

**TECHNICAL MANUAL**

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

**FOR**

**PARACHUTE, CARGO TYPE: 64-FOOT  
DIAMETER, MODEL G-12D,  
NSN 1670-00-893-2371  
AND MODEL G-12E,  
NSN 1670-01-065-3755**

**This copy is a reprint which includes current  
pages from Changes 1 through 4.**

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**HEADQUARTERS, DEPARTMENTS OF THE ARMY,  
AIR FORCE AND NAVY  
1 OCTOBER 1990**



**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.

**WARNING**

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 where using petroleum products to destroy equipment by fire, as severe burns or DEATH could result.

**WARNING**

FIRST AID

For First Aid treatment, refer to FM 21-11

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ARMY TM 10-1670-281-23&P  
AIR FORCE T.O. 13C5-32-2  
NAVY NAVAIR 13-1-32

CHANGE  
NO. 6

HEADQUARTERS, DEPARTMENT OF THE ARMY  
WASHINGTON, DC, 31 AUGUST 2005

TECHNICAL MANUAL

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

FOR  
PARACHUTE, CARGO TYPE: 64-FOOT DIAMETER

MODEL G-12D                    1670-00-893-2371  
MODEL G-12E                    1670-01-065-3755

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**AIR FORCE T.O. 13C5-32-2**  
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**C6**

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AIR FORCE T.O. 13C5-32-2  
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C5

**CHANGE**

**No. 5**

**HEADQUARTERS, DEPARTMENTS OF  
THE ARMY, AIR FORCE, AND THE NAVY  
WASHINGTON, D.C., 23 May 1997**

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

**for**

**Parachute, Cargo Type: 64-Foot  
Diameter, Model G-12D  
NSN 1670-00-893-2371 and  
Model G-12E, NSN 1670-01-065-3755**

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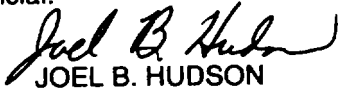
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NO. 4

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

for

**Parachute, Cargo Type: 64-Foot  
Diameter, Model G-12D  
NSN 1670-00-893-2371 and  
Model G-12E, NSN 1670-01-065-3755**

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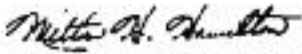
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Unit and Intermediate Direct Support (DS)  
Maintenance Manual (Including Repair Parts  
and Special Tools List)

For

PARACHUTE, CARGO TYPE: 64-FOOT  
DIAMETER, MODEL G-12D,  
NSN 1670-00-893-2371  
AND MODEL G-12E,  
NSN 1670-01-065-3755

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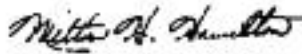
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Unit and Intermediate Direct Support (DS)  
Maintenance Manual (Including Repair Parts  
And Special Tools List)

For

PARACHUTE, CARGO TYPE: 64-FOOT  
DIAMETER, MODEL G-12D,  
NSN 1670-00-893-2371  
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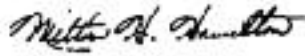
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CHANGE

NO. 1

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

**PARACHUTE, CARGO TYPE: 64-FOOT DIAMETER**  
**MODEL G-12D**  
**NSN 1670-00-893-2371**  
**AND MODEL G-12E**  
**NSN 1670-01-065-3755**

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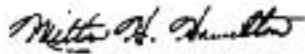
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**TECHNICAL MANUAL**

**HEADQUARTERS, DEPARTMENTS OF  
 THE ARMY, AIR FORCE, AND NAVY  
 WASHINGTON, D.C., 1 October 1990**

**NO. 10-1670-281-23&P**

**Unit and Intermediate Direct Support (DS) Maintenance Manual  
 (Including Repair Parts and Special Tads List)**

for

**PARACHUTE, CARGO TYPE: 64-FOOT DIAMETER  
 MODEL G-12D, NSN 1670-00-893-2371  
 AND MODEL G-12E, NSN 1670-01-065-3755  
 Current as of 26 June 1990**

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**ARMY TM 10-1670-281-23&P**  
**AIR FORCE T.O. 13C5-32-2**  
**NAVY NAVAIR 13-1-32**

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**CHAPTER 1**

**INTRODUCTION**

	Page
Section I. General .....	1-1
Section II. Equipment Description and Data .....	1-5

**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**

Paragraph	Page
1-1 Scope .....	1-1
1-2 Maintenance Forms and Records .....	1-4
1-3 Destruction of Army Materiel to Prevent Enemy Use .....	1-4
1-4 Preparation for Storage or Shipment .....	1-5
1-5 Reporting of Equipment Improvement Recommendations (EIR) .....	1-5

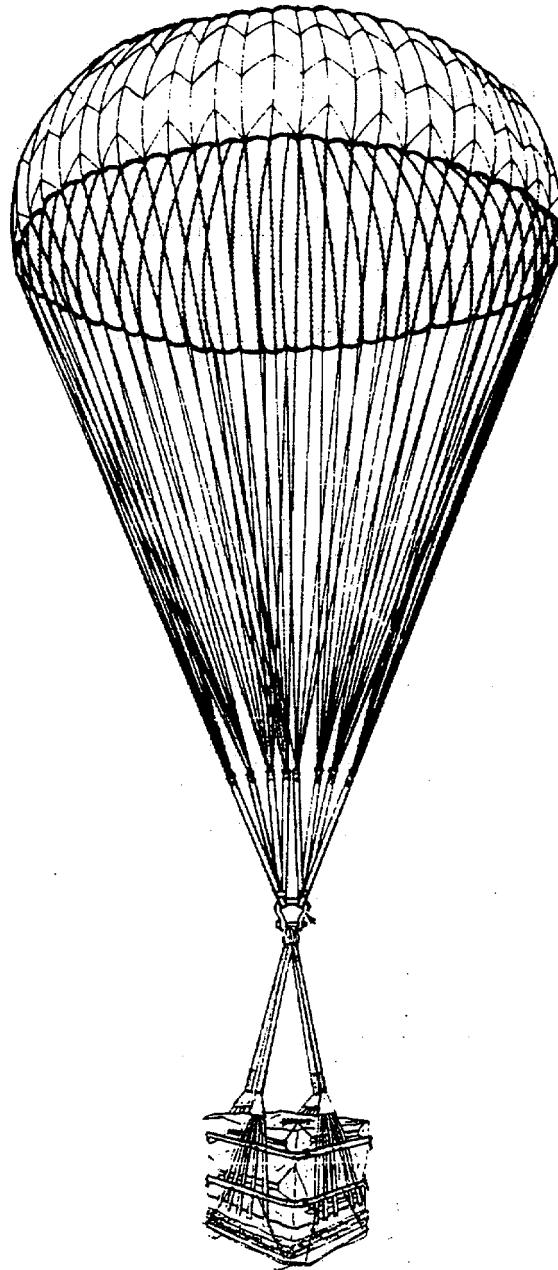
**1-1. Scope.** The scope of this manual is described in the following subparagraphs.

*a. Type of Manual.* This manual provides unit and intermediate direct support (DS) maintenance instructions for parachutes NSN 1670-00-893-2371 and NSN 1670-01-065-3755, shown 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.* 64-Foot Diameter Cargo Parachute, Model G-12D and Model G-12E, hereinafter called 64-Foot Cargo Parachute.

*c. Purpose of Equipment.* The parachute is designed for medium capacity use with the A-22 Air Delivery Cargo Bag and with variations of platform rigged loads.

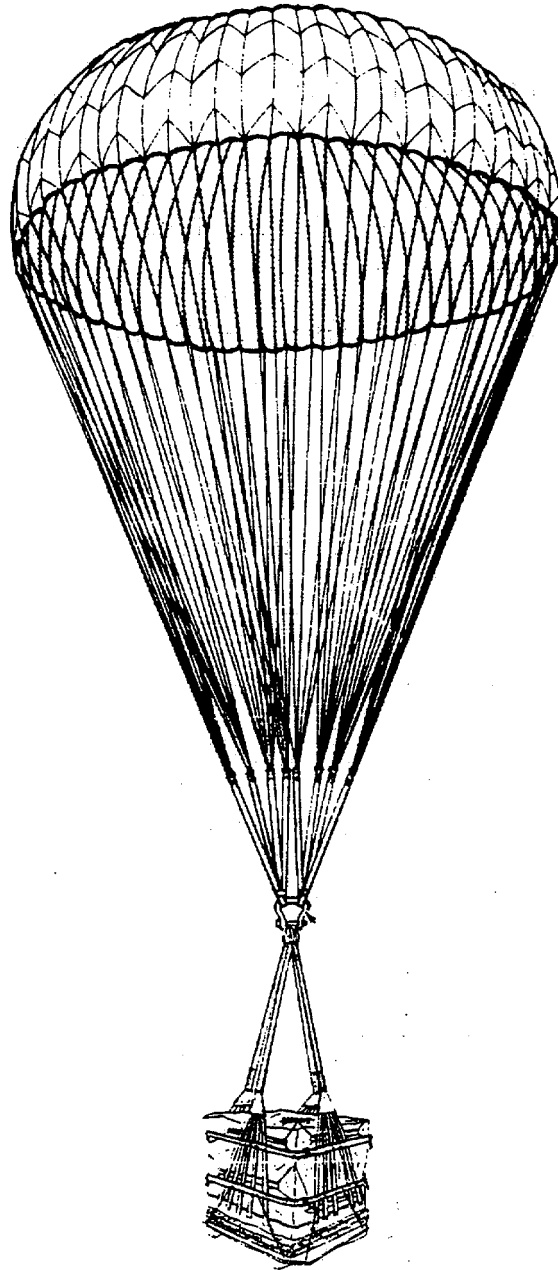
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4839-001

*Figure 1-1. 64-Foot Diameter Cargo Parachute Assembly, Model G-12D, NSN 1670-00-893-2371.*

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4839-002

*Figure 1-2. 64-Foot Diameter Cargo Parachute Assembly, Model G- 12E, NSN 1670-01-065-3755.*

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**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 DA PAM 738-751, The Army Maintenance Management System - Aviation.

**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 delivery 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 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-QX, 4300 Goodfellow Blvd., St. Louis, MO 63120-1798. We will send y6u a reply.

## SECTION II. EQUIPMENT DESCRIPTION AND DATA

Paragraph	Page
1-6	Equipment Characteristics, Capabilities and Features ..... 1-5
1-7	Location and Description of Major Components ..... 1-5
1-8	Differences Between Models ..... 1-11
1-9	Equipment Data ..... 1-11
1-10	Safety, Care and Handling ..... 1-12

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

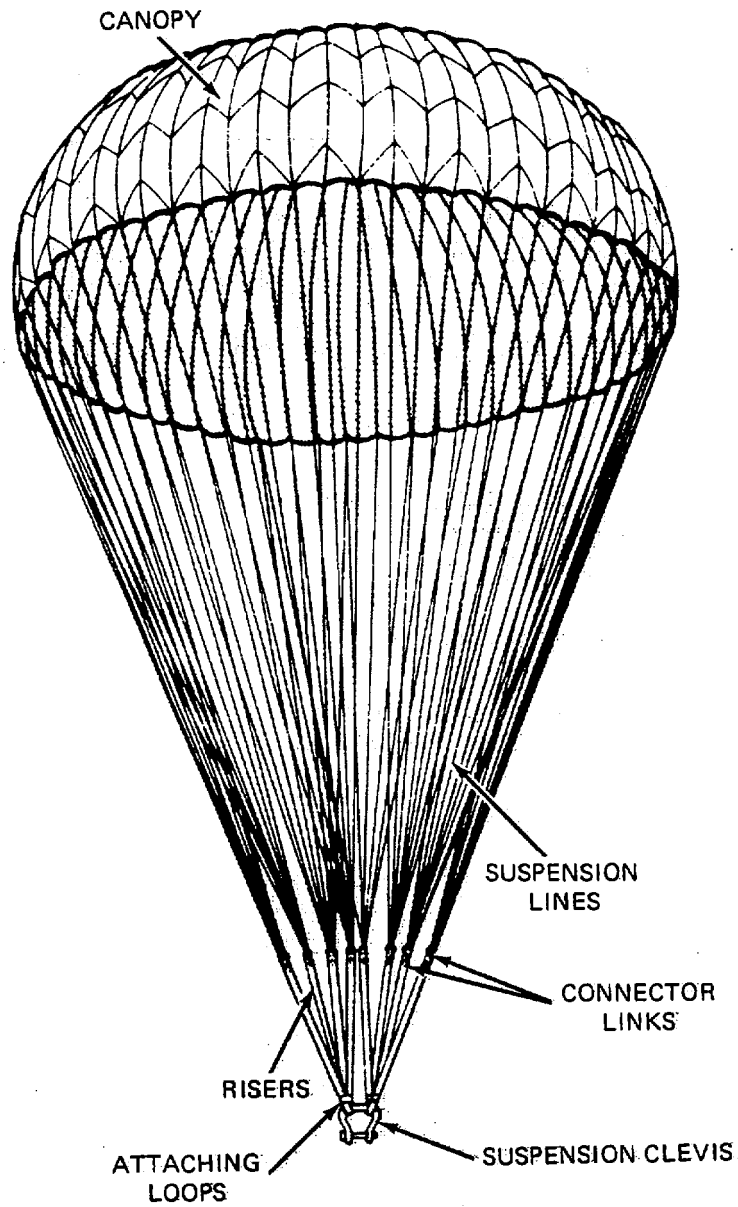
a. Characteristics. A heavy capacity parachute designed for the air delivery of bulk-type platform loads.

b. Capabilities and Features.

- (1) Capable of supporting 2200 pounds.
- (2) Can be used for air delivery of fragile items.
- (3) Designed for deceleration and stabilization of bulk-type platform air delivery cargo loads.

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

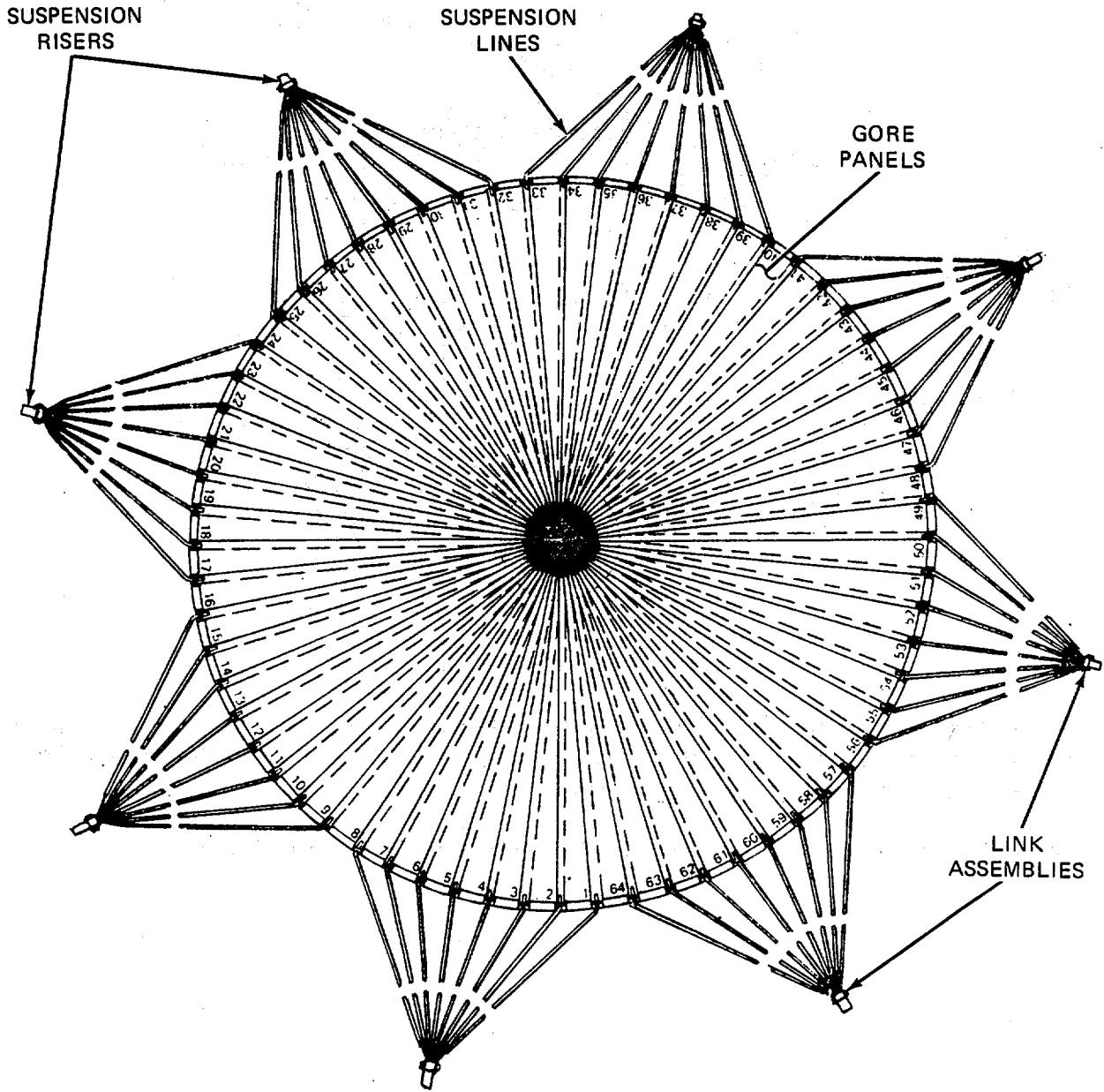
a. Canopy. The canopy (figure 1-3) consists of a 64-foot diameter flat-circular nylon canopy, with gores and suspension lines numbered clockwise when viewed from the canopy vent (figure 1-4); and two riser assemblies, each composed of four suspension risers, terminating in two riser attaching loops connected to a suspension clevis. Each of the 8 suspension risers is connected to 8 consecutively numbered suspension lines by a link assembly.



4839-003

*Figure 1-3. Parachute Canopy Assembly.*



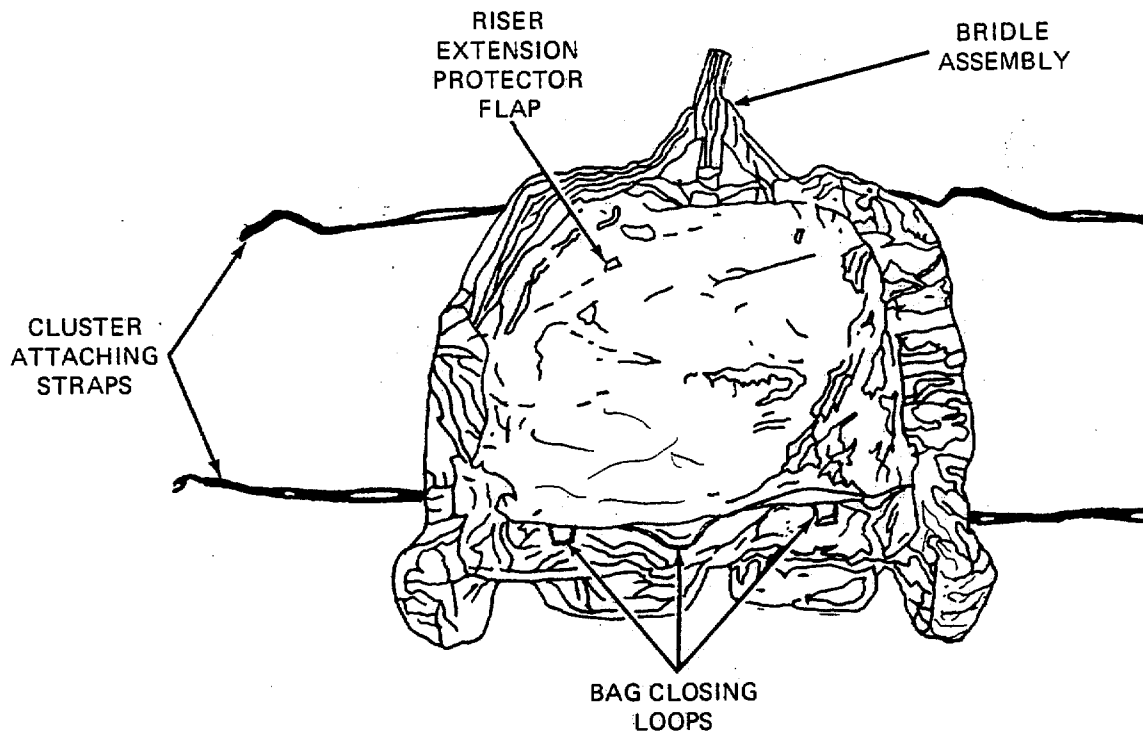


4839-004

Figure 1-4. Suspension Line and Gore Panel Arrangement and Numbering.

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b. Deployment Bag. The deployment bag (figure 1-5) is of the locking-closure type. It is used for packing the G-12D and G-12E parachutes.

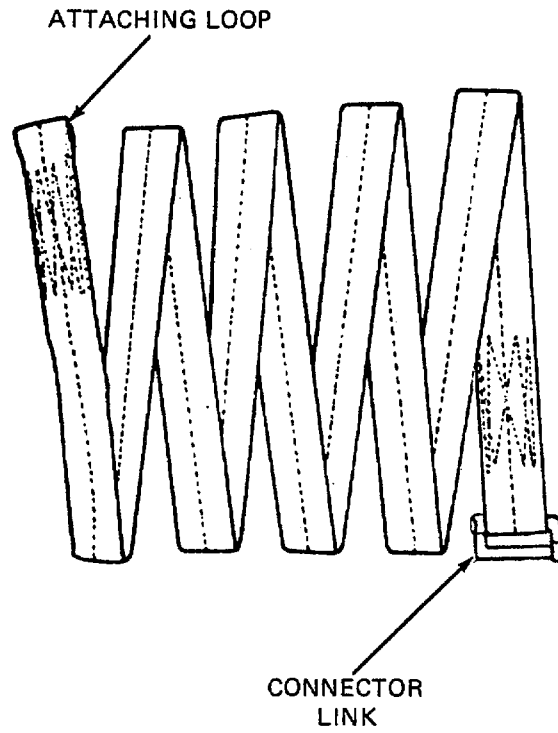


4839-005

Figure 1-5. Deployment Bag.

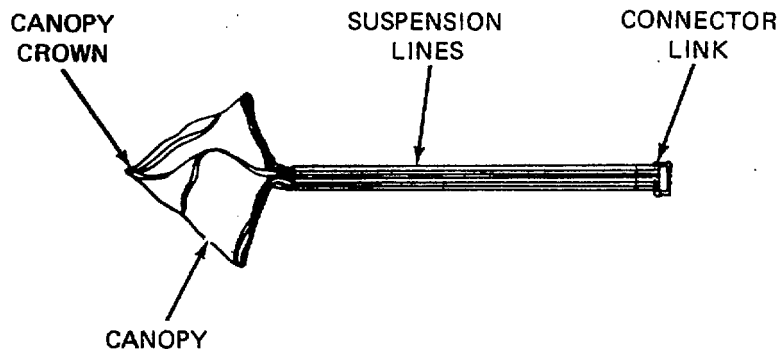
c. Deployment Line. Pilot Chute and Static Line. The 111 -inch long deployment line (figure 1 -6), the 68-inch diameter pilot chute (figure 1-7) and the 15-foot long static line (figure 1-8) are used with the G-12D and G-12E parachutes when the A-22 Air Delivery Cargo Bag is used.

d. 57-Foot Center Line (figure 1-9). Used with G-12E parachute to pull down canopy vent.



4839-006

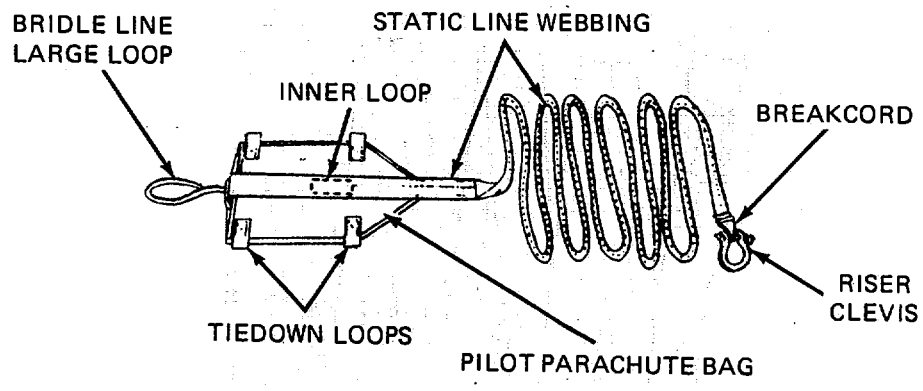
*Figure 1-6. 111-Inch Long Deployment Line.*



4839-007

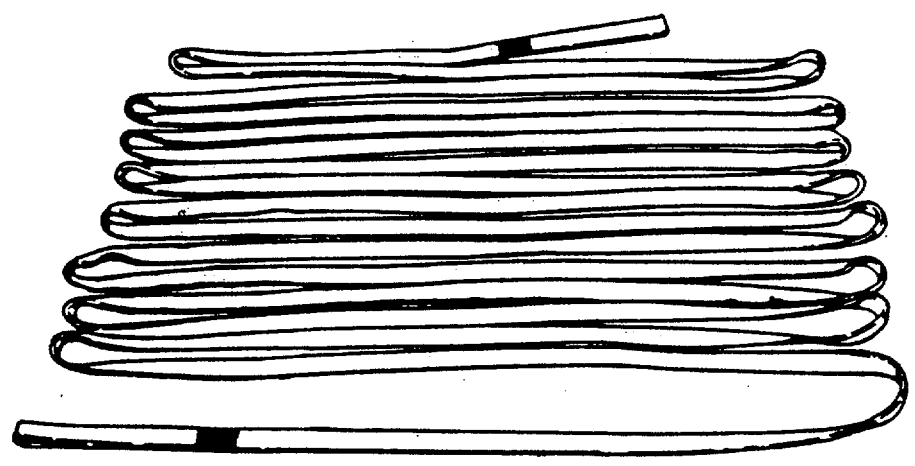
*Figure 1-7. 68-Inch Diameter Pilot Parachute.*

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4839-008

Figure 1-8. 68-Inch Diameter Pilot Parachute Static Line.



4839-009

Figure 1-9. 57-Foot Centerline (Model G- 12E only).

**1-8. Differences Between Models.**

Model	Difference
G-12D	No centerline.
G-12E	Uses 57-foot centerline to pull down canopy vent

**1-9. Equipment Data.** The following listing summarizes the specific capabilities and limitations of the equipment and other critical data needed by the unit and intermediate direct support (DS) maintenance personnel for maintenance of the 64-foot cargo parachute.

**a. General.**

Total weight (packed for use) .....	128 pounds
Dimensions (packed for use) .....	24-inches wide by 35-inches long by 12-inches high
Cube (packed for use) .....	5.7 cubic feet

**b. Canopy Assembly.**

Shape .....	Flat-circular
Diameter .....	64 feet
Number of gores .....	64
Number of sections per gore .....	8
Gore material .....	Type I, 2.25-ounce nylon parachute cloth
Number of canopy lines .....	32
Canopy line material .....	Type IV coreless nylon cord
Number of suspension lines .....	64
Number of radial lines .....	64
Number of vent lines .....	32
Number of suspension line reinforcements (v-tabs) .....	64
Number of pocket bands .....	64
Number of risers .....	2
Number of connector links .....	8
Number of 3/4-inch suspension devices used .....	1
Radial seam reinforcement tapes .....	192 (when present)

**c. Deployment Bag.**

Type bag .....	Locking-closure
Bag dimensions .....	24-inches wide by 36-inches by 10-inches high

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*d. Pilot Parachute.*

shape .....	Rat-octagonal
Diameter .....	68 inches
Canopy material .....	Type 1, 1.1-or type II, 1.6-ounce nylon cloth
Number of suspension lines .....	8
Suspension line material .....	Type III nylon cord or type II coreless nylon cord
Number of connector links .....	1

*e. Deployment Line*

Length .....	111 inches
Number of connector links .....	1

*f. Static Line.*

Length .....	15 feet
Tiedown loops .....	4
Number of riser clevises used .....	1

*g. Center Line.*

Material ..... Type V nylon webbing

**1-10. Safety, are, and Handing.**

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 warning 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 parachute as metal parts could cause personal injury.
- (2) Remove ail 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 for for prolonged periods 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**

	Page
Section I. Repair Parts, Special Tools, Test Measurement and Diagnostic Equipment (TMDE) and Support Equipment.....	2-1
Section II. Service Upon Receipt .....	2-2
Section III. Assembly .....	2-8
Section IV. Preventive Maintenance Checks and Services (PMCS) .....	2-8
Section V. Unit and Intermediate Direct Support (DS) Maintenance Procedures .....	2-11
Section VI. Repair .....	2-105
Section VII. Preparation for Storage or Shipment .....	2-215

**OVERVIEW**

This chapter contains information necessary to maintain the 64-Foot Diameter Cargo 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**

Paragraph	Page
2-1 Common Tools and Equipment .....	2-1
2-2 Special Tools, TMDE and Support Equipment .....	2-2
2-3 Repair Parts .....	2-2

**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

Paragraph	Page
2-4 Initial Receipt .....	2-2
2-5 Receipt of Used Parachute.....	2-8
2-6 After-Use Receipt .....	2-8
2-7 Checking Unpacked Equipment After Shipment.....	2-8

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

*a. General Procedures for 64-Foot Diameter Cargo 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 2-13. Upon completion of the inspection, the item(s) will be tagged as prescribed in DA PAM 738-751. 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.

*b. Inspection Personnel.* Personnel other than parachute rigger personnel may assist in the unpacking process of initially received parachutes as directed by the local air delivery 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 contracts are authorized to make deviations in material and construction techniques. Air delivery 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 10-42 or 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

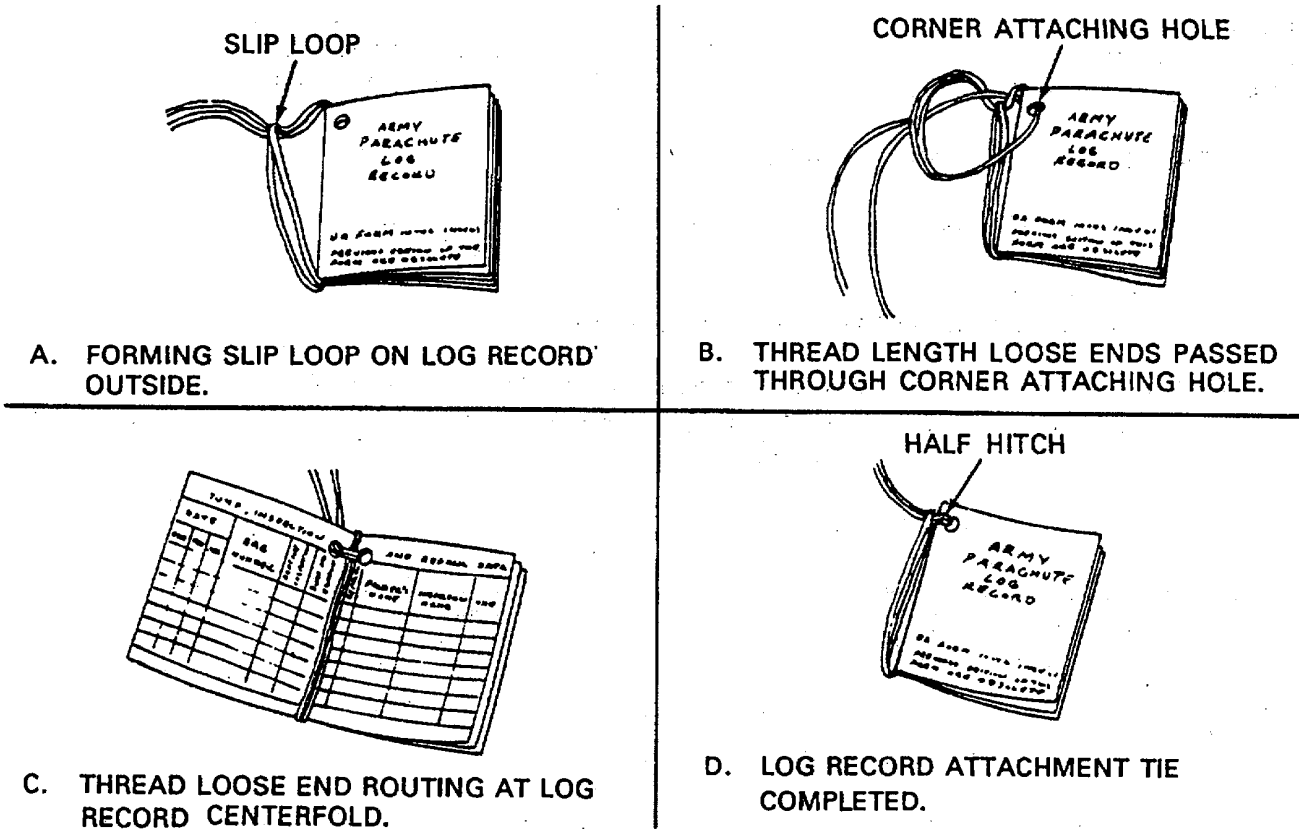


removed or separated from a parachute, and especially a packed parachute, except as directed by the local air delivery equipment maintenance activity officer. A log record which is illegible, lost, damaged, soiled, or precludes further entries due to lack of space will be replaced upon the next repack 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 double thread length around the centerfold of the log record and form a sliploop 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 (D, figure 2-1) 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 record attaching loop by securing the two thread 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.

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 NAVY NAVAIR 13-1-32



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

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 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.



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(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).

MODIFICATION WORK ORDER		COMPLIANCE RECORD			
MWO NUMBER	MWO TITLE	MODIFIED BY (Name)	INSP. BY	UNIT	DATE
					DAY - MO - YR
10-1670-281-23&P 1 JUN 72	ENLARGE ORIFICE	Evans	Jab	101	25 7 71
10-1670-281-23&P 8 JUN 72	ENLARGE ORIFICE	C/W			25 10 72

1. MODIFICATION WORK ORDER COMPLIANCE COMPLETED.

2. MODIFICATION COMPLETED BY UNKNOWN DUE TO LOST ORIGINAL LOG RECORD.

4839-013

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 2-4).
- (b) *MWO title.* Enter a short, abbreviated title extracted from the MWO prescribing the work.
- (c) *Modified by.* Enter the last name of the individual who has performed the modification. 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 canopy 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 canopy 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, repair accomplishment, Technical Bulletin Inspection compliance.
- (b) *Inspection by.* The individual who accomplished the inspection required will sign this entry with last name.

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- (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.

UNIT & INTERMEDIATE	REPAIR & INSPECTION DATA				
TYPE OF REPAIR	REP BY	UNIT	DATE		
			DAY	MO	YR
INITIAL INSPECTION	Diff	TRACON	2		87
2 SEC. and 4 Lines R/WED	Evans	TRACON	3		87
TB 10-1670-213-205	Morley	TRACON	4		87

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

4839-014

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 canopy assembly (figure 2-6). This shall also include the month and year the item was placed in service.

**NOTES**

○

RISER MFG. DATE: JAN '86

PLACED IN SERVICE: MAR. '86

IMMERSED IN SALT WATER: 26/10/86

RINSED 27/10/86

4839-015

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 not used, it does not need to be given a shakeout, however, it must be 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 Form 364, Packing Improvement Report.
- b. Check the equipment against the packing slip to see if the shipment is complete. Report all discrepancies in accordance with the instructions in DA PAM 738-750.
- c. Check to see whether the equipment has been modified.

### **Section III. ASSEMBLY**

Paragraph	Page
2-8      Assembly of the 64-Foot Cargo Parachute .....	2-8

**2-8. Assembly of the 64-Foot Cargo Parachute.**

#### **NOTE**

The procedure for assembling components of the parachute is incorporated in paragraphs 2-16 and 2-17.

### **SECTION IV. PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS)**

Paragraph	Page
2-9      PMCS Procedures .....	2-8

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

- a. General. Table 2-1 lists preventive maintenance checks and services. The purpose of PMCS is to assure that the 64-Foot Cargo 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 Number' column on DA Form 2404 (Equipment Inspection and Maintenance Worksheet) when recording the results of PMCS.

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

(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. Record Defects. All defects discovered during the inspection will be recorded using the applicable specifics in DA Pamphlet 738-750, DA Pamphlet 738-751, and TB 43-0002-43 Maintenance Expenditure Limits for FSC Group 16 (FSC Class 1670).

e. Overage items. The 64-foot parachute has no age or service life.

f. Inspection Function Requirement. Normally, a technical/rigger-type inspection will be performed by air delivery 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 surface 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. 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

A parachute that is found to be unserviceable by a packing or rigging activity will have the canopy S-folded in its deployment bag and the suspension lines daisy chained and placed on top of the canopy prior to being sent to a repair activity.

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

Item No.	Interval			Item to be inspected	Procedures
	B - Before	D - During	A - After		
					<b>NOTE</b>
					Any defective material noted must be repaired prior to use.
1	•			The 64-Foot-Diameter Cargo Parachute Parachute Packed for Use	Visually check visible parts for serviceability and completeness without opening deployment bag. Check parachute inspection data record for pack date.
2	•		•	Canopy	As canopy is inflated for shakeout, remove all debris by hand using a suitable broom or brush. Also 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, burns, cuts, breaks, frays, tears, holes, thin spots, loose weaving; loose or broken stitching, tacking and lines; freedom of lines in radial seams; raveled ends.
	•		•	Hardware Components	Corrosion, rough spots, burrs, breaks, cracks, bends; loose or missing screws and nuts; stripped or damaged threads.
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, burns, cuts, breaks, frays, tears, holes; loose or broken stitching.



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

Item No.	Interval			Item to be inspected	Procedures
	B	D	A		
4	•		•	Pilot Parachute (68-Inch Diameter), Deployment Line (111-Inch Long), and Static Line  Pilot Parachute Packed for Use (complete)  Fabric Materials  Hardware Components	Visually check visible parts for serviceability and completeness without opening the pack.  Completeness; dampness, fungus, dirt, acid, grease, oil, foreign material, rips, burns, cuts, breaks, frays, tears, holes, loose weaving; loose or broken stitching, tacking, or lines.  Corrosion, rough spots, burrs, breaks, bends; stripped or damaged threads; loose or missing screws, pins, and tie cord.

**SECTION V. UNIT AND INTERMEDIATE DIRECT SUPPORT (DS)  
 MAINTENANCE PROCEDURES**

Paragraph	Page
2-10      General Information .....	2-11
2-11      Shakeout and Airing .....	2-12
2-12      Cleaning and Drying .....	2-15
2-13      Inspection .....	2-19
2-14      Acidity Test.....	2-22
2-15      Salt-Water Contamination Test.....	2-23
2-16      Packing the 64-Foot Cargo Parachute, Model G12-D.....	2-24
2-17      Packing the 64-Foot Cargo Parachute, Model G12-E.....	2-61

**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**

---

### **INITIAL SETUP:**

**Tools:**

Brush, Scrub, Household, Item 1, Appendix B  
Broom, Item 26, Appendix B  
Fan, Pedestal, Item 27, Appendix B

**Equipment Condition:**

Parachute suspended or inflated

---

a. Shakeout. The shakeout will be accomplished by a two- or three-person team either indoors within a shakeout room or outdoors at a shakeout tower. If facilities permit, shakeout will be accomplished by suspending the canopy as described in (1), below. If facilities do not permit canopy suspension, the canopy will be inflated and shakeout will be accomplished as described in (2), below.

(1) Canopy suspension method. Each parachute will be suspended by the canopy vent and all debris removed by shaking the canopy thoroughly or by brushing with a dry, soft-bristled brush as detailed below:

- (a) With assistance from No. 2 person, No. 1 person will connect snap on a pulley rope to canopy bridle loop (A, figure 2-7).
- (b) Through use of pulley rope, No. 2 person will raise canopy to a suitable height which will enable No. 1 person to perform shakeout on each canopy gore. Until gore shaking process is completed, No. 2 person will maintain a steady pull on pulley rope to hold suspended canopy at working height needed by No. 1 person.
- (c) No. 1 person will grasp any two consecutive suspension lines, one in each hand (B, figure 2-7), and vigorously shake first gore. When gore is free of debris, No. 1 person passes line from right hand to left hand and grasps next consecutive suspension line in right hand. No. 1 person will shake out each consecutive gore until all suspension lines are held in left hand and all gores are free of debris.
- (d) Once gore shaking process is completed, No. 2 person will slowly raise suspended canopy higher as No. 1 person clears suspension lines and risers of debris and removes entanglements (C, figure 2-7) when possible.
- (e) After suspension lines have been cleared, No. 2 person may hold or temporarily secure pulley rope while No. 1 person proceeds to clear debris from other parachute components.
- (f) When all components are free of debris, No. 2 person will slowly lower canopy while No. 1 person S-folds suspension lines and risers into deployment bag (D, figure 2-7). After suspension lines and risers have been completely folded, No. 1 person will accordion-fold canopy length on top of folded lines.
- (g) As canopy folding is being completed, No. 1 person disconnects canopy vent from pulley rope snap. Secure folded canopy assembly for further handling.

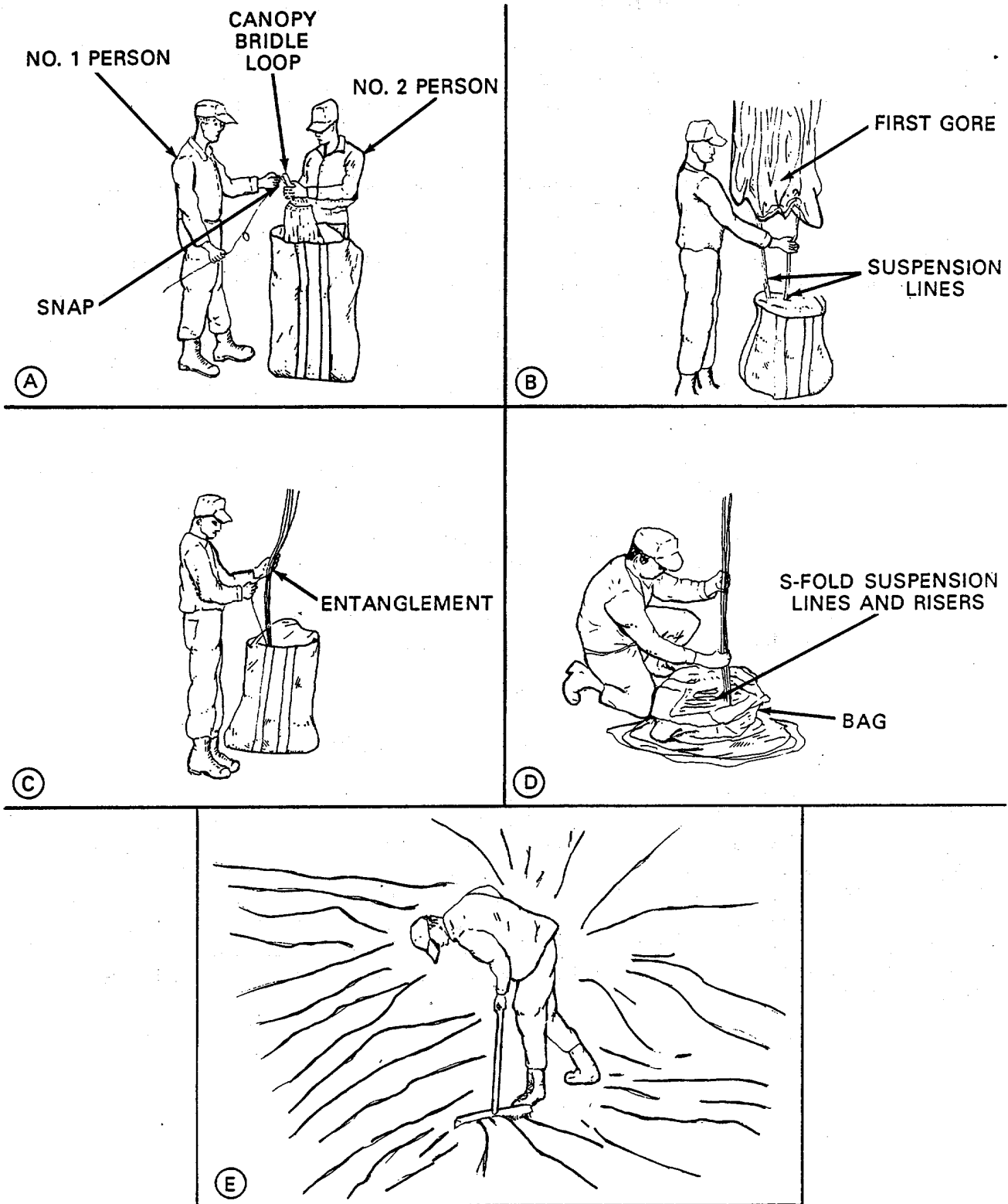


Figure 2-7. Shakeout.

4839-016

## 2-11. Shakeout and Airing (cont).

(2) *Canopy inflation method.* The shakeout will be accomplished by a three-person team, either indoor within a shakeout room or outdoors at a suitably-sized shakeout area. Each parachute canopy will be inflated and all debris removed by shaking the canopy thoroughly or by brushing with a dry soft-bristled brush or broom, as detailed below:

- (a) The No. 1 person will position a large pedestal fan at a point 10 feet below the canopy skirt so the airstrip will partially inflate the canopy.
- (b) The No. 2 person will enter the inflated canopy with a broom or fine-bristled brush and sweep the inside surfaces of accumulated debris (E, figure 2-7).
- (c) The No. 1 person will grasp the first available suspension line, holding it high above the head while holding the next consecutive suspension line with the foot. The No. 3 person on the outside of the canopy and the No. 2 person on the inside will sweep or brush accumulated debris from the exposed canopy gore.
- (d) As each gore is cleared of debris, the No. 1 person will continue to expose the next consecutive gore to the sweeping or brushing process until all gores are free of debris.
- (e) Once the gore sweeping or brushing process is complete, the No. 2 person will exit the canopy, shut down the pedestal fan and continue to clear accumulated debris from the suspension lines and risers.
- (f) When all components are free of debris, the No. 1 person will S-fold the canopy, suspension lines and risers into a deployment bag, while the No. 2 person holds the bag open.

### 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 more frequently. 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 air delivery 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 objects which would not cause damage.

---

## 2-12. Cleaning and Drying.

---

**This task covers:**

- |  |                                      |
|--|--------------------------------------|
| a. Cleaning fabric items with cleaning solvent     | c. Equipment immersed in salt water  |
| b. Cleaning fabric items with dishwashing compound | d. Equipment immersed in fresh water |
|  | e. Drying fabric items               |
|  | f. Cleaning metal items              |
- 

**Tools:**

Brush, Scrub, Household, Item 1, Appendix B

**Equipment Condition:**

Layout on packing surface or other suitable area.

**Materials/Pans:**

Tetrachloroethylene, Item 35, Appendix D  
Dishwashing Compound, Item 17, Appendix D  
Rag, Wiping, Item 27, Appendix D  
Lubricant, Solid Film, Item 19, Appendix D  
Cloth, Abrasive, Item 2, Appendix D

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**Special Environmental Condition:**

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

### 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 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.

## 2-12. Cleaning and Drying (cont).

### 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 tetrachloroethylene.
  - (a) Rub soiled area with a clean cloth dampened with tetrachloroethylene.
  - (b) Rinse cleaned area by repeating the rubbing process with clean portion of cloth dampened with the cleaning solvent.

### NOTE

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

b. Cleanup 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 1/2 cup of dishwashing compound in one gallon of warm water.
  - (b) Rub soiled area with a clean cloth dampened with solution of dishwashing compound.
  - (c) Rinse cleaned area by repeating rubbing process with a clean portion of cloth dampened with the dishwashing compound.

### NOTE

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

#### NOTE

Any equipment made of cotton fabric immersed in salt water is to be condemned. See paragraph 2-13e for equipment disposition.

c. Parachute Assemblies Immersed in Salt Water. If the parachute, or any of its components, has been immersed in salt water for a period in excess of 24 hours it will be condemned. Additionally, if the parachute, or any of its nylon components, has been immersed in salt water for a period of less than 24 hours, but cannot be rinsed within 48 hours after recovery, R will also be condemned. However, if the cited time limitations can be met, then immediately upon recovery, suspend or elevate the parachute assembly in a shaded area and allow it to drain for at least 5 minutes. Do not attempt to wring the fabric or the suspension lines. Within 48 hours after recovery, under the supervision of a qualified parachute rigger (43E), rinse the recovered parachute assembly as follows:

- (1) Place the parachute assembly into a large water-tight container filled with a suitable amount of fresh, clean water to cover the assembly.

#### NOTE

If the salt-water-soaked parachute assembly is too large to be placed into a rinsing container, then the rinsing process will be effected by applying fresh, clean water to the assembly using a hose.

- (2) Agitate the container contents by hand for 5 minutes.
- (3) Remove the parachute assembly from the container and suspend or elevate it in a shaded area, allowing a 5-minute drainage period. Do not attempt to wring the fabric or the suspension lines.
- (4) Repeat the procedures in steps (1) through (3), above, twice, using fresh, clean water for each rinse.
- (5) After the third rinse, allow the parachute assembly to drain thoroughly. Upon completion of draining, dry the assembly in accordance with procedures in e., below.
- (6) When dried, perform a technical/rigger-type inspection of the parachute assembly. Corroded metal components, or corrosion-stained fabrics or suspension lines will be either repaired or replaced as prescribed by the Maintenance Allocation Chart (MAC) in Appendix B.
- (7) Record any repairs, immersion and rinsing in the parachute log record as shown in figures 2-5 and 2-6.

d. Parachute Assembly Immersed in Fresh Water. Any parachute or its components that has been immersed in a fresh water lake, river or stream will not require rinsing unless it has been ascertained that the water is dirty, oily or otherwise contaminated. Procedures for handling a fresh water immersed parachute are as follows:

- (1) *Contaminated fresh water.* If the parachute, or its components, has been immersed in contaminated fresh water, rinse and dry (see c., above) and, if applicable, repair.

## **2-12. Cleaning and Drying (cont).**

(2) *Uncontaminated fresh water.* If the parachute, or its components, has been immersed in uncontaminated fresh water, it will be cleaned and dried as outlined in a., b., e. and f., above and below. Minor discoloration of fabric items resulting from immersion in uncontaminated fresh water may occur. No attempt should be made to eliminate a minor discoloration as a slight discoloring is preferable to employing vigorous techniques that may damage fabric. Small stains caused by petroleum products or blood will be removed using spot-cleaning procedures in a., or b., above.

e. Drying Fabric Items. Dry fabric items as follows:

- (1) Suspend or elevate 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 160°F (71 0C). Preferred temperature is 140°F (60°C).

f. 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 Inspection              | d. In-Storage Inspection |
| b. Pack-In-Process Inspection      | e. Equipment Disposition |
| c. Modified/Rigger-Type Inspection |                          |

---

### Equipment Condition:

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 use. 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 supervisor 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 canopy is placed in proper layout.
- (2) After center line is installed (G-12E).
- (3) After gore folding is completed.
- (4) After the canopy, suspension lines, and connector link ties are completed.
- (5) After canopy stowage is completed.
- (6) After stowage of suspension lines, center line (G-12E) and risers is completed.
- (7) After the deployment bag is closed and suspension lines and risers are laced.

c. Modified/Ripper-Type Inspection Procedures. Perform inspection as follows:

(1) *Overall inspection.* An overall inspection will be made on the 64-Foot Cargo 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 24d. Further, remove the log record from the pocket and evaluate the recorded entries to insure compliance with paragraph 2-4e.

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

## **2-13. Inspection (cont).**

(c) *Operational adequacy.* Check item components and parts to ensure proper assembly, which includes attachment and alignment, and that assembled product functions in prescribed manner. Further ensure 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 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 materials which constitute 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 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 bumps, 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 ensure 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.

e. Equipment Disposition. Air delivery equipment may be rendered unserviceable by either normal fair wear or by aging and will subsequently be repaired, modified, or condemned, as appropriate. Equipment that is uneconomically repairable (outdated) will be condemned. Disposition of air delivery equipment that is condemned, unserviceable, or for which the serviceability is questionable, will be accomplished using the following procedures, as applicable.

(1) *Item requiring repair or modification.* An air delivery item which requires repair or modification will be tagged in accordance with DA PAM 738-751. Subsequent work on the item will be performed at the maintenance level specified for the maintenance function in the applicable paragraph of this manual.

(2) *Disposition of condemned air delivery equipment.* Condemned equipment, other than fatality parachutes, will be removed from service and disposed of in accordance with current directives listed in Appendix A of this manual.

(3) *Rejected equipment.* Equipment which, prior to use, is deemed unserviceable for use will be reported in an EIR in accordance with DA PAM 738-750, as authorized by AR 750-1. Each applicable item which is defective will be held and safeguarded pending receipt of disposition instructions from the National Maintenance Point (NMP). In all instances, EIR exhibit material will be handled as prescribed in DA Pam 738-750. If the quality or the serviceability of an item is questionable, clarification and assistance may be obtained by contacting Commander, US Army Troop Support Command, ATTN: AMSTR-QP, 4300 Goodfellow Blvd., St. Louis, Missouri 63120.

(4) *Equipment of doubtful serviceability.* Equipment which has had previous use and has not exceeded normal fair wear or aging criteria, but of which further serviceability is doubtful, will be tagged as prescribed in DA PAM 738-751. In addition, the equipment will be reported in an EIR in accordance with DA Pam 738-750 and AR 750-1. The item(s) in question will be held as EIR exhibit material as outlined in DA Pam 738-750 pending receipt of disposition instructions from the NMP. A maintenance activity holding EIR exhibit material will not tamper with the applicable item(s) or make any attempt to ascertain cause factors. Unnecessary handling of EIR exhibit material may disturb or alter peculiar aspects of the affected item(s) which might affect the judgment of engineering personnel who have the responsibility for final evaluation of EIR actions.

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## 2-14. Acidity Test.

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**This task covers:**

**Acidity test**

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**Tools:**

Packing Paddle, Item 10, Appendix B

**Materials/Parts:**

Medicine Dropper, Item 21, Appendix D  
Three-Color pH Paper, Item 23, Appendix D  
Spool with Color Chart, Item 28, Appendix D

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**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 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 1-3 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 paragraph 2-13e.
- (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.

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**2-15. Salt-Water Contamination Test.**

---

**This task covers:**

**Inspection**

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**Equipment Condition:**

Layout on packing surface or other suitable area.

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Inspection. Look for a white crystalline residue.

**NOTE**

Clean or condemn equipment known or suspected of salt contamination in accordance with paragraph 2-12(c) or 2-13(e).

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## 2-16. Packing the 64-Foot Cargo Parachute, Model G-12D.

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**This task covers:**

- |   |  |
|---|--|
| <b>a. Inspection</b>                            | <b>d. Packing the G-12D Parachute Assembly</b>         |
| <b>b. Orientation</b>                           | <b>e. Packing the 68-Inch Diameter Pilot Parachute</b> |
| <b>c. Preparing Parachute for Proper Layout</b> |  |
- 

**Tools:**

Line Separator, Item 7, Appendix B  
Knife, Item 4, Appendix B  
Yardstick, Item 24, Appendix B  
Separator, Link, Item 23, Appendix B

**Materials/Parts:**

Cloth, Cotton, Muslin, Item 5/6, Appendix D  
Cord, Nylon, Type III, Item 14/15, Appendix D  
Marking Aid, Item 25/26, Appendix D  
Paper, Kraft, Item 22, Appendix D  
Tape, Pressure Sensitive, Item 34, Appendix D  
Thread, Cotton, Size 8/4, Item 37, Appendix D  
Thread, Cotton, Size 8/7, Item 38, Appendix D  
Webbing, Cotton, Type I, 1/4-in.,  
Item 48, Appendix D

**Materials/Parts (Cont):**

Webbing, Nylon, Tubular, 1/2-In., Item 57, Appendix D  
Rubber Bands, Item 63, Appendix D

**Equipment Condition:**

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

**References:**

DA PAM 738-751  
TB 43-000243  
DA PAM 738-750

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### WARNING

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

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 paragraph 2-13e and DA PAM 738-751. A rigger type inspection and a pack-in-process inspection must be performed in conjunction with each packing of a parachute (refer to paragraph 2-13).

(1) *Modified/rigger-type inspection*. During packing of each parachute, it must be given a rigger-type inspection by the packers in accordance with paragraph 2-13(2).

(2) *Pack-in-process inspection*. A pack-in-process inspection must be performed by a designated supervisory rigger, other than the packers, at seven intervals during the packing procedure. The inspection is performed to ensure that the parachute is packed according to authorized packing procedures. (Refer to paragraph 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 looking from the parachute riser (tension device) toward the canopy vent (stationary post). See figure 2-8.

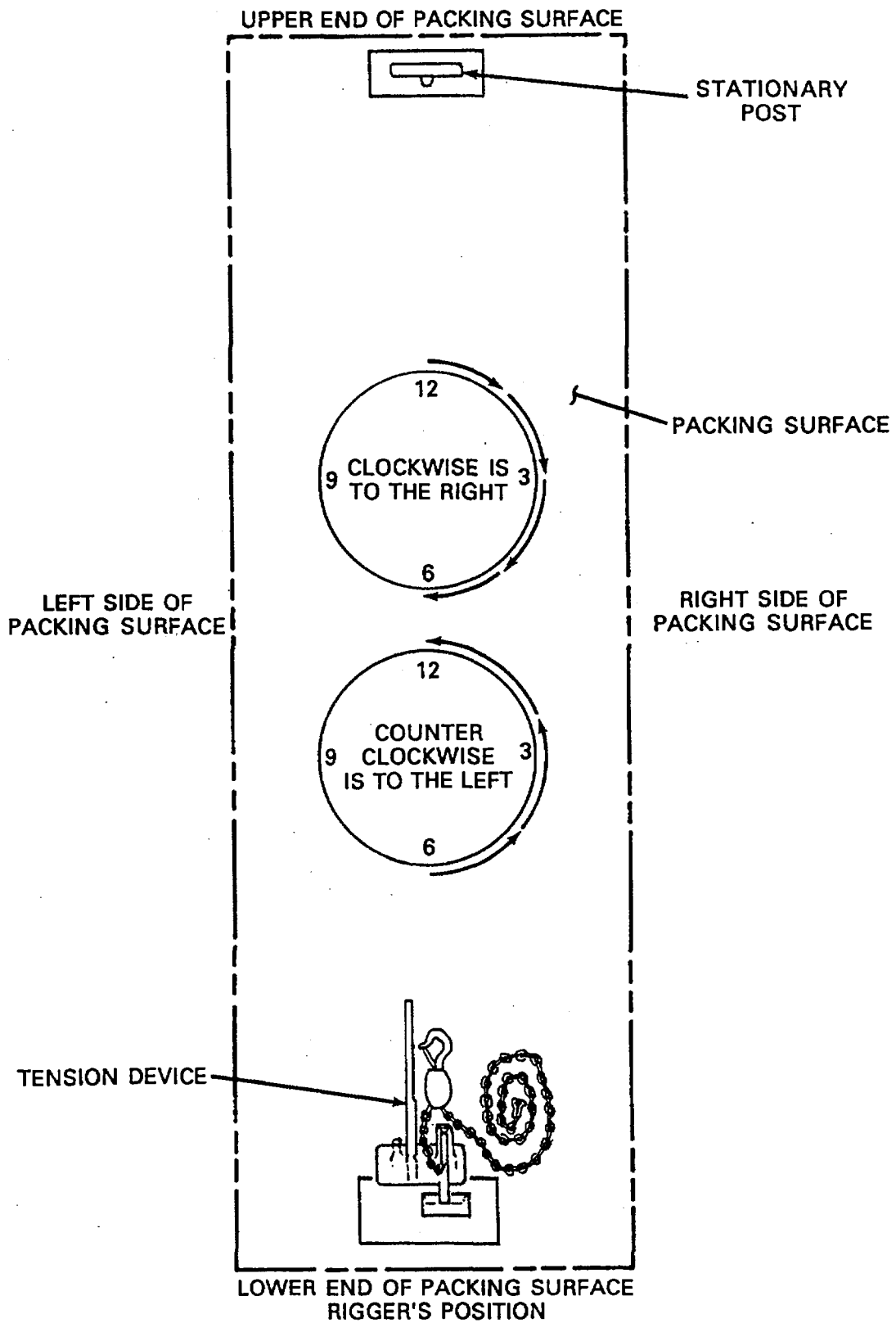


Figure 2-8. Rigger's Orientation.

4839-017

## 2-16. Packing the 64-Foot Cargo Parachute, Model G-12D (cont).

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

### NOTE

Packing of the G-12D parachute will require a 3-person team.

c. Preparing Parachute for Proper Layout. Prepare the parachute for proper layout by positioning the canopy in an elongated manner on a suitable packing surface, with the vent lines located next to a stationary post (figure 2-9) and the suspension risers near a tension device. Disconnect the pilot parachute, static line and deployment line. To complete the proper layout, perform the following:

(1) *Removing canopy inversion.* Inspect the canopy vent lines to determine if the canopy is inverted. If the vent lines are located on the inside of the upper lateral band, the canopy is inverted. To remove the inversion, lift the canopy skirt and walk up through the canopy to the vent area. Grasp the bridle loop and pull the canopy vent down through the canopy skirt between two adjacent suspension lines (figure 2-10). On the outside of the canopy, pull the canopy vent back to the stationary post. Attach the bridle loop to the stationary post.

(2) *Locating suspension lines in proper layout.* Locate the top center gore of the canopy and divide the suspension lines into two groups, Lines 1 through 32 in the left group and lines 33 through 64 in the right group. Maintain the line group separation and remove any turns, tangles or twists from the suspension lines as follows:

(a) *Turns.* A turn occurs when one group of suspension lines rotates around the opposite group of suspension lines. Remove the turn by rotating the suspension lines (figure 2-11) in a direction opposite to that of the turn.

(b) *Tangles.* To remove a tangle, or tangles, in the suspension lines, begin by maintaining suspension line group separation and work the tangle(s) to a point as close as possible to the connector links. Select the top line(s) forming the tangle and, using the left hand, lift the line(s) away from the lines in the group. Using the right hand, reach through the opening formed by the raised lines and pull the suspension risers through the opening (figure 2-12). Repeat the procedure to remove each remaining tangle in either group of suspension lines.

(c) *Twists.* A twist occurs when the suspension lines in one group become improperly crossed. To determine if twists are present, trace lines 1 and 64 from the canopy skirt to the connector link assemblies. If the lines cannot be traced directly to the inside of the top connector links, the suspension lines are twisted. Remove a twist by rotating the suspension risers between the suspension line groups in a direction opposite to that of the twist (figure 2-13).

(d) *Canopy layout.* Check the canopy assembly for proper layout by tracing suspension lines 1 and 64 from the canopy skirt to the inside of the top connector-links and lines 32 and 33 from the canopy skirt to the inside of the bottom connector links. To complete the proper layout of the canopy, arrange the risers, connector link assemblies and suspension clevis as indicated in figure 2-14.



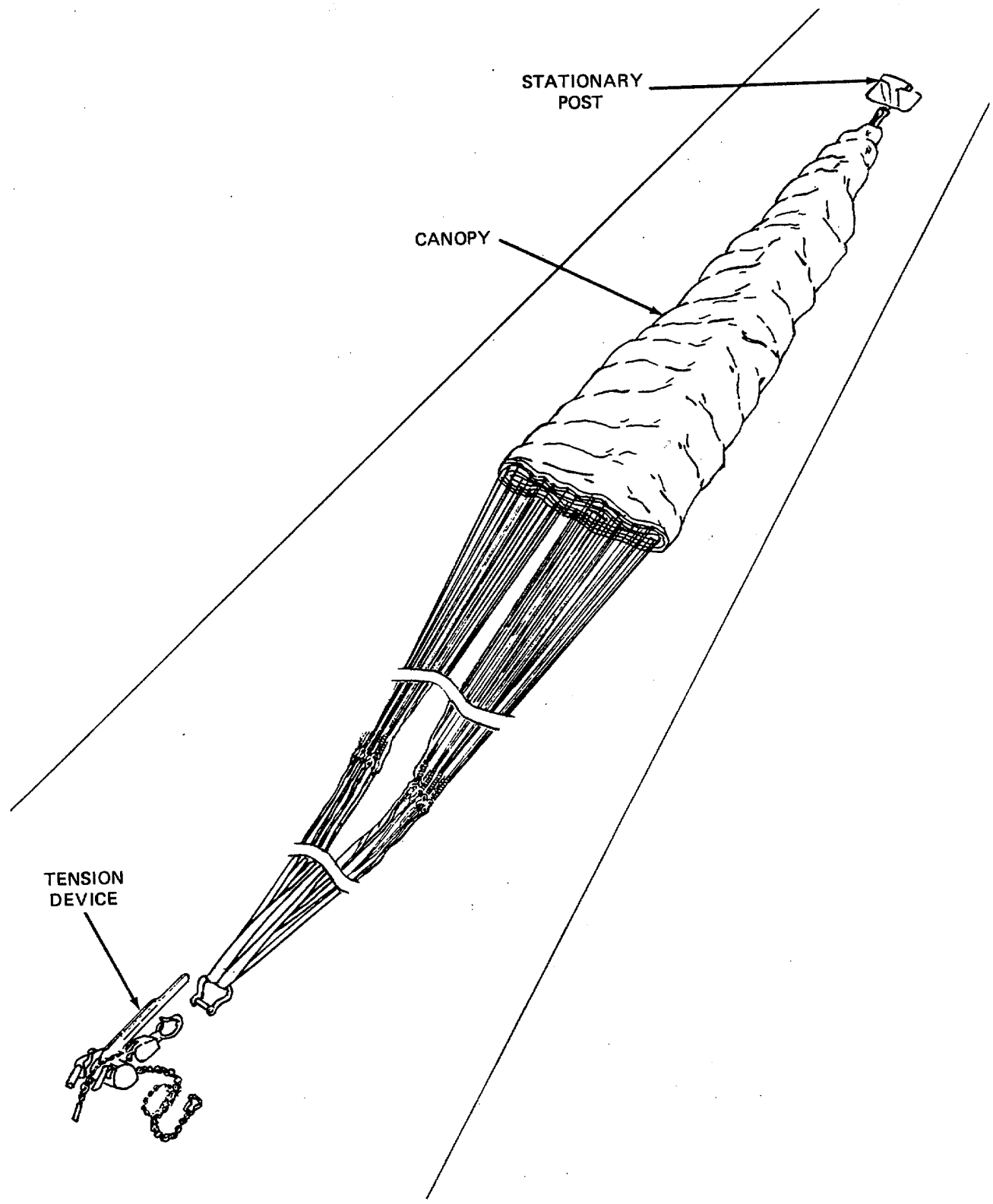


Figure 2-9. Canopy Positioned on Packing Surface.

4839-018

2-16. Packing the 64-Foot Cargo Parachute, Model G-12D (cont).

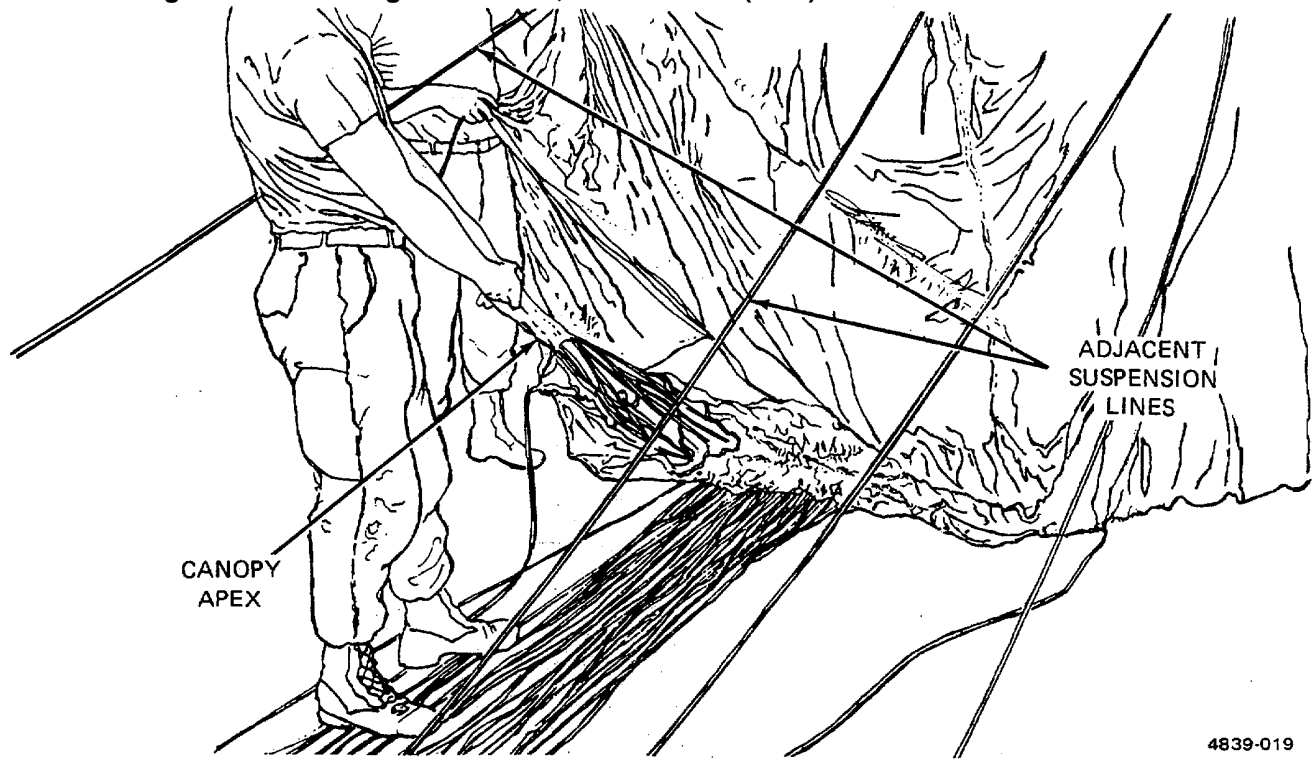


Figure 2-10. Removing Canopy Inversion.

4839-019

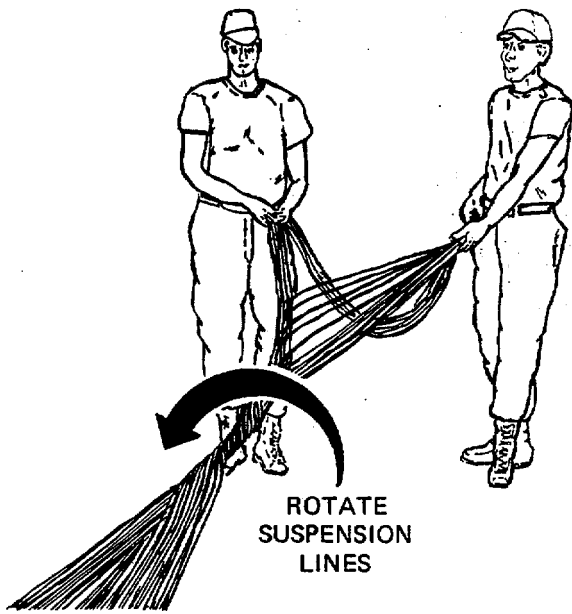
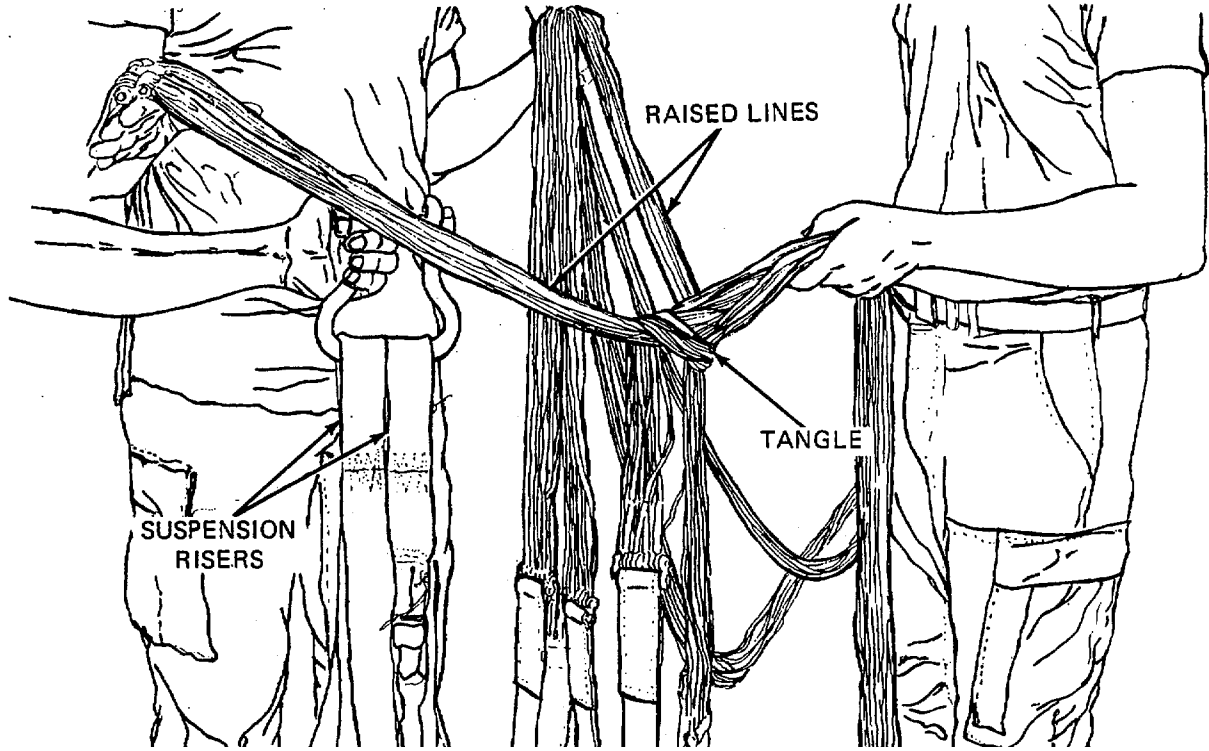


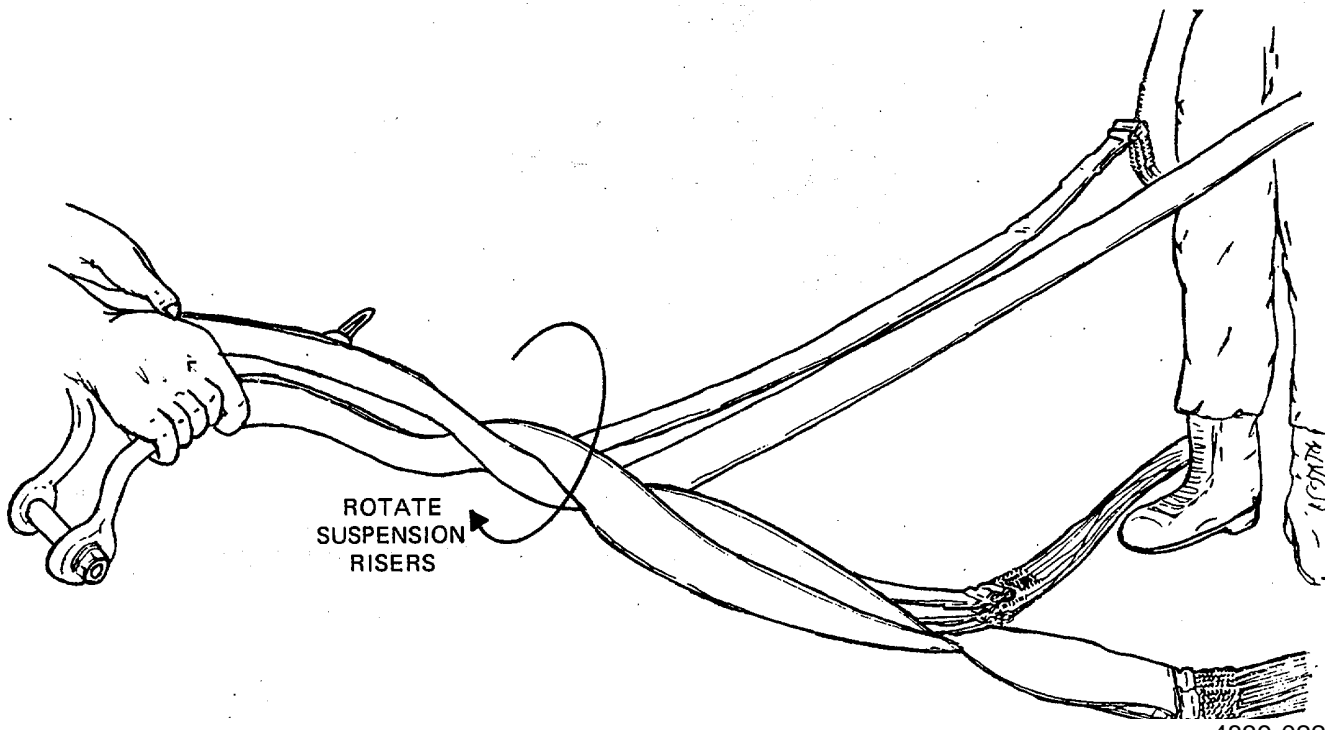
Figure 2-11. Removing Turns from Suspension Lines.

4839-020



4839-021

Figure 2-12. Removing Tangles from Suspension Lines.



4839-022

Figure 2-13. Removing Twists from Suspension Lines.

2-16. Packing the 64-Foot Cargo Parachute, Model G-12D (cont).

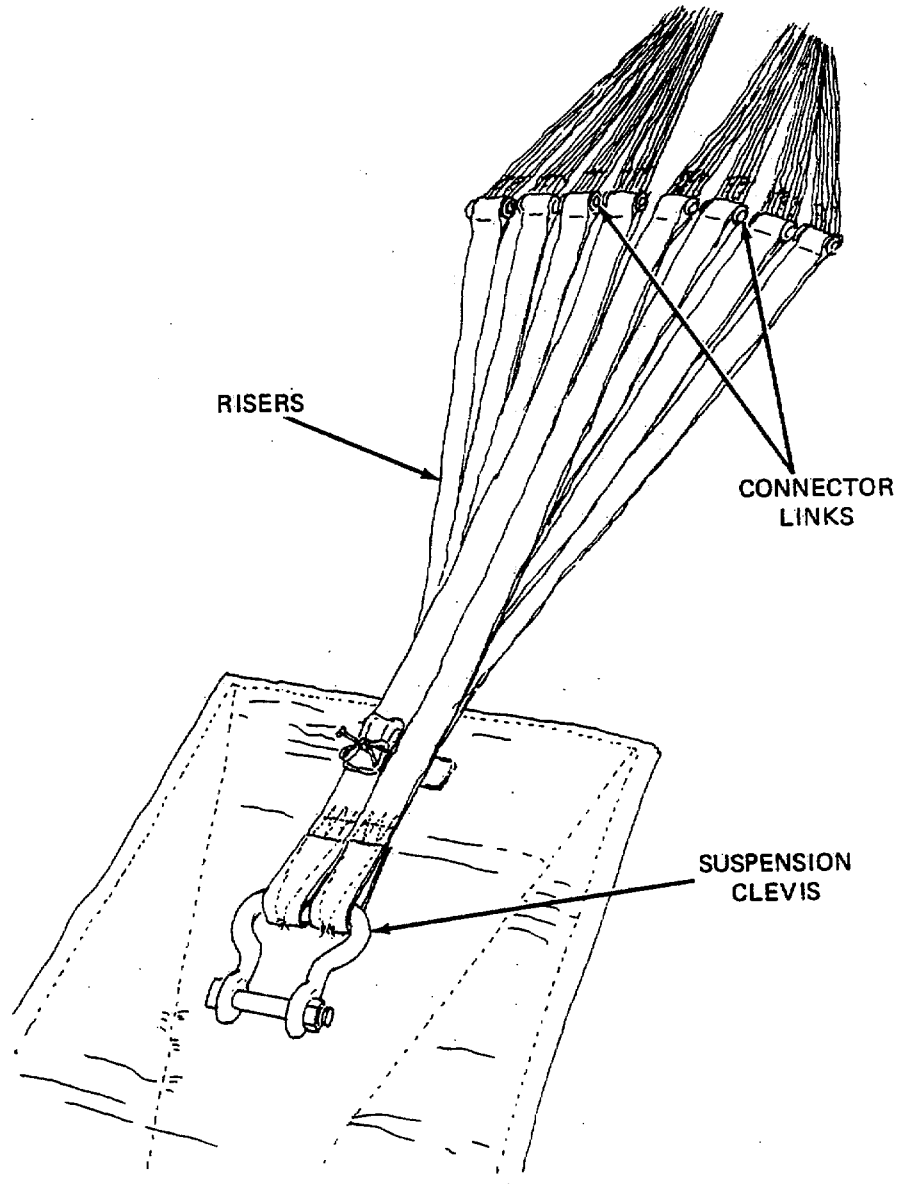


Figure 2-14. Risers, Connector Links and Suspension Clevis in Proper Layout.

4839-023

d. Packing the G-12D Parachute.

(1) *Serving the canopy vent*

- (a) Remove the canopy bridle loop from the stationary post, insuring the dressed vent reinforcement (upper lateral band) is not disturbed unnecessarily, and slide the bridle loop to one side of the canopy vent lines.
- (b) Cut a 10-inch square piece of type 11 cotton muslin cloth and wrap the cloth around the center of the vent lines.
- (c) Center the canopy bridle loop on the wrapped portion of the vent lines.
- (d) Bring the cloth wrap ends together to form a loop around the bridle loop. Secure the cloth wrap ends together with a 24-inch length of 1/4-inch wide, type I cotton webbing. Make the tie with two turns single and secure the tie with a surgeon's knot and a locking knot. Trim tie ends to 2 inches (figure 2-15).
- (e) At a point 2 inches above that part of the bridle loop through which the vent lines pass, make a tie around the bridle loop using a 24-inch length of 1/4-inch wide, type I cotton webbing (figure 2-16). Make the tie with two turns single and secure the tie with a surgeon's knot and locking knot. Trim tie ends to 2 inches. Reconnect the bridle loop to the stationary post.

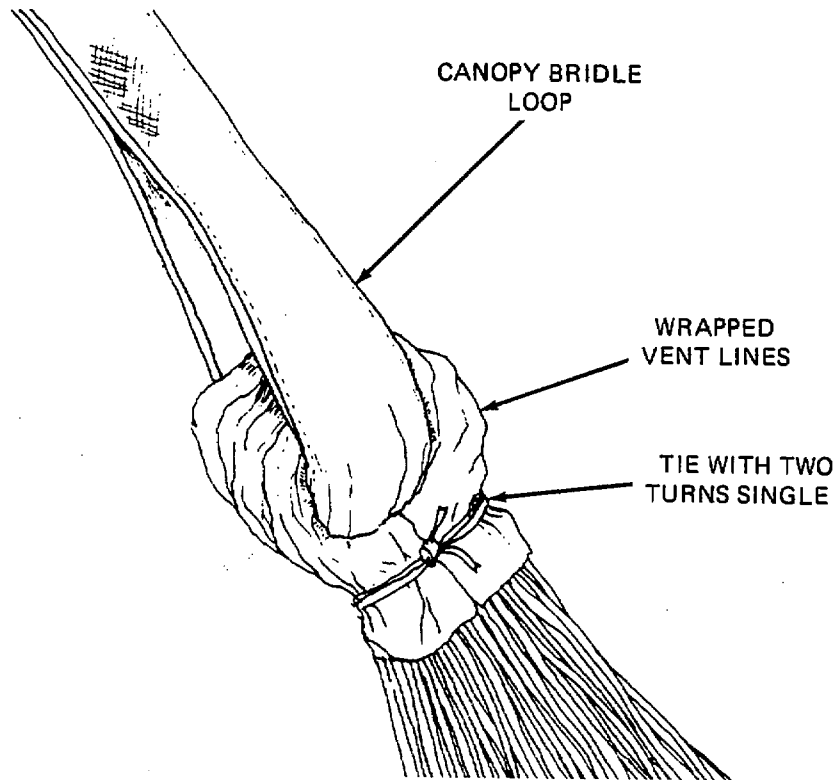
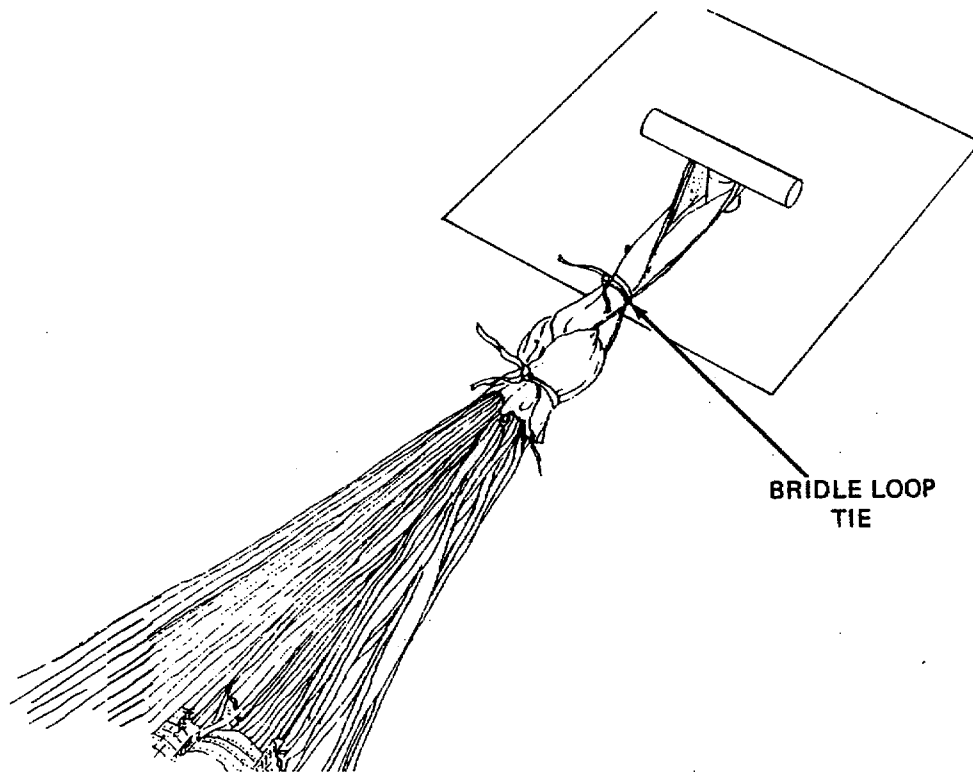


Figure 2-15. Canopy Vent Lines Wrapped and Secured.

4839-024



4839-025

Figure 2-16. Canopy Vent Ties Completed.

(2) *Applying tension.*

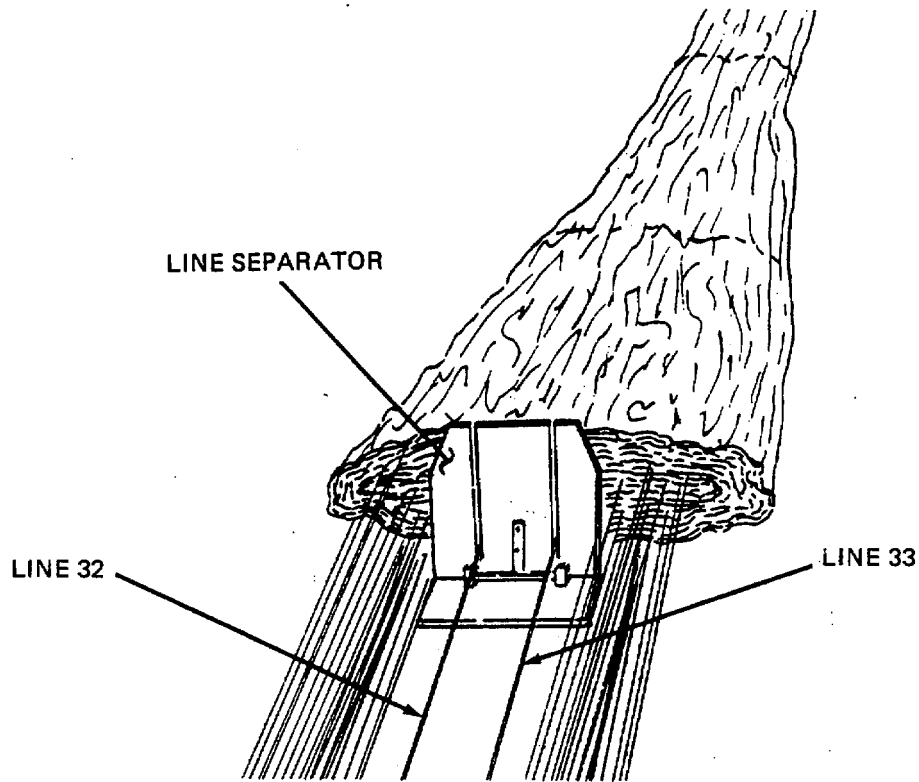
- (a) Insure that the two risers are attached to the body of a 3/4-inch suspension clevis and the applicable nut and screw are installed on the clevis.
- (b) Connect the clevis to a tension device and apply tension.

