ORGANIZATIONAL AND DIRECT SUPPORT MAINTENANCE INCLUDING REPAIR PARTS AND SPECIAL TOOLS LIST

MC-4
RAM AIR FREE-FALL
PERSONNEL PARACHUTE
SYSTEM
(1670-01-306-2100)

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ARMY TM 10-1670-287-23&P
AIR FORCE TO 14D1-2-468-2
NAVY NAVFAC 13-1-38
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NO. 2

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THE ARMY, AIR FORCE AND NAVY AND
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WASHINGTON, D.C., 30 NOVEMBER 1993

Organizational and Direct Support Maintenance Manual
(Including Repair Parts and Special Tools List)
For

MC-4 RAM AIR FREE-FALL
PERSONNEL PARACHUTE SYSTEM
NSN 1670-01-306-2100

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WARNING

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

WARNING

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

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 when 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.

TECHNICAL MANUAL

NO. 10-1670-287-23&P

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Organizational and Direct Support Maintenance Manual (Including Repair Parts and Special Tools List) for MC-4 RAM AIR FREE-FALL PERSONNEL PARACHUTE SYSTEM NSN 1670-01-306-2100

Current as of 16 January 1992

REPORTING ERRORS AND RECOMMENDING IMPROVEMENTS

ARMY

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

AIR FORCE

For Air Force, submit AFTO Form 22 (Technical Order System Publication Improvement Report and Reply) and forward to the address prescribed above for the Army. An information copy of the prepared AFTO Form 22 shall be furnished to SA-ALC/TIRTR, Kelly AFB, TX 78241-5000.

MARINE CORPS

Marine Corps personnel submit NAVMC 10772 form to Commanding General, Marine Corps Logistics Base, (Code 850) Albany, GA 31704-5000.

NAVY

For Navy, mail comments to Commander, Space and Naval Warfare Systems Command, ATTN: SPAWAR 8122, Washington, DC, 20363-5100.

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CHAPTER 1

INTRODUCTION

SECTION I. GENERAL INFORMATION

1-1. Scope. This manual contains instructions for organizational and direct support maintenance on the MC-4 Ram Air Free-Fall Parachute System. Included are procedures for service upon receipt, packing procedures, maintenance procedures, and repair parts and special tools lists.

1-2. Maintenance Forms and Records. Department of the Army forms and procedures used for equipment maintenance will be those prescribed by TM PAM 738-750, the Army Maintenance Management System. Additional maintenance forms, records, and reports that are to be used by organizational and direct support maintenance personnel are listed in and prescribed by TM 10-1670-201-23, DA PAM 738-751, and TB 43-0002-43. Maintenance forms and records used by the Marine Corps are prescribed by TM 4700-15/1.

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

a. General.

(1) *Objective*. Methods of destruction used to inflict damage on air delivery equipment 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.

1-3 Destruction of Army Material to Prevent Enemy Use (Cont).

(5) *Specific method's.* Specific methods of destroying Army material 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 these materials are highly flammable.

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. 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 item, then soaked with a flammable petroleum product and ignited. Proper concentration of equipment that is suitable for burning will provide a hotter and more destructive fire.

d. Destruction By Use of Natural Surroundings. Small vital parts of assemblies that 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.

e. Other Method's of Destruction. Oxygen system equipment will be destroyed as prescribed in TM 750-244-1-2.

1-4. Preparation for Storage and Shipment. For instructions concerning storage or shipment, refer to TM 10-1670-201-23 and Chapter 2, Section VI of this manual.

1-5. Reporting Equipment Improvement Recommendations (EIR).

a. Army. If the ram air parachute 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. Tell us why a procedure is hard to perform. Put it on a SF368 (Quality Deficiency Report). Mail it to us at Headquarters Commander, US Army Aviation and Troop Command, ATTN: AMSAT-I-MDC, 4300 Goodfellow Blvd., St. Louis, MO 63120-1798. We'll send you a reply.

b. Air Force. Air Force personnel are encouraged to submit EIRs in accordance with AFR 900-4.

c. Navy. Navy personnel are encouraged to submit EIRs thorough their local Beneficial Suggestion Program.

d. Marine Corps. Marine Corps personnel are encouraged to submit EIRs in accordance with MCO 1650.17.

*U.S. GOVERNMENT PRINTING OFFICE: 1993 - 755-028/80163

SECTION II. EQUIPMENT DESCRIPTION AND DATA

1-6. Equipment Characteristics, Capabilities, and Features. The ram air parachute system (figure 1-1) is designed to place Army personnel into areas of mission interest. A ram air parachute's inherent gliding capability offers important potential for minimizing detection during entry or changing the landing area during descent in order to avoid capture. The large stand-off capability significantly reduces aircraft vulnerability and detection. The various modes of ram air parachute use, such as high altitude high opening (HAHO) and high altitude low opening (HALO), provide versatility and opportunity for controlling descent which are not possible with standard (round) or less efficient gliding parachute designs.

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

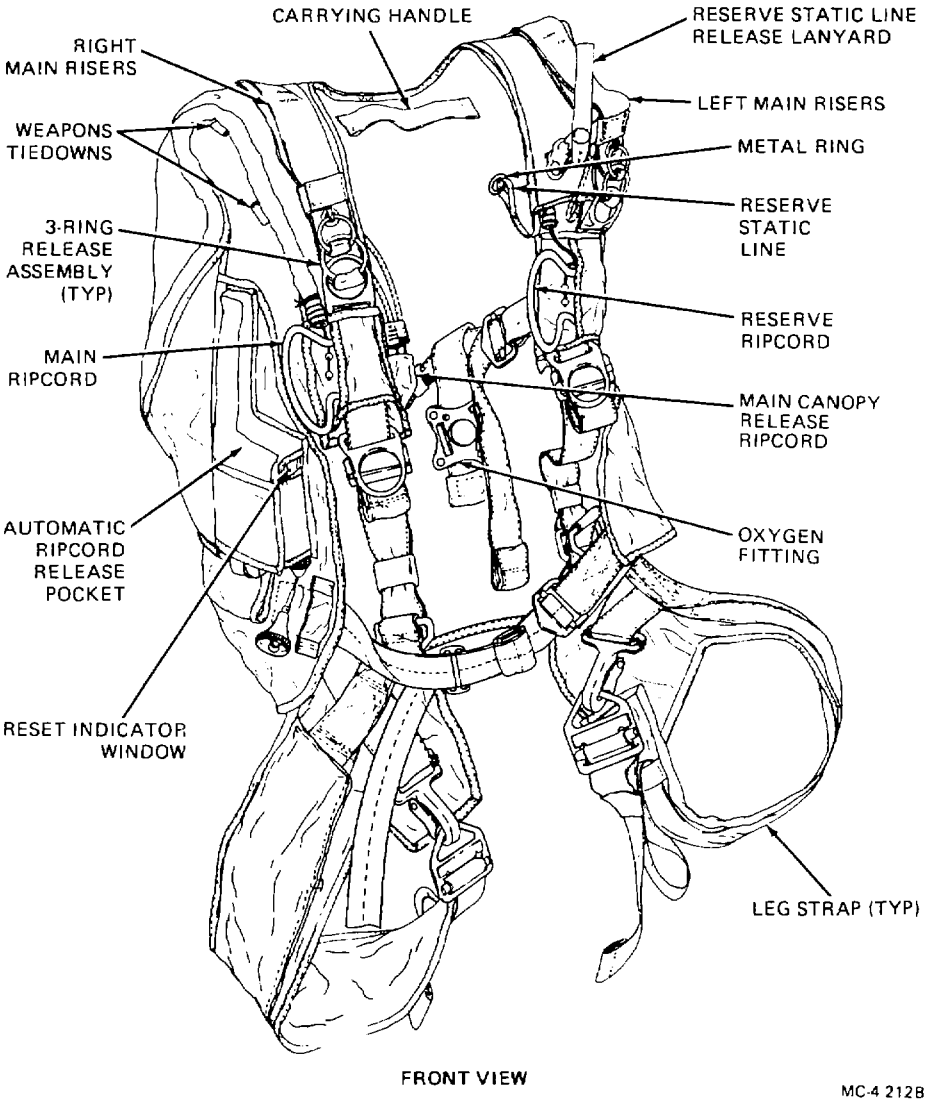


Figure 1-1. Ram Air Free-Fall Parachute System. (Sheet 1 of 2)

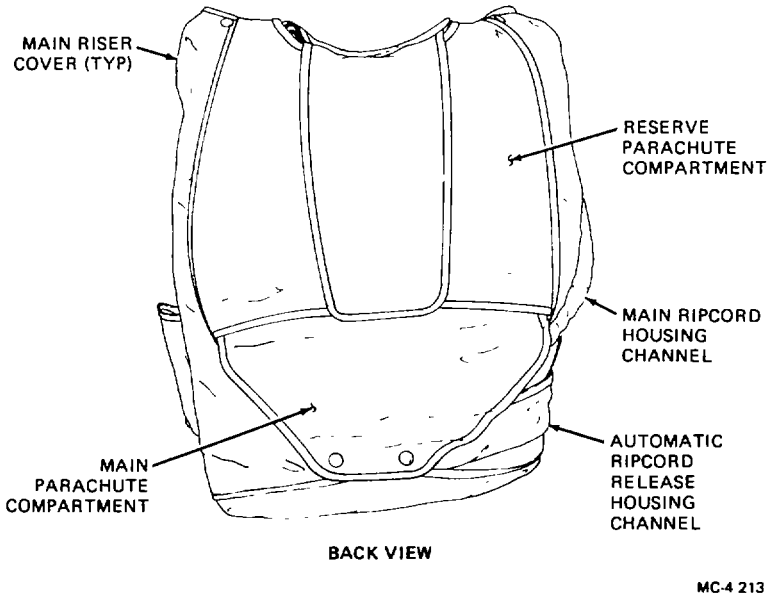


Figure 1-1. Ram Air Free-Fall Parachute System. (Sheet 2 of 2)

1-7. Components. The ram air parachute system consists of:

a. A harness assembly compatible with an FF-2 automatic ripcord release, and a single-point canopy release system. The harness also includes four equipment/lowering line attachment points.

b. A back-mounted container assembly designed to accommodate a main and reserve canopy situated in tandem with the reserve canopy above the main canopy. The main and reserve canopies are identical in size and performance with provisions for turning and executing maneuvers prior to landing. Both canopies are capable of three-to-one glide ratios.

1-8. Deployment Capability. The ram air parachute system has a deployment capability as follows:

a. The deployment of the main canopy is by either the automatic ripcord release or the main ripcord.

b. In the event the main canopy needs to be released during descent or landing, the main parachute system is equipped with a single-point canopy release system. This system releases both left and right risers from the same single point at the same instant.

c. Deployment of the reserve canopy Is by either a static line connected to main canopy risers and initiated through the single-point canopy release system or by the reserve ripcord.

d. The reserve deployment system allows reserve canopy deployment even if the reserve pilot chute becomes entangled/snagged with the parachutist or equipment.

1-9. Location and Description of Major Components.

a. *Main Parachute Assembly.* The main parachute assembly (figure 1-2) consists of a pilot chute connected by a bridle line to a seven-cell ram air canopy. A deployment bag is used to stow the canopy and suspension lines. The pilot chute, bridle line, and deployment bag comprise the main deployment system. The deployment bag is packed in the bottom compartment of the container assembly with risers attached to the main harness using a three-ring release system. A single-point release can be used to actuate the three-ring release system and to disengage the risers from the harness.

