-H33
6	0	Needle, Tacking	8315-00-262-3733	FF-N-180
7	0	Packing Paddle	1670-00-764-6381	11-1-152
8	0	Packing Weight	1670-00-375-9134	66C38599
9	0	Pot, Melting, Electric	5120-00-242-1276	WG441
10	0	Shears	5110-00-223-6370	GGG-S-278
11	0	Set, Chuck and Die	5120-00-694-5153	7540756
12	0	Sewing Machine, Light-Duty	See Table 2-2	
13	0	Sewing Machine, Zig-Zag	See Table 2-2	
14	0	Sewing Machine, Heavy-Duty	See Table 2-2	
15	0	Sewing Machine, Medium-Duty	See Table 2-2	
16	0	Sewing Machine, Darning	See Table 2-2	
17	0	Sewing Machine, Very Heavy Duty	See Table 2-2	
18	0	Screwdriver, Flat Tip	5120-00-293-0314	GGG-S-121

Section III. TOOL AND TEST EQUIPMENT REQUIREMENTS (cont)

Tool or test equipment ref. code (1)	Maintenance category (2)	Nomenclature (3)	National NATO stock number (4)	PN Tool number (5)
19	0	Separator, Link	1670-00-072-4941	MIL-S-43243
20	0	Yardstick	5210-00-985-6610	GGG-Y-0035
21	0	Splicing Aid	See Appendix E	
22	0	Cutter, Single Bow, 1/4 inch	5110-00-180-0943	

Section IV. REMARKS

Reference Code	Remarks/Notes
A	Inspect is a technical-rigger type inspection.
B	Service is to clean equipment.
C	Service is the packing of parachutes.
D	Repair by restitching, darning or restencil canopy panel.
E	Repair at unit maintenance consists of darning, restitching, patching and replacement of parts authorized for unit maintenance. Direct support repair consists of replacing gore sections.
F	Repair by darning, retacking, restitching splice edge binding and repairing grommets. Replacement of parts authorized for unit maintenance.

APPENDIX C

UNIT, DIRECT SUPPORT AND GENERAL SUPPORT MAINTENANCE REPAIR PARTS AND SPECIAL TOOLS LIST

Section I. INTRODUCTION

C-1. SCOPE. This RPSTL lists and authorizes spares and repair parts; special tools; special test, measurement, and diagnostic equipment (TMDE); and other special support equipment required for performance of Organizational Maintenance of the Lubricating and Servicing Unit. It authorizes the requisitioning, issue, and disposition of spares, repair parts and special tools as indicated by the source, maintenance and recoverability (SMR) codes.

C-2. GENERAL. In addition to this section, Introduction, this Repair Parts and Special Tools List is divided into the following sections:

a. Section II. Repair Parts List. A list of spares and repair parts authorized by this RPSTL for use in the performance of maintenance. This list also includes parts which must be removed for replacement of the authorized parts. Parts lists are composed of functional groups in ascending alphanumeric sequence, with the parts in each group listed in ascending figure and item number sequence. Bulk materials are listed in item name sequence. Repair parts kits are listed separately in functional groups in Section II. Repair parts for repairable special tools are also listed in this section. Items listed are shown in the associated illustration(s)/figure(s).

b. Section III. Special Tools List. A list of special tools, special TMDE, and other special support equipment authorized by this RPSTL (as indicated by Basis of Issue (BOI) information in DESCRIPTION AND USABLE ON CODE column) for the performance of maintenance.

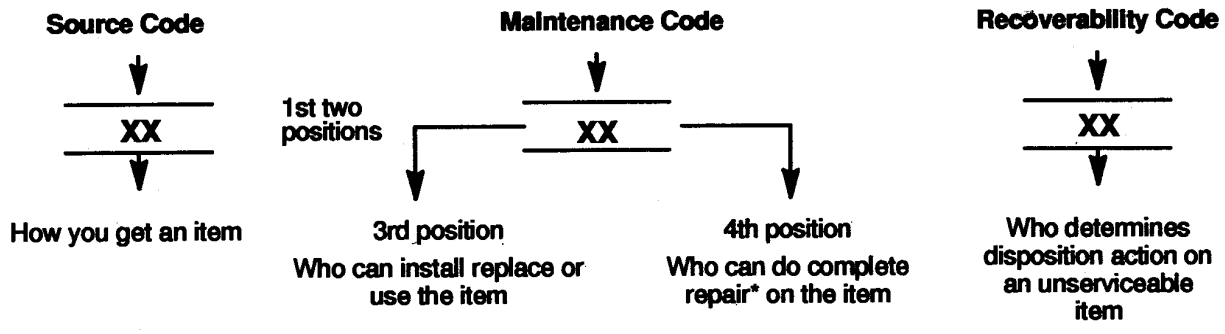
c. Section IV. Cross-Reference Index. A list, in National Item Identification Number (NIIN) sequence, of all national stock numbered items appearing in the listing, followed by a list in alphanumeric sequence of all part numbers appearing in the listings. National stock numbers and part numbers are cross referenced to each illustration figure and item number appearance. The figure and item number index lists figure and item numbers in alphanumeric sequence and cross references NSN, FSCM and part number.

3. EXPLANATION OF COLUMNS (SECTIONS II AND III).

a. ITEM NO. (Column (1)). Indicates the number used to identify items called out in the illustration.

C-3. Explanation of Columns (Sections II and III) (cont).

b. SMR COD (Column (2)). The Source, Maintenance, and Recoverability (SMR) code is a 5-position code containing supply/requisition information, maintenance category authorization criteria, and disposition instructions as shown in the following breakout:



* Complete Repair: Maintenance capacity, capability, and authority to perform all corrective maintenance tasks of the "Repair" function in a use/user environment in order to restore serviceability to a failed item.

(1) Source Code. The source code tells you how you get an item needed for maintenance, repair, or overhaul of an end item/equipment. Explanations of source codes follow.

Code	Explanation
PA PB PC** PD PE PF PG	Stocked items; use the applicable NSN to request/requisition items with these source codes. They are authorized to the category indicated by the code entered in the 3rd position of the SMR code. **NOTE: Items coded PC are subject to deterioration.
KD KF KB	Items with these codes are not to be requested/requisitioned individually. They are part of a kit which is authorized to the maintenance category indicated in the 3rd position of the SMR code. The complete kit must be requisitioned and applied.

	Explanation
MO (Made at org AVUM level) MF (Made at DS/AVUM level) MH (Made at GS level) ML (Made at Specialized Repair Activity (SRA)) MD (Made at Depot)	Items with these codes are not to be requested/requisitioned individually. They must be made from bulk material which is identified by the part number in the DESCRIPTION and USABLE ON CODE (UOC) column and listed in the Bulk Material group of the repair parts list in the RPSTL. If the item is authorized to you by the 3rd position code of the SMR code, but the source code indicates it is made at a higher level, order the item from the higher level of maintenance.