**NOTE**

**A tension jack, chain hoist, power winch, or a vehicle may be used as a tension device when applying tension to the cargo parachute canopy.**

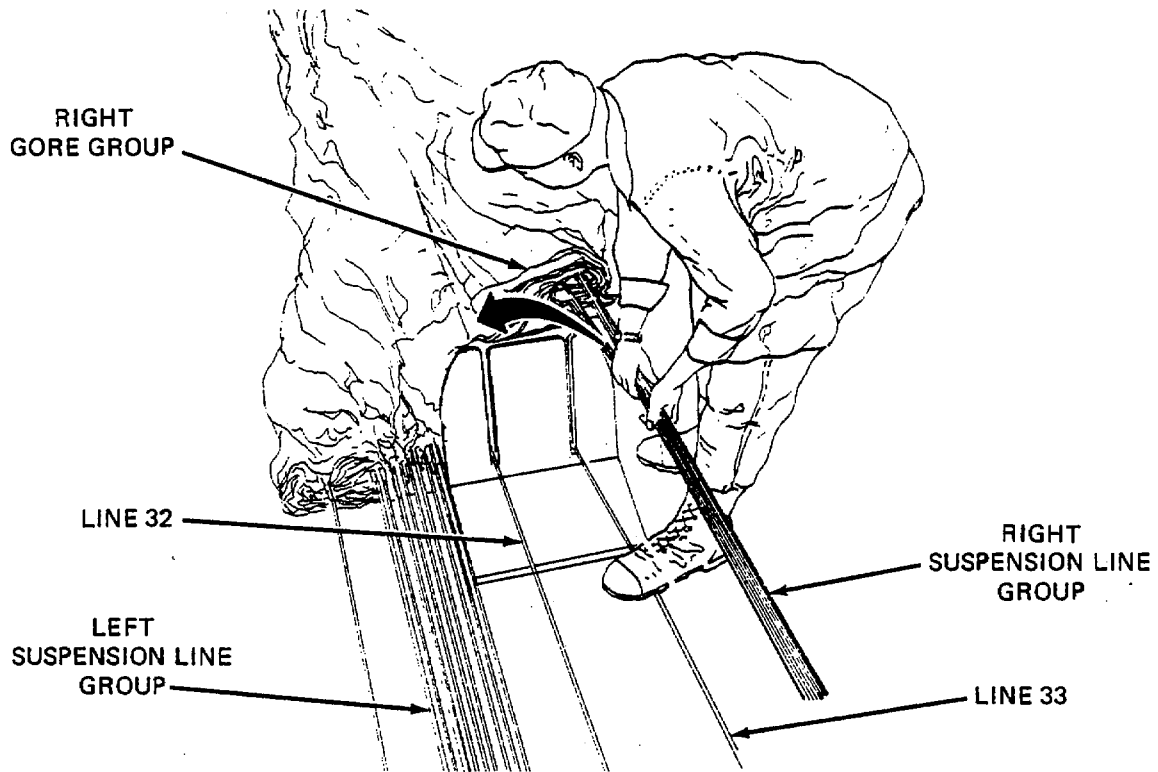
(3) *Folding the gores.* The canopy gores are folded into two groups of 32 gores each as follows:

- (a) At a point below the canopy skirt and adjacent to the skirt reinforcement (lower lateral band), position a large line separator between the two suspension line groups and insert line 32 into the left slot of the separator and line 33 into the right slot (figure 2-17).
- (b) While holding line 33 in position in the line separator, pick up the right suspension line group (figure 2-18) and throw the right group of gores and lines over the left group of gores and lines.



4839-026

Figure 2-17. Line Separator Positioned Between Suspension Line Groups.

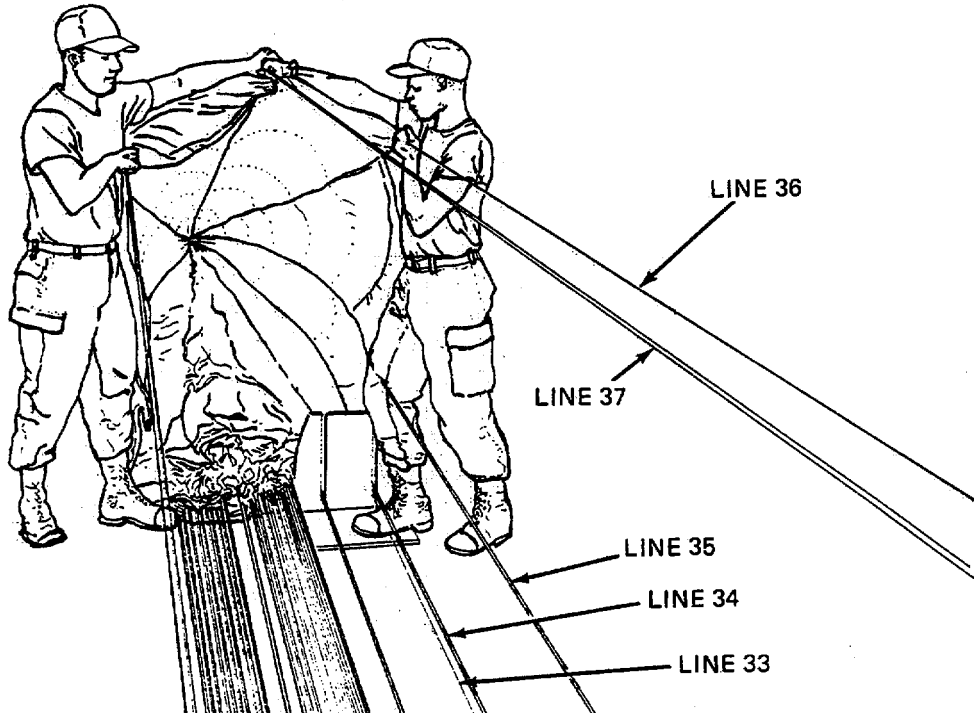


4839-027

Figure 2-18. Preparing to Throw Right Group of Gores and Suspension Lines.

**2-16. Packing the 64-Foot Cargo Parachute, Model G-12D (cont).**

- (c) At a point 10 feet below the canopy skirt, position a large pedestal fan in a manner which will allow the fan airstream to partially inflate the canopy.
- (d) To fold the first gore of the right gore group, one man passes line 34 to a second (figure 2-19) who places the line on top of line 33 in the right slot of the line separator. Insure that while placing line 34 into the line separator, the gore between lines 33 and 34 deflates and lies flat in a folded manner.



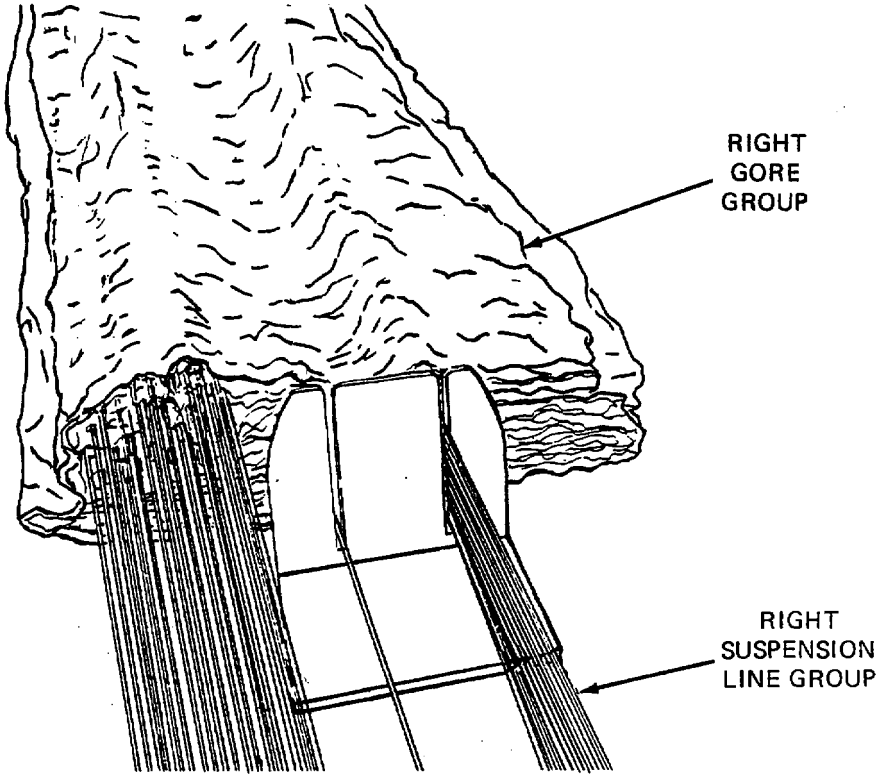
4839-028

*Figure 2-19. Folding the Right Group of Gores.*

- (e) Using the procedures in (d) above, fold the remainder of the right gore group, placing lines 33 through 64 in the right slot of the line separator. (figure 2-20).
- (f) While holding line 32 in the line separator, pick up the left suspension line group (figure 2-21) and throw the left group of gores and lines over the folded right group of gores and lines.
- (g) To fold the first gore of the left gore group, one man passes line 31 to a second man (figure 2-22) who places the line on top of line 32 in the left slot of the line separator. During the process of placing line 31 in the line separator, insure the gore between lines 31 and 32 deflates and lies flat in a folded manner.
- (h) Using the procedures in (g) above, fold the remainder of the left gore group until all the suspension lines of the left group are in the left slot of the line separator (figure 2-23).

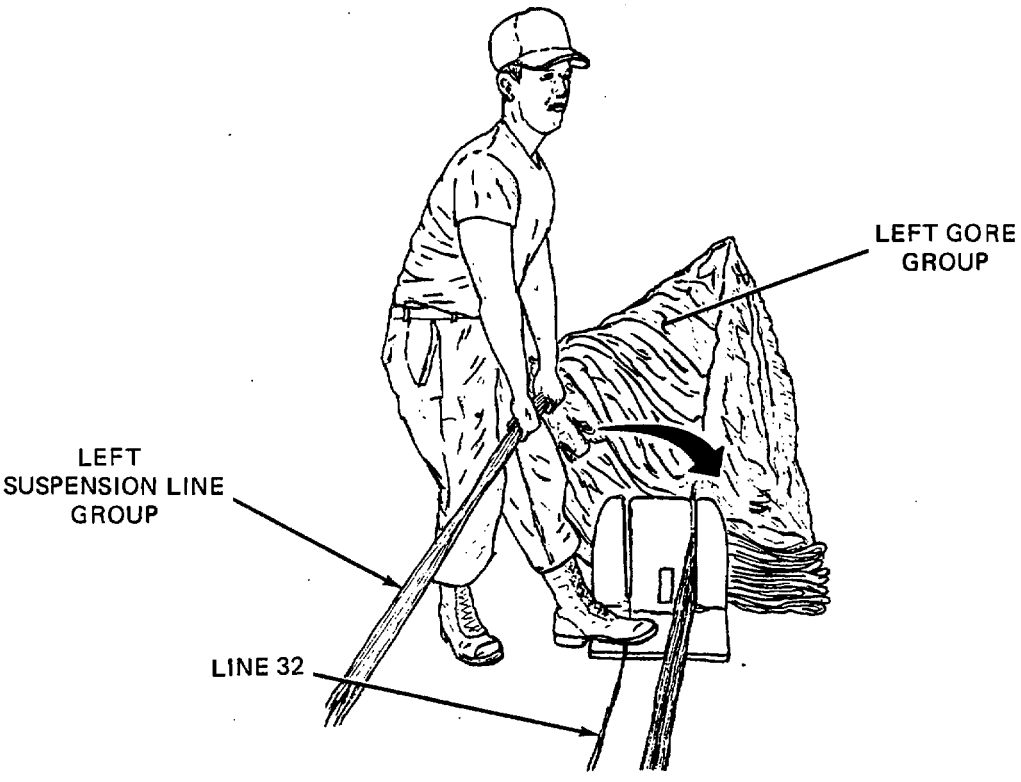


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AIR FORCE T.O. 13C5-32-2  
NAVY NAVAIR 13-1-32



4839-029

Figure 2-20. Right Gore Group Folded.



4839-030

Figure 2-21. Preparing to Throw Left Group of Gore and Suspension Lines.

2-16. Packing the 64-Foot Cargo Parachute, Model G-12D (cont).

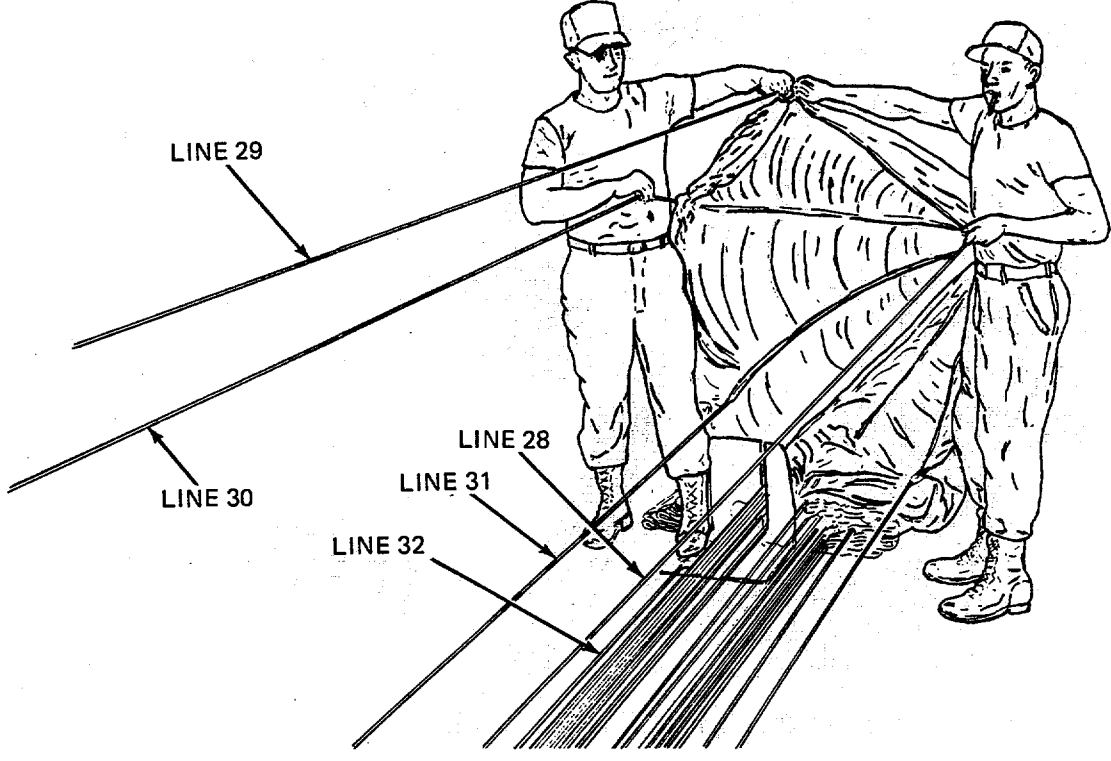


Figure 2-22. Folding the Left Gore Group.

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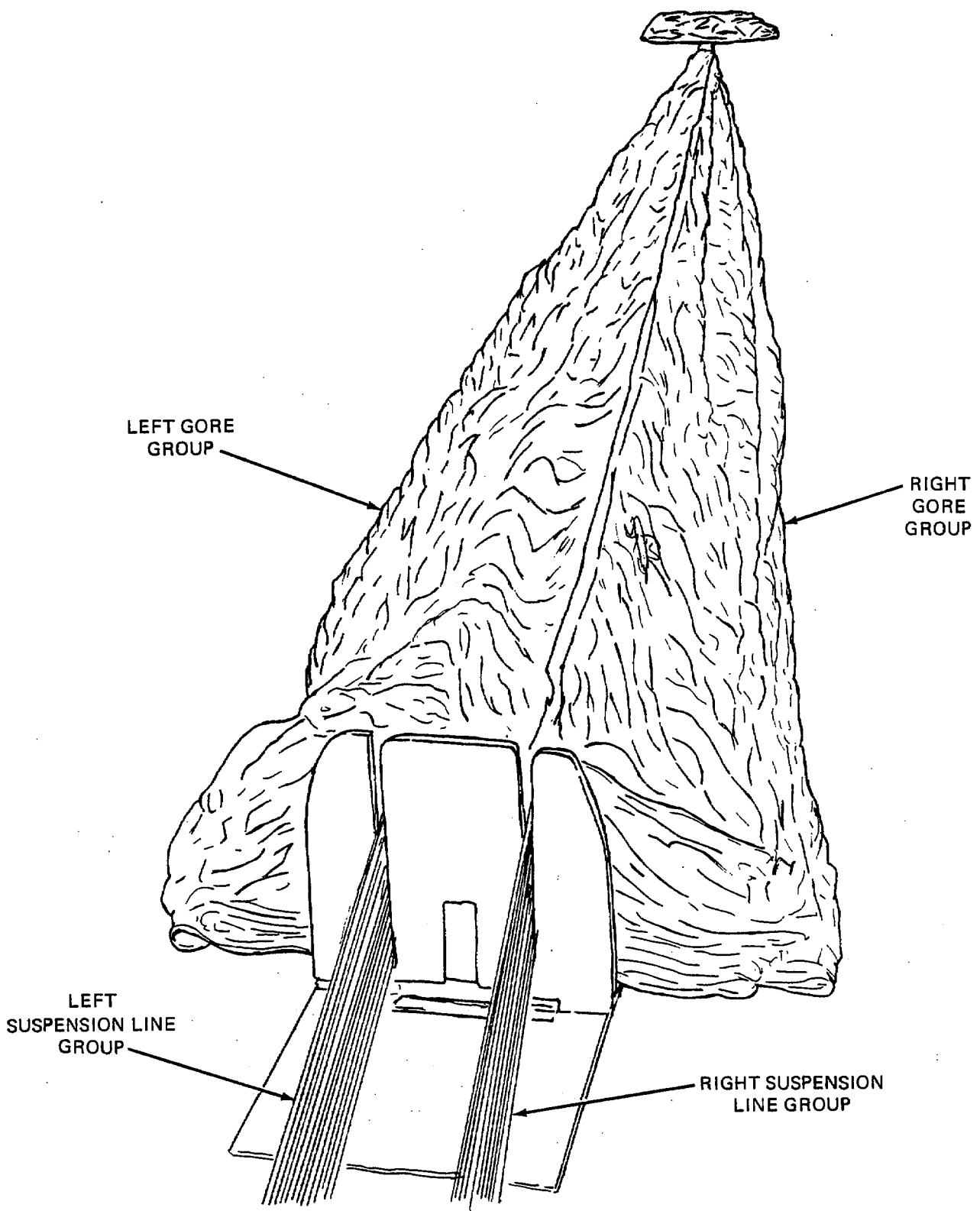


Figure 2-23. Gore Folding Completed.

4839-032

**2-16. Packing the 64-Foot Cargo Parachute, Model G-12D (cont).**

(4) *Tying the canopy and suspension lines.* Using one-turn single, ticket no. 3 cotton thread, make the following ties on the canopy and the suspension lines. Secure each tie with a surgeon's knot and locking knot.

(a) Make the canopy ties beginning 5 feet above the skirt reinforcement (lower lateral band) and at 5-foot intervals along the remaining canopy length (figure 2-24). Release tension and remove tension devices after the canopy ties have been completed.

(b) At a point 5 feet below the skirt reinforcement (lower lateral band), tie each group of suspension lines separately.

(c) Tie both suspension line groups together beginning at a point 10 feet below the skirt reinforcement (lower lateral band) and at 10-foot intervals along the remaining length of the suspension lines (figure 2-25), with the last tie being made at a point 1 foot above the connector link assemblies.

(5) *Tying the connector link assemblies.* Check the risers and connector link assemblies to ensure proper arrangement and insure that screws are tight (figure 2-26). Then tie the connector links as follows:

(a) Cut a 24-inch length of 1/4-inch wide, type I cotton webbing and thread one end of the webbing length down through one group of connector links and up through the opposite group of connector links.

(b) Pull the two connector link groups together with the webbing length ends and secure the webbing ends on top of the connector links with a surgeon's knot and locking knot (figure 2-27). Trim tie ends to 2 inches.

(6) *Installing canopy breakcord.*

(a) Remove the canopy bridle loop from the-stationary post.

(b) Position the deployment bag at the canopy vent.

(c) With the suspension: line -cover flap down, pass the canopy bridle loop through the deployment bag from the bag open end and through the vent line hole located in the bag closed end. Allow 8 inches of the bridle loop to extend from the vent hole.

(d) Check the deployment bag bridle assembly to insure that the straps are properly arranged and not twisted.

(e) Cut an 18-inch length of type III nylon cord for use as the canopy breakcord.

(f) Pass one end of the cord length through the canopy bridle loop and through the breakcord attaching loop of the deployment bag bridle assembly (figure 2-28). Secure the cord ends with a surgeon's knot and a locking knot (figure 2-29). Make-an-overhand knot in each running end. Trim each tie end at a point 2 inches from the surgeon's knot and locking knot.

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**NAVY NAVAIR 13-1-32**

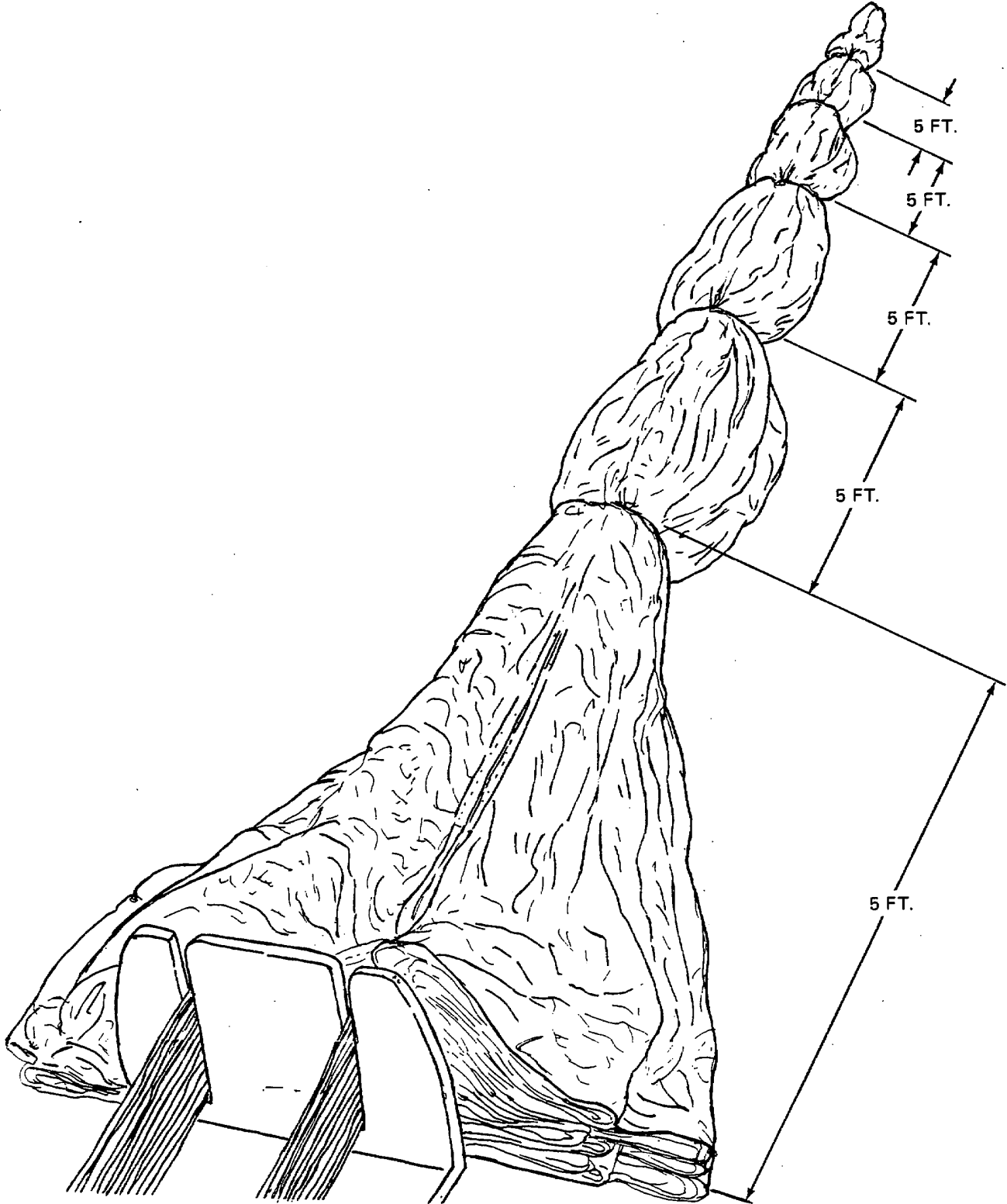


Figure 2-24. Canopy Ties Completed.

4839-033

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NAVY NAVAIR 13-1-32

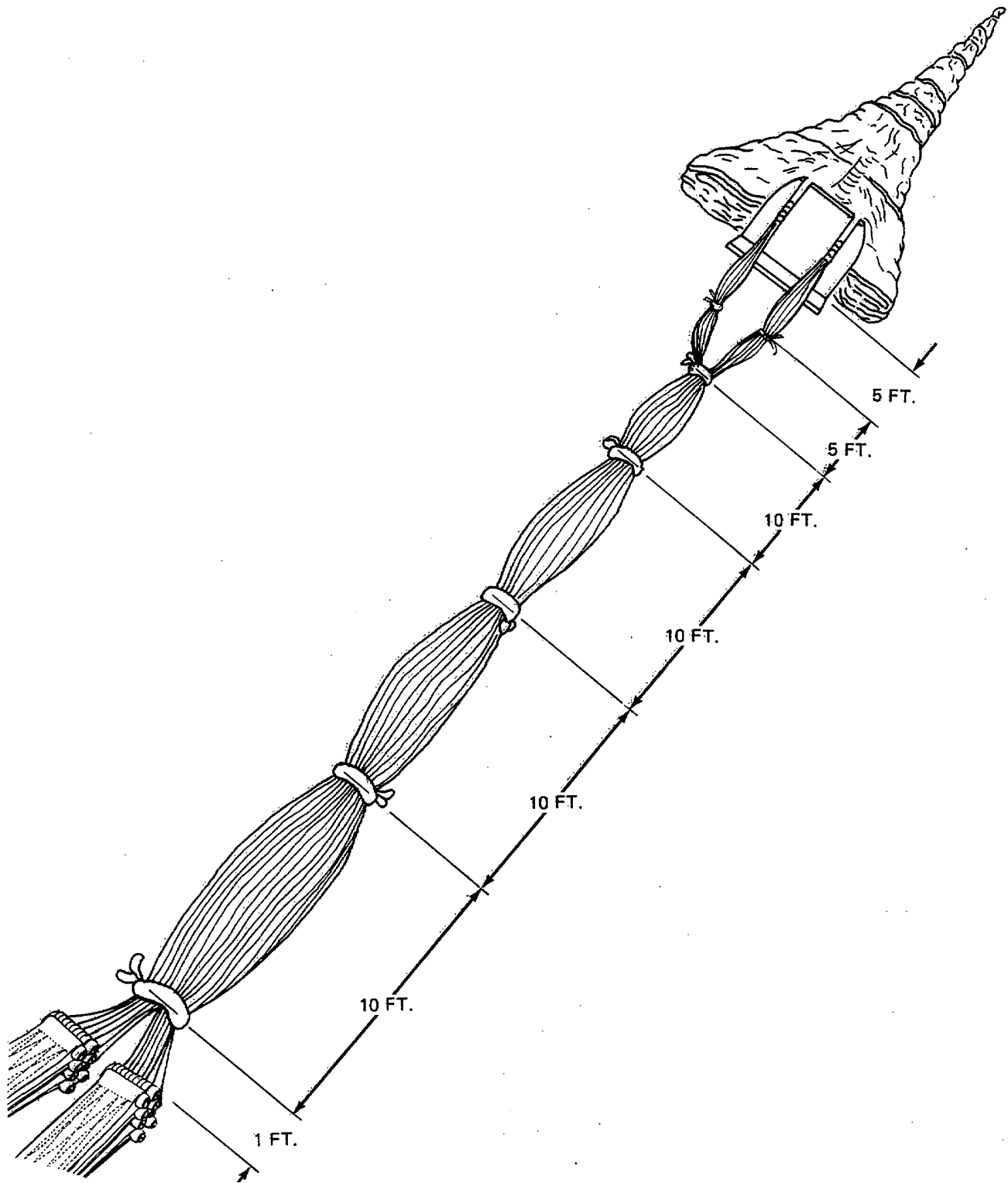
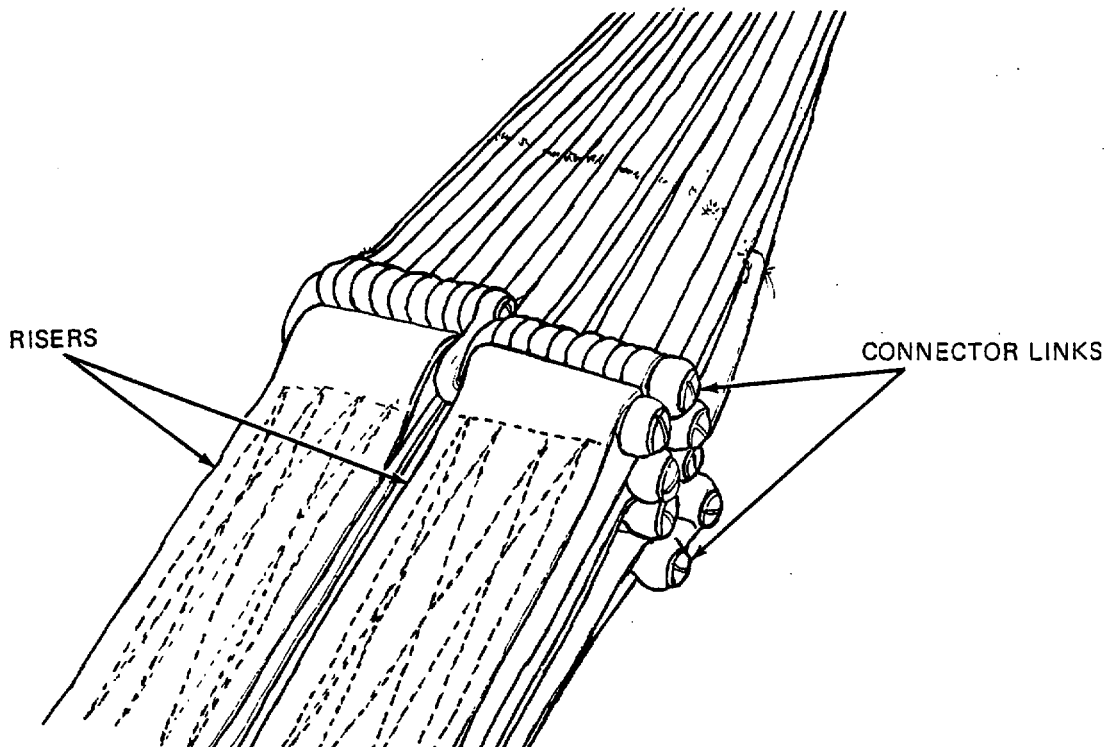


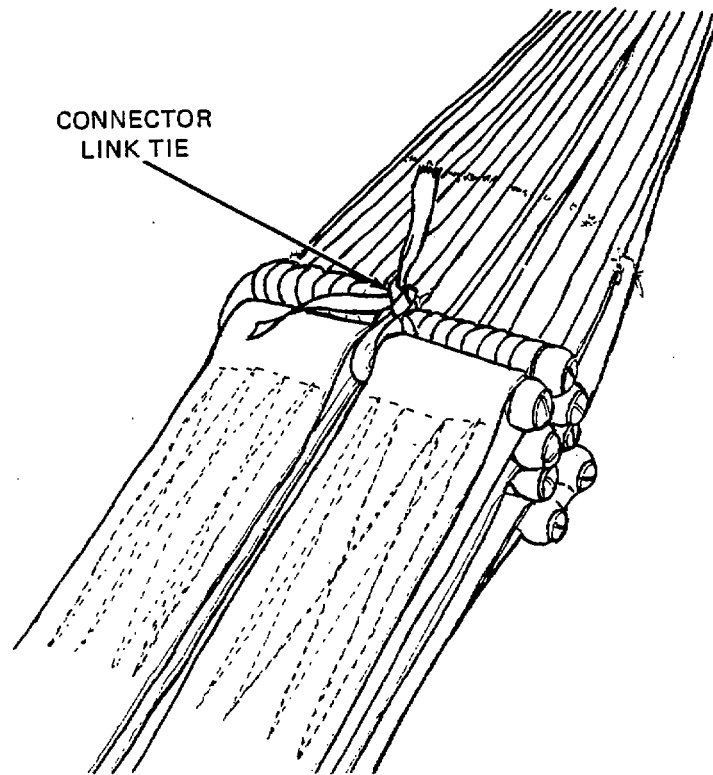
Figure 2-25. Suspension Line Ties Completed.

4839-034



4839-035

Figure 2-26. Risers and Connector Link Assemblies in Proper Arrangement.



4839-036

Figure 2-27. Connector Link Assemblies Tied.

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NAVY NAVAIR 13-1-32

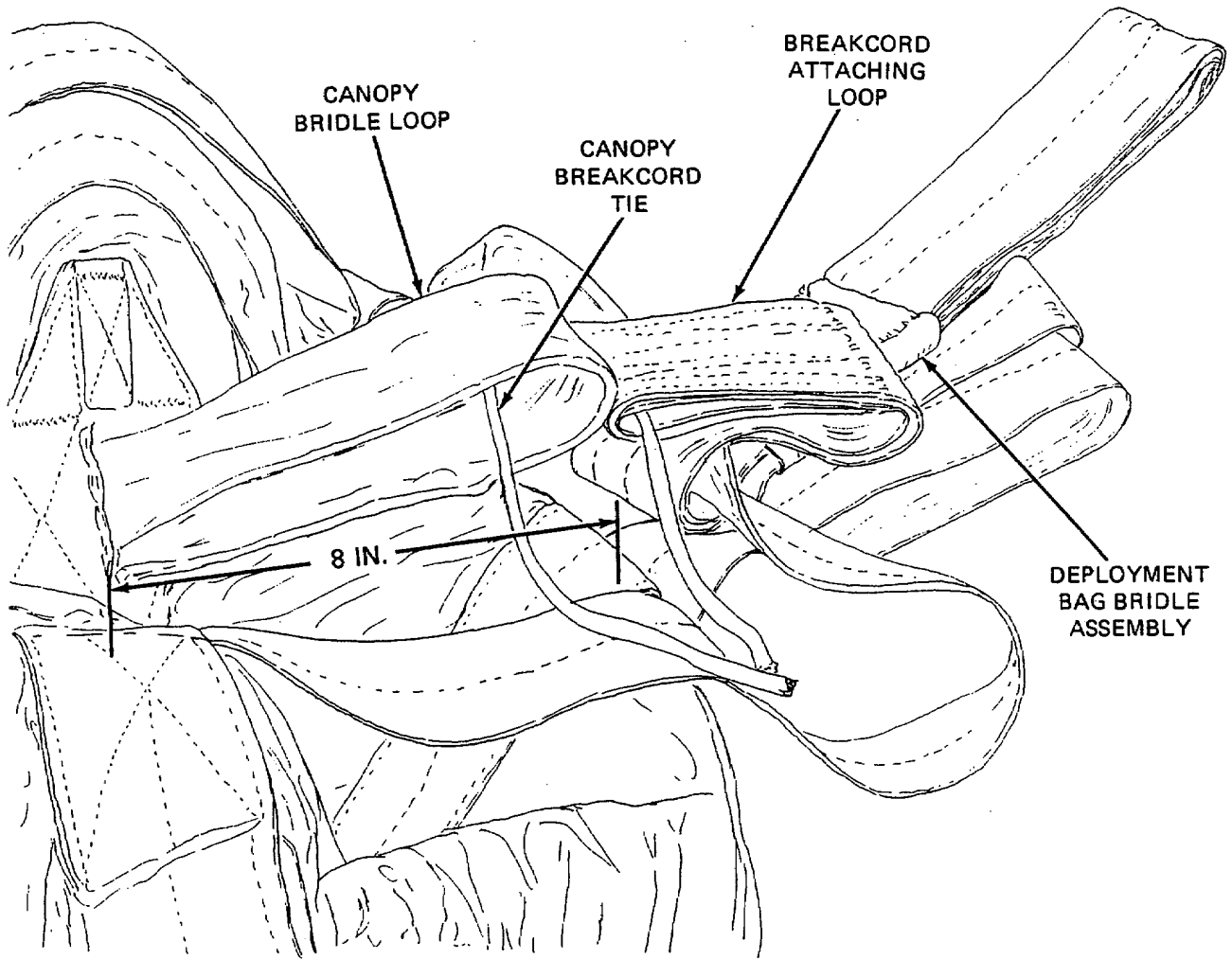
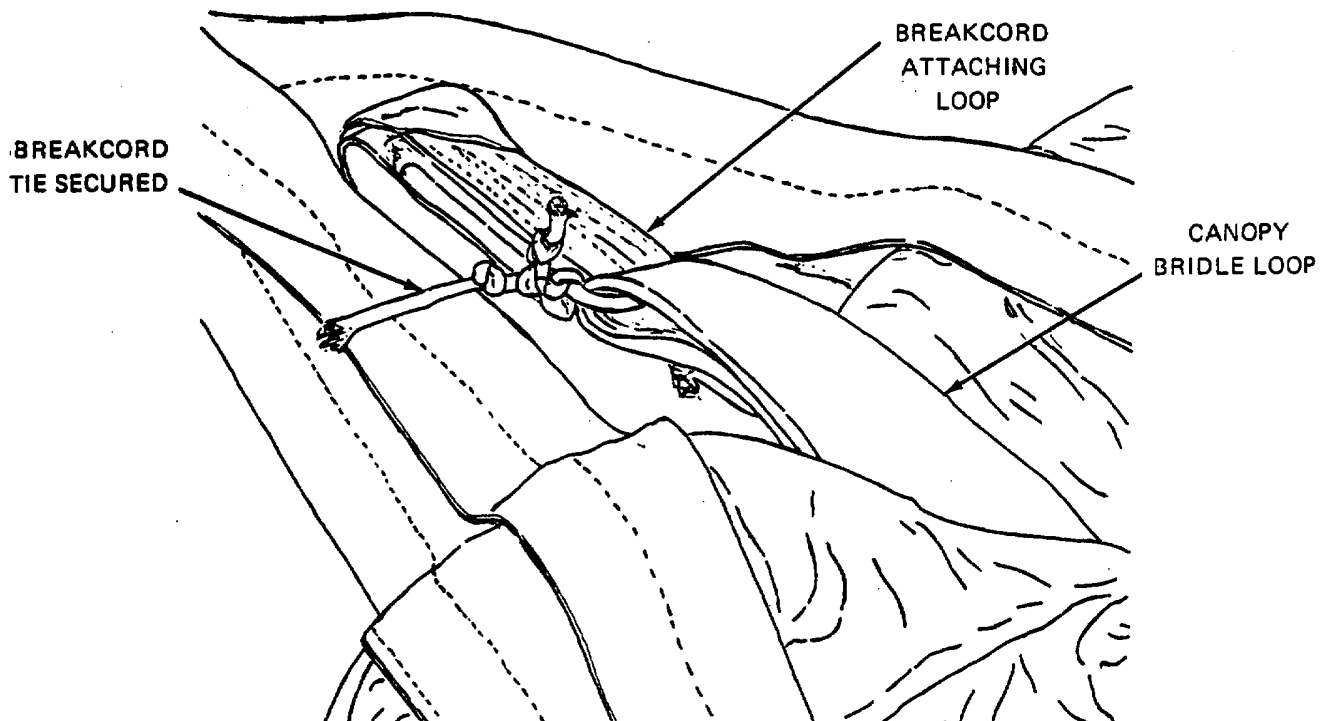


Figure 2-28. Installing Canopy Breakcord Tie.

4839-037





4839-038

Figure 2-29. Canopy Breakcord Tie Completed.

(6.1) *Installing Deployment Bag Strap.*

- (a) If required, a 60-inch deployment bag retaining strap may be substituted for a breakcord.
- (b) Use on connector link, and attach one end of the 60-inch connector strap to the parachute bridle loop.
- (c) Use a second connector link, and attach the free end of the 60-inch connector strap to the deployment bag breakcord attaching loop.
- (d) S-fold the connector strap, and secure it with a retainer band.
- (e) Place the bridle loop connector link and the retention strap inside the deployment bag through its vent line hole.

(7) *Stowing the canopy.*

- (a) Two men, positioned at the top of the canopy, will raise the open end of the deployment bag and hold the bag erect. In addition, one or both individuals should hold the canopy material to the bag to prevent the canopy vent from being withdrawn through the bag vent line hole while the canopy is being picked up from the packing surface.
- (b) A third man shall move to a point located a reasonable distance below the canopy top, pick up the canopy from the packing surface and S-fold the canopy material into the deployment bag (figure 2-30).
- (c) Continue stowing the canopy using procedures in (b), above, until only 2 feet of the canopy remains out of the deployment bag.

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**NAVY NAVAIR 13-1-32**

- (d) At a point immediately below the skirt reinforcement (lower lateral band), grasp both groups of suspension lines with the left hand. At a point 2 feet below the skirt reinforcement, grasp both groups of suspension lines with the right hand.
- (e) Push the canopy skirt and 18 inches of suspension line length into the bag (figure 2-31). Insure that all canopy folds are neat.

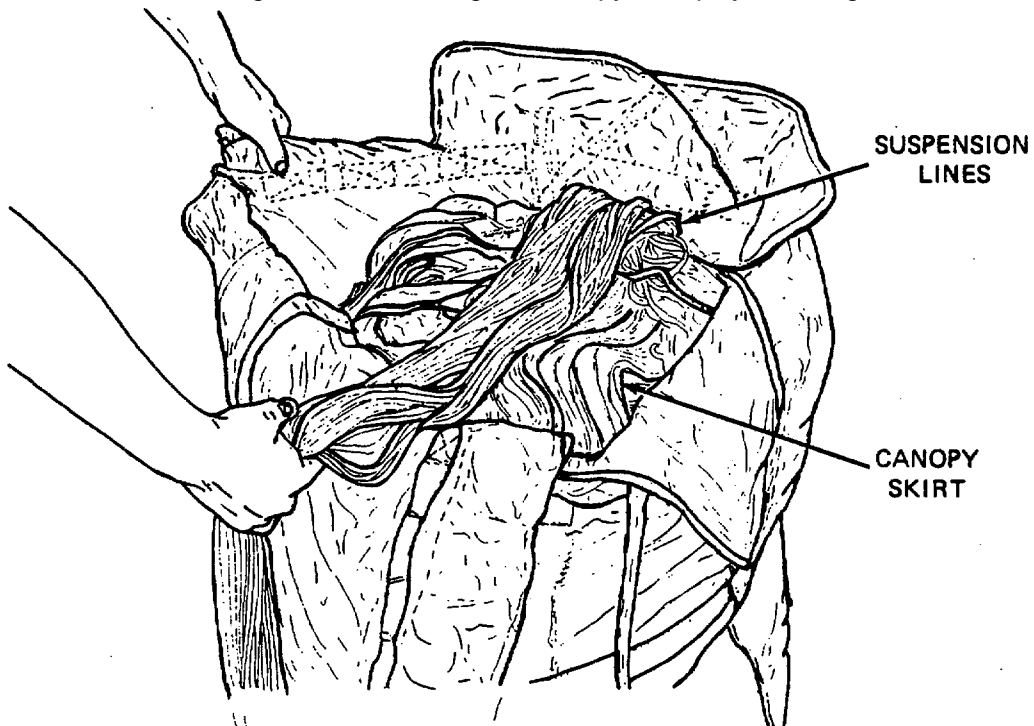
**Change 1      2-44**

2-16. Packing the 64-Foot Cargo Parachute, Model G-12D (cont).



4839-039

Figure 2-30. Stowing the Canopy in Deployment Bag.



4839-040

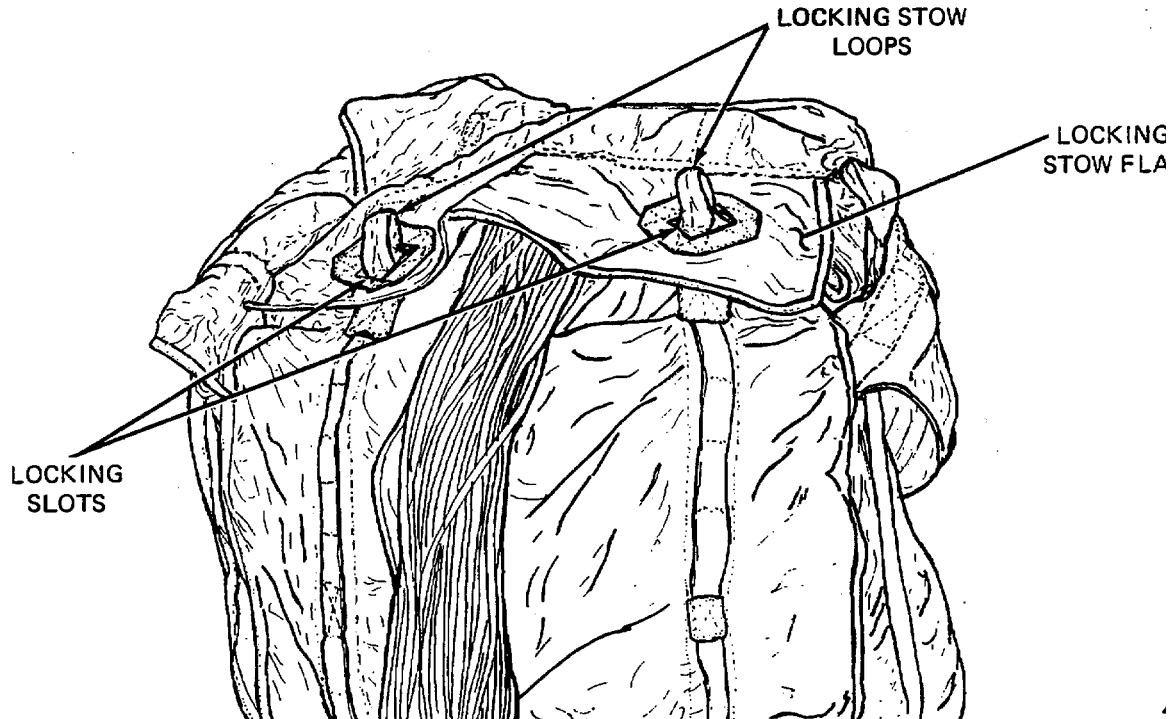
Figure 2-31. Canopy Stowing Completed.



(8) *Stowing the suspension lines and risers.*

(a) Fold the locking stow flap and the locking slot flap over the stowed canopy and insert the locking stow loops through the respective locking slots (figure 2-32).

(b) Cut a 36-inch length of 1/2-inch wide tubular nylon webbing, or equivalent, for use as a packing aid. Double the webbing length and make an overhand knot in the aligned webbing ends.



4839-041

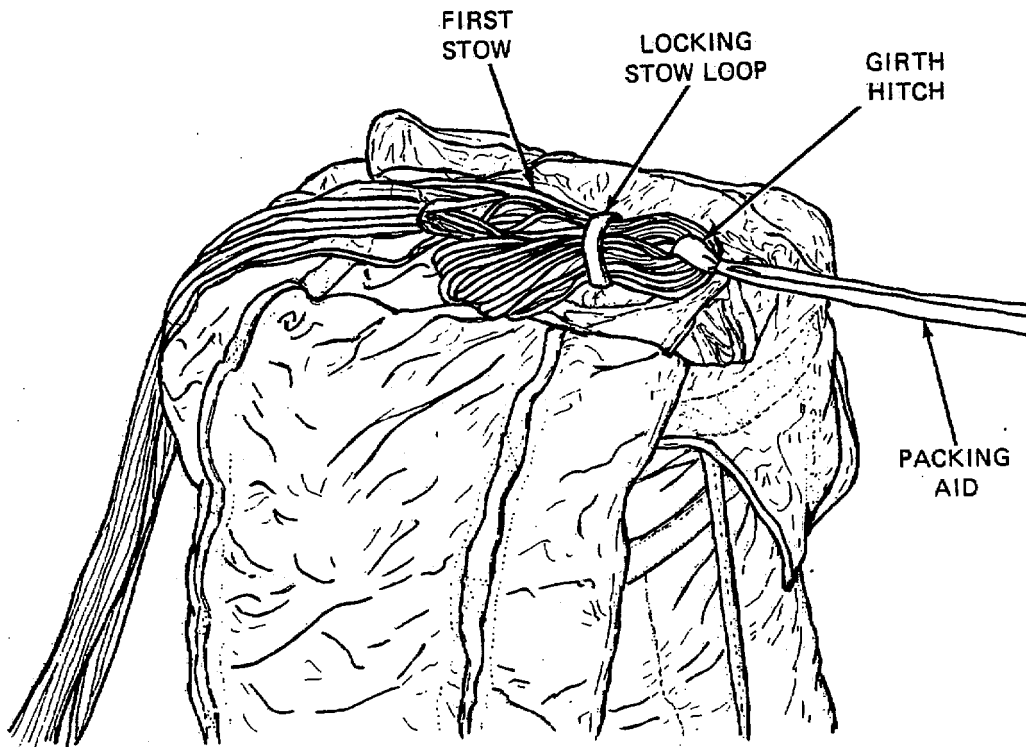
Figure 2-32. *Locking Stow Loops Inserted Through Locking Slots.*

(c) Using the doubled webbing, encircle the suspension lines and make a girth hitch in the webbing at a point 15 inches from the closed flaps of the bag. Thread the packing aid length knotted end through the right locking stow loop and make the first locking stow by pulling the webbing and suspension lines through the locking stow loop (figure 2-33) until a 3-inch loop is formed in the suspension lines beyond the locking stow loop. Remove the packing aid.

(d) Using the webbing length packing aid and the procedures in (c) above, make the second locking stow in the left locking stow loop (figure 2-34).

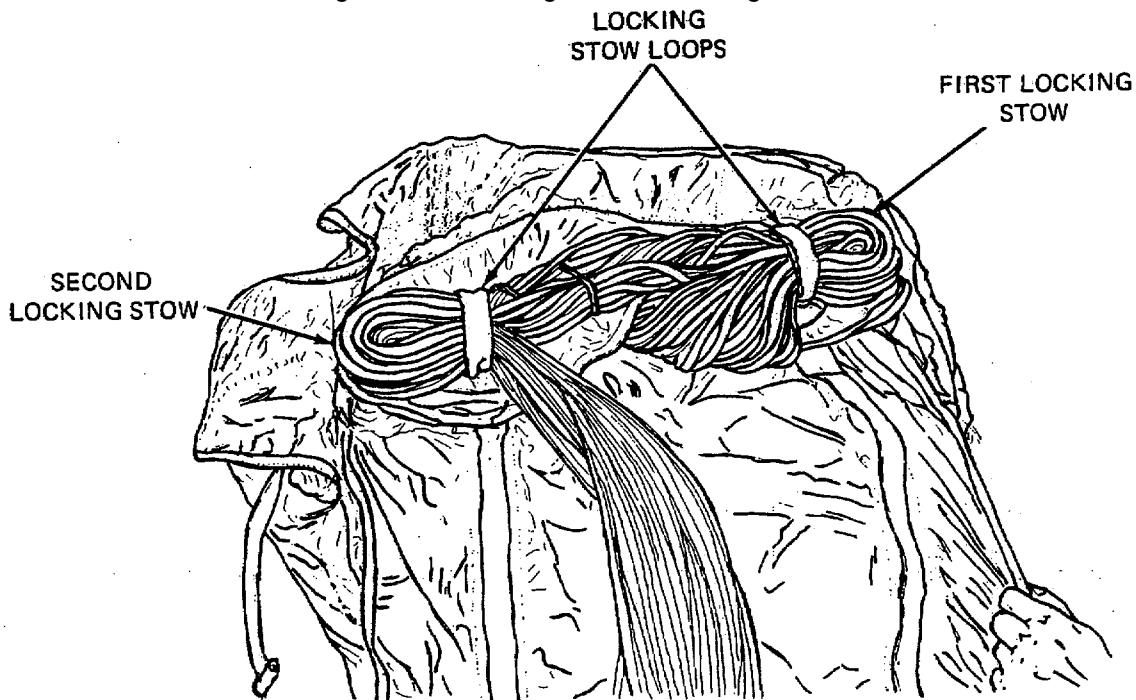
(e) Lay the deployment bag flat on the floor and expose the suspension line retaining straps by folding the suspension line stowage flap back over the top panel.

2-16. Packing the 64-Foot Cargo Parachute, Model G-12D (cont).



4839-042

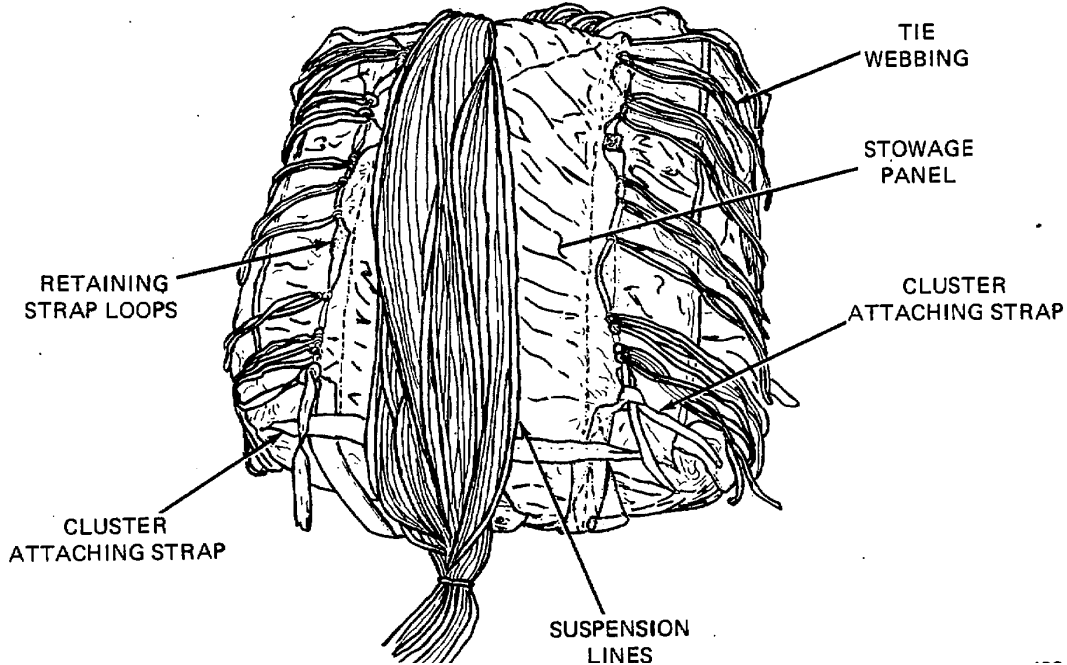
Figure 2-33. Making the First Locking Stow.



4839-043

Figure 2-34. Locking Stows Completed.

- (f) Temporarily secure the folded suspension line stowage flap at the bridle end of the bag with the two adjacent cluster tie webbing straps. Pass each webbing strap through the end loop of the adjacent suspension line retaining strap and make a slip knot in the webbing strap.
- (g) Cut a minimum of twenty-four 18-inch lengths of 1/4-inch wide, type I cotton webbing for use as suspension line ties.
- (h) Beginning with the suspension line retaining strap loops at the top of the bag, secure three lengths of tie webbing to each loop on the line stowage panel by making a slip loop in each webbing length



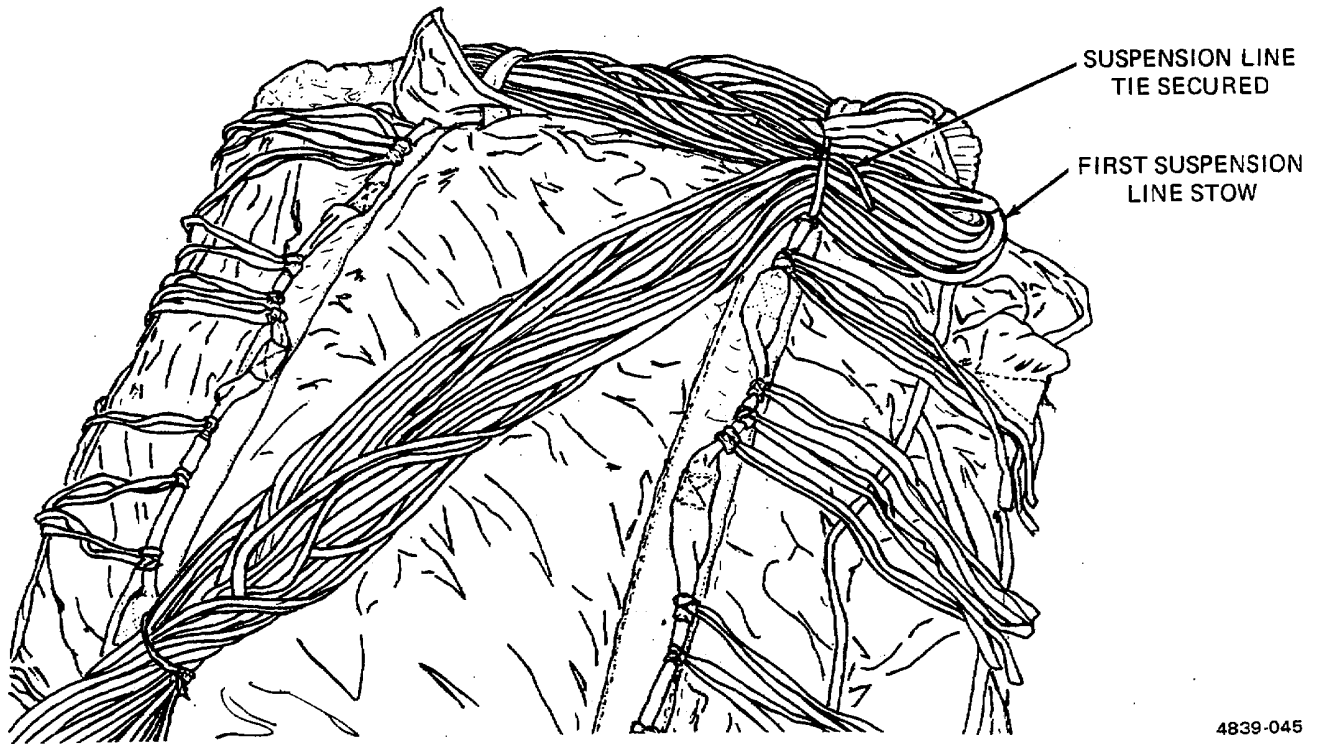
4839-044

Figure 2-35. Suspension Line Ties Positioned on Suspension Line Retaining Strap Loops.

- (i) Extend the suspension line length from the left locking stow to the first webbing loop at the upper right corner of the line stowage panel and form the first suspension line stow by making an S-fold in the suspension lines at the edge of the line stowage panel. Secure the formed suspension line stow with the first length of tie webbing, make a surgeon's knot and a locking knot (figure 2-36).
- (j) Extend the suspension line length to the first webbing loop at the upper left corner of the line stowage panel. Form and secure the second suspension line stows as described in (i), above (figure 2-37). Continue stowing and securing the remaining suspension line length alternately from right to left. Insure each stow is alined with the line stowage panel edge.

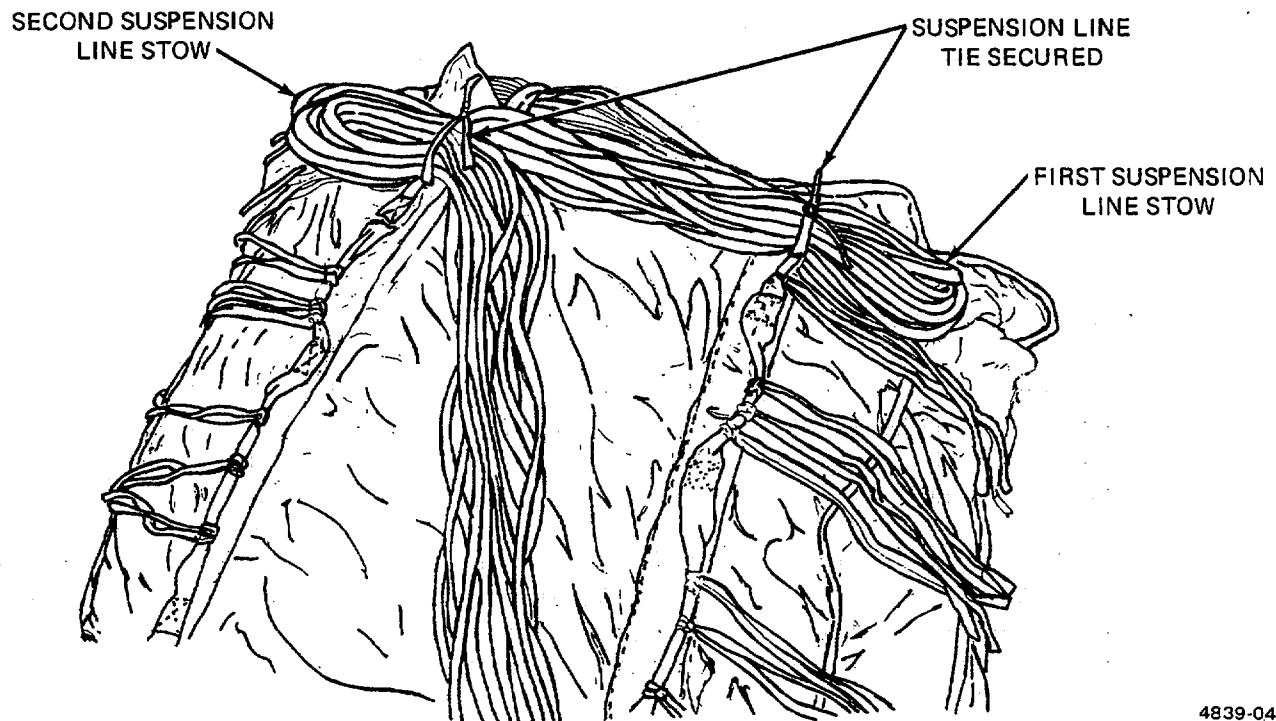


2-16. Packing the 64-Foot Cargo Parachute, Model G-12D (cont.)



4839-045

Figure 2-36. First Suspension Line Stow Completed.



4839-046

Figure 2-37. Second Suspension Line Stow Completed.



- (k) Stow the risers to a point 18 inches from the suspension clevis (figure 2-38), using procedures in(j), above. However, an S-fold is not made in the last slow. Trim all tie ends to 2 inches.

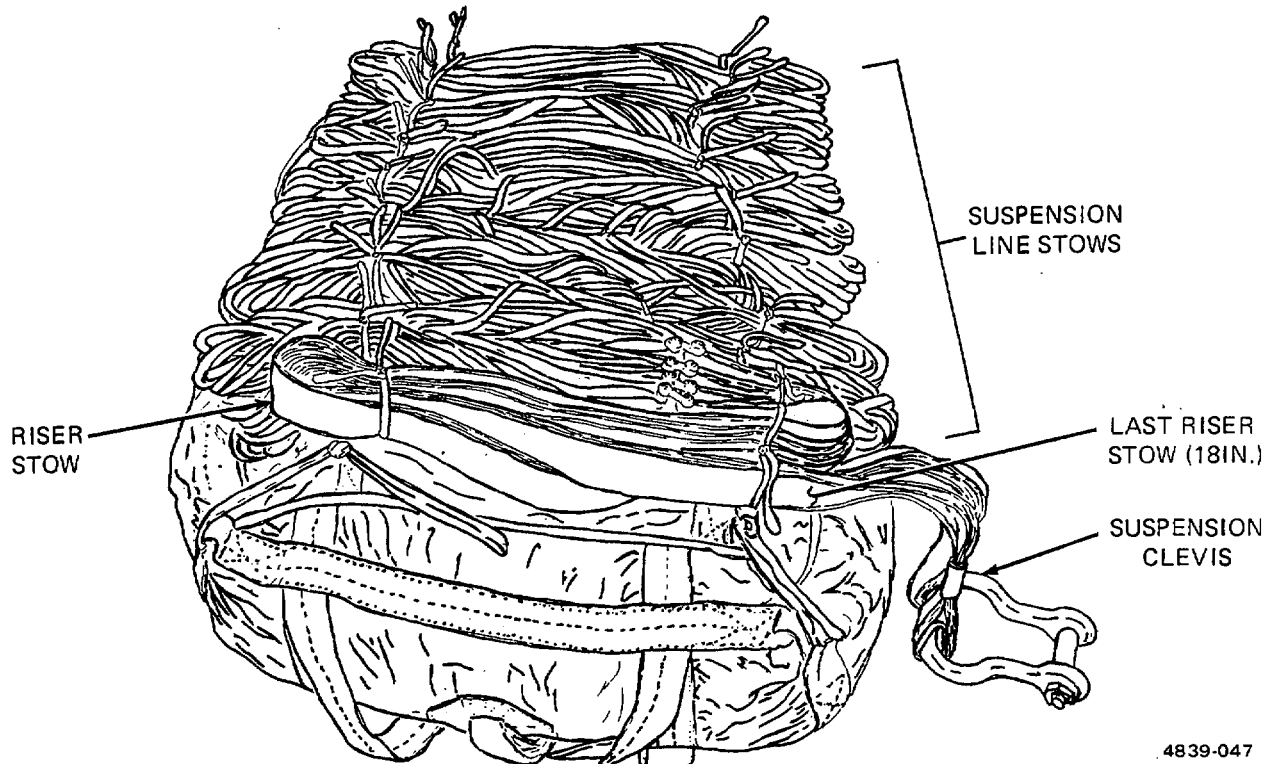


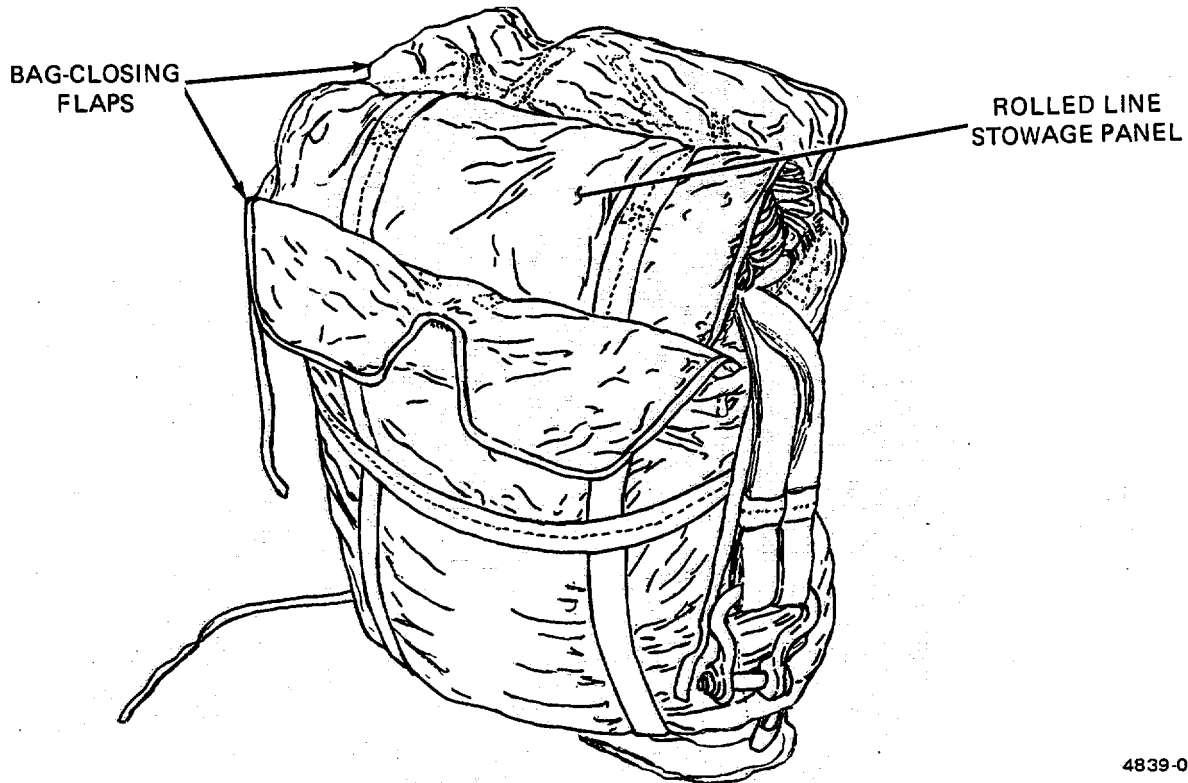
Figure 2-38. Suspension Line and Riser Stowage Completed.

- (9) Closing the deployment bag. Closing the deployment bag requires a packer to be located on each side of the bag to perform the following:
- Roll the suspension line stowage panel as tight as possible toward the bag open end.
  - Insert the line stowage panel roll between the bag closing flaps and into the open end of the bag (figure 2-39).
  - Fold the bag closing flaps over the positioned line stowage panel roll and insure the running end of the risers and the suspension clevis remain free and above the flaps.

#### WARNING

The bag closing ties will not be knotted until the risers and clevis have been positioned over the center of the flap closure.

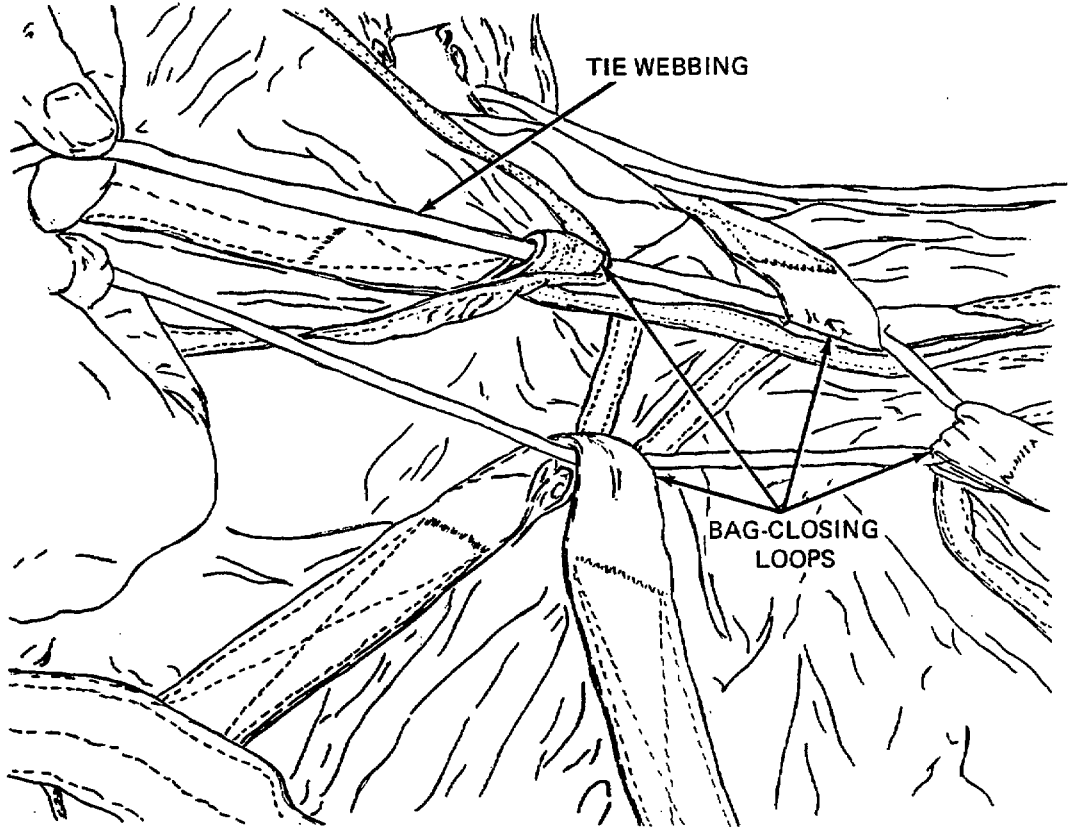
2-16. Packing the 64-Foot Cargo Parachute, Model G-12D (cont).



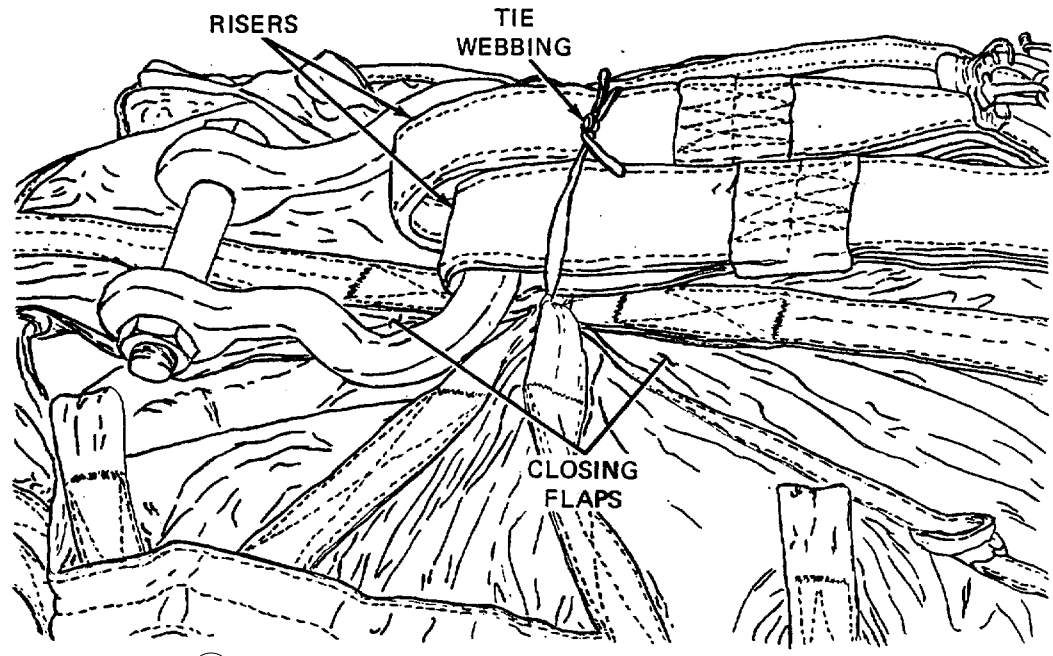
4839-048

Figure 2-39. Suspension Line Stowage Panel Rolled and Inserted Into Bag Open End.

- (d) Cut a 24-inch length of 1/4-inch wide, type I cotton webbing and pass one end of the webbing length through the closing loop on each of the four bag closing flaps. Pull the webbing ends to draw the closing loops together (A, figure 2-40).
- (e) Position the extended risers over the center of the flap closure and bring the webbing ends around the risers (B, figure 2-40). Secure the webbing ends on top of the risers with a surgeon's knot and a locking knot. Trim tie ends to 2 inches.
- (f) Using a 24-inch length of 1/4-inch wide, type I cotton webbing, secure the right secondary bag closing loops with one turn single by passing one end of the webbing through one loop, under the secured risers, and through the opposite loop. Secure both webbing ends on top of the risers (figure 2-41) with a surgeon's knot and a locking knot. Trim tie ends to 2 inches.
- (g) Secure the left secondary bag closing loops and the positioned suspension clevis using a 48-inch length of 1/4-inch wide, type I cotton webbing. Make the tie with one turn triple using the procedures in (f), above (figure 2-42). Insure the closing flaps are tucked into the bag neatly and trim tie ends to 2 inches (figure 2-43).



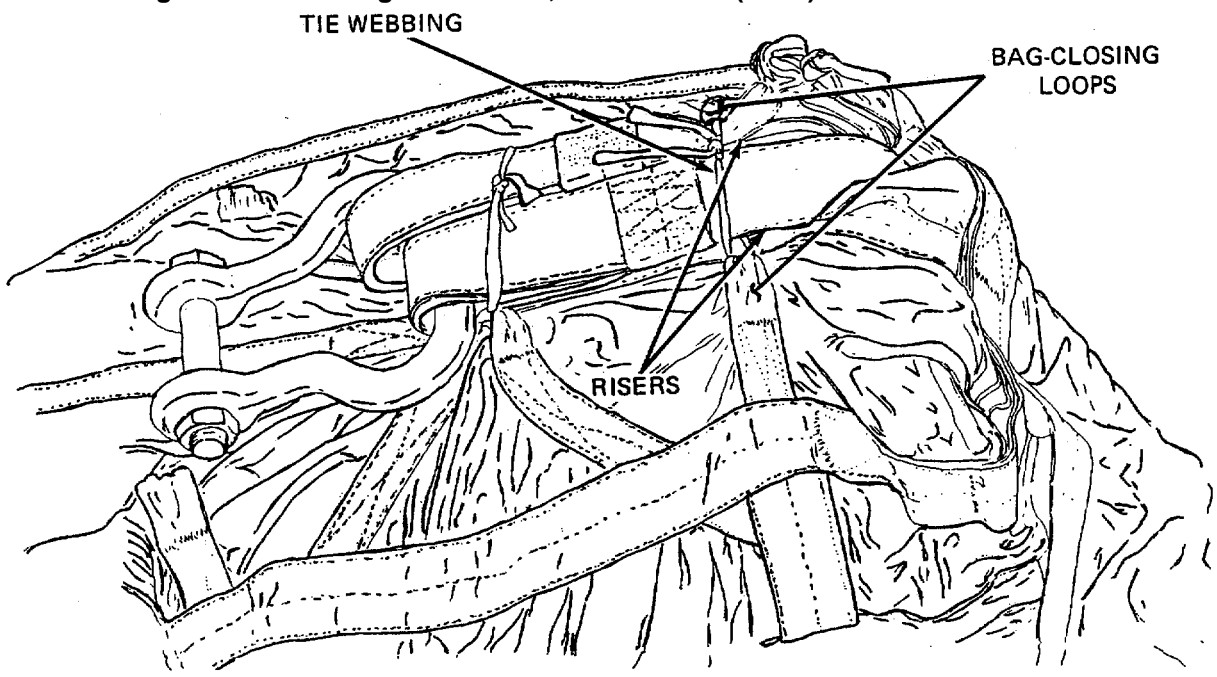
**(A) TIE WEBBING INSTALLED ON CLOSING FLAPS**



**(B) SECURING RISERS ON TOP OF CLOSING FLAPS**

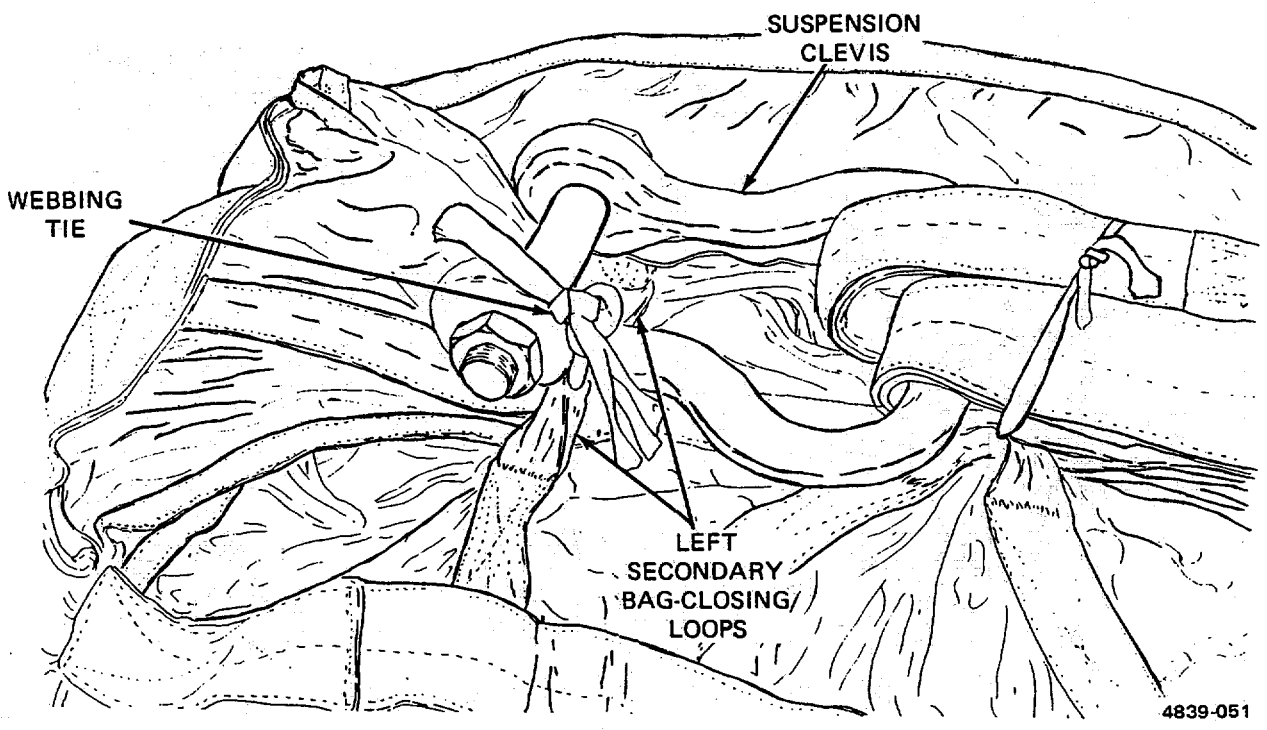
*Figure 2-40. Making Primary Bag Closing Tie.*

2-16. Packing the 64-Foot Cargo Parachute, Model G-12D (cont.)



4839-050

Figure 2-41. Securing the Right Secondary Bag Closing Loops.



4839-051

Figure 2-42. Securing the Left Secondary Bag Closing Loops and Suspension Clevis.



Figure 2-43. Packing Completed, G-12D Parachute.

(10) *Completing the log record.* Remove the Army Parachute Log Record (DA Form 10-42 or DA Form 3912) from the parachute inspection data pocket (log record pocket) on the riser. Make entries on the "Jump, Inspection and Repack Data" page as follows:

- (a) *Date.* Enter the day, month and year of each packing action.
- (b) *Bag number.* Indicate breakaway deployment bag attachment.
- (c) *Routine inspection.* No entry required.
- (d) *Jumps or dropped.* No entry required.
- (e) *Repack.* For initial packing, enter "IN"; thereafter, enter a check mark in the column each time the parachute is replaced.
- (f) *Packer's name.* The packers performing the packing will sign this entry.
- (g) *Inspector's name.* The inspector who has performed the pack-in-process inspection will sign this entry.
- (h) *Unit.* Enter the unit designation to which the packers and/or the inspector are assigned.

**2-16. Packing the 64Foot Cargo Parachute, Model G-12D (cont).**

*e. Packing the 68Inch Diameter Pilot Parachute.* The 68-inch diameter pilot parachute may be used with the G-12D cargo parachute when it is used in air delivery operations which require the parachute to be deployed by static line. The pilot parachute will be packed in a breakaway or non-breakaway configuration, as required. Pack the pilot parachute on a packing table as follows:

(1) *Attaching the breakaway static line.*

- (a) Partially invert the pilot parachute deployment bag by folding the sides back to expose the inner loop.
- (b) Pass the small loop of the bridle line through the deployment bag inner loop. Further pass the large loop on the opposite end of the bridle line through the small loop to form a slip loop around the inner loop. Draw the slip loop tight.
- (c) Pass the bridle line large loop through the pilot parachute breakcord attaching loop. Further pass the pilot parachute deployment bag and static line through the large loop to form a slip loop around the pilot parachute breakcord attaching loop.

(2) *Attaching the non-breakaway static line.*

- (a) Perform procedures outlined in (1) (a), above, and position the inner loop immediately above the pilot parachute breakcord attaching loop.
- (b) Using a single length of ticket no. 5 cotton thread, pass one end of the thread through the pilot parachute breakcord attaching loop until the thread center is reached.
- (c) Working from opposite directions, pass each end of the thread length through the inner loop and draw the thread tight.
- (d) Secure the thread ends on top of the inner loop with a surgeon's knot and a locking knot. Trim thread ends to 2 inches.

(3) *Folding the canopy.*

- (a) Make four gore folds to the right of the suspension lines, four gore folds to the left of the suspension lines, and dress the gores.
- (b) Fold the tight gore group over the canopy center and fold the left gore group over the right gore group (figure-2-44).

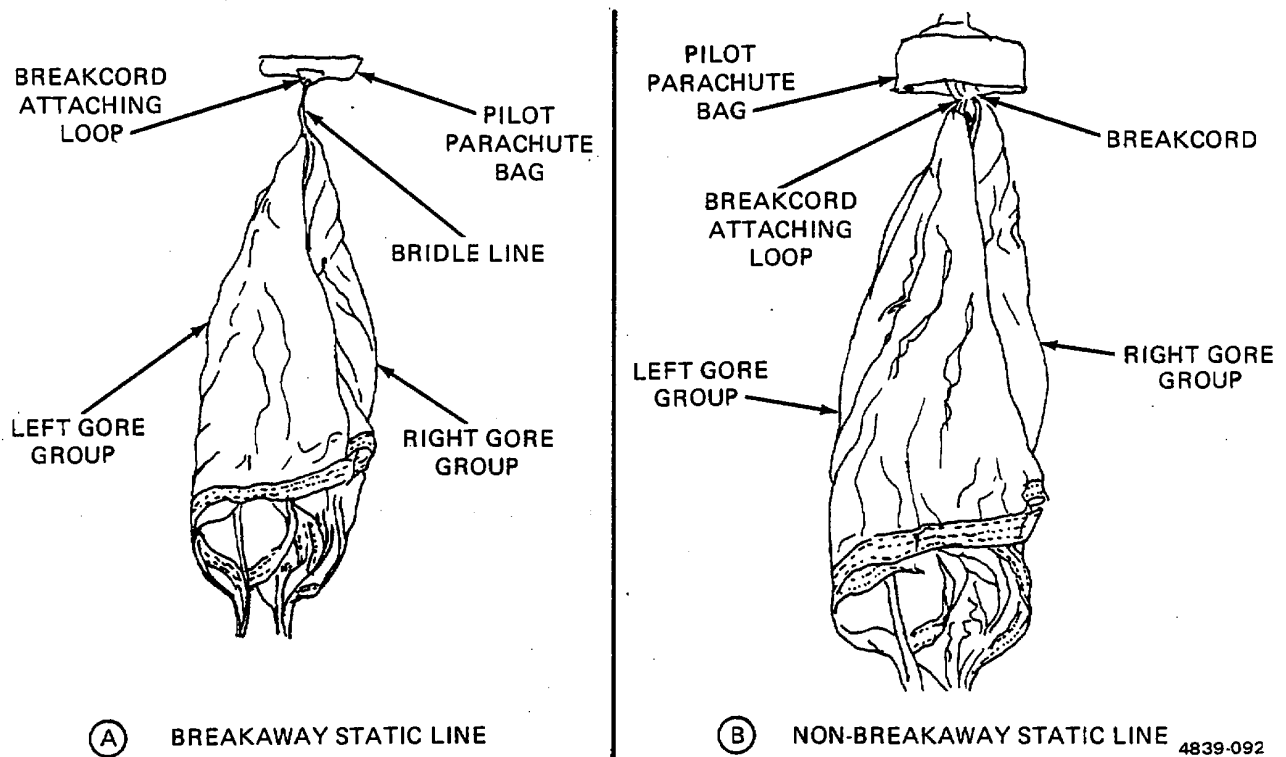


Figure 2-44. Parachute Bag and Static Line Attached and Gore Folding Completed.

- (4) *Attaching the deployment line.*
  - (a) Disassemble the pilot parachute suspension line connector link assembly.
  - (b) Insert the free connector link L-bar through the loop on one end of the 111 -inch long deployment line and reassemble the link assembly.
- (5) *Stowing the canopy, suspension lines and deployment line.*
  - (a) Remove the bag inversion made in (1)(a), above.
  - (b) Working from the crown to the skirt, S-fold the canopy into the bag (figure 2-45).



2-16. Packing the 64-Foot Cargo Parachute, Model G-12D (cont).