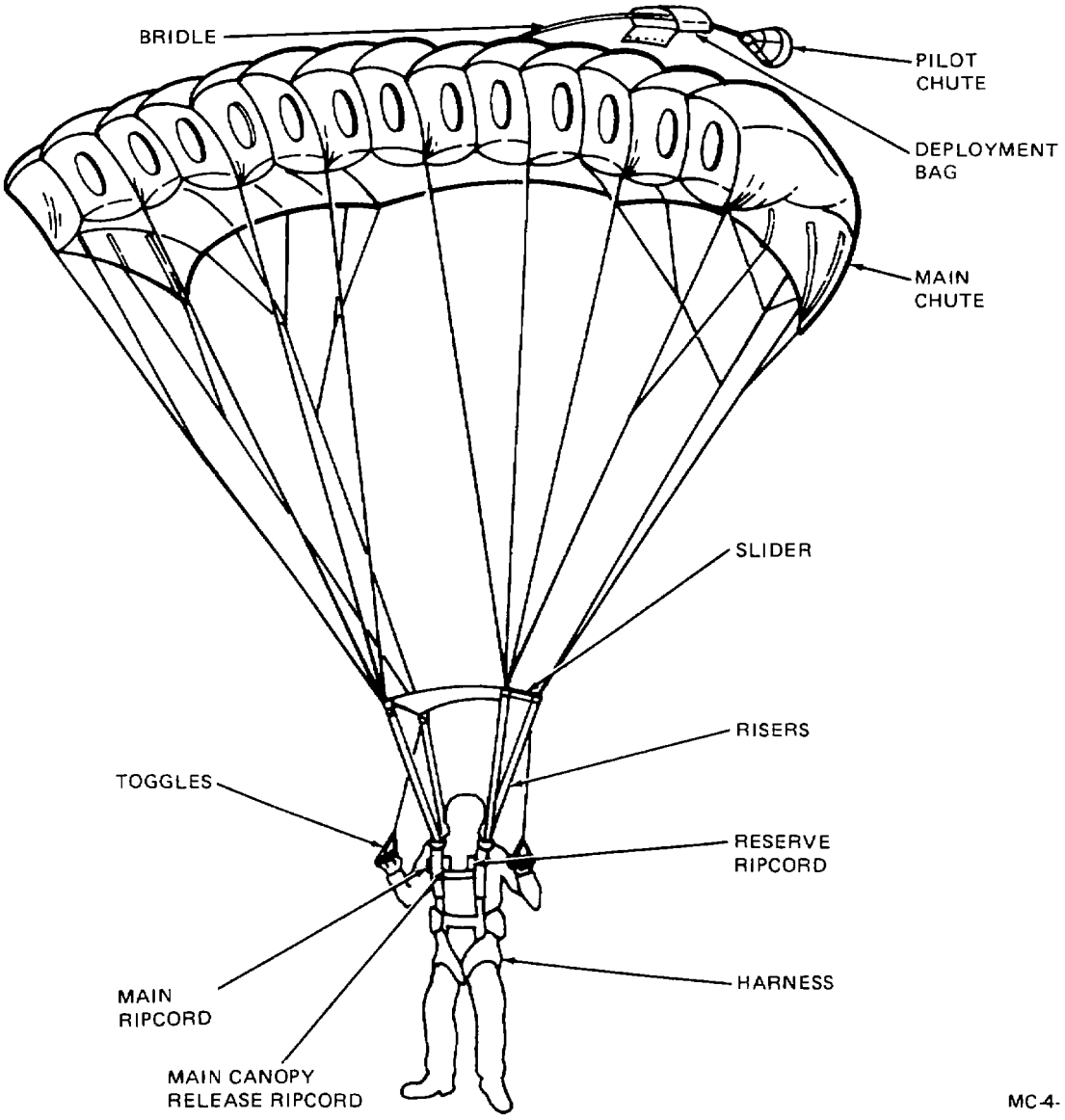


Figure 1-2. Main Parachute Assembly.

b. Main Deployment System. The main deployment system consists of the items shown in figure 1-3. The pilot chute has a 7-inch diameter crown, a 32-inch spiral spring, and is covered with a combination of MIL-C44378, Type I nylon cloth (O to 5 cfm) and nylon mesh fabric. A 1-inch loop at the bottom of the main pilot chute is used to connect a 62-inch main pilot chute bridle line to the main canopy. The deployment bag measures 17 by 10 inches and is constructed of nylon cloth. A grommet in the top of the bag allows the bridle line to pass through the bag and attach to the canopy. The bag has attachment points for Type II heavy duty retainer bands which are used to lock the bag closed and stow the suspension lines.

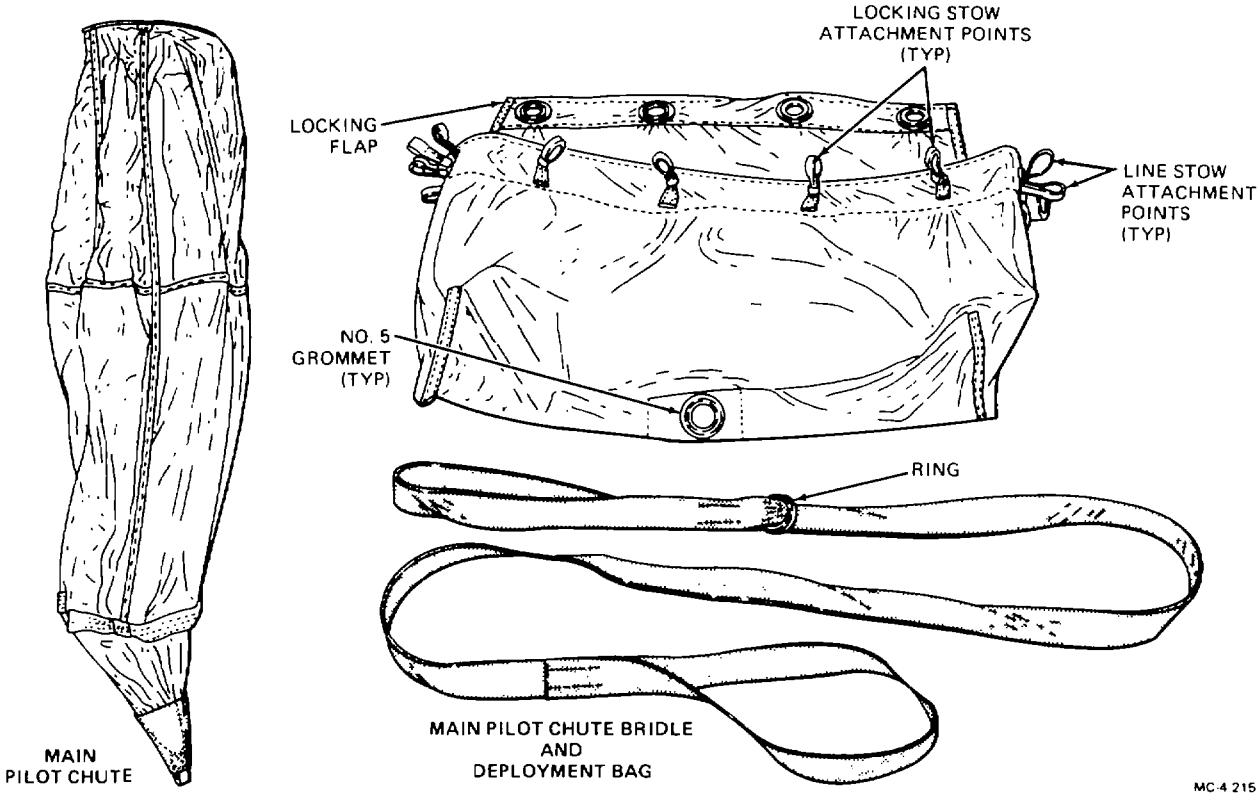


Figure 1-3. Main Deployment System.

c. Main Canopy Assembly. The main canopy assembly (figure 1-4) consists of a rectangular canopy constructed of MIL-C-44378, Type I nylon with heat set, stabilized, braided polyester suspension and steering lines, a slider for reefing, and four barrel-nut style connector links for connection to the main risers.

1-9. Location and Description of Major Components (CONT).

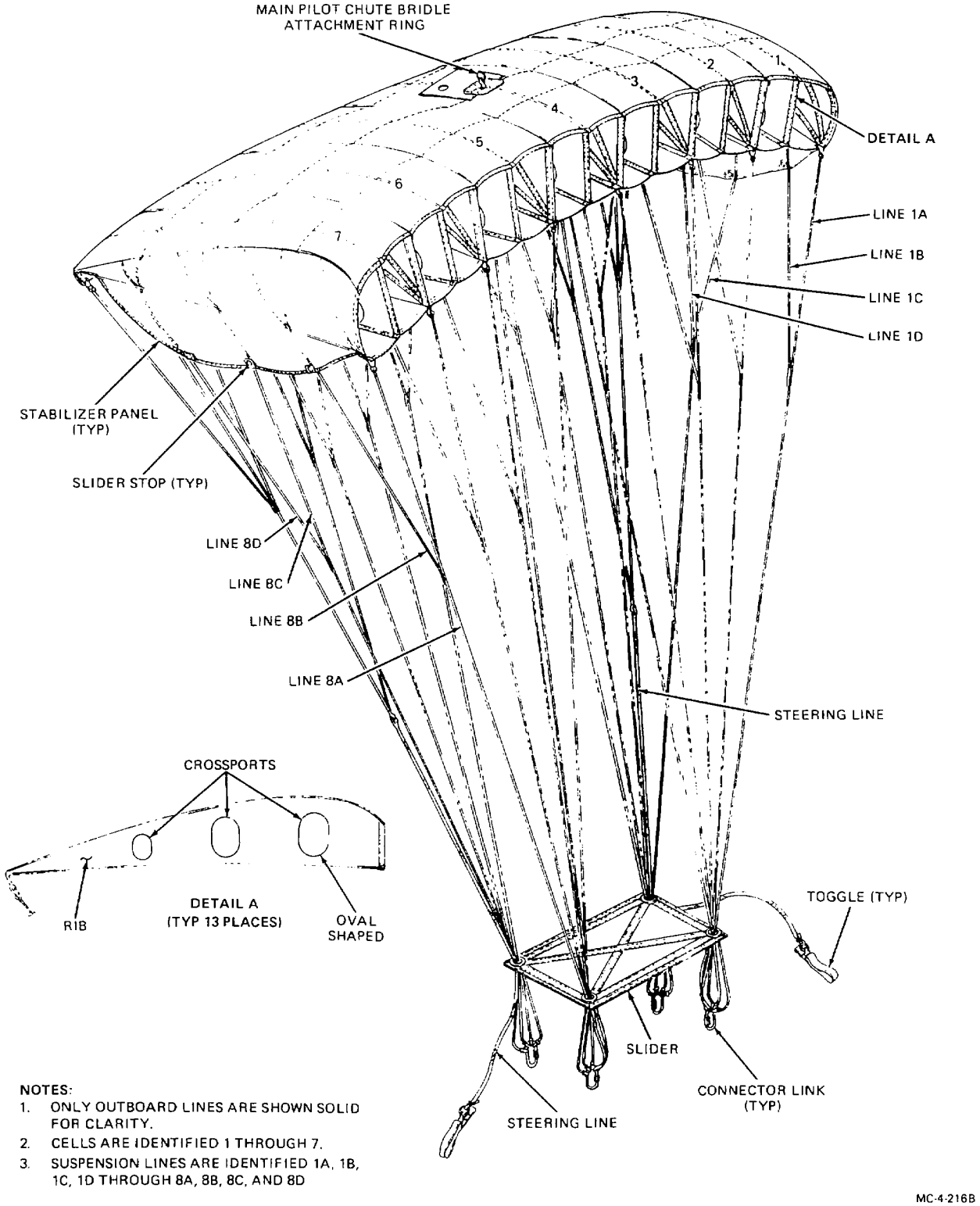


Figure 1-4. Canopy Assembly, Typical.

(1) Canopy. The ram air canopy (figure 1-4) is a wing. It has an upper and lower surface connected by a series of ribs. This construction forms a rectangularly shaped canopy with seven dual openings at the leading edge known as cells. Each cell is identified numerically, 1 through 7. The cells allow ram air pressure between upper and lower surfaces giving the canopy its shape and glide characteristics.