Code	Explanation
AO (Assembled by org AVUM Level) AF (Assembled by DS/AVUM Level) AH (Assembled by GS Category) AL (Assembled by SRA) AD (Assembled by Depot)	Items with these codes are not to be requested/requisitioned individually. The parts that make up the assembled item must be requisitioned or fabricated and assembled at the level of maintenance indicated by the source code. If the 3rd position code of the SMR code authorizes you to replace the item, but the source code indicates the items are assembled at a higher level, order the item from the higher level of maintenance.

Code	Explanation
XA	- - Do not requisition an "XA"-coded item. Order its next higher assembly. (Also, refer to the NOTE below.)
XB	- - If an "XB" item is not available from salvage, order it using the FSCM and part number given.
XC	- - Installation drawing, diagram, instruction sheet, field service drawing, that is identified by manufacturer's part number.
XD	- - Item is not stocked. Order an "XD"-coded item through normal supply channels using the FSCM and part number given, if no NSN is available.

NOTE

Cannibalization or controlled exchange, when authorized, may be used as a source of supply for items with the above source codes, except for those source coded "XA" or those aircraft support items restricted by requirements of AR 750-1

(2) Maintenance Code. Maintenance codes tells you the level(s) of maintenance authorized to USE and REPAIR support items. The maintenance codes are entered in the third and fourth positions of the SMR code as follows:

(a) The maintenance code entered in the third position tells you the lowest maintenance level authorized to remove, replace, and use an item. The maintenance code entered in the third position will indicate authorization to the following levels of maintenance.

Code	Application/Explanation
C	- Crew or operator maintenance done within the organization or aviation unit maintenance.
O	- Organizational or aviation unit category can remove, replace, and use the item.
F	- Direct support or aviation intermediate level can remove, replace, and use the item.
H	- General support level can remove, replace, and use the item.
L	- Specialized repair activity can remove, replace, and use the item.
D	- Depot level can remove, replace, and use the item.

C-3. Explanation of Columns (Sections II and III) (cont).

(b) The maintenance code entered in the fourth position tells whether or not the item is to be repaired and identifies the lowest maintenance level with the capability to do complete repair (i.e., perform all authorized repair functions). NOTE: Some limited repair may be done on the item at a lower level of maintenance, if authorized by the Maintenance Allocation Chart (MAC) and SMR codes. This position will contain one of the following maintenance codes.

Code	Application/Explanation
O	Organizational or (aviation unit) is the lowest level that can do complete repair of the item.
F	Direct support or aviation intermediate level is the lowest level that can do complete repair of the item.
H	General Support is the lowest level that can do complete repair of the item.
L	Specialized repair activity is the lowest level that can do complete repair of the item.
D	Depot is the lowest level that can do complete repair of the item.
Z	Nonreparable. No repair is authorized.
B	No repair is authorized. (No parts or special tools are authorized for the maintenance of a "B" coded item). However, the item may be reconditioned by adjusting, lubricating, etc., at the user level.

(3) ***Recoverability Code***. Recoverability codes are assigned to items to indicate the disposition action on unserviceable items. The recoverability code is entered in the fifth position of the SMR Code as follows:

Recoverability Codes	Application/Explanation
Z	Nonreparable item. When unserviceable, condemn and dispose of the item at the level of maintenance shown in 3rd position of SMR Code.

Recoverability Codes	Application/Explanation
O	Reparable item. When not economically reparable, condemn and dispose of the item at organizational or aviation unit level.
F	Reparable item. When uneconomically reparable, condemn and dispose of the item at the direct support or aviation intermediate level.
H	Reparable item. When uneconomically reparable, condemn and dispose of the item at the general support level.
D	Reparable item. When beyond lower level repair capability, return to depot. Condemnation and disposal of item not authorized below depot level.
L	Reparable item. Condemnation and disposal not authorized below specialized repair activity (SRA).
A	Item requires special handling or condemnation procedures because of specific reasons (e.g., precious metal content, high dollar value, critical material, or hazardous material). Refer to appropriate manuals/directives for specific instructions.

c. *FSCM (Column (3)).* The Federal Supply Code for Manufacturer (FSCM) is a 5-digit numeric code which is used to identify the manufacturer, distributor, or Government agency, etc. that supplies the item.

d. *Part Number (Column (4)).* Indicates the primary number used by the manufacturer, (individual, company, firm, corporation, or Government activity), which controls the design and characteristics of the item by means of its engineering drawings, specifications, standards, and inspection requirements to identify an item or range of items.

NOTE

When you use an NSN to requisition an item, the item you receive may have a different part number from the part ordered.

e. *Description and Usable on Code (UOC) (Column (5)).* This column includes the following information:

(1) The Federal item name and, when required, a minimum description to identify the item.
(2) The physical security classification of the item is indicated by the parenthetical entry, e.g., Phy Sec C1 (C)-Confidential, Phy Sec CI (S)-Secret, Phy Sec CI (T)-Top-Secret.
(3) Items that are included in kits and sets are listed below the name of the kit or set.
(4) Spare/repair parts that make up an assembled item are listed immediately following the assembled item line entry.
(5) Part numbers of bulk materials are referenced in this column in the line entry for the item to be manufactured/fabricated.
(6) When the item is not used with all serial numbers of the same model, the effective serial numbers are shown on the last line(s) of the description (before UOC).
(7) The usable on code, when applicable (reference paragraph 5, Special Information).
(8) In the Special Tools List Section, the basis of issue (BOI) appears as the last line(s) in the entry for each special tool, special TMDE, and other special support equipment. When density of equipment supported exceeds density spread indicated in the basis of issue, the total authorization is increased proportionately.
(9) The statement “END OF FIGURE" appears just below the last item description in Column (5) for a given figure in both Section II and Section III.

f. *Qty (Column (6)).* The QTY (quantity per figure) column indicates the quantity of the item used in the breakout shown on the illustration figure, which is prepared for a functional group, subfunctional group, or an assembly. A "V" appearing in the column in lieu of a quantity indicates that the quantity is variable and may vary from application to application.

C-4. Explanation of Columns (Set. IV).

a. *NATIONAL STOCK NUMBER (NSN) INDEX.*

(1) *STOCK NUMBER Column*. This column lists the NSN in national item identification number (NIIN) sequence. The NIIN consists of the last nine digits of the NSN, i.e.

NSN
5305-01-574-1467
NIIN

When using this column to locate an item, ignore the first four digits of the NSN. However, the complete NSN should be used when ordering items by stock number.

(2) *FIG. Column*. This column lists the number of the figure where the item is identified/located. The figures are in numerical order in Section II and Section III.

(3) *ITEM Column*. The item number identifies the item associated with the figure listed in the adjacent FIG. column. This item is also identified by the NSN listed on the same line.

b. *PART NUMBER INDEX.* Part numbers in this index are listed in ascending alphanumeric sequence (i. e., vertical arrangement of letter and number combinations which place the first letter or digit of each group in order A through Z, followed by the numbers 0 through 9, and each following letter or digit in like order).

(1) *FSCM column.* The Federal Supply Code for Manufacturer (FSCM) is a 5-digit numeric code used to identify the manufacturer, distributor, or Government agency/activity that supplies the item.