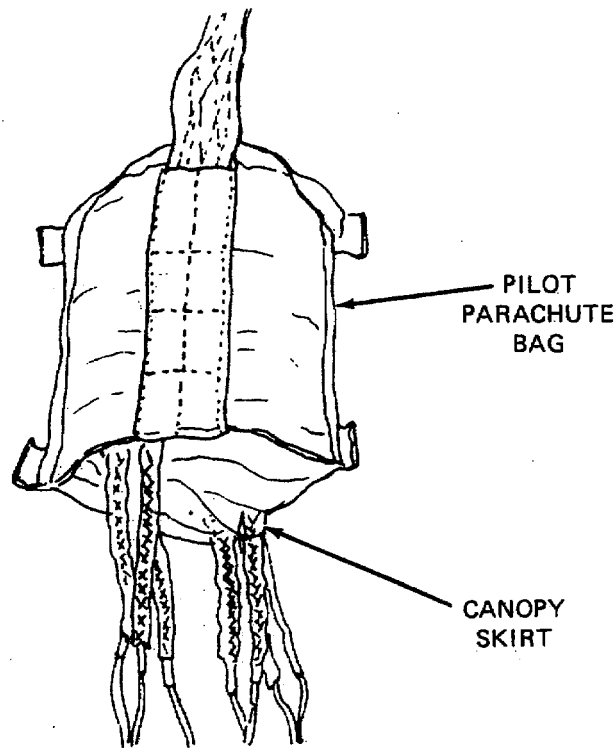
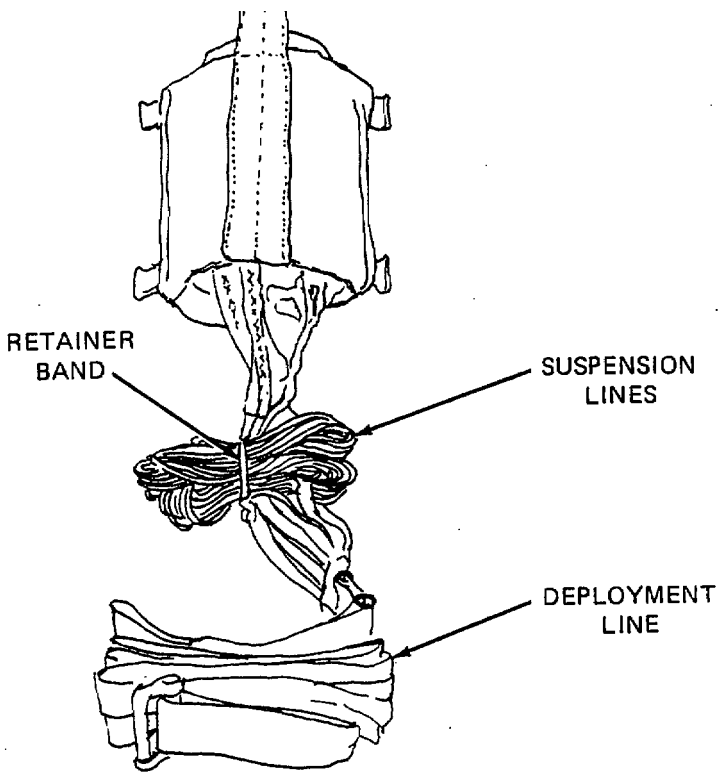


Figure 2-45. Canopy Stowed in Bag.

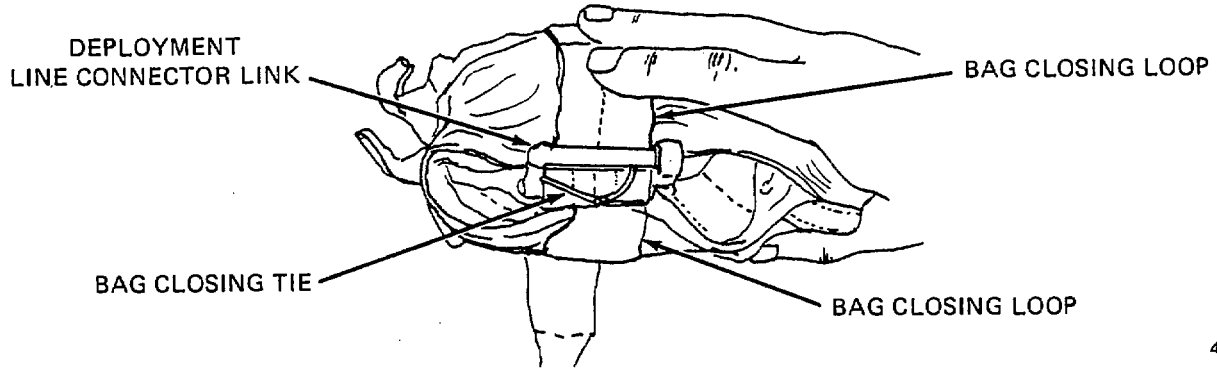
- (c) S-fold the suspension lines to the width of the bag. Secure the folded lines in the center with a rubber retainer band (figure 2-46).
- (d) Insert the folded suspension lines into the pilot parachute bag.
- (e) S-fold the deployment line length into the pilot parachute bag and position the deployment line connector link at the lower center of the bag open end.
- (6) *Closing the pilot parachute bag.* Using a single length of ticket No. 5 cotton thread, pass one thread end through the top bag closing loop, through the deployment-line connector link assembly, through the-bottom bag closing loop, back through the deployment line link, and through the opposite side of the top bag closing loop. Pull the thread ends tight and make a tie with a surgeon's knot and a locking knot (figure 2-47). Trim tie ends to 2 inches.





4839-094

Figure 2-46. Suspension Lines Folded and Secured.



4839-095

Figure 2-47. Bag Closing Completed.

**2-16. Packing the 64-Foot Cargo Parachute, Model G-12D (cont).**

(7) *Attaching the riser clevis.* The manner in which the riser clevis is to be attached to the static line shall depend upon whether the pilot parachute is packed for breakaway or non-breakaway use. The clevis attachment procedures for both methods are as follows:

(a) *Breakaway static line.*

- 1 Cut a 12-inch length of type III nylon cord and remove the core threads.
- 2 Center the cord length around the clevis pin and insure the running cord ends are aligned. Pass each running end of the cord length through the static line clevis attaching loop from opposite directions (figure 2-48) and secure the cord ends on top of the static line attaching loop with a surgeon's knot and a locking knot. Make an overhand knot-in each running end. Trim each tie end at a point 2 inches from the surgeon's knot and locking knot.

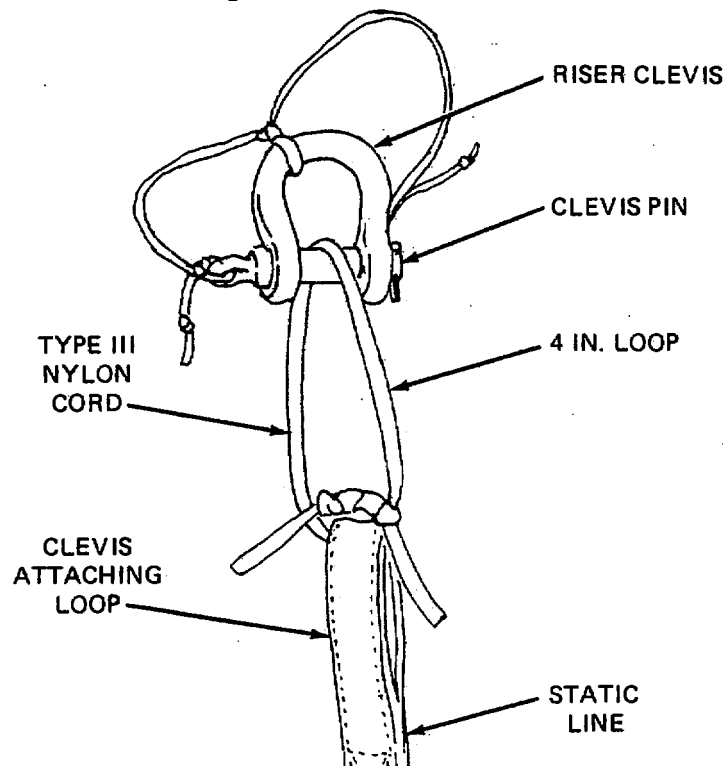


Figure 2-48. Riser Clevis Attached to Breakaway Static Line.

4839-096

(b) *Non-breakaway static line.*

- 1 Remove the cotter pin from the clevis pin and the clevis pin from the body of the clevis.
- 2 Position the static line clevis attaching loop between the clevis bottom ends and reinsert the clevis pin into the clevis body, passing the pin through the clevis attaching loop. Reinstall the safety pin into the end of the clevis pin (figure 2-49).

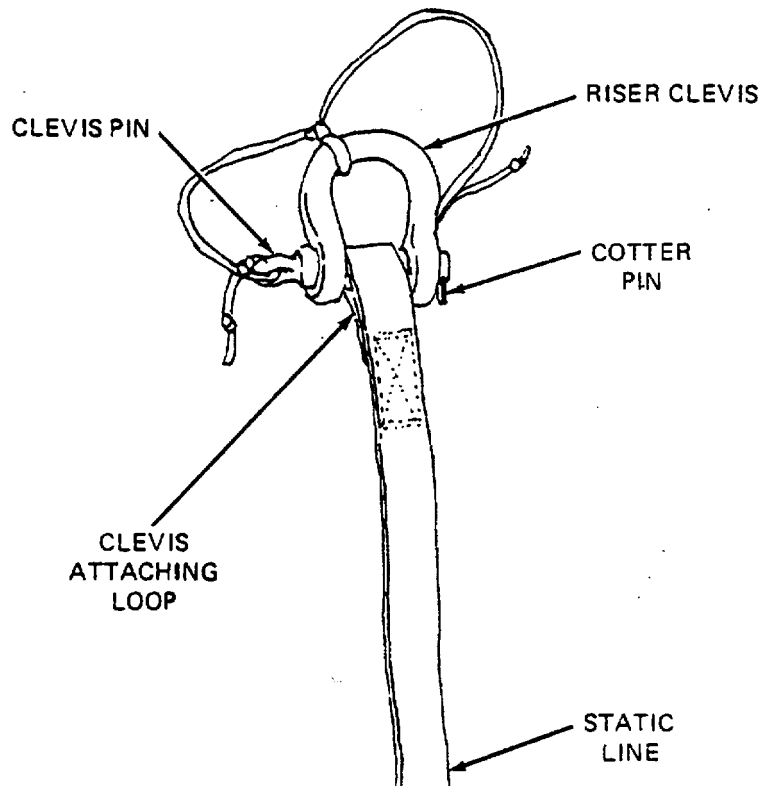
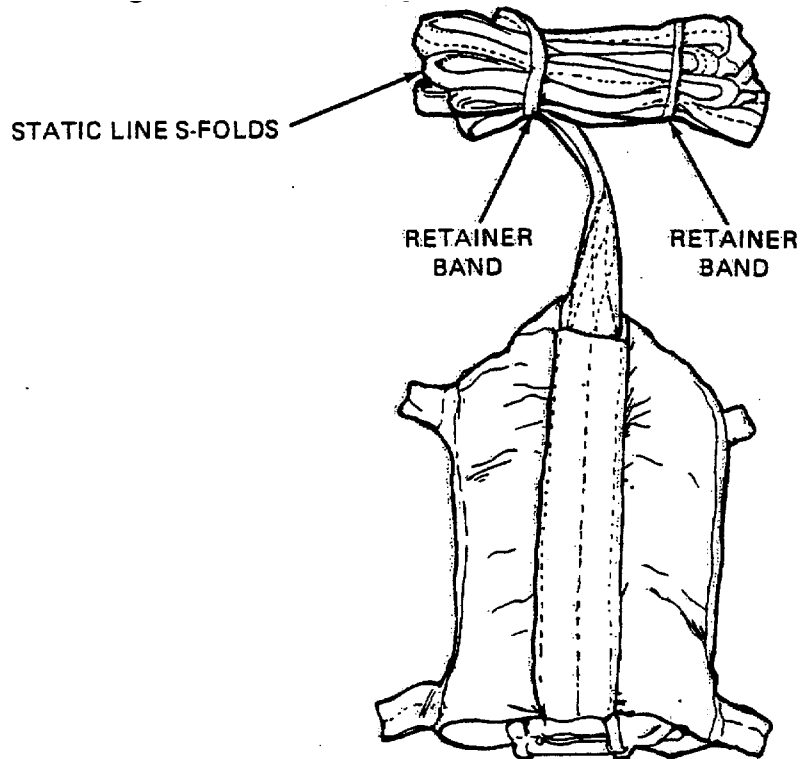


Figure 2-49. Riser Clevis Attached to Non-Breakaway Static Line.

(8) *Stowing the static line.* S-fold the static line length in 8 inch folds and secure each end of the folded webbing with a rubber retainer band (figure 2-50).

(9) *Marking the deployment bag.* Place a piece of masking tape on deployment bag. Mark "breakaway" or "non-breakaway".

2-16. Packing the 64-Foot Cargo Parachute, Model G-12D (cont).



4839-098

Figure 2-50. Packing Completed.

(10) Attaching the Pilot Parachute.

- (a) Attach a 69inch pilot parachute to the bridle of the G-12D cargo parachute with the connector link of the pilot parachute.
- (b) Cut four suitable lengths of ticket number 8/7 cotton thread.
- (c) Using on turn single of 8/7 cotton thread and the four tie loops, secure the pilot chute to the deployment bag of the G-12D clustering tie loops.
- (d) S-fold the static line across the G-12D cargo parachute. Secure the folds to the riser stow bar with two retainer bands.

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## 2-17. Packing the 64 Foot Cargo Parachute, Model G-12E.

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- This task covers:
- |  |   |
|--|---|
| a. Inspection                            | d. Padding the G-12E Parachute Assembly         |
| b. Orientation                           | e. Padding the 68-Inch Diameter Pilot Parachute |
| c. Preparing Parachute for Proper Layout |   |

---

*Tools:*

Line Separator, Item 7, Appendix B  
Knife, Item 4, Appendix B  
Yardstick Item 24, Appendix B  
Separator, Link Item 23, Appendix B

*Materials/Parts:*

Cloth, Cotton, Muslin, Item 5/6, Appendix D  
Cord, Nylon, Type III, item 14/15, Appendix D  
Marking Aid, Item 25/26, Appendix D  
Paper, Kraft, Item 22, Appendix D  
Tape, Pressure Sensitive, item 34, Appendix D  
Thread, Cotton, Size 8/4, Item 37, Appendix D  
Thread, Cotton, Size 8/7, Item 38, Appendix D  
Webbing, Cotton, Type I, 1/4-in., Item 48, Appendix D

*Materials/Parts (Cont):*

Webbing, Nylon, Tubular, 1/2-In., Item 57, Appendix D  
Rubber Bands, Item 63, Appendix D

*Equipment Condition:*

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

*References:*

DA PAM 738-751  
TB 43-0002-43  
DA PAM 738-750

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### WARNING

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

### NOTE

"All inspection data pockets that are located on the bridle loop shall be removed and relocated to a riser. Packet shall be located 1 1/2 inches above the keeper at the clevis attaching loop IAW paragraph 2-34."

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 paragraph 2-13e and DA PAM 738-751. A rigger type inspection and a pack-in-process inspection must be performed in conjunction with each packing of a parachute (refer to paragraph 2-13).

(1) *Modified/rigger-type inspection.* During packing of each parachute, it must be given a rigger-type inspection by the packers in accordance with paragraph 2-13(2).

(2) *Pack-in-process inspection.* A pack-in-process inspection must be performed by a designated supervisory rigger, other than the packers, at seven intervals during the packing procedure. The inspection is performed to ensure that the parachute is packed according to authorized packing procedures. (Refer to paragraph 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 looking from the parachute riser (tension device) toward the canopy vent (stationary post). See figure 2-51.

2-17. Packing the 64-Foot Cargo Parachute, Model G-12E (cont).

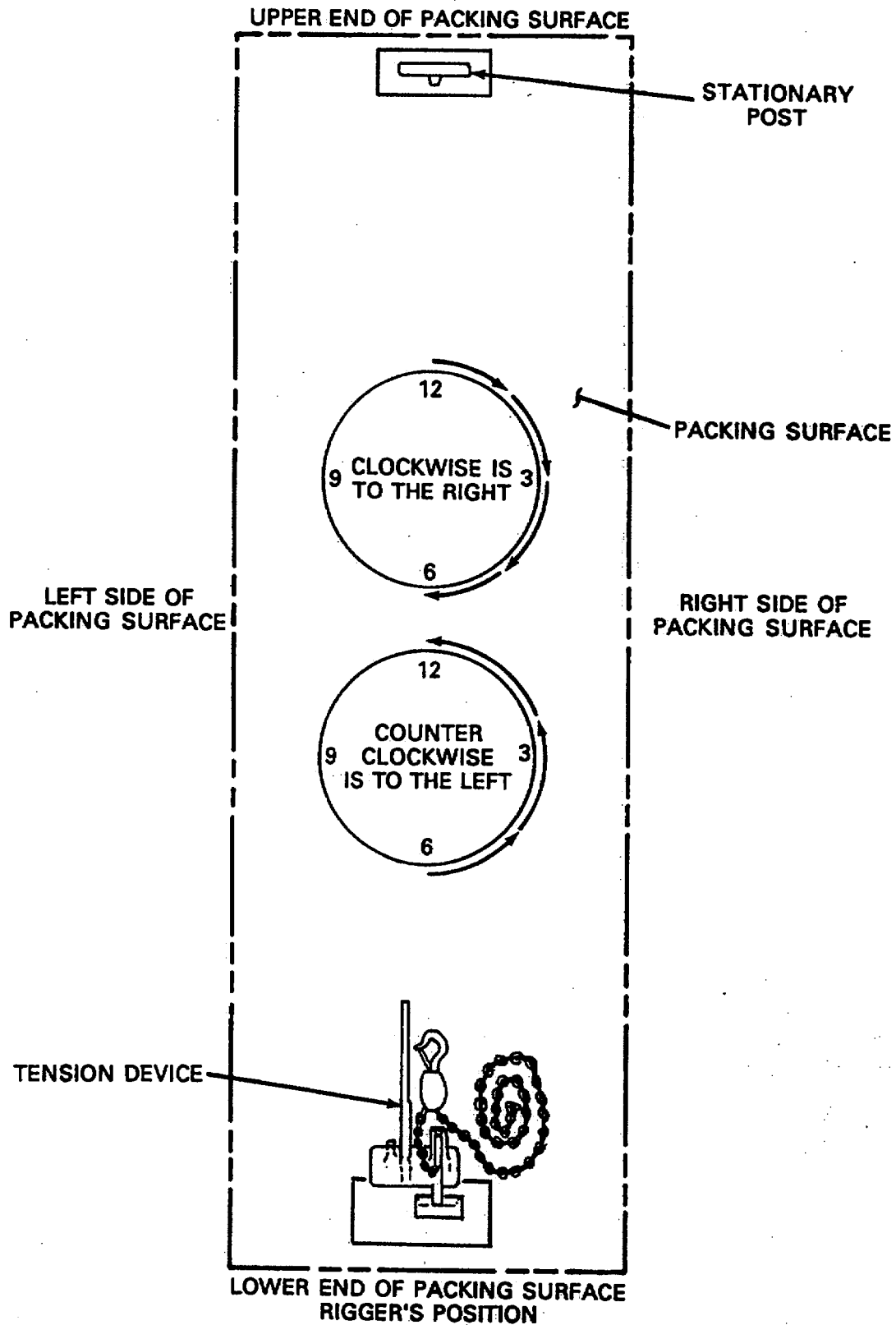


Figure 2-51. Riggers Orientation.  
2-62

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

#### NOTE

Packing of the G-12E parachute will require a 3-person team.

*c* Preparing Parachute for Proper Layout. Prepare the parachute for proper layout by positioning the canopy in an elongated manner on a suitable packing surface, with the vent lines located next to a stationary post (figure 2-52) and the suspension risers near a tension device. Disconnect the pilot parachute, static line and deployment line. For the G-12E parachute, also remove the center line for Before Use inspection. To complete the proper layout, perform the following:

(1) *Removing canopy inversion.* Inspect the canopy vent lines to determine if the canopy is inverted. If the vent lines are located on the inside of the upper lateral band, the canopy is inverted. To remove the inversion, lift the canopy skirt and walk up through the canopy to the vent area. Grasp the bridle loop and pull the canopy vent down through the canopy skirt between two adjacent suspension lines (figure 2-53). On the outside of the canopy, pull the canopy vent back to the stationary post. Attach the bridle loop to the stationary post.

(2) *Locating suspension lines in proper layout.* Locate the top center gore of the canopy and divide the suspension lines into two groups, Lines 1 through 32 in the left group and lines 33 through 64 in the right group. Maintain the line group separation and remove any turns, tangles or twists from the suspension lines as follows:

(a) *Turns.* A turn occurs when one group of suspension lines rotates around the opposite group of suspension lines. Remove the turn by rotating the suspension lines (figure 2-54) in a direction opposite to that of the turn.

(b) *Tangles.* To remove a tangle, or tangles, in the suspension lines, begin by maintaining suspension line group separation and work the tangle(s) to a point as close as possible to the connector links. Select the top line(s) forming the tangle and, using the left hand, lift the line(s) away from the lines in the group. Using the right hand, reach through the opening formed by the raised lines and pull the suspension risers through the opening (figure 2-55). Repeat the procedure to remove each remaining tangle in either group of suspension lines.

(c) *Twists.* A twist occurs when the suspension lines in one group become improperly crossed. To determine if twists are present, trace lines 1 and 64 from the canopy skirt to the connector link assemblies. If the lines cannot be traced directly to the inside of the top connector links, the suspension lines are twisted. Remove a twist by rotating the suspension risers between the suspension line groups in a direction opposite to that of the twist (figure 2-56).

(d) *Canopy layout.* Check the canopy assembly for proper layout by tracing suspension lines 1 and 64 from the canopy skirt to the inside of the top connector links and lines 32 and 33 from the canopy skirt to the inside of the bottom connector links. To complete the proper layout of the canopy, arrange the risers, connector link assemblies and suspension clevis as indicated in figure 2-57.

2-17. Packing the 64-Foot Cargo Parachute, Model G-12E (cont).

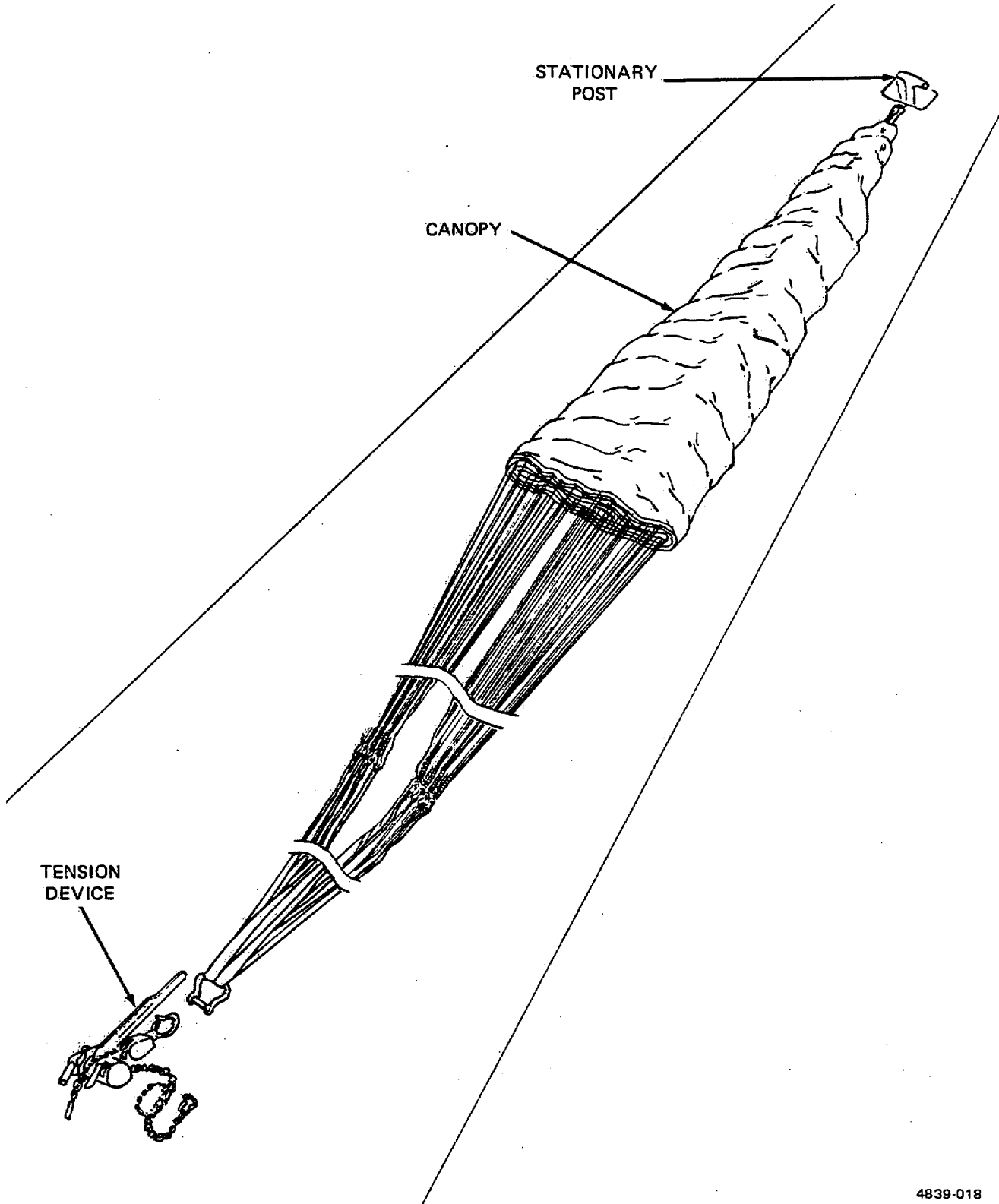
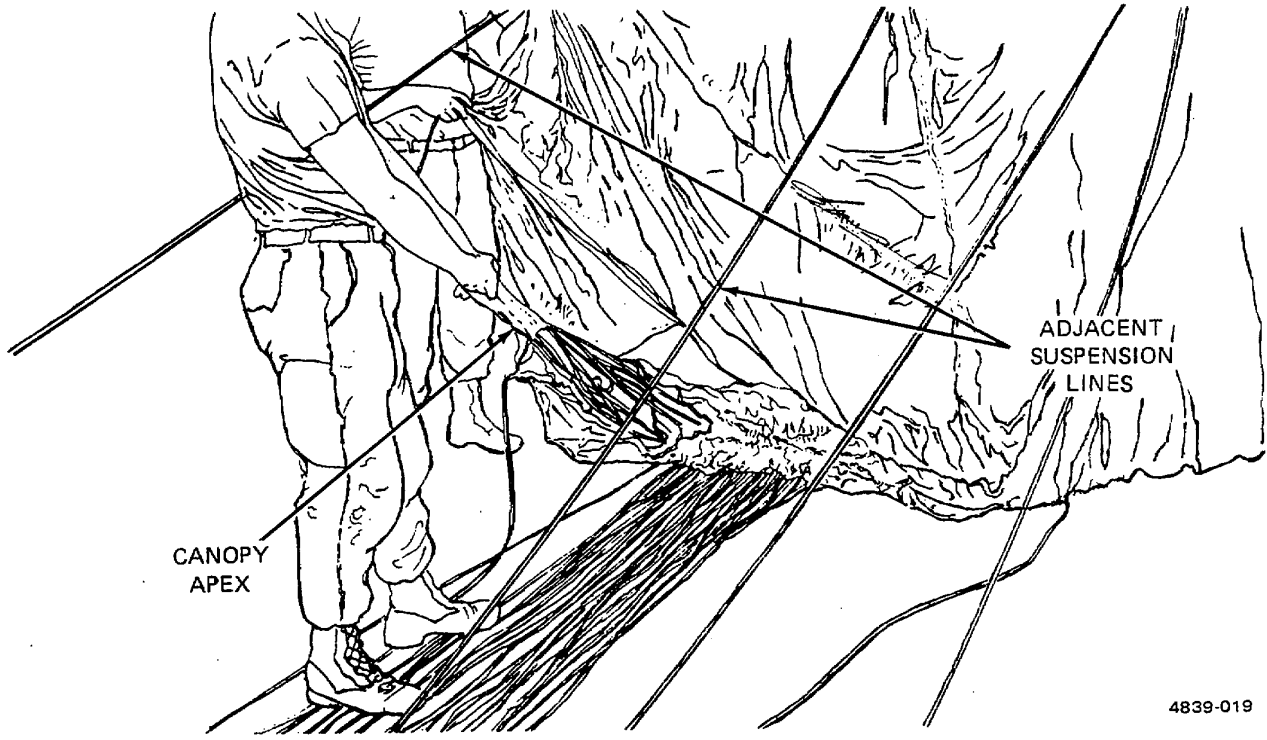


Figure 2-52. Canopy Positioned on Packing Surface.

4839-018





4839-019

Figure 2-53. Removing Canopy Inversion.

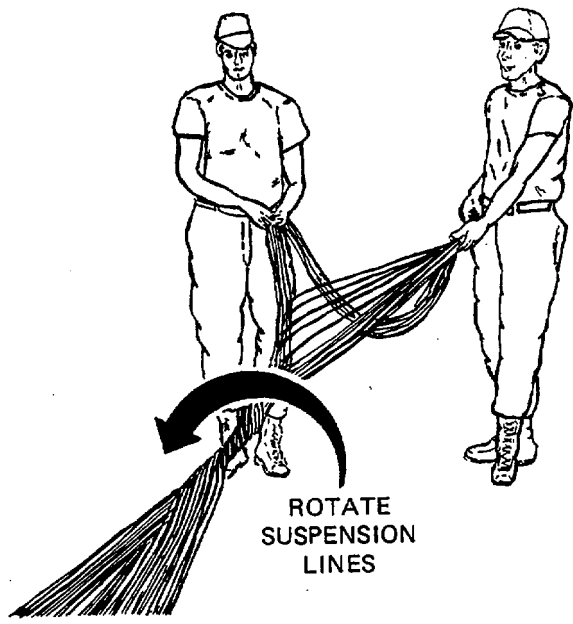
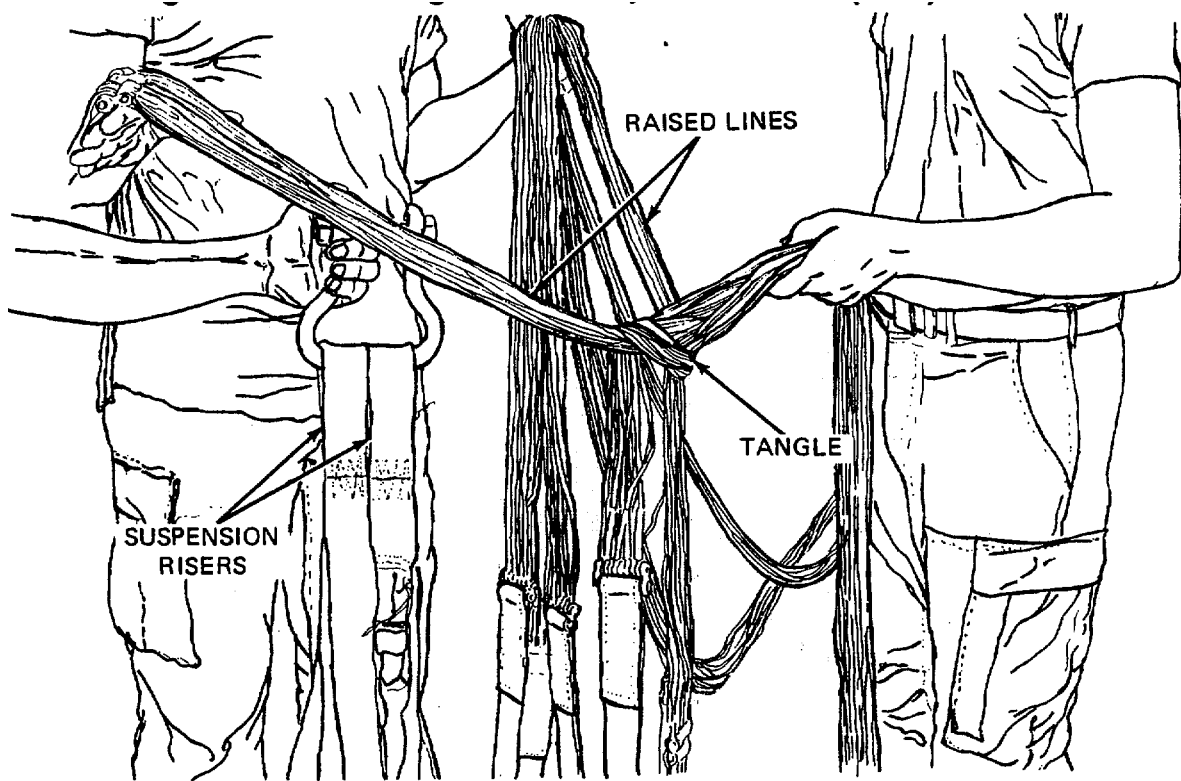


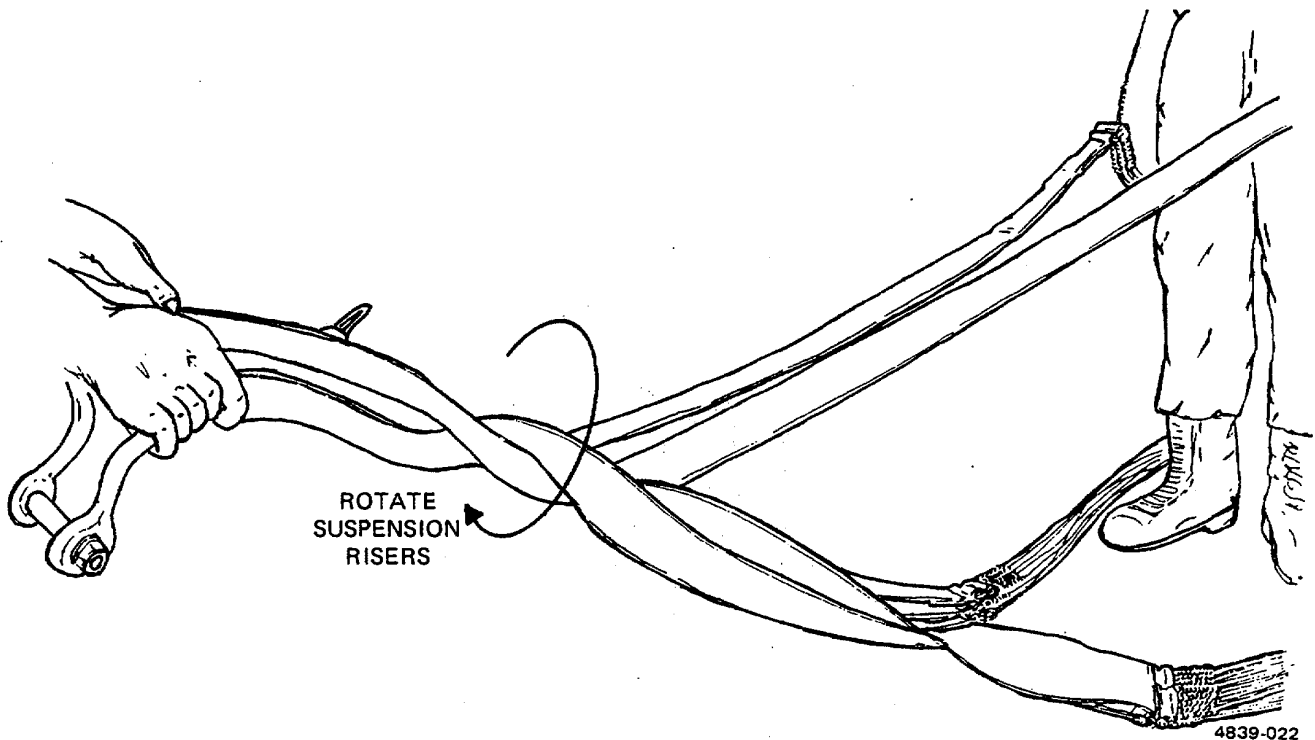
Figure 2-54. Removing Turns from Suspension Lines.

2-17. Packing the 64-Foot Cargo Parachute, Model G-12E (cont).



4839-021

Figure 2-55. Removing Tangles from Suspension Lines.



4839-022

Figure 2-56. Removing Twists from Suspension Lines.

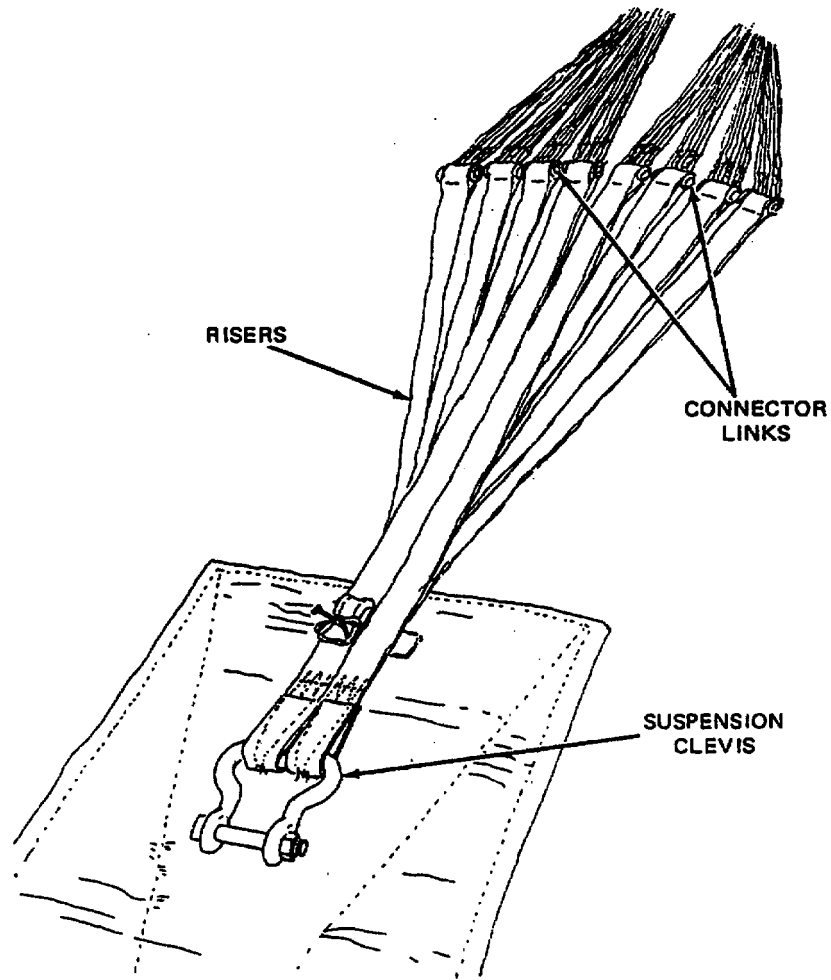


Figure 2-57 . Risers, Connector Links and Suspension Clevis in Proper Layout

d. Packing the G-12E Parachute.

**NOTE**

The G-12E deployment bag must be modified to function properly. Select a deployment bag which has been stenciled on the riser extension stowage panel: "D-BAG FOR G-12E ONLY." Modification instructions can be found in paragraph 2-43.

(1) *Serving the canopy vent*

- (a) Remove the canopy bridle loop from stationary post, insuring that the dressed upper lateral band is not disturbed.
- (b) Cut an 8 inch wide by 12-inch long piece of type III cotton muslin cloth.

**2-17 . Packing the 64-Foot Cargo Parachute, Model G-12E (cont) .**

- (c) Divide the center of the canopy vent lines into two equal groups and insert 3 inches of the cloth between the two groups (A, figure 2-58).
- (d) Extend the opposite end of the cloth down toward the inside of the vent lines and around both vent line groups to serve the vent lines (B, figure 2-58).
- (e) At a point 1 inch back from each outside edge of the vent line serving cloth, secure each end by making a tie around the vent lines with a 24-inch length of type I cotton webbing (C, figure 2-58). Make the tie with 2 turns single and secure the tie with a surgeon's knot and a locking knot. Trim tie ends to 2 inches.

(2) *Attaching center line to canopy vent lines.*

- (a) Pass one loop of the center line around the center of the vent lines.
- (b) Pass the opposite end of the center line through the end loop routed around the vent lines. Draw the center line length through the loop until a snug girth hitch is formed around the vent lines (figure 2-59).
- (c) S-fold the center lines, and place them as far as possible inside the canopy.
- (d) Reconnect the canopy bridle loop to the stationary post.

(3) *Applying tension.*

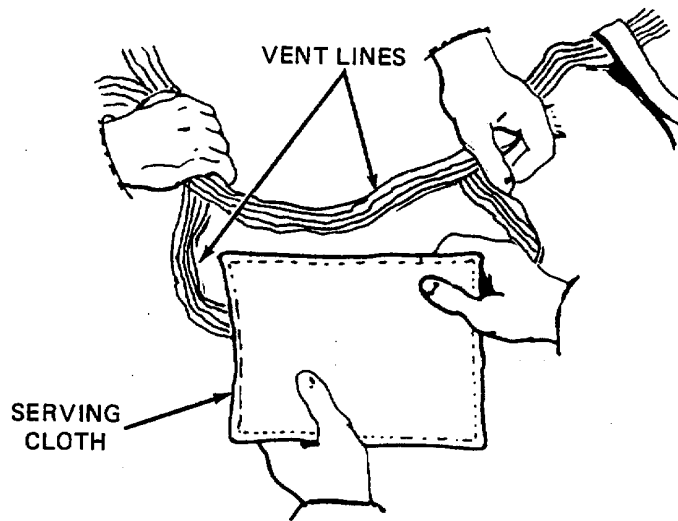
- (a) Insure that the two risers are attached to the body of a  $\frac{3}{4}$  inch shackle (clevis) and the applicable nut and screw are installed on the clevis.
- (b) Connect the  $\frac{3}{4}$ -inch clevis to a tension device and apply tension.

**NOTE**

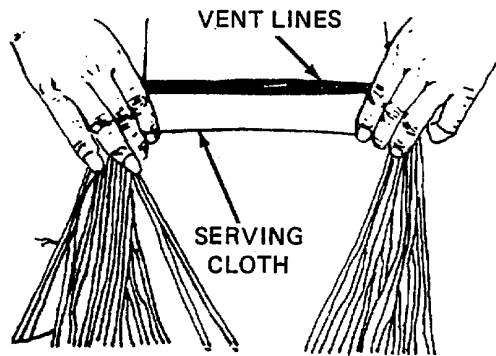
A tension jack, chain hoist, power winch or a vehicle may be used as a tension device when applying tension to the parachute canopy.

(4) *Folding the gores.* Fold the canopy gores into two groups of 32 gores each as follows:

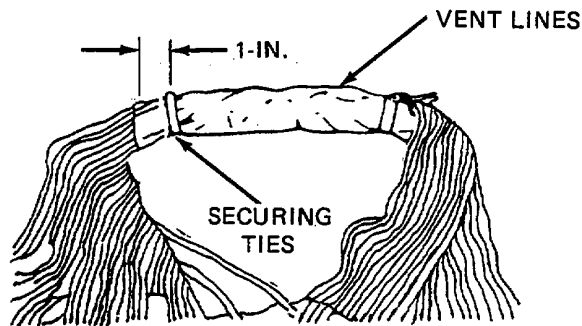
- (a) At a point 1 feet below the canopy skirt, position a large circulating fan in a manner that will allow the fan air stream to partially inflate the canopy. Turn fan on.
- (b) With the fan operating and rigger number 1 holding the canopy skirt at least shoulder high to allow the canopy to partially inflate, rigger number 2 will move through the canopy inside to the canopy vent and pull the center line length back through the canopy to within approximately 6 inches of the canopy skirt.



(A) POSITIONING CLOTH BETWEEN DIVIDED VENT LINES



(B) WRAPPING VENT LINES



(C) WRAPPED VENT LINES SECURED

Figure 2-58. Serving Canopy Vent .

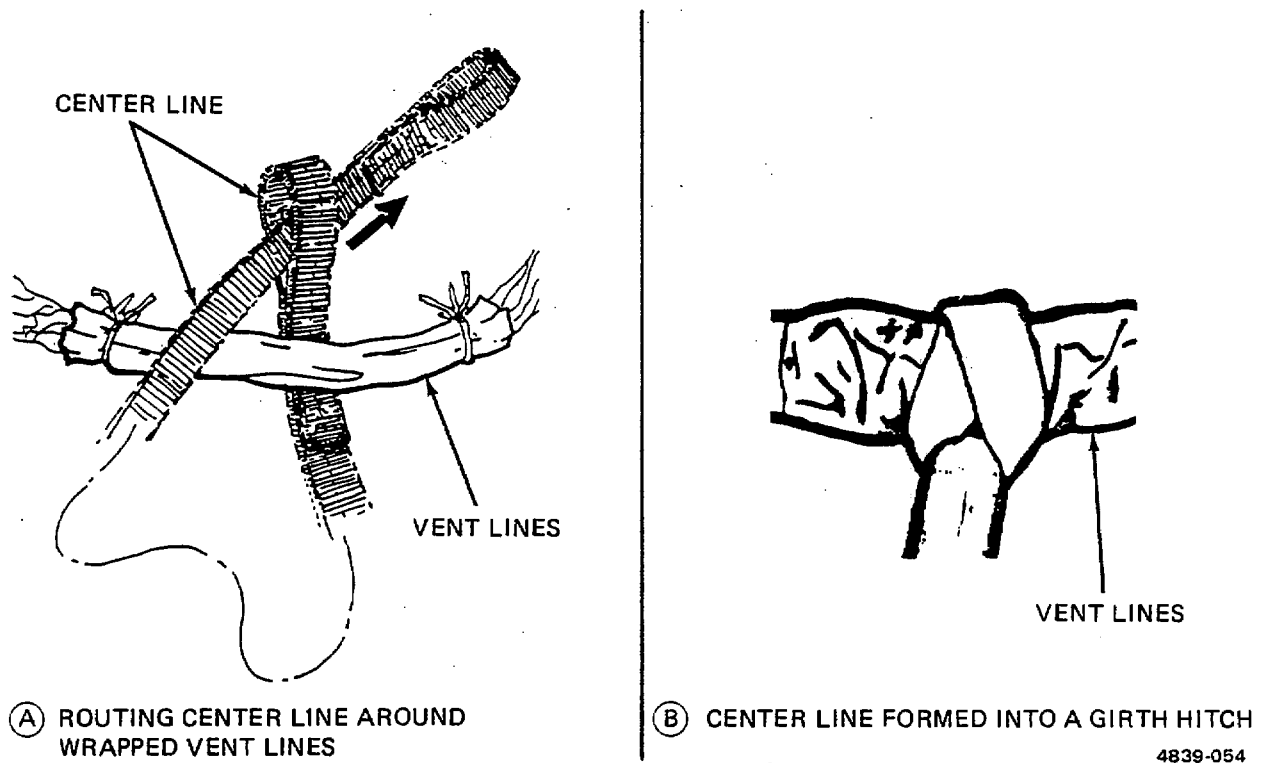


Figure 2-59. Attaching Center Line .

- (c) Insure all twists are removed from the center line length and the line is located between suspension lines 32 and 33 (figure 2-60).
- (d) Temporarily position center line inside the canopy until gore folding is completed to preclude entanglement with the suspension lines.
- (e) Turn fan off.
- (f) While holding line 33 in position in the line separator, pick up the right suspension line group and throw the right group of gores and lines over the left group of gores and lines (figure 2-61).
- (g) Turn fan on.
- (h) To fold the first gore of the right group, rigger number 1 passes line 34 to rigger number 2 who places the line on top of line 33 in the right slot of the line separator.
- (i) Insure that while placing line 34 into the line separator, the gore between lines 33 and 34 deflates and lies flat in a folded fashion.

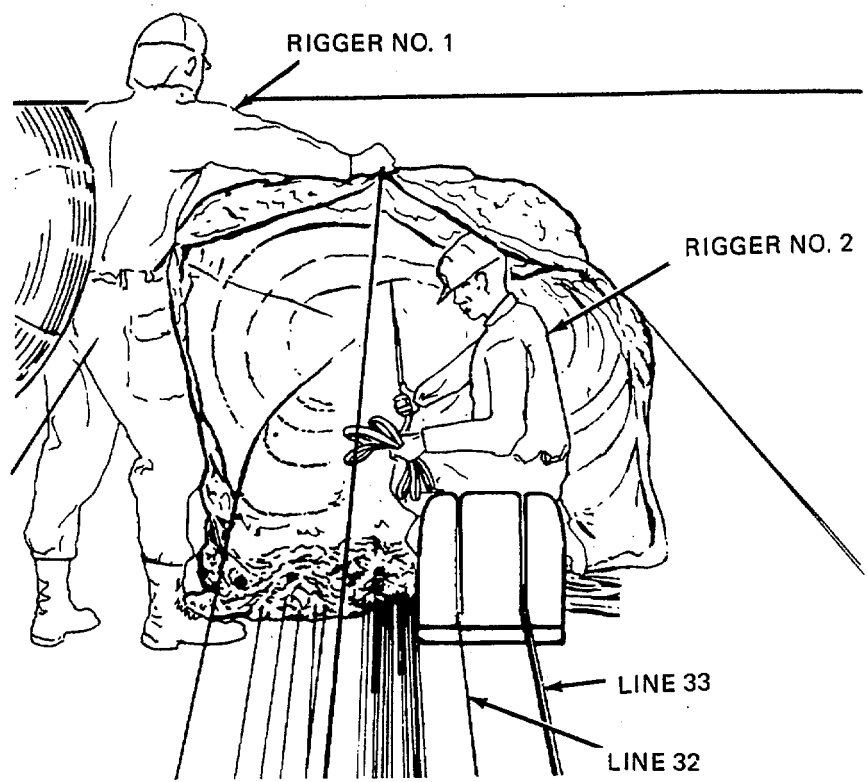


Figure 2-60. Placing the Center Line .

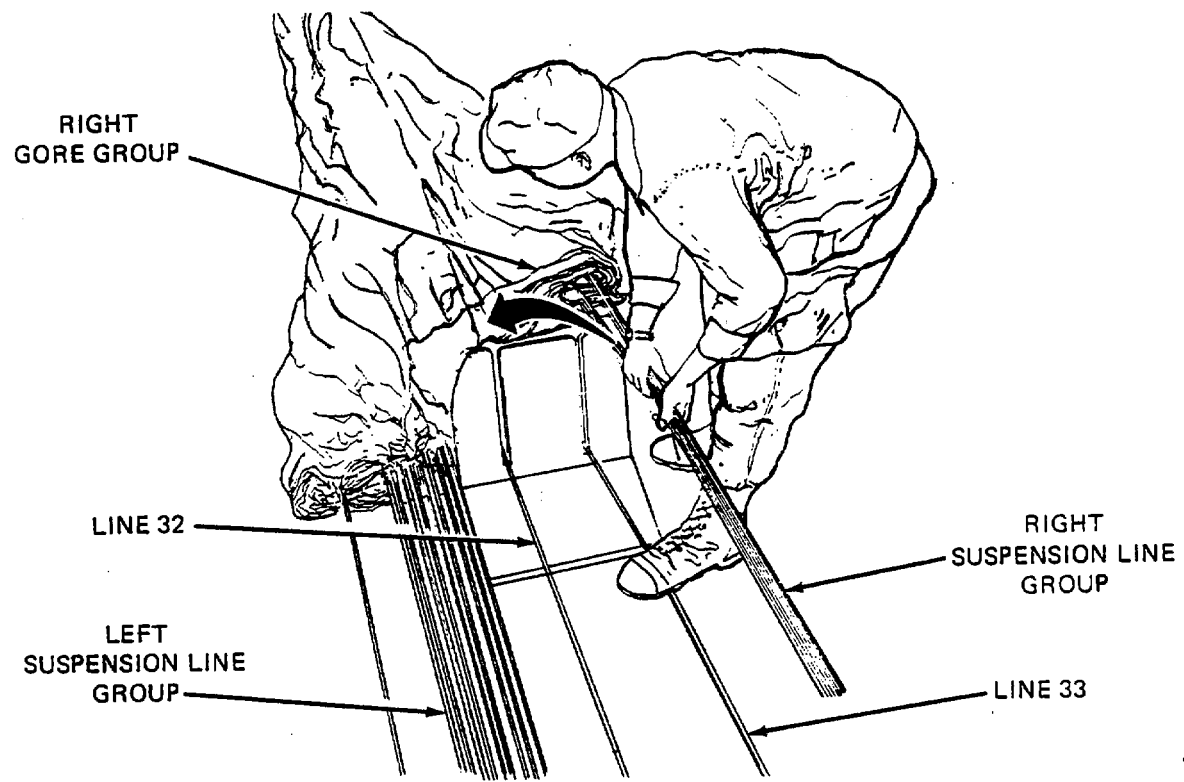


Figure 2-61. Preparing to Throw Right Group of Gores and Suspension Lines .  
2-71

**2-17. Packing the 64-Foot Cargo Parachute, Model G-12E (cont).**

- (j) Fold the remainder of the right group, placing lines 35 through 64 in the right slot of the line separator (figure 2-62).

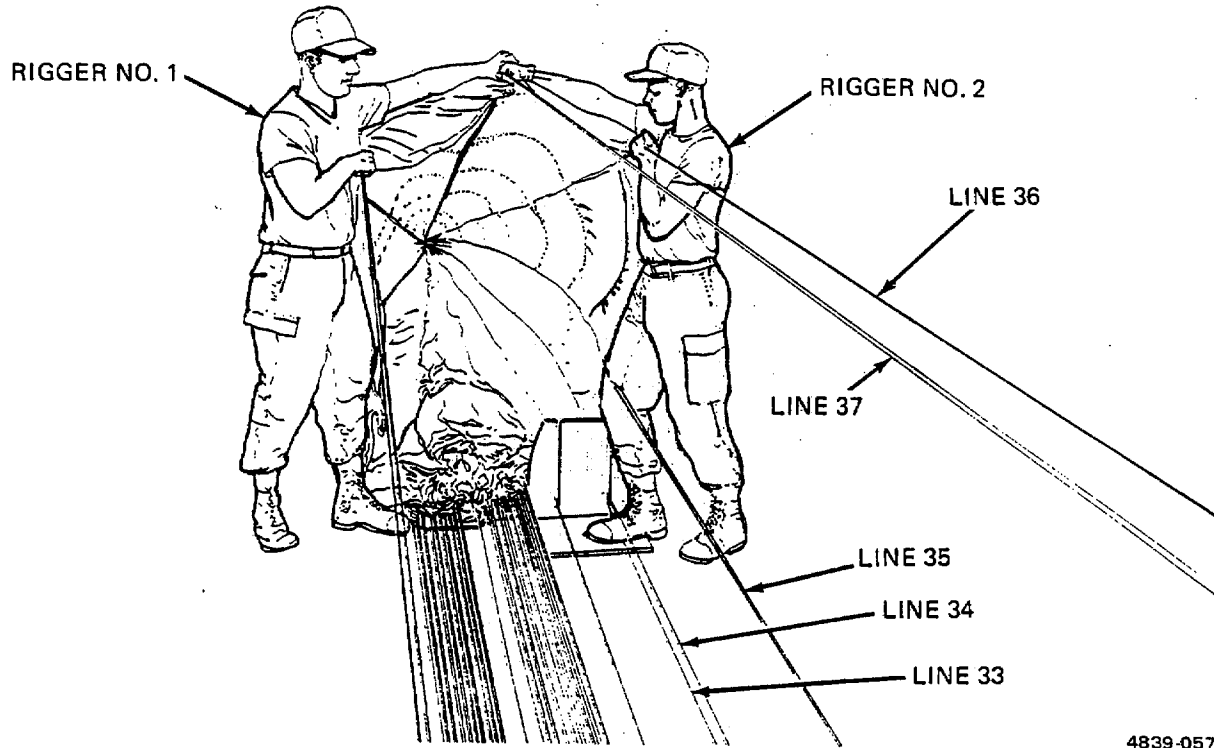


Figure 2-62. Folding the Right Group of Gores .

- (k) Turn fan off
- (l) While holding line 32 in the line separator, pick up the left suspension line group and throw the left group of gores and lines over the folded right group of gores and lines (figure 2-63).
- (m) Turn fan on.
- (n) The left gore group is folded in the same manner as the right group. Rigger number 1 passes line 31 to a second man who places the line on top of line 32 in the left slot of the line separator (figure 2-64).



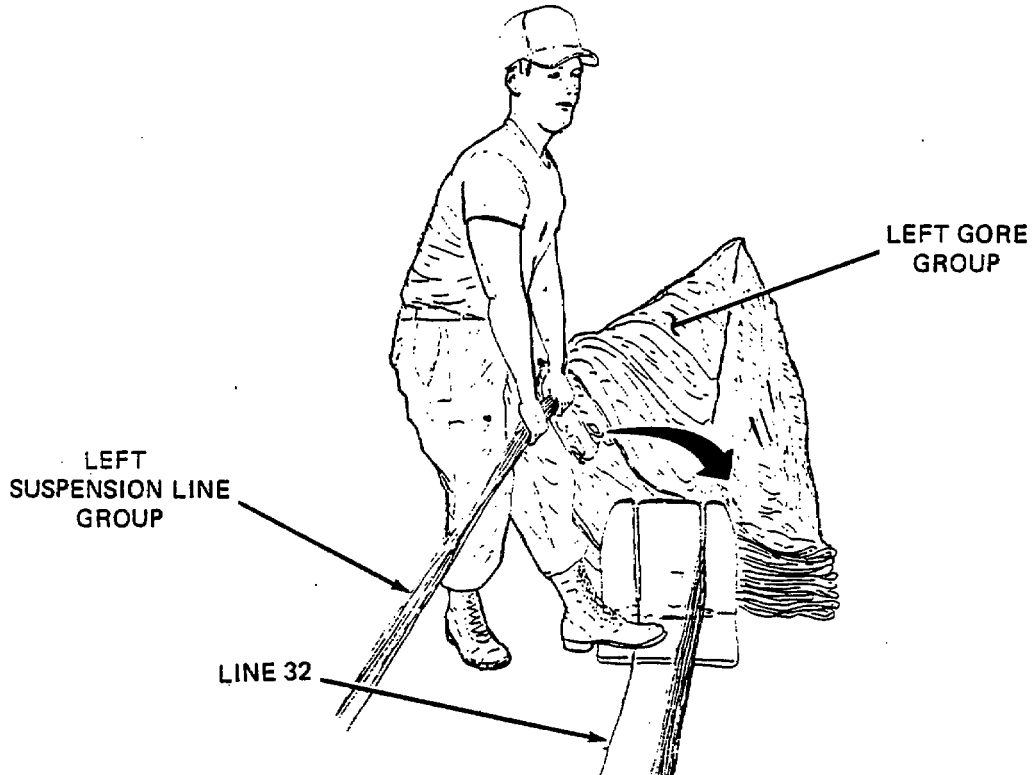


Figure 2-63. Preparing to Throw Left Group of Gores and Suspension Lines .

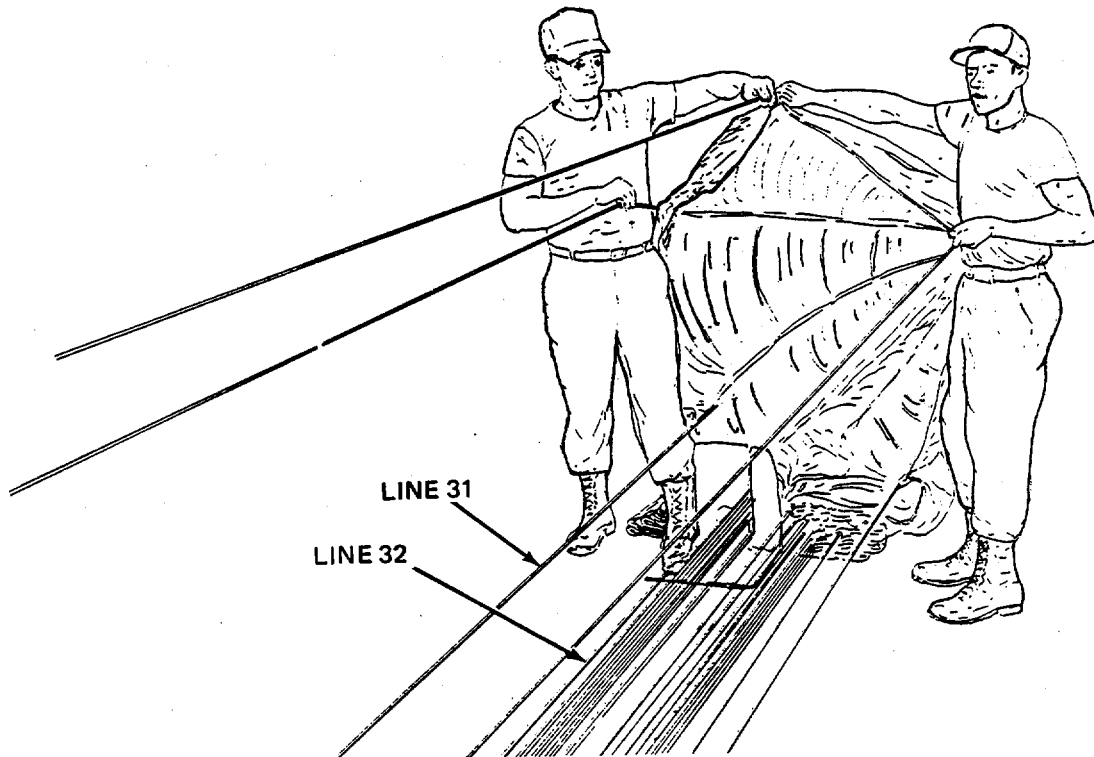


Figure 2-64. Folding the Left Gore Group .

**2-17. Packing the 64-Foot Cargo Parachute, Model G-12E (cont).**

- (o) Ensure that while placing line 31 into the line separator, the gore between lines 31 and 32 deflates and lies flat in a folded fashion.
- (p) Fold the remainder of the left gore group, until all of the suspension lines of the left group are in the left slot of the line separator (figure 2-65).
- (q) Turn fan off.
- (r) Remove the running end of the canopy center line from within the canopy skirt.
- (s) Place the center line in the right slot of the line separator.
- (t) Extend the center line length along the length of the right suspension line group (figure 2-66).
- (u) Insure that the canopy skirt does not become disarranged during removal of the center line.
- (v) Insure that all twists are removed from the portion of the center line extending below the canopy skirt.

**(5) Canopy vent pull-down.**

- (a) Release tension device and remove the canopy bridle loop from the stationary post.
- (b) Riggers 2 and 3 position themselves on each side of the skirt of the folded canopy and raise the top - center gore.
- (c) Rigger 1 grasps the free end loop of the center line and slowly pulls the center line toward the 3/4-inch clevis (figure 2-67).
- (d) Riggers 2 and 3 insure that the folded canopy gores do not become disarranged while the canopy vent is being pulled through the inside of the canopy, toward the canopy skirt.

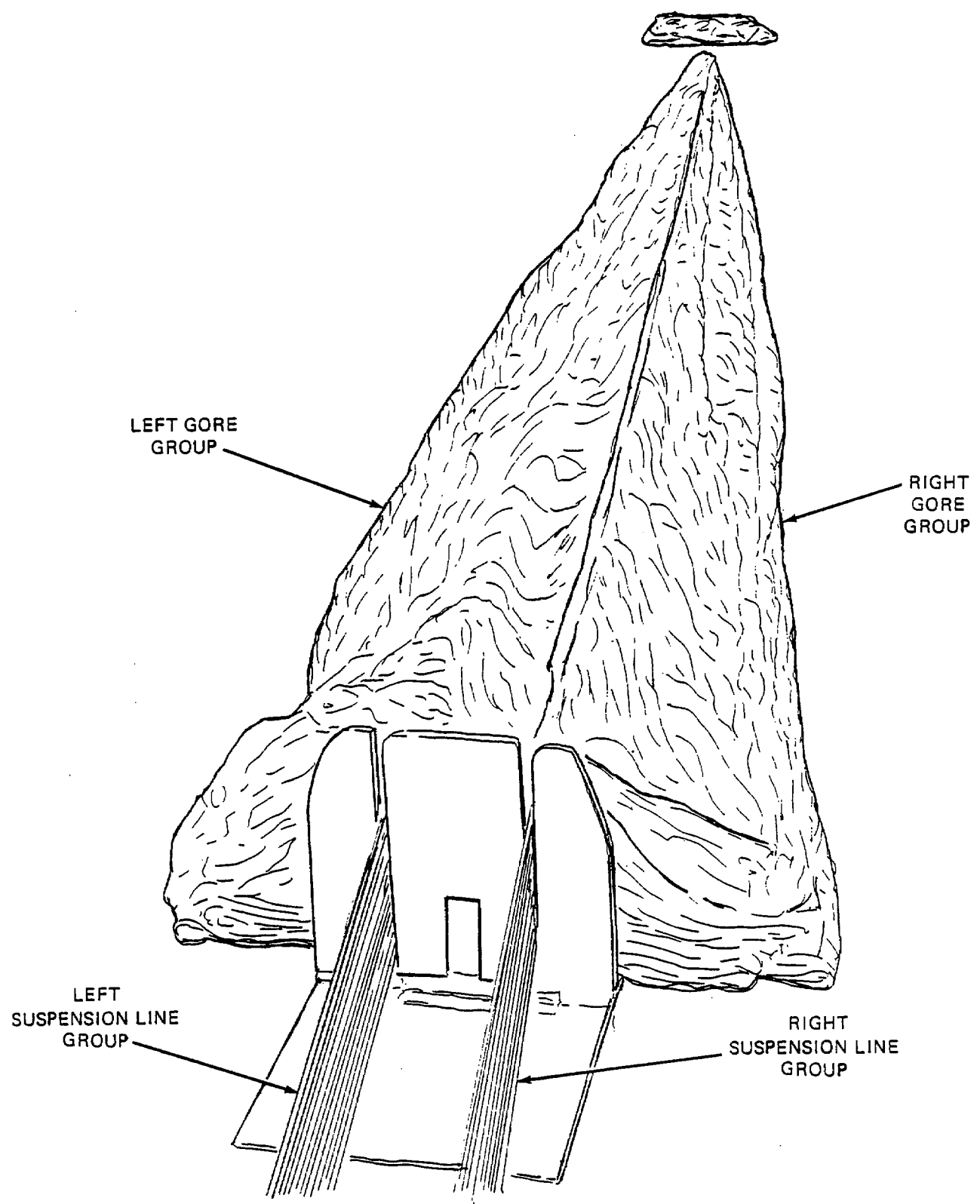


Figure 2-65. Gore Folding Completed .

2-17. Packing the 64-Foot Cargo Parachute, Model G-12E (cont).

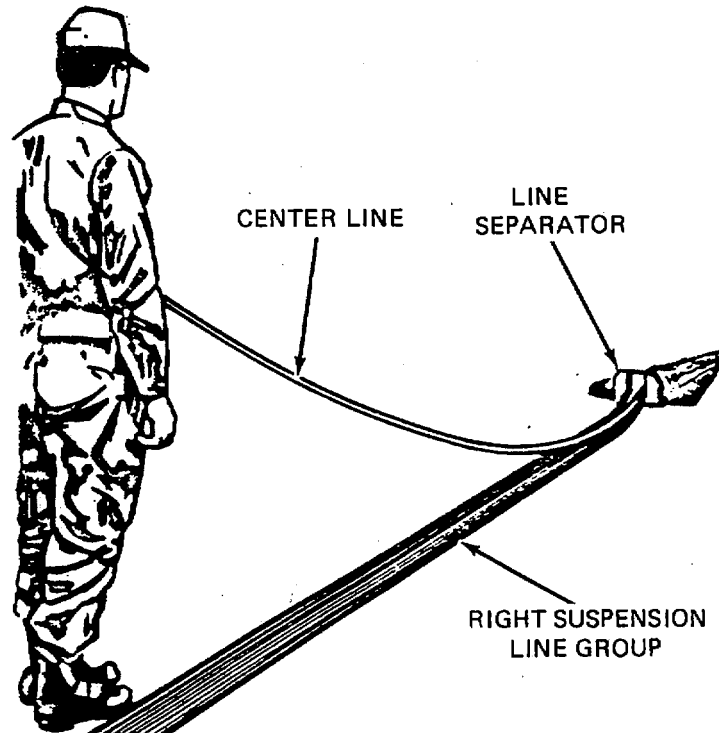


Figure 2-66. Positioning the Center Line .

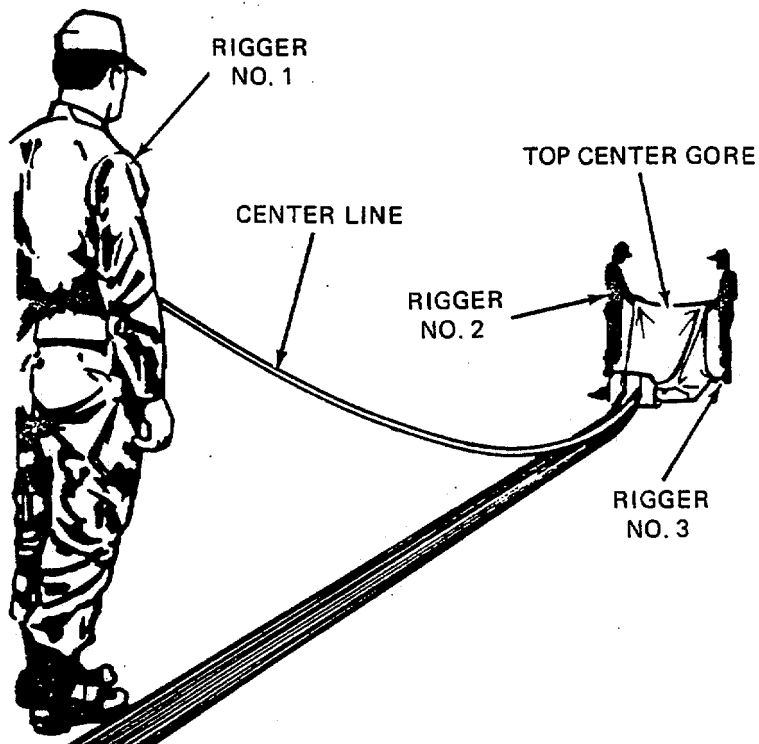
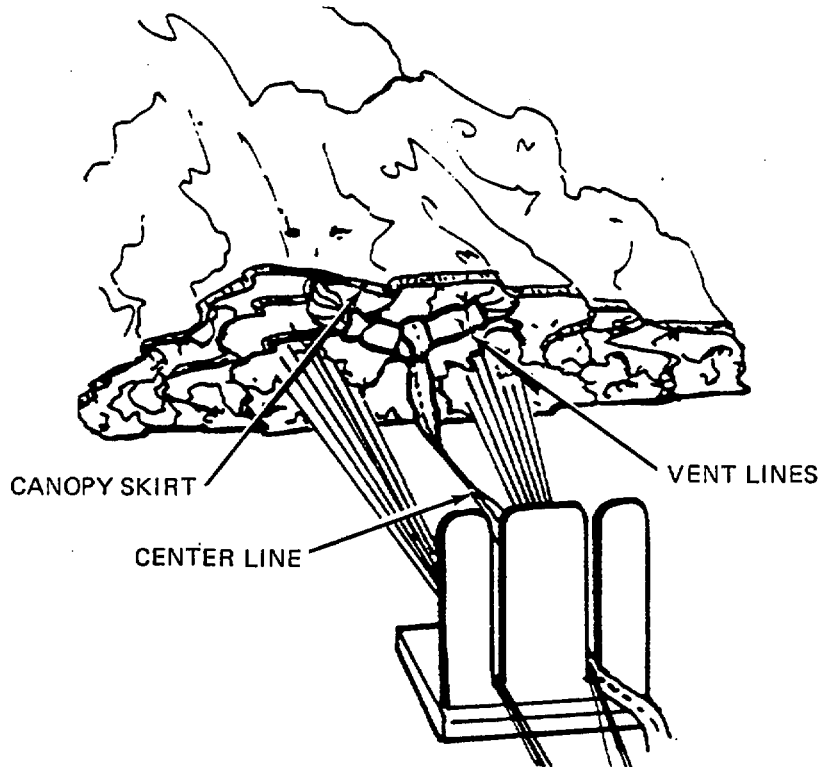


Figure 2-67. Pulling Down Canopy Vent

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- (e) Rigger 1 stops pulling on the center line when the served portion of the canopy vent lines becomes aligned with the canopy skirt (figure 2-68).



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Figure 2-68. Canopy Vent Lines Alined with Canopy Skirt .

- (f) Riggers 2 and 3 lay the top center gore back down on the canopy, insuring that the gore is dressed along the lower edge and each side.
- (g) Place the center line on top of the right suspension line group. The running end loop of the center line should be located 6 to 9 inches below the 3/4-inch clevis.
- (h) Remove tension device from clevis.
- (i) Remove nut and screw from clevis.
- (j) Remove one of the risers from the clevis.
- (k) Install center line running end loop on clevis.
- (l) Replace riser and assemble the screw and nut on the clevis (figure 2-69).

2-17. Packing the 64-Foot Cargo Parachute, Model G-12E (cont).

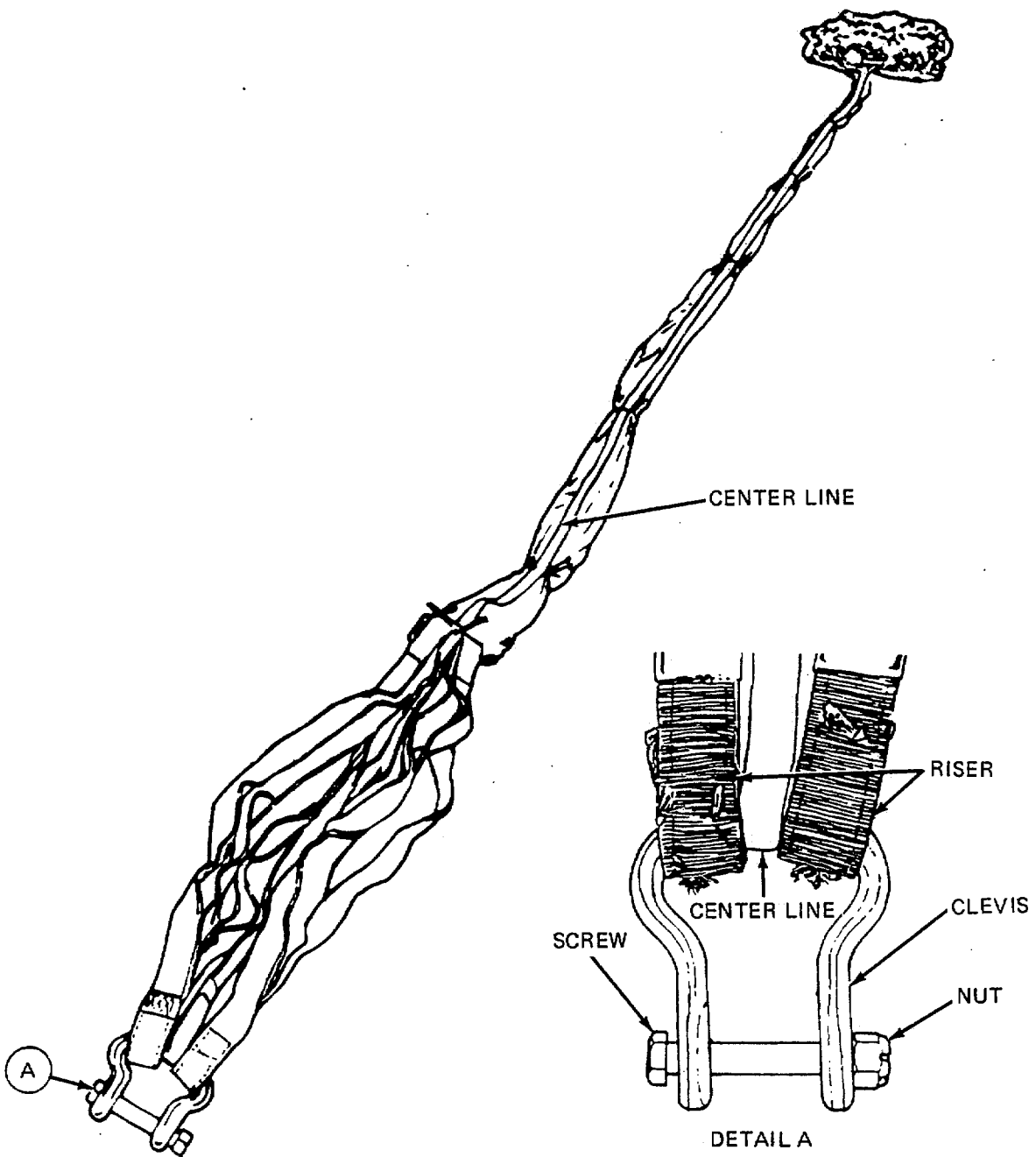


Figure 2-69. Center Line Attached to Clevis .

(6) *Tying the canopy, suspension lines and centerline.*

- (a) Beginning at a point 3 feet above the canopy skirt reinforcement (lower lateral band), tie the canopy using one turn single, ticket no. 3 cotton thread.
- (b) Secure the tie with a surgeon's knot and a locking knot. Trim the tie ends to 2 inches.
- (c) Repeat steps (a) and (b), above, at subsequent 5-foot intervals along the remaining length of the canopy (figure 2-70).

4839-065

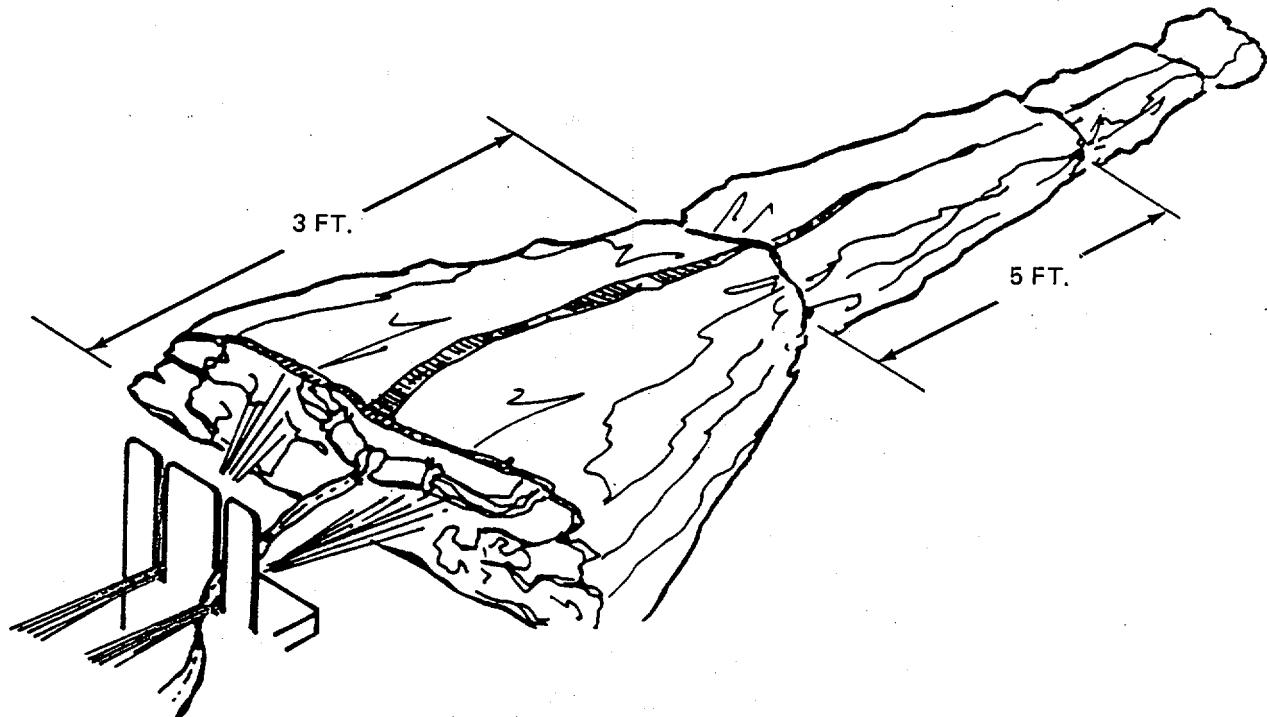
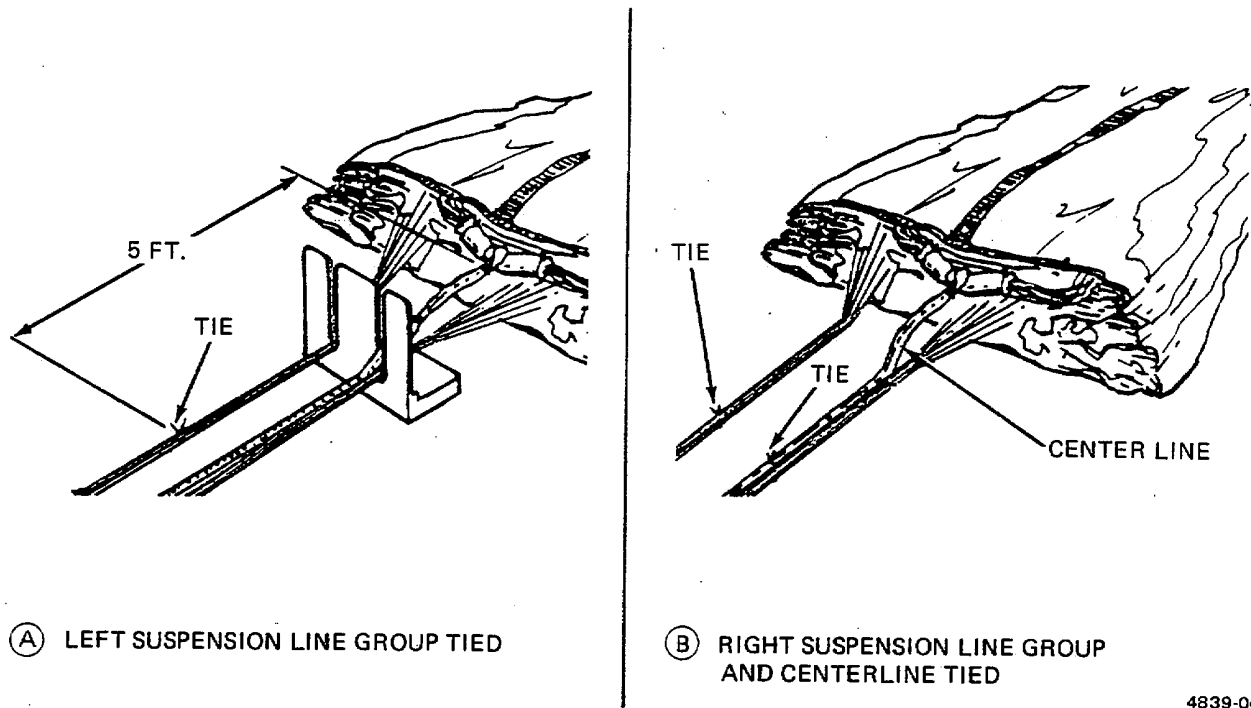


Figure 2-70. *Tying the Canopy Lines .*

- (d) At a point 5 feet below the skirt reinforcement, tie the left suspension line group using one turn single, ticket no. 3 cotton thread (A, figure 2-71).
- (e) Secure the tie with a surgeon's knot and a locking knot. Trim the tie ends to 2 inches.
- (f) Remove the line separator from the suspension lines.
- (g) Repeat steps (d) and (e), above, for the right suspension line group but include the center line (B, figure 2-71).
- (h) Beginning at a point 10 feet below the skirt reinforcement, tie both groups of suspension lines and the center line using one turn single, ticket no. 3 cotton thread (figure 2-72).

2-17. Packing the 64-Foot Cargo Parachute, Model G-12E (cont).



4839-066

Figure 2-71. Tying the Suspension Line Groups .

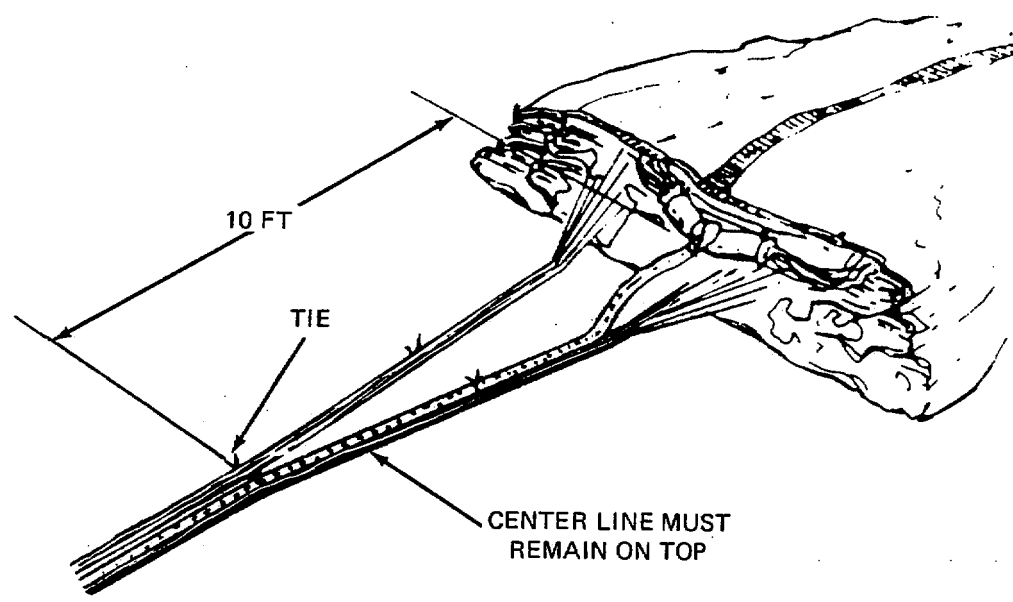
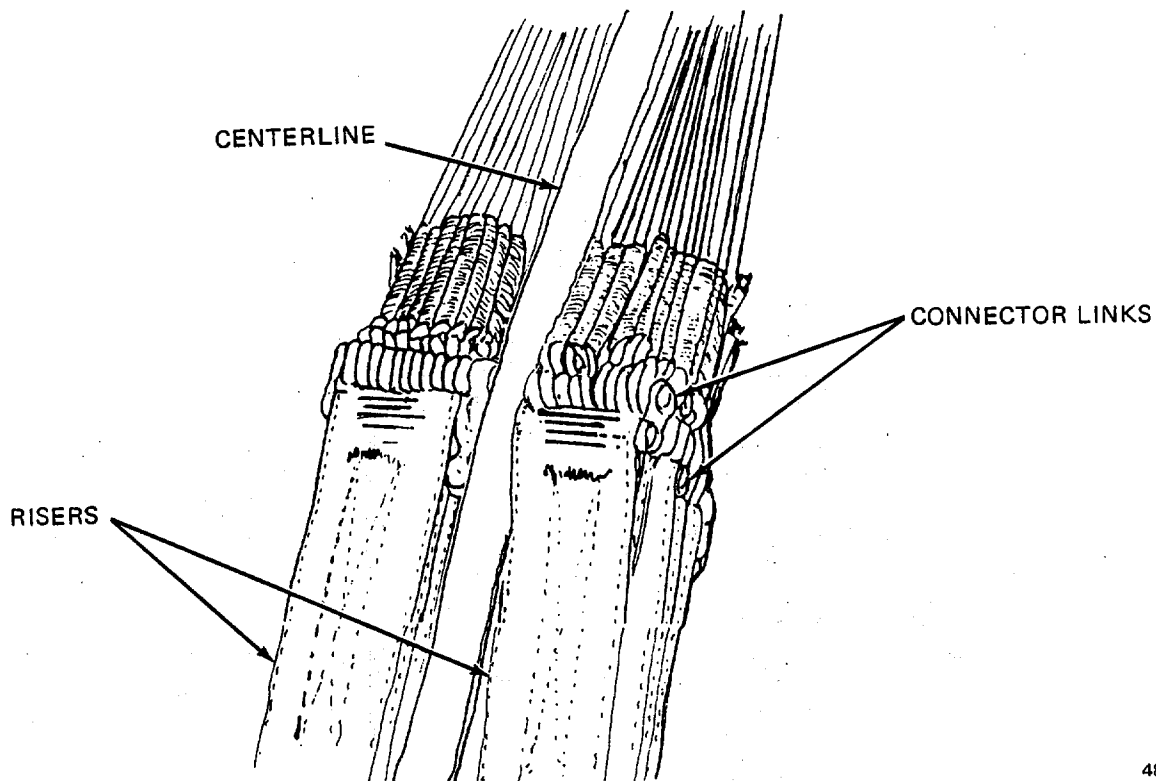


Figure 2-72. Tying Both Groups of Suspension Lines .



- (i) Secure the tie with a surgeon's knot and a locking knot. Trim the tie ends to 2 inches.
  - (j) Repeat steps (h) and (i), above, at 10-foot intervals along the remaining length of the suspension lines.
- (7) Tying the connector link assemblies. Check the risers and connector link assemblies to ensure proper arrangement (figure 2-73). Then tie the connector links as follows:
- (a) Thread a nylon webbing strap down through one stack of connector links and up through the adjacent stack.
  - (b) Attach a 24-inch length of 1/4-inch wide type I cotton webbing to the running end of the nylon webbing strap with pressure-sensitive tape (figure 2-74).
  - (c) Pull nylon webbing strap through the connector link assemblies which, in turn, will insert the taped cotton webbing into the connector link assemblies. Leave the cotton webbing in the link assemblies.
  - (d) Remove the taped cotton webbing from the nylon webbing strap. Remove and discard the pressure-sensitive tape.
  - (e) Stack each of the two groups of connector link assemblies.
  - (f) S-fold the slack in the center line between the two stacks of connector link assemblies (figure 2-75)



4839-068

Figure 2-73. Risers and Connector Link Assemblies in Proper Layout .

2-17. Packing the 64-Foot Cargo Parachute, Model G-12E (cont).