(a) All ribs except the outer ribs have oval shaped crossports cut into them to allow spanwise airflow. The outer ribs and alternating ribs through the canopy (eight) have load distributing tapes and attachment loops for suspension line attachment.

(b) The suspension lines are connected to alternate ribs at four chordwise attachment points on each rib. The lines attached to the leading edge are identified as the A lines. The lines attached aft of the A lines are the B lines, and so on to the D lines. The lines attached to the trailing edge are the steering lines. Each set of lines along each rib (A, B, C, D) are identified numerically, 1 through 8.

(c) The center A and B lines are continuous (lines 4A, 4B, 5A, and 5B). They run directly from the fourth A line attachment point down to and around the front left connector link, and up to the fourth B line attachment point. The fifth A and B lines run similarly from the fifth B line attachment point down to and around the front right connector link and up to the fifth B line attachment point.

(d) Lines other than the forward center lines are cascaded to points beneath the canopy. The A lines are attached directly to one of the front two connector links. The B lines are attached to their associated A lines at a point below the canopy. The C lines run directly to one of the two rear connector links, and the D lines are attached to their associated C lines in the same way that the B lines are connected to the A lines. This cascaded method of construction reduces weight, volume, and aerodynamic drag and also contributes to structural Integrity.

(e) Two steering lines controlled at the risers are used to maneuver the canopy. Each steering line is formed by attaching five cascaded lines from the trailing edge of the canopy into one main steering line. Each steering line then runs directly to the back of the rear risers.

(f) A stabilizer panel is attached to each outboard side of the canopy.

(2) Slider. The slider (figure 1-4), used for reefing, is made of MIL-C-44378, Type I nylon, is dome shaped, and measures 27 by 28 inches. All sides are reinforced with Type XII webbing, MIL-W-4088. MIL-G16491 No. 8 grommets are installed at each corner.

(3) Connector links. Four barrel-nut style stainless steel connector links (figure 1-4) are used to connect the suspension lines to risers.

NOTE
Only No. 6 stainless steel connector links are authorized.

d. Container and Harness Assembly. The container and harness (figure 1-5) are an integral part of each other. The container Is divided into two compartments for the main and reserve canopies while the harness provides attachment points for the main and reserve ripcords, main risers, main canopy release, and accessory attachment rings.

1-9. Location and Description of Major Components (CONT).

(1) Container. The container, constructed of nylon duck cloth, provides an upper (reserve) and lower (main) compartment for stowage of the canopies. Protective covers are provided for the main risers and an automatic ripcord release pocket is located on the right side of the container.

(2) Harness. The harness is constructed of Type VII nylon webbing, MIL-W-4088, and is an integral part of the container. The harness includes eight adjustment points: two leg connector snaps and six adjusting adapters. Four accessory attachment rings, one each on the upper and lower lift webs, are used to accommodate rucksacks, containers, and weapons. The reserve canopy attaches to the reserve risers. The risers feature steering line guide rings and covers for the steering lines. The right and left lift webs serve as attachment locations for the main and reserve ripcord pockets. Also located on the lift webs are the base rings of the threering release assembly. These rings are used for attachment/release of the main parachute.

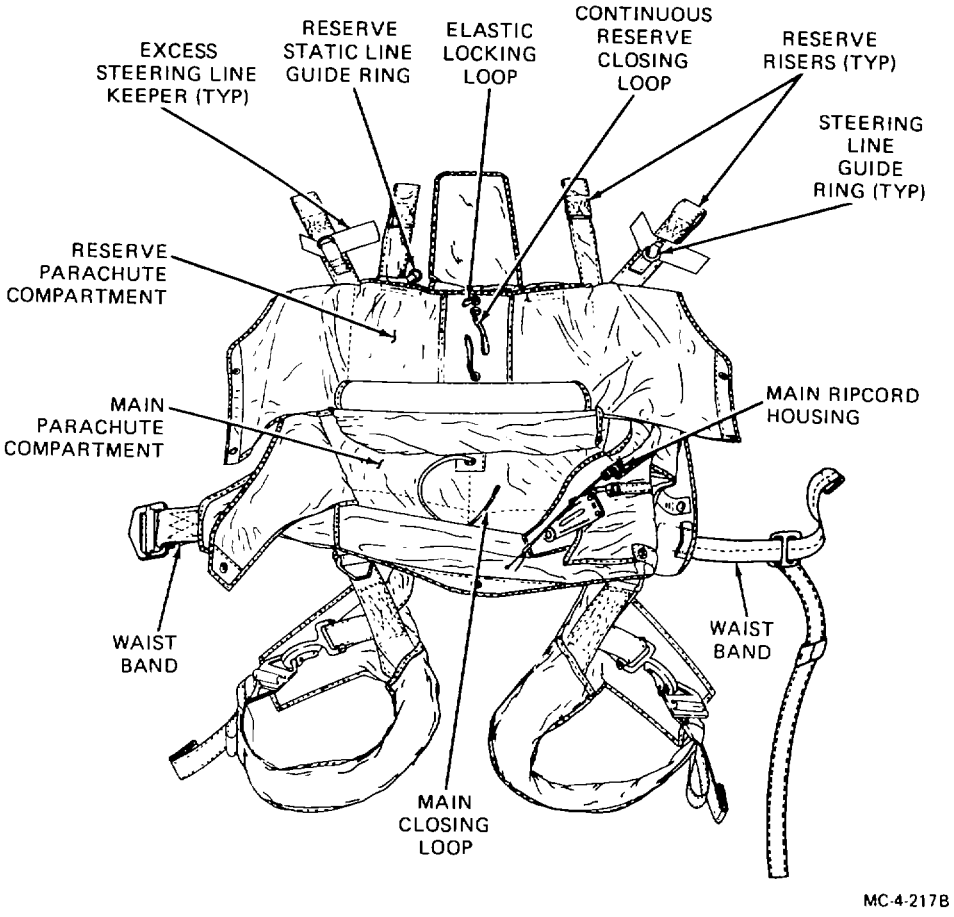


Figure 1-5. Container and Harness Assembly. (Sheet 1 of 2)

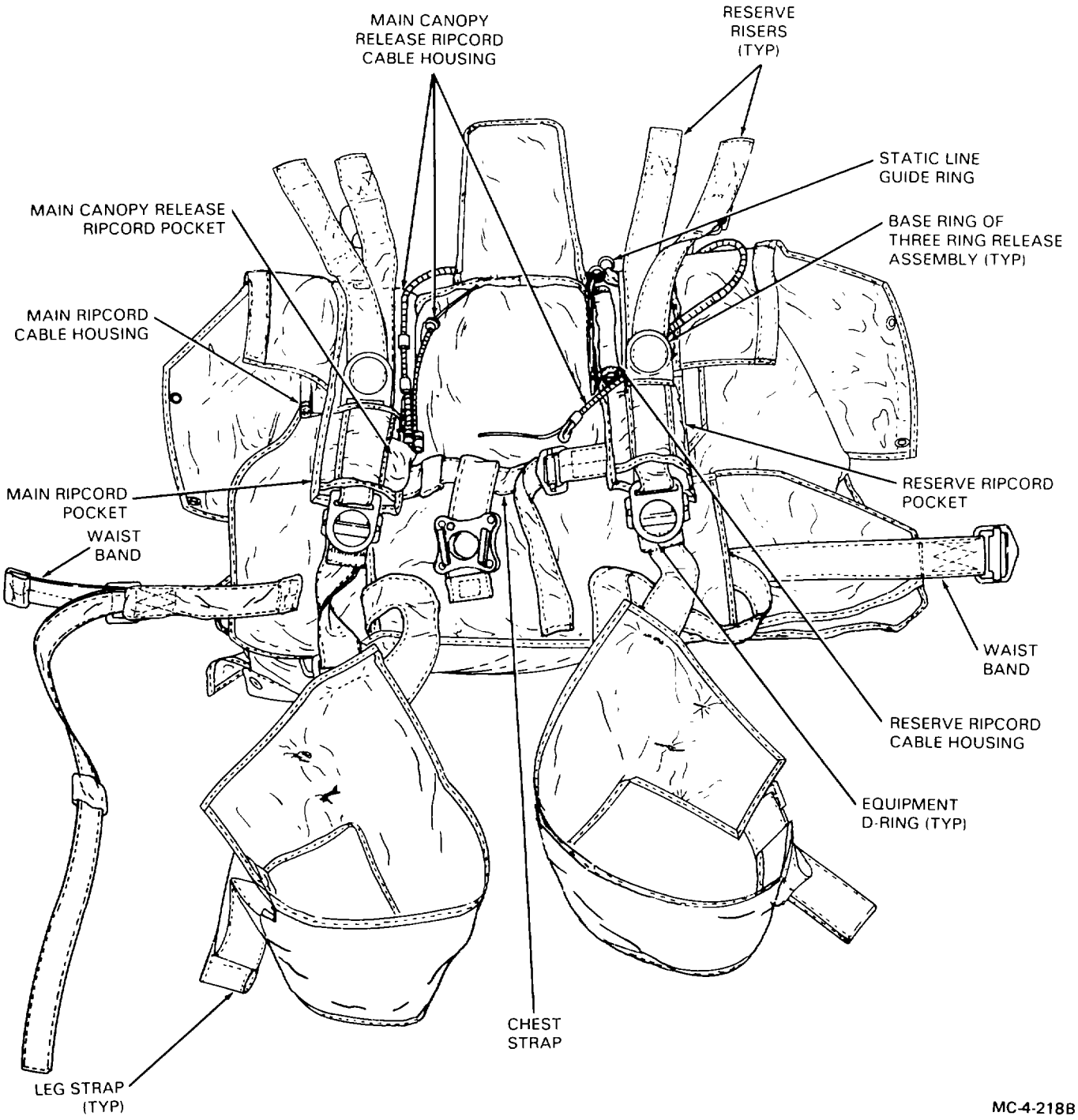


Figure 1-5. Container and Harness Assembly. (Sheet 2 of 2)

1-9. Location and Description of Major Components (CONT).

e. Main Ripcord Assembly. The main ripcord assembly (figure 1-6) consists of a stainless steel braided cable with a single locking pin. The cable is secured to a curved ripcord handle with two swaged balls. The terminal end of the cable also has a swaged ball.

f. Reserve Ripcord Assembly. The reserve ripcord assembly (figure 1-6) consists of a stainless steel braided cable with two locking pins. The cable is secured to a curved ripcord handle with two swaged balls.

g. Main Canopy Release Ripcord. The main canopy release ripcord (figure 1-6) consists of a padded nylon cushion grip and lengths of plastic coated ripcord cable. A length of hook tape is sewn to the cushion grip to secure the grip to the stow pocket.