(2) *PART NUMBER Column*. Indicates the primary number used by the manufacturer (individual, firm, corporation, or Government activity), which controls the design and characteristics of the item by means of its engineering drawings, specifications, standards, and inspection requirements to identify an item or range of items.

(3) *STOCK NUMBER Column*. This column lists the NSN for the associated part number and manufacturer identified in the PART NUMBER and FSCM columns to the left.

(4) *FIG. Column*. This column lists the number of the figure where the item is identified/located in Section II and Section III.

(5) *ITEM Column*. The item number is that number assigned to the item as it appears in the figure referenced in the adjacent figure number column.

C-5. Special Information.

a. *USABLE ON CODE*. The usable on code appears in the lower left corner of the Description column heading. Usable on codes are shown as "UOC"... 1 in the Description Column (justified left) on the first line applicable item description/nomenclature. Uncoded items are applicable to all models. Identification of the usable on codes used in the RPSTL are:

Code	Used on
DWT	Model 1670-01-063-3715
DWS	Model 1670-00-052-1548

b. *FABRICATION INSTRUCTIONS*. Bulk materials required to manufacture items are listed in the Bulk Material Functional Group of this RPSTL. Part numbers for bulk materials are also referenced in the description column of the line item entry for the item to be manufactured/fabricated. Detailed fabrication instructions for items source coded to be manufactured or fabricated are found in Chapter 2, Section VI of this manual.

c. *ASSEMBLY INSTRUCTION*. (Not Applicable)

d. *INDEX NUMBERS*. Items which have the work BULK in the figure column will have an index number shown in the item number column. This index number is a cross-reference between the National Stock Number/Part Number Index and the bulk material list in Section II.

C-6. How to Locate Repair Parts.

a. *When National Stock Number or Part Number is Not Known.*

(1) First. Using the table of contents, determine the assembly group or subassembly group to which the item belongs. This is necessary since figures are prepared for assembly groups and subassembly groups, and listings are divided into the same groups.

(2) Second. Find the figure covering the assembly group or subassembly group to which the Item belongs.

(3) Third. Identify the items on the figure and note the item number.

(4) Fourth. Refer to the Repair Parts List for the figure to find the part number

(5) Fifth. Refer to the Part Number Index to find the NSN, if assigned.

b. *When National Stock Number of Part Number is Known:*

(1) *First.* Using the Index of National Stock Numbers and Part Numbers, find the pertinent National Stock Number or Part Number. The NSN index is in National Item Identification Number (NIIN) sequence (see 4.1(1)). The part numbers in the Part Number index are listed in ascending alphanumeric sequence (see 4.b). Both indexes cross-reference you to the illustration figure and Item number of the item you are looking for.

(2) *Second*. After finding the figure and item number, verify that the item is the one you're looking for, then locate the item number in the repair parts list for the figure.

C-7. Abbreviations.

Abbreviations	Explanations
EA	Each
FT	Foot/Feet
IN.	Inch/Inches
LG	Long
MTG	Mounting
NF	National Fine (Thread)

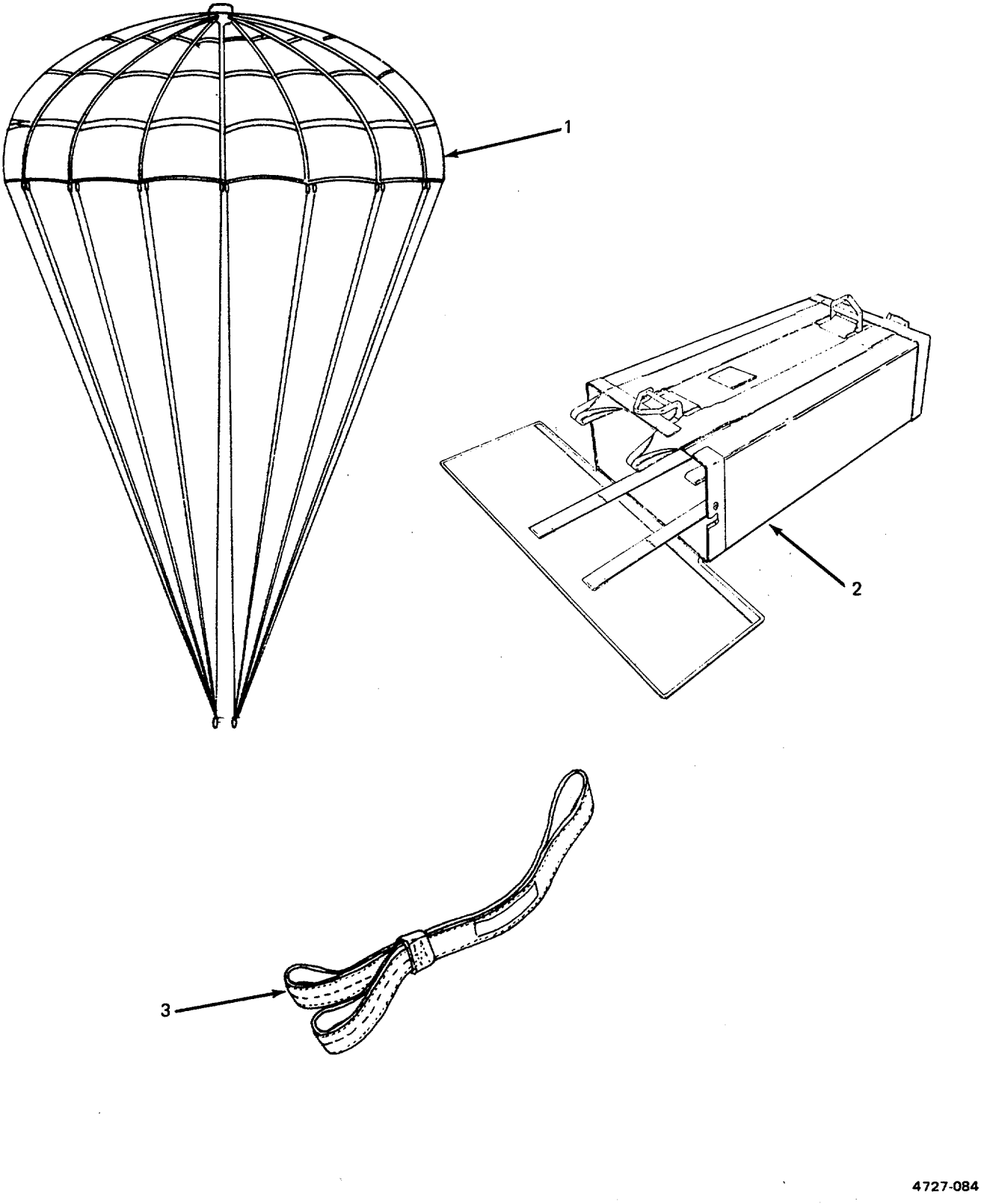


Figure C-1. 15-Foot Diameter Cargo Extraction Parachute.