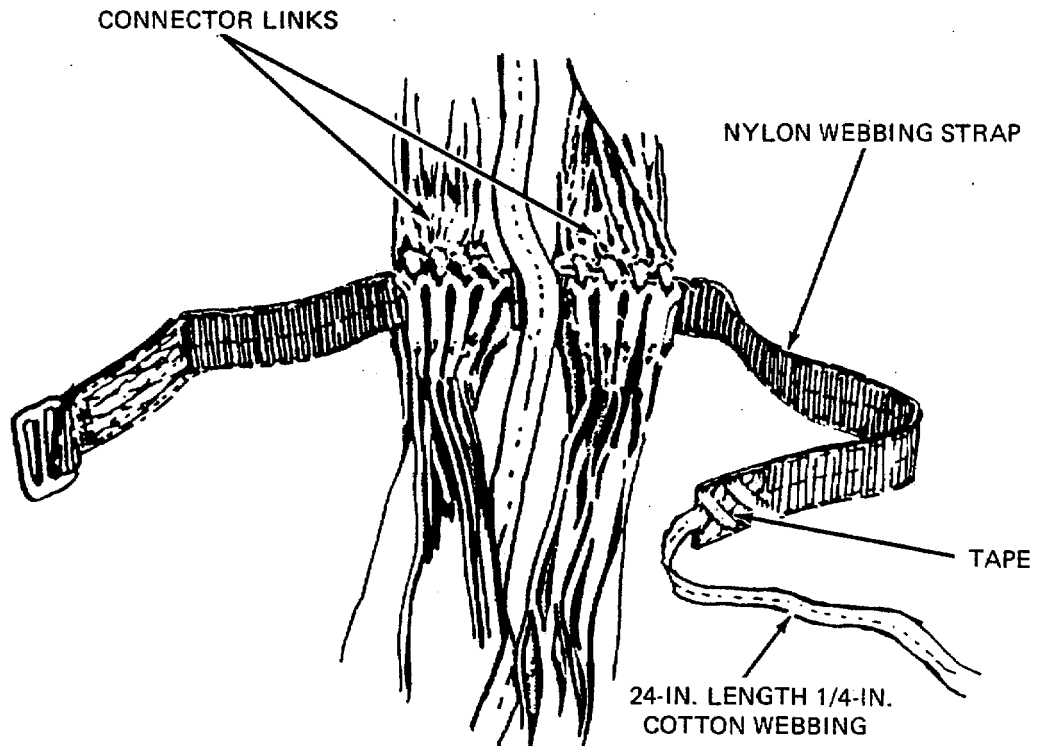


Figure 2-74. Preparing to Thread Tie Through Connector Links .

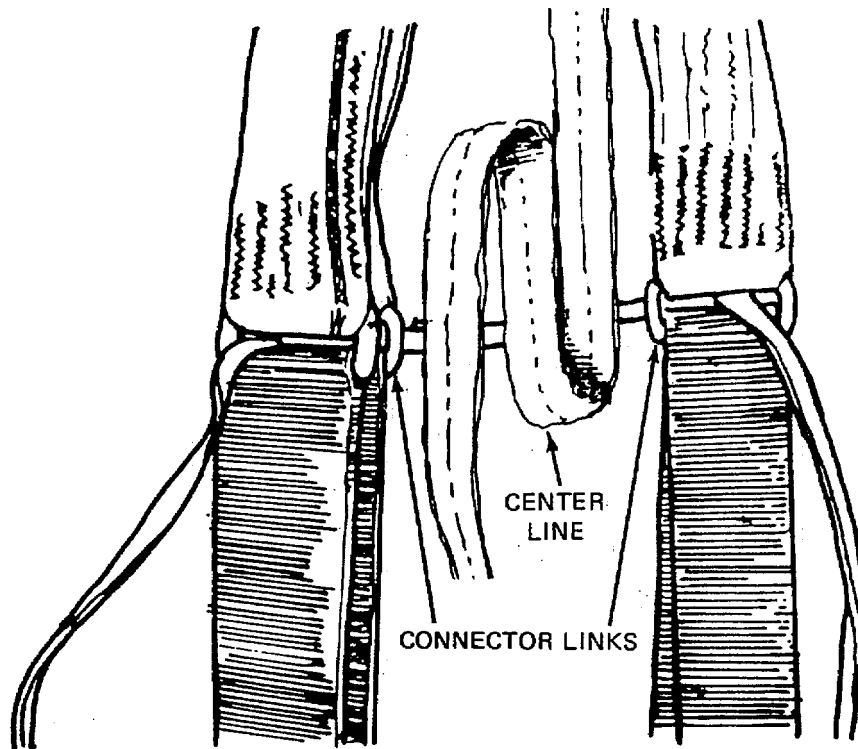


Figure 2-75. Center Line S-Folded Between Connector Link Stacks .

- (g) Pull the two connector linkgroups together against the S-folded center line with the webbing length ends.
- (h) Secure the webbing ends on the top center of the link assembly groups with a surgeon's knot and a locking knot. Trim tie ends to 2 inches (figure 2-76).
- (i) All canopy assembly ties are now completed.

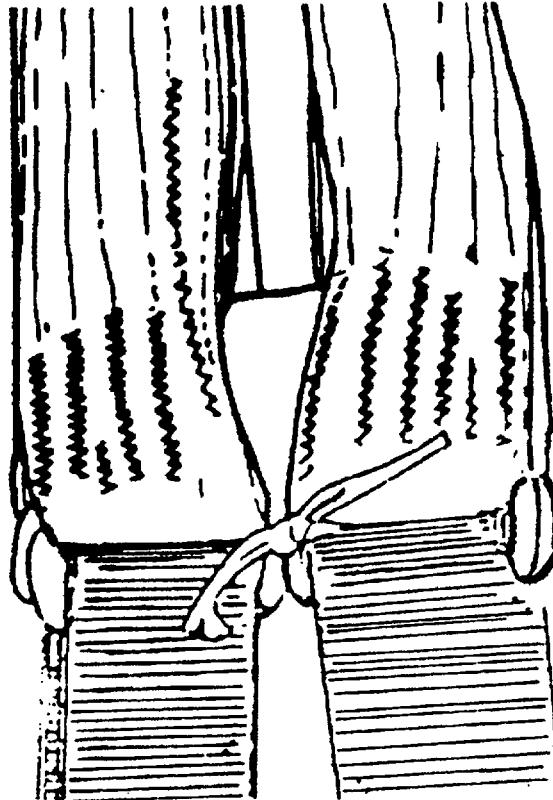


Figure 2-76. Connector Links Tied and Secured .

**NOTE**

- The G-1 2E deployment bag must be modified to function properly. Select a Deployment bag which has been stenciled on the riser extension stowage panel: "D-BAG FOR G-12E ONLY". Modification instructions can be found in paragraph 2-43.
  - There are two deployment bags that may be used in the packing of the G-12E. You may use a modified G-12D deployment bag, PIN 54K6299, as explained in paragraph 2-17(8) thru 2-17(11) or the G-1 2E deployment bag, P/N 11-1-3967, as explained in paragraph 2-17(12) thru 2-17(14).
- (12) Deleted.

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**2-17. Packing the 64-Foot Cargo Parachute, Model G-12E (cont).**

\* *Figure 2-77. Deleted*

\* *Figure 2-78. Deleted*

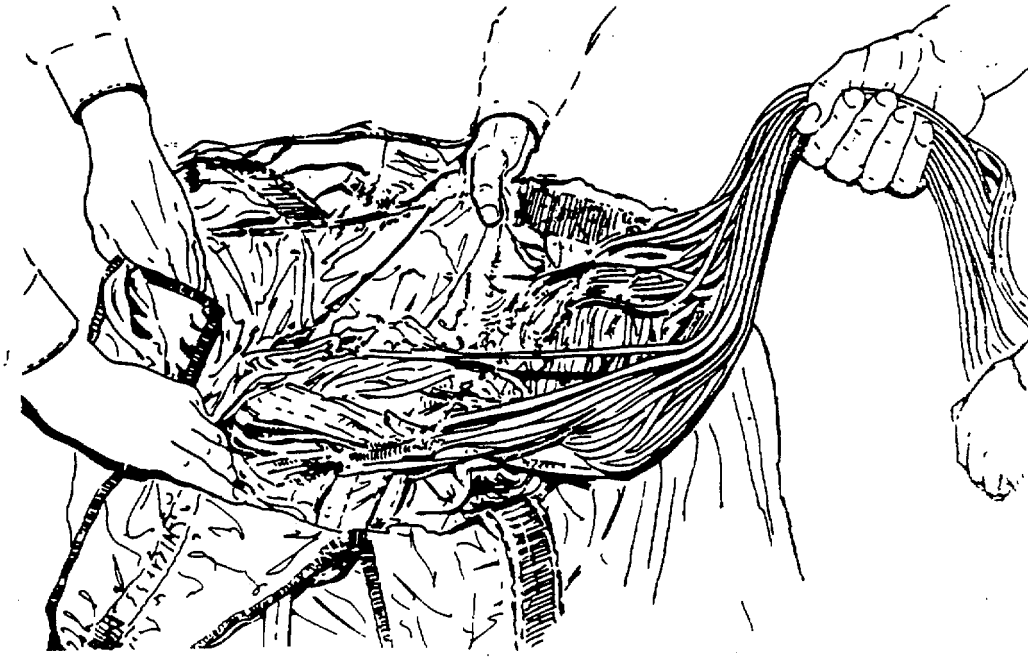
(9) *Stowing the canopy.*

- (a) Riggers 2 and 3 positioned at the canopy upper end, will raise the open end of the deployment bag and hold the bag erect.
- (b) Ensure the suspension line retaining straps, on the suspension line stowage flap, face the lower end of the canopy.
- (c) Rigger 1 moves to a point located below the canopy upper end and picks up the canopy from the packing surface. The rigger then S-folds the canopy materiel into the deployment bag (figure 2-79).
- (d) Rigger 1 continues to stow the canopy using the procedures in (b) and (c), above, until only 2 feet of the canopy remains out of the deployment bag.
- (e) At a point immediately below the skirt reinforcement (lower lateral band), rigger 1 grasps both groups of suspension lines with one hand, and 2 feet below the skirt reinforcement grasps both groups of suspension lines with the other hand (figure 2-80).
- (f) The rigger then pushes the canopy skirt and the held suspension line groups into the bag. Ensure that the canopy folds are neat.
- (g) Rigger 1 continues to stow the two suspension line groups by S-folding the lines on top of the stowed canopy until the two individual suspension line group ties, located 5 feet below the canopy skirt, are positioned at the edge of the bag open end (figure 281).

2-17. Packing the 64-Foot Carge Parachute, Model G-12E (cont).



Figure 2-79. Stowing the Canopy Into the Deployment Bag .



4839-075

Figure 2-80. Grasping Suspension Lines.



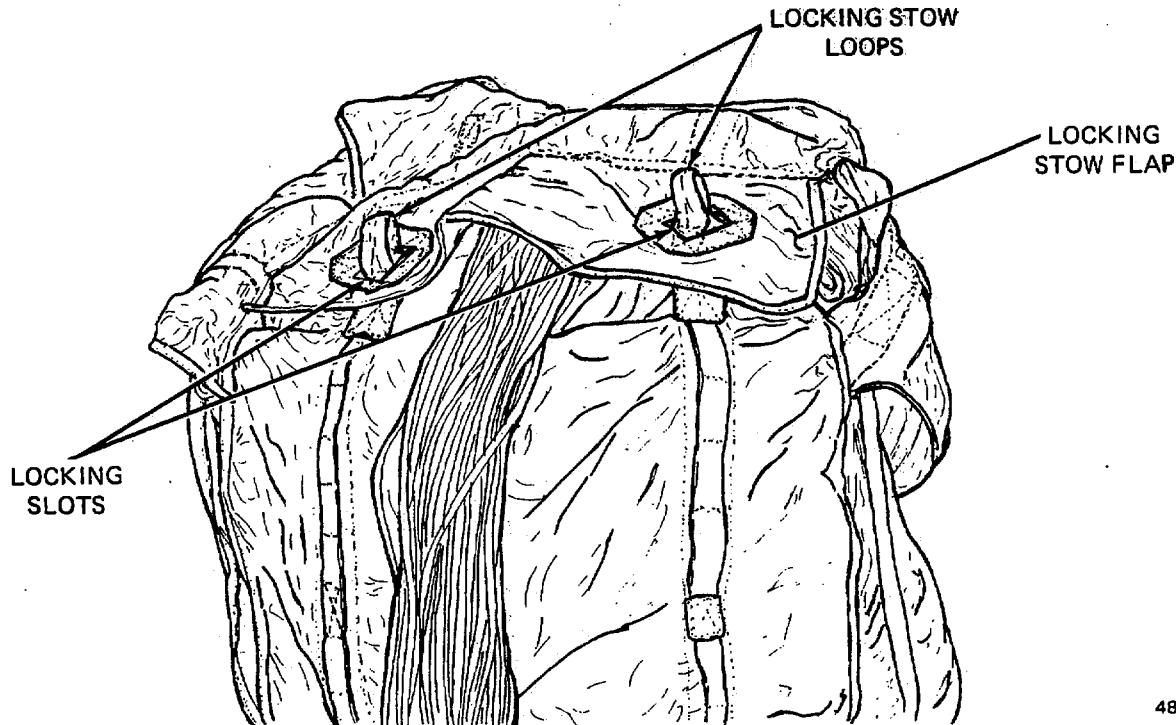
4839-076

Figure 2-81. S-Folding Suspension Lines on Top of Stowed Canopy.

**2-17. Packing the 64-Foot Cargo Parachute, Model G-12E (cont).**

(10) Stowing the suspension lines, centerlines and risers.

- (a) Fold the locking stow flap and the locking slot flap over the stowed canopy and insert the locking stow loops through the respective locking slots (figure 2-82).
- (b) Cut a 36-inch length of 1/2-inch wide tubular nylon webbing, or equivalent, for use as a packing aid. Double-the webbing length and make an overhand knot in the aligned webbing ends..

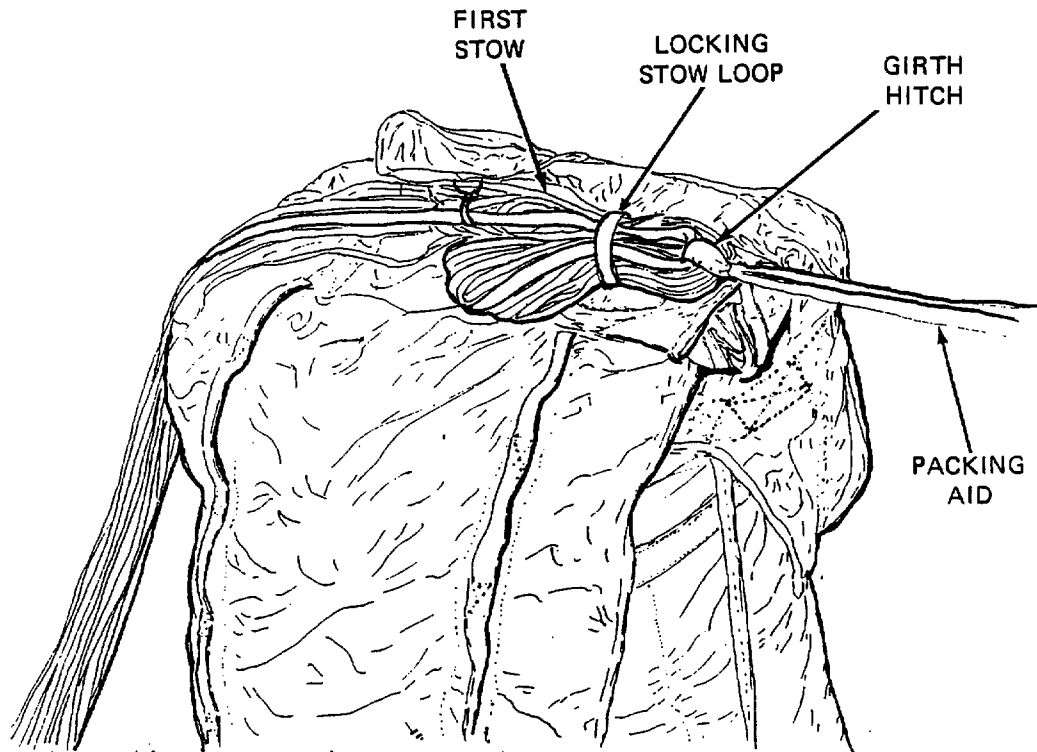


4839-041

*Figure 2-82. Locking Stow Loops Inserted Through Locking Slots*

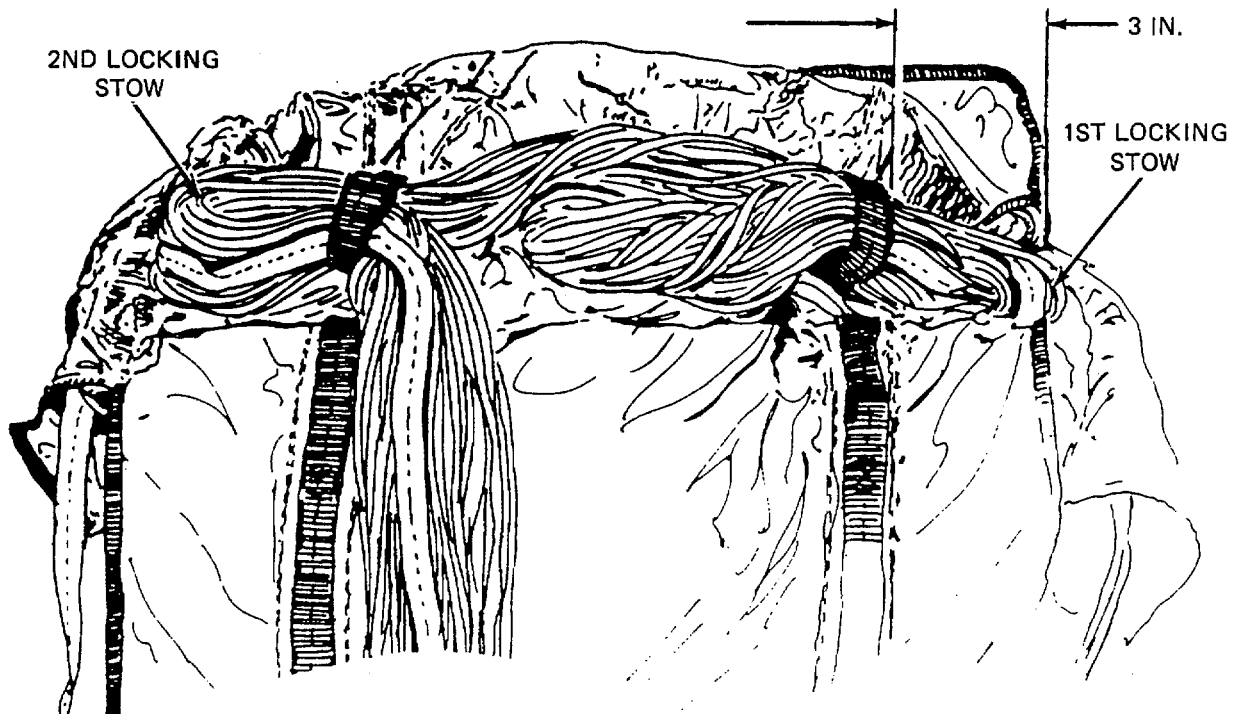
- (c) Using the doubled webbing, encircle the suspension lines and make a girth hitch in the webbing at a point 15 inches from the closed flaps of the bag. Thread the packing aid length knotted end through the right locking stow loop and make the first locking stow by pulling the webbing and suspension lines through the locking stow loop (figure 2-83) until a 3-inch loop is formed in the suspension lines beyond the locking stow loop. Remove the packing aid.
- (d) Using the webbing length packing aid and the procedures in (c) above, make the second locking stow in the left locking stow loop (figure 2-84).
- (e) Lay the deployment bag flat on the floor and expose the suspension line retaining straps by folding the suspension line stowage flap back over the top panel.





4839-079

Figure 2-83. Making the First Locking Stow.

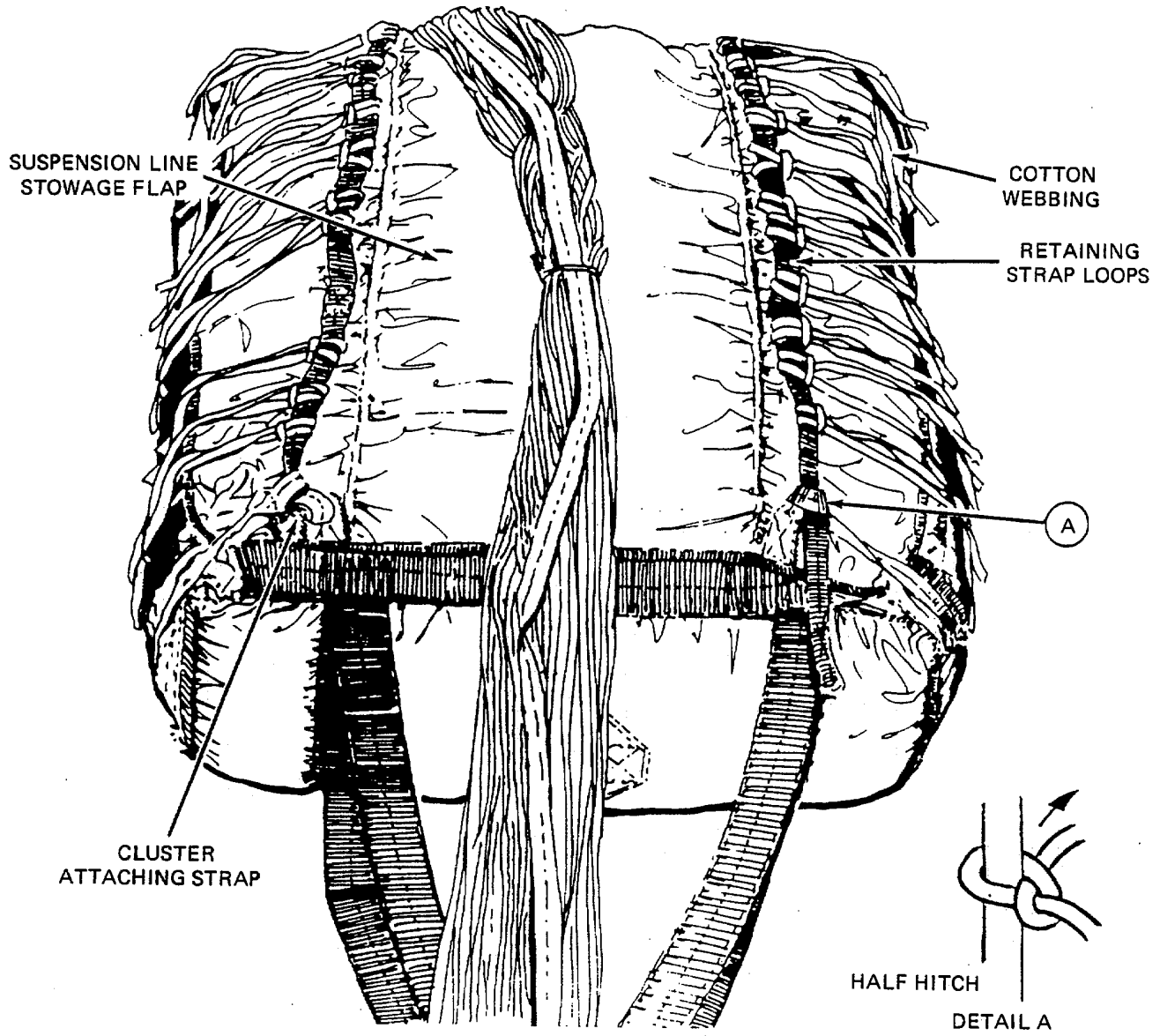


4839-080

Figure 2-84. Locking Stows Completed.

2-17. Packing the 64-Foot Cargo Parachute, Model G-12E (cont).

- (f) Using the two cluster attaching straps, at the bottom of the bag, temporarily secure the suspension line stowage flap. Tie each strap with a half hitch (figure 2-85).
- (g) Cut a minimum of twenty-four 18-inch lengths of 1/4-inch wide, type I cotton webbing for use as suspension line stow ties.



4839-081

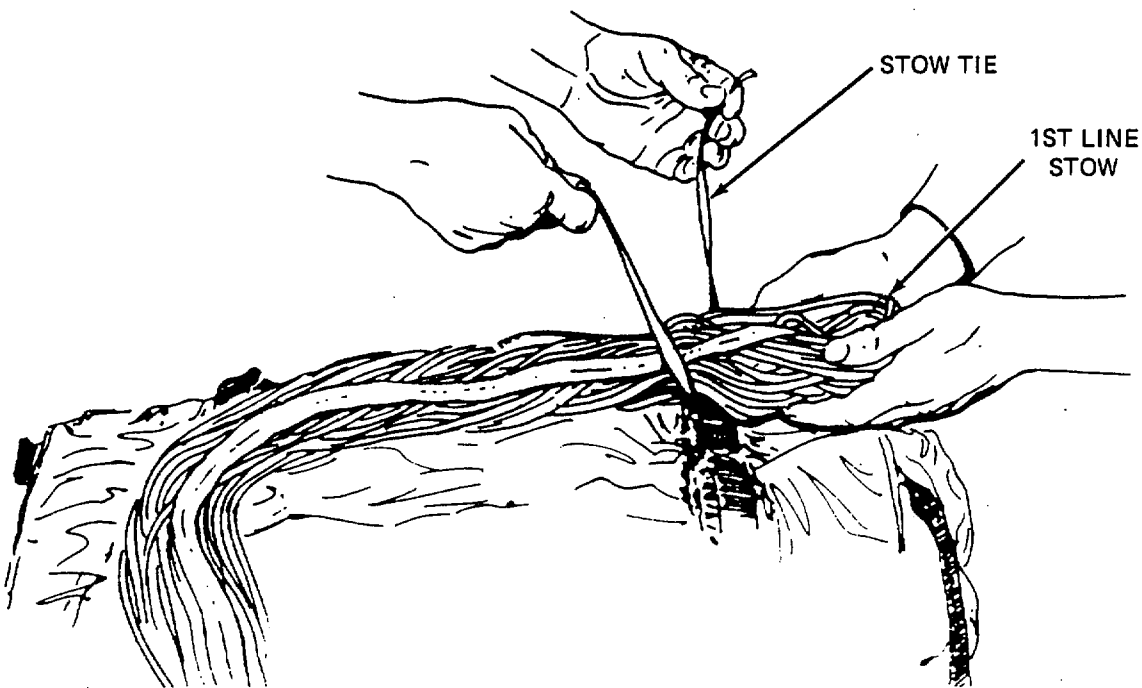
Figure 2-85. Suspension Line Stow Ties Installed on Retaining Strap Loops.

- (h) Secure three lengths of webbing to each loop on the suspension line stowage panel by making a girth-hitch. Insure that the ends of each webbing length are alined and positioned toward the outer edges of the bag.
- (i) Position the suspension lines and center line from the left locking stow to the first loop at the upper right corner of the stowage flap.
- (j) Form the first line stow by making an S-fold in the lines at the edge of the line stowage flap.
- (k) Secure with the first length of webbing making a surgeon's knot and a locking knot (figure 2-86).

**NOTE**

The outer edges of the line stows must be alined with the outside edges of the stowage flap.

- (l) Extend the lines to the first webbing loop at the upper left corner of the stowage flap.

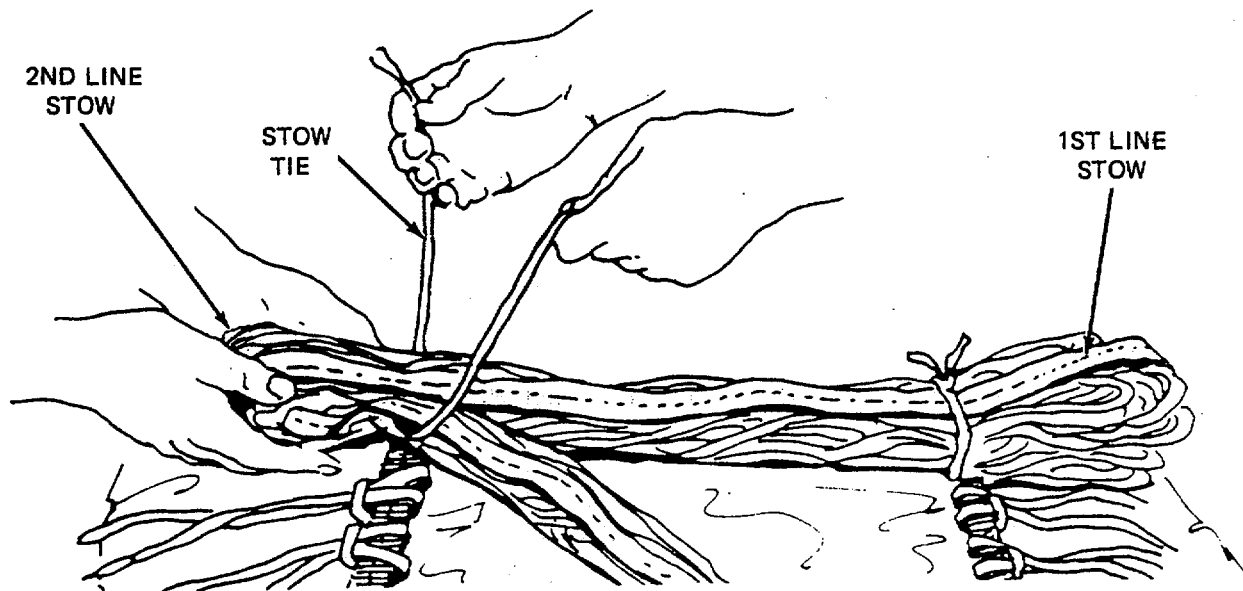


4839-082

*Figure 2-86. Forming the First Suspension Line Stow.*

- (m) Form and secure the second line stow as outlined in steps (j) and (k), above (figure 2-87).
- (n) Continue stowing and securing the remaining length of lines by stowing alternately from right to left.

2-17. Packing the 64-Foot Cargo Parachute, Model G-12E (cont).



4839-083

Figure 2-87. Forming the Second Line Stow.

- (o) Stow the risers and remaining lines to a point 18 inches from the clevis (figure 2-88). An S-fold is not made in the last stow.
- (p) Trim all the webbing ends to 2 inches.
- (11) *Closing the deployment bag.* Closing the deployment bag requires a rigger to be located on each side of the bag to perform the following:
  - (a) Untie the two cluster attaching straps securing the suspension line stowage flap at the bottom of the bag.
  - (b) Roll the stowage flap as tight as possible toward the bag open end (figure 2-89)
  - (c) Lay the closing flaps outside the bag.
  - (d) Insert the rolled stowage flap into the bag.
  - (e) Fold the closing flaps in the sequence shown in figure 2-90.

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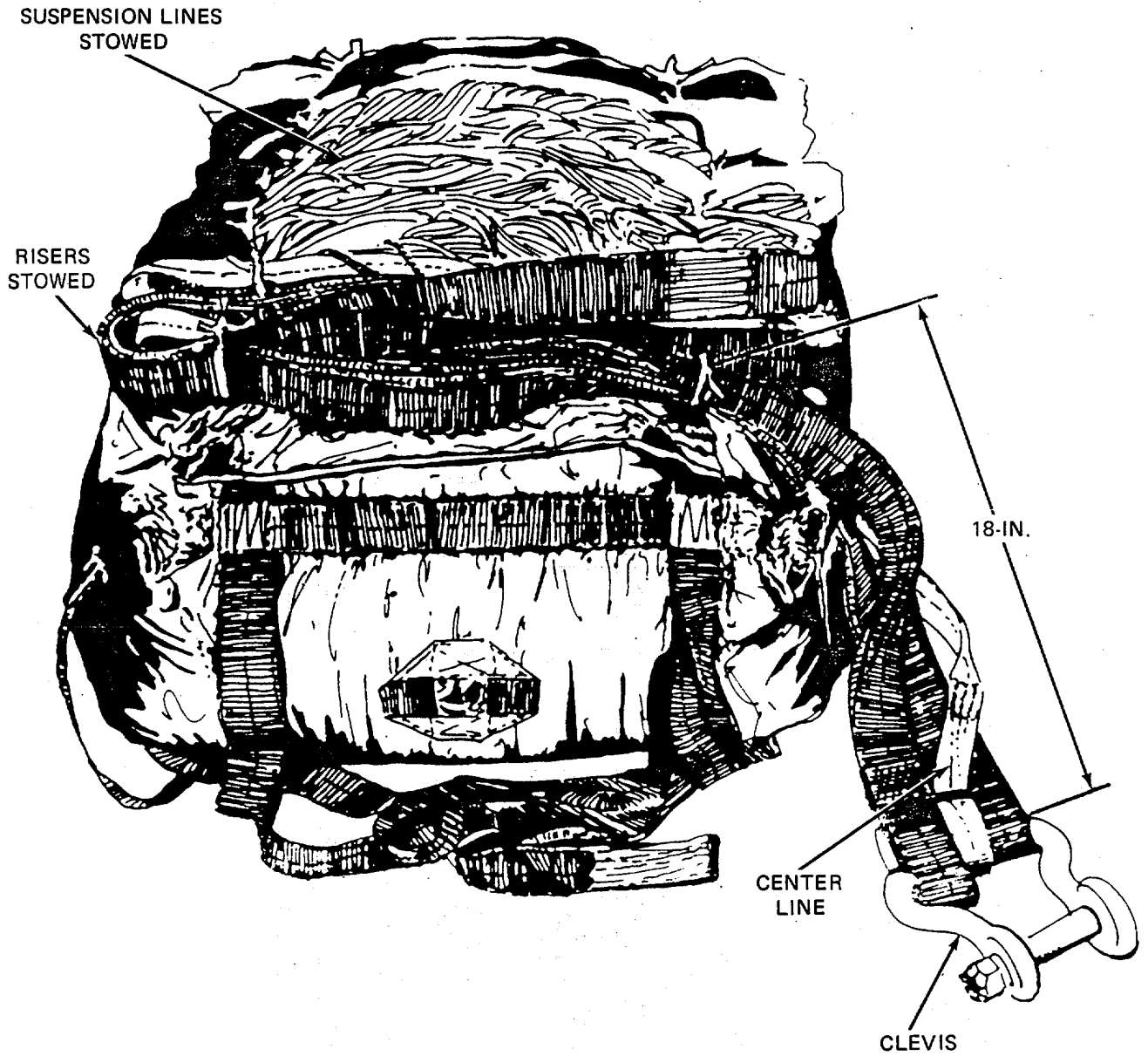


Figure 2-88. Suspension Line, Center Line and Riser Stowage Completed.

4839-084

2-17. Packing the 64-Foot Cargo Parachute, Model G-12E (cont).

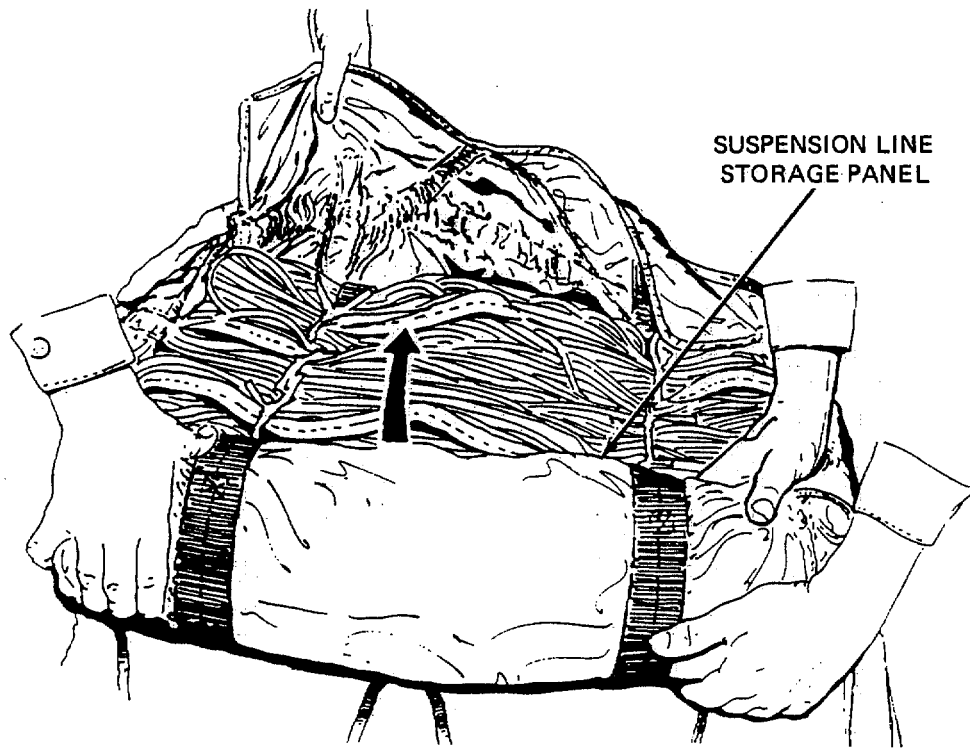


Figure 2-89. Rolling the Suspension Line Stowage Flap.

4839-085

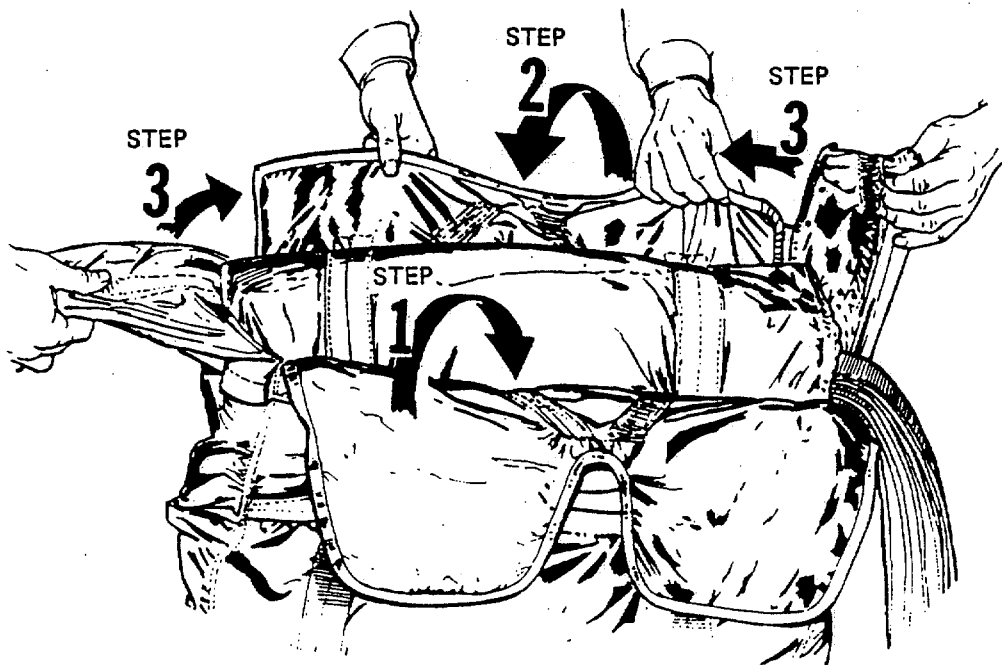


Figure 2-90. Folding Deployment Bag Closing Flaps.

2-94

4839-086

**CAUTION**

The bag closing tie will not be knotted until the center line, risers, and clevis have been positioned over the center of the flap closure. Failure to observe this caution may result in a malfunction.

- (f) Cut two 24-inch lengths of 1/4inch wide type I cotton webbing.
- (g) Rigger 1 passes an end of one of the webbing lengths through the closing loop on each of the four bag closing flaps (A, figure 2-91).
- (h) Pull the webbing ends to draw the closing loops together (B, figure 2-92).
- (i) Rigger 2 positions the risers and center line over the center of the flap closure.
- (j) Rigger 1 brings the webbing ends around the risers and center line.
- (k) Secure the webbing ends on top with a surgeon's knot and a locking knot (figure 2-93).

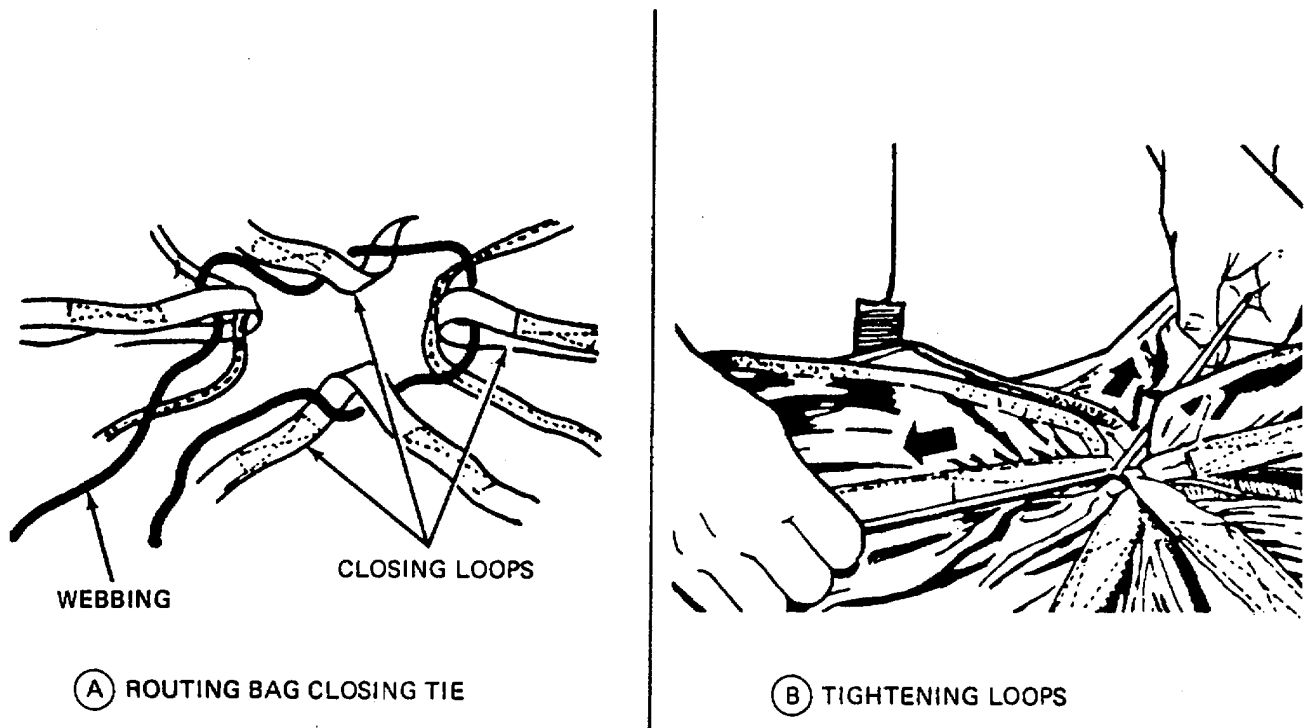


Figure 2-91. Routing Tie and Tightening Bag Closing Loops.



2-17 Packing the 64-Foot Cargo Parachute, Model G-12E (cont).

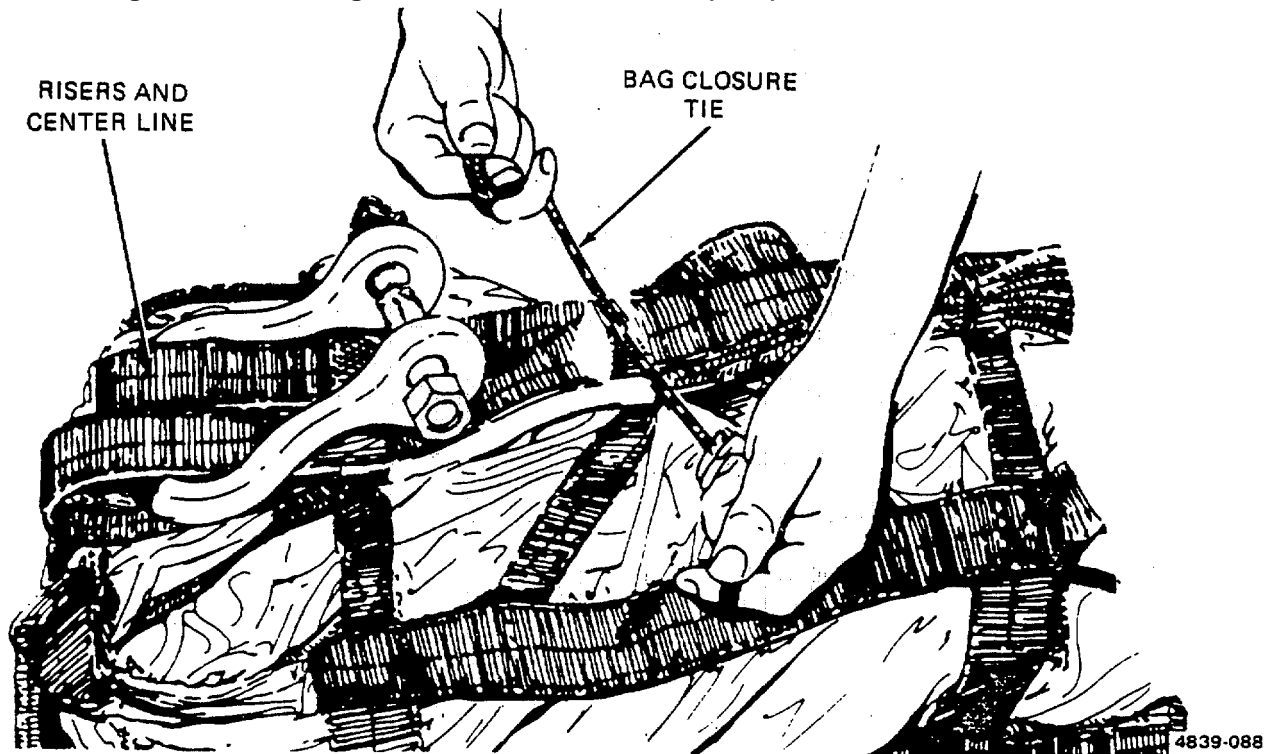
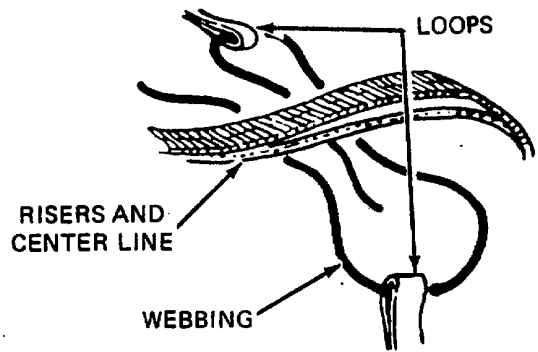


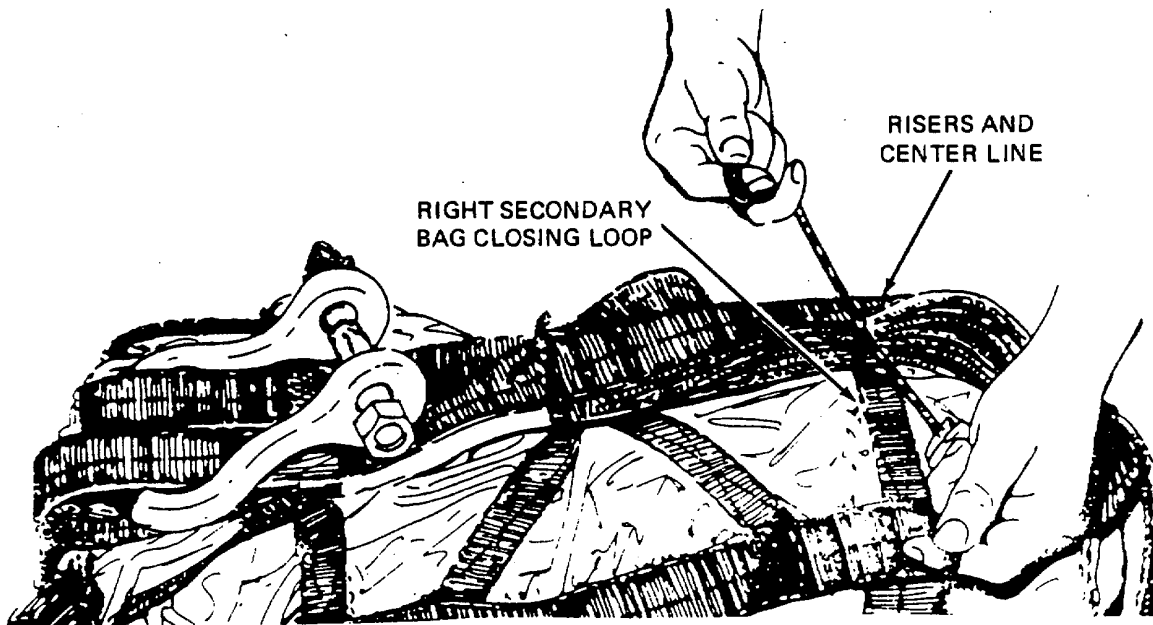
Figure 2-92. Securing Risers and Center Line Over Bag Closure Flaps.

- (m) Pass one end of the second length of webbing through one right secondary bag closing loop and under the secured risers and center line (A, figure 2-93).
- (n) Pass the webbing end through the opposite loop with the running ends of the webbing routed under the riser and center line in opposite directions (A, Figure 2-93).
- (o) Pull the webbing ends tight to draw the closing loops together and secure the webbing end, on top of the risers and center line, with a surgeon's knot and locking knot (B, figure 2-93).
- (p) Trim the tie ends to 2 inches.
- (q) Cut a 48-inch length of 1/4-inch wide type I cotton webbing, with your rigger's knife.
- (r) Fold the webbing into three equal lengths.
- (s) Position the 3/4-inch clevis between the left secondary bag closing loops.





(A) ROUTING WEBBING THROUGH LOOPS



4839-089

Figure 2-93. Securing Right Secondary Bag Closing Loops.

- (t) Secure the loops, risers, center line and clevis with the webbing, using the procedures in steps (m) through
- (p) above (figure 2-94).
- (u) Insure that the closing flaps are tucked into the bag (figure 2-95).

2-17. Packing the 64-Foot Cargo Parachute, Model G-12E (cont).

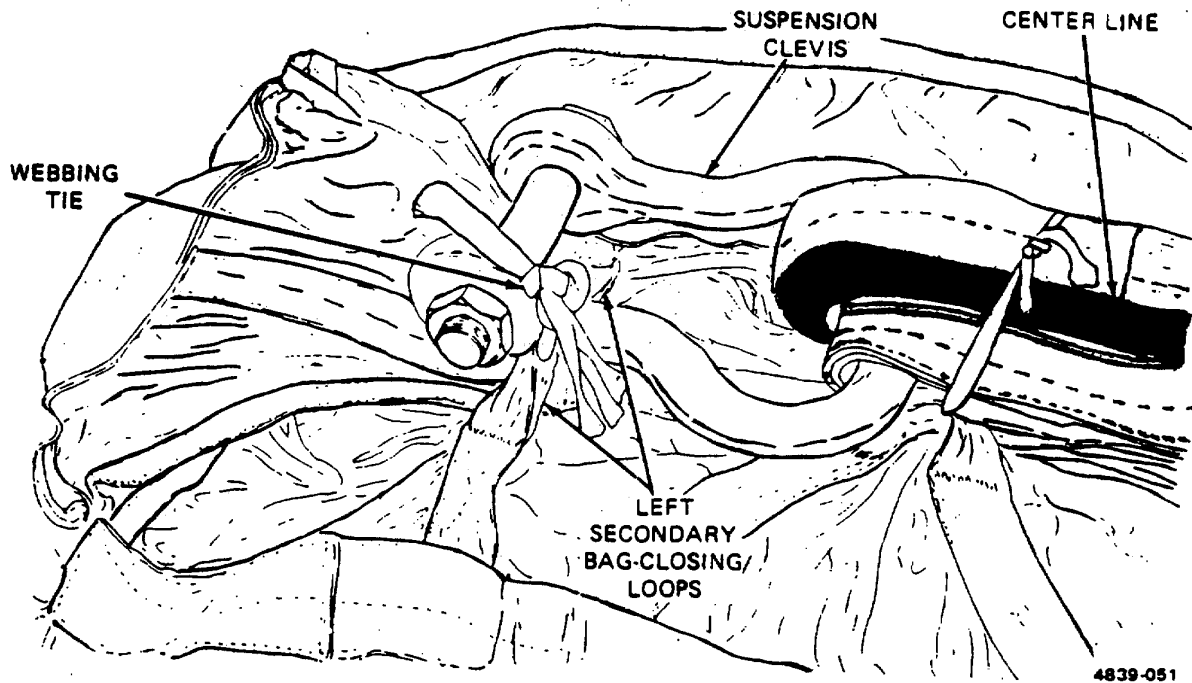


Figure 2-94. Securing Left Secondary Bag Closing Loops.

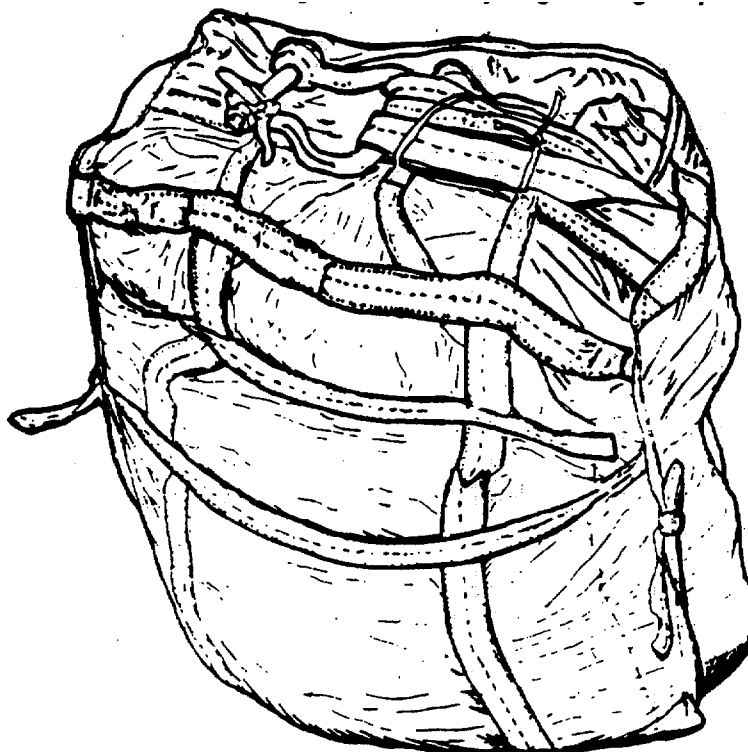


Figure 2-95. Packing Completed, G12E Parachute.

(12) *Packing procedures using the G 12E deployment bag.*

- (a) Cut two 18 inch lengths of 1/4 inch, type I cotton webbing, with a girth hitch secure one webbing length to each stow loop on the center of the stowage panel.
- (b) Fold the locking slot over the stowed canopy and insert the locking loops through the respective locking slots. Ensure the first webbing length ends installed on the center stow bop are extended through the center locking slot (figure 2-95.1).

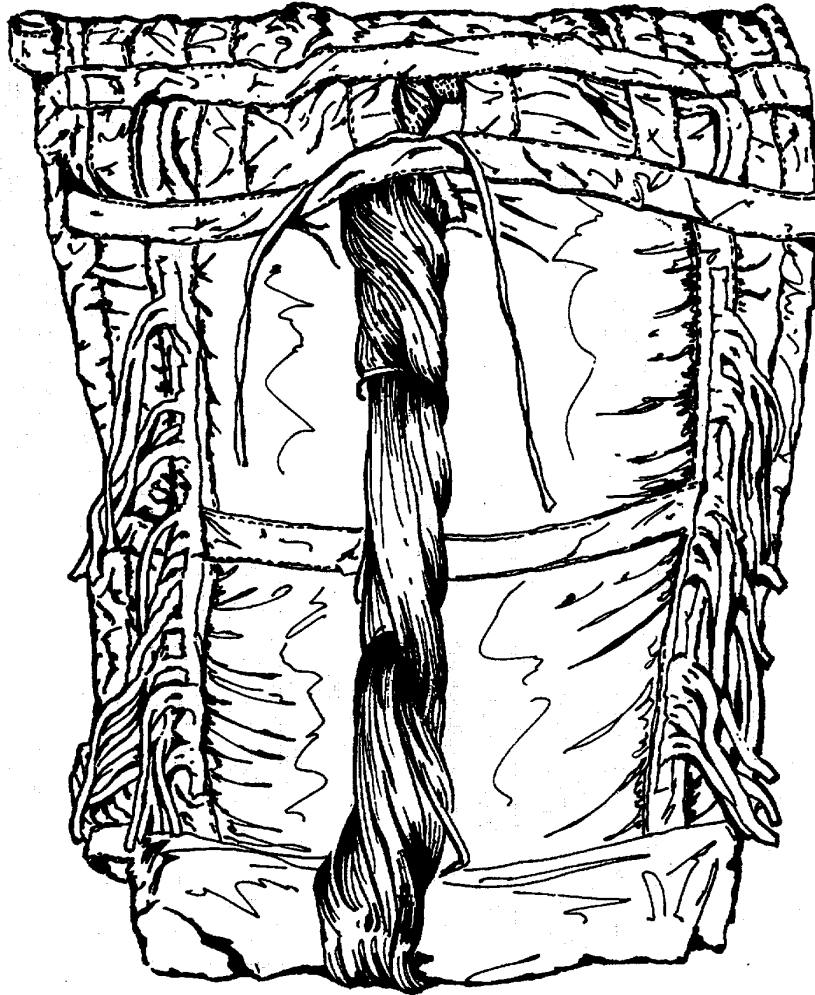


Figure 2-95.1. Bag Closing, G-12E

- (c) Cut a 36 inch length of 1/2 inch wide tubular nylon webbing or equivalent, for use as a packing aid. Double the webbing length and make an overhand knot in the aligned webbing ends.
- (d) Using the double webbing, encircle the suspension lines and make a girth hitch in the webbing. Thread the packing aid knotted end through the right locking stow loop and make the first locking stow by pulling the webbing and suspension lines through the locking stow until the edge of the stow is aligned with the edge of the locking slot flap. Remove the packing aid.

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NAVY NAVAIR 13-1-32

- (a) Using the packing aid and the procedures in step (d), above, make the second locking stow in the left locking stow loop (figure 2-95.2).

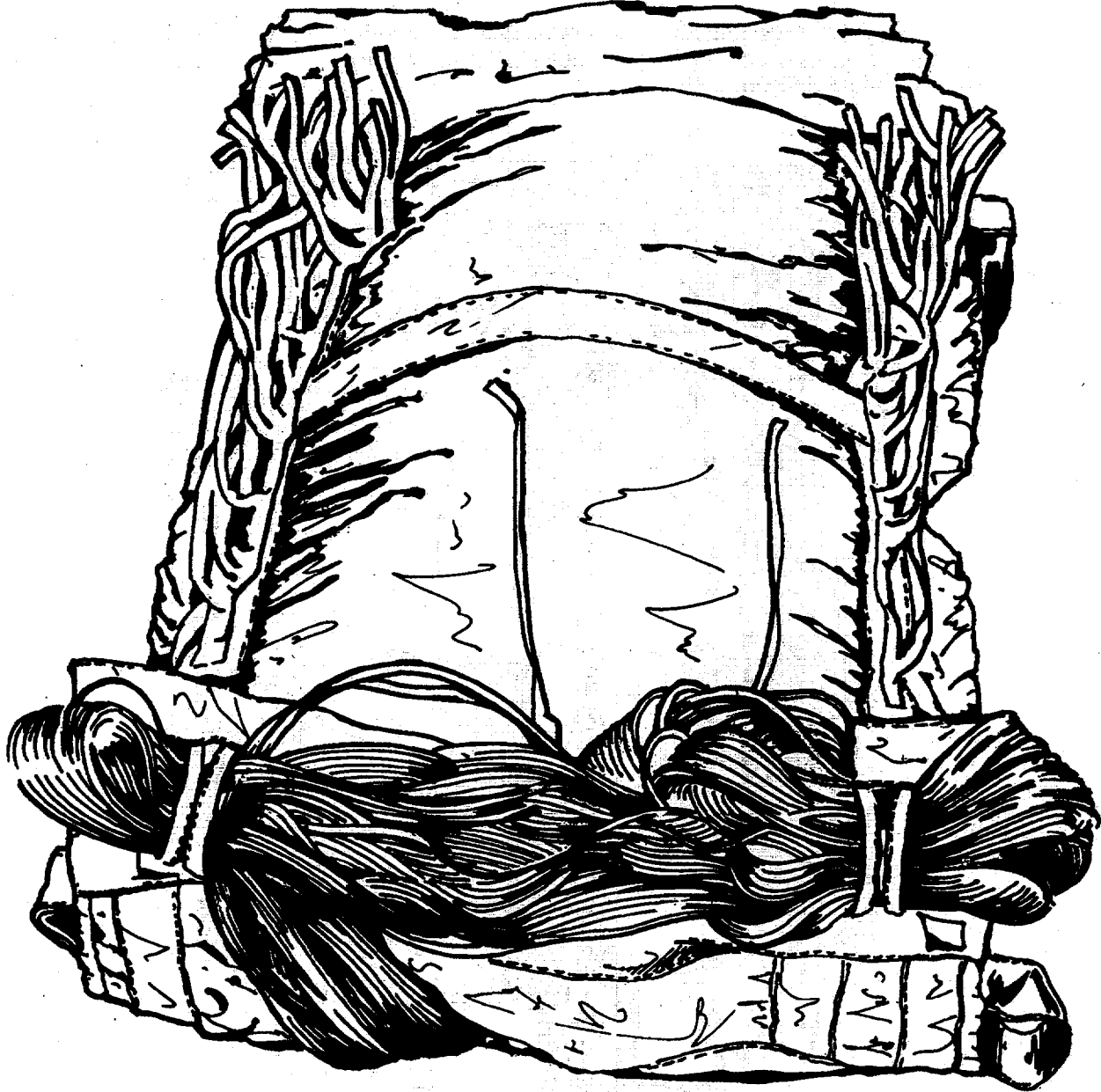


Figure 2-95.2. Locking Stows Completed, G-12E

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NAVY NAVAIR 13-1-32

- (f) Secure the locking stows by tying the suspension line lengths to the first center stow loop on the stowage panel using the webbing length installed in step (a), above. Make the tie with the surgeon's knot and locking knot Trim the ends 2 inches (figure 2-95.3).

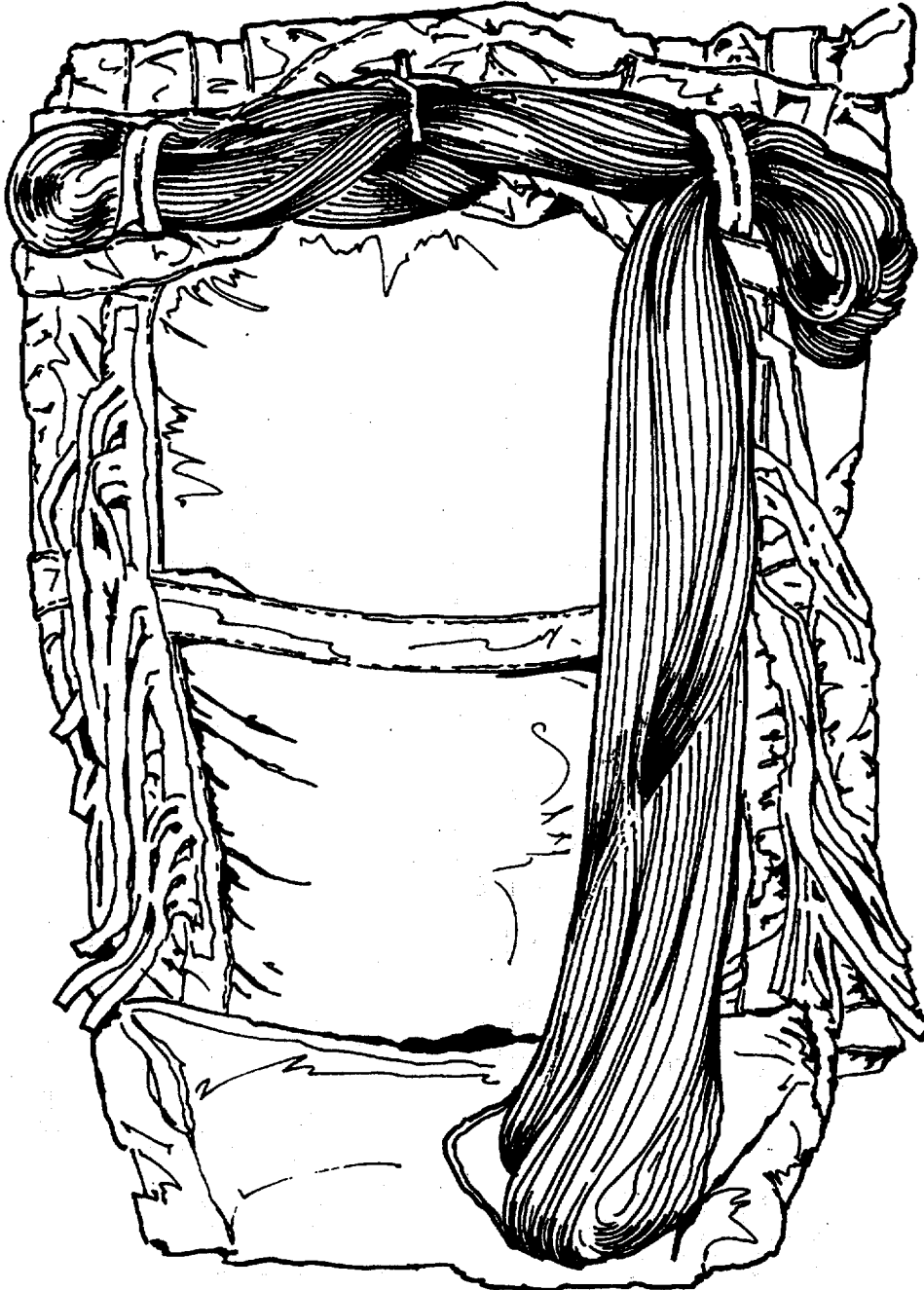


Figure 2-95.3. Securing Tie Completed, G-12E

- (13) *Stowing the suspension lines and suspension risers.*

- (a) Cut a minimum of twenty-four 18 inch lengths of 1/4 inch wide, type I cotton webbing, for use as suspension line stow lines.

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**NAVY NAVAIR 13-1-32**

- (b) Secure two lengths of webbing to each stow loop on the suspension line stowage panel by making a girth hitch in each webbing length. Ensure the ends of each webbing length are aligned and positioned towards the respective outer edges of the bag.
- (c) To prevent nylon-to-nylon bums on the suspension lines and to the canopy during parachute deployment, the suspension lines shall be wrapped as follows:
  - 1 Extend the suspension lines along the top center of the deployment bag toward the bridle end of the bag.
  - 2 Using an 8-1/2 inch wide by 24 inch long piece of kraft paper, wrap the suspension lines extended along the top center of the development bag. Secure each end of the suspension line wrap with ticket No. 3 cotton thread. Make each be with a surgeon's knot and locking knot. Trim tie ends to 2 inches (figure 2-95.4).

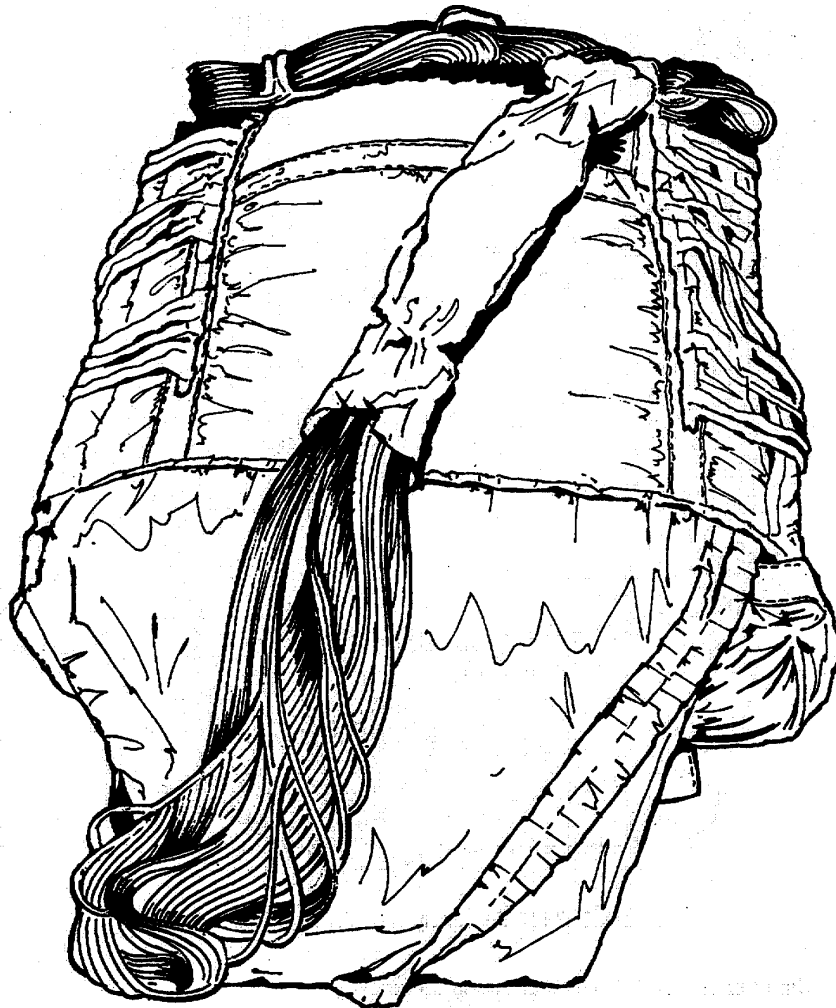


Figure 2-95.4. First and Second Suspension Line Stowed, G-12E



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- (d) Extend the running end of the suspension lines to the upper right corner of the stowage panel and for the first suspension line stow by making a loop in the suspension lines aligned with the edge of the locking slot flap. Secure the suspension line stow with the first installed webbing length. Make the tie with a surgeon's knot and locking knot
- (e) Extend the suspension lines to the upper left corner of the stowage panel. Form and secure the second suspension line stow by making a loop in the suspension line stow as outlined in step (d), above (figure 2-95.5S. Continue to stow and secure the remaining suspension lines alternating from right to left

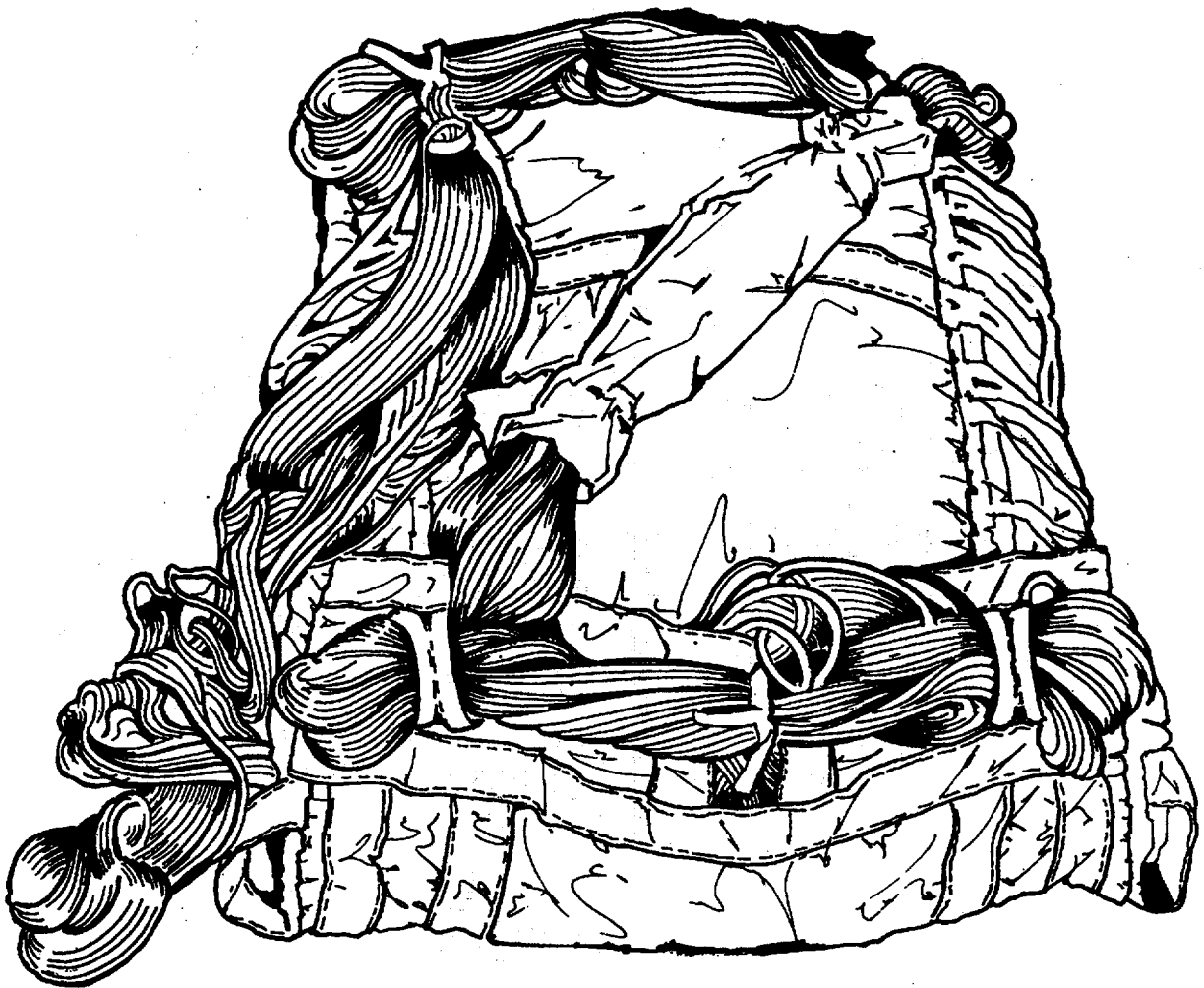


Figure 2-95.5. First and Second Suspension Line Stowed, G-12E

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AIR FORCE T.O. 13C5-32-2  
NAVY NAVAIR 13-1-32

- (f) Stow and secure the suspension risers using the procedures in step (d) above. Make the last suspension riser tie 16 inches above the suspension clevis to the center stow loop on the stowage panel using the second web tie installed in step (8)(a), above. Make a surgeon's knot and locking knot. Trim all tie ends to 2 inches (figure 2-95.6).

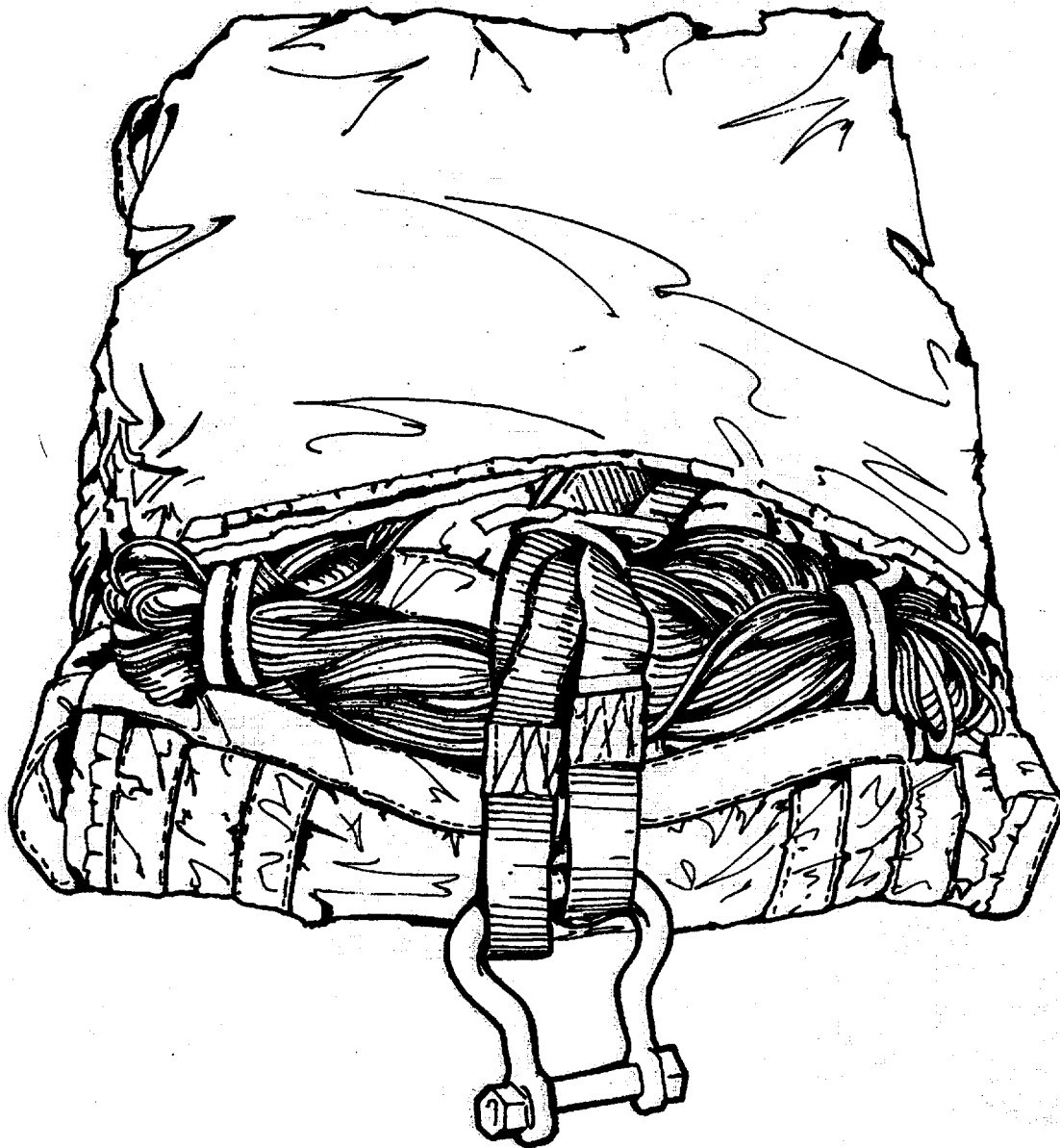


Figure 2-95.6. Suspension Line, Center line, and Riser Stowage Completed, G-12E

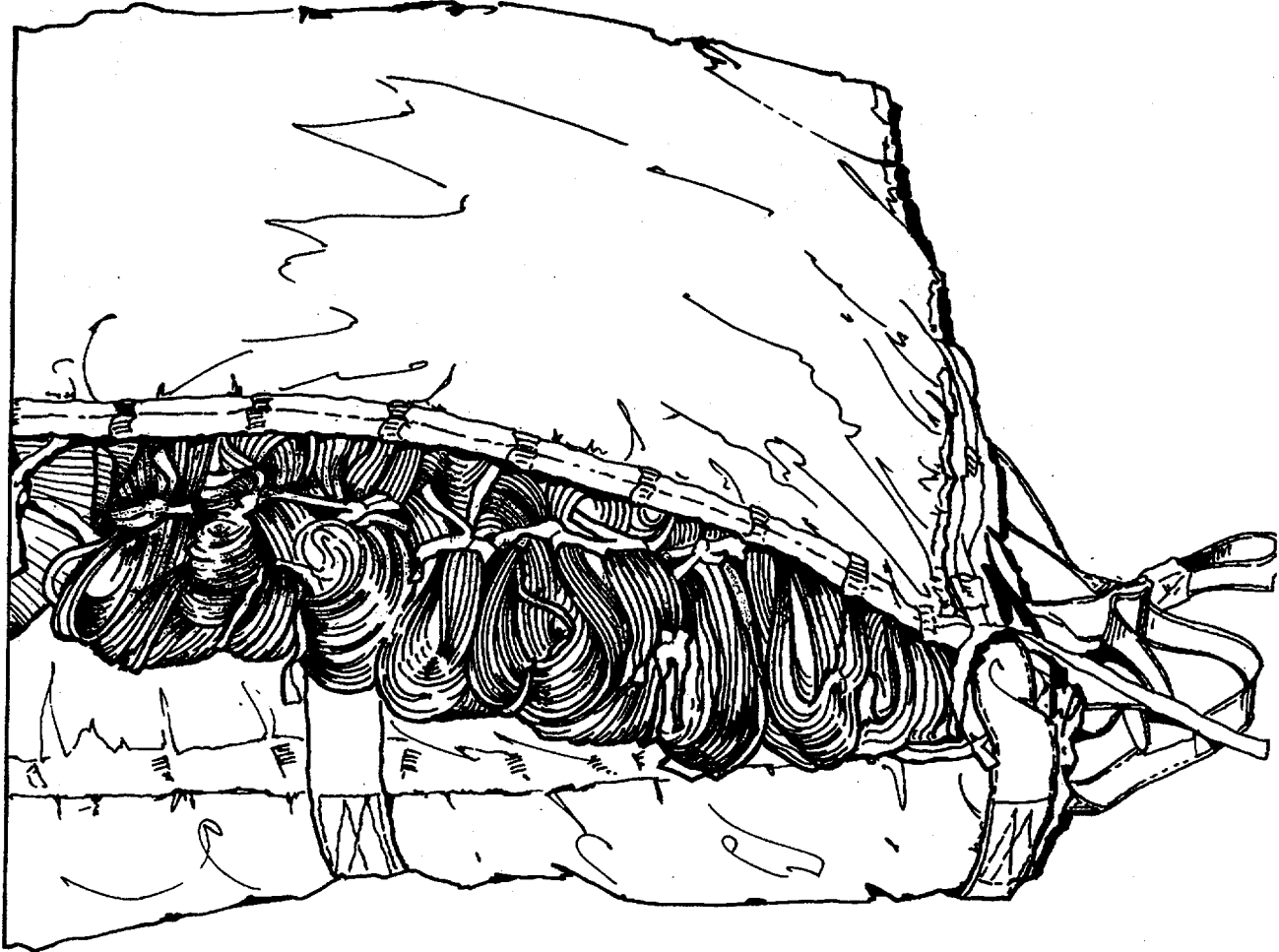
(14) Lacing the deployment bag.

- (a) Bring the deployment bag cover over the stowage panel. The hops on the cover should overlap the loops on the side-of the bag.
- (b) Cut two 60 inch lengths of 1/4 inch wide, type I cotton webbing, for use as lacing material.



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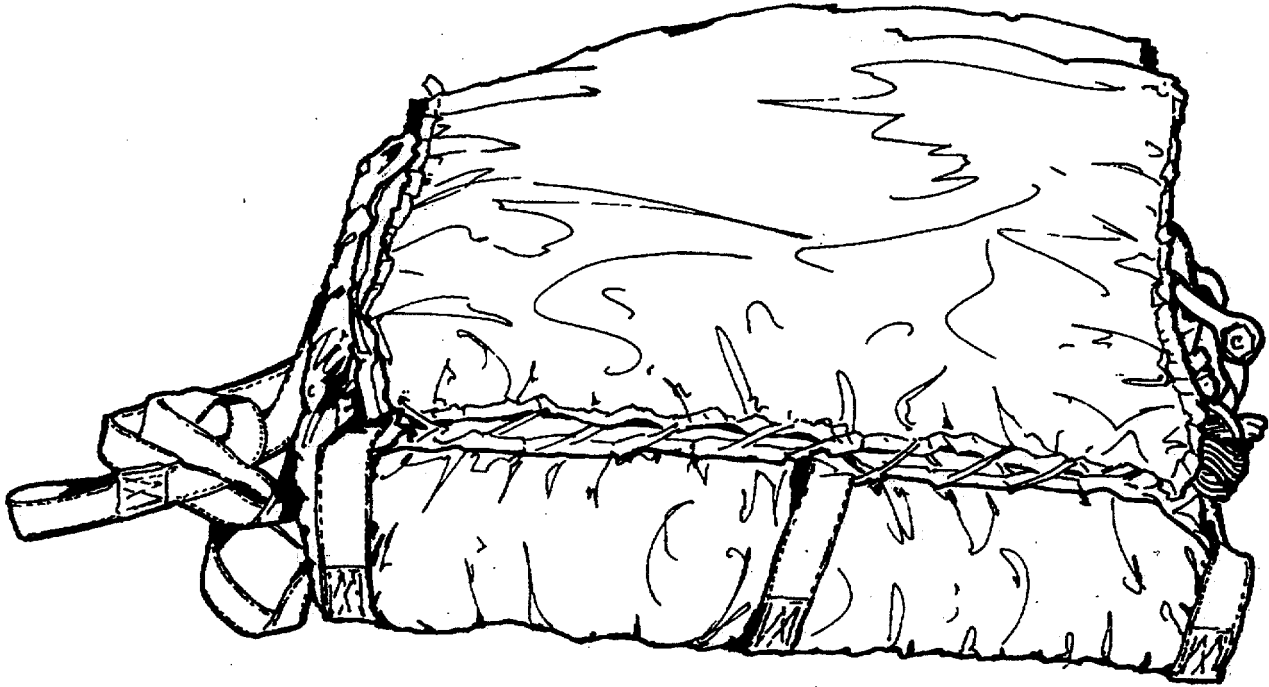
- (c) Secure the end of one web length to the first loop on the upper right corner of the deployment bag cover with two half-hitches (figure 2-95.7).



*Figure 2-95.7. Lacing Deployment Bag, G-12E*

- (d) Lace the bag cover to the side of the deployment bag, loop over loop, toward the opening of the bag. Secure the webbing length to the last loop on the bag cover with two half-hitches. Trim tie ends to 2 inches.
- (e) Using the second 60 inch web length, lace the left side using the procedures in steps (c) and (d), above.

(15) Padding complete, G-12E parachute (figure 2-95.8).



*Figure 2-95.8. Lacing Completed, G-12E*

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- (16) *Completing the log record.* Remove the hg record (DA Form 10-42 inspection data pocket log record pocket), on the canopy riser, and record the pack data on the "Jump, Inspection and Repack Data" page as follows:
- (a) *Date.* Enter the day, month and year of each packing action.
  - (b) *Bag number.* Indicate non-breakaway deployment bag attachment.
  - (c) *Routine inspection.* No entry required.
  - (d) *Jumps or dropped.* No entry required.
  - (e) *Repack.* For initial packing, enter "IN"; thereafter, enter a check mark in the column each time the parachute is repacked.
  - (f) *Packer's name.* The packers performing the packing will sign this entry.
  - (g) *Inspector's name.* The inspector performing the pack-in-process inspection will sign this entry.
  - (h) *Unit.* Enter the unit designation to which the packers and/or the inspector are assigned.
- h. *Packing the 68 inch Diameter Pilot Parachute.* The 68 inch diameter pilot parachute may be used with the G-12E cargo parachute when it is used in air delivery operations which require the parachute to be deployed by static line. The pilot parachute will be packed in a breakaway or non-breakaway configuration, as required. Pack the pilot parachute on a packing table as follows:
- (1) *Attaching the breakaway static line.*
    - (a) Partially invert the pilot parachute deployment bag by folding the sides back to expose the inner loop.
    - (b) Pass the small loop of the bridle line through the deployment bag inner loop. Further pass the large loop on the opposite end of the bridle line through the small loop to form a slip loop around the inner loop. Draw the slip loop tight.
    - (c) Pass the bridle line large loop through the pilot parachute breakcord attaching loop. Further pass the pilot parachute deployment bag and static line through the large loop to form a slip loop around the pilot parachute breakcord attaching loop.
  - (2) *Attaching the non-breakaway static line.*
    - (a) Perform procedures outlined in (1)(a), above, and position the inner loop immediately above the pilot parachute breakcord attaching loop.
    - (b) Using a single length of ticket no.5 cotton thread, pass one end of the thread through the pilot parachute breakcord attaching loop until the thread center is reached.

**2-17. Packing the 64-Foot Cargo Parachute, Model G-12E (cont).**

- (c) Working from opposite directions, pass each end of the thread length through the inner loop and draw the thread tight.
  - (d) Secure the thread ends on top of the inner loop with a surgeon's knot and a locking knot. Trim thread ends to 2 inches.
- (3) *Folding the canopy.*
- (a) Make four gore folds to the right of the suspension lines, four gore folds to the left of the suspension lines, and dress the gores.
  - (b) Fold the right gore group over the canopy center and fold the left gore group over the right gore group (figure 2-96).