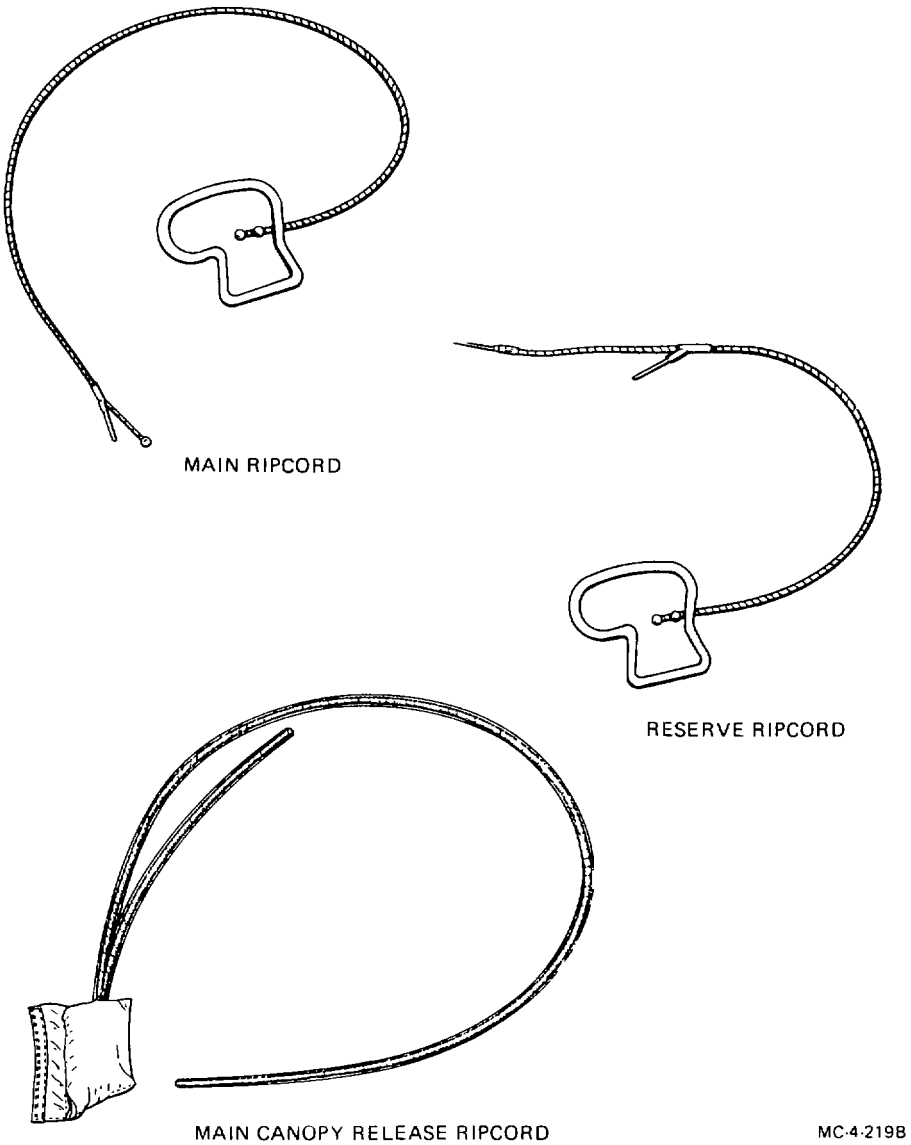


Figure 1-6. Ripcords.

h. Main Riser Assembly. The main risers (figure 1-7) are constructed of Type VII nylon webbing, MIL-W-4088. Each riser is 36 inches in length. The bottom end of the main risers Incorporates two riser release rings, a grommet, and a main canopy release locking loop. A channel is sewn to the back of the rear risers for stowage of the main canopy release cable. The back of the rear risers incorporates steering line keepers used to stow excess steering line, and steering line toggle keepers for stowage of steering line toggles.

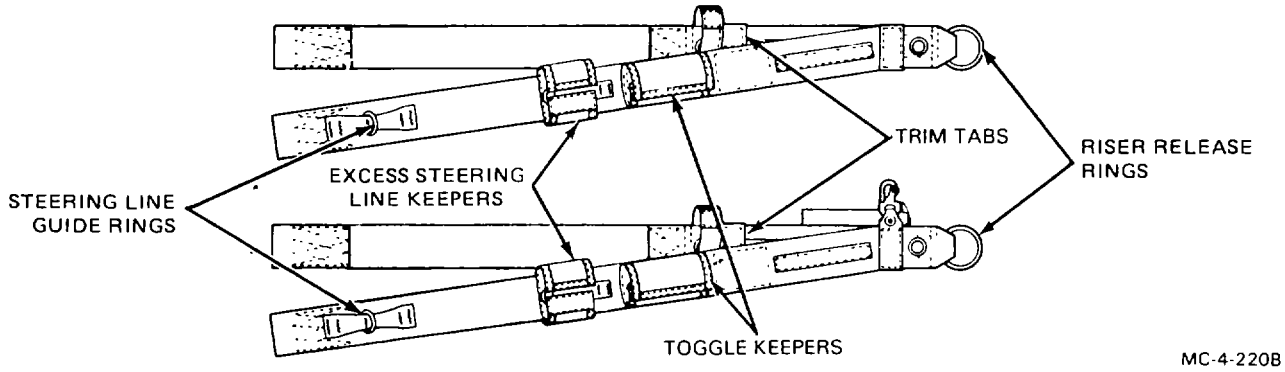


Figure 1-7. Main Risers.

i. Automatic Ripcord Release FF-2. The automatic ripcord release (figure 1-8) is designed to open the main parachute compartment automatically. It consists of a release mechanism mounted in a metal case and is designed to work mechanically on barometric pressure. The arming cable, power cable, and power cable housings are located on one side of the case. The 14-inch power cable housing is attached to the container baseplate and the power cable is attached to the ripcord locking pin. Refer to TM 10-1670-264-13&P for operational limitations, maintenance, and repair.

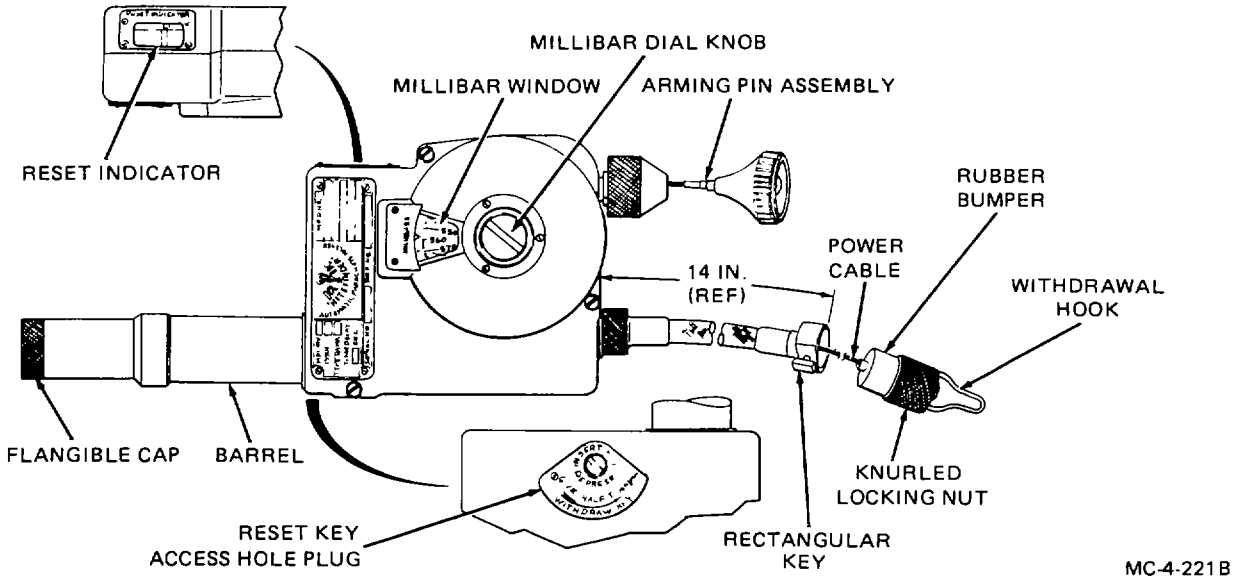


Figure 1-8. Automatic Ripcord Release FF-2.

1-9. Location and Description of Major Components (CONT).

j. Reserve Parachute Assembly. The reserve parachute consists of a seven-cell ram air canopy and the reserve deployment system. The canopy is attached to the reserve risers and is packed in the upper compartment of the container. The reserve parachute can be deployed by two methods: manually by using the reserve ripcord, or automatically by the static line upon release of the main parachute after pulling the main canopy release ripcord.

k. Reserve Deployment System. The reserve deployment system consists of the items shown in figure 1-9. The reserve pilot chute has a 7-inch diameter crown and a 19-inch spiral spring, and is covered with a combination of MIL-C-44378, Type I nylon and large hole nylon mesh fabric. A 2-inch wide by 18-foot bridle line is attached to the reserve pilot chute and deployment bag. The deployment bag, constructed of nylon cloth, measures 12 by 16 inches. The mouth of the bag has a channel for an elastic safety stow loop and grommets for locking the bag closed. The suspension lines are stowed in the bag's line retention pocket.

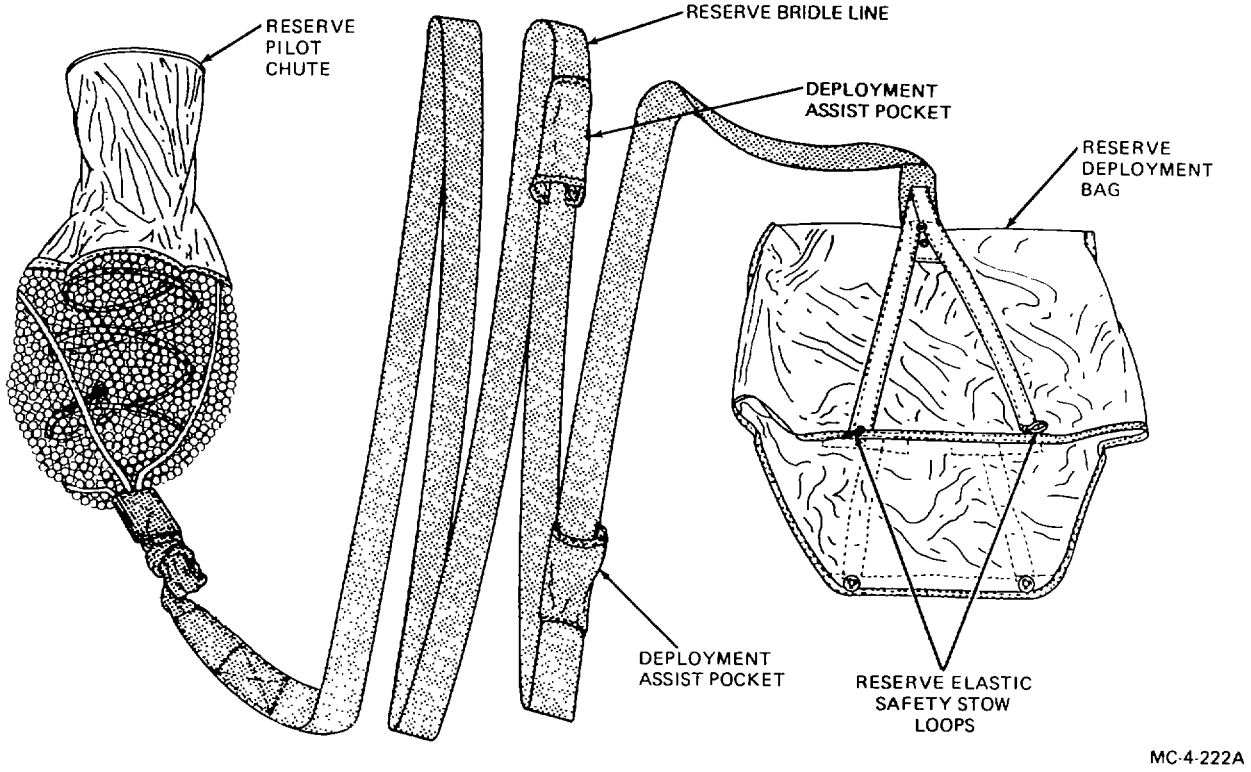


Figure 1-9. Reserve Deployment System.

1-10. Differences Between Main and Reserve Parachute Assemblies. The ram air parachute system consists of a main and reserve parachute mounted in tandem on the back of the parachutist. The differences between the main and reserve assemblies are as follows:

a. The main and reserve deployment systems are different and are described in paragraphs 1-9(b) and 1-9(k).

b. The main parachute may be deployed by ripcord or automatic ripcord release.

c. The reserve parachute may be deployed by ripcord or a left main riser actuated reserve static line.

d. The main risers have excess steering line keepers as well as toggle keepers; the reserve risers have excess steering line keepers only.

e. There is 8-inch difference in steering line length. The main canopy steering lines are longer than the reserve canopy steering lines.

f. The main ripcord has a single locking pin; the reserve ripcord as two locking pins.