Section II. REPAIR PARTS LIST

(1) ITEM NO	(2) SMR CODE	(3) FSCM	(4) PART NUMBER	(5) DESCRIPTION AND USABLE ON CODES (UOC)	(6) QTY
				GROUP 00 PARACHUTE CARGO, 15-FOOT DIAMETER, EXTRACTION	
				FIG. C-1 15-FOOT DIAMETER CARGO EXTRACTION PARACHUTE 11-1-2583	
1	XAOFF	98750	57J6032	CANOPY, CARGO EXTRACTION, 15-FOOT DIAMETER (SEE FIGURE C-2)	1
2	PAOOO	98750	58J6100	DEPLOYMENT BAG, PARACHUTE (SEE FIGURE C-3)	1
3	PAOOO	81337	68C380-10	ADAPTER WEB, PARACHUTE (SEE FIGURE C-4) UOC: DWT	1
				END OF FIGURE	

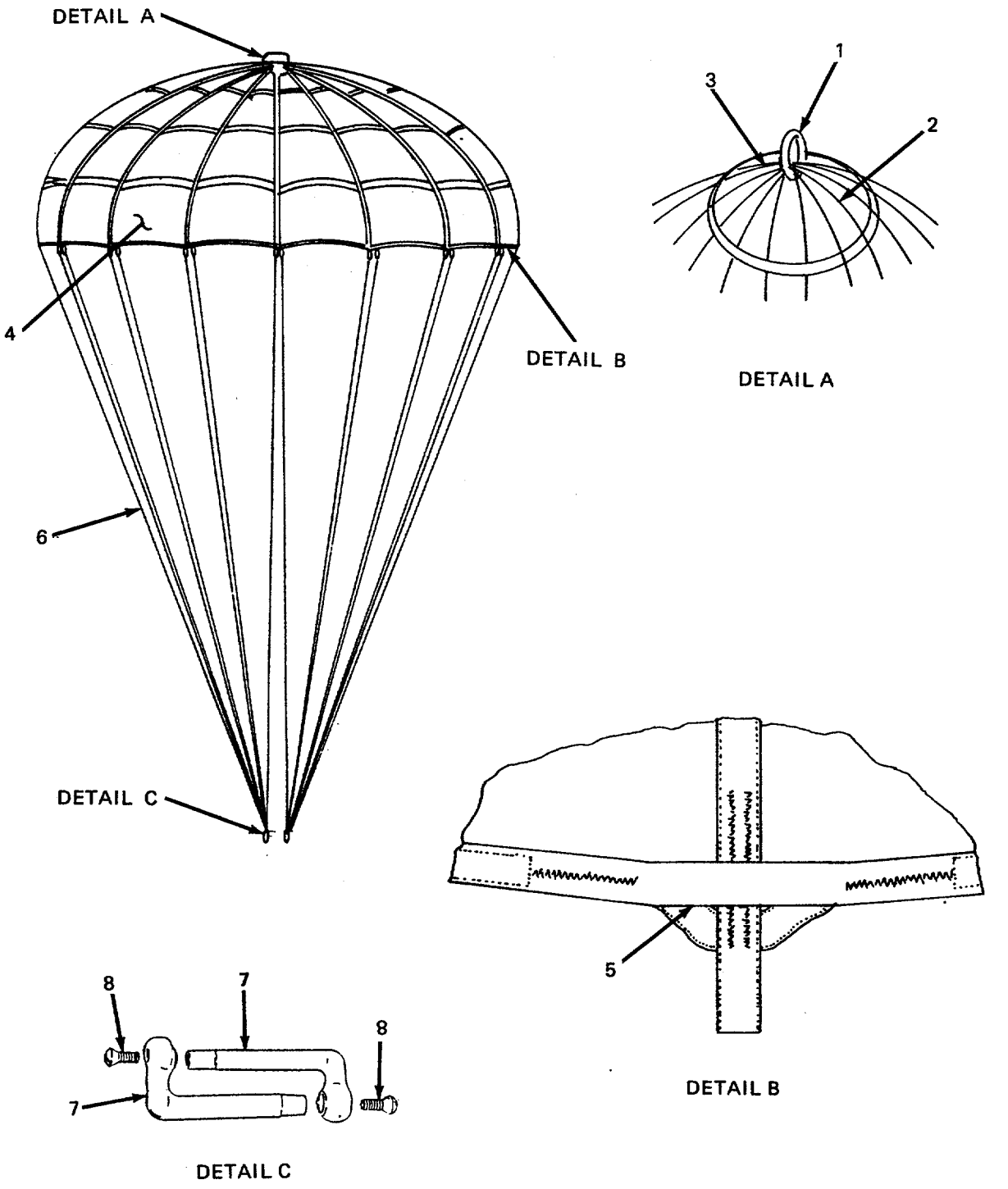


Figure C-2. 15-Foot Diameter Cargo Extraction Parachute Canopy.

SECTION II

(1) ITEM NO	(2) SMR CODE	(3) FSCM	(4) PART NUMBER	(5) DESCRIPTION AND USABLE ON CODES (UOC)	(6) QTY
				GROUP 01 CANOPY, CARGO EXTRACTION PARACHUTE, 15-FOOT DIAMETER	
				FIG. C-2 15-FOOT DIAMETER CARGO EXTRACTION PARACHUTE CANOPY	
1	MOOOO	98750	57J6032-17	LOOP, ATTACHMENT, MAKE FROM WEBBING, COTTON CLASS 2B, TYPE VIII, OD 1 3/4-IN W P/N MIL-W-5665 & THREAD, NYLON SIZE E TY 1 CL A, P/N V-T-295	1
2	MFFFF	98750	57J6032-14	VENT LINE, MAKE FROM CORD NYLON TY IV, OD P/N MIL-C-7515 & THREAD, NYLON SIZE E TY 1 CL A, P/N V-T-295	4
3	MFFFF	98750	57J6032-15	LINE, CENTER, BRIDLE, MAKE FROM CORD NYLON TY IV OD P/N MIL-C-7515 & THREAD, NYLON SIZE E TY 1 CL A, P/N V-T-295	1
4	MFFFF	98750	57J6032-18	GORE, PANEL, CANOPY, MAKE FROM CLOTH, NYLON PARACHUTE TY 1 OD 2.25 OZ P/N MIL-C-7350 & THREAD, NYLON SIZE E TY 1 CL A P/N V-T-295	80
5	MOOOO	98750	57J6032-13	POCKET BAND, MAKE FROM WEBBING NYLON TY II OD 3/4-IN P/N MIL-W-4088 & THREAD, NYLON SIZE E TY 1 CL A P/N V-T-295	16
6	MFFFF	98750	57J6032-16	LINE SUSPENSION, MAKE FROM CORD NYLON CORELESS TY IV OD P/N MIL-C-7515 & THREAD, NYLON SIZE E TY 1 CL A P/N V-T-295	16
7	PAOOO	96906	MS22002-1	LINK PARACHUTE	2
8	PAOZZ	96906	MS22002-7	SCREW, SLOTTED.	2
				END OF FIGURE	