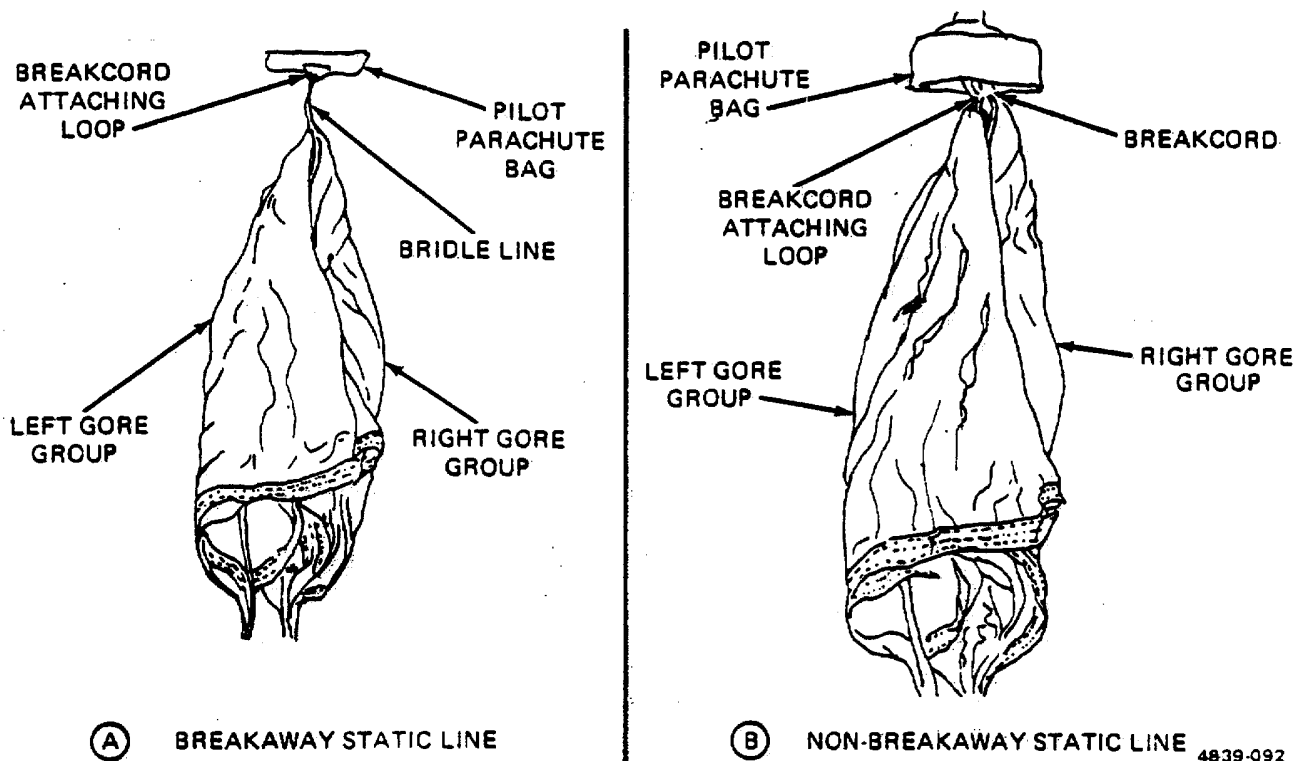


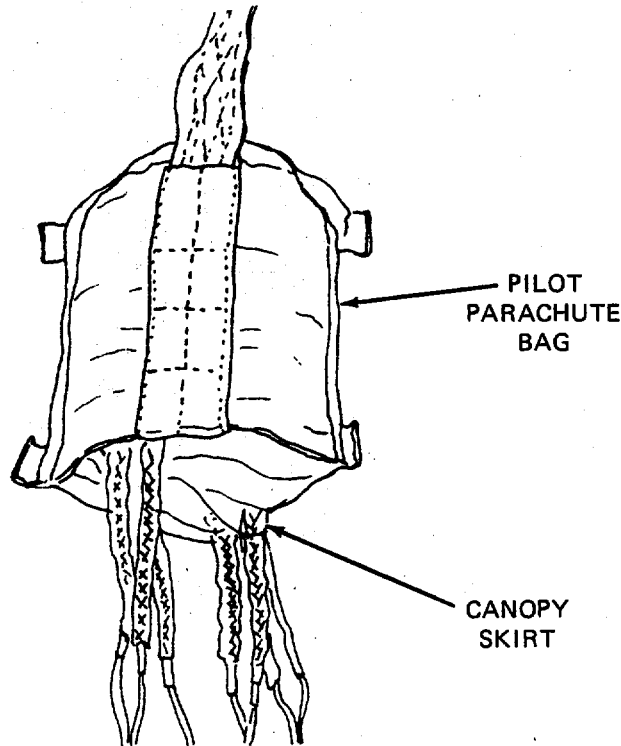
Figure 2-96. Parachute Bag and Static Line Attached and Gore Folding Completed.

- (4) *Attaching the deployment line.*
- (a) Disassemble the pilot parachute suspension line connector link assembly.
  - (b) Insert the free connector link L-bar through the loop on one end of the 111 inch long deployment line and reassemble the link assembly.

(5) *Stowing the canopy, suspension lines and deployment line.*

(a) Remove the bag inversion made in (1)(a), above.

(b) Working from the crown to the skirt, S-fold the canopy into the bag (figure 2-97).



4839-093

*Figure 2-97. Canopy Stowed in Bag.*

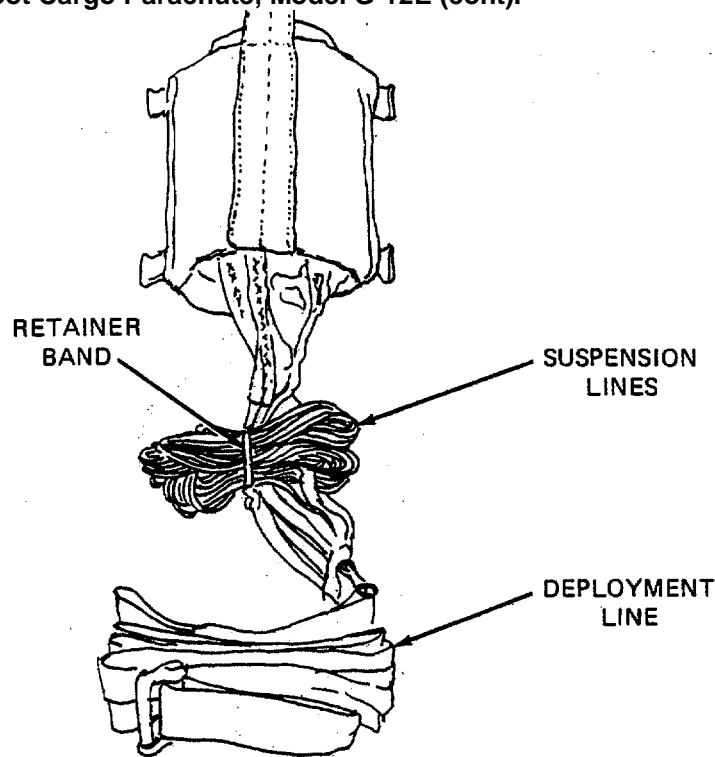
(c) S-fold the suspension lines to the width of the bag. Secure the folded lines in the center with a rubber retainer band (figure 2-98).

(d) Insert the folded suspension lines into the pilot parachute bag.

(e) S-fold the deployment line length into the pilot parachute bag and position the deployment line connector link at the lower center of the bag open end.

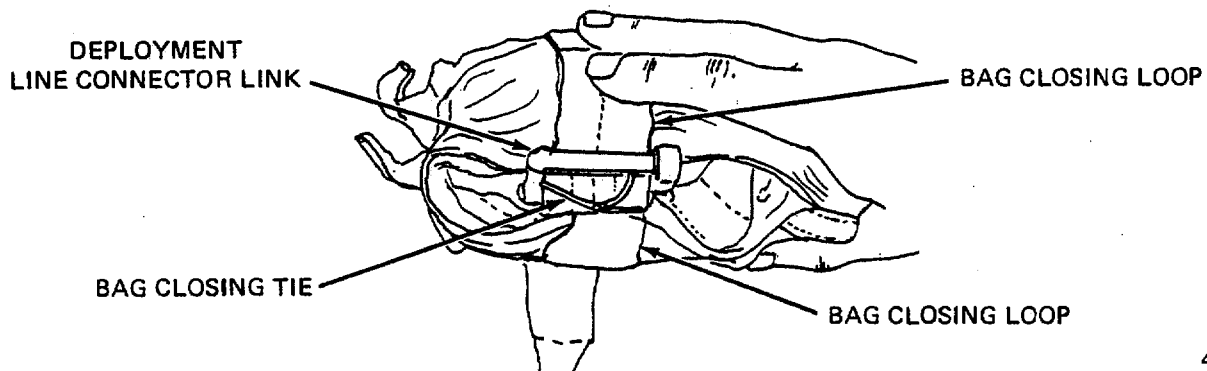
(6) *Closing the pilot parachute bag.* Using a single length of ticket No. 5 cotton thread, pass one thread end through the top bag closing loop, through the deployment line connector link assembly, through the bottom bag closing loop, back through the deployment line link, and through the opposite side of the top bag closing loop. Pull the thread ends tight and make a tie with a surgeon's knot and a locking knot (figure 2-99). Trim tie ends to 2 inches.

**2-17. Packing the 64-Foot Cargo Parachute, Model G-12E (cont).**



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*Figure 2-98. Suspension Lines Folded and Secured.*



4839-095

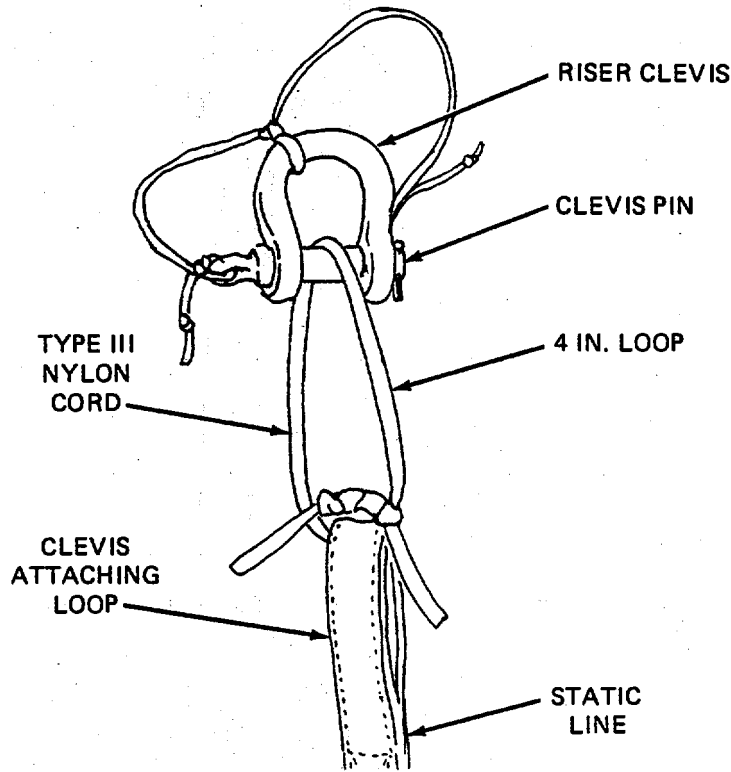
*Figure 2-99. Bag Closing Completed.*

(7) *Attaching the riser clevis.* The manner in which the riser clevis is to be attached to the static line shall depend upon whether the pilot parachute is packed for breakaway or non-breakaway use. The clevis attachment procedures for both methods are as follows:

(a) *Breakaway static line.*

- 1 Cut a 12-inch length of type III nylon cord and remove the core threads.

- 2 Center the cord length around the clevis pin and insure the running cord ends are alined. Pass each running end of the cord length through the static line clevis attaching loop from opposite directions (figure 2-100) and secure the cord ends on top of the static line attaching loop with a surgeon's knot and a locking knot. Make an overhand knot in each running end. Trim each at a point 2 inches from the surgeon's knot and locking knot.



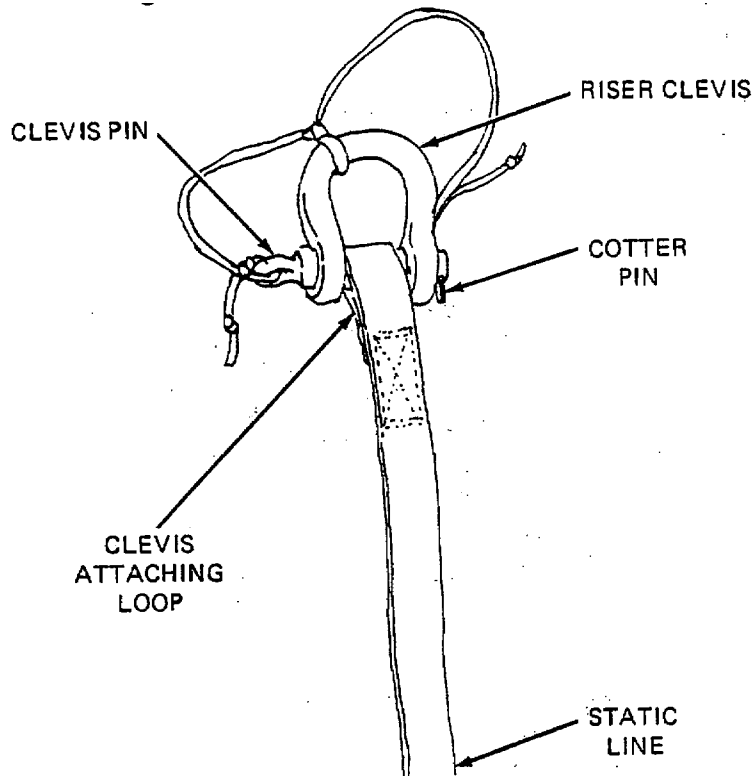
4839-096

Figure 2-100. Riser Clevis Attached to Breakaway Static Line.

(b) *Non-breakaway static line.*

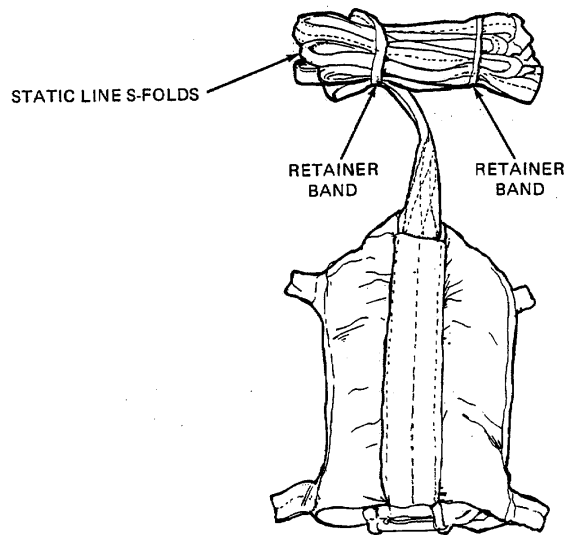
- 1 Remove the cotter pin from the clevis pin and the clevis pin from the body of the clevis.
  - 2 Position the static line clevis attaching loop between the clevis bottom ends and reinsert the clevis pin into the clevis body, passing the pin through the clevis attaching loop. Reinstall the safety pin into the end of the clevis pin (figure 2-101).
- (8) *Stowing the static line.* S-fold the static line length in 8-inch folds and secure each end of the folded webbing with a rubber retainer band (figure 2-102).
- (9) *Marking the deployment bag.* Place a piece of masking tape on deployment bag and mark "breakaway" or "non-breakaway".

**2-17. Packing the 64-Foot Cargo Parachute, Model G-12E (cont).**



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*Figure 2-101. Riser Clevis Attached to Non-Breakaway Static Line.*



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*Figure 2-102. Packing Completed.*



(10) Attaching the Pilot Parachute.

- (a) Attach a 68-inch pilot parachute to the bridle of the G-12E cargo parachute with the connector links of the pilot parachute.
- (b) Cut four suitable lengths of ticket number 8/7 cotton thread.
- (c) Using one turn single 8/7 cotton thread and the four tie loops secure the pilot chute to the deployment bag of the G-12E clustering tie loops.
- (d) S-fold the static line across the G-12E cargo parachute. Secure the folds to the risers stow bar with two retainer bands.

**Change 1      2-104.1/(2-104.2 blank)**



**SECTION VI. REPAIR**

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**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.

**2-18. 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 43-0002-4.

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**2-19. Repair-Sewing Procedures.**

---

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

---

*Tools:*

*Equipment Condition:*

Specified in paragraph applicable to the item being repaired.

Unpacked. Canopy with defects recorded and clean.

*Materials/Parts:*

Specified in paragraph applicable to the item being repaired.

---

**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 Temporarily 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) When basting, do not tie knots at any point in the thread length. Also, the sewing should be made with two stitches per inch.
- (3) Temporary tacking will usually be made using a length of size E nylon thread (item 39/40, Appendix D). However, an alternate type thread may be specified within the paragraph applicable to the item.
- (4) 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 3530-01-181-1420.
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.
VHD	SEWING MACHINE, INDUSTRIAL, 301 stitch, very heavy duty; NSN 3530-xx-xxx-xxxx.

**2-19. Repair - Sewing Procedures (cont).**

*Table 2-3. Stitching and Restitching Specifications.*

Code symbol	Recommended sewing machine (code symbol)	Stitches per inch	Thread Size
Canopy			
Gore section	LD	7-11	E
	DN	Darn	E
Vent and skirt bands (upper and lower lateral bands)	LD	7-11	E
Canopy line	ZZ	7-11	E
Suspension line	ZZ	7-11	E
Vent line	ZZ	7-11	E
Attaching loop (bridle loop)	HD	5-8	3
Parachute inspection data pocket	LD	7-11	E
Tie cord loop	ZZ	7-11	E
Tie cord	ZZ	7-11	E
Pocket band	ZZ	7-11	FF
Radial seam reinforcement tape	ZZ	7-11	E
Radial seam	LD	7-11	E
Riser	HD	5-8	6
Clevis loop buffer	LD	7-11	E
V-tab	LD	7-11	FF
	ZZ	7-11	FF
Deployment Bag			
	HD	5-8	3
Bag closing loop	HD	5-8	3
Bridle strap	HD	5-8	3
Edge binding	ZZ	7-11	E
Horizontal strap	HD	5-8	3
Panels, flaps, and cover	MD	7-11	FF
	DN	Darn	E
Locking stow loop	HD	5-8	3
Locking stow slot reinforcement	HD	5-8	3
Suspension line stow loop	HD	5-8	3
Suspension line stow strap	HD	5-8	3
Suspension line stow loop reinforcement	HD	5-8	3
Cluster tie webbing	HD	5-8	3
Riser extension tie loop	HD	5-8	3
Riser extension tie strap	HD	5-8	3
Riser extension cover end reinforcement	MD	7-11	FF
Vent line hole reinforcement	HD	5-8	3
Deployment Line ( 111 -inch Long)	HD	5-8	3
Reinforcement straps	VHD	5-8	5

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

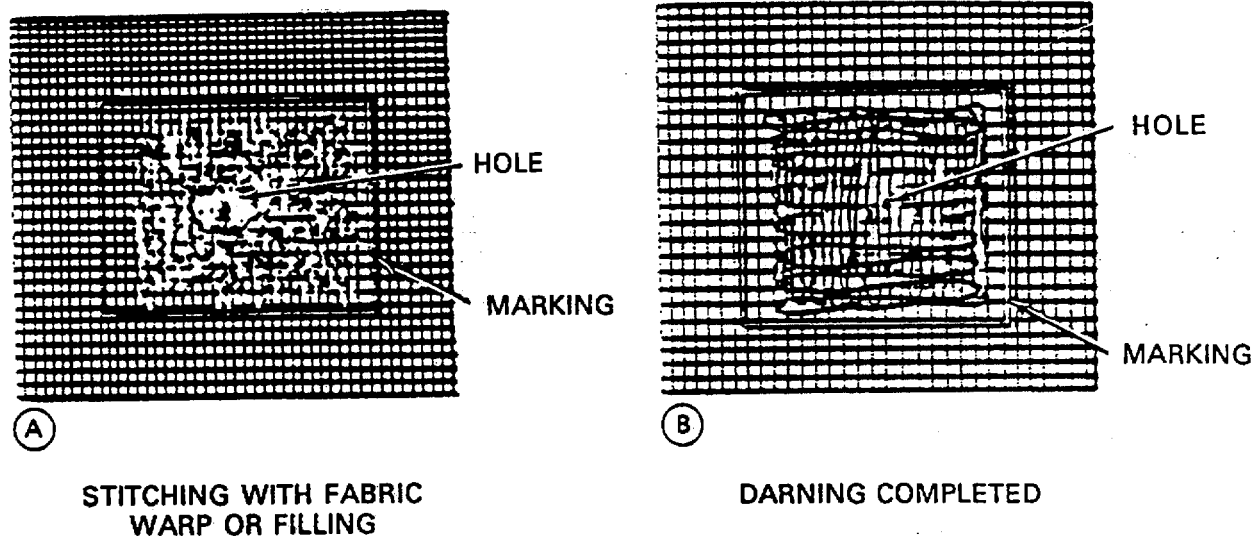
Code symbol	Recommended sewing machine (code symbol)	Stitches per inch	Thread Size
Pilot Parachute (68-Inch Diameter)			
Canopy panel	LD	7-11	E
	DN	Darn	E
Crown inside reinforcement tape	LD	7-11	E
Canopy reinforcing tape	LD	7-11	E
Crown attaching loop	LD	7-11	E
Skirt reinforcement webbing	LD	7-11	E
Suspension line reinforcing tape	ZZ	7-11	FF
	LD	7-11	E
Suspension line	ZZ	7-11	E
Static Line			
Edge binding	LD	7-11	E
Bag panel	DN	Darn	E
Bridle line	ZZ	7-11	E
Bridle webbing	HD	5-8	3
Tiedown loop	LD	7-11	E

(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. 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. 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 air delivery items constructed from textile material such as parachute canopy gore sections and the cloth and reinforcement webbing of deployment bags. 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:

- (1) 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.
- (2) 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 2-103).

## 2-19. Repair - Sewing Procedures.



4839-099

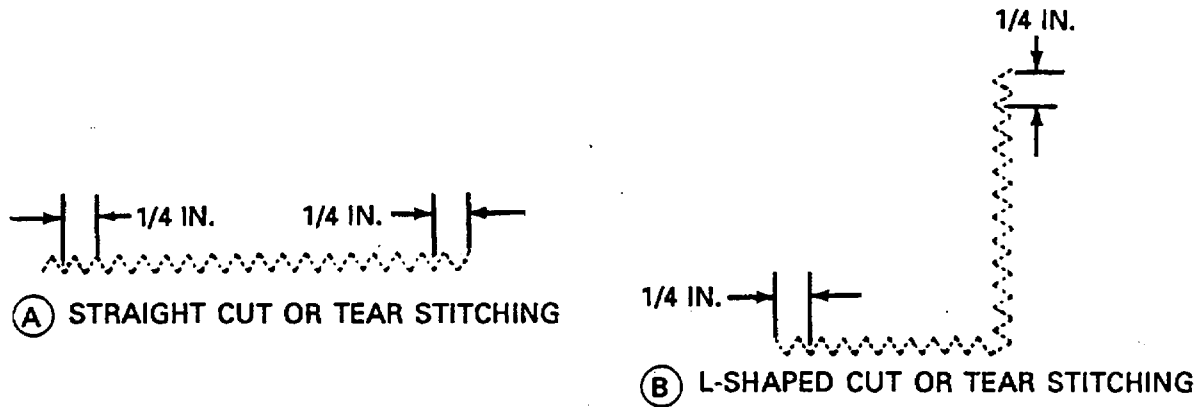
Figure 2-103. Darning Method Using a Darning Sewing Machine.

- (3) 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 2-103).
- (4) If applicable, restencil informational data, gore number(s), or identification marks using the criteria in para. 2-21.

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 zig-zag 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 with a zig-zag sewing machine, using the following procedures:

- (1) Set the sewing machine to the maximum stitch width.
- (2) Beginning at a point 1/4 inch beyond one end of the cut or tear, stitch lengthwise along the damaged area to a point 1/4 inch beyond the opposite end of the cut or tear (A, figure 2-104). The cited stitching procedure will also apply to an L-shaped cut or tear (B, figure 2-104).
- (3) If applicable, restencil informational data or identification marks as prescribed in para. 2-21.





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Figure 2-104. Repair Method Using a Zig-Zag Sewing Machine.



---

## 2-21. Marking and Restenciling.

---

This task covers:      a. Marking                      b. Restenciling                      c. Remarking and Restenciling

---

*Tools:*

Brush, Stenciling, Item 2, Appendix B

*Equipment Condition:*

Layout on packing table or other suitable area.

*Materials/Parts:*

Ink, Marking, Item 18, Appendix D  
Marker, Felt Tip, Black, Item 20, Appendix D  
Pen, Ball Point, Item 24, Appendix D  
Stencilboard, Oiled, Item 29, Appendix D

---

### 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 air delivery 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 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.

---

**2-22. Parachute Canopy.**

---

This task covers:                      a. Repair                                      b. Replace

---

*Equipment Condition:*

Cleaned and dried, paragraph 2-12  
Inspected, paragraphs 2-9, 2-13  
Unpacked, canopy laid flat

---

- 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.

---

## **2-23. Bridle Loop.**

---

This task covers:                      a. Repair                                      b. Replacement

---

*Tools:*

Knife, Item 4, Appendix B  
Pot, Melting, Item 13, Appendix B  
Sewing Machine, Heavy Duty, Item 18,  
Appendix B  
Yardstick, Item 24, Appendix B

*Materials/Parts:*

Beeswax, Item 1, Appendix D  
Webbing, Cotton, Type X, Item 51, Appendix D  
Thread, Nylon, Size 3, Hem 42/43, Appendix D

*Materials/Parts (cont):*

Wax, Parafin, Item 47, Appendix D  
Pencil, Marking Aid, Item 25/26, Appendix D

*Equipment Condition:*

Cleaned, paragraph 2-12  
Inspected, paragraph 2-9, paragraph 2-13  
Lay out on packing surface or other suitable area.

---

a. Repair. Restitch broken or loose stitching according to original construction details, using the procedures in paragraph 2-1 9.

b. Replacement. Replace an unserviceable attaching loop (bridle loop) by fabricating as follows:

- (1) Cut a 30-inch-length of 1 3/4-inch wide, type X cotton webbing and wax the ends.
- (2) Pass one end of the webbing length through the canopy vent lines and join the webbing ends together above the vent lines with a 5-inch-long overlap (figure 2-105). Insure the webbing encircles all the canopy vent lines.
- (3) Beginning at a point 1/8 inch back from one overlapped webbing end, secure the overlapped ends together by stitching a 4 3/4-inch long three-point-WW-stitch formation to a point 1/8 inch back from the opposite overlapped webbing end (figure 2-105). Stitching will be made in accordance with para. 2-18 using a heavy-duty sewing machine and size 3 nylon thread. Stitching will be 5 to 8 stitches per inch, using the specifics in table 2-3.
- (4) Remove the original canopy attaching loop (bridle loop) from around the canopy vent lines by cutting the loop webbing.

2-23. Bridle Loop (cont).

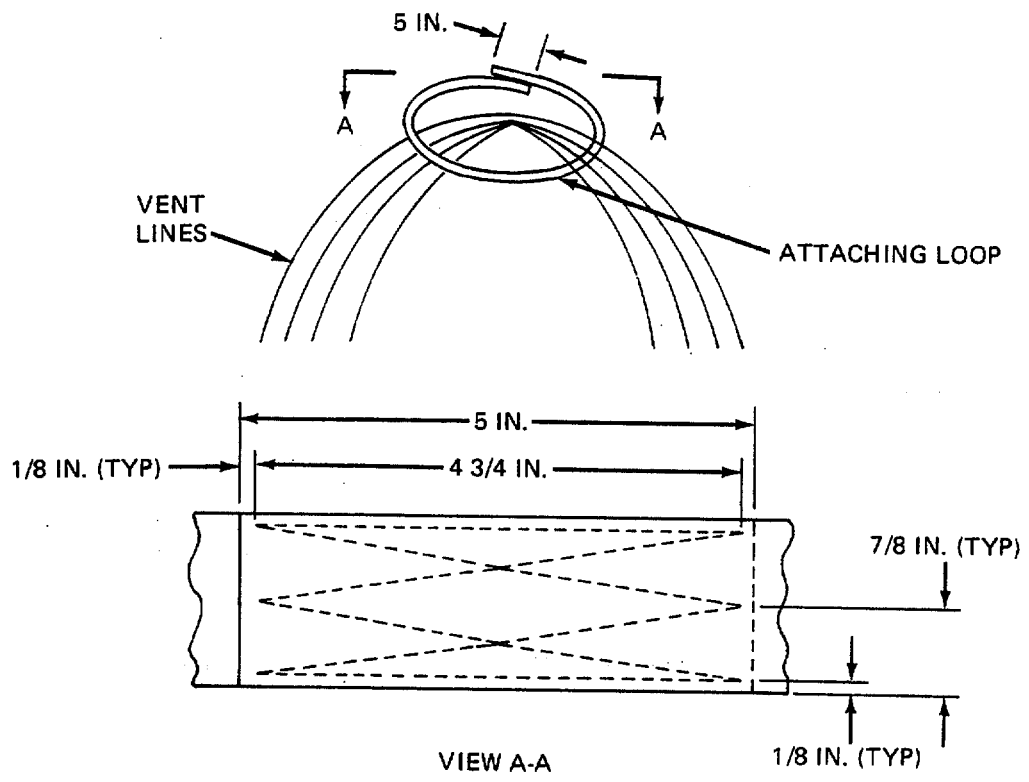


Figure 2-105. Canopy Bridle Loop Replacement Details.

4839-101

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## 2-24. Vent Reinforcement (Upper Lateral Band).

---

This task covers: Repair

---

*Tools:*

Knife, Item 4, Appendix B  
Pot, Melting, Item 13, Appendix B  
Sewing Machine, Light Duty, Item 16, Appendix B  
Shears, Item 14, Appendix B  
Yardstick, Item 24, Appendix B

*Equipment Condition:*

Cleaned, paragraph 2-12  
Inspected, paragraphs 2-9, paragraph 2-1 3  
Unpacked, canopy laid flat

*Materials/Parts:*

Marking Aid, Item 25/26, Appendix D  
Thread, Nylon, Size E, Item 39/40, Appendix D  
Webbing, Nylon, 1 -inch, Tubular, Item 58,  
Appendix D

---

a. Restitching. Restitching of vent reinforcement webbing 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.**

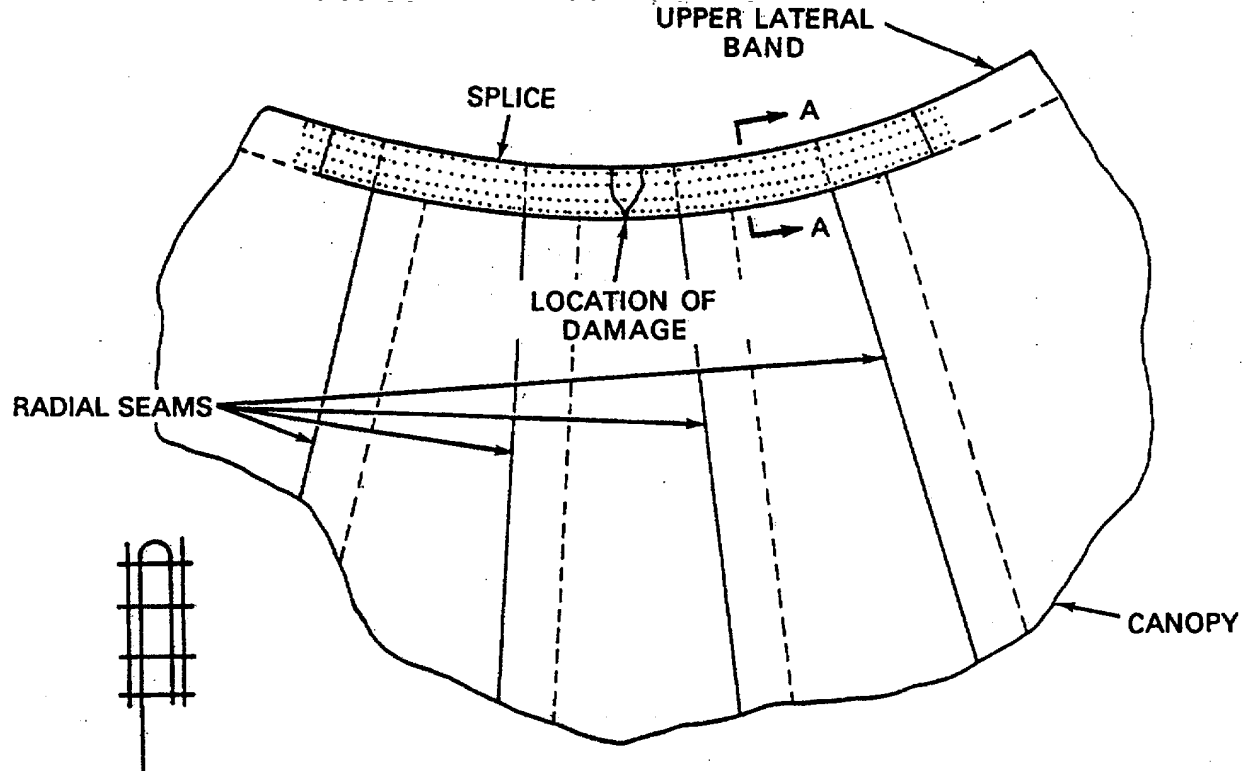
b. Damage Between Radial Seams. Repair as follows:

- (1) Mark vent line position and cut stitching of two vent lines on each side of damaged area. Move lines to one side.
- (2) Smooth canopy around damaged area.
- (3) Cut a piece of 1-inch wide tubular nylon webbing, long enough to extend 1 inch beyond outside edge of second radial seam on each side of damaged area. Wax the ends of webbing (para. 2-20).
- (4) Center webbing over damaged area. Using a light duty sewing machine and size E, nylon thread, sew webbing in place with four continuous rows of stitching 1/8 inch from edge of webbing, 7 to 11 stitches per inch. Overstitch ends of webbing 1/2 inch (A, figure 2-106).
- (5) Reposition vent lines and sew them in place according to original construction.

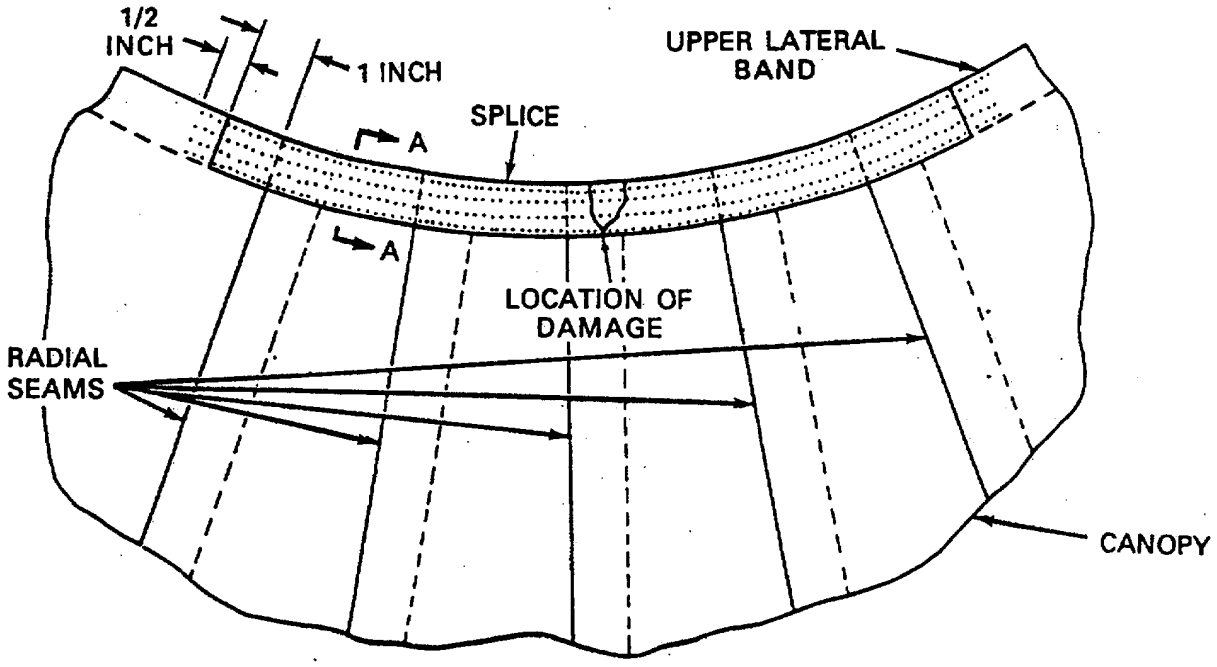
c. Damage Extending Into Radial Seam. Repair as follows:

- (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.

2-24. Vent Reinforcement (Upper Lateral Band) (cont).



(A) DAMAGE BETWEEN RADIAL SEAMS



(B) DAMAGE EXTENDING INTO RADIAL SEAM

Figure 2-106. Vent Reinforcement Splicing Details.

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- (3) Cut a piece of 1-inch wide tubular 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. 2-18).
- (4) Center webbing over damaged area. Using a light duty sewing machine and size E nylon thread, sew webbing in place with four continuous rows of stitching, 1/8 inch from edge of webbing, 7 to 11 stitches per inch. Overstitch ends of webbing 1/2 inch (B, figure 2-106).
- (5) Reposition vent lines and sew in place according to original construction.



- 2 There is no limitation to the number of patches or size of patch to each canopy gore section or gore panel. However, determination should be made, of the most economical method to be used, i.e., two or more 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.

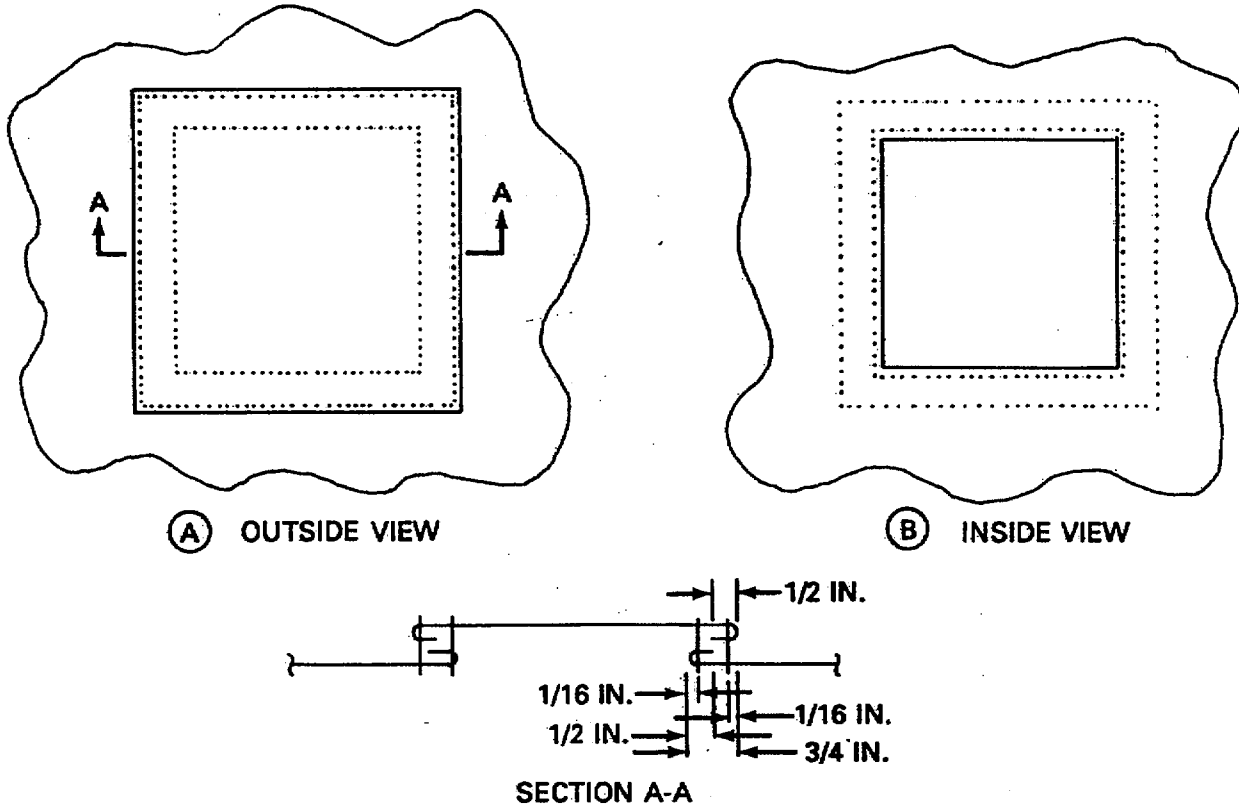
(b) *Making a basic patch.* A basic patch is used to repair damaged cloth when the affected area is no closer than 1 inch from a radial seam or lower lateral band. Should a damaged area be closer than 1 inch to the cited areas, a miscellaneous patch will be made as detailed in paragraph (c). There are two methods which may be used to apply a basic patch and the procedures for performing each method are outlined in paragraphs 1 and 2 as follows:

**NOTE**

**A basic patch applied to the parachute canopy by sewing will be square or rectangular in shape. A parachute canopy basic patch constructed from adhesive nylon parachute mending cloth may be shaped, rectangular or triangular as required.**

- 1 The sewn patch. The primary method of applying a basic patch is by sewing. When using this method of patching on a parachute canopy, the patch will be applied to the inside of the canopy. (The sewn patch is shown in figure 2-107.) Apply a sewn patch as follows:
- a Place the reparable item on a repair table, smooth the fabric around the damaged area, and secure the item to the table with pushpins. Do not pin the damaged area.
  - b Using an authorized marking aid of contrasting color, mark a square or rectangle around the area to be patched and insure that one side of the marked square is parallel to the warp or filling of the material.
  - c Cut the damaged area fabric along the lines made in k, above. Further cut the fabric diagonally at each corner to allow a 1/2-inch foldback in the raw edges.
  - d Make a 1/2-inch foldback on each raw edge. Pin and baste each foldback to complete the prepared hole. Basting will be performed using the procedures in paragraph 2-19a.
  - e Using the same type material as in original construction, mark and cut a patch 2 1/2-inches wider and longer than the inside measurements of the prepared hole.
  - f Center the patch material over the prepared hole and insure the warp or filling of each patch material matches the warp or filling of the fabric being patched. Pin the patch material in position.
  - g Make a 1/2 -inch fold under on each edge of the patch material and baste the patch to the prepared area. Basting will be performed using the procedures in paragraph 2-19a.
  - h Remove the pushpins securing the canopy to the repair table and secure the patch by stitching, using the applicable details in figure 2-107 and paragraph 2-19b. Make the first row of stitching completely around the patch. Turn the canopy over and make a second row of stitching around the prepared hole. Stitching will be performed in accordance with paragraph 2-19b.
  - i If applicable, restencil informational data or gore number according to procedures in paragraph 2-21.

2-25. Canopy Gore Section (cont).



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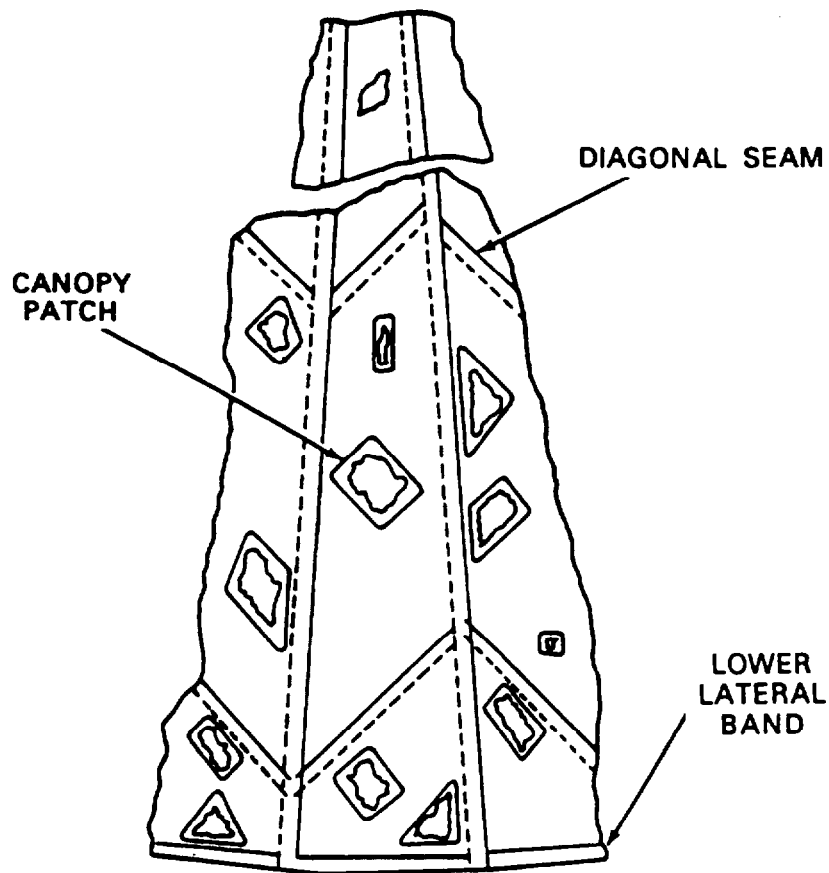
Figure 2-107. Basic Patch Application.

2 The parachute mending cloth patch. A second method of applying a basic patch is by use of 36-inch wide adhesive nylon parachute mending cloth. Patching limitations as outlined in paragraph (3)(a), above, shall be adhered to. Apply a parachute mending cloth patch as follows (figure 2-108):

**NOTE**

**Age life for the nylon parachute mending cloth, prior to application, is three years from the date of adhesive coating which is marked on each roll of mending cloth.**

- a Lay out the canopy with the damaged area exposed.
- b To facilitate the application of the mending cloth patch, place a 1/2- by 20-inch smooth wooden board or similar smooth, hard-finished, rigid material, except paper board, under the damaged area.



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Figure 2-108. Basic Patching Details Using Parachute Mending Cloth.

- c Trim the ragged, frayed, or severely burned areas of the canopy cloth to provide a smooth area for patch application.
- d Using an authorized marking aid of contrasting color, mark a square, triangle or rectangle, as applicable, around the damaged area.
- e Measure and cut lengths of the mending cloth to achieve the shape and size of the intended patch. Cut the patch to provide an overlap of the damaged area using the specifics in table 2-4. Round off patch corners. Patches will be prepared in duplicate to allow for application on the inside and outside of the canopy.
- f Remove the paper backing from the adhesive side of the mending cloth by forming a crease, scoring the paper with a fingernail, and peeling the paper from the adhesive coating. Insure the mending cloth is not damaged when scoring the paper backing.
- g Smooth the canopy material adjacent to the damaged area on the canopy outside and place the formed mending cloth patch over the damaged area.
- h Using the edge of a packing paddle or a roller, apply pressure to smooth the patch on.

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**2-25. Canopy Gore Section (cont).**

- j Apply the duplicate-shaped patch to the damaged area on the canopy inside using the procedures in f, g, and h, above

Table 2-4. Mending Cloth Patching Specifications for Cargo Parachutes.

Damaged area size	Patch minimum size
1 inch to 1 1/2 inches	2 inches
1 1/2 inches to 2 inches	3 1/2 inches
2 inches to 3 inches	4 1/2 inches
3 inches to 5 inches	9 inches
5 inches to 7 inches	10 inches
7 inches to 12 inches	15 1/2 inches
12 inches to 15 1/2 inches	19 1/2 inches

(c) Applying a miscellaneous canopy patch. A miscellaneous canopy patch which may be irregularly shaped, is used to repair damaged canopy material when the location of the damaged area requires the patch to extend into or over a seam, reinforcement, or lateral band. Ascertain the type of patch required for the canopy, using the details in figure 2-109. A canopy gore section that cannot be patched with a basic patch as outlined in paragraph a(3)(b), above, will be patched with a miscellaneous patch. Apply a miscellaneous patch to a gore section as follows:

**NOTE**

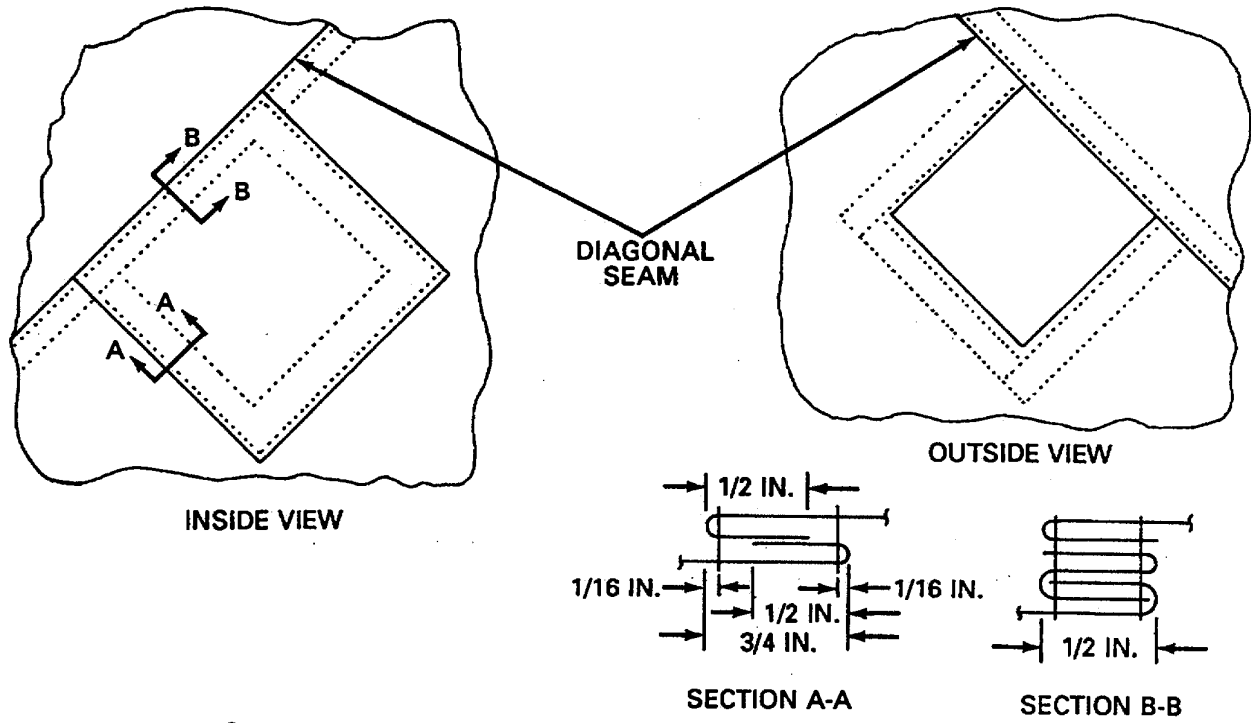
Adhesive nylon parachute mending cloth will not be used in the construction or application of a miscellaneous canopy patch.

- 1 Place the canopy inside out on a repair table, smooth the fabric around the damaged area, and secure the damaged gore section to the table with pushpins. Do not pin the damaged area of the gore section.
- 2 As required, cut the applicable stitching to remove or lay aside items which may interfere with the patching process.
- 3 Using an authorized marking aid of contrasting color, mark a rectangle or triangle around the damaged area. Make the mark 1/2 inch from any adjacent seam, reinforcement, or lateral band. Insure that one side of the marked rectangle or triangle is parallel to the warp or filling of the canopy material.
- 4 Prepare the hole in the damaged area by cutting along the marks made in 3, above. Also make a diagonal cut at each corner of the formed hole to permit a 1/2-inch foldback of each raw edge.
- 5 To complete hole preparation, make a 1/2-inch foldback of each raw edge. Pin and baste each edge foldback using the procedures in paragraph 2-19a.

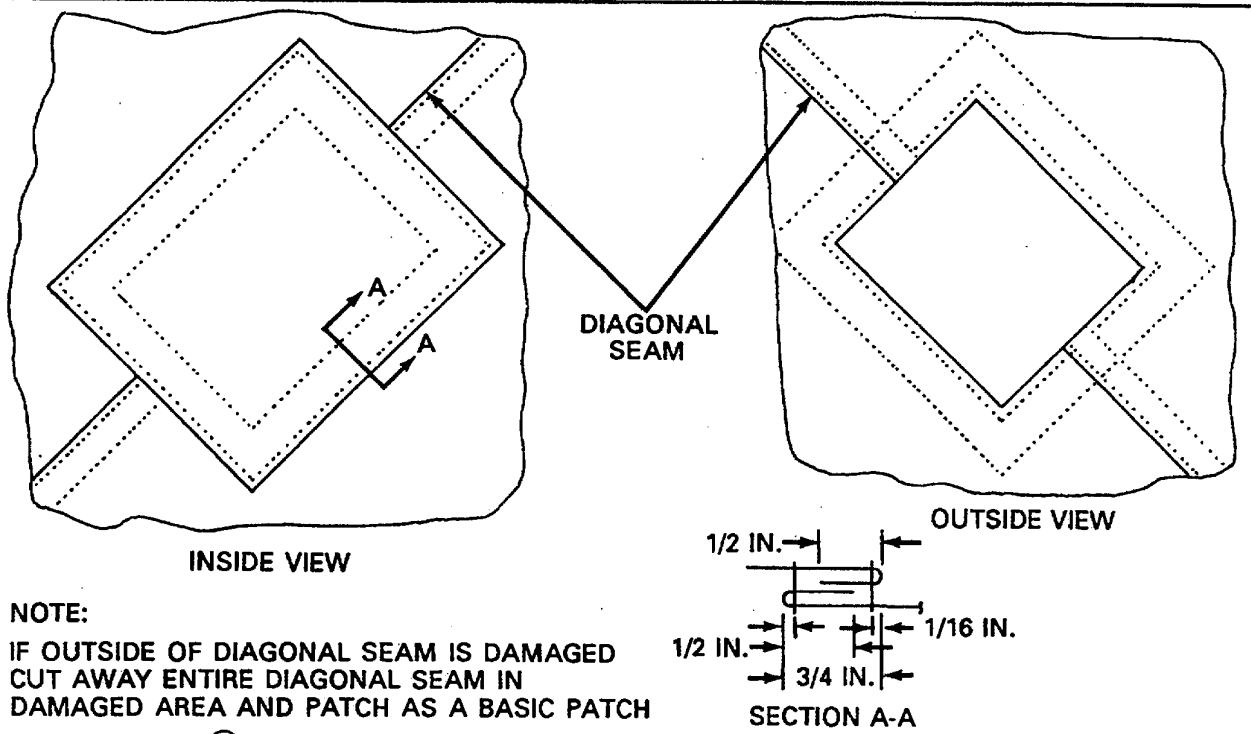
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- 6 Using the same type material as in original canopy construction, mark and cut a patch 2 1/2-inches wider and longer than the inside measurements of the prepared hole.
- 7 Center the patch material over the prepared hole. Insure the warp or filling of the patch material matches the warp or filling of the material to be patched. Pin the patch material in position.
- 8 Make a 1/2-inch fold under on each edge of the patch material and baste the patch to the prepared area. Basting will be performed using the procedures in paragraph 2-19a.
- 9 Remove the pushpins securing the canopy to the repair table and secure the patch by stitching according to the details in figure 2-109, using a light-duty sewing machine and size E nylon thread, 7 to 11 stitches per inches. Make the first row of stitching completely around the edges of the patch. Turn the canopy right side out and make a second row of stitching around the edges of the prepared hole. Stitching will be performed in accordance with paragraph 2-19b.
- 10 Reposition the canopy items removed or laid aside in X, above, in the original location and secure each item to the canopy by restitching according to original construction details and paragraph 2-19b.
- 11 If applicable, restencil informational data or gore numbers according to procedures in paragraph 2-21.

2-25. Canopy Gore Section (cont).



**(A) RECTANGULAR PATCH INCLUDING A DIAGONAL SEAM.**



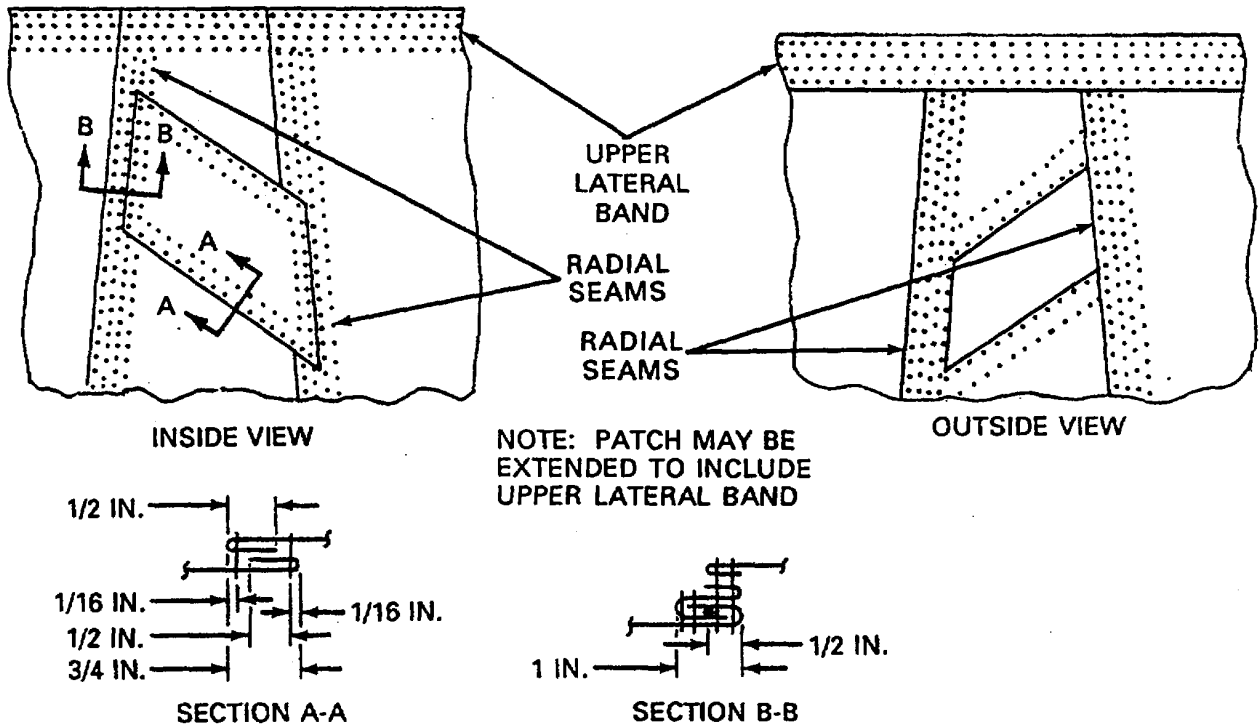
**NOTE:**  
 IF OUTSIDE OF DIAGONAL SEAM IS DAMAGED  
 CUT AWAY ENTIRE DIAGONAL SEAM IN  
 DAMAGED AREA AND PATCH AS A BASIC PATCH

**(B) RECTANGULAR PATCH CROSSING A DIAGONAL SEAM**

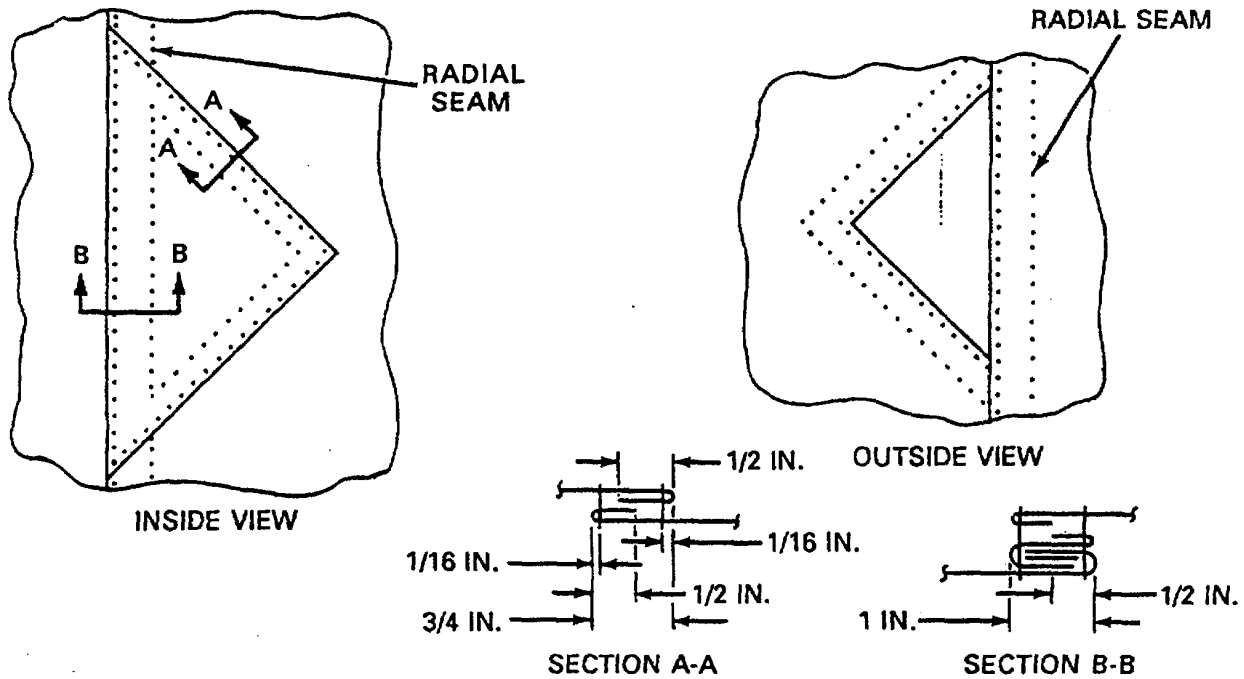
Figure 2-109. Common Miscellaneous Patches (Sheet 1 of 4).



2-25 Canopy Gore Section (cont).



© IRREGULAR SHAPE PATCH INCLUDING TWO RADIAL SEAMS, CONTINUOUS-LINE CANOPY.

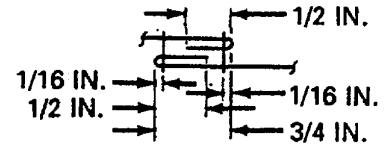
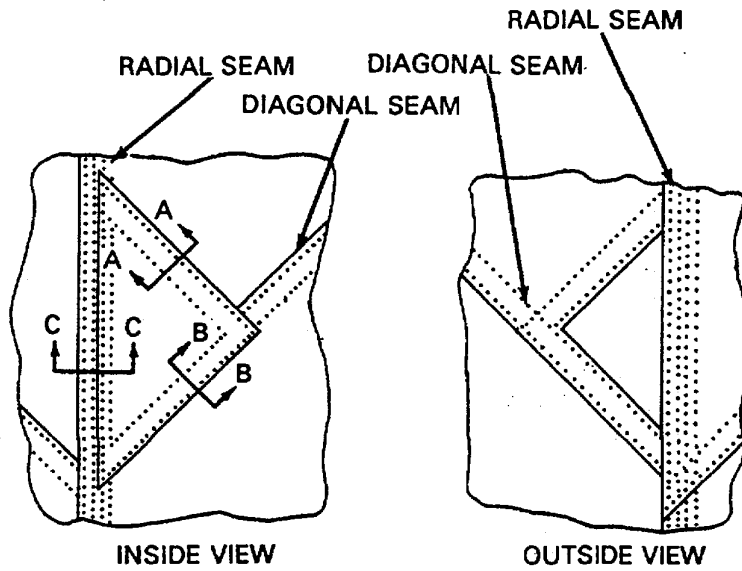


© TRIANGULAR PATCH INCLUDING RADIAL SEAM, NONCONTINUOUS-LINE CANOPY.

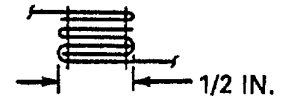
4839-106

Figure 2-109. Common Miscellaneous Patches (Sheet 2 of 4).

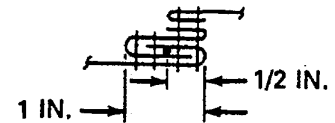
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SECTION A-A

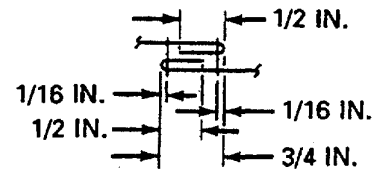
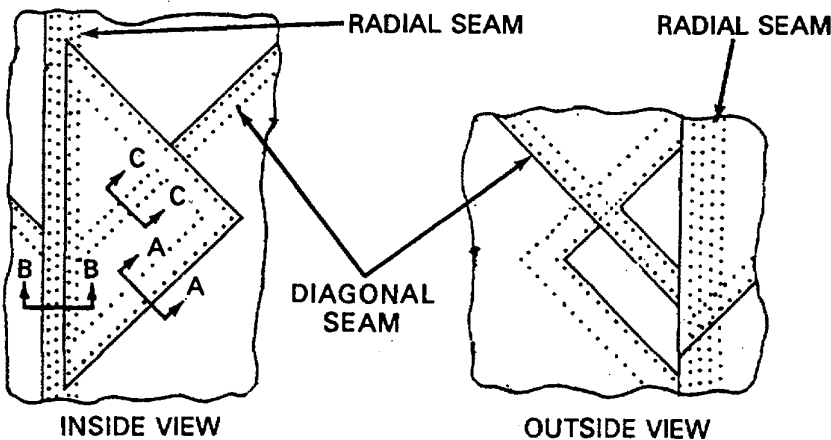


SECTION B-B

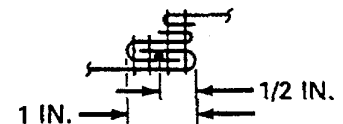


SECTION C-C

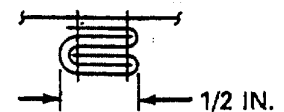
- Ⓔ **TRIANGULAR PATCH INCLUDING A RADIAL SEAM AND A DIAGONAL SEAM, CONTINUOUS-LINE CANOPY.**



SECTION A-A



SECTION B-B



SECTION C-C

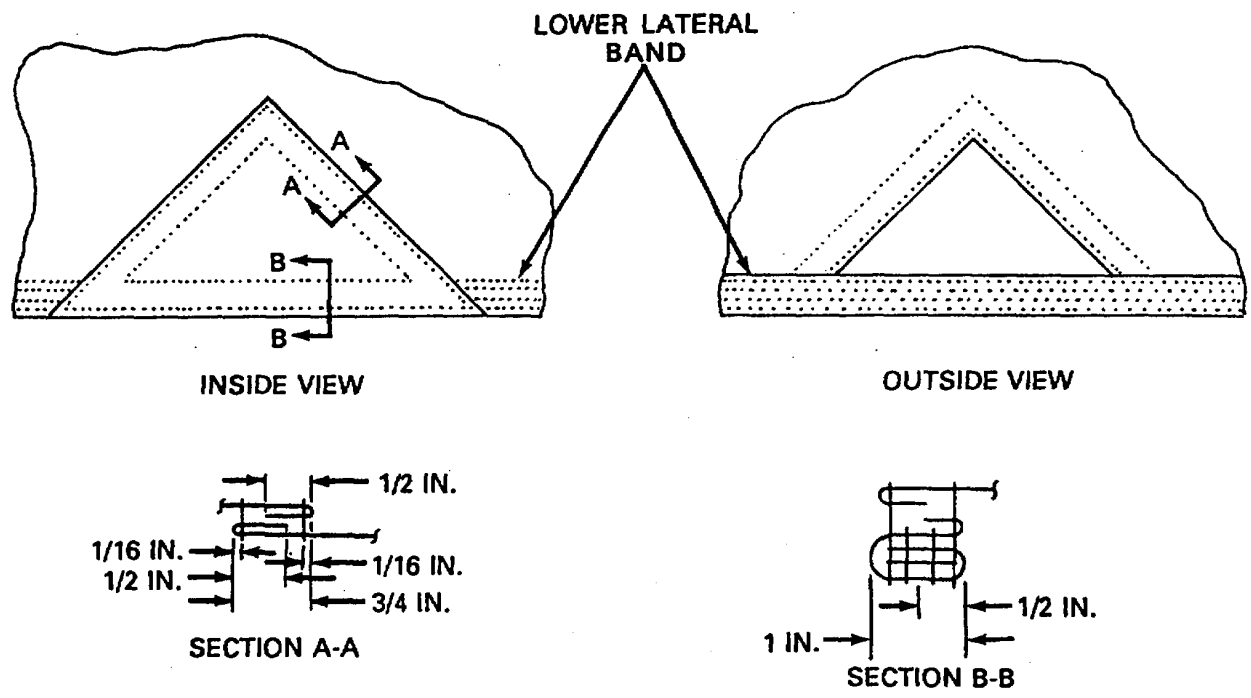
**NOTE: IF OUTSIDE OF DIAGONAL SEAM IS DAMAGED, CUT AWAY ENTIRE DIAGONAL SEAM IN DAMAGED AREA AND PATCH IN SAME MANNER AS TRIANGULAR PATCH INCLUDING RADIAL SEAM ONLY (D).**

- Ⓕ **TRIANGULAR PATCH CROSSING DIAGONAL SEAM AND INCLUDING RADIAL SEAM, CONTINUOUS-LINE CANOPY.**

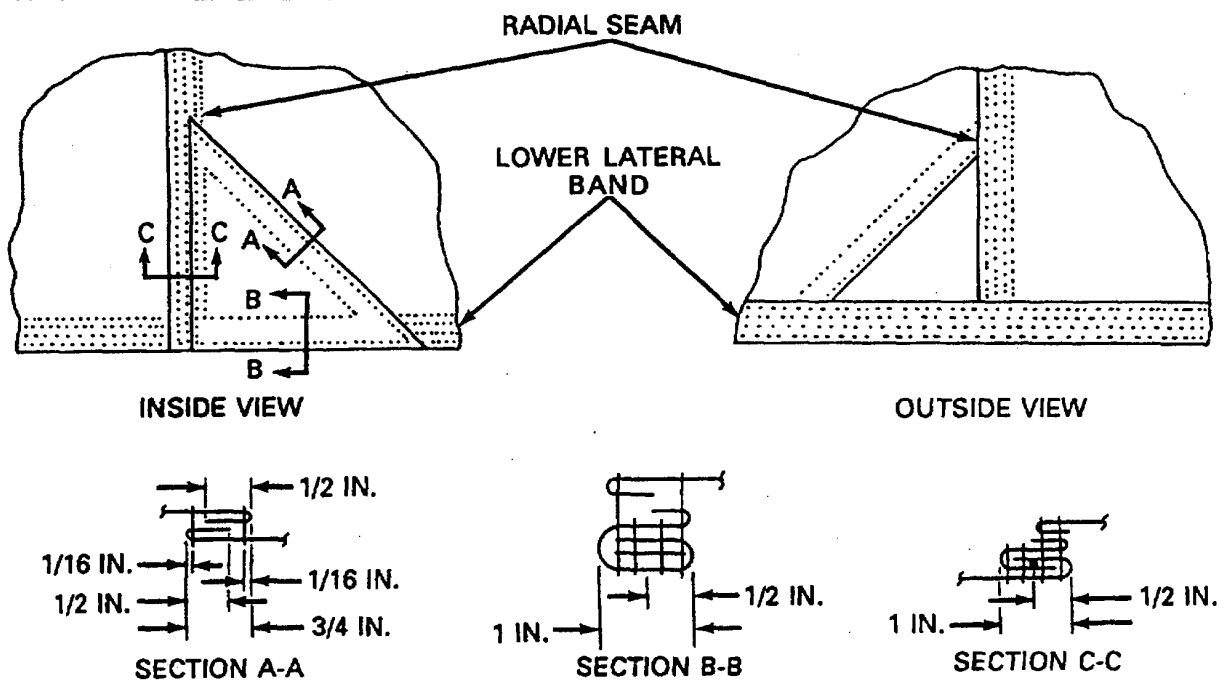
4839-107

Figure 2-109. Common Miscellaneous Patches (Sheet 3 of 4).

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**G** TRIANGULAR PATCH INCLUDING LOWER LATERAL BAND.



**H** TRIANGULAR PATCH INCLUDING RADIAL SEAM AND LOWER LATERAL BAND, CONTINUOUS-LINE CANOPY.

Figure 2-109. Common Miscellaneous Patches (Sheet 4 of 4).

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**2-25. Canopy Gore Section (cont).**

*b. Replacement.* Replace a gore section which is damaged beyond repair by fabricating a replacement section, in accordance with the following procedures.

(1) *Inspection.* Inspect the canopy in accordance with table 2-1. To determine the extend of canopy damage, proceed as follows:

- (a) Invert the canopy on a repair table and locate the damaged section.
- (b) As required, remove or lay aside items that may interfere with the section replacement process by cuffing the stitching securing the items to the canopy.
- (c) Smooth out the damaged gore section and secure surrounding canopy material to the repair surface by placing pushpins through seams or lateral bands as far above and below the damaged section as necessary. Insure that all adjacent seams or lateral bands are straight and the damaged section is not distorted.
- (d) Any gore sections that are damaged beyond repair by patching may be replaced individually by the

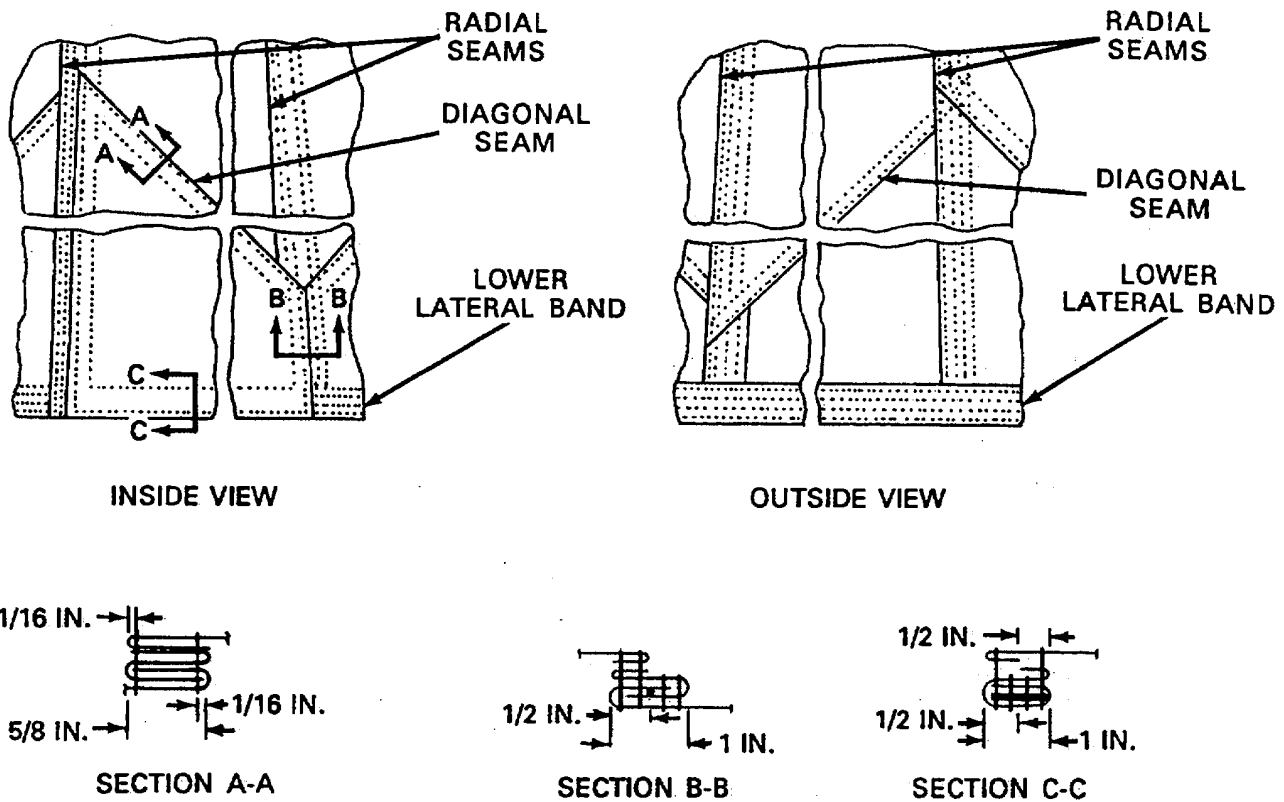
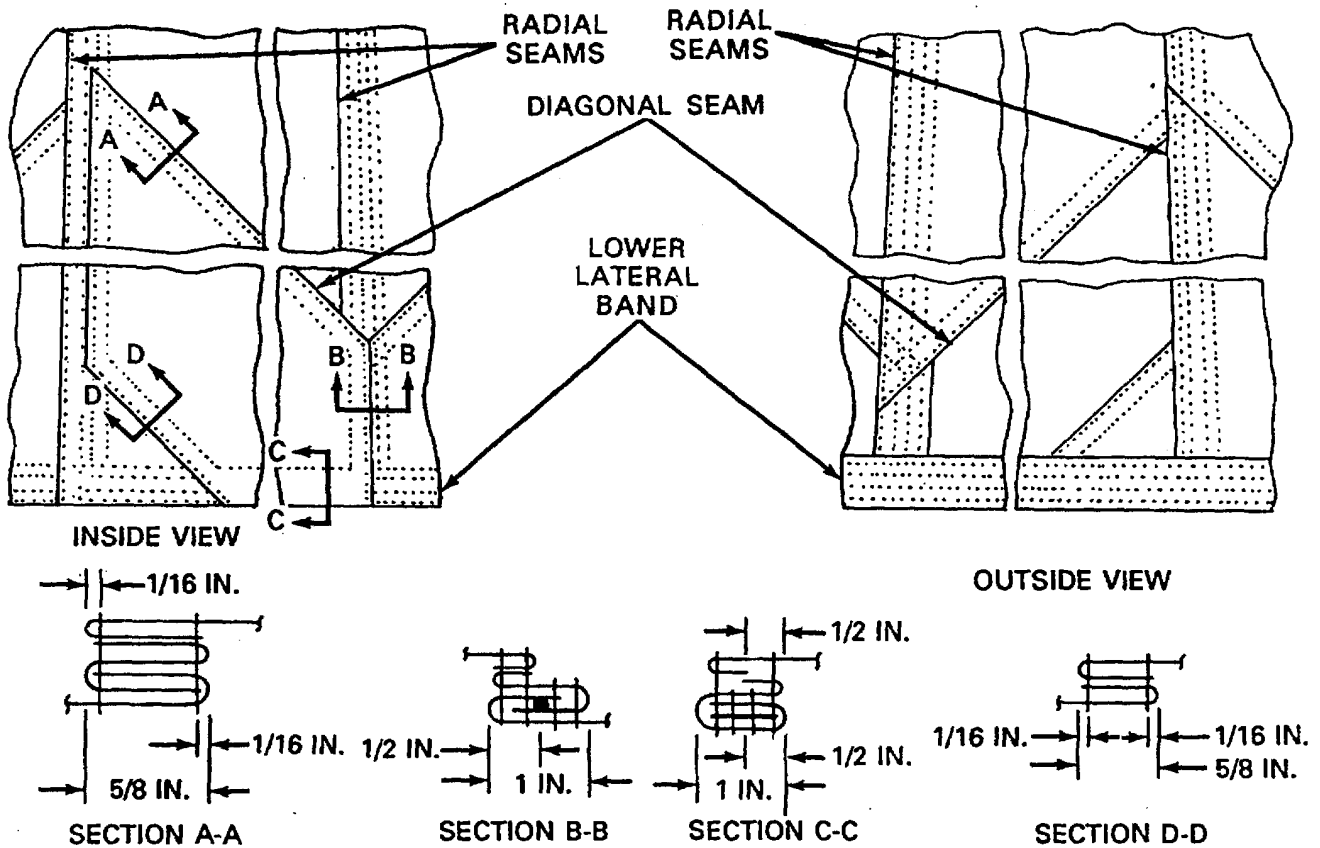


Figure 2-110. Normal Gore Section Replacement Details.

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 4839-109

(2) *Normal gore section replacement.* Gore sections are normally replaced as follows:

- (a) Remove the damaged section by cutting the section material at a point 1/2 inch in from the inside edge of each adjacent seam or lateral band.
- (b) Cut the remaining fabric diagonally at each corner to allow the raw edges to be folded back.
- (c) Fold each raw edge back by 1/2 inch and pin and baste each folded edge to complete area preparation. Basting will be performed according to procedures in paragraph 2-19a.



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Figure 2-111. Modified Gore Section Replacement Details.

- (d) Position a piece of serviceable parachute cloth, equal to the material used in original gore section construction, over the prepared area.
- (e) Cut the cloth piece to a size that will cover the entire prepared area. Allow as many selvedged edges of the cloth piece to remain as possible. Also allow at least 3 inches of extra fabric to remain on each raw edge.
- (f) Fold under each selvedged edge of the cloth piece to a width equal to the width of adjacent seams and align the cloth folded edges with the outside edges of adjacent seams or bands. Secure the seams or bands with pushpins.

**2-25. Canopy Gore Section (cont).**

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

- 1 Fold under the raw edges located adjacent to a lateral band and align the folded edges with the outside edges of the lateral band. Secure the aligned edges to the applicable lateral band with pushpins.
- 2 Fold under the raw edges located along radial seams that have four rows of stitching and align the folded edges with the center of the radial seams. Secure the folded edges to the radial seams with pushpins.

(h) Secure the situated replacement section cloth to the canopy material by basting along each of the folded edges. Basting will be made according to the procedures in paragraph 2-19a.

(i) Remove the pushpins from the edges of the replacement section and secure the section material to the canopy inside by stitching, according to the details in figure 2-110. Use the stitching procedures in paragraph 2-19b, with size E nylon thread, 7 to 11 stitches per inch.

(j) 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 step (i), above.

(k) On the canopy outside, stitch completely around the prepared area using the stitching criteria in step (i), above.

(l) Reposition the item(s) removed or laid aside in step (1)(b), above, in the original location(s) and reattach each item to the canopy by restitching according to original construction details and paragraph 2-19b. Use a light-duty sewing machine and size E nylon thread, 7 to 11 stitches per inch.

(m) Stencil informational data or other markings on the replacement section using the procedures in paragraph 2-21.

(3) *Modified gore section replacement.* If a gore section that is located next to the lower lateral band on a bias-constructed canopy does not have damage extending into a corner that is bounded by the lower lateral band and a radial seam, the section may be replaced using a modified method as follows:

(a) When removing the damaged section, cut the section material diagonally across the corner. Allow the corner material of the original section to remain intact and also allow a sufficient amount of material to remain to preclude the replacement section overlapping the pocket band.

(b) Except for the procedure in step (a), above, complete the section replacement using the applicable procedures outlined in paragraph b(2), above, and the details in figure 2-111.

**NOTE**

**When replacing a gore section on a bias-constructed canopy using the modified replacement method, it is not necessary to remove the V-tab from the radial seam located alongside the damaged section.**

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(4) *Multiple gore section replacement.* If two or more adjacent sections within a bias-constructed gore require replacement, cut and remove all affected sections, including the joining diagonal seams as prescribed in paragraph b(2), above. Prepare the material for the replacement sections and join the replacement sections together with 112 inch wide lapped seams (figure 2-112). Install the joined replacement sections using the

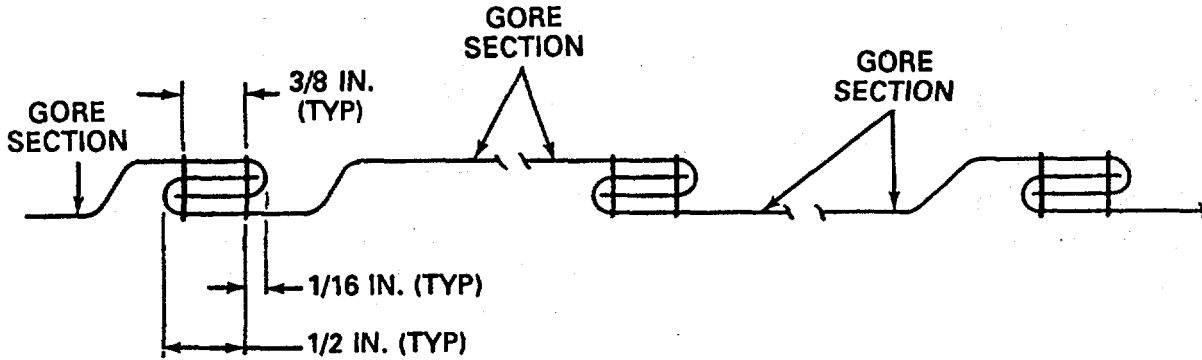


Figure 2-112. Lapped Seams Completed for Multiple Gore Section Replacement

**2-26. Canopy Line.**

<b>This task covers:</b>	<b>a. Repair</b>	<b>b. Replacement</b>
<i>Tools:</i>	Knife, Item 4, Appendix B Knife, Hot Metal, Item 5, Appendix B Pot, Melting, Item 13, Appendix B - Sewing Machine, Medium Duty, Zig-Zag, Item 17, Appendix -B Yardstick, Item 24, Appendix B Splicing Aid, Item 25, Appendix B Cleaned (paragraph 2-12)	<i>Materials/Parts (cont):</i>  Wax, Paraffin, Item 47, Appendix D Webbing, Nylon, Type 1, 9/16-inch wide, Item 52/53, Appendix D  <i>Equipment Condition:</i>  Inspected (paragraph 2-9, paragraph 2-13).
<i>Material/Parts:</i>	Beeswax, Item 1, Appendix D Cord, Nylon, Type IV, Coreless, Item 16, Appendix D Thread, Nylon, Size E, Item 39/40, Appendix D	Canopy laid flat on repair surface

a. **General.** A canopy line is a length of nylon cord which extends from a point of attachment on a connector link assembly on one side of the canopy, up through a canopy radial seam channel, across the canopy vent, and down through a canopy radial seam to a connector link assembly on the opposite side of the canopy. As a result of the routing, a canopy line length is divided into segments which are referred to as suspension line, radial line, and vent line. The procedures that follow include the repair and replacement of individual segments of the canopy line and the entire canopy line.

b. **Repair.**

- (1) **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 the stitch row when possible. Zig-zag restitching should extend at least two inches at each end of a stitch row when possible. Zig-zag restitching should extend at least 1/4 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.

**CAUTION**

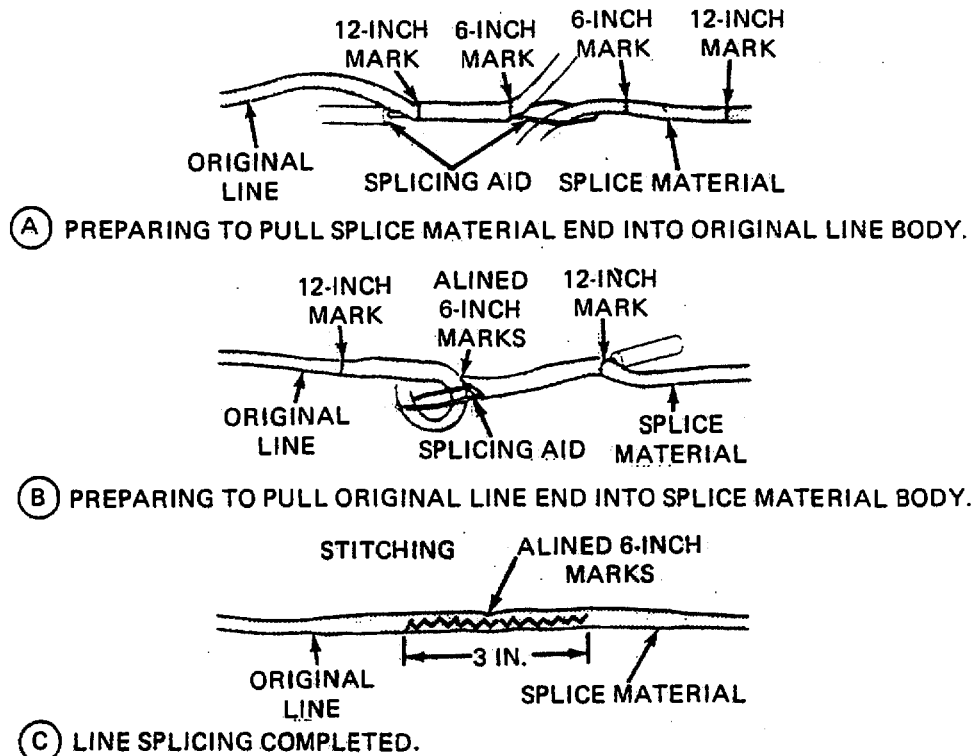
**The radial line portion of a canopy line will not be spliced. Whenever a canopy line is to be spliced, the splice will be located either above the upper lateral band or below the lower lateral band.**

- (2) **Splicing a type IV coreless nylon cord suspension line.** A suspension line made from type IV coreless nylon cord will be spliced as follows:
  - (a) Cut and remove the damaged portion of the line.