1-11. Equipment Data. Refer to table 1-1 for performance data for the main and reserve parachute assemblies.

Table 1-1. Main and Reserve Parachute Characteristics

Performance/Description	Characteristics
Lift/Drag Ratio, L/D	3 to 1
Span	28.5 ft
Chord	13 ft
Area	370 sq ft
Maximum Suspended Weight	360 lbs
Forward Speed Range	10 to 25 mph
Rate of Descent	
Full Flight	14 to 16 fps
50% Brakes	6 to 10 fps
100% Brakes	2 to 6 fps
Fully Flared Landing Touchdown	0 to 4 fps (if executed properly)
Deployment Altitude Range	2000 ft AGL to 25,000 ft MSL
Deployment Velocity Range	0 to 150 KIAS

1-12. Safety, Care, and Handling. The following subparagraphs summarize the safety, care, and handling requirements for the parachute assembly.

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

1-12. Safety, Care, and Handling (CONT).

b. *Care and Handling*. Observe the following precautions:

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

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

(3) Avoid grabbing the ripcord grip or grip retaining pocket when handling a parachute.

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

(5) Place unpacked parachutes in aviator kit bags.

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

(7) 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.

(8) Canopies should be slowly removed from water immersion by tail section first so water will drain from the open cells and not warp the construction.

SECTION III. PRINCIPLES OF OPERATION

1-13. Ram Air Parachute System Design Principles. The ram air parachute system is a dual parachute system with similar main and reserve canopies. Both parachutes are located on the back of the parachutist leaving the front clear for mounting additional equipment or instrumentation. The principles used in its construction allow it to have high forward speed, a 3 to 1 glide ratio, and excellent maneuverability. In an emergency, the ram air system uses a single point canopy release to jettison the main canopy and deploy the reserve canopy. The reserve parachute uses a deployment bag, a high drag pilot chute, and an 18-foot pilot chute bridle line with deployment assist pockets, each designed to increase the reliability of the reserve parachute in an emergency.

a. *Canopy.* The ram air canopy (figure 1-10) incorporates spanwise construction. By running fabric from side-to-side instead of from front-to-rear, the size of each cell is not limited to the width of the cloth. This method of construction results in a decrease in weight and bulk and a higher level of safety. The upper and lower surfaces of the canopy are attached by 13 airfoil section ribs dividing the canopy into 7 cells. Each rib has 3 elliptical crossports cut into it. These crossports allow air to flow spanwise through the canopy to equalize parachute pressurization. During descent, air enters the cell openings at the leading edge, pressurizing each cell and giving the canopy its shape and glide characteristics. A glide ratio of 3 feet of lateral movement to 1 foot of descent is obtained. The rate of descent is determined by the suspended weight as well as the angle of the

parachute with respect to the ground and the distance that the trailing edge is pulled down. The parachute is controlled and maneuvered by using trim tabs and steering lines. The canopy has two steering lines which connect to 5 cascaded lines attached to the trailing edge of the outer cells. By pulling on either the right or left steering line, the canopy will turn in that direction. By pulling down on both steering lines simultaneously, the rate of descent and the forward speed are decreased. Trim tabs are used to change the angle of attack.

b. *Slider*. A slider (figure 1-10) is employed with the ram air parachute system to reef the opening of the canopy and reduce opening loads. This allows for a more controlled opening of the canopy. During packing, the slider is placed at the lower surface of the canopy. During opening, the slider controls the drag area of the parachute.

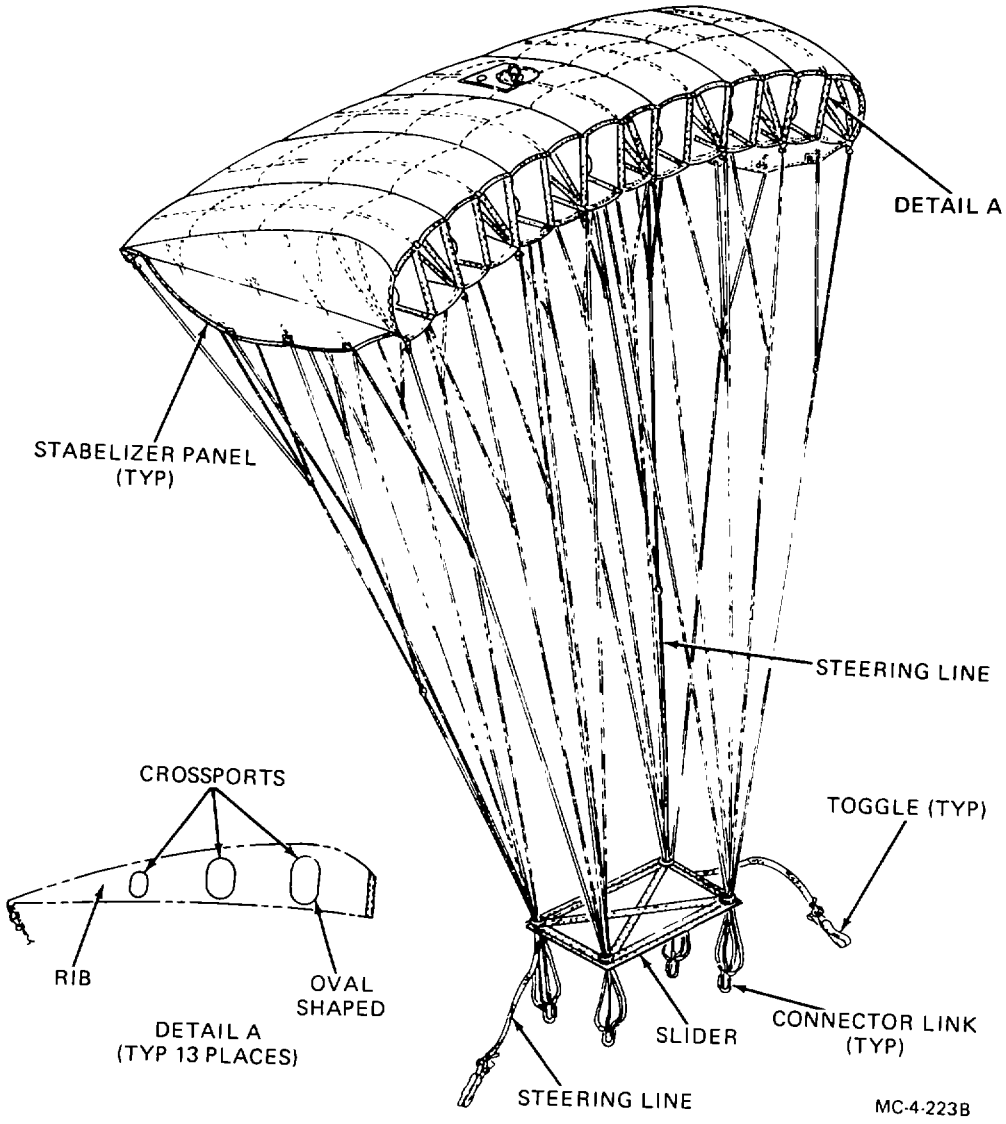


Figure 1-10. Ram Air Canopy Assembly.

c. *Stabilizer Panels*. During parachute descent, turbulent air can be produced at each side of the canopy, creating instability. The addition of a stabilizer panel (figure 1-10) to each side helps reduce turbulent air flow, thus stabilizing the canopy.

1-13. Ram Air Parachute System Design Principles (CONT).

d. *Deployment Brakes*. Without deployment brakes, the parachute deployment becomes less reliable. Deployment brakes lock down the trailing edge of the parachute using the steering lines during deployment. They are set by pulling each steering line down through the guide ring and locking each in place by using the appropriate toggle. The steering line remains locked in place until manually released by the parachutist after deployment.

e. *Reserve Deployment System*. The reserve deployment systems consists of the items shown in figure 1-11. The reserve pilot chute is constructed to provide a maximum amount of drag during a low speed canopy deployment. The reserve pilot chute is connected to an 18-foot bridle line with deployment assist pockets that, in case the pilot chute is unable to deploy due to entanglement, will alone create sufficient drag to deploy the reserve canopy successfully. The deployment bag is not attached to the canopy, allowing the parachute to deploy even in situations of pilot chute entanglement with the parachutist or a "horseshoe' malfunction.

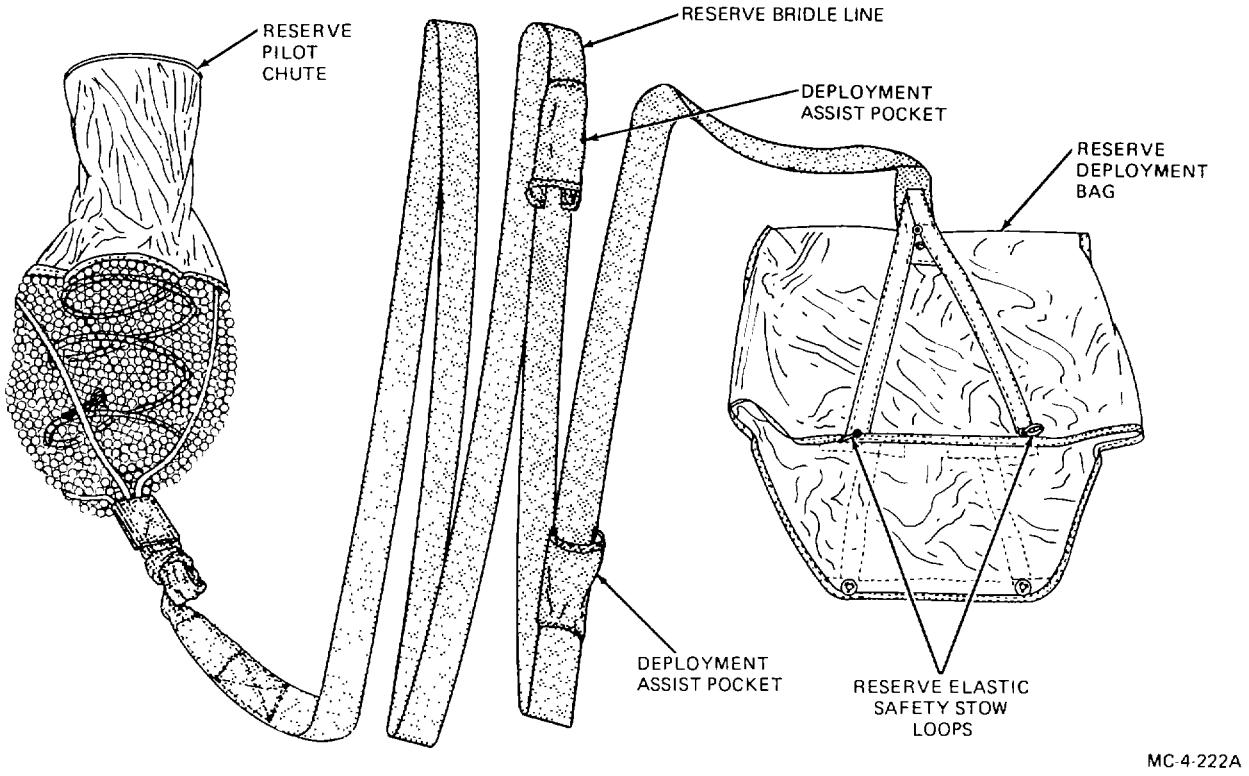


Figure 1-11. Reserve Deployment System.

f. Main Canopy Release Ripcord. The ram air parachute design features a single-point release that is capable of releasing the main canopy and deploying the reserve in one smooth function. In the event of a main parachute malfunction, the parachutist has only to withdraw the main canopy release ripcord (figure 1-12). Once withdrawn, the two rings on each riser are released from the base ring, releasing the main canopy. If still attached to the main risers, the reserve static line will withdraw the reserve ripcord pins, deploying the reserve parachute.