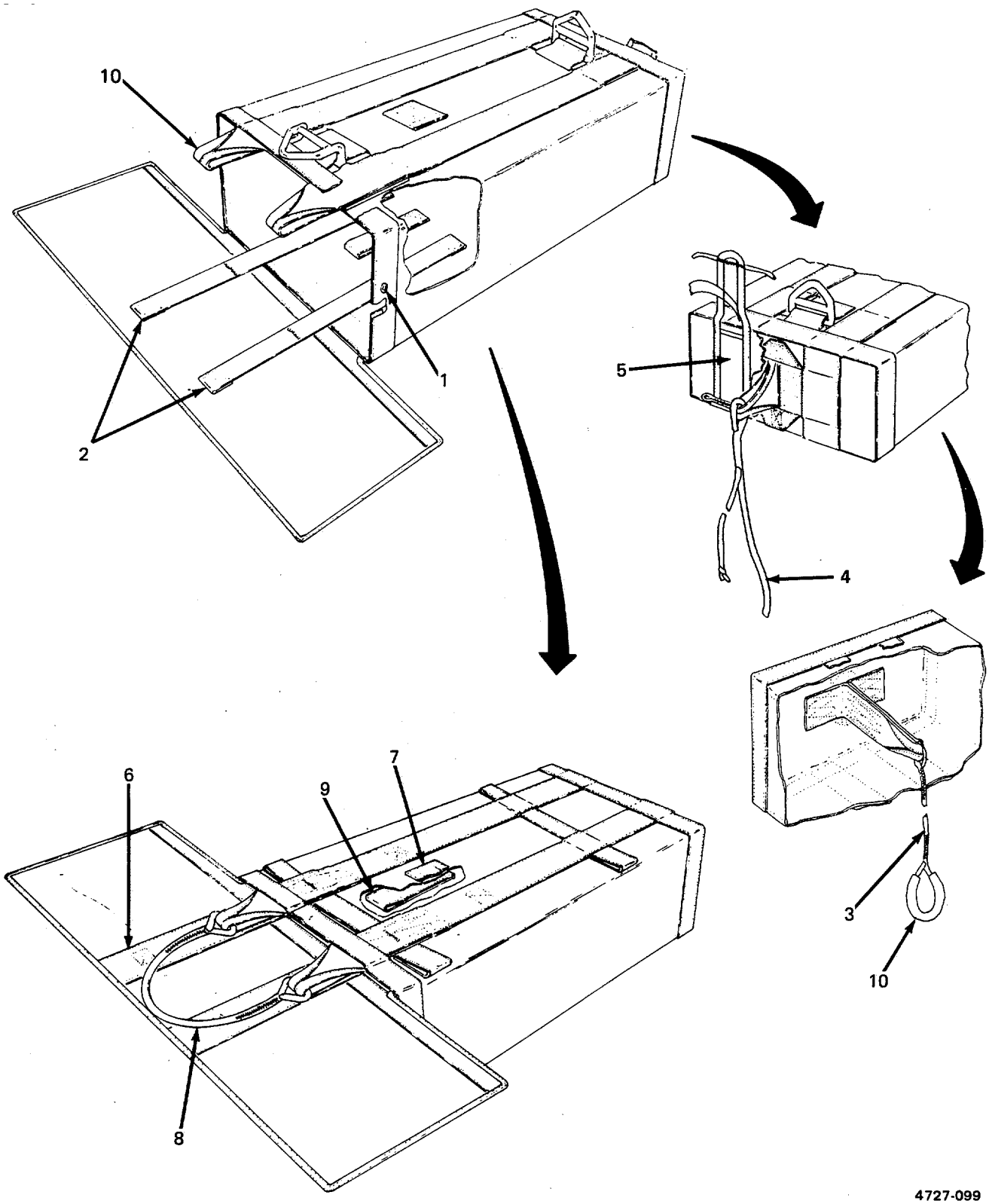


Figure C-3. Development Bag.

SECTION II

(1) ITEM NO	(2) SMR CODE	(3) FSCM	(4) PART NUMBER	(5) DESCRIPTION AND USABLE ON CODES (UOC)	(6) QTY
				GROUP 02 DEPLOYMENT BAG, PARACHUTE	
				FIG. C-3 DEPLOYMENT BAG 58J6100	
1	PBOOO	81349	MIL-G-16491	GROMMET, METALLIC, SIZE 0 TYPE 1, CL 1B	2
2	MOOOO	81337	58J6100-7	KEEPER, RETAINER BAND, MAKE FROM WEBBING NYLON TY IV 1-IN P/N MIL-T-5038 & THREAD, NYLON SIZE 3 TY 1 CL A P/N V-T-295	2
3	MOOOO	81337	58J6100-17	RETAINING TIE, MAKE FROM CORD, NYLON CORELESS TY IV OD P/N MIL-C-7515 & THREAD, NYLON SIZE FF, TY 1 CL A, P/N V-T-295	1
4	MOOOO	81337	58J6100-19	LINE, PENDULUM, MAKE FROM CORD, NYLON TY IV, OD P/N MIL-C-7515	1
5	PAOOZ	98750	54C6335	POCKET, INSPECTION DATA	1
6	MOOOO	81337	58J6100-11	REINFORCEMENT, RETAINER BAND KEEPER, MAKE FROM WEBBING NYLON TY VIII OD 1 23/32-IN-W P/N MIL-W-4088 & THREAD, NYLON SIZE FF, TY 1 CL A P/N V-T-295	2
7	MOOOO	81337	58J6100-10	REINFORCEMENT, TIE LOOP, MAKE FROM WEBBING, NYLON TY IV 1-IN-W P/N MIL-T-5038 & THREAD, NYLON SIZE FF, TY 1 CL A, P/N V-T-295	2
8	MOOOO	81337	58J6100-18	SAFETY CORD, MAKE FROM CORD, NYLON MIL-C-7515, TYPE IV, OD & THREAD, NYLON SIZE FF, TY 1 CL A, P/N V-T-295	1
9	MOOOO	81337	58J6100-5	TIE LOOP, MAKE FROM WEBBING, NYLON, MIL-T-5038, TYPE IV, MIL-T-5038 & THREAD, NYLON, SIZE FF TY 1 CL A, P/N V-T-295	2
10	MOOZZ	81337	58J6100-6	LOOP, RETAINING, MAKE FROM TAPE, COTTON, TYPE 1, 1 1/2-IN., MIL-T-43566 AND THREAD, NYLON, SIZE E, TY 1 CL A, P/N V-T-295	1
				END OF FIGURE	