- (b) Cut a length of type IV coreless nylon cord 24 inches longer than the damaged portion removed in 1 above, for use as splice material.
- (c) Taper-cut each end of the cord length and the ends of the original line from which the damaged portion was removed.
- (d) Using an authorized marking aid of contrasting color, mark the splice material at points 6 and 12 inches from each end. Also mark the original line length at points 6 and 12 inches from each cut end.
- (e) Insert a splicing aid into the body of the original line length at one 12-inch mark. Work the splicing aid through the cord body and to the outside at the 6-inch mark.
- (f) Thread and secure one end of the splice material to the splicing aid (A, figure 2-113).
- (g) Pull the threaded splicing aid back into the line and back through the line body until the 6-inch mark on the attached end of the splice material is aligned with the 6-inch mark on the original line end being spliced.
- (h) Hold the original line and the splice material at the aligned 6-inch marks and continue pulling the splicing aid until the attached splice material end protrudes from the line body at the 12-inch mark, the point of original splicing aid insertion. Remove the attached splice material end from the splicing aid.
- (i) While holding the splice at the aligned 6-inch marks, stretch the original line to allow the protruding splice material end to recede into the line body.
- (j) Insert the splicing aid into the splice material body at the 12-inch mark nearest the aligned 6-inch marks. Work the splicing aid through the body of the splice material and to the outside at the aligned 6-inch marks.
- (k) Attach the adjacent tapered line end to the splicing aid (B, figure 2-113) and pull the splicing aid back into the splice material body.
- (l) Pull the splicing aid back through the splice material until the attached line end protrudes from the 12-inch mark, the point of splicing aid insertion. Remove the attached line end from the splicing aid.
- (m) Grasp the splice material free end and the original line, and stretch the material to allow the protruding line end to recede into the body of the splice material.
- (n) Using the procedures in (e) through (m), above, splice the free end of the splice material to the remaining cut end of the original line.
- (o) Secure each end of the line splice by stitching across each set of aligned 6-inch marks (C, figure 2-113). Stitching will be made with a light-duty sewing machine using size E nylon thread, 7 to 11 stitches per inch.

2-26. Canopy Line (cont).



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Figure 2-113. Making a Line Splice with Type IV Coreless Nylon Cord.

**NOTE**

**Replacement of canopy lines is accomplished at the Intermediate Direct Support (DS) Maintenance level only, in accordance with the Maintenance Allocation Chart (MAC), Appendix B.**

(1) *Replacing a suspension line.* A suspension line that is damaged beyond repair or that exceeds the one splice limitation will be replaced by attaching one end of a replacement line length to the original connector link, routing the running end through the original radial seam channel, then splicing the end to the original vent line. Fabricate the replacement line in accordance with the following (figure 2-114):

- (a) Place the canopy assembly in proper layout on a suitable work surface and trace the affected suspension line from the point of attachment on the respective connector link to the canopy skirt, then through the radial seam channel to the respective vent line.
- (b) Remove the original suspension line from the applicable connector link by cutting and at the lower edge of the lower lateral band, just above the V-tab. Secure the loose end of the radial line using temporary tacking or push pins.
- (c) Cut an 83-foot length of type IV coreless nylon cord. Wax one end.

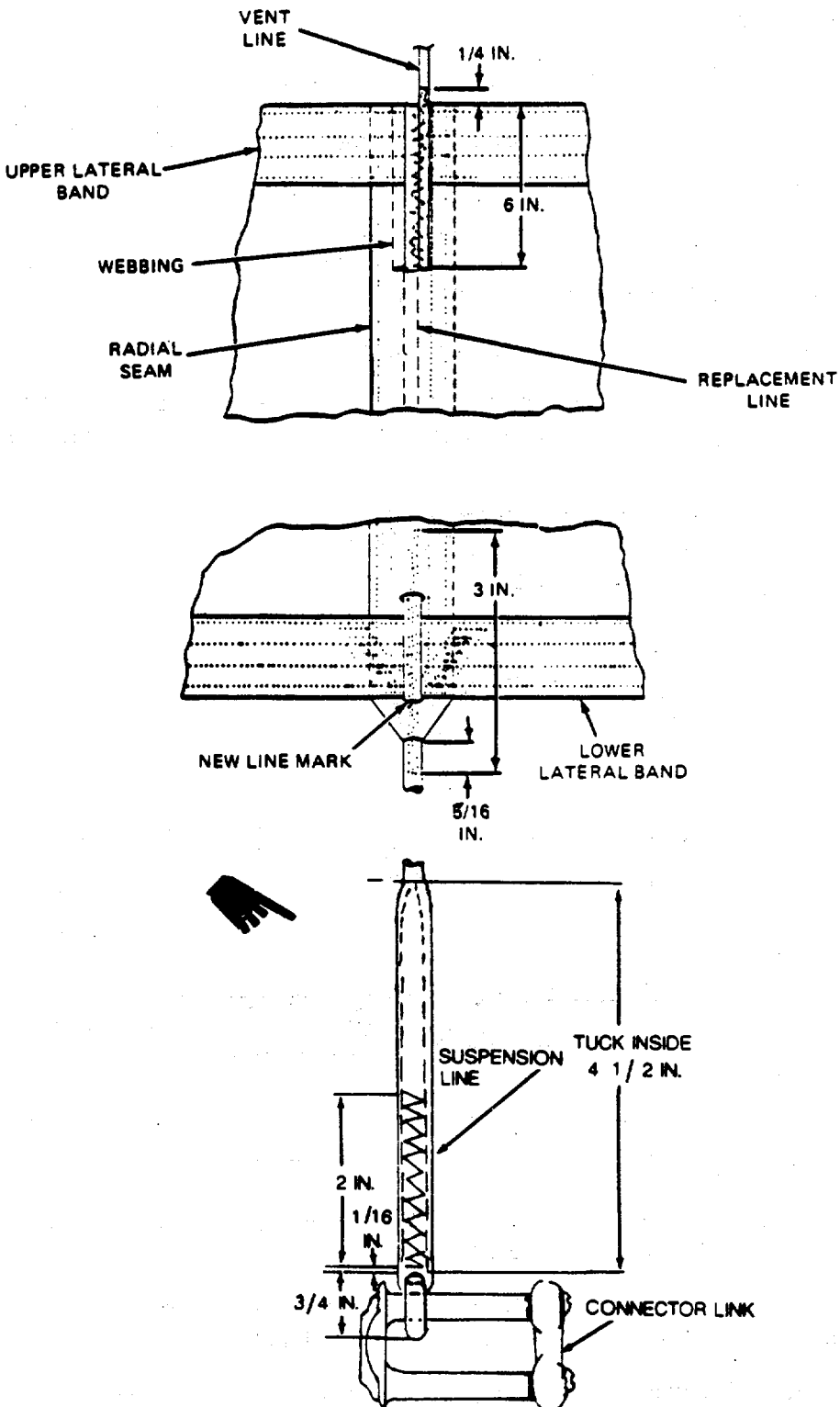
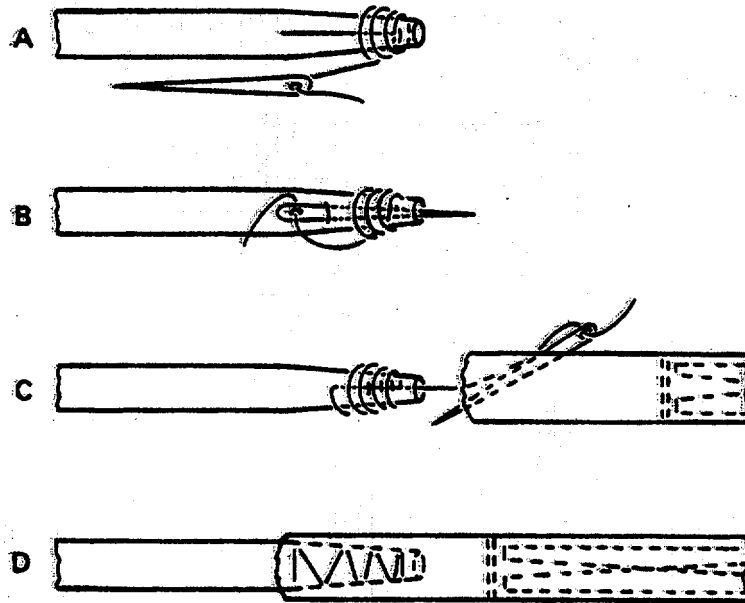


Figure 2-114. Suspension Line Replacement Details.

**2-26. Canopy Line (cont).**

- (d) Position the unwaxed end of the cord length on the applicable connector link assembly in the original suspension line location. Using a suitable marking aid, mark the line on the inside, edge of the link assembly. Secure the cord end to the connector link with two half-hitches, leaving a 6-inch long tie free end.
- (e) Remove the upper, intermediate and lower radial seam reinforcement tapes from the applicable radial seam by cutting the stitching securing the tape lengths to the canopy. Also cut the stitching securing the V-tab and suspension line together.
- (f) At a suitable point below the canopy skirt, cut the original suspension line.
- (g) Insert 1 inch of the waxed end of the replacement suspension line into the sheath cover at the cut end of the original suspension line. Secure the two lines together with whip stitching (figure 2-115).



4839-114

*Figure 2-115. Securing Damaged Line to New Line for Line Replacement.*

- (h) Working at the canopy vent and using a suitable marking aid, mark the original radial line at the upper edge of the upper lateral band.
- (i) Pull 10 inches of the original radial line from the upper end of the radial seam and cut the line length at a point 6 inches below the mark made in (h), above.
- (j) Pull the original radial line up through the radial seam until the attached replacement line length extends beyond the upper edge of the upper lateral band. Pull all slack out of the replacement line.
- (k) Remove one end of the applicable pocket band by cutting the stitching securing the pocket band end to the lower lateral band. Position the loose pocket band end above the secured end and temporarily secure the loose end to the lateral band using a pushpin.

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- (l) Moving to the connector link, hold replacement line and adjacent line tightly together at link and trace both lines from link to canopy skirt under equal tension. Mark new line where lines reach lower edge of lower lateral band (figure 2-114). Check correctness of marking by again applying equal tension on both lines.
- (m) Hold adjacent line and new line together at lower lateral band, grasp both lines at upper lateral band, and apply equal tension to both lines. Mark new line at upper edge of upper lateral band. Check correctness of marking.
- (n) Aline the mark made in (m), above, with the upper edge of the upper lateral band. Secure the cord to the radial seam with temporary tacking or push pins. Cut the cord even with the upper edge of the upper lateral band.
- (o) Position the loose end of the applicable vent line alongside the new suspension line positioned in (m), above, so that the end of the vent line is 6 inches below the upper edge of the upper lateral band. Secure in place with temporary tacking or push pins. Ensure that the vent line passes through the bridle loop before being secured to the radial seam.
- (p) Cut a 6-inch length of 9/16-inch wide, type I nylon webbing and wax each webbing end 1/4 inch.
- (q) Place the 6-inch long webbing lengthwise on the inside of the affected radial seam with the upper end of the webbing length alined with the upper edge of the upper lateral band. Insure the webbing length is centered on the respective radial line and positioned vent line end. Secure the webbing length with temporary tacking or pushpins.
- (r) Working on the canopy outside, secure the positioned end of the vent line to the applicable radial seam and 6-inch webbing length by stitching a 3/16-inch wide row of double-throw zigzag stitching from a point 1/4 inch above the upper lateral band to the lower edge of the applicable vent line end. Stitching will be made using a medium-duty sewing machine, size E nylon thread, 7 to 11 stitches per inch.
- (s) Beginning 6 inches below the upper edge of the upper lateral band, secure the radial line upper end to the radial seam and 6-inch webbing length by stitching a 6-inch long row of 3/16-inch wide double throw zigzag stitching to the upper edge. Stitching will be made using a medium-duty sewing machine, size E nylon thread, 7 to 11 stitches per inch. Remove temporary tacking or pushpins installed in steps (n), (o) and (q), above.
- (t) Reinstall the upper, intermediate and lower seam reinforcement tapes removed in (e), above, by restitching according to original construction details and paragraph 2-28, below. Stitching will be made using a medium-duty sewing machine, size E nylon thread, 7 to 11 stitches per inch.
- (u) Aline mark on new line with lower edge of lower lateral band and sew new line to canopy at all attaching points in accordance with figure 2-114. Use a medium-duty sewing machine and size E nylon thread, 7 to 11 stitches per inch.
- (v) Aline mark on line with inside edge of link assembly and tie line to link in accordance with figure 2-114.

**2-26. Canopy Line (cont).**

- (w) Sew line and free end together in accordance with figure 2-114. Cut off excess end of line close to stitching.
  - (x) Compare knots with adjacent knots, and trace line from link assembly to canopy skirt for correctness of attachment and position.
  - (y) Replace end of pocket band removed in (k), above, according to original construction details.
- (2) *Replacing radial line.* A radial line portion of a canopy line that is damaged within a radial seam will be replaced by splicing one end of the replacement line to the original vent line. The replacement radial line running end will then be routed down through the original radial seam channel and spliced on to the upper end of the original suspension line. Fabricate the replacement line in accordance with the following:
- (a) Place the canopy in proper layout on a suitable work surface.
  - (b) Remove the upper, intermediate, and lower radial seam reinforcement tapes from the applicable radial line radial seam by cuffing the stitching securing the tape lengths to the canopy. Also cut the stitching securing the V-tab and suspension line together.
  - (c) Using a suitable marking aid, mark the damaged radial line at the lower edge of the lower lateral band.
  - (d) Remove and temporarily secure one end of the applicable pocket band.
  - (e) Working below the canopy skirt, pull 10 inches of the original radial line from the radial seam and cut the line length at a point 6 inches above the- mark made in (c), above.
  - (f) Cut a 35-foot length of type IV coreless nylon cord and wax one end.
  - (g) Insert the waxed end of the cord into the-sheath cover of the original radial line and secure the two line ends together with whip stitching (see figure, 2-115).
  - (h) Working at the canopy vent and using-a suitable marking aid, mark the original radial line at the upper edge of the upper lateral band.
  - (i) Pull 10 inches of the damaged radial line from the upper end of the radial seam and cut the line length at a point 6 inches below the mark made in (h), above.
  - (j) Pull the original radial line up through the radial seam until the attached replacement line length extends 2 inches beyond the upper edge of the upper lateral band.
  - (k) Cut the replacement radial line length even with the upper edge of the upper lateral band. Temporarily secure the line end to the upper lateral band with tacking or pushpins.
  - (l) Cut a 6 inch length of 9/16-inch-wide, type I nylon webbing and wax each end by 1/4 inch.

- (m) Place the webbing length lengthwise over the original radial seam upper end on the canopy inside and align the webbing upper end with the upper edge of the upper lateral band. Secure the webbing length in position using temporary tacking or pushpins.
- (n) Place the loose end of the original vent line on the radial seam outside, adjacent to the replacement radial line. Align the mark made in (h), above, with the upper edge of the upper lateral band. Secure the vent line loose end and the upper end of the replacement radial line to the radial seam using temporary tacking or pushpins.
- (o) Working on the outside of the canopy top, secure the 6-inch long webbing seam by making a row of 3/16-inch wide double-throw zigzag stitching from 1/4 inch above the upper lateral band to the end of the vent line. Stitching will be made using size E nylon thread, 7 to 11 stitches per inch, with a medium-duty sewing machine.
- (p) Beginning at a point 6 inches below the upper lateral band upper edge, secure the 6-inch long webbing and the upper end of the replacement radial line by stitching a 6-inch-long row of 3/16-inch wide double-throw zigzag stitching to the upper edge of the upper lateral band. Stitching will be made using a medium-duty sewing machine and size E nylon thread, 7 to 11 stitches per inch (figure 2-116). Remove temporary tacking or pushpins installed in (m) and (n), above.
- (q) Working at the lower lateral band nick up the loose end of the replacement radial line and an adjacent radial line and allow both lines to settle under equal tension.

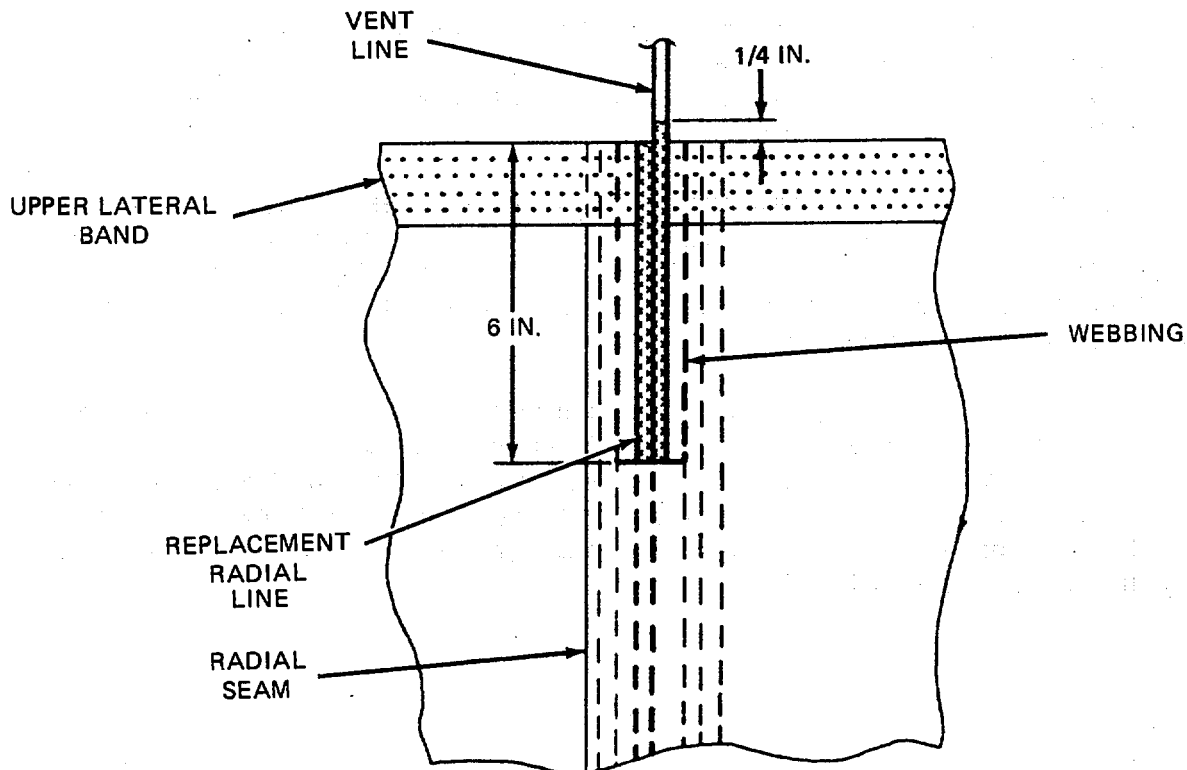
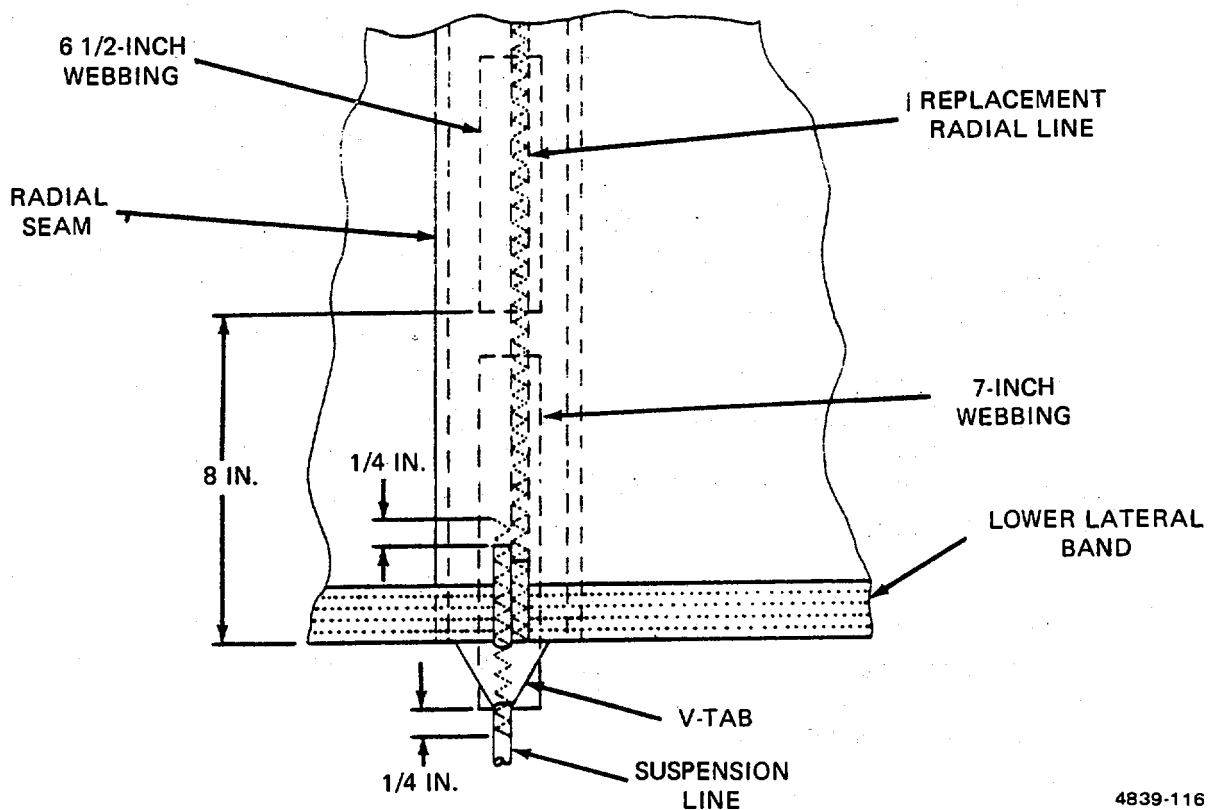


Figure 2-116. Securing Radial Line and Vent Line to Canopy.

## 2-26. Canopy Line (cont).

- (r) Using a suitable marking aid, mark the replacement line length at the lower edge of the lower lateral band.
- (s) Cut the replacement radial line-length at the mark made in (r), above, and temporarily secure the line loose end to the lower lateral band with tacking or pushpins.
- (t) Wax the cut upper end of the original suspension line. Pass the waxed line end up through the V-tab and position the line end of the canopy outside adjacent to the replacement radial line. The mark made in (c), above, should be aligned with the lower edge of the lower lateral band. Secure the suspension line end to the radial seam using temporary tacking or pushpins.
- (u) Cut a 6 1/2-inch length and a 7-inch length of 9/16-inch-wide, type I nylon webbing and wax each webbing end by 1/4 inch. Place the 6 1/2-inch-long webbing lengthwise on the inside of the affected canopy radial seam with the lower edge of the webbing located 8 inches above the lower edge of the lower lateral band. Secure the webbing to the radial seam center from the canopy outside with a 6 1/2-inch long row of 3/16-inch wide double-throw zigzag stitching. Stitching will be made using a medium-duty sewing machine and size E nylon thread, 7 to 11 stitches per inch.
- (v) Place the 7-inch long webbing lengthwise on the original radial seam on the canopy inside and align the lower end of the webbing with the lower edge of the V-tab. Secure the webbing to the radial seam with temporary tacking or pushpins.
- (w) Secure the 7-inch long webbing to the replacement radial line by stitching a 3/16-inch-wide row of double-throw zigzag stitching from the lower edge of the lower lateral band to the upper end of the webbing length (figure 2-117). Stitching will be made using a medium-duty sewing machine and size E nylon thread, 7 to 11 stitches per inch.
- (x) Secure the upper end of the suspension line-to the V-tab and radial seam by making a 3/16-inch wide row of double-throw zigzag stitching from a point 1/4 inch below the V-tab to a point 1/4 inch beyond the end of the suspension line (figure 2-117). Stitching will be made using a medium-duty sewing machine and size E nylon thread, 7 to 11 stitches per inch. Remove the temporary tacking or pushpins installed in (t) and (u), above.
- (y) Reinstall the upper, intermediate, and lower radial seam reinforcement tapes removed in (b), above, by restitching according to original construction details and the procedures in paragraph 2-28, below. Stitching will be made using a medium-duty sewing machine and size E nylon thread, 7 to 11 stitches per inch. Reinstall the loose end of the pocket band removed in (d), above, by restitching according to original attachment details. Stitching will be made using a medium-duty sewing machine and size E nylon thread, 7 to 11 stitches per inch.





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Figure 2-117. Securing Radial Line and Suspension Line to Canopy.

(3) *Replacing a vent line.* When a vent line portion of a canopy line requires more than one splice, the vent line will be replaced by fabricating as follows:

- (a) Lay the canopy vent out on a suitable work surface.
- (b) Remove the affected vent line from the canopy vent by cutting the line even with the upper edge of the upper lateral band at two points. Secure the loose upper end of each radial line with temporary tacking or pushpins.
- (c) Remove the upper radial line reinforcement tape from each of the two applicable radial lines by cutting the stitching securing the tapes to the canopy.
- (d) Cut a length of type IV coreless nylon cord 12 inches longer than the length of the removed original vent line and wax the cord ends.
- (e) Using a suitable marking aid, mark the cord length at a point 6 inches from each end.
- (f) Place one end of the cord length on the outside of one applicable radial seam, adjacent to an original radial line. Aline the respective 6-inch mark made in (e), above, with the upper edge of the upper lateral band. Secure the cord end to the radial seam with temporary tacking or pushpins.

**2-26. Canopy Line (cont).**

- (g) Pass the loose end of the replacement vent line through the canopy bridle loop and position the end on the applicable radial seam on the opposite side of the canopy using the procedures in (f) above.
  - (h) Cut two 6-inch lengths of 9/16-inch-wide, type I nylon webbing and wax each webbing end 1/4 inch.
  - (i) Place a 6-inch long webbing lengthwise on the inside of each affected radial seam with the upper end of each webbing length aligned with the upper edge of the upper lateral band. Insure each webbing length is centered on the respective radial line and positioned vent line end. Secure each webbing length with temporary tacking or pushpins.
  - (d) Working on the canopy outside, secure each positioned end of the replacement vent line to the applicable radial seam and 6-inch webbing length by stitching a 3/16-inch-wide row of double-throw zigzag stitching from a point 1/4 inch above the upper lateral band to the lower edge of the applicable vent line end. Stitching will be made using a medium-duty sewing machine, size E nylon thread, 7 to 11 stitches per inch.
  - (k) Beginning 6 inches below the upper edge of the upper lateral band, secure each radial line upper end to the radial seam and 6-inch webbing length by stitching a 6-inch long row of 3/16-inch wide double throw zigzag stitching to the upper edge. Stitching will be made using a medium-duty sewing machine and size E nylon thread, 7 to 11 stitches per inch. Remove temporary tacking or pushpins installed in (b), (f), (g) and (i), above.
  - (l) Reinstall the upper radial line reinforcement tape removed in (c), above, by restitching according to original construction details and paragraph 2-28, below. Stitching will be made using a medium-duty sewing machine, size E nylon thread, 7 to 11 stitches per inch.
- (4) Replacing a Canopy Line. Replace an unserviceable canopy line by fabricating as follows:
- (a) Cut and remove all stitching that holds canopy line to canopy. Remove other items as required, allowing entire line to move freely across lateral bands, through V-tabs, and within radial seams. Do not remove V-tabs unless they are damaged.
  - (b) Cut off damaged line (hereafter referred to as old line) 24 inches below skirt on each side of canopy.
  - (c) Select a spool of type IV coreless nylon cord (hereafter referred to as new line), and wax end of new line.
  - (d) Insert waxed end of new line into sheath of old line at least 1 inch, and whipstitch, or otherwise temporarily secure ends together (see figure 2-115).
  - (e) Grasp cut end of old line at opposite side of canopy skirt and pull old line, working line through V-tabs and channels and across vent, until end of new line extends approximately 10 inches beyond link assembly. Cut old line from new line at whipstitching to include waxed end.

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- (t) Make certain that approximately 10 inches of new line still extends beyond link assembly, and mark new line at point even width inside edge of link. Hold adjacent line and new line tightly together at link, and trace both lines from link to canopy skirt under equal tension. Mark new line where lines reach lower edge of lower lateral band (figure 2-118). Check correctness of marking by again applying equal tension to both sides.
- (g) Hold adjacent line and new line together at lower lateral band, grasp both lines at upper lateral band, and apply equal tension to both lines. Mark line at upper edge of upper lateral band. Check correctness of marking.
- (h) Hold adjacent line and new line tightly together at upper lateral band and trace both lines to opposite side of vent under equal tension. Mark new line where lines reach upper edge of upper lateral band. Check correctness of marking.
- (i) Hold adjacent line and new line tightly together at upper lateral band, grasp both lines at lower lateral band, and apply equal tension to both lines. Mark new lines at lower edge of lower lateral band. Check correctness of marking.
- (j) Hold adjacent line and new line tightly together at lower lateral band, and trace both lines from canopy skirt to link assembly under equal tension. Mark new line at point even with inside edge of link. Check correctness of marking, and cut new line from spool at a point approximately 10 inches beyond link assembly.
- (k) Relieve tension from all lines.
- (l) Aline marks on new line with lateral bands, and sew new line to canopy at all attaching points in accordance with figure 2-118, using a medium-duty sewing machine and size E nylon thread, 7 to 11 stitches per inch. On canopies that have a pucker in the radial seams, make certain the radial seam is still correctly puckered after all sewing is completed.
- (m) Reposition items removed in step (a), above, and sew in place according to original construction.
- (n) Cut away remaining end of old line from link assembly, noting position of line on link.
- (o) Pass end of new line through link assembly in space left by old line, and fold end back over link.
- (p) Aline mark on line inside edge of link assembly and tie line to link in accordance with figure 2-118.
- (q) Sew line and free end together in accordance with figure 2-118. Cut off excess end of line close to stitching.
- (r) Compare knots with adjacent knots, and trace line from link assembly to canopy skirt for correctness of attachment and position.
- (s) Attach remaining free end of new line to opposite link assembly by repeating the procedures in steps (n) through (r), above.

2-26. Canopy Line (cont).

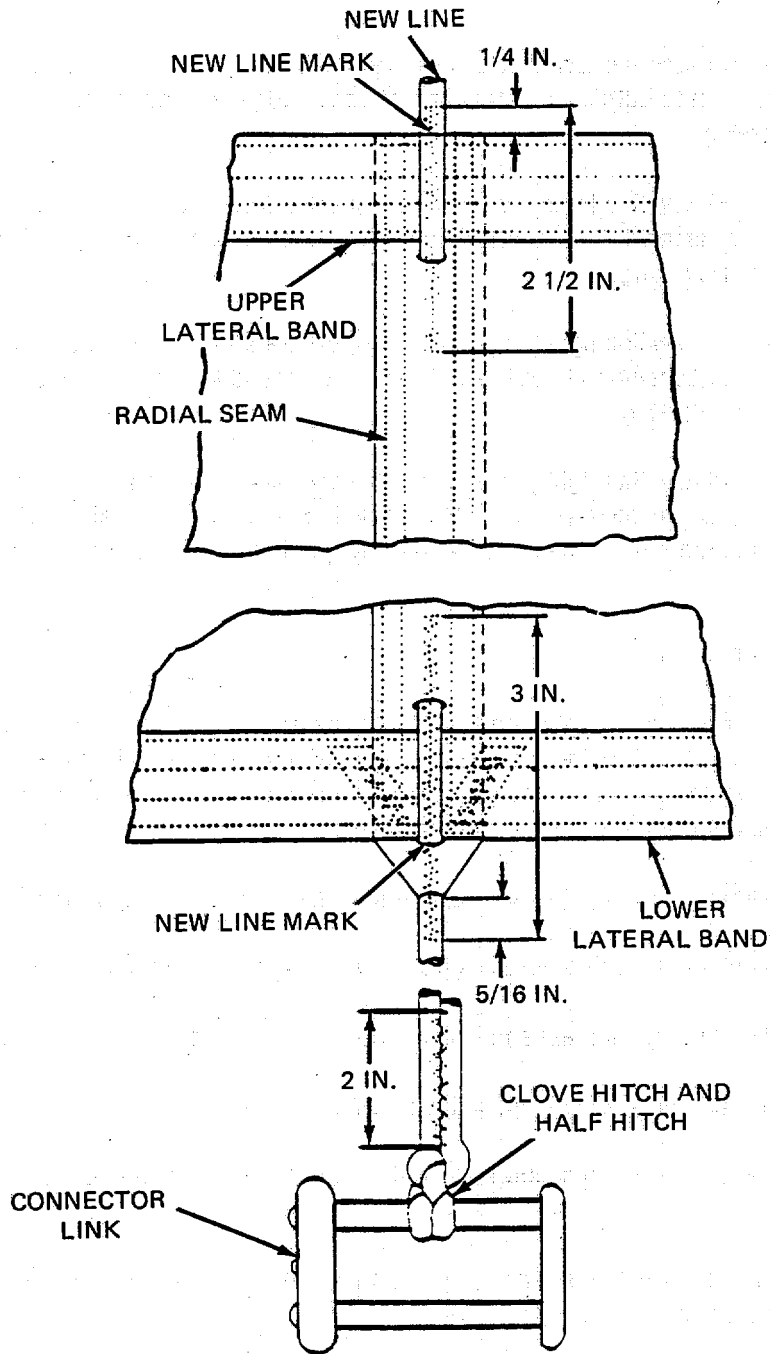


Figure 2-118. Canopy Line Replacement Details.

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## 2-27. Patching a Radial Seam.

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**This task covers:**

**a. Inspect**

**b. Repair**

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*Tools:*

Shears, Item 14, Appendix B  
Sewing Machine, Light Duty, Item 16, Appendix B  
Yardstick, Item 24, Appendix B

*Equipment Condition:*

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

*Materials/Parts:*

Thread, Nylon, Size E, Items 39/40, Appendix D  
Cloth, Parachute, Nylon, Type I, Item 11, Appendix D

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a. Inspection. Inspect the radial seam in accordance with table 2-1.

b. Preparation for Patching. Prepare the radial seam for patching as follows:

- (1) Place the canopy on a repair table with the damaged side of the radial seam facing up.
- (2) As required, cut the applicable stitching to remove or lay aside items which may interfere with the patching process.
- (3) Smooth the canopy material surrounding the damaged area and secure the undamaged portion of the seam to the table with pushpins. Do not pin the damaged area of the seam.
- (4) Using the same type material as in original canopy construction, bias-cut a rectangular patch 3 1/2 inches wider and 4 inches longer than the damaged area. If one piece of material is not long enough to achieve the required size, join additional pieces of bias-cut material with 1/2-inch-wide lapped seams.

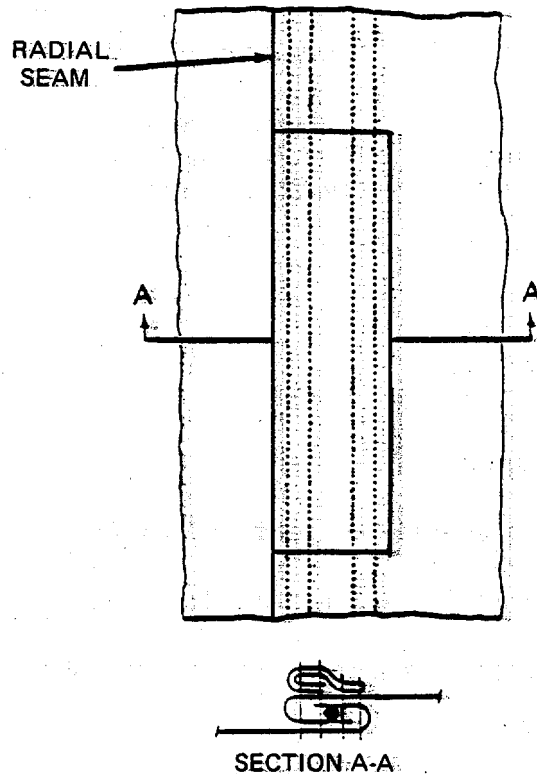
**NOTE**

Patch material for a damaged area that does not exceed 1 inch need not be bias cut.

c. Patching Radial Seam. There is no limit to the length of a miscellaneous patch made on a canopy radial seam. In addition, a radial seam may be patched on both the inside and the outside of a canopy, as required. Patch a damaged radial seam as follows (see figure 2-119):

- (1) Fold the patch material lengthwise and align the raw edges.
- (2) Make a fold-under on each edge of the patch material and baste each fold-under using the procedures in paragraph 2-19.

2-27. Patching a Radial Seam (cont).



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Figure 2-119. Radial Seam Patching.

- (3) Make a 1-inch fold-under on each end of the patch material and baste each fold-under using the procedures in paragraph 2-19.
- (4) Center the patch lengthwise over the damaged area with the folded edges facing down. Secure the patch to the canopy with pushpins and baste the patch to the canopy using the procedures in paragraph 2-19.
- (5) Remove the pins-securing the canopy-to the repair table. Secure the patch to the radial seam by stitching, using the procedures in paragraph 2-19, with a light-duty sewing machine-and .size E nylon thread, 7 to 11 stitches per inch. Sew the radial seam patch with four rows of stitching.
- (6) When applicable, repeat the stitching procedures in step (5), above, on the opposite side of the radial seam channel.
- (7) Reposition in their original locations the items removed or laid aside in step b(2), above. Reattach each item to the canopy by restitching in accordance with original construction details and-paragraph 2-19. Stitch with a light-duty sewing machine and size E nylon thread, 7 to 11 stitches per inch.

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## 2-28. Radial Seam Reinforcement Tape.

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**This task covers:**

**a. Repair**

**b. Replace**

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*Tools:*

Knife, Item 4, Appendix B  
Knife, Hot Metal, Item 5, Appendix B  
Sewing Machine, Zig-Zag, Item 17, Appendix B  
Yardstick, Item 24, Appendix B

*Equipment Condition:*

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

*Materials/Parts:*

Tape, Nylon, Type III, 1/2 Inch, Item 31,  
Appendix D  
Thread, Nylon, Size E Item 39/40, Appendix D

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a. Repair. Stitch and restitch broken or loose stitching according to original construction details using the procedures in paragraph 2-19.

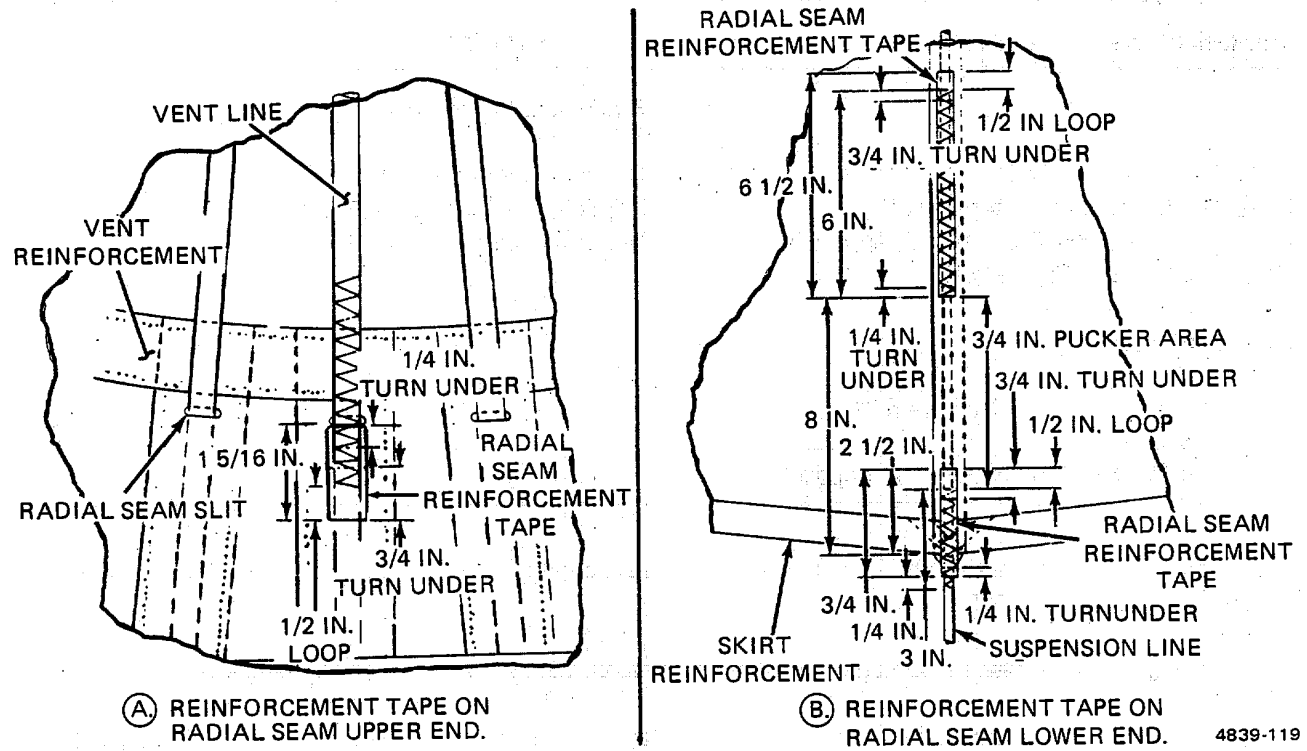
b. Replacement. Replace a damaged radial seam reinforcement tape by fabricating as follows (figure 2-120):

- (1) Remove the original radial seam reinforcement tape by cutting the stitching that secures the tape to the radial seam.
- (2) Cut a 2 5/6-, 4 1/4- or 7 1/2-inch length of 112-inch wide type III nylon tape, as applicable. Seal the ends.
- (3) Make a 3/4-inch turn under on one end of the tape and a 1/4-inch turn under on the opposite end.
- (4) Position the folded tape in the original reinforcement tape location on the radial seam, with the turn under facing down. The folded end with the 3/4-inch turn under shall face away from the vent reinforcement (upper lateral band) (A, figure 2-120) or skirt reinforcement (lower lateral band) (B, figure 2-120), whichever is nearest.
- (5) Secure the applicable reinforcement tape to the radial seam and the radial line by stitching a 1/4-inch wide double-throw zig-zag stitch according to original construction details and figure 2-120, using a zig-zag sewing machine and size E nylon thread, 7 to 11 stitches per inch.

**NOTE**

A 3/4-inch pucker will be allowed in the radial seam fabric between the two reinforcement tape stitch formations at the lower end of the radial seam.

2-28. Radial Seam Reinforcement Tape (cont).



4839-119

Figure 2-120. Radial Seam Reinforcement Tape Replacement Details.



---

## 2-29. Pocket Band.

---

This task covers:

a. Repair

b. Replace

---

*Tools:*

Knife, Hem 4, Appendix B  
Knife, Hot Metal, Item 5, Appendix B  
Sewing Machine, Light-Duty, Item 16, Appendix B  
Sewing Machine, Zig-Zag, Item 17, Appendix B  
Shears, Item 14, Appendix B  
Yardstick, Item 24, Appendix B

*Equipment Condition:*

Cleaned, paragraph 2-12  
Inspected, paragraphs 2-9, paragraph 2-13  
Unpacked, laid flat on repair surface

*Materials/Parts:*

Thread. Size E Item 39/40, Appendix D  
Cord, Nylon, Type IV, Item 16, Appendix D

---

a. Repair. Stitch and restitch (para. 2-19) with size E thread which matches the color of original stitching, when possible. Lock all zig-zag stitching at least 1/2 inch. Restitch directly over the original stitching, following the original stitch pattern as closely as possible.

b. Replace. 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 7 7/8-inch length of type IV coreless nylon cord and sear ends (para. 2-20).
- (4) Position cord length in original pocket band location.
- (5) Using a zig-zag sewing machine and size E nylon thread, secure each end of the replacement pocket band by stitching a 2 1/4-inch long row of double-throw zig-zag stitching, 7 to 11 stitches per inch, in accordance with the details of figure 2-121.

2-29. Pocket Band (cont).

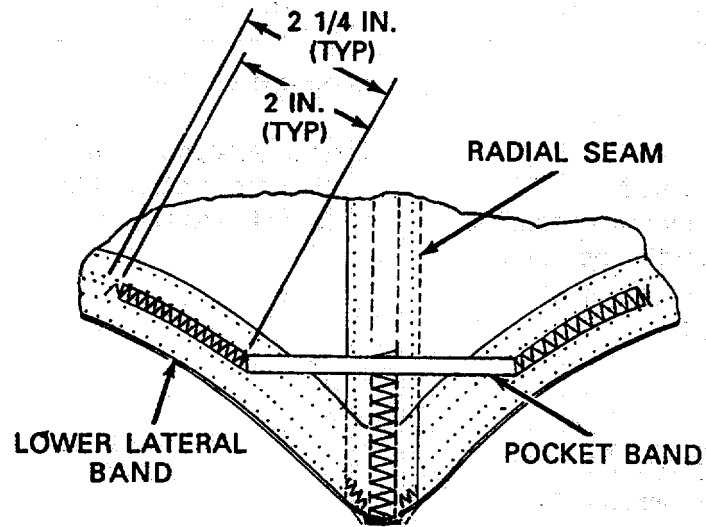


Figure 2-121. Pocket Band Replacement Details.

4839-120

---

## **2-30. Skirt Reinforcement (Lower Lateral Band).**

---

**This task covers:     Repair**

---

*Tools:*

Knife, Item 4, Appendix B  
Knife, Hot Metal, Item 5, Appendix B  
Sewing Machine, Light Duty, Item 16, Appendix B  
Sewing Machine, Zig-Zag, Item 17, Appendix B  
Shears, Item 14, Appendix B  
Yardstick, Item 24, Appendix B

*Equipment Condition:*

Cleaned, paragraph 2-12  
Inspected, paragraphs 2-9, 2-13  
Unpacked, laying flat on repair surface

*Materials/Parts:*

Webbing, Nylon, 1-inch Wide, Tubular, Item 58,  
Appendix D  
Thread, Nylon, Size E, Item 39/40, Appendix D

---

### **NOTE**

The skirt reinforcement tape may have one splice between any two suspension lines and cannot 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. 2-19) with nylon thread, size E, which contrasts the color of the original stitching and material when possible. Lock all straight stitching by back stitching at least 2 inches. Zig-zag restitching should extend 1/4 inch 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 areas 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 tubular nylon webbing long enough to extend 6 inches beyond each side of damaged area. Sear each end of tape (para. 2-20).
- (4) Center webbing length over damaged area (figure 2-122) and secure splice by making four rows of continuous stitching using a light duty sewing machine and size E nylon thread. Overstitch each webbing end by 1/2 inch. Stitching will be 7 to 11 stitches per inches.
- (5) Reattach pocket band, if required (para. 2-29).

2-30. Skirt Reinforcement (Lower Lateral Band) (cont).

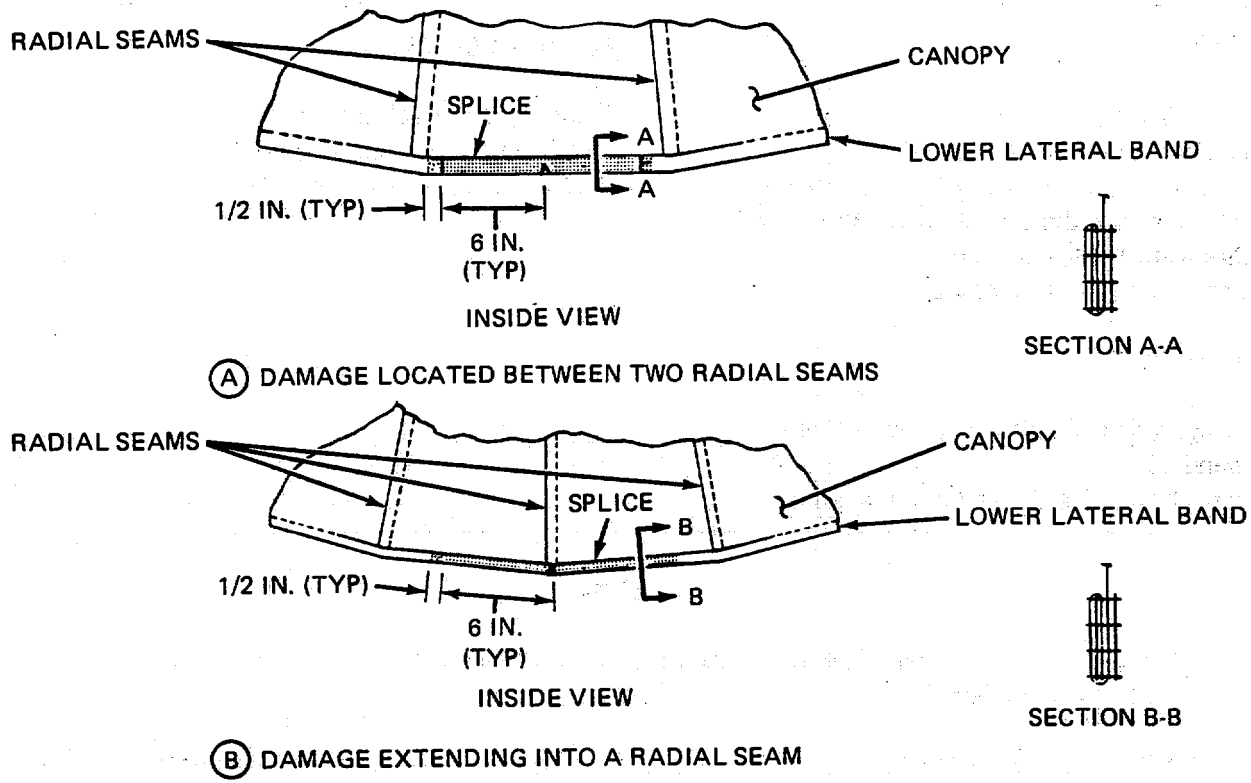


Figure 2-122. Skirt Reinforcement (Lower Lateral Band) Splice Details.

---

## 2-31. Suspension Line Reinforcement (V-Tab).

---

This task covers:

a. Repair

b. Replace

---

*Tools:*

Knife, Item 4, Appendix B  
Knife, Hot Metal, Item 5, Appendix B  
Sewing Machine, Light Duty, Item 16, Appendix B  
Sewing Machine, Light Duty, Zig-Zag, Item 17,  
Appendix B  
Yardstick, Item 24, Appendix B  
Needle, Tacking, Item 9, Appendix B

*Equipment Condition:*

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

*Materials/Parts:*

Pencil, Marking Aid, Items 25/26, Appendix D  
Thread, Nylon, Size E, Items 39140, Appendix D  
Webbing, Nylon, Tubular, 1/2 Inch, Item 57,  
Appendix D

---

a. Repair. Stitch and restitch broken or loose stitching (para. 2-19) with nylon thread, size E, which contrasts the color of the original stitching and material when possible. Zig-zag restitching should extend 1/4 inch into undamaged stitching at each end. Restitch directly over the original stitching. Follow the original stitch pattern as closely as possible.

### NOTE

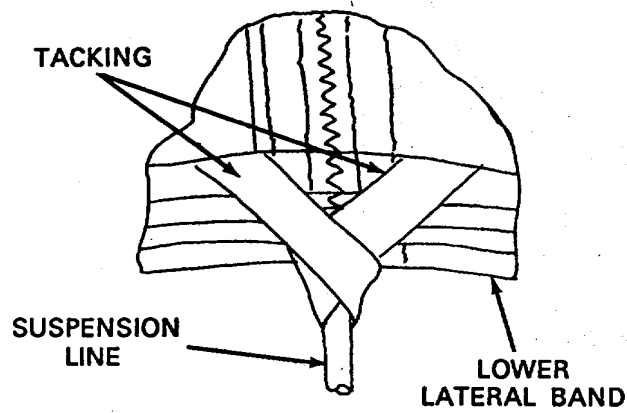
Replacement of a V-tab is done at the direct support (intermediate) maintenance level as outlined in the Maintenance Allocation Chart (MAC), Section II, Appendix B.

b. Replacement. If V-tab requires replacement, proceed as follows:

- (1) Position the canopy assembly on a repair table or other repair surface and turn the inside of the lower lateral band to the outside to place the damaged V-tab facing up.
- (2) Using an authorized marking aid of contrasting color, mark the suspension line which is contained within the damaged V-tab at the point where the line intersects the lower edge of the lower lateral band.
- (3) Remove the affected V-tab from the canopy by cuffing the stitching securing the V-tab to the lower lateral band and the suspension line.
- (4) Using tubular nylon webbing, 1/2-inch wide, cut a 5-inch length of material and sear the ends.
- (5) Center the material lengthwise under the applicable suspension line, placing the upper edge of the material immediately adjacent to the lower edge of the lower lateral band.

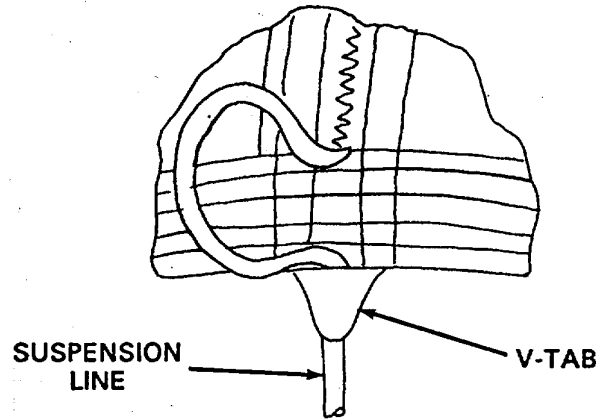
**2-31. Suspension Line Reinforcement (V-Tab) (cont).**

- (6) Working from opposite directions, pass each end-of the material length over the top of the suspension line. Draw the ends snug to develop a tight wrap around the line and to form a V-shaped design on the lower lateral band inside.
- (7) Secure each end of the replacement V-tab to the lower lateral band inside with temporary tacking. The temporary tacking will be made using the procedures in paragraph 2-19. Bias-trim each tab end even with the upper edge-of the lower lateral band, (A, figure 2-123).
- (8) Pull a suitable length of the suspension line up through the V-tab on the outside of the lower lateral band (B, figure 2-123) and lay the pulled length to one side.
- (9) Secure the V-tab ends to the lower lateral band inside by stitching a single row of double4hrow zig-zag stitching along the center of material, making a V-shaped design.
- (10) Further stitch a single row of stitching 1/8 inch in along the edges of the V-tab ends, (C, figure 2-123). Ensure that the pulled suspension line length is held to one side during the stitching process. Also ensure the stitching does not extend above the upper edge or below the lower edge of the lower lateral band. Stitch with size E nylon thread, 7 to 11 stitches per inch, using a light-duty sewing machine.
- (11) Turn the lower lateral band right side out and pull the suspension line length back down through the V-tab. Ensure the mark made in step (2) above, is alined with the lower edge of the lower lateral band.
- (12) Beginning at-a point ¼ inch below-the V-tab lower edge, secure the suspension line upper end to the installed V-tab and the canopy skirt outside by -stitching a single row of double4hrow zig-zag stitching (D, figure 2-123) according to-original construction figure 2-124).



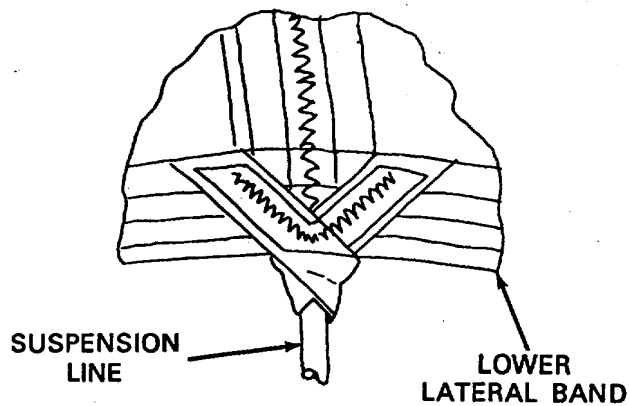
INSIDE VIEW

Ⓐ BIAS-TRIMMED V-TAB ENDS SECURED WITH TEMPORARY TACKING



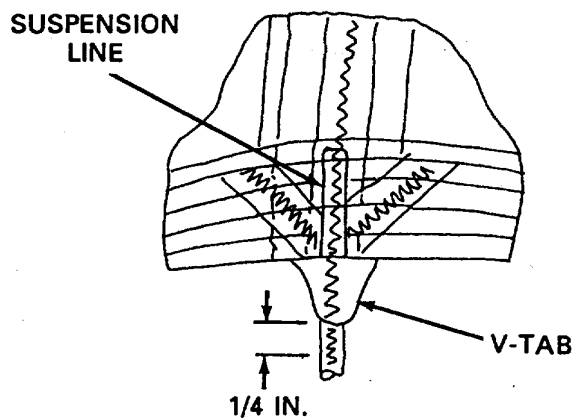
OUTSIDE VIEW

Ⓑ LENGTH OF SUSPENSION LINE PULLED UP THROUGH V-TAB



INSIDE VIEW

Ⓒ V-TAB ENDS SECURED TO LOWER LATERAL BAND.



OUTSIDE VIEW

Ⓓ SUSPENSION LINE SECURED TO V-TAB AND CANOPY SKIRT.

4839-122

Figure 2-123. V-Tab Replacement Details.

2-31. Suspension Line Reinforcement (V-Tab) (cont).

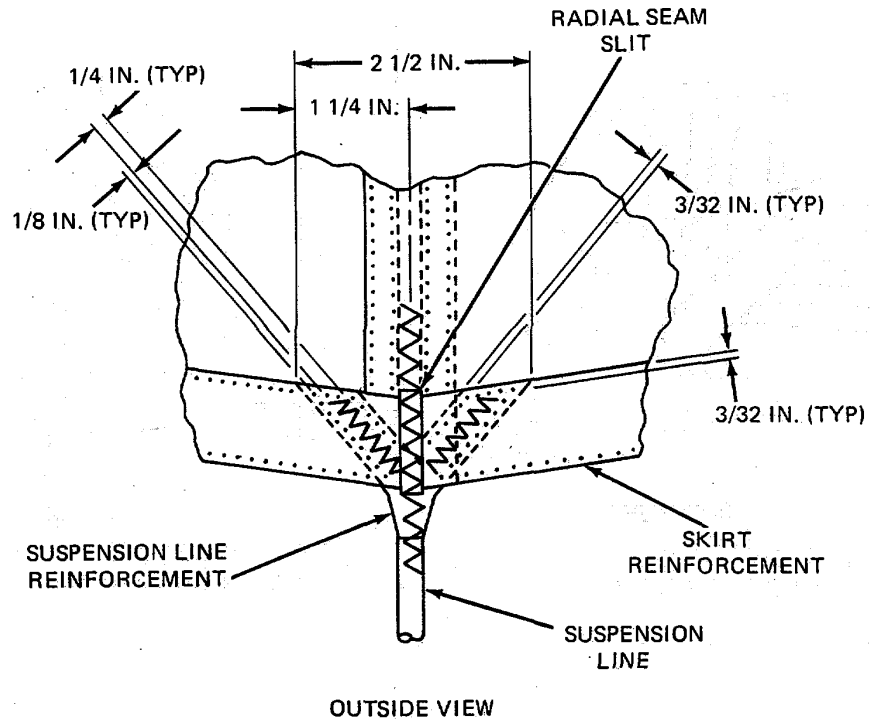


Figure 2-124. Suspension Line Reinforcement (V-Tab) Construction Details.

4839-123



---

## 2-32. Connector Link.

---

**This task covers:**    **a. Inspect**                      **b. Repair**                      **c. Replace**

---

*Tools:*

File, Item 3, Appendix B  
Mallet, Rawhide, Item 8, Appendix B  
Screwdriver, Flat Tip, Item 22, Appendix B  
Separator, Connector Link, Item 23, Appendix B

*Equipment Condition:*

Unpacked, canopy laid flat

*Materials/Parts:*

Cloth, Abrasive, Item 2, Appendix D

---

a. Inspection. Inspect connector link assemblies in accordance with table 2-1.

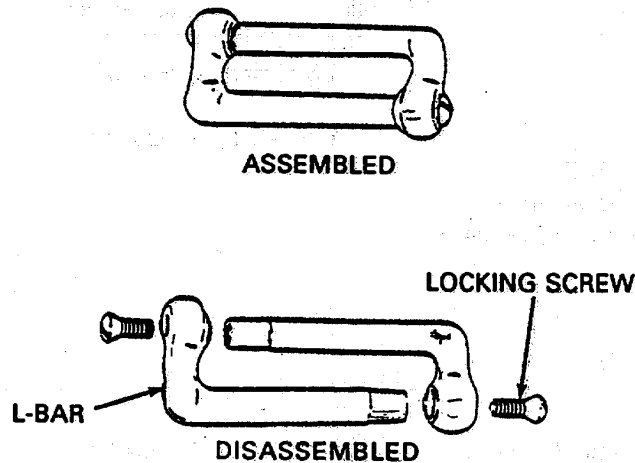
b. Repair. Repair a connector link assembly as follows (see figure 2-125):

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

c. Replace. A parachute connector link assembly that is damaged beyond repair will be replaced with a serviceable L-bar parachute connector link assembly from stock. Use the following procedures:

- (1) Using suitably sized flat-tip (slotted-head) screwdriver, remove the locking screws from the ends of the replacement L-bar parachute connector link assembly and disassemble the link (see figure 2-125).
- (2) Using suitably sized flat-tip (slotted-head) screwdriver, remove the two locking screws from the damaged original parachute connector link assembly. Disassemble the link assembly, using a link separator, if necessary. If the connector link contains suspension lines, ensure the lines are not allowed to slide off the damaged link during the disassembly process.

2-32. Connector Link (cont).



4839-124

Figure 2-125. Connector Link Assembly.

- (3) As applicable, position an L-bar of the replacement link assembly adjacent to the disassembled original link assembly and slide the suspension lines from the damaged link onto the replacement link L-bar.
- (4) If required, pass the remaining L-bar link through the attaching loop of the adjoining component.
- (5) Fit the replacement link L-bar together and ensure L-bar leg engagement by tapping the end of each L-bar with a rawhide mallet.
- (6) As applicable, trace the suspension lines from the connector link assembly to the canopy skirt to ensure the lines are properly installed and in the correct sequence.

---

**2-33. Riser.**

---

**This task covers:**      **a.      Repair   b.      Replace**

---

*Tools:*

Brush, Stenciling, Item 2, Appendix B  
Knife, Item 4, Appendix B  
Pot, Melting, Item 13, Appendix B  
Needle, Tacking, Item 9, Appendix B  
Sewing Machine, Heavy-Duty, Item 18, Appendix B  
Sewing Machine, Light-Duty, Item 16, Appendix B

*Materials/Parts (cont):*

Wax, Paraffin, Item 47, Appendix D  
Webbing, Cotton, Type VIII, Item 50, Appendix D  
Thread, Cotton, Ticket No. 5, Item 36, Appendix D  
Thread, Nylon, Size 6, Items 45/46, Appendix D  
Thread, Nylon, Size E, Item 39/40, Appendix D

*Materials/Parts:*

Beeswax, Item 1, Appendix D  
Ink, Marking, Parachute, Strata-Blue, Item 18,  
Appendix D  
Stencilboard, Oiled, Item 29, Appendix D

*Equipment Condition:*

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

---

a. Repair

(1) *Restitching.* Restitch broken or loose stitching according to original construction details using the specifics of paragraph 2-19.

(2) *Restencil.* As required, restencil identification marks using the procedures of paragraph 2-21.

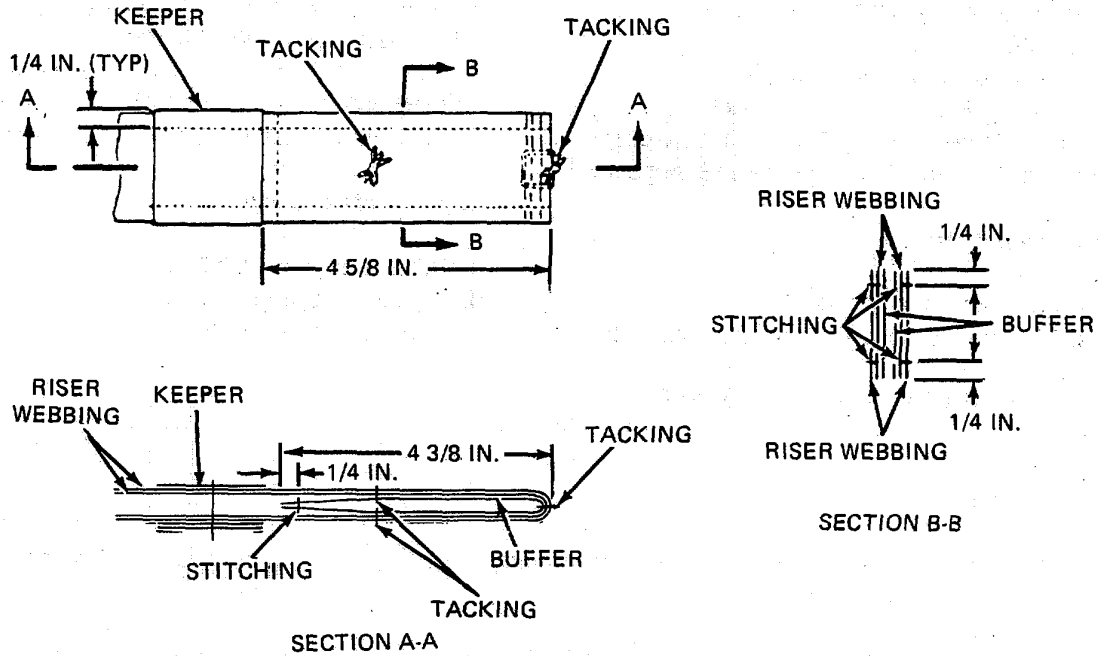
(3) *Retacking.* Retack the buffer on the clevis attaching loop end of a riser at each of the original three tacking points using one turn double, ticket No. 5 waxed cotton thread at each point. Secure the tacking ends at each point with a surgeon's knot and a locking knot. Trim tie ends to ¼ inch.

(4) *Replacing a clevis attaching loop buffer.* Replace a damaged clevis attaching loop buffer by fabricating as follows:

- (a) If applicable, remove the attaching loop from the suspension clevis.
- (b) Remove the original buffer from the clevis attaching loop by cuffing the tacking which secures the buffer within the loop.
- (c) Cut an 8 ¾-inch length of 1 ¾-inch wide, type VIII cotton webbing and wax the ends.
- (d) Double the webbing length and align the ends. At a point ¼ inch back from the aligned ends, secure the webbing ends together by stitching two rows laterally across the webbing width. Stitching will be made with a light-duty sewing machine, using size E nylon thread, 7 to 11 stitches per inch (figure 2-126).

**2-33. Riser (cont).**

- (e) Position the folded webbing length in the original buffer location and secure the webbing within the attaching loop by handtacking at three points according in figure 2-126 and using the procedures in (3), above.



4839-125

Figure 2-126. Clevis Attaching Loop Buffer Replacement Details.

- b. Replace. Replace an unserviceable riser with a serviceable item from stock.



---

**2-35. Suspension Clevis.**

---

**This task covers:      a.      Repair   b.      Replace**

---

*a. Repair.* Replace a defective or missing ¾-inch -16 NF hexagon plain nut or 4 ½-inch long ¾-inch -16 NF hexagon cap screw with a serviceable item from stock. Hand tighten for pack operation.

*b. Replace.* Replace an unserviceable ¾-inch suspension clevis with a serviceable item from stock.

---

**2-36. Deployment Bag.**

---

**This task covers:**     **a.     Repair   b.     Replace**

---

*Equipment Condition:*

Cleaned, paragraph 2-12  
Inspected, paragraph 2-9, 2-13  
Unpacked, detached from canopy

---

- a. Repair. Refer to individual repair procedures.

**CAUTION**

When performing a repair on deployment bag which requires the cutting of stitching of an original part, ensure that adjacent bag material is not damaged during the cuffing process.

- b. Replace. An unrepairable deployment bag will be replaced with a serviceable bag from stock.

---

**2-37. Bridle Breakcord Attaching Loop Buffer.**

---

**This task covers:**      **a.      Repair    b.      Replace**

---

*Tools:*

Knife, Item 4, Appendix B  
Pot, Melting, Item 13, Appendix B  
Sewing Machine, Heavy-Duty, Item 18, Appendix B  
Yardstick, Item 24, Appendix B

*Materials/Parts:*

Beeswax, Item 1, Appendix D  
Thread, Nylon, Size 3, Item 42/43, Appendix D

*Materials/Parts (cont):*

Wax, Paraffin, Item 47, Appendix D  
Webbing, Cotton, 1 3/4-inch Wide, Type VIII,  
Item 50, Appendix D

*Equipment Condition:*

Cleaned, paragraph 2-12  
Inspected, paragraph 2-9, 2-13  
Bag laid out flat

---

*a. Repair.* Restitch broken or loose stitching according to original construction details using a heavy-duty sewing machine with size 3 nylon thread, 5 to 8 stitches per inch.

*b. Replacement.* Replace a damaged bridle breakcord attaching loop buffer by fabricating as follows:

- (1) Remove the original buffer from within the bridle breakcord attaching loop by cutting the stitching which secures the buffer to the loop.
- (2) Cut an 8-inch length of 1 3/4-inch wide, type VIII cotton webbing and wax the ends.
- (3) Position the webbing length in the original buffer location and secure the replacement buffer to the loop webbing by stitching a 7 3/4-inch long box-stitch formation 1/8 inch in from each edge according to the details in figure 2-127. Stitching will be made using a heavy-duty sewing machine, with size 3 nylon thread, 5 to 8 stitches per inch.



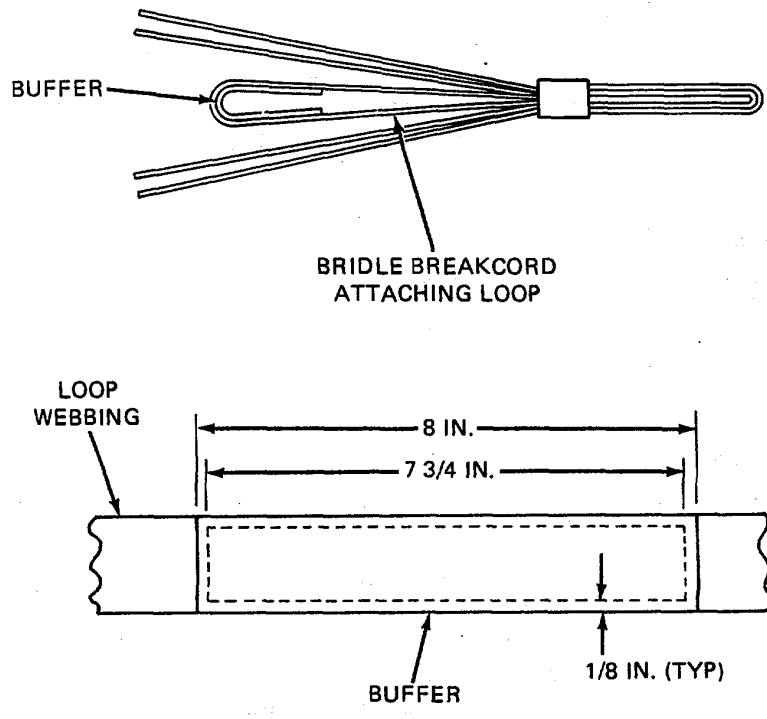


Figure 2-127. Bridle Breakcord Attaching Loop Buffer Replacement Details.

4839-126

---

## 2-38. Deployment Bag Closing Loops.

---

**This task covers:**      **a.      Repair    b.      Replace**

---

*Tools:*

Knife, Item 4, Appendix B  
Knife, Hot Metal, Item 5, Appendix B  
Sewing Machine, Heavy-Duty, Item 18, Appendix B  
Yardstick, Item 24, Appendix B

*Equipment Condition:*

Cleaned, paragraph 2-12  
Inspected, paragraph 2-9, 2-13  
Bag laid out flat

*Materials/Parts:*

Thread, Nylon, Size 3, Item 42t43, Appendix D  
Webbing, Nylon, Type XVII, 1-Inch, Item 59,  
Appendix D

---

a. Repair. Restitch broken or loose stitching according to original construction details, using a heavy-duty sewing machine and size 3 nylon thread, 5 to 8 stitches per inch.

b. Replacement. Replace a damaged main bag closing loop or secondary bag closing loop on the bag top and bottom closing flaps, or a closing loop on a side flap by fabricating as follows:

(1) *Main bag closing loop.*

- (a) Remove the damaged loop by cuffing the loop webbing at a point adjacent to each of the original stitch formations which secures the loop webbing to the top or bottom closing flap, as applicable.
- (b) Cut a 9 ½-inch length of 1-inch wide, type XVII nylon webbing and sear the ends.
- (c) Form the replacement loop by folding the webbing length according to the details in A or B, figure 2-128, as applicable.
- (d) Position the folded webbing in the original loop location and allow the webbing ends to extend over the remaining original loop webbing ends stitched to the closing flap.
- (e) Secure the folded webbing to the closing flap by stitching a 3 ½-inch long single-X-box-stitch formation, with one double end, on each of the webbing ends according to original construction details and the details in A or B, figure 2-128, as applicable. Stitching will be made with a heavy-duty sewing machine and size 3 nylon thread, 5 to 8 stitches per inch.

(2) *Secondary bag closing loop.*

- (a) Remove the damaged loop by cutting the loop webbing at a point adjacent to the original stitch formation securing the loop webbing to the top or bottom closing flap, as applicable.
- (b) Cut a 6-inch length of 1-inch wide, type XVII nylon webbing and sear the ends.

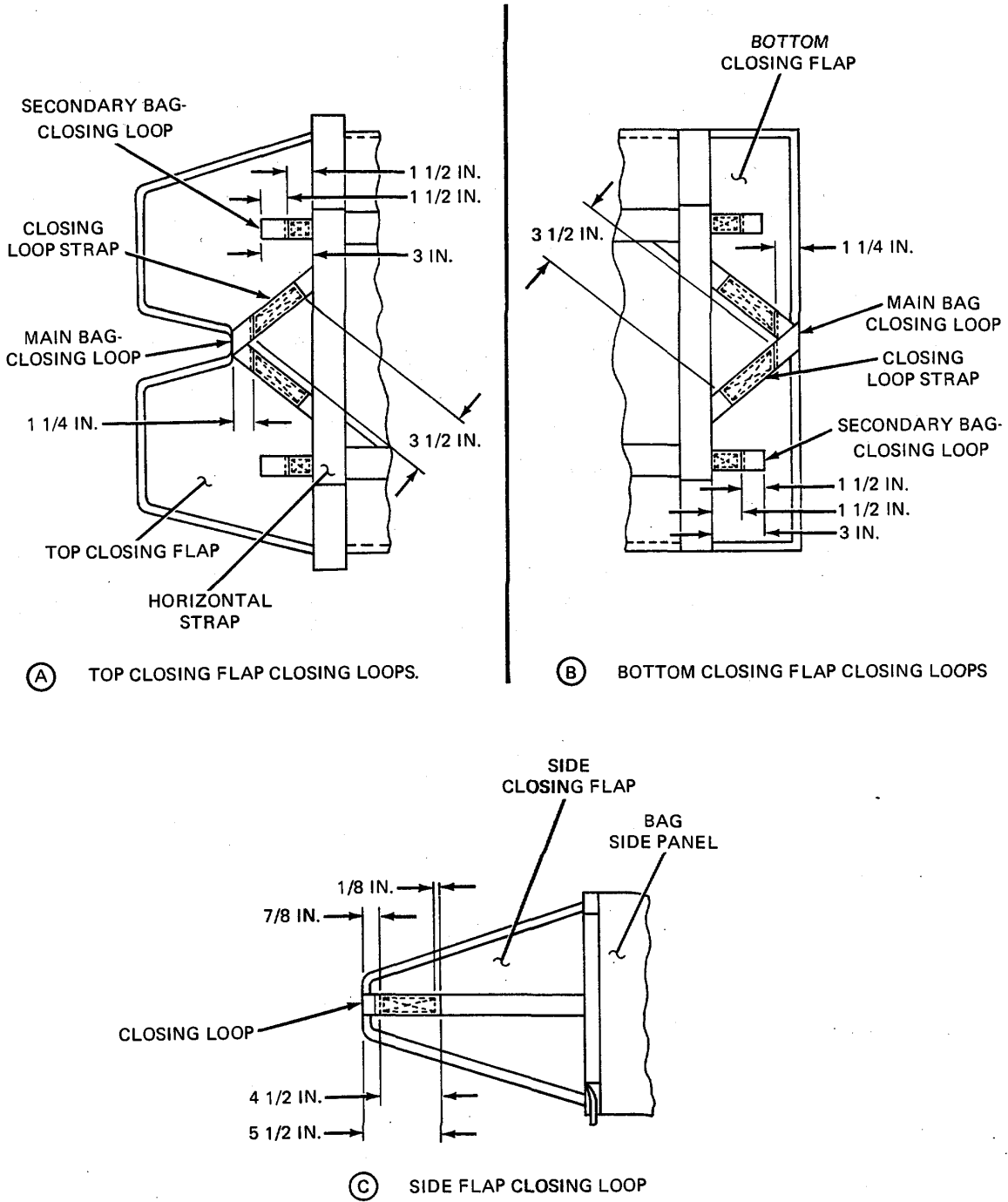


Figure 2-128. Bag Closing Loop Replacement Details.

4839-127

**2-38. Deployment Bag Closing Loops (cont).**

- (c) Double the webbing length and position the folded webbing in the original loop location over the remaining original stitched webbing. Locate the aligned ends of the folded webbing against the outer edge of the bag end horizontal strap.
- (d) Secure the aligned running ends of the doubled webbing length to the closing flap by stitching a 1 ½-inch long single-X-box-stitch formation, with one double end, according to the details in A or B, figure 2-128, as applicable. Stitching will be made using a heavy-duty sewing machine with size 3 nylon thread, 5 to 8 stitches per inch.

(3) *Side flap closing loop.*

- (a) Remove the damaged loop by cutting the loop webbing at a point adjacent to the original stitch formation securing the loop webbing to the side closing flap.
- (b) Cut an 11-inch length of 1-inch wide, type XVII nylon webbing and sear the ends.
- (c) Double the webbing length and position the folded webbing in the original loop location over the remaining original stitched webbing. Align the end of a webbing fold with the outer edge of the side flap.
- (d) Secure the aligned running ends of the doubled webbing length to the side flap by stitching a 4 ½-inch long single-X-box-stitch formation according to the details in C, figure 2-128. Stitching will be made using a heavy-duty sewing machine, with size 3 nylon thread, 5 to 8 stitches per inch.

---

## 2-39. Deployment Bag Edge Binding.

---

**This task covers:**      **a.      Repair**

---

*Tools:*

Knife, Hot Metal, Item 5, Appendix B  
Knife, Item 4, Appendix B  
Sewing Machine, Medium-Duty, Item 19, Appendix B  
Shears, Item 14, Appendix B  
Yardstick, Item 24, Appendix B

*Equipment Condition:*

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

*Materials/Parts:*

Thread, Nylon, Size E, Item 39/40, Appendix D  
Tape, Nylon, 3/4-Inch Wide, Type III, Item 32,  
Appendix D

---

a. Stitching. Stitch and restitch broken or loose stitching with size E nylon 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 1/2 inch. Restitch directly over the original stitching, following the original stitch pattern as closely as possible. Stitch according to para. 2-18 and table 2-3.

b. Splicing. Splice an edge binding an unlimited number of times as follows:

- (1) Cut a length of 3/4-inch wide type III nylon tape 2 inches longer than the damaged area. Seal the ends.
- (2) Make a 1/2-inch fold under on each end of tape length.
- (3) Center and fold the tape lengthwise over the damaged area. Secure the splice by making two rows of stitching over the original stitching, the full length of the splice, to a point 1/2 inch beyond each end of the splice material according to the details in figure 2-129. Use a medium-duty sewing machine and size E nylon thread. Stitching shall be 7 to 11 stitches per inch.

2-39. Deployment Bag Edge Binding (cont).

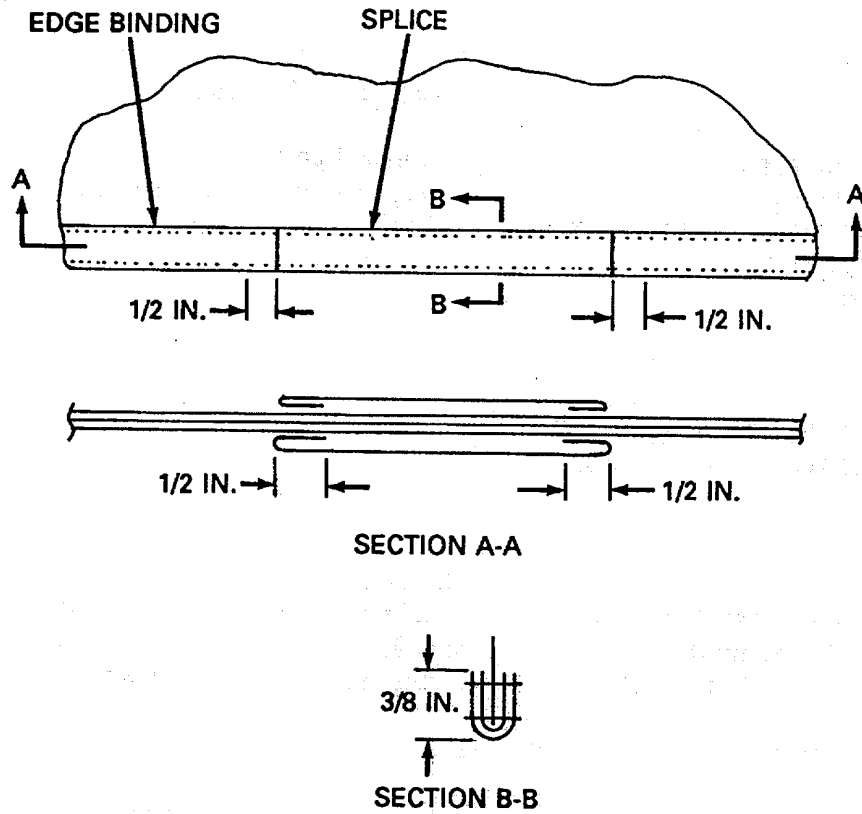


Figure 2-129. Deployment Bag Edge Binding Splicing Details.

4839-128

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## 2-40. Deployment Bag Bridle strap.

---

### This task covers:      a.      Repair

---

*Tools:*

Knife, Item 4, Appendix B  
Knife, Hot Metal, Item 5, Appendix B  
Sewing Machine, Heavy-Duty, Item 18, Appendix B  
Yardstick, Item 24, Appendix B

*Equipment Condition:*

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

*Materials/Parts:*

Thread, Nylon, Size 3, Item 42/43, Appendix D  
Webbing, Nylon, Type VIII, 1 23/32-Inch, Item 54,  
Appendix D

---

a. Stitching. Stitch and restitch broken or loose stitching with size 3 nylon thread which matches the color of the original stitching, when possible. Lock all straight stitching by backstitching at least ½ inch. Restitch by overstitching each end of the stitch formation by ½ inch. Restitch directly over the original stitching, following the original stitch pattern as closely as possible. Stitch according to para. 2-19 and table 2-3.

b. Splicing. A bridle strap may be spliced regardless of whether the damaged area is located on that part of the strap which is secured to the bag or on the free portion of the strap, providing 4 inches of undamaged original strap webbing remains on each side of the damaged area. Splice the bridle strap as follows:

- (1) Cut a length of 1 23/32-inch wide, type VIII nylon webbing long enough to extend 4 inches beyond each side of the damaged area and sear the ends.
- (2) Center the webbing length over the damaged area and secure the splice by stitching a 4-inch long, three-point-WW-stitch formation on each end of the splice material according to the details in figure 2-130. Overstitch each end by 1/8 inch. Stitching will be made using a heavy-duty sewing machine and size 3 nylon thread, 5 to 8 stitches per inch.
- (3) If the splice is made on the free portion of the strap, cut and remove the damaged area from beneath the splice material.
- (4) If the splice is made in an area of the strap which is secured to the bag, make a row of stitching, 3/16 inch in, along each side of the splice material. Stitching will be made using a heavy-duty sewing machine and size 3 nylon thread, 5 to 8 stitches per inch.

2-40. Deployment Bag Bridle Strap (cont).

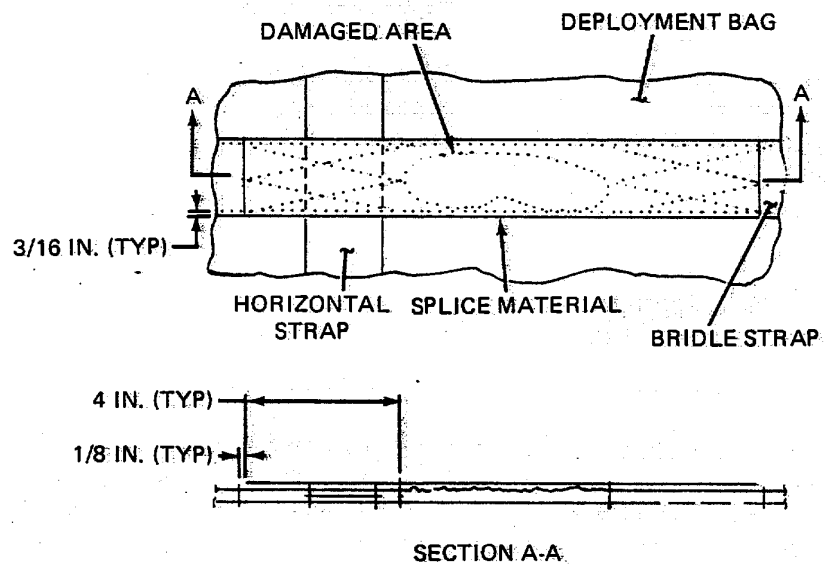


Figure 2-130. Bridle Strap Splicing Details.

4839-129



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## 2-41. Deployment Bag Horizontal Strap.

---

### This task covers: a. Repair

---

*Tools:*

Knife, Item 4, Appendix B  
Knife, Hot Metal, Item 5, Appendix B  
Sewing Machine, Heavy-Duty, Item 18,  
Appendix B  
Yardstick, Item 24, Appendix B

*Equipment Condition:*

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

*Materials/Parts:*

Thread, Nylon, Size 3, Item 42/43, Appendix D  
Webbing, Nylon, Type VIII, 1 23/32 Inch, Item 54,  
Appendix D

---

- a. Stitching. Stitch and restitch broken or loose stitching with size 3-nylon thread which matches the color of the original stitching, when possible. Lock all straight stitching by backstitching at least 1/2 inch. Restitch by over stitching each end of the stitch formation by 1/2 inch. Restitch directly over the original stitching, following the original stitch pattern as closely as possible. Stitch according to para. 2-19 and table 2-3.
- b. Splicing. A horizontal strap may be spliced an unlimited number of times as follows:
- (1) Cut a length of 1 23/32-inch wide, type VI II nylon webbing long enough to extend 4 inches beyond each side of the damaged area and sear the ends.
  - (2) Center the webbing length over the damaged area and secure the splice by stitching a 4-inch long three-point-WW-stitch on each end of the splice material. Overstitch each end by 1/8 inch. In addition, make a row of stitching 3/16 inch in along each side of the splice material (figure 2-131). Stitching will be made using a heavy-duty sewing machine and size 3 nylon thread, 5 to 8 stitches per inch.

2-41. Deployment Bag Horizontal Strap (cont).

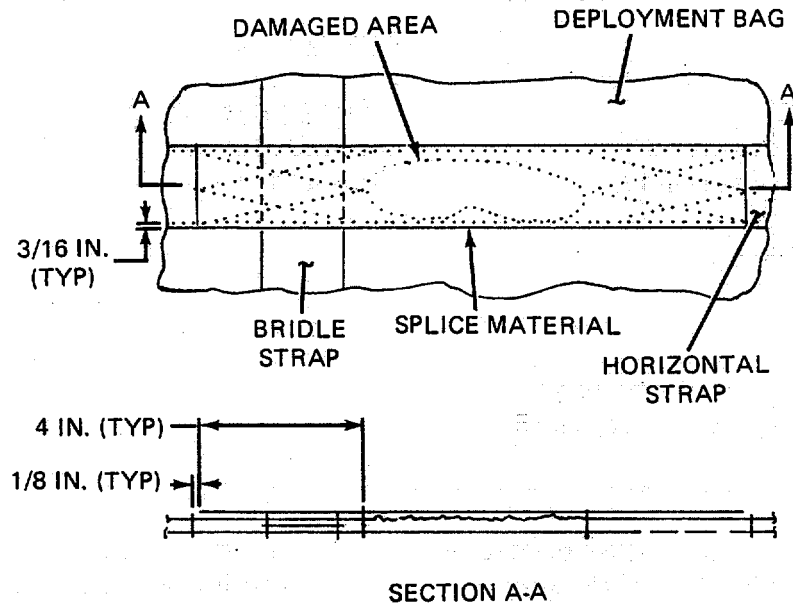


Figure 2-131. Horizontal Strap Splicing Details.

4839-130

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## 2-42. Deployment Bag Panels, Flaps and Cover.

---

**This task covers:** Repair

---

**Tools:**

Sewing Machine, Medium-Duty, Item 19, Appendix B  
Sewing Machine, Darning, Item 20, Appendix B  
Brush, Stenciling, Item 2, Appendix B  
Shears, Item 14, Appendix B  
Yardstick, Item 24, Appendix B

**Materials/Parts:**

Thread, Nylon, Size E, Item 39/40, Appendix D  
Thread, Nylon, Size 3, Item 42/43, Appendix D

**Materials/Parts (cont):**

Marking Aid, Item 25/26, Appendix D  
Ink, Marking, Item 18, Appendix D  
Cloth, Nylon, Duck, Type III, Item 7, Appendix D

**Equipment Condition:**

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

---

Repair.