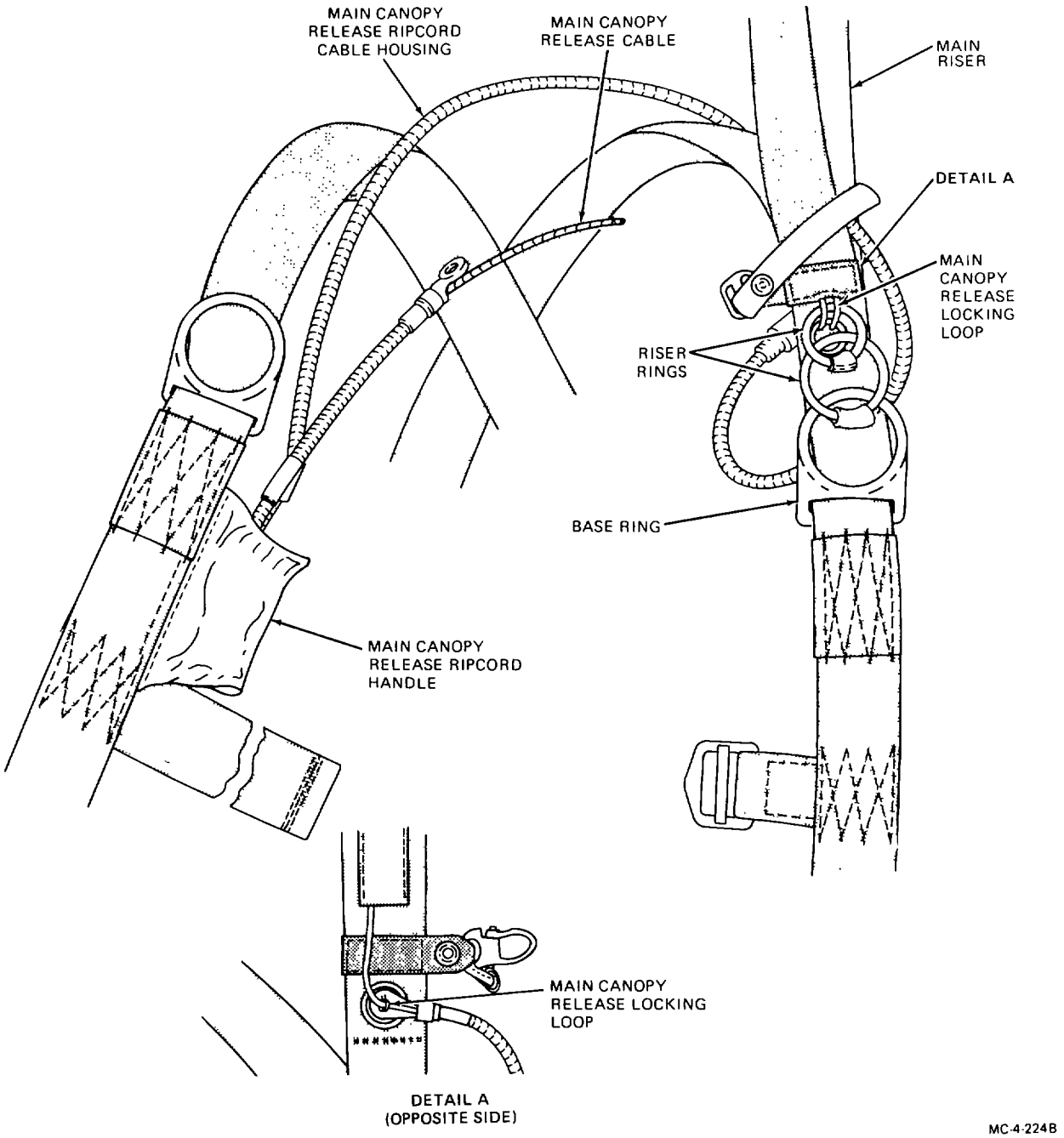


Figure 1-12. Main Canopy Release Ripcord.

CHAPTER 2

ORGANIZATIONAL AND DIRECT SUPPORT MAINTENANCE - MAINTENANCE INSTRUCTIONS

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

2-1. Common Tools and Equipment. For authorized common tools and equipment, refer to the Modified Table of Organization and Equipment or Table of Distribution and Allowances (MTOE/TDA) applicable to your unit.

2-2. Special Tools, TMDE, and Support Equipment. A repair parts and special tools list (RPSTL) is included in Appendix C of this manual. Tools or equipment that must be fabricated are listed in Appendix E of this manual.

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

SECTION II. SERVICE UPON RECEIPT

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

a. General Procedures for Air Delivery Equipment. When air delivery equipment is initially procured from a supply source and issued to a using unit, unpack the item(s) from shipping container(s) and inspect by a qualified parachute rigger (MOS 43E). The inspection performed is a technical/rigger type which will be conducted as outlined in paragraph 2-9. Upon completion of the inspection, tag the item(s) as prescribed in TB 750-126. Serviceable equipment may then be entered either into storage or into use in air delivery operations, as applicable. An unserviceable item is 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 ensures that the entire unpacking effort is conducted under the direct supervision of a qualified rigger (MOS 43E) in accordance with AR 750-32.

c. Configuration/Condition. Acceptance of new equipment from the manufacturer is based upon inspections made of sample lots that 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 sometimes evolve from the original equipment design and sometimes contractors are authorized 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 air worthy, 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 and AFTO 391 are history-type maintenance documents that accompany the parachute canopy and harness/container assemblies through the period of service of the individual assembly. The log record will be attached in accordance with TM 10-1670-201-23.

e. Accomplishing a Log Record. Upon completion of the first technical/rigger type inspection, the individual performing the inspection initially prepares a log record for an individual parachute or applicable type parachute harness/container and accomplishes subsequent record entries using the following procedures:

NOTE

Log record book entries shall 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 2-1). 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, Equipment Improvement Report (EIR) and Quality Deficiency Report (QDR) documentation, and to ensure the correct original record is reattached should the record become detached. A canopy serial number will not be used for property accountability, except in test projects or other special instances.

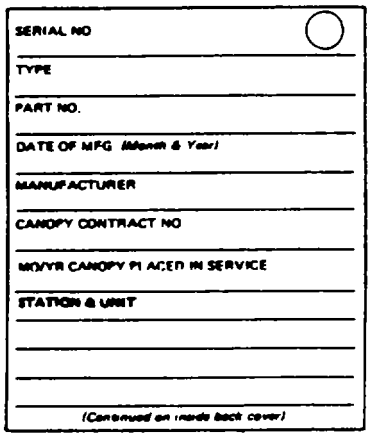


Figure 2-1. Inside Front Cover of Parachute Log Record.

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

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

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

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

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

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

2-4. Initial Receipt (CONT).

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

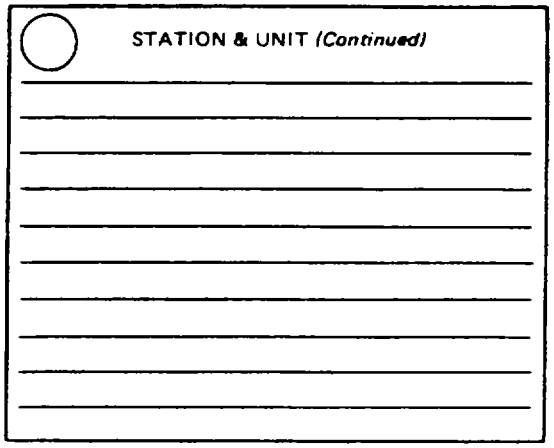
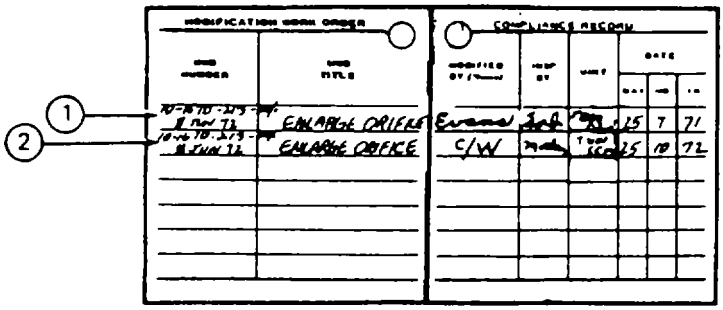


Figure 2-2. Inside Back Cover of Parachute Log Record.

(3) Modification Work Order (MWO) compliance record page. When a modification is performed on a parachute canopy, make the following entries on the Modification Work Order Compliance Record pages of the Log Record (figure 2-3).



1. MODIFICATION WORK ORDER COMPLIANCE COMPLETED.
2. MODIFICATION COMPLETED BY UNKNOWN DUE TO LOST ORIGINAL LOG RECORD.

Figure 2-3. Log Record Entries for the Modification Work Order (MWO) Compliance Record Page.

(a) *MWO number*. Enter the publication number and date of the MWO that describes the MWO (1, figure 2-3).

(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 2-3), which signifies the applicable MWO has been complied with.

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

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

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

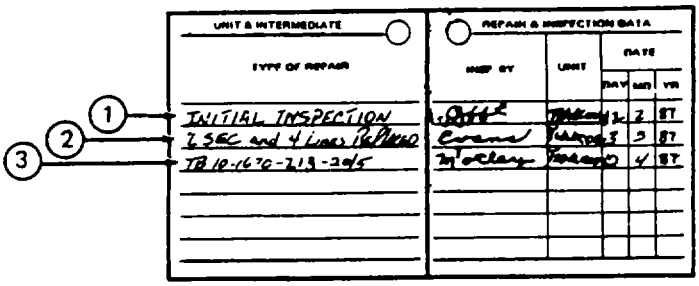
(4) *Unit and Intermediate repair and inspection data.* When a parachute assembly is initially received from a supply source and a technical/rigger type inspection is performed, document the inspection accomplishment on the Unit and Intermediate Repair and Inspection Data page of the individual Parachute Log Record (figure 2-4). 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.

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

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



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

Figure 2-4. Log Record Entries for Unit and Intermediate Repair and Inspection Data Page.

2-4. Initial Receipt (CONT).

(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 2-5). This shall also include the month and year the item was placed in service.

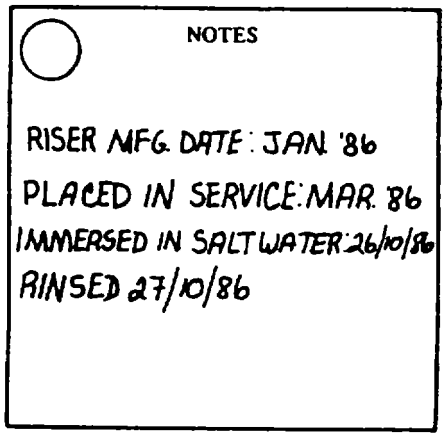


Figure 2-5. Data Entries for a Log Record Note Page.

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 (MAC) (Appendix B).

2-6. After-Use Receipt. When a parachute is received at the maintenance activity following its use by the parachutist during air delivery, it must be given a shakeout and aired (paragraph 2-11), and if necessary, cleaned (paragraph 2-12) before it can be, returned to service. If a parachute is issued but is not used, it does not need to be given a shakeout; however, it must be given a routine inspection by a qualified parachute rigger.

2-7. Initial Receipt - Reserve Parachute.