SECTION II

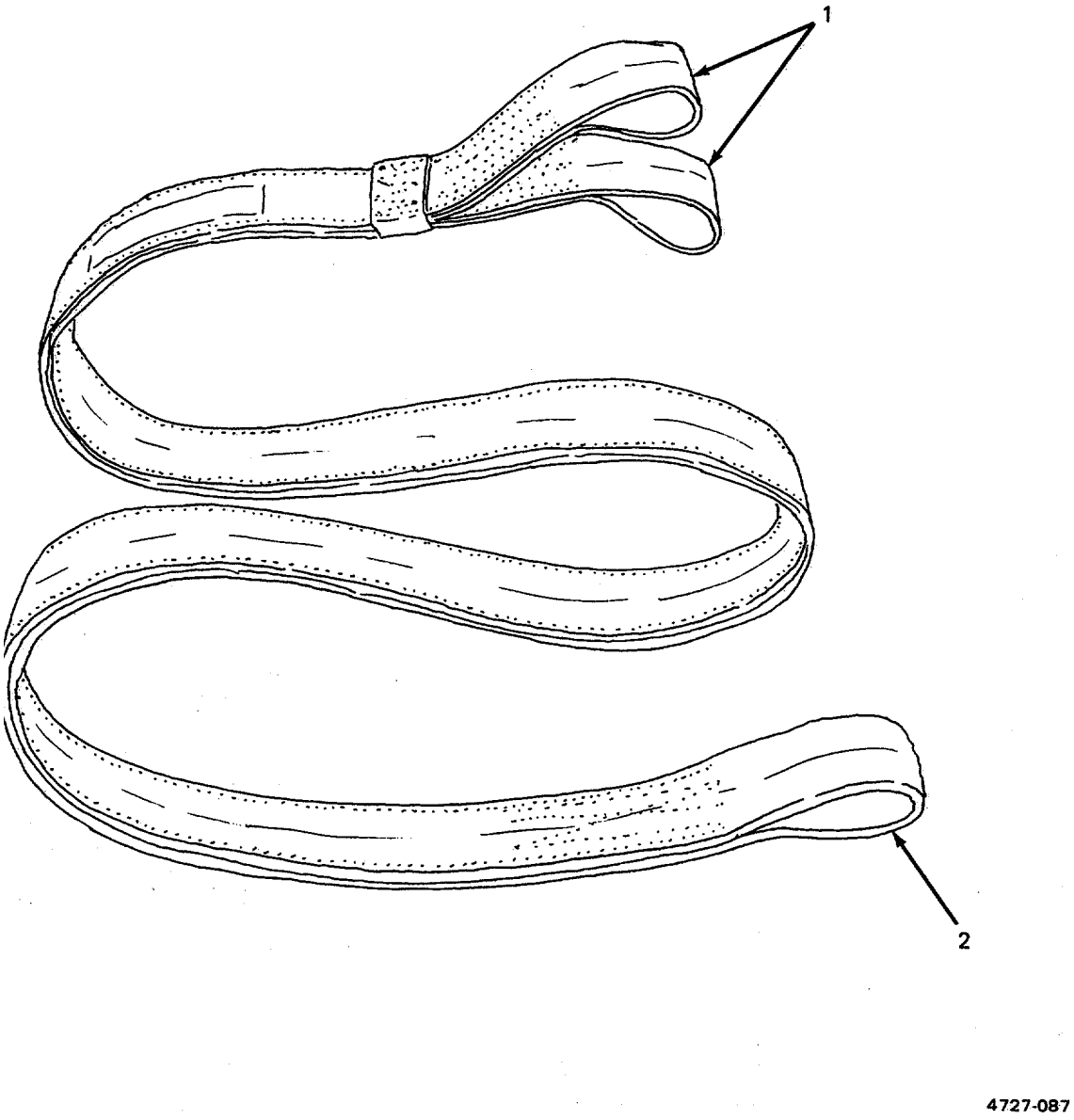


Figure C-4. Adapter Web, 36-Inch-Long.

SECTION II

(1) ITEM NO	(2) SMR CODE	(3) FSCM	(4) PART NUMBER	(5) DESCRIPTION AND USABLE ON CODES (UOC)	(6) QTY
				GROUP 03 ADAPTER WEB, 36-INCH-LONG	
				FIG. C-4 ADAPTER WEB, 36-INCH-LONG, 68C380-10	
1	M0000	81337	68C380-5	BUFFER, SHORT, MAKE FROM WEBBING, COTTON, MIL-W-5665, TYPE VIII, CLASS 2B, OD & THREAD, COTTON, TICKET 8/7, P/N V-T-276	2
2	M0000	81337	68C380-3	BUFFER, LONG, MAKE FROM WEBBING, COTTON, MIL-W-5665, TYPE X, CLASS 2B, OD & THREAD, COTTON, TICKET 8/7, P/N V-T-276	
				END OF FIGURE	

SECTION II

(1) ITEM NO	(2) SMR CODE	(3) FSCM	(4) PART NUMBER	(5) DESCRIPTION AND USABLE ON CODES (UOC)	(6) QTY
				GROUP 04 BULK MATERIALS	
				FIG. BULK	
1	PAOZZ	81348	MIL-C-7350	CLOTH, NYLON, PARACHUTE TYPE I, 2.25 OZ, OD	V
2	PAOZZ	81348	MIL-C-7515	CORD, FIBROUS, TYPE IV, OD	V
3	PAOZZ	81348	MIL-G-16491	GROMMET, METALLIC, TYPE I, CLASS I, SIZE 0	
4	PAOZZ	81349	MIL-T-5038	TAPE, NYLON, TYPE IV, 1-INCH WIDE, OD	V
5	PAOZZ	81348	V-T-295	THREAD, TYPE I, CLASS A, SIZE E, OD	V
6	PAOZZ	81348	V-T-295	THREAD, TYPE I, CLASS A, SIZE E, WHITE.	V
7	PAOZZ	81348	V-T-295	THREAD, TYPE I, CLASS A, SIZE FF, OD	V
8	PAOZZ	81349	MIL-W-4088	WEBBING, NYLON, TYPE VIII, CLASS R, OD	
9	PAOZZ	81348	MIL-W-4088	WEBBING, NYLON, TYPE II, 3/4-IN., NYLON, OD	V
10	PAOZZ	81348	MIL-W-5665	WEBBING, COTTON, TYPE VIII, CLASS 2B, OD	V
11	PAOZZ	81348	MIL-W-5665	WEBBING, TEXTILE, TYPE X, CLASS 2B, OD, MILDEW-RESISTANT	V
				END OF FIGURE	

Section III. SPECIAL TOOLS LIST

Not Applicable

SECTION IV

CROSS-REFERENCE INDEXES

NATIONAL STOCK NUMBER INDEX

STOCK NUMBER	FIG.	ITEM	STOCK NUMBER	FIG.	ITEM
1670-00-040-8215	C-1	3	8310-00-281-2898	BULK	5
8315-00-176-8083	BULK	4	1670-00-308-4221	C-3	5
1670-00-217-2421	C-2	7	8305-00-753-6086	BULK	11
8305-00-260-2564	BULK	8	1670-00-815-2727	C-1	2
8305-00-260-2565	BULK	10	4020-00-965-0435	BULK	2
8305-00-260-6910	BULK	9	5120-01-028-0945	BULK	3