(1) *Restitching.* Restitch broken or loose stitching according to original construction details and the specifics in paragraph 2-19, using a medium-duty sewing machine and size 3 nylon thread, 5 to 8 stitches per inch.

(2) *Restencil.* As required, restencil identification marks using the procedures in paragraph 2-21.

(3) *Darning.* Darn a hole or tear which does not exceed 3/4 inch in length or diameter and which is accessible using the procedures in paragraph 2-19, and a darning sewing machine with size E nylon thread. There is no limit to the number of times a flap or panel may be darned.

(4) *Patching.* Patch a hole or tear which exceeds 3/4 inch in length or diameter using the procedures in paragraph 2-19, the specifics in table 2-3, and the following patching criteria:

(a) *Bag body.* There is no limit to the number or size of patches that may be applied to the deployment bag body. However, each damaged area must be accessible and there must be at least 1 1/4 inches of undamaged material remaining on all sides of the affected area. Patch material will be of type III, 7.25-ounce nylon duck cloth. Proceed as follows:

- 1 Smooth fabric around the damaged area, and secure with pushpins. Do not pin damaged area.
- 2 Using a marking aid of contrasting color, mark a square or rectangle around the area to be patched and ensure one side of marked square or rectangle is parallel to warp or filling of fabric.
- 3 Cut damaged area fabric along lines made in 2, above. Further cut fabric diagonally at each corner to allow a 1/2-inch foldback in raw edges.
- 4 Make a 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 2-19a.

**2-42. Deployment Bag Panels, Flaps and Cover (cont).**

- 5 Using nylon cloth, mark and cut a patch 2 1/2 inches wider and longer than inside measurements of the prepared hole. Ensure that patch material is marked and cut along the warp or filling of fabric.
- 6 Center patch material over prepared hole. Pin patch material in position.
- 7 Make a 1/2-inch fold under on each edge of patch material and baste patch to prepared area. Basting will be performed using procedures in paragraph 2-19a.
- 8 Remove pushpins securing the item to repair table and secure the patch of the nylon bag, using a medium-duty sewing machine and size E nylon thread. Stitching will be 7 to 11 stitches per inch (figure 2-132).

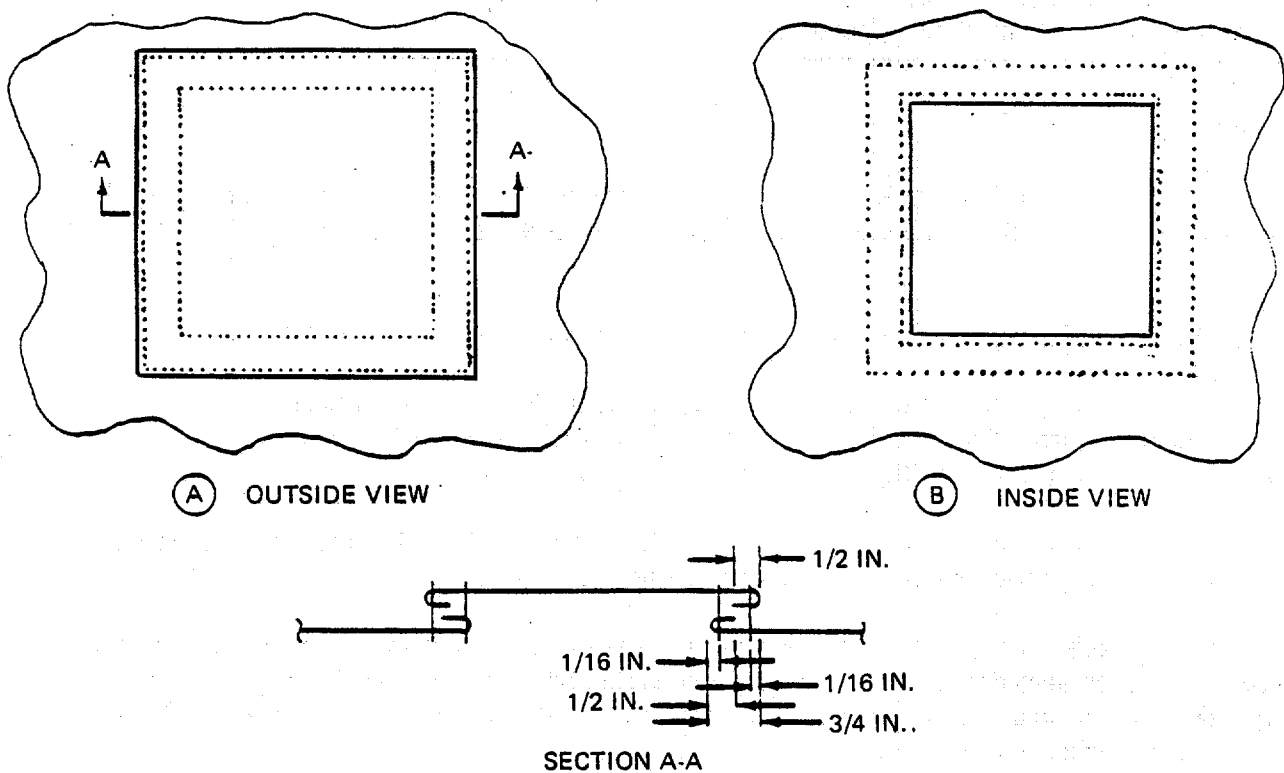


Figure 2-132 . Patching Deployment Bag Panels, Flaps and Cover .

(b) *Suspension line stowage flap and bag closing flaps.* There is no limit to the size or number of patches that may be applied to the suspension line stowage flap and bag closing flaps. Patch material will be of type III 7.25-ounce nylon duck cloth. Use the patching procedure in (a), above.

(c) *Bag cover.* There is no limit to the size or number of patches that may be applied to the bag body. Patch material will be type III 7.25-ounce nylon duck cloth. Use the patching procedure in (a), above.

---

## 2-43. Deployment Bag Locking Stow Loops.

---

**This task covers:**    **a. Repair**            **b. Replacement**            **c. Adjustment**

---

**Tools:**

Knife, Item 4, Appendix B  
Pot, Melting, Item 13, Appendix B  
Sewing Machine, Heavy - Duty, Item 18,  
Appendix B

Yardstick, Item 24, Appendix B  
Brush, Stencil, Item 2, Appendix B

**Materials/Parts:**

Beeswax, Item 1, Appendix D  
Thread, Nylon, Size 3, Item 42/43, Appendix D

**Materials/Parts (cont):**

Wax, Paraffin, Item 47, Appendix D  
Webbing, Cotton Type VIII item 50, Appendix D  
Marking Aid, Item 25/26, Appendix D  
Ink Parachute Marking, Item 18, Appendix D  
Stencil Board, Item 29, Appendix D

**Equipment Condition:**

Cleaned, paragraph 2-12  
Inspected, paragraphs 2-9, 2-13  
Laid out on work table

---

a. Repair. Restitch broken or loose stitching according to original construction details and the specifics in paragraph 2-19, using a heavy-duty sewing machine and size 3 nylon thread, 5 to 8 stitches per inch.

b. Replacement. Replace a damaged locking stow loop by fabricating as follows:

- (1) Remove the original loop by cutting the loop material at a point adjacent to each of the stitch formations securing the original loop webbing length.
- (2) Cut a 12 1/2-inch length of 1 3/4-inch wide, type VIII cotton webbing and wax the ends.
- (3) Using a suitable marking aid, mark the webbing length at a point 2 5/8 inches from one end and 3 1/8 inches from the opposite end.
- (4) Between the two marks made in (3), above, roll the webbing edges in to the center of the webbing width and secure each rolled edge by making a single row of stitching along the inside and outside edges of the rolled webbing, according to the details in A, figure 2-133. Stitching will be made using a heavy-duty sewing machine with size 3 nylon thread, 5 to 8 stitches per inch.
- (5) Place the webbing length in the original locking stow loop location with the running ends positioned over the remaining original loop webbing ends (B, figure 2-133). Secure each of the webbing running ends by stitching a single-X-box-stitch formation, with one-double end, according to original construction details. Stitching will be made using a heavy-duty sewing machine with size 3 nylon thread, 5 to 8 stitches per inch.

2-43. Deployment -Bag Locking Stow Loops (cont).

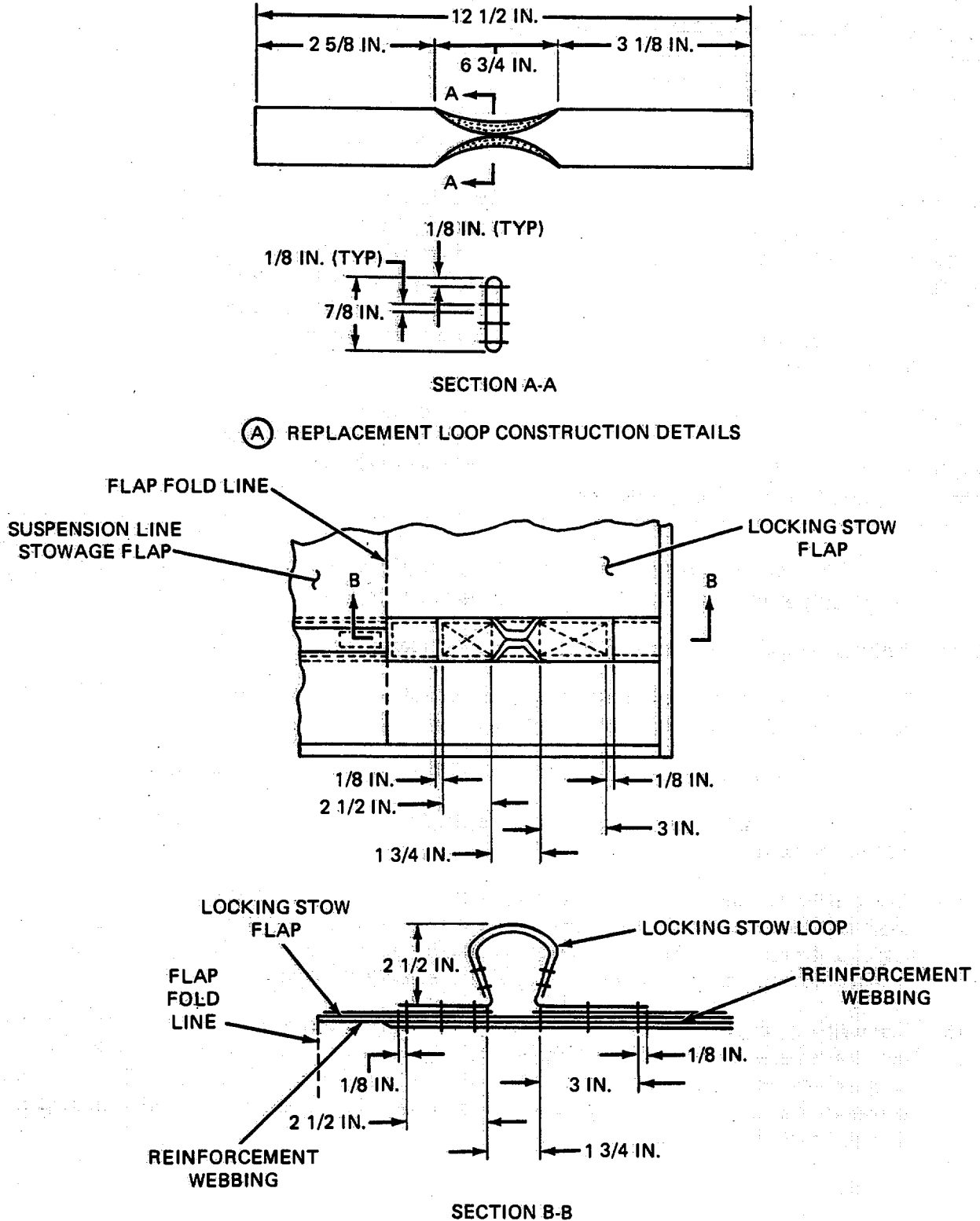


Figure 2-133. Locking Stow Loop Replacement Details.  
 2-180

c. Adjustment. Modifying deployment bag for G-12E

- (1) Enlarge each locking stow loop by cutting 3/4 to 1 1/2 inches of stitching on one end of the loop with your rigger's knife (figure 2-133.1).
- (2) Insure that the stitching is cut only on one end, and that the length of cut stitching does not exceed 1 1/2 inches.
- (3) Stencil "D-BAG FOR G-12E ONLY" on the riser extension protector flap, 3 inches from the edge of open end. Stencil 1 -inch letters with a stencil brush, ink and a stencil marking set (figure 2-133.2).

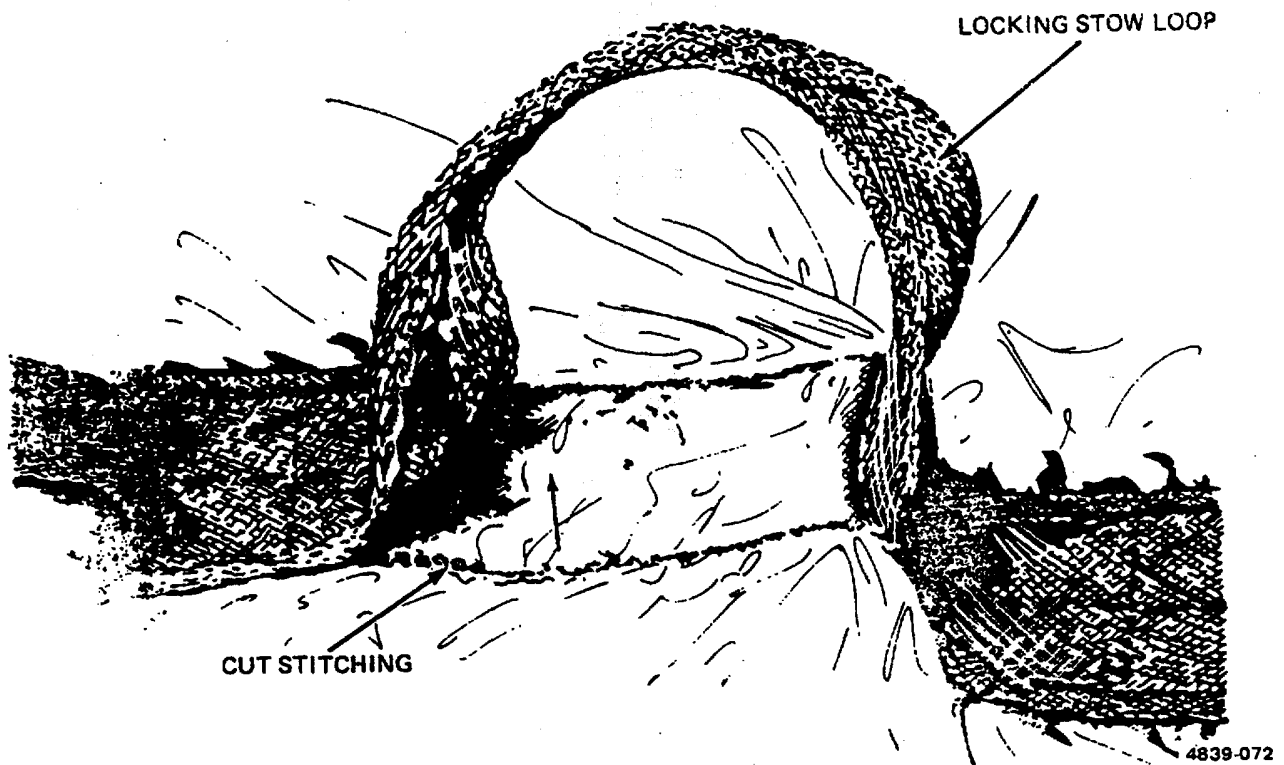


Figure 2-133.1. Enlarging Locking Stow Loops, G-12E Deployment Bag .

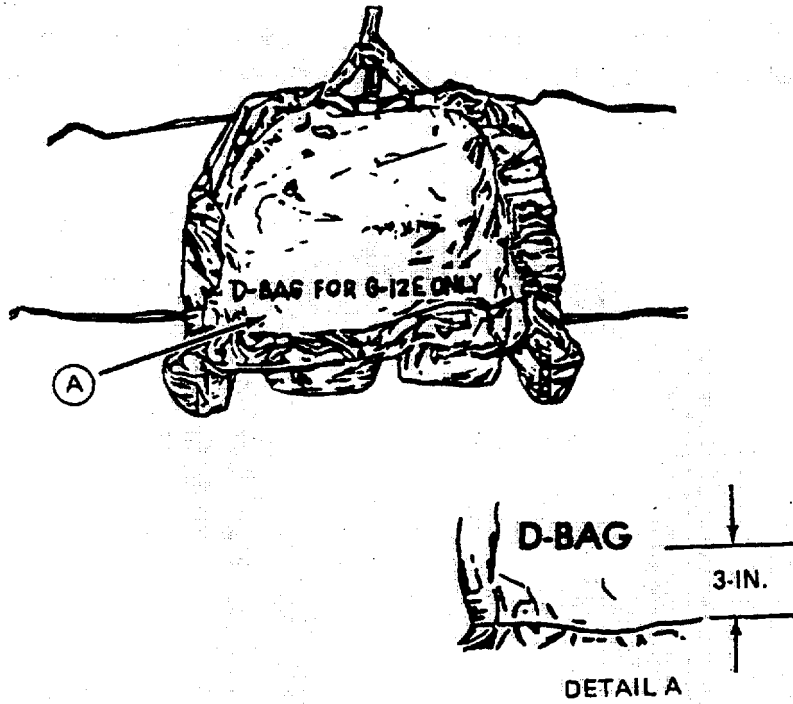


Figure 2-133.2. Marking Modified G-12E Deployment Bag .

2-180.2 Change 3



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## 2-44. Deployment Bag Locking Stow Slot Reinforcement.

---

**This task covers:** Repair

---

**Tools:**

Knife, Item 4, Appendix B  
Knife, Hot Metal, Item 5, Appendix B  
Sewing Machine, Heavy - Duty, Item 18,  
Appendix B  
Yardstick, Item 24, Appendix B

**Equipment Condition:**

Cleaned, paragraph 2-12  
Inspected, paragraphs 2-9, 2-13  
Laid out on work table

**Materials/Parts:**

Thread, Nylon, Size 3, Item 42/43, Appendix D  
Webbing, Nylon, Type XII, 1 23/32-Inch Wide,  
Item 60, Appendix D

---

a. Restitching. Restitch broken or loose stitching according to original construction details and the specifics in paragraph 2-19, using a heavy-duty sewing machine and size 3 nylon thread, 5 to 8 stitches per inch.

b. Splicing. A locking stow slot reinforcement may be spliced an unlimited number of times as follows:

**NOTE**

If a locking stow slot reinforcement is damaged on both sides of the small suspension line stowage flap, a splice will be made on each side of the flap.

- (1) Cut a length of 1 23/32-inch wide, type XII nylon webbing long enough to extend 1 inch beyond each side of the damaged area and sear the ends.
- (2) Center the webbing length over the damaged area and, if required, fold the webbing to conform to original construction details. Secure the full length of the splice material by stitching according to original construction details. Stitching will be made with a heavy-duty sewing machine, using size 3 nylon thread, 5 to 8 stitches per inch.

---

## 2-45. Suspension Line Retaining Strap and Strap Loops.

---

This task covers: a. Repair

b. Replacement

---

### Tools:

Knife, Item 4, Appendix B  
Knife, Hot Metal, Item 5, Appendix B  
Sewing Machine, Heavy - Duty, Item 18,  
Appendix B  
Yardstick, Item 24, Appendix B

### Equipment Condition:

Cleaned, paragraph 2-12  
Inspected, paragraphs 2-9, 2-13  
Laid out on work table

### Materials/Parts:

Marking Aid, Item 25/26, Appendix D  
Thread, Nylon, Size 3, Item 42/43, Appendix D  
Webbing, Nylon, Type XVII, 1-inch Wide, Item 59,  
Appendix D

---

a. Repair. Stitch and restitch broken or loose stitching with size 3 nylon 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 1/2 inch. Restitch directly over the original stitching, following the original stitch pattern as closely as possible. Stitch according to para. 2-19 and table 2-3.

b. Replacement. Replace a damaged suspension line retaining strap or a strap loop by fabricating using the following procedures, as applicable:

### NOTE

If one strap loop on the suspension line retaining strap has previously been replaced or more than one strap loop is damaged, the entire retaining strap will be replaced.

#### (1) *Suspension line retaining strap loop.*

- (a) Remove a damaged strap loop by cutting the loop material at a point adjacent to the stitch formation located on each end of the loop.
- (b) Cut a length of 1-inch wide, type XVII nylon webbing 2 3/4 inches longer than the distance between the inside edges of the two stitch formations which secured the original loop and sear the ends.
- (c) Using a suitable marking aid, mark the webbing length at a point 1 inch from each end.
- (d) Position the webbing length in the original strap loop location with the webbing ends extending over the original loop stitch formations.

- (e) On one end of the webbing length, align the mark made in (c), above, with the inside edge of the adjacent original stitch formation and secure the webbing end by stitching a 1 -inch long single-X-box- stitch formation with two double ends (figure 2-134). Stitching will be made using a heavy-duty sewing machine with size E nylon thread, 5 to 8 stitches per inch.
- (f) Position and secure the opposite webbing end using the procedures in (e), above. Insure that 3/4 inch of slack remains in the length of the loop between each of the webbing end stitch formations.

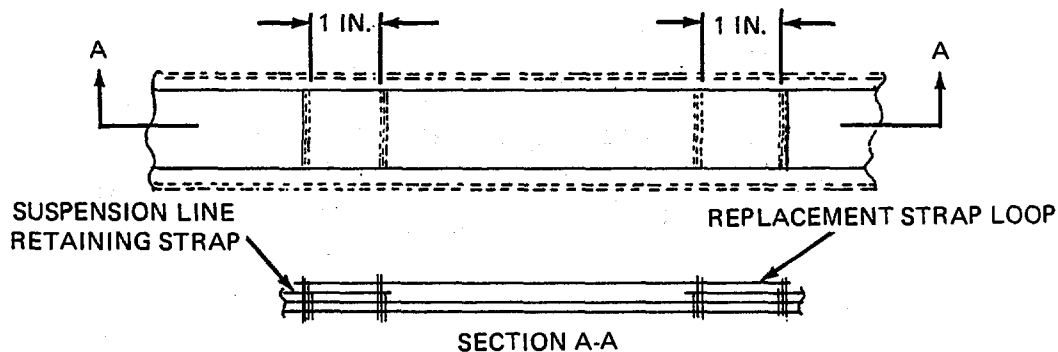


Figure 2-134. Suspension Line Retaining Strap Loop Replacement Details .

(2) Suspension line retaining strap.

- (a) Remove a damaged retaining strap by cutting the strap material at a point adjacent to each of the end stitch formations and also cuffing the three stitch formations securing the strap length to the stowage flap.
- (b) At the locking stow flap fold line, cut a suitable amount of stitching between the locking stow loop webbing and the remaining retaining strap end to expose the edge of the original retaining strap end.
- (c) Cut a 32 3/4-inch length of 1 -inch wide, type XVII nylon webbing and sear the ends.
- (d) Place the webbing length in the original retaining strap location with the ends extending over the remaining original strap ends. One webbing end will be located on top of the stowage flap edge binding and aligned with the flap outer edge.

**2-45. Suspension Line Retaining Strap and Strap Loops (cont).**

- (e) Secure each webbing end by stitching according to original construction details and figure 2-135. Stitching will be made with a heavy-duty sewing machine, using size 3 nylon thread, 5 to 8 stitches per inch.
- (f) Form and secure the loops in the retaining strap by stitching a 1 -inch long single-X-box-stitch formation, with two double ends, at three points according to original constructions details and figure 2-135. Insure that 3/4 inch of slack remains in the length of each loop between each of the stitch formations. Stitching will be made with a heavy-duty sewing machine, using size 3 nylon thread, 5 to 8 stitches per inch.
- (g) Replace the stitching removed in (b), above, by restitching according to original construction details. Stitching will be made with heavy-duty sewing machine, using size 3 nylon thread, 5 to 8 stitches per inch.

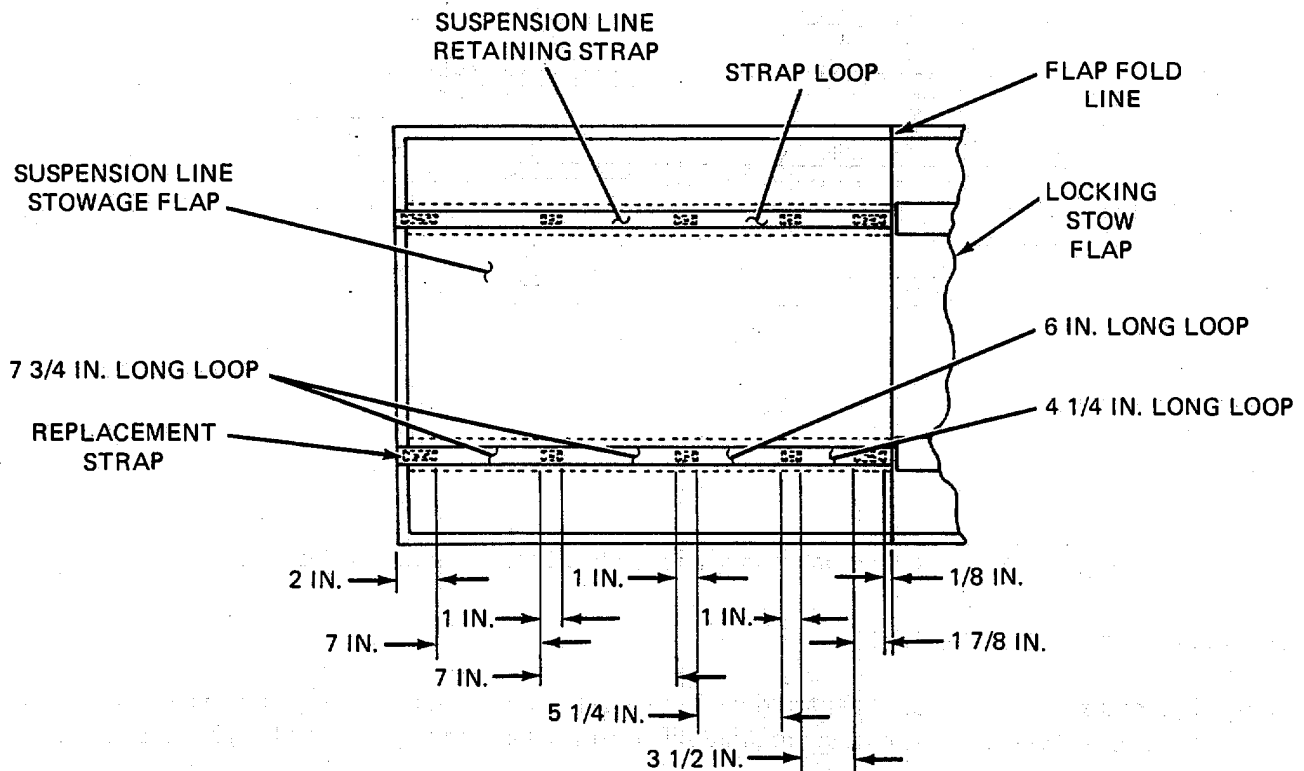


Figure 2-135. Suspension Line Retaining Strap Replacement Details.

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## 2-46. Suspension Line Retaining Strap Reinforcement.

---

**This task covers:**    **Repair**

---

**Tools:**

Knife, Item 4, Appendix B  
Knife, Hot Metal, Item 5, Appendix B  
Sewing Machine, Heavy Duty, Item 18, Appendix B

**Equipment Condition:**

Cleaned, paragraph 2-12  
Inspected, paragraphs 2-9, 2-13  
Laid out on work table

**Materials/Parts:**

Thread, Nylon, Size 3, Item 42/43, Appendix D  
Webbing, Nylon, Type VIII, 1 23/32-inch wide,  
Item 54, Appendix D

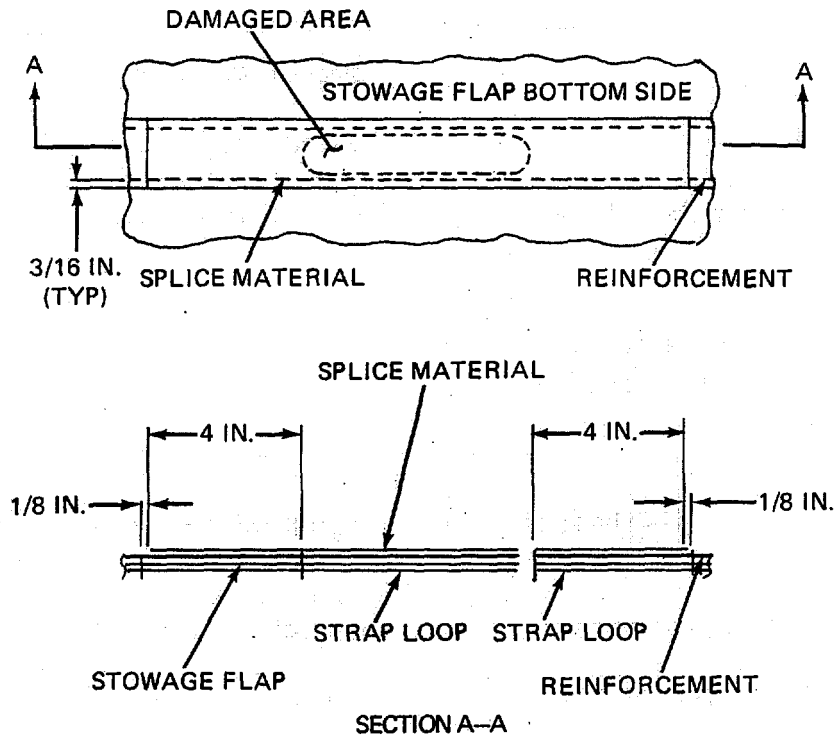
---

a. Restitching. Stitch and restitch broken or loose stitching with size 3 nylon thread which matches the color of the original stitching, when possible. Lock all straight stitching by backstitching at least 1/2 inch. Restitch by over stitching each end of the stitch formation by 1/2 inch. Restitch directly over the original stitching, following the original stitch pattern as closely as possible. Stitch according to para 2-19 and table 2-3.

b Splicing. A suspension line retaining strap reinforcement may be spliced an unlimited number of times as follows:

- (1) On the outside of the suspension line stowage flap, cut and remove all applicable stitching securing the suspension line retaining strap within 5 inches on either side of the damaged area on the suspension line retaining strap reinforcement. The retaining strap reinforcement is located on the opposite side of the flap. Position the retaining strap to one side
- (2) Cut a length of 1 23/32-inch wide, type VIII nylon webbing long enough to extend 4 inches beyond each side of the damaged area and sear the ends.
- (3) Fold the stowage flap back to locate the reinforcement facing out and center the webbing length over the damaged area on the reinforcement.
- (4) Secure each end of the webbing length by stitching a 4-inch long three-point-WW-stitch formation according to figure 2-136. Overstitch each end of the splice material by 1/8 inch. Stitching will be made with a heavy-duty sewing machine using size 3 nylon thread 5 to 8 stitches per inch.
- (5) Turn the stowage flap to place the retaining strap facing out and reposition the retaining strap in the original location. Secure the retaining strap by restitching according to original construction details. Stitching will be made with a heavy-duty sewing machine using size 3 nylon thread, 5 to 8 stitches per inch.

2-46. Suspension Line Retaining Strap Reinforcement (cont).



4839-135

Figure 2-136. Suspension Line Retaining Strap Reinforcement Splicing Details .



2-47. Deployment Bag Cluster Tie Webbing (cont).

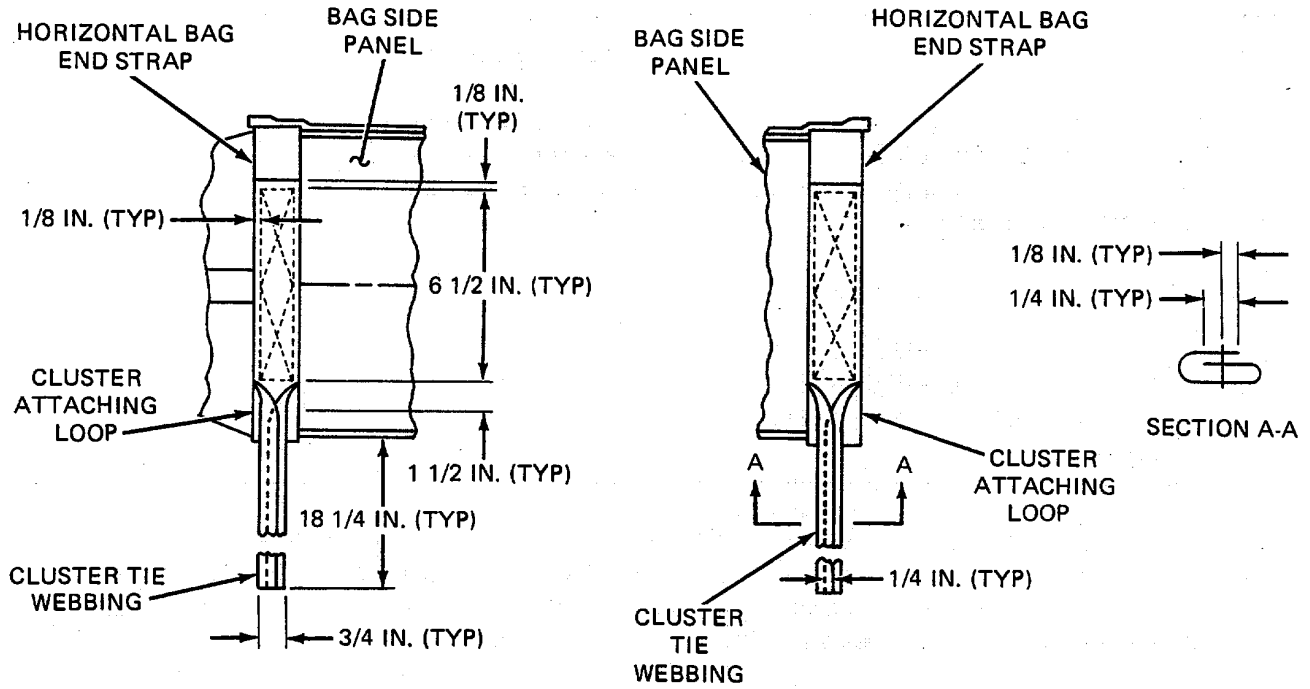


Figure 2-137. Cluster Tie Webbing Replacement Details .





**2-48. Riser Extension Tie Loop and Tie Strap (cont).**

- (d) Center the webbing length in the original tie strap location and secure the webbing at various points by stitching according to original construction details and figure 2-138. Stitching will be made with a heavy-duty sewing machine using size 3 nylon thread, 5 to 8 stitches be inch.
- (e) Restitch each applicable corner of the riser extension cover by stitching according to original construction details. Stitching will be made with a heavy-duty sewing machine using size 3 nylon thread, 5 to 8 stitches be inch.

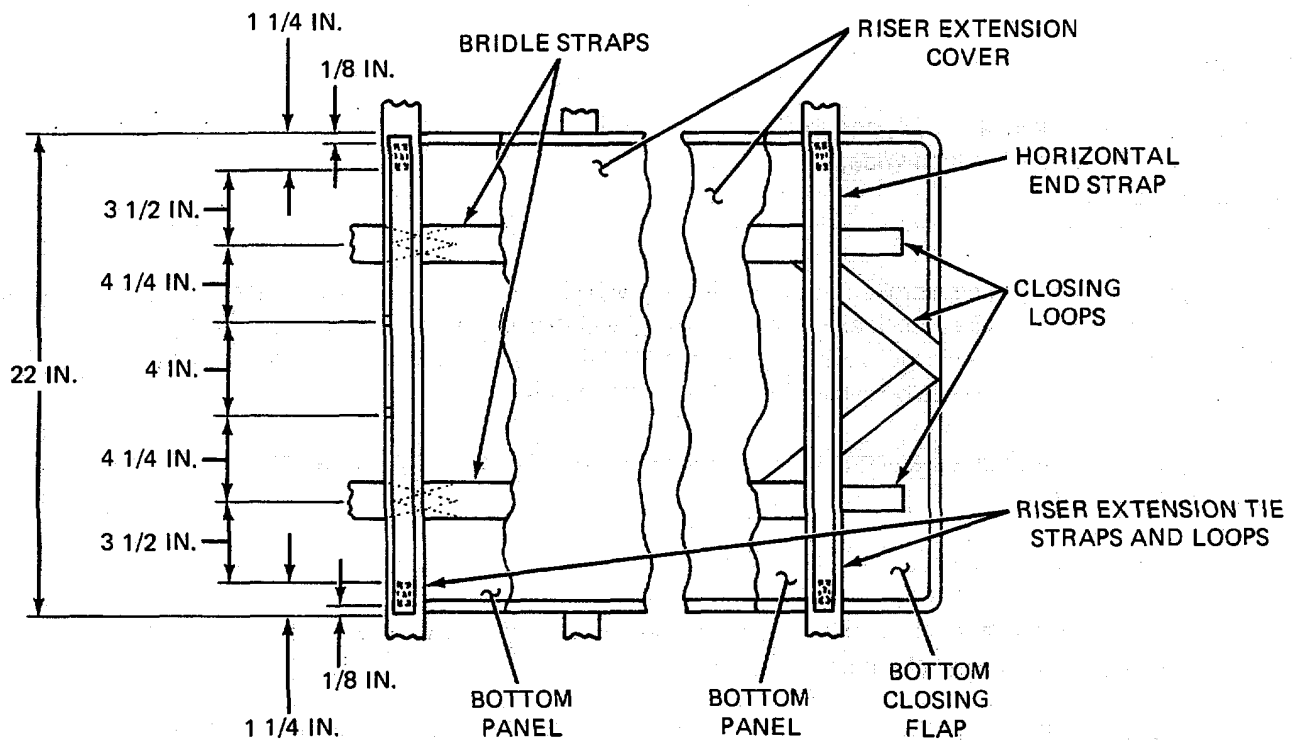


Figure 2-138. Riser Extension Tie Strap Replacement Details .

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## 2-49. Riser Extension Cover End Reinforcement.

---

**This task covers:**    **Repair**

---

**Tools:**

Knife, Item 4, Appendix B  
Knife, Hot Metal, Item 5, Appendix B  
Sewing Machine, Medium-Duty, Item 19, Appendix B  
Yardstick, Item 24, Appendix B

**Equipment Condition:**

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

**Materials/Parts:**

Thread Nylon, Size E, Item 39/40, Appendix D  
Webbing, Nylon, Type 1, 9/16-Inch Wide,  
Item 52/53, Appendix D

---

a. Restitching. Stitch and restitch broken or loose stitching with size 3 nylon 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 1/2 inch. Restitch directly over the original stitching, following the original stitch pattern as closely as possible. Stitch according to para. 2-19 and table 2-3.

b. Splicing. A riser cover end reinforcement may be spliced an unlimited number of times as follows:

- (1) Cut a length of 9/16-inch wide, type I nylon webbing long enough to extend 1 inch beyond each side of the damaged area and sear the ends.
- (2) Center the webbing length over the damaged area and secure the splice by stitching a box-stitch formation, 1/8 inch in from each edge, the full length of the splice material. Stitching will be made with a medium-duty sewing machine using size E nylon thread, 7 to 11 stitches per inch.

---

## 2-50. Vent Line Hole Reinforcement.

---

**This task covers:**    **Repair**

---

**Tools:**

Knife, Item 4, Appendix B  
Knife, Hot Metal, Item 5, Appendix B  
Sewing Machine, Heavy-Duty, Item 18, Appendix B  
Yardstick, Item 24, Appendix B

**Equipment Condition:**

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

**Materials /Parts:**

Thread, Nylon, Size 3, Item 42/43, Appendix D  
Webbing, Nylon, Type XII, 1 23/32-Inch Wide,  
Item 60, Appendix D

---

a. Restitching. Stitch and restitch broken or loose stitching with size 3 nylon 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 1/2 inch. Restitch directly over the original stitching, following the original stitch pattern as closely as possible. Stitch according to para. 2-19 and table 2-3.

b. Splicing. A vent line hole reinforcement may be spliced an unlimited number of times as follows:

**NOTE**

A vent line hole reinforcement is located on both the outside and the inside of the end panel at the bridle end of the bag.

- (1) Cut a length of 1 23/32-inch wide, type XII nylon webbing long enough to extend 1 inch beyond each side of the damaged area and sear the ends.
- (2) Center the webbing length over the damaged area and, if required, fold the webbing to conform to original construction details. Secure the full length of the splice by stitching according to original construction details. Stitching will be made with a medium-duty sewing machine using size E nylon thread, 5 to 8 stitches per inch.

---

**2-51. 111-inch Long Deployment Line.**

---

**This task covers:**    **a. Inspection**            **b. Service**            **c. Repair**            **d. Replacement**

---

**Tools:**

Screwdriver, Flat Tip, Item 22, Appendix B  
Separator, Link, Item 23, Appendix B  
Sewing Machine, Heavy - Duty, Item 18, Appendix B

**Equipment Condition:**

Laid out on work table

**Materials/Parts:**

Thread, Nylon, Size 3, Item 42/43, Appendix D

---

a. Inspection. Inspect a 111-inch long deployment line in accordance with paragraphs 2-9 and 2-13, using the procedures in table 2-1.

b. Service. Service a 111 -inch long deployment line by cleaning the line webbing and the connector link assembly in accordance with paragraph 2-12.

c. Repair.

(1) Restitching. Stitch and restitch broken or loose stitching with size 3 nylon 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 1/2 inch. Restitch directly over the original stitching, following the original stitch pattern as closely as possible. Stitch according to para. 2-19 and table 2-3 using a heavy-duty sewing machine with size 3 nylon thread, 5 to 8 stitches per inch.

(2) Repairing a parachute connector link assembly. Repair a connector link assembly on the 111 -inch long deployment line as prescribed in paragraph 2-32. In addition, and as required, tighten the connector link screws using a suitable size flat-top (common-head) screwdriver.

(3) Replacing a parachute connector link assembly. Replace an unserviceable or missing parachute connector link assembly with a serviceable item from stock.

d. Replacement. Replace an unserviceable 111-inch long deployment line with a serviceable item from stock.

---

## 2-52. 68-Inch Pilot Parachute.

---

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

---

### Tools:

Knife, Item 4, Appendix B  
Knife, Hot Metal, Item 5, Appendix B  
Screwdriver, Item 22, Appendix B  
Sewing Machine, Darning, Item 20, Appendix B  
Sewing Machine, Light-Duty, Item 16, Appendix B  
Sewing Machine, Zig-Zag, Item 17, Appendix B  
Separator, Link, Item 23, Appendix B  
Splicing Aid, Item 25, Appendix B

### Materials/Parts:

Cloth, Nylon, Parachute, Type I, 11 oz.. Item 9,  
Appendix A  
Cloth, Nylon, Parachute, Type II, 1.6 oz, Item 10,  
Appendix D

### Materials/Parts (cont):

Cord, Nylon, Type II, Item 12, Appendix D  
Cord Nylon, Type III, Item 14/15, Appendix D  
Marking Aid, Item 25/26, Appendix D  
Thread, Nylon, Size E, Item 39/40, Appendix D  
Thread, Nylon, Size FF, Item 41, Appendix D  
Webbing Nylon Type 1, 9/16-inch, Item 52/53,  
Appendix D  
Webbing, Nylon, Type IV, 1 -inch, Item 61,  
Appendix D

### Equipment Condition:

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

---

a. Inspection. Inspect a 68-inch-diameter pilot parachute used with G-12D and G-12E 64-foot-diameter cargo parachutes in accordance with paragraphs 2-9 and 2-13, using the procedures in table 2-1.

b. Service. Service a 68-inch-diameter pilot parachute by cleaning and drying the canopy and associated parachute components in accordance with paragraph 2-12.

c. Repair.

### CAUTION

When performing a repair on a 68-inch-diameter pilot-parachute canopy which requires the cutting of stitching of an original part, insure that adjacent canopy material is not damaged during the cuffing process.

(1) *Parachute connector link assembly.*

(a) Repair. Repair a parachute connector link assembly as outlined in paragraph 2-32. As required, tighten the connector link screws using a suitable size flat-tip (common-head) screwdriver.

(b) Replacement. Replace an unserviceable parachute connector link assembly with a serviceable item from stock, using the procedures in paragraph 2-32.

(2) *Canopy panel.*

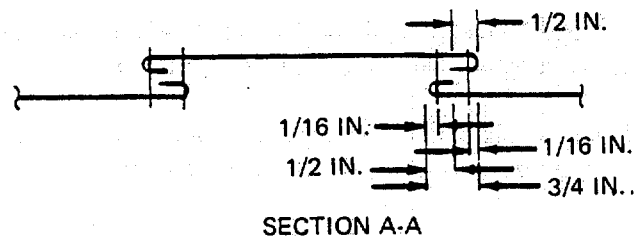
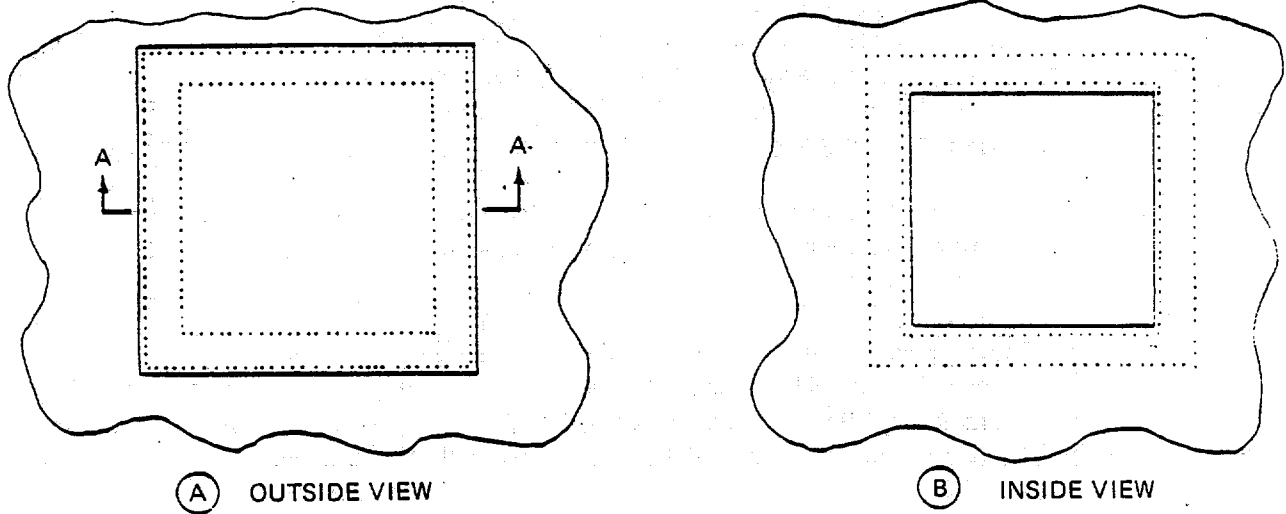
(a) *Restitching.* Stitch and restitch with size E nylon thread which matches the color of the original stitching, when possible. Lock all straight stitching by backstitching at least 1/2 inch. Restitch by overstitching each end of the stitch formation by 1/2 inch. Restitch directly over the original stitching, following the original stitch pattern as closely as possible. Stitching will be in accordance with paragraph 2-19 and table 2-3.

(b) *Darning.* Darn a hole or tear which does not exceed 3/4 inch in length or diameter using the procedures in paragraph 2-19 and size E nylon thread. A canopy panel may be darned a maximum of three times.

(c) *Patching.* Patch a hole or tear which exceeds 3/4 inch in length or diameter using the details in figure 2-139 and 2-140. Patch material will be either type 11 .1-ounce nylon cloth or type II 1.6-ounce nylon cloth, according to original panel material. The 68-inch-diameter pilot chute canopy is limited to three patches for the entire canopy and the size of each patch is limited to the size of the panel being patched. Apply a patch as follows:

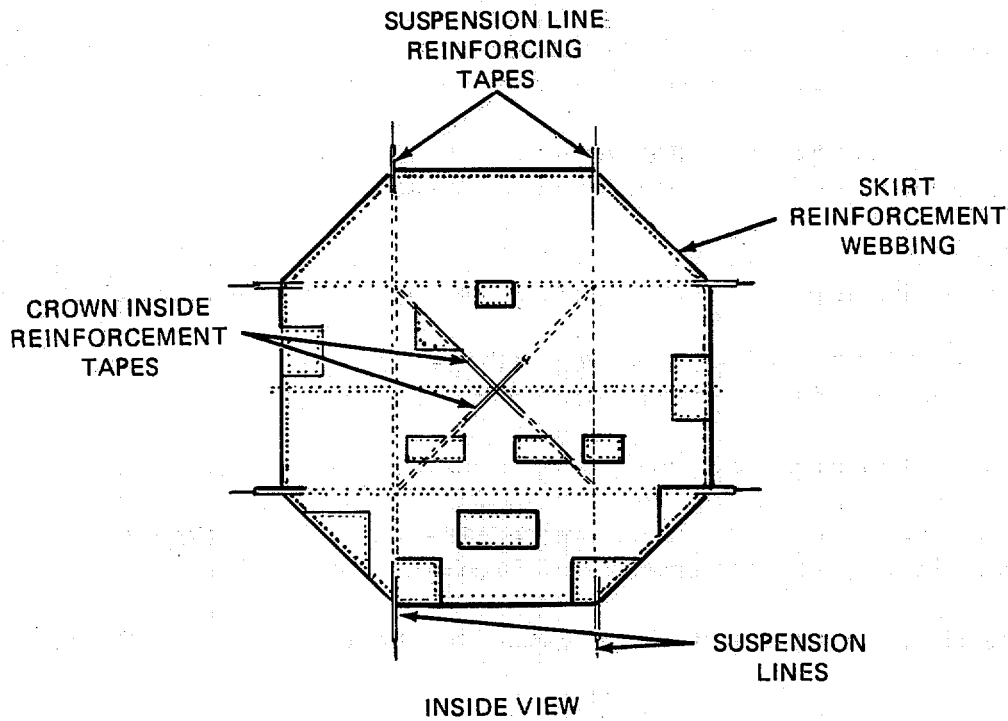
- 1 Place the canopy on a repair table, smooth the fabric around the damaged area and secure the canopy to the table with pushpins. Do not pin the damaged area.
- 2 Using an authorized marking aid of contrasting color, mark a square or rectangle around the area to be patched and insure that one side of the marked square is parallel to the warp or filling of the material.
- 3 Cut the damaged area fabric along the lines made in 2, above. Further cut the fabric diagonally at each corner to allow a 1/2-inch foldback in the raw edges.
- 4 Make a 1/2-inch foldback on each raw edge. Pin and baste each foldback to complete the prepared hole. Basting will be performed using the procedures in paragraph 2-19a.
- 5 Using the same type material as original construction, mark and cut a patch 2 1/2-inches wider and longer than the inside measurements of the prepared hole.
- 6 Center the patch material over the prepared hole and insure the warp or filling of each patch material matches the warp or filling of the fabric being patched. Pin the patch material in position.
- 7 Make a 1/2-inch fold under on each edge of the patch material and baste the patch to the prepared area. Basting will be performed using procedures in paragraph 2-19a.
- 8 Remove the pushpins securing the canopy to the repair table and secure the patch by stitching using the applicable details in figure 2-139 and paragraph 2-19b. Make the first row of stitching completely around the patch. Turn the canopy over and make a second row of stitching around the prepared hole. Stitching will be performed in accordance with paragraph 2-19b.
- 9 If applicable, restencil information data according to procedures in paragraph 2-19.

2-52. 68-Inch Pilot Parachute (cont).



4839-140

Figure 2-139. Basic Patch Application.



4839-141

Figure 2-140. Typical Canopy Panel Patches.



(3) Crown inside reinforcement tape.

(a) *Restitching.* Stitch and restitch with size E nylon 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 1/2 inch. Restitch directly over the original stitching, following the original stitch pattern as closely as possible. Stitching will be in accordance with paragraph 2-19 and table 2-3.

(b) *Replacement* Replace a damaged crown inside reinforcement tape by fabricating as follows:

- 1 Beginning at the canopy crown attaching loops on the canopy outside, cut 6 inches of stitching down each of the crown outside reinforcing tapes.
- 2 Invert the canopy to locate the two crown inside reinforcement tapes to the outside.
- 3 Remove the damaged inside tape by cuffing and removing the stitching which secures the tape to the canopy.
- 4 Cut a 1 2-inch-length of 9/16-inch wide, type I nylon webbing and sear the ends.
- 5 Place the webbing length in the original reinforcement tape location and secure the webbing by stitching a 12-inch long row of stitching, 1/8 inch in, along each edge (figure 2-141). Insure the two crown outside reinforcing tapes are laid aside prior to stitching the webbing length. Stitching will be made with a light-duty sewing machine, using size E nylon tape, 7 to 11 stitches per inch.

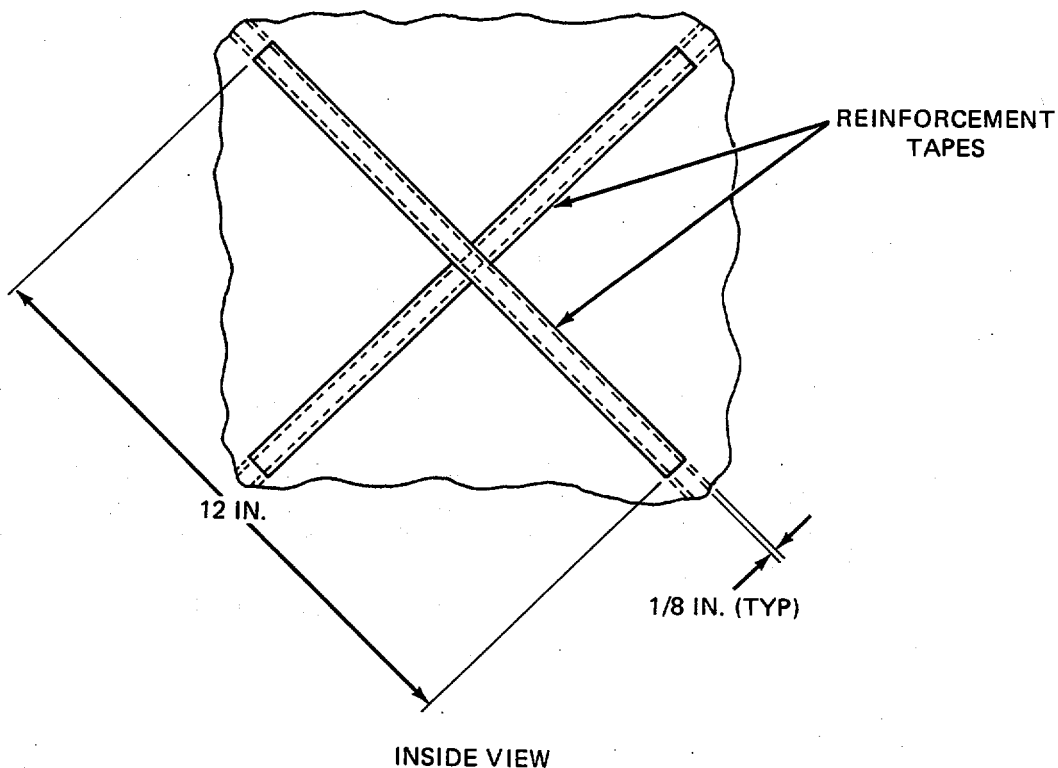


Figure 2-141. Crown Inside Reinforcement Tape Replacement Details.

4839-142

**2-52. 68-Inch Pilot Parachute (cont).**

- 6 Reinvert the canopy to locate the inside reinforcement tapes to the inside.
  - 7 Reposition each of the crown outside reinforcing tapes in the original location and secure the tapes by stitching according to original construction details using the specifics in table 2-3. Stitching will be made with a light-duty sewing machine using size 3 nylon thread, 7 to 11 stitches per inch.
- (4) *Canopy reinforcing tape.*
- (a) *Restitching.* Stitch and restitch with size E nylon 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 1/2 inch. Restitch directly over the original stitching, following the original stitch pattern as closely as possible. Stitching will be in accordance with paragraph 2-19 and table 2-3.
  - (b) *Splicing.* A canopy reinforcing tape may be spliced an unlimited number of times as follows:
    - 1 Cut a length of 9/16-inch wide, type I nylon webbing long enough to extend 2 inches beyond each side of the damaged area and sear the ends.
    - 2 Center the webbing length over the damaged area and secure the splice by stitching a box-stitch formation, 1/8 inch in from each edge, the full length of the splice material. Stitching will be made with a light-duty sewing machine using size E nylon thread, 7 to 11 stitches per inch.
- (5) *Crown attaching loop.* A damaged crown attaching loop will be replaced by fabricating as follows:
- (a) Cut the damaged loop at the center and, if applicable, pass the cut ends of the loop under the other original loop from opposite directions.
  - (b) Overlap the cut loop ends and secure the overlapped ends to the center of the canopy crown by stitching a 3-inch long row of stitching, 1/8 inch in, along each edge. Stitching will be made with a light-duty sewing machine using size E nylon thread, 7 to 11 stitches per inch.
  - (c) Cut a 12 7/8-inch length of 9/16-inch wide, type I nylon webbing and sear the ends.
  - (d) Using a suitable marking aid, mark the webbing length at a point 5 inches from each end.
  - (e) Center the webbing length over the original loop location on the canopy outside and align the ends with the ends of the crown inside reinforcement tape. Secure each end of the webbing length by stitching a 5-inch long row of stitching, 1/8-inch in, along each edge (figure 2-142). Insure a 2-inch long, 7/8-inch radius loop is formed at the center of the webbing length, between the 5-inch marks. Stitching will be made with a light-duty sewing machine using size E nylon thread, 7 to 11 stitches per inch.

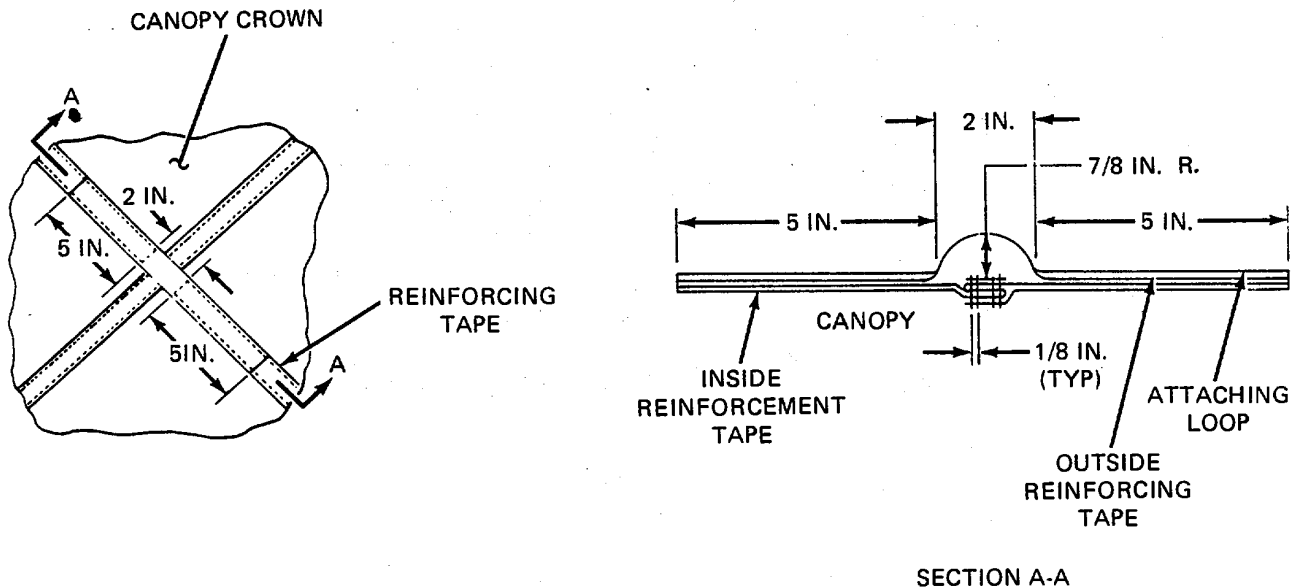


Figure 2-142. Canopy Crown Attaching Loop Replacement Details.

4839-143

(6) Skirt reinforcement webbing (lower lateral band).

- (a) *Restitching.* Stitch and restitch with size E nylon 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 1/2 inch. Restitch directly over the original stitching, following the original stitch pattern as closely as possible. Stitching will be in accordance with paragraph 2-19 and table 2-3.
- (b) *Splicing.* The skirt reinforcement webbing (lower lateral band) is limited to three splices. In addition, a splice will not extend across any suspension line(s) and a splice will not be performed if less than 4 inches of undamaged material remains on each side of the damaged area. Splice a damaged skirt reinforcement webbing (lower lateral band) as follows:
  - 1 Cut a length of 1 -inch wide, type IV nylon webbing long enough to extend 3 1/2 inches beyond each side of the damaged area and sear the ends.
  - 2 Center the webbing length over the damaged area on the canopy outside and secure the splice by stitching four continuous rows along the full length of the splice material (figure 2-143). Each row of stitching will be started at a point 1/2 inch from one end of the splice material and finished 1/2 inch beyond the opposite end of the splice material. Stitching will be made with a light-duty sewing machine using size E nylon thread, 7 to 11 stitches per inch.

2-52. 68-Inch Pilot Parachute (cont).

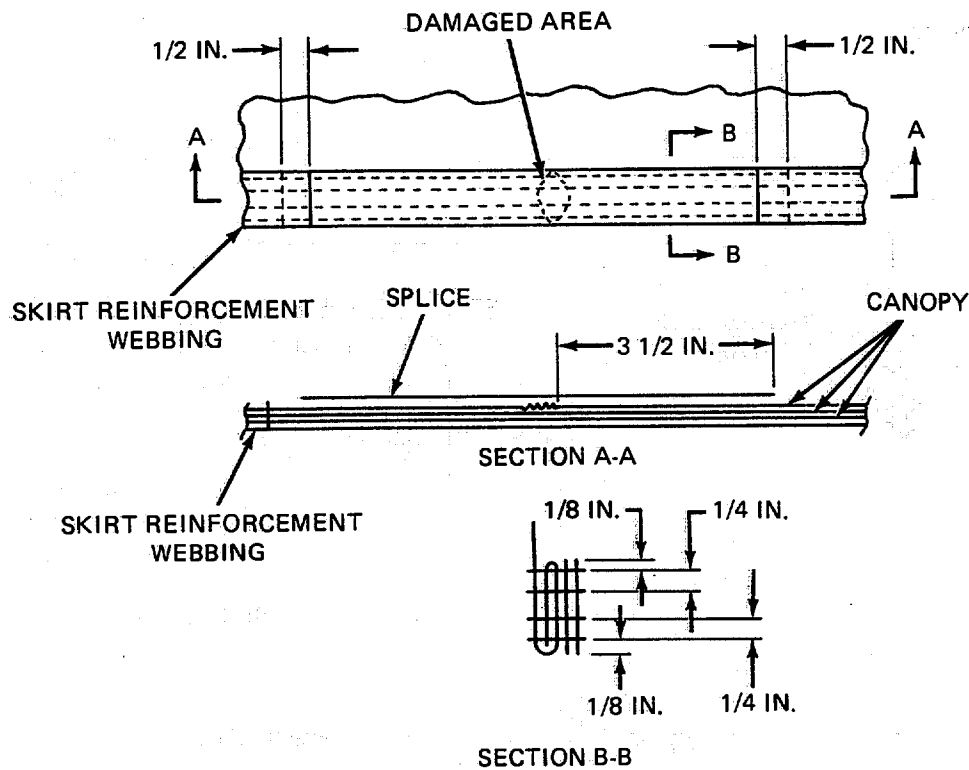
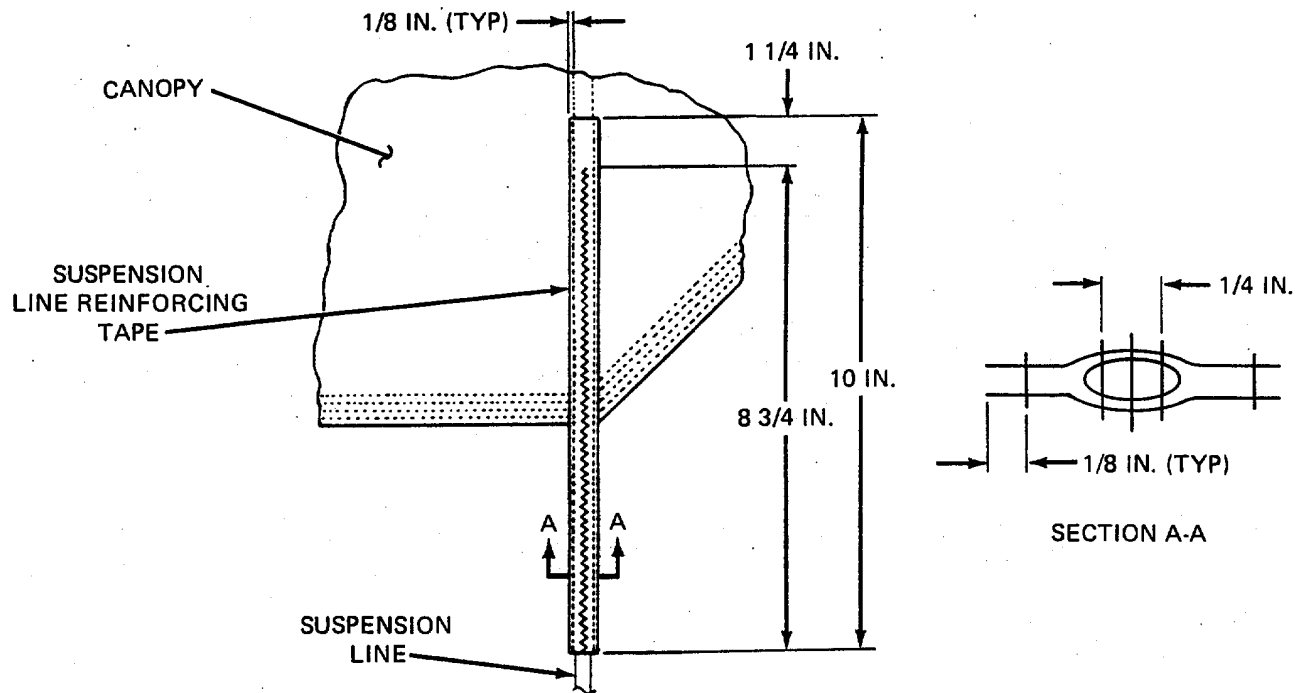


Figure 2-143. Skirt Reinforcement Webbing Splice Details.

4839-144

(7) Suspension line reinforcing tape.

- (a) *Restitching.* Stitch and restitch with size E nylon 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 1/2 inch. Restitch directly over the original stitching, following the original stitch pattern as closely as possible. Stitching will be in accordance with paragraph 2-19 and table 2-3.
- (b) *Replacement* There are two reinforcing tape lengths at each point of suspension line attachment on the canopy skirt. Both tape lengths will be replaced whenever damage is incurred on either one or both tapes. Replace the reinforcing tapes by fabricating as follows:
  - 1 Remove the original suspension line reinforcing tapes by cutting the stitching which secures the tapes to the inside and the outside of the skirt.
  - 2 Cut two 10-inch lengths of 9/16-inch wide, type I nylon webbing and sear the ends.
  - 3 Position the webbing lengths in the location of the original reinforcing tapes. Secure the replacement reinforcing tapes by stitching a 1/4-inch wide by 8 3/4-inch long row of double-throw zigzag stitching according to the details in figure 2-144. Further make a single row of stitching, 1/8-inch in, along each side edge to a point 1/2 inch above the upper edges of the reinforcing tapes. Stitching will be made with a light-duty sewing machine using size E nylon tape, 7 to 11 stitches per inch and a zigzag sewing machine using size FF nylon tape, 7 to 11 stitches per inch.



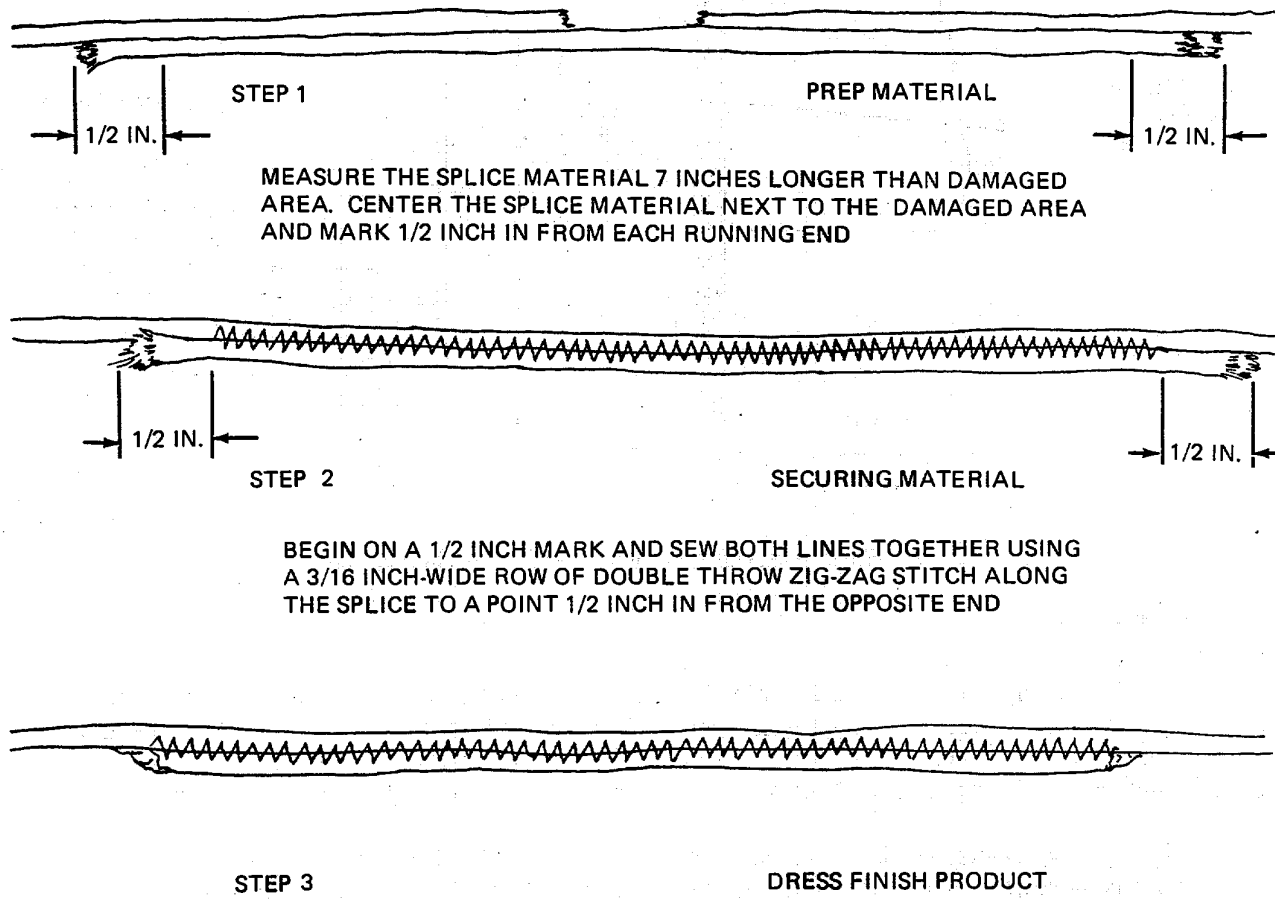
4839-145

Figure 2-144. Suspension Line Reinforcement Tape Replacement Details.

(8) Suspension line.

- (a) *Restitching.* Stitch and restitch with size E nylon thread which matches the color of the original stitching when possible. Lock ail straight stitching by backstitching at least 1/2 inch. Restitch by overstitching each end of the stitch formation by 1/2 inch. Restitch directly over the original stitching, following the original stitch pattern as closely as possible. Stitching will be in accordance with paragraph 2-19 and table 2-3.
- (b) *Splicing.* A suspension line which is constructed of type III nylon cord will be limited to one splice. In addition, a type III nylon cord suspension line can be spliced only if one side of the cord casing is damaged and none of the core threads are severed. Splice a Type III nylon cord line as follows:
- 1 Cut a length of type III nylon cord 8-1/2 inches longer than the damaged area. Center the cord length alongside of the damaged area.
  - 2 Beginning at a point 1/2 inch in from one end of the splice material, secure the splice material to the original line by stitching a 3/16 inch wide row of double throw zig-zag stitching along the splice to a point 1/2 inch in from the opposite end of the splice material. Trim the ends of the splice material as close as possible to stitching and wax (figure 2-145). Stitching will be made with a zig-zag sewing machine using size E nylon thread, 7 to 11 stitches per inch.

2-52. 68-Inch Pilot Parachute (cont).



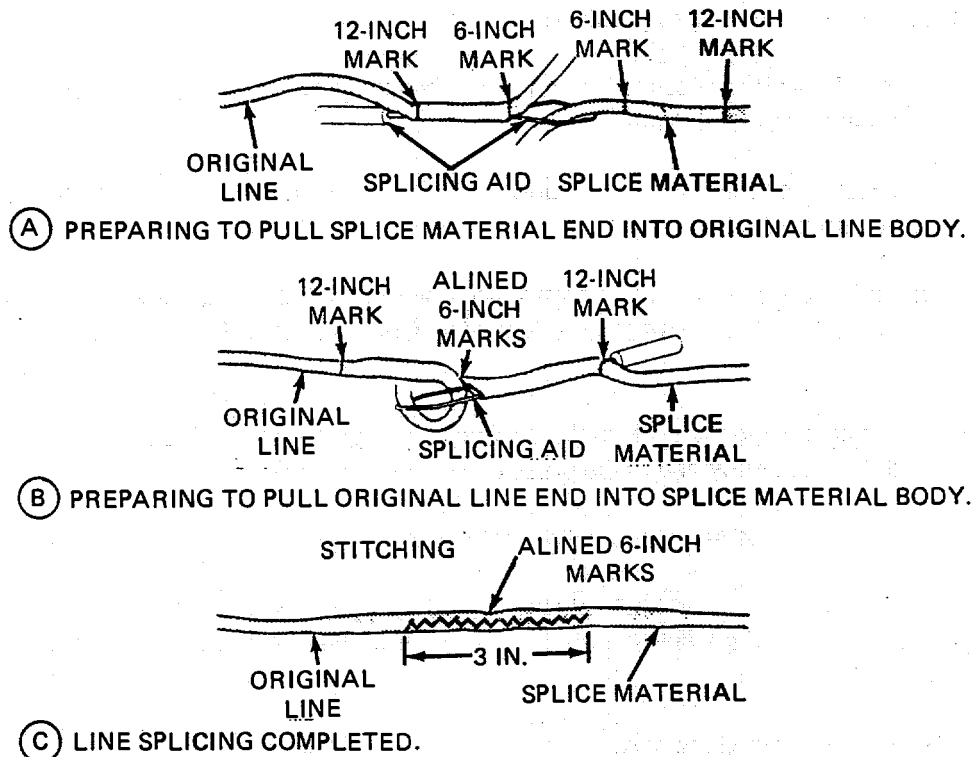
4839-146

Figure 2-145. Splicing a Type III Nylon Cord Suspension Line.

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- (c) *Splicing a type II coreless nylon cord suspension line.* A suspension line made from Type II coreless nylon cord will be spliced as follows:
- 1 Cut and remove the damaged portion of the line.
  - 2 Cut a length of type II coreless nylon cord 24 inches longer than the damaged portion removed in 1 above, for use as splice material.
  - 3 Taper-cut each end of the cord length and the ends of the original line from which the damaged portion was removed.
  - 4 Using an authorized marking aid of contrasting color, mark the splice material at points 6 and 12 inches from each end. Also mark the original line length at points 6 and 12 inches from each cut end.
  - 5 Insert a splicing aid into the body of the original line length at one 12-inch mark. Work the splicing aid through the cord body and to the outside at the 6-inch mark.
  - 6 Thread and secure one end of the splice material to the splicing aid (A, figure 2-146).
  - 7 Pull the threaded splicing aid back into the line and back through the line body until the 6-inch mark on the attached end of the splice material is aligned with the 6-inch mark on the original line end being spliced.
  - 8 Hold the original line and the splice material at the aligned 6-inch marks and continue pulling the splicing aid until the attached splice material end protrudes from the line body at the 12-inch mark, the point of original splicing aid insertion. Remove the attached splice material end from the splicing aid.
  - 9 While holding the splice at the aligned 6-inch marks, stretch the original line to allow the protruding splice material end to recede into the line body.
  - 10 Insert the splicing aid into the splice material body at the 12-inch mark nearest the aligned 6-inch marks. Work the splicing aid through the body of the splice material and to the outside at the aligned 6-inch marks.
  - 11 Attach the adjacent tapered line end to the splicing aid (B, figure 2-146) and pull the splicing aid back into the splice material body.
  - 12 Pull the splicing aid back through the splice material until the attached line end protrudes from the 12-inch mark, the point of splicing aid insertion. Remove the attached line end from the splicing aid.
  - 13 Grasp the splice material free end and the original line, and stretch the material to allow the protruding line end to recede into the body of the splice material.
  - 14 Using the procedures in 5 through 11, above, splice the free end of the splice material to the remaining cut end of the original line.
  - 15 Secure each end of the line splice by stitching across each set of aligned 6-inch marks (C, figure 2-146). Stitching will be made with a light-duty sewing machine using size E nylon thread, 7 to 11 stitches per inch.

2-52. 68-Inch Pilot Parachute (cont).



4839-147

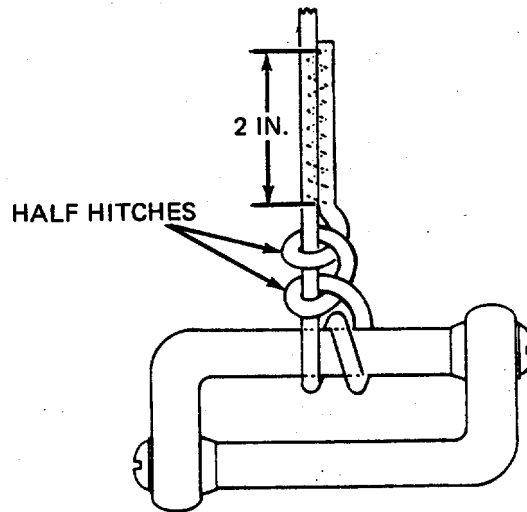
Figure 2-146. Making a Line Splice with Type II coreless Nylon Cord.

- (d) Replacing a type III nylon cord suspension line. Replace an unserviceable type III nylon cord suspension line by fabricating using the following procedures:
- 1 Place the canopy in proper layout on a repair table and trace the damaged suspension line from the canopy skirt to the connector link assembly.
  - 2 Remove the affected suspension line from the canopy skirt by cutting and removing the stitching which secures the line between the canopy reinforcing tape and the suspension line reinforcing tape. Further cut and remove the stitching which secures the upper end of the suspension line to the canopy reinforcing tape on the outside of the canopy skirt and pull the line end down through the hole in the canopy reinforcing tape.
  - 3 Cut an 80-inch length of type III nylon cord and sear the ends.
  - 4 Pass one end of the cord length up between the lower ends of the canopy reinforcing tape and the suspension line reinforcing tape, up through the hole in the lower end of the canopy reinforcing tape and to the outside, and position the cord end in the original suspension line upper end location.
  - 5 Temporarily secure the suspension line between the lower ends of the canopy reinforcing tape and the suspension line reinforcing tape by handtacking. Temporary tacking will be performed as outlined in paragraph 2-19a.



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- 6 Secure the upper end of the suspension line to the canopy skirt by stitching according to the original construction details. Stitching will be made with a light-duty sewing machine using size E nylon thread, 7 to 11 stitches per inch.
- 7 Trace the cord length running end with an adjacent suspension line under equal tension from the canopy skirt to the connector link assembly at the suspension line lower end. Using a suitable marking aid, mark the cord running end at a point alined with the inside edge of the connector link bar to which the suspension line group is attached.
- 8 Cut and remove the damaged suspension line from the connector link assembly.
- 9 Aline the mark made on the cord length running end with the inside edge of the connector link bar at the location of the original suspension line. Secure the cord running end to the bar by passing the end around the bar twice and making two half hitches (figure 2-147). Draw the half hitch knots tight against the top of the connector link bar.



4839-148

*Figure 2-147. Method of Attaching a Type III Nylon Cord Suspension Line to a Connector Link.*

**NOTE**

The knot formation in figure 2-147 is shown loose for clarity only. Insure the knot is drawn tight before stitching.

**2-52. 68-Inch Pilot Parachute (cont).**

10 Position the tie running end against the suspension line length and beginning at a point 2 inches above the formed knots, secure the tie running end to the suspension line by stitching a 3/16-inch wide by 2-inch long row of double-throw zig-zag stitching toward the secured knots. Finish the stitch row as close as possible to the knots. Stitching will be made with a light-duty sewing machine using size E nylon thread, 7 to 11 stitches per inch. Trim the remaining cord loose end to a point immediately adjacent to the stitch row and lightly sear the exposed cord end.

(e) *Replacing a type II coreless nylon cord suspension line.* Replace an unserviceable type II coreless nylon cord suspension line by fabricating using the following procedures:

1 Using the procedures in paragraphs (d) 1 through a, above, type II coreless nylon cord, and a light-duty sewing machine using size E nylon thread, 7 to 11 stitches per inch, attach a replacement suspension line to the canopy skirt and prepare to attach the opposite line end to the original connector link assembly.

2 At a point 9 1/8 inches below the mark previously made on the cord running end, cut and remove any excess cord length. Taper-cut the cord end by 1/2 inch.

3 Using a suitable marking aid, mark the cord length at point 7 1/8, 9 1/8, and 16 1/4 inches from the cord tapered end.

4 Aline the first mark on the cord length with the inside edge of the connector link bar at the location of the original suspension line and pass the tapered running end around the connector link bar twice (figure 2-148).

**NOTE**

The line attachment to the connector link in figure 2-148 is shown loose for clarity only. The loop splice will be tight against the connector link bar before stitching.

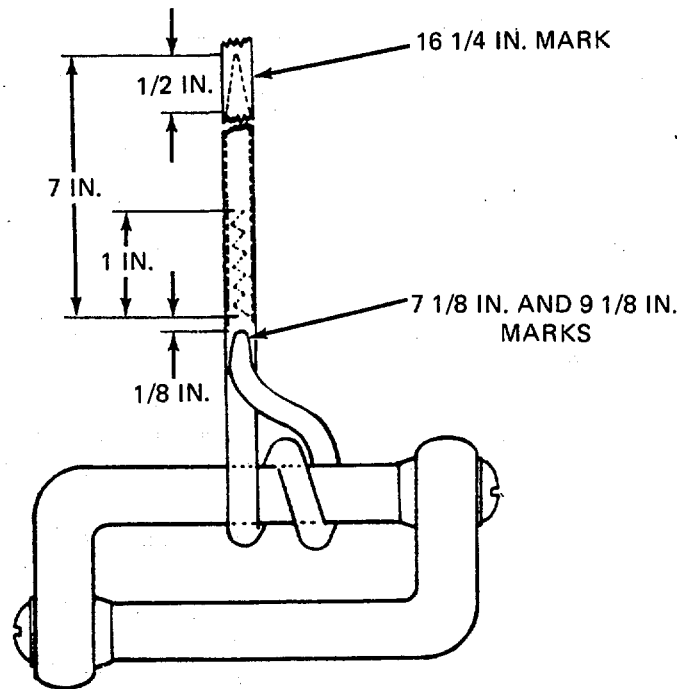
5 Insert a suitable splicing aid into the cord casing at the 16 1/4-inch mark and work the splicing aid through the cord casing to the outside at the 9 1/8-inch mark.

6 Attach the cord tapered end to the splicing aid and pull the splicing aid back through the cord casing until the 7 1/8- and 8 1/8-inch marks are alined.

7 Hold the alined marks together and continue pulling the splicing aid back through the cord casing to the outside at the 16 1/4-inch mark, allowing only the cord tapered end to protrude from the cord casing.

8 Remove the cord tapered end from the splicing aid. While holding the alined marks together, stretch the cord length to permit the tapered end to recede into the cord casing.

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Figure 2-148. Method of Attaching a Type 11 Coreless Nylon Cord Suspension Line to a Connector Link.

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## 2-53. Static Line.

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**This task covers:**

**a. Repair**

**b. Replacement**

---

*Tools:*

Knife, Item 4, Appendix B  
Knife, Hot Metal, Item 5, Appendix B  
Pot, Melting, Item 13, Appendix B  
Sewing Machine, Darning Item 20, Appendix B  
Sewing Machine, Light Duty, Item 16, Appendix B  
Sewing Machine, Heavy Duty, Item 18,  
Appendix B  
Sewing Machine, Zig-Zag, Item 17, Appendix B  
Splicing Aid, Item 25, Appendix B

*Materials/Parts:*

Beeswax, Item 1, Appendix D  
Cord, Nylon, Type IV, Item 16, Appendix D  
Cord, Nylon, Type I, Item 13, Appendix D

*Materials/Parts (cont):*

Marking Aid, Item 26, Appendix D  
Thread, Nylon, Size 3, Item 42/43, Appendix D  
Thread, Nylon, Size E, Item 39/40, Appendix D  
Tape, Cotton, 3/4 inch wide, Type III, Item 30,  
Appendix D  
Wax, Paraffin, Item 47, Appendix D  
Webbing, Cotton, Type II, Item 49, Appendix D  
Wire, Item 62, Appendix D

*Equipment Condition:*

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

---

a. Repair.

### CAUTION

When performing a repair on a 15-foot long static line which requires the cutting or stitching of an original part, insure that adjacent static line material is not damaged during the cutting process.

(1) *Edge binding.*

(a) *Restitching.* Stitch and restitch with size E nylon 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 1/2 inch. Restitch directly over the original stitching, following the original stitch pattern as closely as possible. Stitching will be in accordance with paragraph 2-19 and table 2-3.

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

1 Cut a length of 3/4-inch wide type III cotton tape 2 inches longer than the damaged area.

2 Make 1/2-inch fold under on each end of tape length.

3 Center and fold the tape lengthwise over the damaged area. Secure the splice by making two rows of stitching over the original stitching, the full length of the splice, to a point 1/2 inch beyond each end of the splice material according to the details in figure 2-149. Use a light-duty sewing machine and size E nylon thread. Stitching will be 7 to 11 stitches per inch.

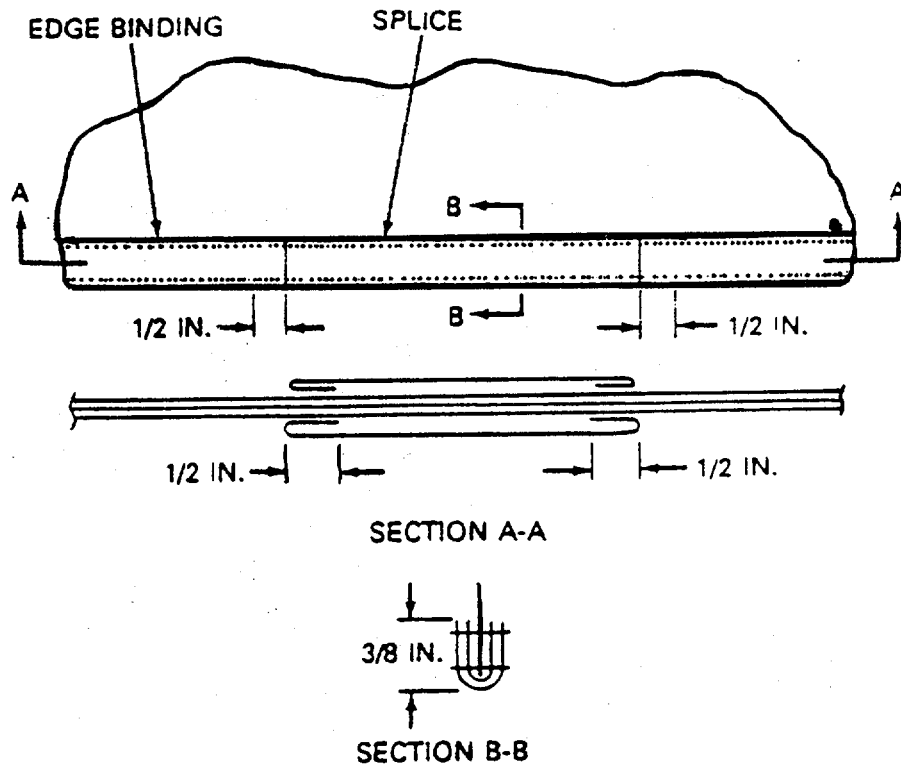


Figure 2-149. Bridle Bag Edge Binding Splicing Details.

4839-150

(2) Bag panel

(a) *Darning.* Darn a hole or tear which does not exceed 3/4 inch in length or diameter using the procedures in paragraph 2-19c, using a darning sewing machine and size E nylon thread. A bag panel may be darned a maximum of three times.