This task covers:

a. Ripcord Test
b. Lay out
c. Attachment of Canopy to Risers
d. Application of Markings
e. Installation of Safety Stow Elastic Loop In Deployment Bag
f. Attachment of Steering Lines to Steering Toggles
g. Canopy Trim Check
h. Spanwise Line Check

Tools:

Ripcord Inspection Kit, Item 21, Appendix B
Needle, Tacking, Item 16, Appendix B
Wrench, 7/16-Inch, Open-End, Item 25, Appendix B
Tape Measure, Item 24, Appendix B

Materials/Parts:

Ink, Parachute Marking, Light Blue, MIL-1-6903, Item 14, Appendix D
Printing Set
Tape, Lacing, Nylon, MIL-T-43435, Item 22, Appendix D
Tape, Pressure-Sensitive, Yellow, 1/2-Inch Wide, Item 24, Appendix D

Personnel Required:

MOS/43E(1P) Parachute Rigger

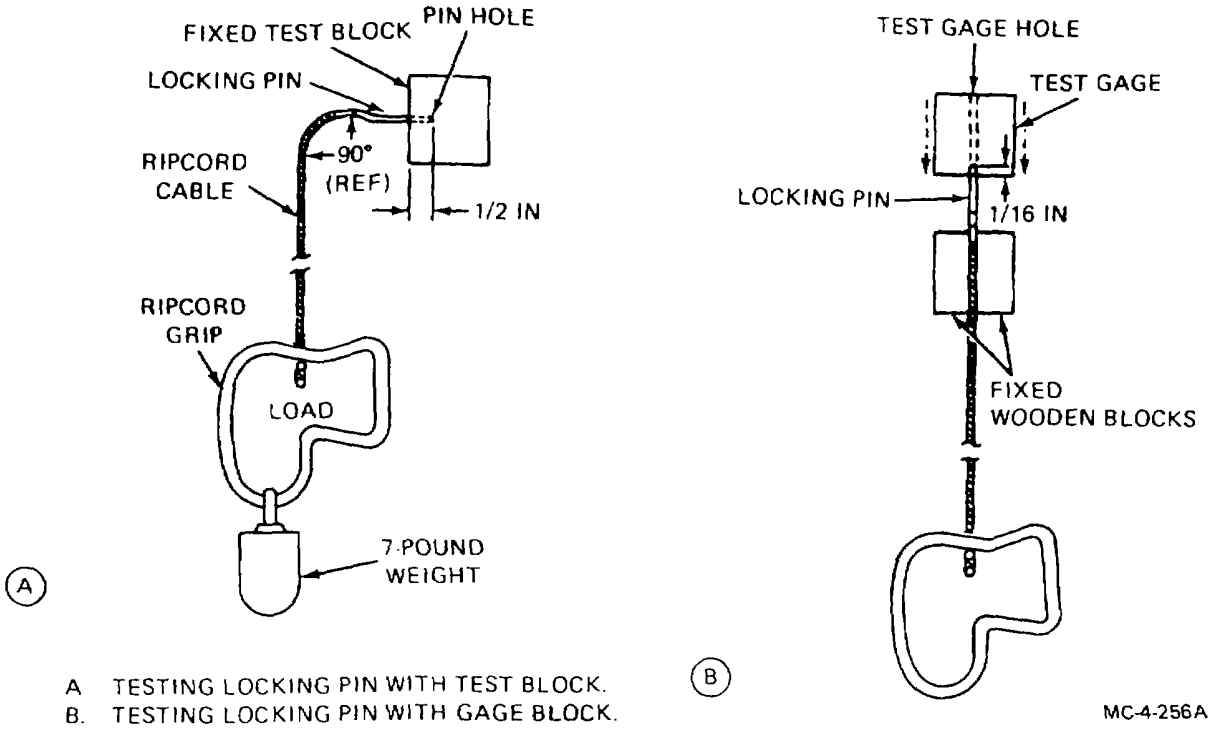
Equipment Condition:

Stretch canopy and suspension lines full length in packing area.

2-7. Initial Receipt - Reserve Parachute (CONT).

a. Perform a ripcord test as follows:

(1) Insert 1/2 inch of a locking pin end into the hole of a fixed ripcord locking pin test block (A, figure 2-6). Ensure the test block is firmly secured in the fixed position.



A TESTING LOCKING PIN WITH TEST BLOCK.
B. TESTING LOCKING PIN WITH GAGE BLOCK.

Figure 2-6. Performing a Ripcord Pin Test, Typical.

(2) Attach a 7-pound weight to ripcord grip and suspend weight from handle, exercising care to apply the load gradually without impact. The hands or lifting device, as applicable, must be fully removed from the weight.

NOTE

A ripcord locking pin will withstand a 7-pound load without assuming a permanent set.

(3) Remove weight, rotate locking pin one-quarter turn, and test pin again by reapplying the load as prescribed in step (2).

(4) Repeat the procedure in step (3) until locking pin has been tested in four positions and rotated one quarter turn prior to each test.

NOTE

Each locking pin on a ripcord length will be tested under load in four positions.

(5) Remove weight from ripcord grip and remove locking pin from test block.

(6) Visually examine the tested locking pin to ascertain if it was marred, cracked, or distorted during the test under load. If any defects are noted, remove ripcord from service.

(7) Repeat the procedures in steps (2) through (6) for the remaining locking pins on the ripcord length. After testing all locking pins, if there are no visual defects apparent, test each of the locking pins for bends.

(8) Place locking pin in vertical position with pin end facing up and either clamp the pin between two wooden blocks at a point below the pin shoulder (B, figure 2-6) or hold between the thumb and index finger of one hand.

(9) Using test gage block, manually locate the hole in the block over the end of the secured pin, allowing for a 1/16-inch maximum insertion.

(10) With axis of the gage block hole aligned with axis of the locking pin, release gage block and allow block to fall freely.

(11) When the weight of the gage block fails to cause full penetration of the pin into gage block hole, the pin is excessively bent. Remove ripcord from service.

(12) Repeat the procedures in steps (8) through (11) for each of the remaining locking pins on the ripcord length.

(13) Position ripcord grip on a fixed hook from a corner nearest weld (figure 2-7).

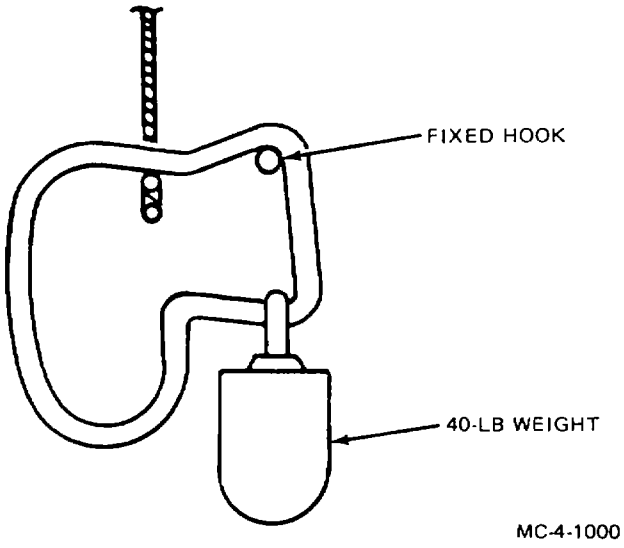


Figure 2-7. Performing a Ripcord Grip Weld Test.

2-7. Initial Receipt - Reserve Parachute (CONT).

(14) Attach and suspend a 40-pound weight from opposite corner of grip nearest the weld. Ensure that total weight is suspended without impact. Hands or lifting device, as applicable, must be fully removed from weight.

(15) Using suitable illumination, visually inspect welded joint for cracks or breaks. If any cracks or breaks are detected in welded area, remove ripcord from service.

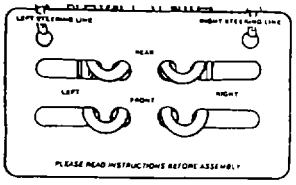
(16) Remove weight from ripcord grip and remove grip from hook.

(17) A ripcord which has been tested according to above and is considered serviceable shall be marked to indicate test accomplishment. Wrap two turns of 1/2-inch-wide yellow pressure-sensitive tape around the center of the grip tubing at a point near the weld. However, ensure tape wrapping does not cover the welding joint.

b. Perform layout as follows:

(1) Lay out parachute on a clean dry surface with canopy positioned on its left side. Leading edge (nose) will be on right when viewed from riser end. Stretch lines full length with a helper positioned at riser end to check continuity and to hold lines taut.

(2) Grasp high points of each cell and flip canopy toward trailing edge. Canopy shall lie flat with trailing edge lines on left side when viewed from riser end (figure 2-8).



LINE ORGANIZING CARD

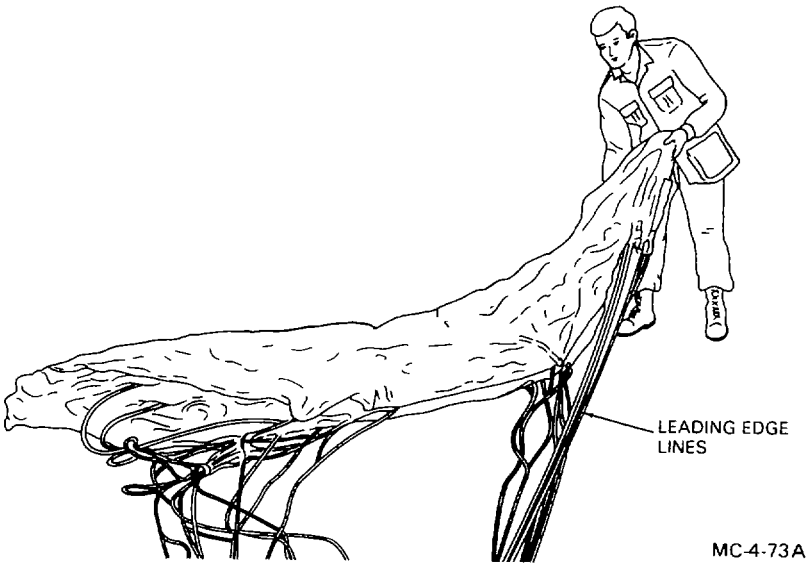


Figure 2-8. Initial Layout of Reserve Canopy.

(3) Remove any twists, turns, and tangles between suspension line groups.

(4) Starting with lines 8A and 8B, raise to a sufficient height to see if line 8A runs free from canopy through right front slider grommet to outside of right front riser connector link. Line 1A should run free through left front slider grommet to outside of left front riser connector line (figure 2-9).

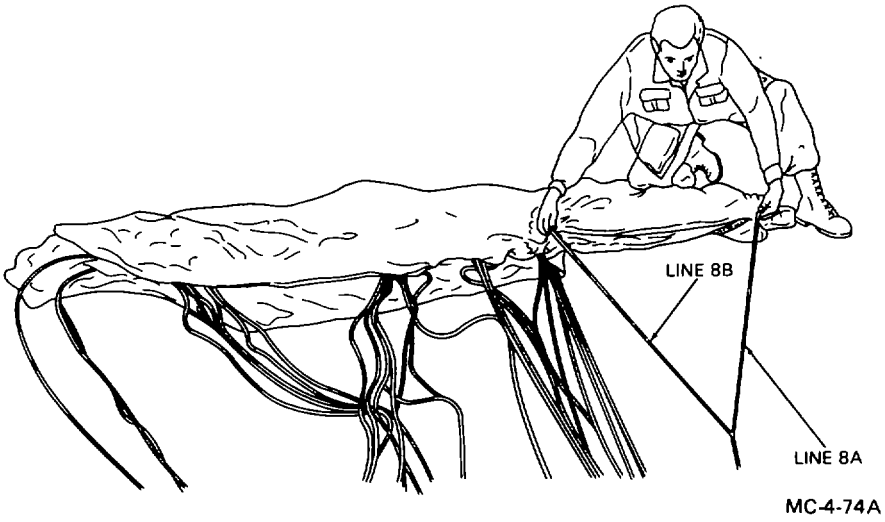


Figure 2-9. Tracing A Lines.