SECTION V

CROSS-REFERENCE INDEXES

PART NUMBER INDEX

FSCM	PART NUMBER	STOCK NUMBER	FIG.	ITEM
81349	MIL-C-7350		BULK	1
81349	MIL-C-7515	4020-00-965-0435	BULK	2
81349	MIL-G-16491		C-3	1
81349	MIL-G-16491	5325-01-028-0945	BULK	3
81349	MIL-T-5038	8315-00-176-8083	BULK	4
81349	MIL-W-4088	8305-00-260-2564	BULK	8
81349	MIL-W-4088	8305-00-260-6910	BULK	9
81349	MIL-W-5665	8305-00-260-2565	BULK	10
81349	MIL-W-5665	8305-00-753-6086	BULK	11
96906	MS22002-7		C-2	8
96906	MS22002-1		C-2	7
81348	V-T-295		BULK	7
81348	V-T-295		BULK	6
81348	V-T-295	8310-00-281-2898	BULK	5
98750	54C6335	1670-00-308-4221	C-3	5
98750	57J6032		C-1	1
98750	57J6032-13		C-2	5
98750	57J6032-14		C-2	2
98750:	57J6032-15		C-2	3
98750	57J6032-16		C-2	6
98750	57J6032-17		C-2	1
98750	57J6032-18		C-2	4
98750	58J6100	1670-00-815-2727	C-1	2
81337	58J6100-5		C-3	9
81337	58J6100-6		C-3	10
81337	58J6100-7		C-3	2
81337	58J6100-10		C-3	7
81337	58J6100-11		C-3	6
81337	58J6100-17		C-3	3
81337	58J6100-18		C-3	8
81337	58J6100-19		C-3	4
81337	68C380-3:		C-4	2
81337	68C380-5		C-4	I
81337	68C380--10		C-1	3

APPENDIX D

EXPENDABLEIDURABLE SUPPLIES AND MATERIALS LIST

Section I. INTRODUCTION

D-1. Scope. This appendix lists expendable supplies and materials you will need to operate and maintain the 15-Foot-Diameter Cargo Extraction Parachute. These items are authorized to you by CTA 50-970, Expendable Items (Except Medical, Class V, Repair Parts, and Heraldic Items).

D-2. Explanation of Columns.

a. *Column (1) Item Number*. This number is assigned to the entry in the listing and is referenced in the narrative instructions to identify the material (e.g., "Use Cloth, Abrasive, Item 5, App. DI.

b. *Column (2) - Level*. This column identifies the lowest level of maintenance that requires the listed item. (Enter as applicable).

C - Operator/Crew
0 - Organizational Maintenance - Unit Maintenance
F - Direct Support Maintenance - Intermediate Maintenance
H - General Support Maintenance - Intermediate Maintenance
D - Depot Maintenance

c. *Column (3) - National Stock Number*. This is the National stock number assigned to the item; use it to request or requisition the item.

d. *Column (4) - Description*. Indicates the Federal item name, and, if required, a description to identify the item.

e. *Column (5) Unit of Measure (U/M).* Indicates the measure used in performing the actual maintenance function. This measure is expressed by a two-character alphabetical abbreviation (e.g., ea, in, pr). If the unit of measure differs from the unit of issue, requisition the lowest unit of issue that will satisfy your requirements.

Section II. EXPENDABLEIDURABLE SUPPLIES AND MATERIALS LIST

(1) Item number	(2) Level	(3) National stock number	(4) Description	(5) UIM
1	0	1670-00-568-0323	Band, Rubber Retainer (81349) MIL-B-1832, TY I	BX
2	0	9160-00-253-1171	Beeswax, Technical, 1 Lb (81349) C-B-191	LB
3	0	7920-00-282-2470	Brush, Scrub, Household (81349) H-B-1490	EA
4	0	7520-00-248-9285	Brush, Stenciling	EA

EXPENDABLEIDURABLE SUPPLIES AND MATERIALS LIST (cont)

(1) Item number	(2) Level	(3) National stock number	(4) Description	(5) UIM
5	0	5350-00-221-0872	Cloth, Abrasive, Ferric Oxide & Quartz (81349) P-C-458	SH
6	0	8305-00-765-2863	Cloth, Nylon, Duck, 7.25 Oz	YD
7	0	8305-00-641-4380	Cloth, Nylon, Parachute, Type I 2.25 Oz, OD, 60 Inch (81349) MIL-C7350	FT
8	0	4020-00-246-0688	Cord, Nylon, Type III, OD, (81349) MIL-C-7515	YD
9	0	4020-00-262-2019	Cord, Nylon, Type IV, OD (81349) MIL-C-7515	YD
10	0	7930-00-281-4731	Dishwashing Compound, Hand, Flake (81348) P-D-410	LB
11	0	7510-00-286-5362	Ink, Marking, Parachute, Strata-Blue (81349) MIL-I-6903	PT
12	0	9150-00-168-2000	Lubricant, Solid Film	
13	0	7520-00-230-2734	Marker, Felt Tip, Black (81348) GG-M-0014	EA
14	0		Medicine Dropper	EA
15	0		Paper, Three-Color, PH	SH
16	0	7520-00-491-2917	Pen, Ballpoint (81348) GG-B-0060	EA
17	0	7510-00-240-1525	Pencil, Marking Aid, White (81348) A-A-87	EA
18	0	7510-00-264-4612	Pencil, Marking Aid, Yellow (81348) A-A-87	EA
19	0	7920-00-205-3570	Rag, Wiping (81348) DDD-R-30	BE
20	0	6630-00-442-8000	Spool with Color Chart	EA
21	0	9310-00-160-7858	Stencil Board, Oiled, Type II (81348) UU-S-625	SH
22	0	831500-253-6292	Tape, Cotton, Type I, 1112 In. OD (81349) MIL-T-43566, Class 4	YD

EXPENDABLEIDURABLE SUPPLIES AND MATERIALS LIST (cont)

(1) Item number	(2) Level	(3) National stock number	(4) Description	(5) U/M
23	0	8315-00-176-8083	Tape, Nylon, Type III, 314 In. OD (81349) MIL-T-5038	YD
24	0	7510-00-633-0199	Tape, Pressure Sensitive, 1-In. (81348) PPP-T-60	RL
25	0	6810-00-270-9982	Tetrachloroethylene, Technical (81348) 0-T-236	RL
26	0	8310-00-917-3945	Thread, Cotton, Ticket No. 817, (81348) V-T-276	YD
27	0	8310-00-262-2770	Thread, Nylon, Size E, Natural White (81348) V-T-295 Type I, Class A	YD
28	0	8310-00-262-2772	Thread, Nylon, Size E, OD (81348) V-T-295 Type I, Class A	YD
29	0	8310-00-267-3024	Thread, Nylon, Size FF, Natural White (81348) V-T-295 Type I, Class A	YD
30	0	8310-00-227-1244	Thread, Nylon, Size FF, OD (81348) V-T-295 Type I, Class A	YD
31	0	8310-00-248-9714	Thread, Nylon, Size 3, Natural White (81348) V-T-295 Type I, Class A	YD
32	0	8310-00-267-3027	Thread, Nylon, Size 3, OD (81348) V-T-295 Type I, Class A	YD
33	0	9160-00-285-2044	Wax, Paraffin, 1 Lb Cake (81348) W-W-95, Type I, Grade A	LB
34	0	8305-00-268-2411	Webbing, Cotton, Type 1, 114 Inch (81349) MIL-T-5661	FT.
35	0	8305-00-260-2565	Webbing, Cotton, Type VIII, OD (81349)	
36	0	8305-00-753-6086	Webbing, Cotton, Type X, OD (81349) MIL-W-5665 Class 2B	YD
37	0	8305-00-260-6909	Webbing, Nylon, Type 1, 9116 In., OD (81349) MIL-W-4088	YD