(b) *Restencil.* As required, restencil identification marks using procedures in paragraph 2-21.

(3) Riser clevis.

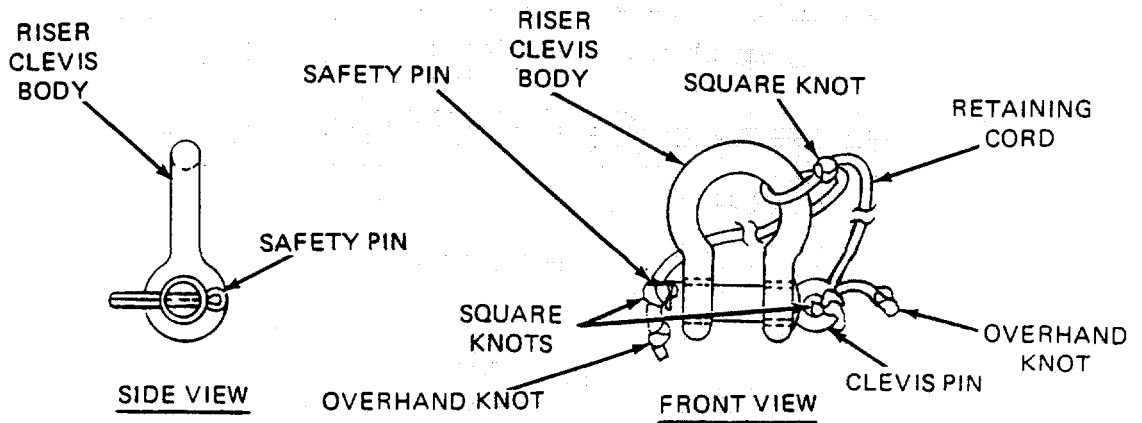
(a) *Repair.* Repair a static line riser clevis using the following procedures:

1 Replacing a clevis pin retaining cord.

- a Cut and remove original clevis pin retaining cord from riser body, clevis pin and safety pin (figure 2-150).
- b Cut a 16-inch length of type I nylon cord and sear ends.
- c Pass one half of cord length around riser clevis body, join ends and make a square knot snug against clevis body (figure 2-150).
- d Pass one tie running end through the eye of the clevis pin and secure the tie end snug with a square knot, leaving a 3/8-inch long running end.

**2-53. Static Line (cont).**

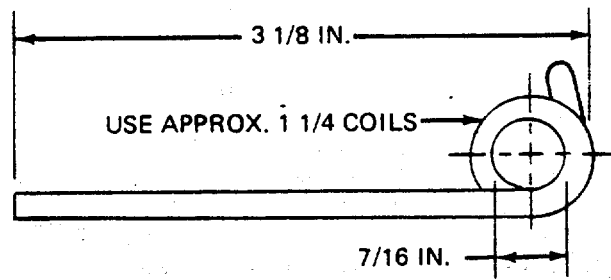
- e Make an overhand knot in the remaining running end at a point within 3/16-inch of the square knot.
- f Secure opposite cord running end to the eye of safety pin using procedures in (d) and (e), above.



*Figure 2-150. Replacing Clevis Pin Retaining Cord.*

2 Replacing a clevis safety pin.

- a Remove original safety pin from clevis assembly by untying overhand knot and square knot which secure pin to clevis.
  - b Cut a 5-inch length of 0.080-inch diameter CRS wire.
  - c Using cut wire length, form a 3 1/8-inch long riser clevis safety pin (figure 2-151).
  - d Reinstall safety pin in clevis pin.
  - e Pass the tie running end through eye of safety pin. Make an overhand knot in running end (figure 2-1 50).
  - f Secure tie end against safety pin with a square knot, leaving a 3/8-inch running end.
- (b) *Replacement.* Replace an unserviceable or missing riser clevis with a serviceable item from stock.



4839-152

Figure 2-151. Forming Riser Clevis Safety Pin.

(4) *Bridle line.*

(a) *Restitching.* Stitch and restitch broken or loose stitching using a zig-zag sewing machine with size E nylon thread which matches the color of the original stitching, when possible. Restitch by overstitching each end of the stitch formation by 1/2 inch. Restitch directly over the original stitching, following the original stitch pattern as closely as possible.

(b) *Replacement.* Replace an unserviceable bridle line by fabricating as follows:

- 1 Remove the bridle line from the inner loop within the static line pilot parachute bag by untying the knot securing the line to the loop.
- 2 Cut a 22-inch length of type IV coreless nylon cord and taper-cut 1/2 inch of each end.
- 3 Using a suitable marking aid, mark the cord length at points 2 1/2, 5 1/2, and 8 1/2 inches from one end, and 2 1/2 and 10 1/2 inches from the opposite end.
- 4 Insert a suitable splicing aid into the cord casing at the 8 1/2-inch mark and work the splicing aid through the cord casing to the outside at the 5 1/2-inch mark.
- 5 Attach the nearest tapered cord end to the splicing aid and pull the aid back through the cord casing until the 2 1/2- and 5 1/2-inch marks are aligned and a 1 1/2-inch long loop is formed (figure 2-152).
- 6 Hold the aligned marks together and continue pulling the splicing aid back through the cord casing to the outside at the 8 1/2-inch mark, allowing only the cord tapered end to protrude from the cord casing.
- 7 Remove the cord tapered end from the splicing aid. While holding the aligned marks, stretch the cord length to permit the tapered end to recede into the cord casing.
- 8 Reinsert the splicing aid into the cord casing at the 8 1/2-inch mark and work the splicing aid through the cord casing to the outside at the 10 1/2-inch mark.

2-53. Static Line (cont).

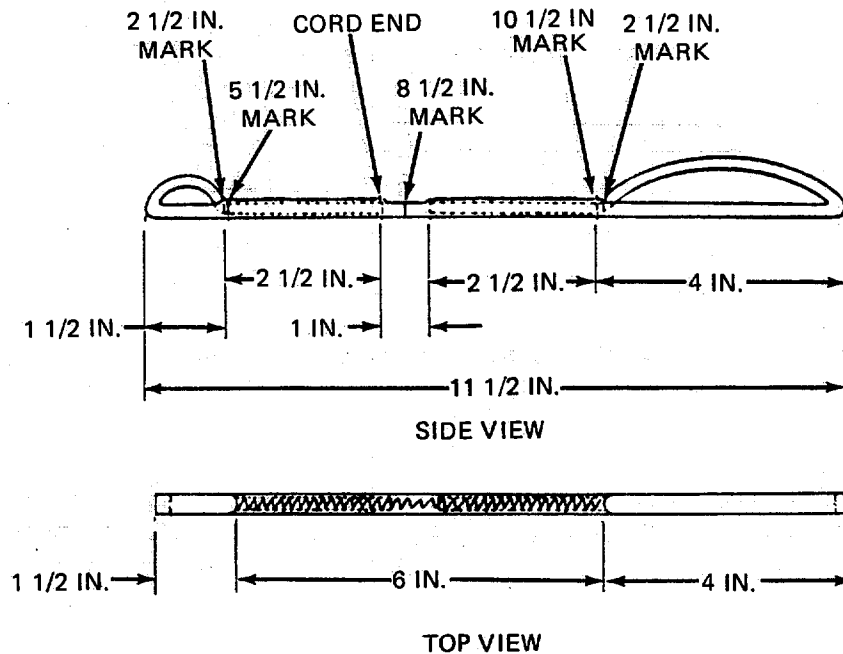
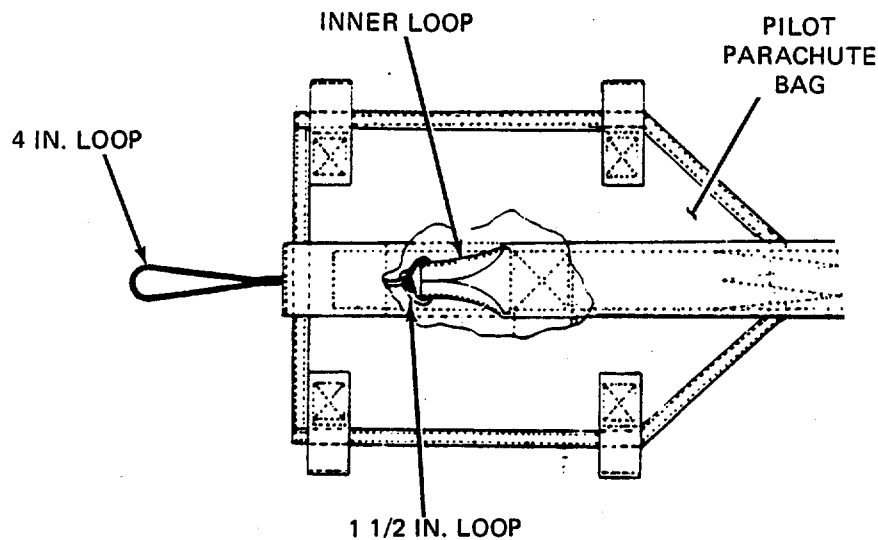


Figure 2-152. Bridle Line Construction Details.

- 9 Using the procedures in S through 7, above, and the 2 1/2- and 10 1/2-inch marks, form a 4-inch long loop on the loose cord end.
  - 10 Secure the bridle line formed loops by stitching a 3/16-inch wide by 6-inch long row of double-throw zigzag stitching along the center of the bridle line length from one set of aligned marks to the opposite set of aligned marks. Stitching will be made using a zig-zag sewing machine with size E nylon thread, 7 to 11 stitches per inch.
  - 11 Attach the replacement bridle line to the static line pilot parachute bag inner loop according to original attachment details and figure 2-153.
- (5) Bridle webbing. The bridle webbing is that length of webbing which extends from the static line pilot parachute bag to the riser clevis. The only repair function performed on the bridle webbing is to restitch broken or loose stitching according to original construction details. Use a heavy duty sewing machine with size 3 nylon 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 1/2 inch. Restitch directly over the original stitching, following the original stitch pattern as-closely as possible.
  - (6) Restitching. Restitch broken or loose stitching according to original construction details with size E nylon 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 1/2 inch. Restitch directly over the original stitching, following the original stitch pattern as closely as possible.





4839-154

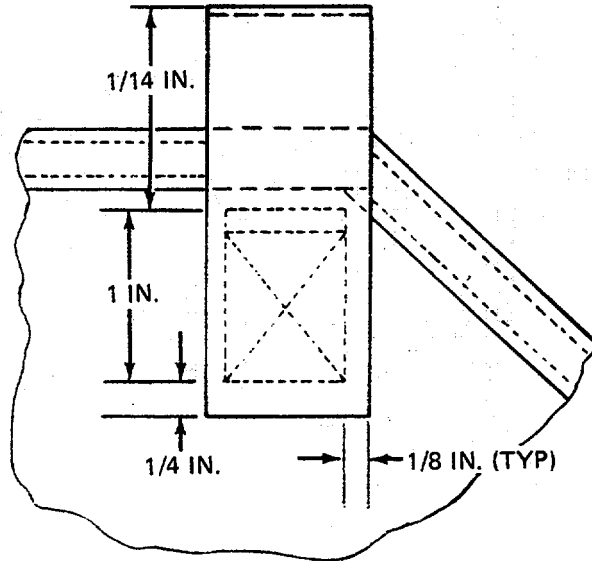
Figure 2-153. Bridle Line Attachment Details.

(b) *Replacement.* Replace a damaged or missing tiedown loop on the static line pilot parachute bag by fabricating as follows:

- 1 If applicable, remove the damaged loop by cutting the stitching which secures the loop to the pilot parachute bag.
- 2 Cut a 5-inch length of 1-inch wide, type II cotton webbing and wax the ends.
- 3 Double the webbing length, align the ends, and position the folded webbing on the bag in the original tiedown loop location.
- 4 Form the 1 1/4-inch long loop and secure the webbing to the bag by stitching a 1 -inch long single-X-box-stitch formation with one double end, according to the details in figure 2-154. Stitching will be made with a light-duty machine using size E nylon thread, 7 to 11 stitches per inch.

d. Replacement. Replace an unserviceable 15-foot long static line with a serviceable item from stock.

2-53. Static Line (cont).



4839-155

Figure 2-154. Pilot Parachute Bag Tiedown Loop Replacement Details.



- (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.

## **2-56. 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.

**ARMY TM 10-1670-281-23&P**  
**AIR FORCE T.O. 13C5-32-2**  
**NAVY NAVAIR 13-1-32**

## **2-57. 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 on 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 using unit will be contained in original packaging materials.

b. Shipping Between Maintenance Activities. The shipping of air delivery equipment between organizational and direct support 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 DA PAM 738-751, 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 DA PAM 738-751 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 previous 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 either AR 700-15, Packaging of Materials, or TM 38-230-1 and TM 38-230-2, Preservation, Packaging, Packing of Military Supplies and Equipment (Vols 1 and 2).

**2-217/(2-218 blank)**



**APPENDIX A**

**REFERENCES**

**A-1. Scope.** This appendix lists all forms, technical manuals, and miscellaneous publications referenced in, or to be used with, 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 (TAMMSA)..... DA PAM 738-751

**A-3. Technical Manuals.**

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  
Air Delivery, Parachute Recovery, and Aircraft Personnel Ejection Systems..... AR 750-32

**A-6. Technical Bulletins.**

Maintenance Expenditure Limits for FSC Group 16 (FSC Class 1670)..... TB 43-0002-43

**A-7. Forms.**

Army Parachute Log Record..... DA Form 3912  
DA Form 10-42  
Packing Improvement Report ..... SF Form 364  
Quality Deficiency Report ..... SF Form 368





## **APPENDIX B**

### **MAINTENANCE ALLOCATION CHART (MAC)**

#### **Section I. INTRODUCTION**

##### **B-1. The Army Maintenance System MAC**

This introduction provides a general explanation of all maintenance and repair functions authorized at the two maintenance levels under the Two-Level Maintenance System concept.

This MAC (immediately following the introduction) 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 shall be consistent with the capacities and capabilities of the designated maintenance levels, which are shown on the MAC in column (4) as:

Field - includes two columns, Unit maintenance and Direct Support maintenance. The Unit maintenance column is divided again into two more subcolumns, C for Operator or Crew and O for Unit maintenance.

Sustainment – includes two subcolumns, General Support (H) and Depot (D).

The tools and test equipment requirements (immediately following the MAC) list the tools and test equipment (both special tools and common tool sets) required for each maintenance function as referenced from the MAC.

The remarks (immediately following the tools and test equipment requirements) contain supplemental instructions and explanatory notes for a particular maintenance function.

##### **B-2. Maintenance Functions**

Maintenance functions are limited to and defined as follows:

1. **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.) This includes scheduled inspection and gagings and evaluation of cannon tubes.
2. **Test.** To verify serviceability by measuring the mechanical, pneumatic, hydraulic, or electrical characteristics of an item and comparing those characteristics with prescribed standards on a scheduled basis, i.e., load testing of lift devices and hydrostatic testing of pressure hoses.
3. **Service.** Operations required periodically to keep an item in proper operating condition; e.g., to clean (includes decontaminate, when required), to preserve, to drain, to paint, or to replenish fuel, lubricants, chemical fluids, or gases. This includes scheduled exercising and purging of recoil mechanisms. The following are examples of service functions:
  - a. **Unpack.** To remove from packing box for service or when required for the performance of maintenance operations.
  - b. **Repack.** To return item to packing box after service and other maintenance operations.
  - c. **Clean.** To rid the item of contamination.

- d. Touch up. To spot paint scratched or blistered surfaces.
  - e. Mark. To restore obliterated identification.
4. Adjust. To maintain or regulate, within prescribed limits, by bringing into proper position, or by setting the operating characteristics to specified parameters.
  5. Align. To adjust specified variable elements of an item to bring about optimum or desired performance
  6. Calibrate. To determine and cause corrections to be made or to be adjusted on instruments of test, measuring, and diagnostic equipment 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.
  7. 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.
  8. Paint. To prepare and spray color coats of paint so that the ammunition can be identified and protected. The color indicating primary use is applied, preferably, to the entire exterior surface as the background color of the item. Other markings are to be repainted as original so as to retain proper ammunition identification.
  9. Replace. To remove an unserviceable item and install a serviceable counterpart in its place. "Replace" is authorized by the MAC and assigned maintenance level is shown as the third position code of the Source, Maintenance and Recoverability (SMR) code.
  10. Repair. The application of maintenance services, including fault location/troubleshooting, removal/installation, 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.

### **NOTE**

The following definitions are applicable to the "repair" maintenance function:

Services. Inspect, test, service, adjust, align, calibrate, and/or replace.

Fault location/troubleshooting. The process of investigating and detecting the cause of equipment malfunctioning; the act of isolating a fault within a system or Unit Under Test (UUT).

Disassembly/assembly. The step-by-step breakdown (taking apart) of a spare/functional group coded item to the level of its least component, that is assigned an SMR code for the level of maintenance under consideration (i.e., identified as maintenance significant).

Actions. Welding, grinding, riveting, straightening, facing, machining, and/or resurfacing.

11. 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. Overhaul is normally the highest degree of maintenance performed by the Army. Overhaul does not normally return an item to like new condition.
12. 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 material maintenance applied to Army equipment. The rebuild operation includes the act of returning to zero those age measurements (e.g., hours/miles.) considered in classifying Army equipment/components.

### **B-3. Explanation of Columns in the MAC, Section II**

Column (1) Group Number. Column (1) lists Functional Group Code (FGC) numbers, the purpose of which is to identify maintenance significant components, assemblies, subassemblies, and modules with the Next Higher Assembly (NHA).

Column (2) Component/Assembly. Column (2) contains the names of components, assemblies, subassemblies, and modules for which maintenance is authorized.

Column (3) Maintenance Function. Column (3) lists the functions to be performed on the item listed in column (2). (For a detailed explanation of these functions refer to "Maintenance Functions" outlined above).

Column (4) Maintenance Level. Column (4) specifies each level of maintenance authorized to perform each function listed in column (3), by indicating work time required (expressed as man-hours in whole hours or decimals) in the appropriate subcolumn. This work time 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 varies at different maintenance levels, appropriate work time figures are to 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 time in addition to the time required to perform the specific tasks identified for the maintenance functions authorized in the MAC. The system designations for the various maintenance levels are as follows:

Field:

- C Operator or Crew maintenance
- O Unit maintenance
- F Direct Support maintenance

Sustainment:

- L Specialized Repair Activity
- H General Support maintenance
- D Depot maintenance

## **NOTE**

The "L" maintenance level is not included in column (4) of the MAC. Functions to this level of maintenance are identified by work time figure in the "H" column of column (4), and an associated reference code is used in the REMARKS column (6). This code is keyed to the remarks and the SRA complete repair application is explained there.

Column (5) Tools and Equipment Reference Code. Column (5) specifies, by code, those common tool sets (not individual tools), common Test, Measurement and Diagnostic Equipment (TMDE), and special tools, special TMDE and special support equipment required to perform the designated function. Codes are keyed to the entries in the tools and test equipment table.

Column (6) Remarks Code. When applicable, this column contains a letter code, in alphabetic order, which is keyed to the remarks table entries.

### **B-4. Explanation of Columns in the Tools and Test Equipment Requirements, Section III**

Column (1) - Tool or Test Equipment Reference Code. The tool or test equipment reference code correlates with a code used in column (5) of the MAC.

Column (2) - Maintenance Level. The lowest level of maintenance authorized to use the tool or test equipment.

Column (3) - Nomenclature. Name or identification of tool or test equipment.

Column (4) - National Stock Number (NSN). The NSN of the tool or test equipment.

Column (5) - Tool Number. The manufacturer's part number.

### **B-5. Explanation of Columns in Remarks, Section IV**

Column (1) - Remarks Code. The code recorded in column (6) of the MAC.

Column (2) - Remarks. This column lists information pertinent to the maintenance function being performed as indicated in the MAC.

**SECTION II. MAINTENANCE ALLOCATION CHART**  
**FOR**  
**PARACHUTE, CARGO TYPE: 64 FOOT DIAMETER, MODEL G-12D/G-12E**

(1) GROUP NUMBER	(2) COMPONENT/ ASSEMBLY	(3) MAINTENANCE FUNCTION	(4) MAINTENANCE LEVEL					(5) TOOLS AND EQUIPMENT REFERENCE CODE	(6) REMARKS CODE
			FIELD		SUSTAINMENT				
			UNIT	DIRECT SUPPORT	GENERAL SUPPORT	DEPOT			
			C	O	F	H	D		
00	G-12 CARGO PARACHUTE								
01	CANOPY	Inspect Service Repair	2.6 0.1 0.5					A B, C D, E	
0101	BRIDLE LOOP	Repair Replace	0.3 0.3					E	
0102	VENT REINFORCEMENT	Repair Replace	0.1 0.1						
0103	GORE SECTION	Repair Replace	0.5		1.0			E	
0104	CANOPY	Repair Replace	0.3		1.0				
0105	RADIAL SEAM	Replace	0.3						
0106	RADIAL SEAM REINFORCEMENT	Repair Replace	0.2		0.3				
0107	TAPE POCKET BAND	Repair Replace	0.2 0.3					E	
0108	LOWER LATERAL BAND	Repair Replace	0.5 0.1						
0109	V-TAB	Repair Replace	0.2		0.3			E	
0110	CONNECTOR LINK	Inspect Repair Replace	0.1 0.1 0.1					E	
0111	RISER	Repair Replace	0.3 0.1					E	
0112	INSPECTION DATA POCKET	Repair Replace	0.1 0.1						
0113	SUSPENSION CLEVIS	Repair Replace	0.1 0.1					E	
02	DEPLOYMENT BAG	Inspect Service Repair Replace	0.3 0.1 0.3 0.1					A B F	
0201	BRIDLE BREAKCORD ATTACHING LOOP BUFFER	Repair Replace	0.2 0.3					E F	

**SECTION II. MAINTENANCE ALLOCATION CHART**  
**FOR**  
**PARACHUTE, CARGO TYPE: 64 FOOT DIAMETER, MODEL G-12D/G-12E - CONTINUED**

(1) GROUP NUMBER	(2) COMPONENT/ ASSEMBLY	(3) MAINTENANCE FUNCTION	(4) MAINTENANCE LEVEL					(5) TOOLS AND EQUIPMENT REFERENCE CODE	(6) REMARKS CODE
			FIELD		SUSTAINMENT				
			UNIT		DIRECT SUPPORT	GENERAL SUPPORT	DEPOT		
			C	O	F	H	D		
0202	DEPLOYMENT BAG CLOSING LOOPS	Repair Replace	0.2 0.4					E F	
0203	DEPLOYMENT BAG EDGE BINDING	Repair		0.3					
0204	DEPLOYMENT BAG BRIDLE STRAP	Repair		0.3				E	
0205	DEPLOYMENT BAG HORIZONTAL TRAP	Repair		0.3				E	
0206	DEPLOYMENT BAG PANELS, FLAPS AND COVER	Repair		0.4				E	
0207	DEPLOYMENT BAG LOCKING STOW LOOPS	Repair Replace Adjust		0.4 0.4 0.1				E	
0208	DEPLOYMENT BAG LOCKING STOW SLOT	Repair		0.4				E	
0209	REINFORCEMENT SUSPENSION LINE STRAP AND STRAP LOOPS	Repair Replace		0.4 0.4				E F	
0210	SUSPENSION LINE RETAINING STRAP REINFORCEMENT	Repair		0.4				E	
0211	DEPLOYMENT BAG CLUSTER TIE WEBBING	Repair Replace		0.3 0.4				E F	
0212	RISER EXTENSION TIE LOOP AND TIE STRAP	Repair Replace		0.3 0.4				E F	
0213	RISER EXTENSION COVER END REINFORCEMENT	Repair		0.4				E	
0214	VENT LINE HOLE REINFORCEMENT	Repair		0.4				E	
03	DEPLOYMENT LINE (111-INCH)	Inspect Service Repair Replace		0.1 0.1 0.3 0.1				A B E F	

**SECTION II. MAINTENANCE ALLOCATION CHART**  
**FOR**  
**PARACHUTE, CARGO TYPE: 64 FOOT DIAMETER, MODEL G-12D/G-12E - CONTINUED**

(1) GROUP NUMBER	(2) COMPONENT/ ASSEMBLY	(3) MAINTENANCE FUNCTION	(4) MAINTENANCE LEVEL					(5) TOOLS AND EQUIPMENT REFERENCE CODE	(6) REMARKS CODE	
			FIELD		SUSTAINMENT					
			UNIT		DIRECT SUPPORT	GENERAL SUPPORT	DEPOT			
			C	O	F	H	D			
04	PILOT PARACHUTE	Inspect Service Repair Replace		0.1 0.1 0.3 0.1					A B E F	
0401	CONNECTOR LINK ASSEMBLY	Repair Replace		0.1 0.1						
0402	CANOPY PANEL	Repair		0.3					D	
0403	CROWN INSIDE REINFORCEMENT TAPE	Repair Replace		0.4 0.4					E F	
0404	CANOPY REINFORCING TAPE	Repair		0.4					E	
0405	SKIRT REINFORCEMENT	Repair		0.4					E	
0406	SUSPENSION LINE REINFORCING TAPE	Repair Replace		0.3 0.4					E	
0407	SUSPENSION LINE	Repair Replace		0.4 0.4					E	
05	STATIC LINE	Inspect Service Repair Replace		0.1 0.1 0.3 0.1					A B E F	
0501	EDGE BINDING	Repair		0.2					F	
0502	BAG PANEL	Repair		0.2					E	
0503	RISER CLEVIS	Repair Replace		0.1 0.1						
0504	BRIDLE LINE	Repair Replace		0.1 0.3					E F	
0505	BRIDLE WEBBING	Repair		0.2					E	
0506	TIEDOWN LOOP	Repair Replace		0.1 0.3					E F	
06	CENTERLINE	Repair Replace		0.1 0.1					E F	

**SECTION III. TOOLS AND TEST EQUIPMENT**  
**FOR**  
**PARACHUTE, CARGO TYPE: 64 FOOT DIAMETER, MODEL G-12D/G-12E**

(1) TOOLS OR TEST EQUIPMENT REFERENCE CODE	(2) MAINTENANCE LEVEL	(3) NOMENCLATURE	(4) NATIONAL STOCK NUMBER	(5) TOOL NUMBER
1	O	Brush, Scrub, Household	7920-00-282-2490	H-B-1490
2	O	Brush, Stenciling	7520-00-248-9285	H-B-621
3	O	File, Flat	5110-00-249-2848	GGG-F-325
4	O	Knife	5110-00-162-2205	MIL-K-818C
5	O	Knife, Hot Metal	3439-01-197-7656	4025
6	O	Lead, Pig, 5-Pounds	9650-00-264-5050	QQ-C-40
7	O	Line Separator	1670-00-092-8661	11-1-17-1
8	O	Mallet, Rawhide	5120-00-293-3397	GGG-H-33
9	O	Needle, Tacking	8315-00-262-3733	FF-N-180
10	O	Packing Paddle	1670-00-764-6381	11-1-152
11	O	Packing Weight	1670-00-375-9134	66C38599
12	O	Pliers, Lineman	1520-00-756-1156	GG-P-471
13	O	Pot, Melting, Electric	5120-00-242-1276	WG441
14	O	Shears	5110-00-223-6370	GGG-S-278
15	O	Set, Chuck and Die	5120-00-694-5153	7540756
16	O	Sewing Machine, Light-Duty	See Table 2-2	
17	O	Sewing Machine, Zig-Zag	See Table 2-2	
18	O	Sewing Machine, Heavy-Duty	See Table 2-2	
19	O	Sewing Machine, Medium-Duty	See Table 2-2	
20	O	Sewing Machine, Darning	See Table 2-2	
21	O	Sewing Machine, Very Heavy-Duty	See Table 2-2	
22	O	Screwdriver, Flat Tip	5120-00-293-0314	GGG-S-121
23	O	Separator, Link	1670-00-072-4941	MIL-S-43243
24	O	Yardstick	5120-00-985-6610	GGG-Y-0035
25	O	Splicing Aid	See Appendix E	
26	O	Broom		
27	O	Fan, Pedestal		

**SECTION IV. REMARKS**  
**FOR**  
**PARACHUTE, CARGO TYPE: 64 FOOT DIAMETER, MODEL G-12D/G-12E**

(1) REMARKS CODE	(2) REMARKS
A	Inspect is a technical-rigger 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

### 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 unit and intermediate direct support (DS) maintenance of the 64-Foot Cargo Parachute. 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 Section I, 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. The 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 name sequence. Repair parts kits are listed separately in their own functional group within Section II. Repair parts for repairable special tools are also listed in this section. Items listed are shown on the associated illustration(s)/ figure(s).

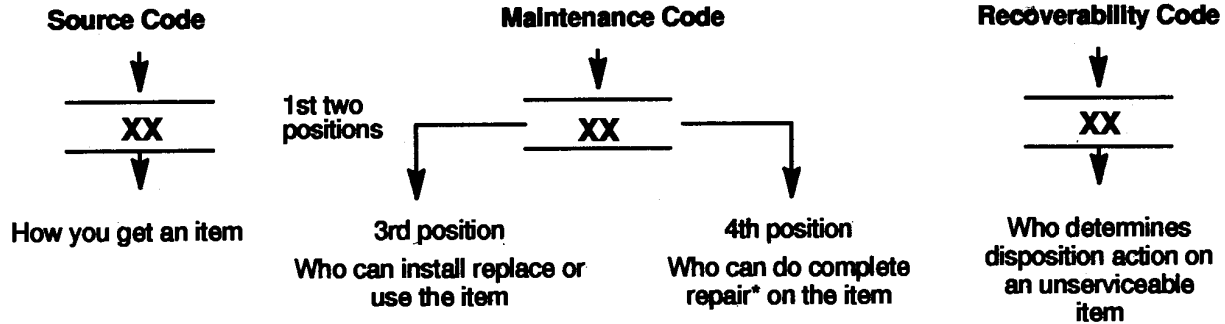
b. Section III. Special Tools List A list of special tools, special TMDE, and other special support equipment authorized by this RPSTL (as indicated by Basis of Issue (BOI) information in DESCRIPTION AND USABLE ON CODE (column) for the performance of maintenance.

c. Section IV. Cross Reference Indexes. 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.

##### C-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.

b. SMR Code (Column (2)). The Source, Maintenance, and Recoverability (SMR) code is a 5-position code containing supply/requisitioning information, maintenance category authorization criteria, and disposition instructions, as shown in the following breakout:



\*Complete Repair: Maintenance capacity, capability, and authority to perform all the 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 to get an item needed for maintenance, repair, or overhaul of an end item/equipment. Explanations of source codes follows:

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.

Code Explanation

MO--(Made at org.  
 AVUM Level  
 MF--(Made at DS/  
 AVUM Level  
 MH--(Made at GS  
 Level)  
 ML--Made at Spe-  
 cialized 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/AVIM 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 item 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 tell 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 one of the following levels of maintenance.

Code	Application/Explanation
C	Crew or operator maintenance done within unit or aviation unit maintenance.
O	Unit 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.

- (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 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 code.) This position will contain one of the following maintenance codes.

Code	Application/Explanation
O	Unit or aviation unit is the lowest level that can do complete repair of the item.
F	Direct support or aviation intermediate 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 (designate the 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.
O _____	Reparable item. When uneconomically repairable, condemn and dispose of the item at unit or aviation unit level.
F _____	Reparable item. When uneconomically repairable, condemn and dispose of the item at the direct support or aviation intermediate level.
H _____	Reparable item. When uneconomically repairable, 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). 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 a 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. (Insert applicable physical security classification abbreviation, e.g., Phy Sec C1 (C) - Confidential, Phy Sec C1 (S) - Secret, Phy Sec C1 (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 for bulk materials are referenced in this column in the line item 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 (see paragraph C-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 equipments 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 Section 11.

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 (Section IV).**

##### a. National Stock Number (NSN) Index.

(1) STOCK NUMBER column (5). This column lists the NSN by National item identification number (NIIN) sequence. The NIIN consists of the last nine digits of the NSN (i.e.

$$\begin{array}{r} \text{NSN} \\ \hline (5305-01-464-1467) \\ \text{NIIN} \end{array}$$

When using this column to locate an item, ignore the first 4 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 by part number in ascending alphanumeric sequence (i.e., vertical arrangement of letter and number combination which places 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, etc., that supplies the item.

(2) *PARTNUMBER 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) *STOCKNUMBER 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 11 and 111.

(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.* Usable on codes are shown in the description column. Uncoded items are applicable to all models. Identification of the usable on codes in this publication are:

Code	Used On
DWP	1670-00-893-2371
DWN	1670-01-065-3755

b. *Fabricated 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 Instructions.* Detailed assembly instructions for items source coded to be assembled from component spare/repair parts are found in Chapter 2, Section III of this manual. Items that make up the assembly are listed immediately following the assembly item entry or reference is made to an applicable figure.

d. *Index Numbers.* Items which have the word 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 or 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.a.(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 used in this manual are listed in MIL-STD-12.





SECTION II

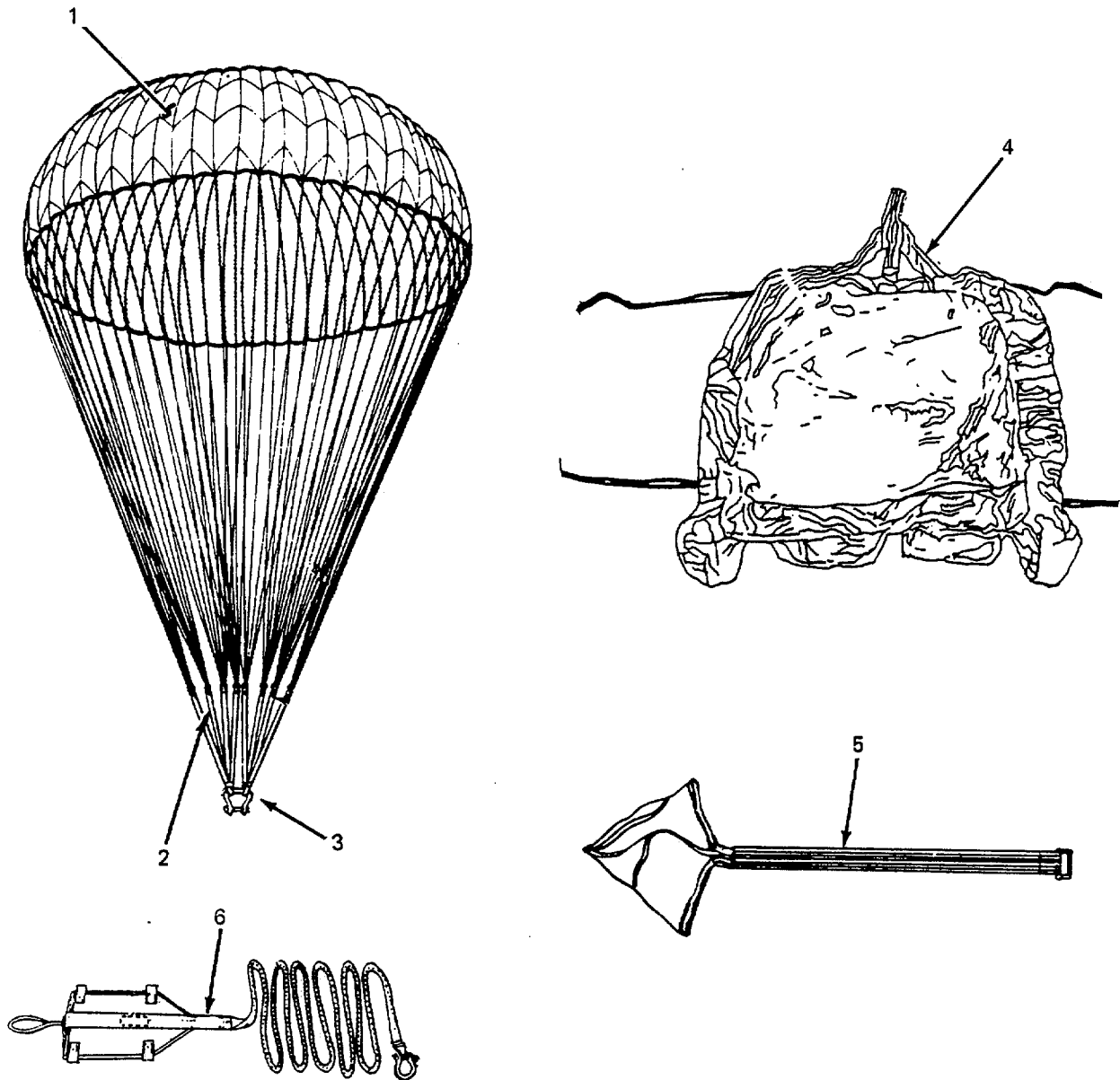


Figure C-1. 64-Foot Diameter Cargo Parachute Model G- 12D (PN 55A6045) and Model G-12E (PN 11-1-2620).

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**SECTION II**

(1) ITEM NO	(2) SMR CODE	(3) FSCM	(4) PART NUMBER	(5) DESCRIPTION AND USABLE ON CODES (UOC)	(6) QTY
				GROUP 00 PARACHUTE, CARGO, 64 FOOT DIAMETER, MODELG-12D AND G-12E	
				FIG. C-1 64 FOOT DIAMETER CARGO PAR- CHUTE, MODEL G-12D (PN 55A6045) AND MODEL G-12E (PN 11-1-2620)	
1	XAOFF	98750	48K6076	CANOPY, CARGO, 64 FOOT.....	1
2	PAOOO	98750 81337	51 D6183 51 D6183	RISER EXTENSION, PARACHUTE .....	2
3	PAOZZ	96906	MS70087-2	SHACKLE .....	1
4	PAOFF	98750	54K6299	DEPLOYMENT BAG, PARACHUTE, G-12D .....	1
	PAOFF	81337	11-1-3967-1	DEPLOYMENT BAG, PARACHUTE, G-12E .....	1
5	PAOOO	98750	59J6171	PILOT CHUTE .....	1
6		81337	59J6171	STATIC LINE, CARGO PARACHUTE.....	1
				END OF FIGURE	
			<b>Change 4</b>	<b>C-11/(C-12 blank)</b>	



SECTION II

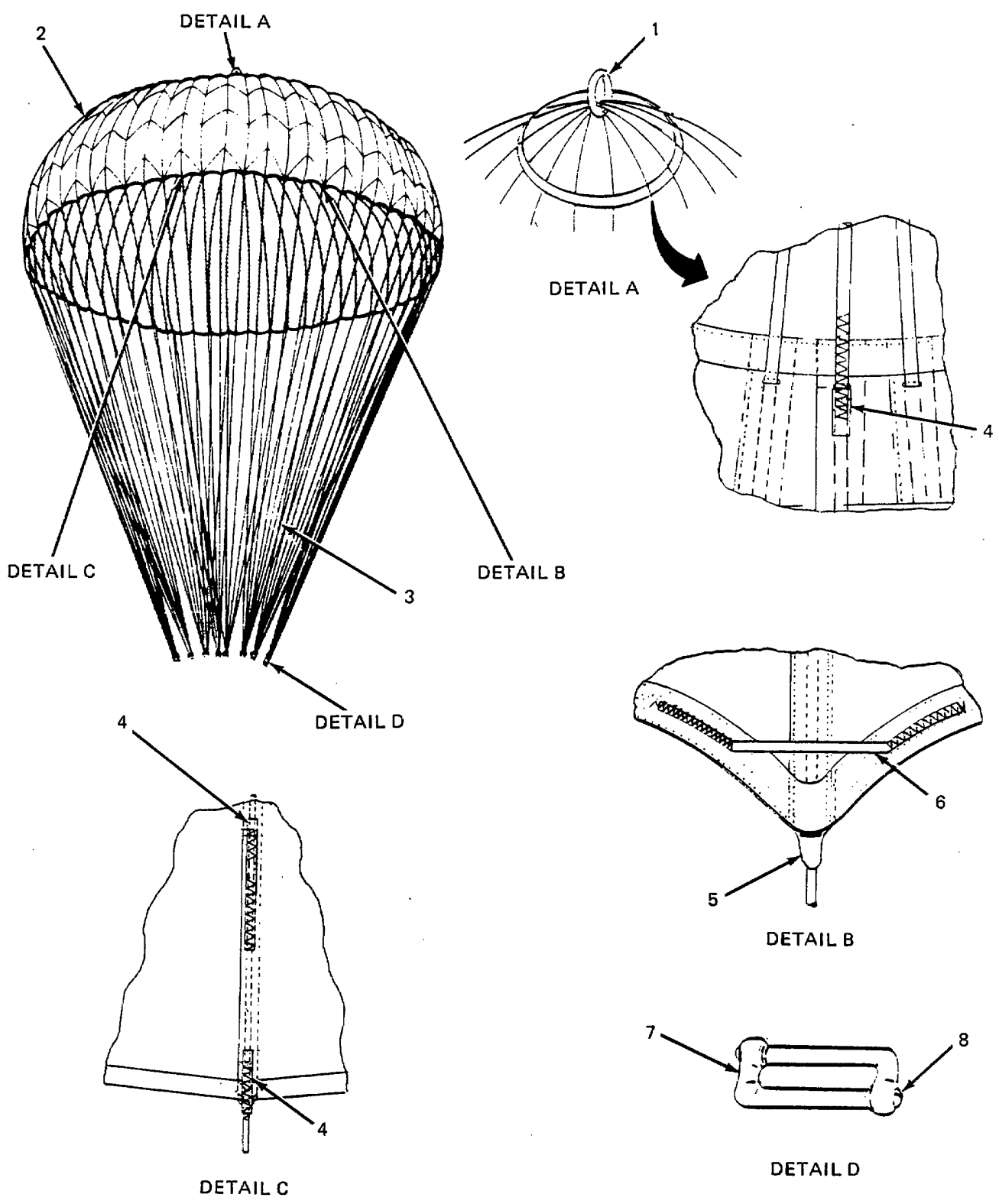


Figure C-2. 64-Foot Cargo Canopy, PN 48K6076 (Sheet 1 of 2).

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**SECTION II**

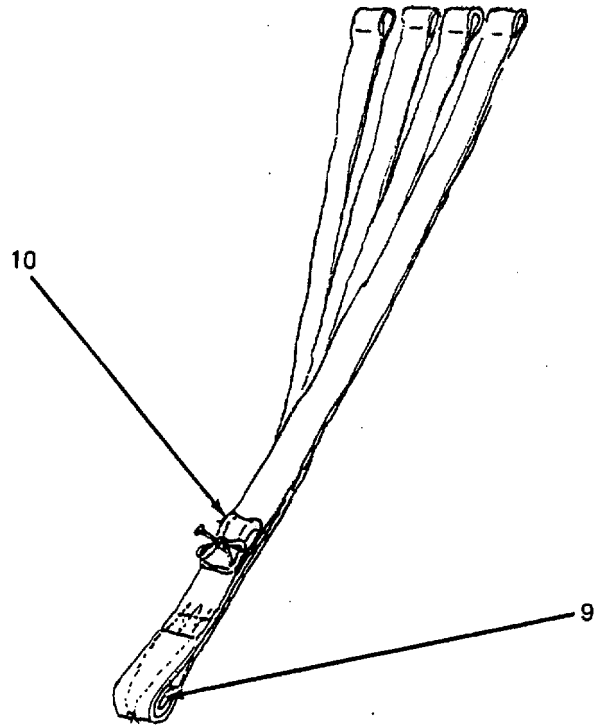


Figure C-2. 64-Foot Cargo Canopy, PN 48K6076 (Sheet 2 of 2).

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**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, 64-FOOT	
				FIG. C-2 64-FOOT CARGO CANOPY, PN 48K6076	
1	MOOOO	98750	48K6076-	LOOP, BRIDLE, MAKE FROM WEBBING, COTTON, TYPE X, OD, PN MIL-W-5665 & THREAD, NYLON, SIZE 3, TYPE I, CLASS A, PN V-T-295 .....	1
2	MFFFF	98750	48K6076-	GORE SECTION, MAKE FROM CLOTH, NYLON, 2.25 OZ, OG, PN MIL-C-7350 & THREAD, NYLON, SIZE 3, TYPE I, CLASS A, PN V-T-295 .....	512
3	MFFFF	98750	48K6076-	LINE, CANOPY, MAKE FROM CORD, NYLON, TYPE IV, OD, PN MIL-C-7515 & THREAD, NYLON, SIZE 3, TYPE I, CLASS A, PN V-T-295 .....	32
4	MFFFF	98750	48K6076-	REINFORCEMENT TAPE, RADIAL SEAM, MAKE FROM TAPE, NYLON, TYPE III, 1/2-IN. W, OD, PN MIL-T-5030 & THREAD, NYLON, SIZE FF, TYPE I, CLASS A, PN V-T-295.....	192
5	MFFFF	98750	48K6076-	REINFORCEMENT, SUSPENSION LINE, MAKE FROM WEBBING, NYLON, TUBULAR, 1/2-INCH W, OD & THREAD, NYLON, SIZE FF, TYPE I, CLASS A, PN V-T-295 .....	64
6	MOOOO	98750	48K6076-	POCKET BAND, MAKE FROM CORD, NYLON, TYPE IV, OD & THREAD, NYLON, SIZE E, TYPE I, CLASS A, PN V-T-295.....	64
7	PAOOO	98750	MS22002-2	LINK, CONNECTOR .....	8
8	PAOZZ	98750	MS22002-8	SETSCREW.....	2
9	MOOOO	81337	51D6183-3	BUFFER, MAKE FROM WEBBING, COTTON, TYPE VIII, 1 3/4-INCH W, OD, PN MIL-W-5665 & THREAD, NYLON, SIZE E, TYPE I, CLASS A PN V-T-295 .....	1
10	PAOZO	81337	11-1-2587	POCKET, PARACHUTE INSPECTION DATA (USED ON PN 51D6183-1, ONLY).....	1
END OF FIGURE					

SECTION II

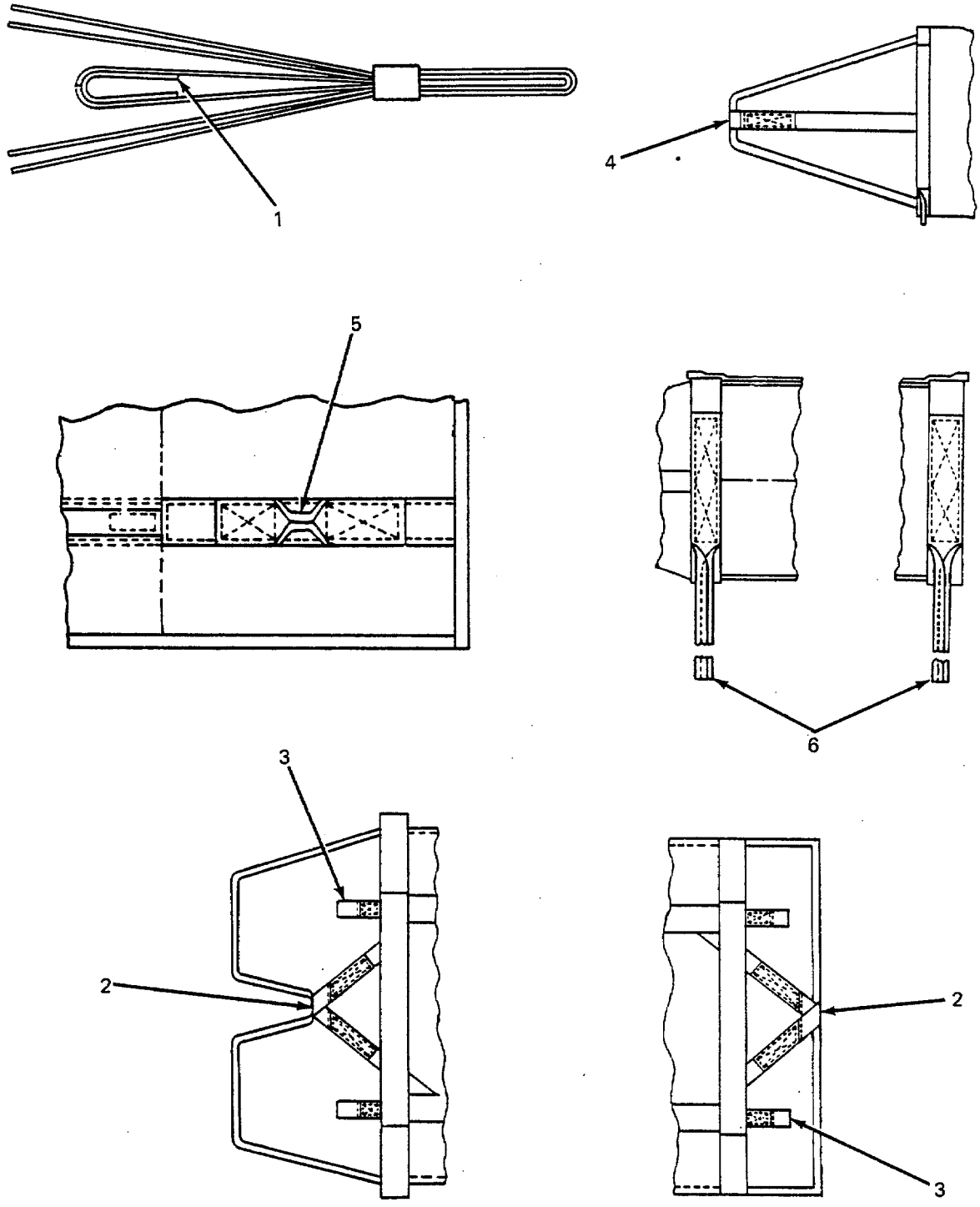


Figure C-3. Parachute Deployment Bag, PN 54K6299

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**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	
				FIG. C-3 PARACHUTE DEPLOYMENT BAG, G12D, PN 54K6299, G-12E PN 11-1-3967-1	
1	MOOOO	98750	54K6299-17	BUFFER, BREAKCORD ATTACHING LOOP, MAKE FROM WEBBING, COTUON, TYPE VIII, CLASS 2B, OD, PN MIL-W-5665 & THREAD, NYLON, SIZE 3, TYPE I, CLASS A, PN V-T-295.....	1
2	MFOOO	98750	54K6299-5/1	CLOSING LOOP, BAG, MAIN, MAKE FROM WEBBING, NYLON, TYPE XVII, OD, PN MIL-W4088 & THREAD, NYLON, SIZE 3, TYPE I, CLASS A, PN V-T-295.....	2
3	MOOOO	98750	54K6299-5/2	CLOSING LOOP, BAG, SECONDARY, MAIN, MAKE FROM WEBBING, NYLON, TYPE XVII, OD, PN MIL-W-4088 & THREAD, NYLON, SIZE 3, TYPE I, CLASS A, PN V-T-295.	
4	MOOOO	98750	54K6299-5/3	CLOSING LOOP, BAG, MAIN, MAKE FROM WEBBING, NYLON, TYPE XVII, OD, PN MIL-W-4088 & THREAD, NYLON, SIZE 3, TYPE E, CLASS A, PN V-T-295 .....	2
5	MOOOO	98750	54K6299-SL	STOW LOOP, LOCKING, MAKE FROM WEB- BING, NYLON, TYPE III, OD, PN MIL-W-4088 & THREAD, NYLON, SIZE 3, TYPE I, CLASS A, PN V-T-295 .....	2
6	MFFFF	98750	54K6299-18	CLUSTER TIE, MAKE FROM WEBBING, NYLON, TYPE XII, OD, PN MIL-W-4088 & THREAD, NYLON, SIZE 3, TYPE I, CLASS A, PN V-T-295.....	4
				END OF FIGURE	

SECTION II

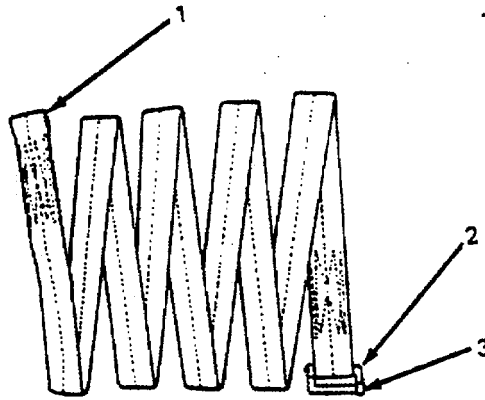


Figure C-4. Deployment Line.

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**SECTION II**

(1) ITEM NO	(2) SMR CODE	(3) FSCM	(4) PART NUMBER	(5) DESCRIPTION AND USABLE ON CODES (UOC)	(6) QTY
				GROUP 03 DEPLOYMENT LINE	
				FIG. C-4 DEPLOYMENT LINE (111 INCH)	
1	MFFFF	81337	53D6085	DEPLOYMENT LINE, MAKE FROM WEBBING, NYLON, TYPE VIII, OD, PN MIL-W-4088 & THREAD, NYLON, SIZE 3, PN V-T-295.....	1
2	PAOZZ	96906	MS22002-2	LINK, CONNECTOR .....	1
3	PAOZZ	96906	MS22002-8	SETSCREW.....	2
				END OF FIGURE	

SECTION II

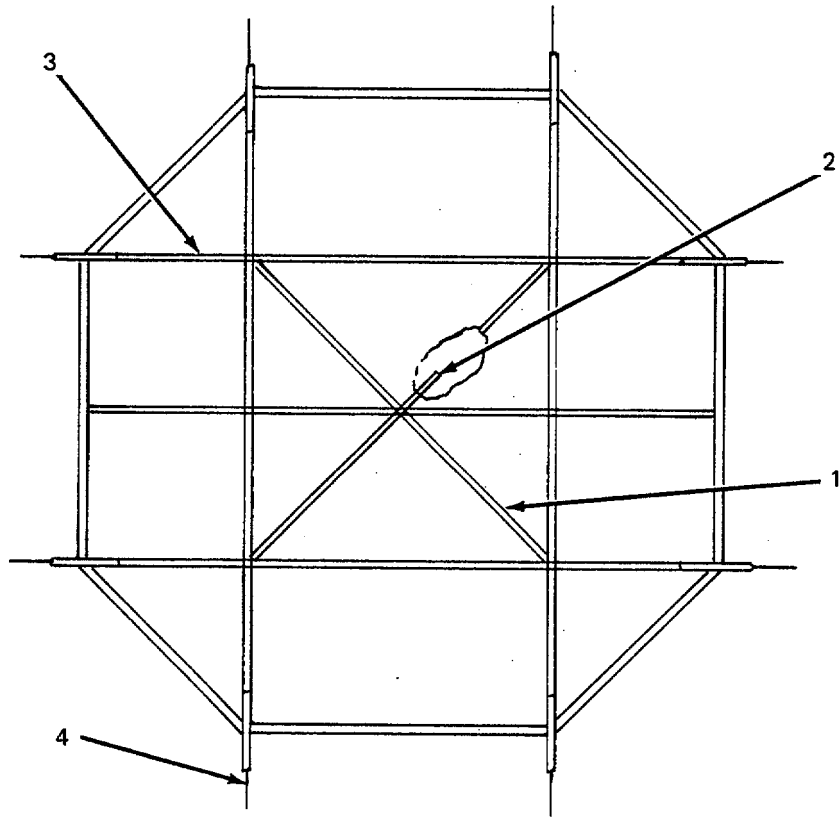


Figure C-5. Pilot Chute, PN 53E6803

**SECTION II**

(1) ITEM NO	(2) SMR CODE	(3) FSCM	(4) PART NUMBER	(5) DESCRIPTION AND USABLE ON CODES (UOC)	(6) QTY
				GROUP 04 PILOT CHUTE	
				FIG. C-5 PILOT CHUTE, PN 53E6803	
1	MFFFF	81337	53E6803-10	LOOP, CROWN REINFORCEMENT, MAKE FROM TAPE, NYLON, TYPE V, OD, PN MIL-T-5038 & THREAD, NYLON, SIZE E, TYPE I, CLASS A, PN V-T-295.....	2
2	MFFFF	81337	53E6803-7	REINFORCEMENT, INSIDE, CROWN, MAKE FROM TAPE, NYLON, TYPE V, OD, PN MIL-T-5038 & THREAD, NYLON, SIZE E, TYPE I, CLASS A, PN V-T-295.....	2
3	MFFFF	81337	53E6803-3	REINFORCEMENT, MAKE FROM TAPE, NYLON, TYPE V, OD, PN MIL-T-5038 & THREAD, NYLON, SIZE E, TYPE I, CLASS A, PN V-T-295.....	4
4	MOOOO	81337	53E6803-5	SUSPENSION LINE, MAKE FROM CORD, NYLON, TYPE III, OD, PN MIL-C-5040 .....	8
				END OF FIGURE	

**SECTION II**

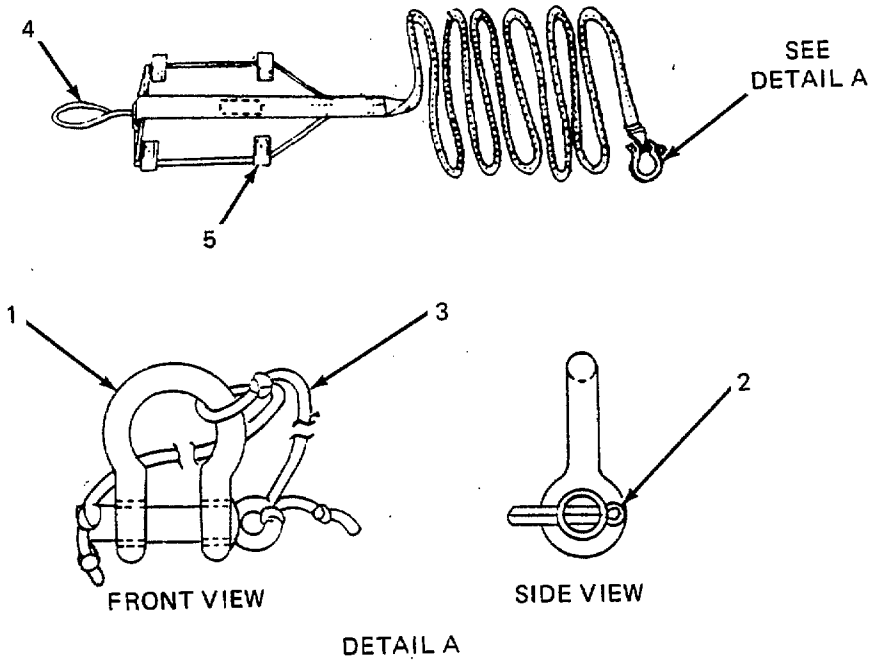


Figure C-6. Cargo Parachute Static Line, PN 59J6171.

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**SECTION II**

(1) ITEM NO	(2) SMR CODE	(3) FSCM	(4) PART NUMBER	(5) DESCRIPTION AND USABLE ON CODES (UOC)	(6) QTY
				GROUP 05 STATIC LINE, CARGO	
				FIG. C-6 CARGO PARACHUTE STATIC LINE PN 59J6171	
1	PAOZZ	96906	MS70086-1	SHACKLE.....	1
2	MOOZZ	96906	MS24665-355	PIN, COTTER, MAKE FROM WIRE, QQ-W-423 .....	
3	MOOZZ	19099	MS70086-CORD	CORD, CLEVIS P/N, MAKE FROM CORD, NYLON, TYPE IA, OD, PN MIL-C-5040.....	1
4	MOOOO	81337	59J6171-9	BRIDLE, STATIC LINE, MAKE FROM CORD, NYLON, TYPE IV, OD, PN MIL-C-7515 & THREAD, NYLON, SIZE E, TYPE I, CLASS A, PN V-T-295.....	1
5	MOOOO	81337	59J6171-3	LOOP, TIEDOWN, MAKE FROM WEBBING, COTTON, TYPE III, CLASS 2B, OD, PN MIL-W-5665 & THREAD, NYLON, SIZE E, TYPE I, CLASS A, PN V-T-295 .....	4
				END OF FIGURE	

**Section III. SPECIAL TOOLS LIST**

Not Applicable

SECTION II

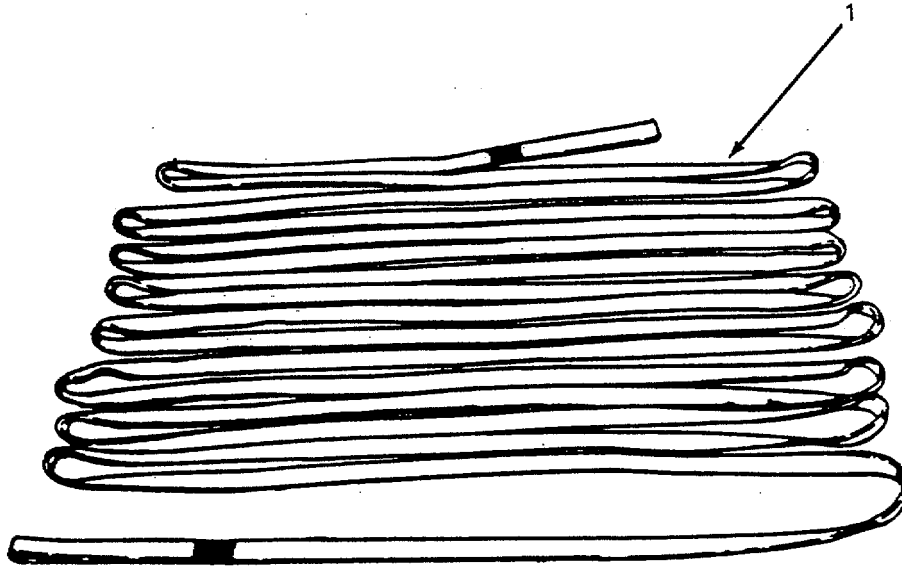


Figure C-7. Centerline.

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**SECTION II**

**ARMY TM 10-1670-281-23&P  
 AIR FORCE T.O. 13C5-32-2  
 NAVY NAVAIR 13-1-32**

(1) ITEM NO	(2) SMR CODE	(3) FSCM	(4) PART NUMBER	(5) DESCRIPTION AND USABLE ON CODES (UOC)	(6) QTY
1	PAOZZ	81337	11-1-568	GROUP 06 CENTERLINE  FIG. C-7 CENTERLINE  57-FOOT LONG CENTERLINE (UOC: DWN) (MDL: G-12E) .....  END OF FIGURE	1

**SECTION II**

**ARMY TM 10-1670-281-23&P**  
**AIR FORCE T.O. 13C5-32-2**  
**NAVY NAVAIR 13-1-32**

(1) ITEM NO	(2) SMR CODE	(3) FSCM	(4) PART NUMBER	(5) DESCRIPTION AND USABLE ON CODES (UOC)	(6) QTY
				GROUP 99 BULK MATERIALS	
				FIG. BULK	
1	PAOZZ	81349	MIL-C-5040	CORD, NYLON, TYPE IA, OD .....	
2	PAOZZ	81349	MIL-C-5040	CORD, NYLON, TYPE III, OD .....	
3	PAOZZ	81349	MIL-C-5040	CORD, NYLON, TYPE IV, OD .....	
4	PAOZZ	81349	MIL-C-7350	CLOTH, NYLON, 2.25 OZ, OG .....	
5	PAOZZ	81349	MIL-T-5030	TAPE, NYLON, TYPE III, 1/2-IN. OD .....	
6	PAOZZ	81349	MIL-T-5038	TAPE, NYLON, TYPE V, OD .....	
7	PAOZZ	81348	V-T-295	THREAD, NYLON, SIZE E, TYPE I, CLASS A, OD .....	
8	PAOZZ	81348	V-T-295	THREAD, NYLON, SIZE 3, TYPE I, CLASS A, OD .....	
9	PAOZZ	81348	V-T-295	THREAD, NYLON, SIZE FF, TYPE I, CLASS A, OD .....	
10	PAOZZ	81349	MIL-W-5665	WEBBING, COTTON, TYPE III, CLASS 2B, OD .....	
11	PAOZZ	81349	MIL-W-5665	WEBBING, COTTON, TYPE VIII, 1 3/4-IN. W, OD .....	
12	PAOZZ	81349	MIL-W-5665	WEBBING, COTTON, TYPE X, OD .....	
13	PAOZZ	81349	MIL-W-4088	WEBBING, NYLON, TYPE VIII, OD .....	
14	PAOZZ	81349	MIL-W-4088	WEBBING, NYLON, TYPE XVII, OD .....	
15	PAOZZ	81349	MIL-W-4088	WEBBING, NYLON, TYPE XII, OD .....	
16	PAOZZ	81349	MIL-W-5625	WEBBING, NYLON, TUBULAR, 1/2-IN., OD .....	
				END OF FIGURE	

**SECTION III. SPECIAL TOOLS LIST**

Not Applicable

**SECTION IV**

**ARMY TM 10-1670-281-23&P  
 AIR FORCE T.O. 13C5-32-2  
 NAVY NAVAIR 13-1-32**

**CROSS-REFERENCE INDEXES**

**NATIONAL STOCK NUMBER INDEX**

<b>STOCK NUMBER</b>	<b>FIG.</b>	<b>ITEM</b>	<b>STOCK NUMBER</b>	<b>FIG.</b>	<b>ITEM</b>
5315-00-012-0123	C-6	2	8305-00-267-3009	BULK	14
1670-00-039-5073	C-1	4	8310-00-267-3027	BULK	8
1670-00-064-4928	C-7	1	8305-00-268-2453	BULK	16
1670-00-216-7297	C-1	5	8305-00-281-3012	BULK	15
8310-00-227-1244	BULK	9	8305-00-281-3315	BULK	10
4020-00-240-2154	BULK	1	1670-00-360-0475	C-1	2
4020-00-246-0688	BULK	2	8305-00-641-4380	BULK	4
8315-00-255-7673	BULK	5	4030-00-678-8560	C-6	1
8305-00-260-2565	BULK	11	8305-00-753-6086	BULK	12
8305-00-261-8585	BULK	13	1670-00-841-0020	C-1	6
4020-00-262-2020	BULK	3	1670-01-018-6756	C-2	10
8310-00-262-2772	BULK	7			

**SECTION IV**

**ARMY TM 10-1670-281-23&P**  
**AIR FORCE T.O. 13C5-32-2**  
**NAVY NAVAIR 13-1-32**

**CROSS-REFERENCE INDEXES**

FSCM	PART NUMBER INDEX		FIG.	ITEM
	PART NUMBER	STOCK NUMBER		
81349	MIL-C-5040	4020-00-240-2154	BULK	1
81349	MIL-C-5040	4020-00-246-0688	BULK	2
81349	MIL-C-5040	4020-00-262-2020	BULK	3
81349	MIL-C-7350	8305-00-641-4380	BULK	4
81349	MIL-T-5030	8315-00-255-7673	BULK	5
81349	MIL-T-5038		BULK	6
81349	MIL-W-4088	8305-00-261-8585	BULK	13
81349	MIL-W-4088	8305-00-267-3009	BULK	14
81349	MIL-W-4088	8305-00-281-3012	BULK	15
81349	MIL-W-5625	8305-00-268-2453	BULK	16
81349	MIL-W-5665	8305-00-281-3315	BULK	10
81349	MIL-W-5665	8305-00-260-2565	BULK	11
81349	MIL-W-5665	8305-00-753-6086	BULK	12
96906	MS22002-2		C-4	2
			C-2	7
96906	MS22002-8		C-4	3
			C-2	8
96906	MS24665-355	5315-00-012-0123	C-6	2
96906	MS70086-1	4030-00-678-8560	C-6	1
19099	MS70086-CORD		C-6	3
96906	MS70087-2		C-1	3
81348	V-T-295	8310-00-262-2772	BULK	7
81348	V-T-295	8310-00-267-3027	BULK	8
81348	V-T-295	8310-00-227-1244	BULK	9
81337	11-1-2587	1670-01-018-6756	C-2	10
81337	11-1-568	1670-00-064-4928	C-7	1
98750	48K6076		C-1	1
98750	48K6076		C-2	1
98750	48K6076		C-2	2
98750	48K6076		C-2	3
98750	48K6076		C-2	4
98750	48K6076		C-2	5
98750	48K6076		C-2	6
98750	51D6183	1670-00-360-0475	C-1	2
81337				
81337	51D6183-3		C-2	9
81337	53D6085		C-4	1
81337	53E6803	1670-00-216-7297	C-1	5
81337	53E6803-3		C-5	3
81337	53E6803-5		C-5	4
81337	53E6803-7		C-5	2
81337	53E6803-10		C-5	1

**SECTION IV**

**ARMY TM 10-1670-281-23&P  
AIR FORCE T.O. 13C5-32-2  
NAVY NAVAIR 13-1-32**

**CROSS-REFERENCE INDEXES**

<b>FSCM</b>	<b>PART NUMBER INDEX (cont)</b>		<b>FIG.</b>	<b>ITEM</b>
	<b>PART NUMBER</b>	<b>STOCK NUMBER</b>		
98750	54K6299	1670-00-039-5073	C-1	2
98750	54K6299-SL		C-3	5
98750	54K6299-17		C-3	1
98750	54K6299-18		C-3	6
98750	54K6299-5/1		C-3	2
98750	54K6299-5/2		C-3	3
98750	54K6299-5/3		C-3	4
98750	59J6171	1670-00-841-0070	C-1	6
81337	11-1-3967-1	1670-00-039-5073	C-1	2
81337				
81337	59J6171-3		C-6	5
81337	59J6171-9		C-6	4

**Change 4 C-29/(C-30 blank)**



## Appendix D. EXPENDABLE/DURABLE SUPPLIES LIST

### Section I. INTRODUCTION

**D-1. SCOPE.** This appendix lists expendable/durable supplies that you will need to operate and maintain the 64-foot Diameter Cargo Parachute. This listing is for information only and is not authority to requisition the listed items. These items are authorized to you by CTA 50-790, Expendable/Durable Items (except medical, class V repair parts, and heraldic items), or CTA 8-100, Army Medical Department Expendable/Durable 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 item (e.g. "Use cleaning compound, item 5, Appendix E".)

**b. Column 2. Level.** This column identifies the lowest level of maintenance that requires the item.

- C - Operator/Crew
- O - Unit Maintenance
- F - Direct Support Maintenance
- H - General Support Maintenance
- D - Depot Maintenance

**c. Column 3. National Stock Number.** This is the national stock number assigned to the item which you can use to requisition it.

**d. Column 4. Item name, Description.** Commercial and Government Entity Code (CAGEC), and part number. This provides the other information you need to identify the item.

**e. Column 5. Unit of measure (U/M).** This code shows the physical measurement or count of an item, such as gallon, dozen, gross, etc.

### Section II. EXPENDABLE/DURABLE SUPPLIES LIST

(1) ITEM NO.	(2) LEVEL	(3) NATIONAL STOCK NUMBER	(4) DESCRIPTION	(5) U/M
1	O	9160-00-253-1171	Beeswax, Technical, 1 lb (8134) C-B-191	lb
2	O	5350-00-221-0872	Cloth, Abrasive, Ferric Oxide & Quartz (81348) P-C-458	sh
3	O	8305-00-170-9268	Cloth, Cotton, Duck, Type 1, 17.55 oz., No.8, od (81346) CCC-C-419	ft

**ARMY TM 10-1670-281-23&P**  
**AIR FORCE T.O. 13C5-32-2**  
**NAVY NAVAIR 13-1-32**

(1) ITEM NO.	(2) LEVEL	(3) NATIONAL STOCK NUMBER	(4) DESCRIPTION	(5) U/M
4	O	8305-00-171-1203	Cloth, Cotton, Duck, Type III, 8.25 oz., OD (81348) CCC-C-419	ft
5	O	8305-01-014-131 a	Cloth, Cotton, Muslin, Type III, 3.6 oz., OD (81349) CCC-C-419	yd
6	O	8305-00-433-5986	Cloth, Cotton, Muslin, Type III, 3.8 oz., OD (61349) AL-C-4279	yd
7	O	8305-01-173-4436	Cloth, Nylon, Duck, Type III, 7.25 oz., OD (81349) MIL-C-7219	yd
8	O	1670-00-176-1802	Cloth, Nylon, Parachute Mending, Adhesive, od	yd
9	O	8305-00-254-4842	Cloth, Nylon, Parachute, Type I, 1.1 oz., Natural, 36 inch (81349) MIL-C-7020	ft
10	O	8305-00-577-4599	Cloth, Nylon, Parachute, Type II, 1.6 oz., Natural, 36 inch (81349) MIL-C-7020	ft
11	O	8305-00-641-4380	Cloth, Nylon, Parachute, Type I, 2.25 oz (81349) MIL-C-7350	ft
11a	O	8305-01-259-2891	Cloth, Nylon, Parachute, Type I, 2.25 oz (61349) MIL-C-7350, 58.5 in WD, OD	yd
11b	O	8305-01-204-1747	Cloth, Nylon, Parachute, Type I, 2.25 oz., Natural, 58 Inch, (81349) MIL-C-7350	yd
12	O	4020-00-262-2019	Cord, Nylon, Type II, OG (81349) MIL-C-5040	yd
13	O	4020-00-240-2154	Cord, Nylon, Type I, Natural (al 349) MIL-C-5040	yd
14	O	4020-00-240-2146	Cord, Nylon, Type III, Natural (81349) MIL-C-5040	yd
15	O	4020-00-246-0688	Cord, Nylon, Type III, OD (81349) MIL-C-5040	yd
16	O	4020-00-262-2020	Cord, Nylon, Type IV, Coreless, OD (61349) MIL-C-7515	yd
17	O	7930-00-281-4731	Dishwashing Compound, Hand, flake (61346) P-D-410	lb
18	O	7510-00-286-5362	Ink, Marking, Parachute, Strata-Blue (81349) MIL-I-6903	pt
19	O	9150-00-168-2000	Lubricant, Solid Film	pt
20	O	7520-00-230-2734	Marker, Felt Tip, Black (81349) GG-M-00114	ft



**EXPENDABLE/DURABLE SUPPLIES LIST (cont)**

(1) ITEM NUMBER	(2) LEVEL	(3) NATIONAL STOCK NUMBER	(4) DESCRIPTION	(5) U/M
21	O		Medicine Dropper	ea
22	O	8135-00-160-7759	Paper, Kraft, Untreated (81348) UU-P-268	ft
23	O		Paper, 3-Color, PH	sh
24	O	7520-00-491-2917	Pen, Ballpoint (81348) GG-B-0060	ea
25	O	7510-00-240-1525	Pencil, Marking Aid, White (81348) A-A-87	ea
26	O	7510-00-264-4612	Pencil, Marking Aid, Yellow (81348) A-A-87	ea
27	O	7920-00-205-3570	Rag, Wiping (81348) DDD-R-30	be
28	O	6630-00-442-8000	Spool, with Color Chart	ea
29	O	9310-00-160-7858	Stencilboard, Oiled, Type II (81348) UU-S-625	sh
30	O	8315-00-281-3221	Tape, Cotton, Type III, 3/4 Inch, OD (81349) MIL-T-5661	yd
31	O	8315-00-255-7673	Tape, Nylon, Type III, 1/2 Inch, OD (81349) MIL-T-5038	ft
32	O	8315-00-176-8083	Tape, Nylon, Type III, 3/4 Inch, OD (81349) MIL-T-5038	yd
33	O	7510-00-266-6712	Tape, Masking	yd
34	O	7510-00-663-0196	Tape, Pressure Sensitive, 2 inch, OD (81348) PPP-T-60	yd
35	O	6810-00-270-9982	Tetrachorethylene, Technical (81348) O-T-236	gl
36	O	8310-00-194-4065	Thread, Cotton, Ticket No. 5, OD (81348) V-T-276	yd
37	O	8310-01-279-6073	Thread, Cotton, Ticket No. 8/4, (81348) V-T-276 (Orange)	yd
38	O	8310-00-917-3945	Thread, Cotton, Ticket No. 8/7 (81348) V-T-276	yd
39	O	8310-00-262-2770	Thread, Nylon, Size E, Natural White (81348) V-T-295 Type I, Class A	yd
40	O	8310-00-262-2772	Thread, Nylon, Size E, OD (81348) V-T-295 Type I. Class A	yd

**EXPENDABLE/DURABLE SUPPLIES LIST (cont)**

(1) ITEM NUMBER	(2) LEVEL	(3) NATIONAL STOCK NUMBER	(4) DESCRIPTION	(5) U/M
41	O	8310-00-227-1244	Thread, Nylon, Size FF, OD (81348) V-T-295, Type I, Class A	yd
42	O	8310-00-248-9714	Thread, Nylon, Size 3, Natural White (81348) V-T-295 Type I, Class A	yd
43	O	8310-00-267-3027	Thread, Nylon, Size 3, OD (81348) V-T-295 Type I, Class A	yd
44	O	8310-00-262-2777	Thread, Nylon, Size 5, OD (81348) V-T-295, Type I, Class A	yd
45	O	8310-00-248-9716	Thread, Nylon, Size 6, Natural White (81348) V-T-295 Type I, Class A	yd
46	O	8310-00-262-2780	Thread, Nylon, Size 6, OD (81348) V-T-295 Type I, Class A	yd
47	O	9160-00-285-2044	Wax, Paraffin, 1 lb Cake (81348) VV-W-95 Type I, Grade A	lb
48	O	8305-00-268-2411	Webbing, Cotton, Type I, 1/4 Inch (81349) MIL-T-5661	ft
49	O	8305-00-260-2561	Webbing, Cotton, Type II, 1-inch (81349) MIL-T-5665	ft
50	O	8305-00-260-2565	Webbing, Cotton, Type VIII, OD (81349) MIL-W-5665 Class 2A	ft
51	O	8305-00-753-6086	Webbing, Cotton, Type X, Class 2B, OD (81349) MIL-W-5665	ft
52	O	8305-00-263-3639	Webbing, Nylon, Type i, 9/16 Inch, natural (81349) MIL-W-4088	ft
53	O	8305-00-260-6909	Webbing, Nylon, Type I, 9/16 Inch, OD (81349) MIL-W-4088	ft
54	O	8305-00-261-8585	Webbing, Nylon, Type VIII, 1 23/32 Inch, OD (81349) MIL-W-4088	ft
55	O	8305-00-261-8584	Webbing, Nylon, Type X, OD (81349) MIL-W-4088	ft
56	O	8305-00-261-6151	Webbing, Nylon, Type XVIII, 1 Inch, OD (81349) MIL-W-4088	ft

**EXPENDABLE/DURABLE SUPPLIES LIST (cont)**

(1) ITEM NUMBER	(2) LEVEL	(3) NATIONAL STOCK NUMBER	(4) DESCRIPTION	(5) U/M
57	O	8305-00-268-2453	Webbing, Nylon, Tubular, 1/2 Inch, OD (81349) MIL-W-5625	ft
58	O	8305-00-268-2455	Webbing, Nylon, Tubular, 1 Inch, OD (81349) MIL-W-5625	ft
59	O	8305-00-267-3009	Webbing, Nylon, Type XVII, 1 Inch, OD, (81349) MIL-W-4088	ft
60	O	8305-00-281-3012	Webbing, Nylon, Type XII, 1 23/32 Inch, OD (81349) MIL-T-5038	ft
61	O	8305-00-261-8579	Webbing, Nylon, Type IV, 1 Inch, OD (81349) MIL-T-5038	ft
62	O	8305-00-892-4616	Wire, Steel, 0.80 Inch Dia. (41348), QQ-W-423	lb
63	O	1670-00-568-0323	Rubber Bands	bx

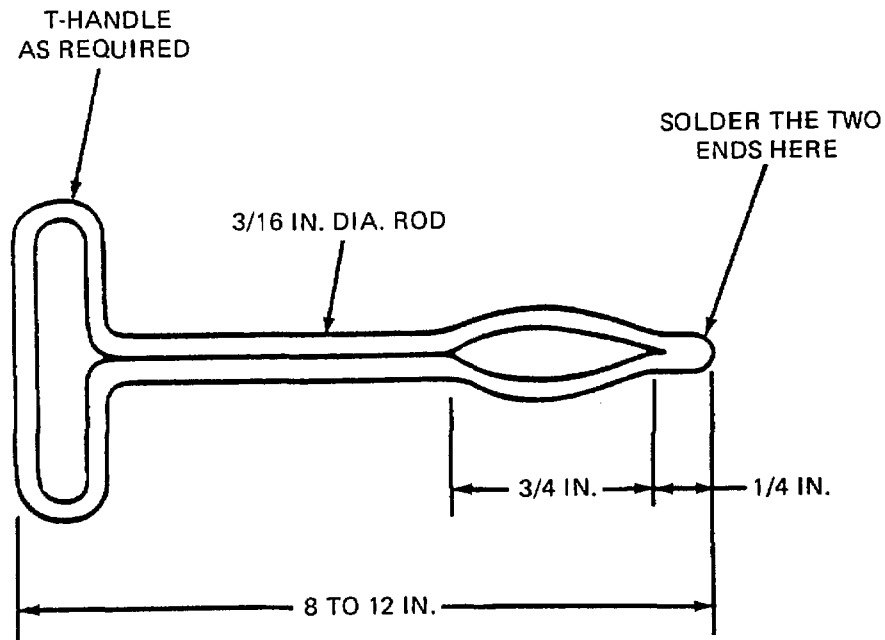
**D-5/(D-6 blank)**



## 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.



4839-156

Figure E-1. Splicing Aid Fabrication.

E-1/(E-2 blank)



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**ARMY TM 10-1670-281-23&P**  
**AIR FORCE T.O. 13C5-32-2**  
**NAVY NAVAIR 13-1-32**

By Order of the Secretaries of the Army, Air Force and Navy:

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## These are the instructions for sending an electronic 2028

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Subject: DA Form 2028

1. **From:** Joe Smith
2. **Unit:** home
3. **Address:** 4300 Park
4. **City:** Hometown
5. **St:** MO
6. **Zip:** 77777
7. **Date Sent:** 19-OCT-93
8. **Pub no:** 55-2840-229-23
9. **Pub Title:** TM
10. **Publication Date:** 04-JUL-85
11. **Change Number:** 7
12. **Submitter Rank:** MSG
13. **Submitter FName:** Joe
14. **Submitter MName:** T
15. **Submitter LName:** Smith
16. **Submitter Phone:** 123-123-1234
17. **Problem:** 1
18. **Page:** 2
19. **Paragraph:** 3
20. **Line:** 4
21. **NSN:** 5
22. **Reference:** 6
23. **Figure:** 7
24. **Table:** 8
25. **Item:** 9
26. **Total:** 123
27. **Text:**

This is the text for the problem below line 27.



<b>RECOMMENDED CHANGES TO PUBLICATIONS AND BLANK FORMS</b>						Use Part II ( <i>reverse</i> ) for Repair Parts and Special Tool Lists (RPSTL) and Supply Catalogs/Supply Manuals (SC/SM).	DATE <i>21 October 2003</i>
For use of this form, see AR 25-30; the proponent agency is ODISC4.							
TO: ( <i>Forward to proponent of publication or form</i> ) ( <i>Include ZIP Code</i> ) COMMANDER U.S. ARMY TANK-AUTOMOTIVE AND ARMAMENT COMMAND ATTN: AMSTA-LC-CECT 15 KANSAS STREET NATICK, MA 01760-5052				FROM: ( <i>Activity and location</i> ) ( <i>Include ZIP Code</i> )  <i>PFC Jane Doe</i> <i>CO A 3<sup>rd</sup> Engineer BR</i> <i>Ft. Leonardwood, MO 63108</i>			
<b>PART I – ALL PUBLICATIONS (EXCEPT RPSTL AND SC/SM) AND BLANK FORMS</b>							
PUBLICATION/FORM NUMBER  TM 10-1670-296-23&P				DATE  30 October 2002		TITLE  Unit Manual for Ancillary Equipment for Low Velocity Air Drop Systems	
ITEM NO.	PAGE NO.	PARA-GRAPH	LINE NO. *	FIGURE NO.	TABLE NO.	RECOMMENDED CHANGES AND REASON <i>(Provide exact wording of recommended changes, if possible).</i>	
	<i>0036 00-2</i>				<i>1</i>	<p><i>In table 1, Sewing Machine Code Symbols, the second sewing machine code symbol should be MD ZZ not MD 22.</i></p> <p><i>Change the manual to show Sewing Machine, Industrial: Zig-Zag; 308 stitch; medium-duty; NSN 3530-01-181-1421 as a MD ZZ code symbol.</i></p>	
<i>*Reference to line numbers within the paragraph or subparagraph.</i>							
TYPED NAME, GRADE OR TITLE  Jane Doe, PFC				TELEPHONE EXCHANGE/AUTOVON, PLUS EXTENSION  508-233-4141		SIGNATURE  Jane Doe <i>Jane Doe</i>	

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--	---	--------------------------------

**PART II - REPAIR PARTS AND SPECIAL TOOL LISTS AND SUPPLY CATALOGS/SUPPLY MANUALS**

<b>PUBLICATION NUMBER</b> TM 10-1670-296-23&P	<b>DATE</b> 30 October 2002	<b>TITLE</b> Unit Manual for Ancillary Equipment for Low Velocity Air Drop Systems
--	--------------------------------	---

PAGE NO.	COLM NO.	LINE NO.	NATIONAL STOCK NUMBER	REFERENCE NO.	FIGURE NO.	ITEM NO.	TOTAL NO. OF MAJOR ITEMS SUPPORTED	RECOMMENDED ACTION
0066 00-1					4			<i>Callout 16 in figure 4 is pointed to a <u>D-Ring</u>. In the Repair Parts List key for figure 4, item 16 is called a <u>Snap Hook</u>. Please correct one or the other.</i>

SAMPLE

**PART III - REMARKS** *(Any general remarks or recommendations, or suggestions for improvement of publications and blank forms. Additional blank sheets may be used if more space is needed.)*

TYPED NAME, GRADE OR TITLE	TELEPHONE EXCHANGE/AUTOVON, PLUS EXTENSION	SIGNATURE
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PUBLICATION/FORM NUMBER TM 10-1670-281-23&P				DATE 01 October 1990		TITLE Unit and Intermediate Direct Support (DS) Maintenance Manual (Including Repair Parts and Special Tools List) for Parachute, Cargo Type: 64-Foot Diameter, Model G-12D/G-12E	
ITEM NO.	PAGE NO.	PARA-GRAPH	LINE NO. *	FIGURE NO.	TABLE NO.	RECOMMENDED CHANGES AND REASON <i>(Provide exact wording of recommended changes, if possible).</i>	
<i>*Reference to line numbers within the paragraph or subparagraph.</i>							
TYPED NAME, GRADE OR TITLE				TELEPHONE EXCHANGE/AUTOVON, PLUS EXTENSION		SIGNATURE	

TO: <i>(Forward direct to addressee listed in publication)</i> COMMANDER U.S. ARMY TANK-AUTOMOTIVE AND ARMAMENT COMMAND ATTN: AMSTA-LC-CECT 15 KANSAS STREET NATICK, MA 01760-5052	FROM: <i>(Activity and location) (Include ZIP Code)</i>	DATE
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**PART II – REPAIR PARTS AND SPECIAL TOOL LISTS AND SUPPLY CATALOGS/SUPPLY MANUALS**

PUBLICATION NUMBER TM 10-1670-281-23&P	DATE 01 October 1990	TITLE Unit and Intermediate Direct Support (DS) Maintenance Manual (Including Repair Parts and Special Tools List) for Parachute, Cargo Type: 64-Foot Diameter, Model G-12D/G-12E
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PAGE NO.	COLM NO.	LINE NO.	NATIONAL STOCK NUMBER	REFERENCE NO.	FIGURE NO.	ITEM NO.	TOTAL NO. OF MAJOR ITEMS SUPPORTED	RECOMMENDED ACTION

**PART III – REMARKS** *(Any general remarks or recommendations, or suggestions for improvement of publications and blank forms. Additional blank sheets may be used if more space is needed.)*

TYPED NAME, GRADE OR TITLE	TELEPHONE EXCHANGE/AUTOVON, PLUS EXTENSION	SIGNATURE
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<b>RECOMMENDED CHANGES TO PUBLICATIONS AND                  BLANK FORMS</b>  For use of this form, see AR 25-30; the proponent agency is ODISC4.						Use Part II ( <i>reverse</i> ) for Repair Parts and Special Tool Lists (RPSTL) and Supply Catalogs/Supply Manuals (SC/SM).	DATE
TO: ( <i>Forward to proponent of publication or form</i> ) ( <i>Include ZIP Code</i> ) COMMANDER U.S. ARMY TANK-AUTOMOTIVE AND ARMAMENT COMMAND ATTN: AMSTA-LC-CECT 15 KANSAS STREET NATICK, MA 01760-5052						FROM: ( <i>Activity and location</i> ) ( <i>Include ZIP Code</i> )	
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ITEM NO.	PAGE NO.	PARA-GRAPH	LINE NO. *	FIGURE NO.	TABLE NO.	RECOMMENDED CHANGES AND REASON <i>(Provide exact wording of recommended changes, if possible).</i>	
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## 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 decigrams = .035 ounce  
 1 dekagram = 10 grams = .35 ounce  
 1 hectogram = 10 dekagrams = 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 milliliters = .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 feet

## Approximate Conversion Factors

<i>To change</i>	<i>To</i>	<i>Multiply by</i>	<i>To change</i>	<i>To</i>	<i>Multiply by</i>
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	5/9 (after	Celsius	_C
	temperature	subtracting 32)	temperature	





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