EXPENDABLEIDURABLE SUPPLIES AND MATERIALS LIST (cont)

(1) Item number	(2) Level	(3) National stock number	(4) Description	(5) UIM
38	0	8305-00-263-3592 (81349) MIL-W-4088	Webbing, Nylon, Type II, 1 In. OD	YD
39	0	8305-00-261-8579 (81349) MIL-T-5038	Webbing, Nylon, Type IV, 1 In., OD	YD
40	0	8305-00-261-8585 MIL-W-4088	Webbing, Nylon, Type VIII, OD (81349)	YD
41	0	8305-00-263-2472 (81349), MIL-T-5038	Webbing, Nylon, Type IV, OD, 1 112 In.	YD

APPENDIX E

ILLUSTRATED LIST OF MANUFACTURED ITEMS

Complete instructions for making items authorized to be manufactured or fabricated are located in Chapter 2, Section VI of this manual. Fabricate a splicing aid in accordance with figure E-1.

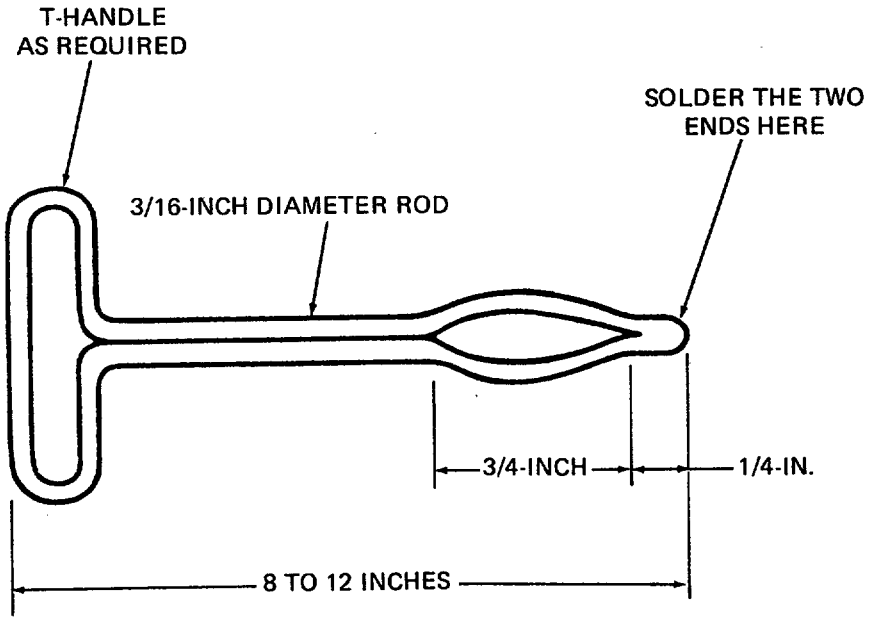


Figure E-1. Splicing Aid Fabrication.

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ARMY TM 10-1670-278-23&P
AIR FORCE T.O. 13C5-26-2
NAVY NAVAIR 13-1-27

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P.S.--IF YOUR OUTFIT WANTS TO KNOW ABOUT YOUR RECOMMENDATION MAKE A CARBON COPY OF THIS AND GIVE IT TO YOUR HEADQUARTERS.

The Metric System and Equivalents

Linear Measure

1 centimeter = 10 millimeters = .39 inch
1 decimeter = 10 centimeters = 3.94 inches
1 meter = 10 decimeters = 39.37 inches
1 dekameter = 10 meters = 32.8 feet
1 hectometer = 10 dekameters = 328.08 feet
1 kilometer = 10 hectometers = 3,280.8 feet

Weights

1 centigram = 10 milligrams = .15 grain
1 decigram = 10 centigrams = 1.54 grains
1 gram = 10 decigram = .035 ounce
1 decagram = 10 grams = .35 ounce
1 hectogram = 10 decagrams = 3.52 ounces
1 kilogram = 10 hectograms = 2.2 pounds
1 quintal = 100 kilograms = 220.46 pounds
1 metric ton = 10 quintals = 1.1 short tons

Liquid Measure

1 centiliter = 10 milliters = .34 fl. ounce
1 deciliter = 10 centiliters = 3.38 fl. ounces
1 liter = 10 deciliters = 33.81 fl. ounces
1 dekaliter = 10 liters = 2.64 gallons
1 hectoliter = 10 dekaliters = 26.42 gallons
1 kiloliter = 10 hectoliters = 264.18 gallons

Square Measure

1 sq. centimeter = 100 sq. millimeters = .155 sq. inch
1 sq. decimeter = 100 sq. centimeters = 15.5 sq. inches
1 sq. meter (centare) = 100 sq. decimeters = 10.76 sq. feet
1 sq. dekameter (are) = 100 sq. meters = 1,076.4 sq. feet
1 sq. hectometer (hectare) = 100 sq. dekameters = 2.47 acres
1 sq. kilometer = 100 sq. hectometers = .386 sq. mile

Cubic Measure

1 cu. centimeter = 1000 cu. millimeters = .06 cu. inch
1 cu. decimeter = 1000 cu. centimeters = 61.02 cu. inches
1 cu. meter = 1000 cu. decimeters = 35.31 cu. feet

Approximate Conversion Factors

To change	*To*	*Multiply by*	*To change*	*To*	*Multiply by*
inches	centimeters	2.540	ounce-inches	Newton-meters	.007062
feet	meters	.305	centimeters	inches	.394
yards	meters	.914	meters	feet	3.280
miles	kilometers	1.609	meters	yards	1.094
square inches	square centimeters	6.451	kilometers	miles	.621
square feet	square meters	.093	square centimeters	square inches	.155
square yards	square meters	.836	square meters	square feet	10.764
square miles	square kilometers	2.590	square meters	square yards	1.196
acres	square hectometers	.405	square kilometers	square miles	.386
cubic feet	cubic meters	.028	square hectometers	acres	2.471
cubic yards	cubic meters	.765	cubic meters	cubic feet	35.315
fluid ounces	milliliters	29,573	cubic meters	cubic yards	1.308
pints	liters	.473	milliliters	fluid ounces	.034
quarts	liters	.946	liters	pints	2.113
gallons	liters	3.785	liters	quarts	1.057
ounces	grams	28.349	liters	gallons	.264
pounds	kilograms	.454	grams	ounces	.035
short tons	metric tons	.907	kilograms	pounds	2.205
pound-feet	Newton-meters	1.356	metric tons	short tons	1.102
pound-inches	Newton-meters	.11296			

Temperature (Exact)

°F	Fahrenheit temperature	5/9 (after subtracting 32)	Celsius temperature	°C

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