(5) Grasp lines 8C and 8D and raise to a sufficient height to see if line 8C runs free from canopy through right rear slider grommet to outside of right rear riser connector link. Line 1C should run free through left rear slider grommet to outside of left rear riser connector link (figure 2-10).

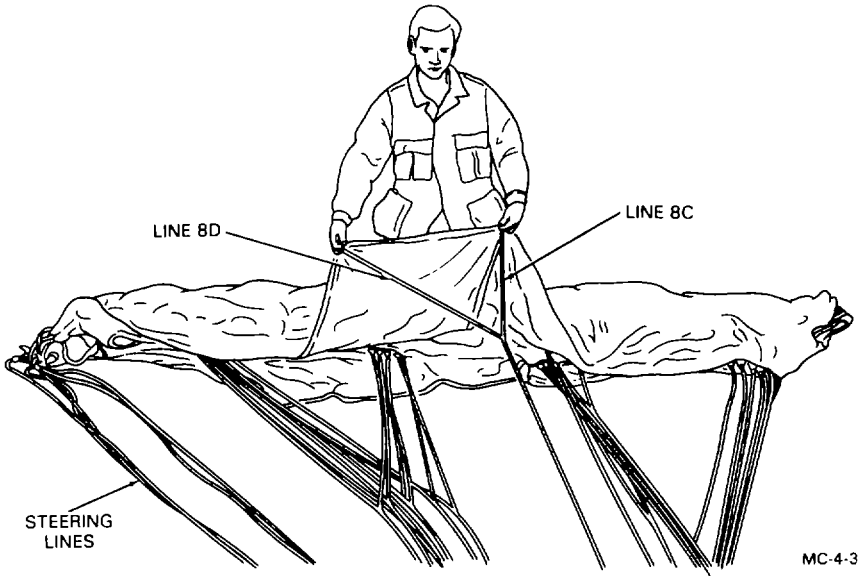


Figure 2-10. Tracing C Lines.

2-7. Initial Receipt - Reserve Parachute (CONT).

(6) Grasp steering lines and raise to a sufficient height to ensure they run free and clear from the tail through the proper slider grommets to the line organizing card (figure 2-11).

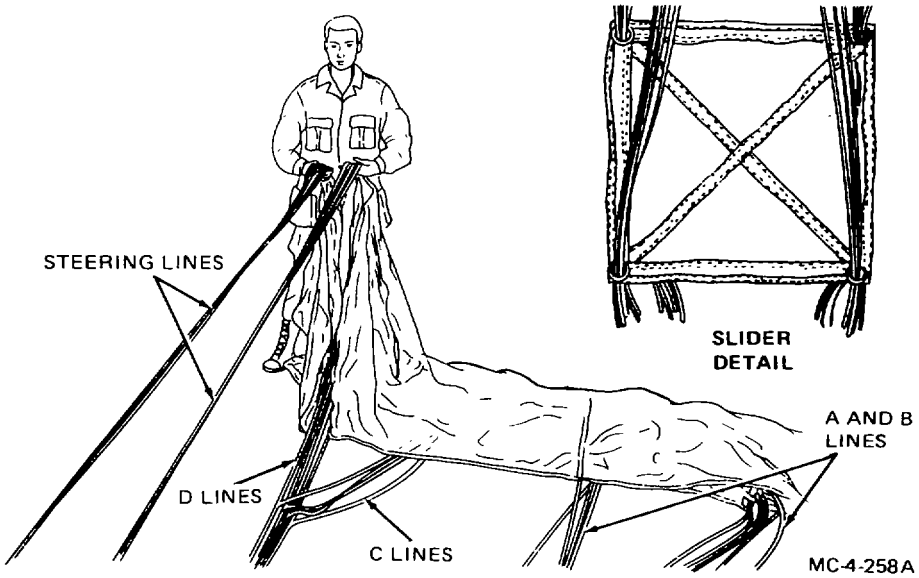


Figure 2-11. Tracing Steering Lines.

c. Attach canopy to risers as follows:

(1) Lay out container at connector links with risers facing canopy and parachute compartment facing up.

NOTE

Connector link barrel nuts must face inboard and tighten downward.

(2) Remove connector links and steering lines from line organizing card and loosely connect connector links to proper riser.

(3) Perform a suspension line continuity check by tracing each line from canopy through proper slider grommet to proper riser connector link as follows:

(a) Right from suspension line group. Line 8A (outside) followed in sequence by 7A, 6A, 5A runs continuous from canopy through slider grommet to the inside of the connector link and back through slider grommet to canopy attachment point 5B.

(b) Left front suspension line group. Line 4A runs continuous from canopy through left slider grommet to the inside left front connector link back through the slider grommet to canopy attachment point 4B followed in sequence by 3A, 2A, 1A (outside).

(c) Right rear suspension line group. Line 8C (outside) followed in sequence by 7C, 6C, 5C through the right rear slider grommet to the right rear riser connector link.

(d) Left rear suspension line group. Line 4C followed in sequence by 3C, 2C, 1C (outside) through the left rear slider grommet to the left rear riser connector link.

(4) Using 7/16-inch open end wrench, tighten barrel nut on connector links until firmly seated against flange.

(5) Hand tack each riser at connector link with one turn double nylon lacing tape tied below the connector link with an overhand knot (figure 2-12).

d. Apply markings as follows:

NOTE

When a parachute component is placed in service, the month and year of date placed in service shall be marked on it.

(1) Canopy. On cell with data block.

(2) Harness/container. On left diagonal back strap data label.

(3) Pilot chute assembly. Anywhere on fabric area that will be visible after marking.

(4) Allow markings to dry 20 to 30 minutes.

e. Install safety stow elastic loop in deployment bag as follows:

CAUTION

Do not tack elastic loop to deployment bag. Safety stow elastic loop must move freely within guide channel.

(1) Insert elastic loop in channel. Center loop splice between grommets.

(2) Route each loop end through appropriate grommet.

2-7. Initial Receipt - Reserve Parachute (CONT).

f. Attach steering lines to steering toggles as follows:

(1) Pass steering line through guide ring on rear riser, and then through ring on steering toggle (figure 2-12).

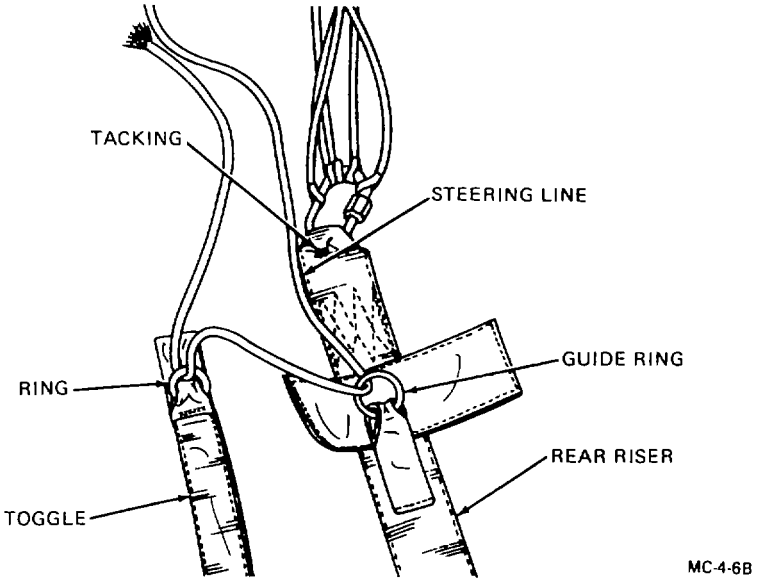


Figure 2-12. Riser Tacking and Steering Line Routing, Typical.

(2) Temporarily secure steering line to ring with loose a overhand knot against toggle ring (figure 2-13).

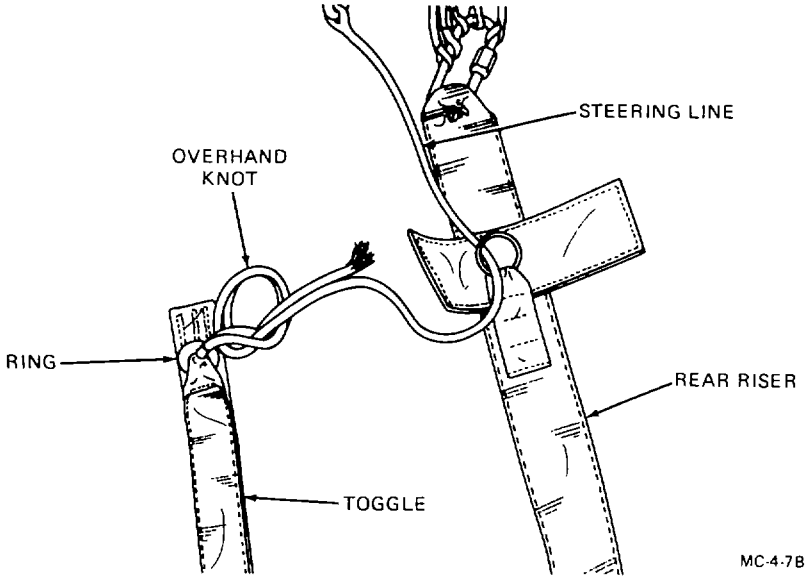


Figure 2-13. Steering Line Attachment.

NOTE

Final adjustment will be made during full-flight trim check (paragraph 2-7.g.(12)).

g. Perform canopy trim check as follows:

(1) Pull steering lines down until finger-trapped loops are below steering line guide rings (figure 2-14).

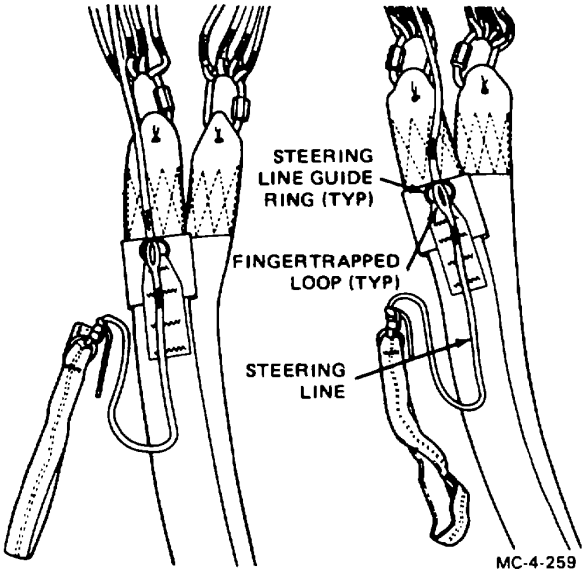


Figure 2-14. Steering Lines Pulled Down, Typical.

(2) Move right finger-trapped loop and riser strap to the left riser strap. Insert toggle thong through both finger trapped loops (figure 2-15).

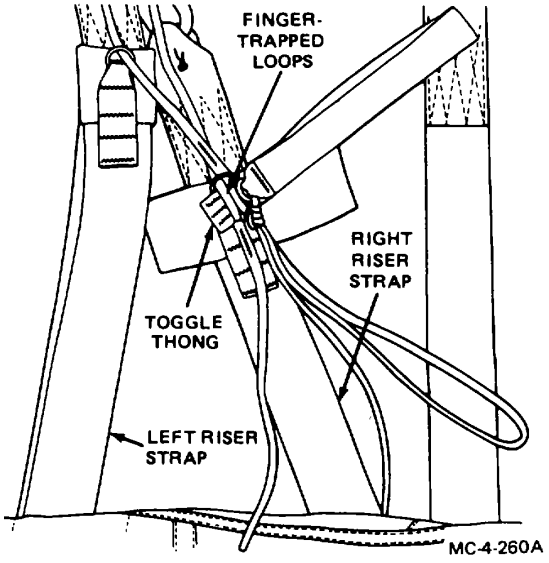


Figure 2-15. Toggle Inserted in Finger-Trapped Loops.

2-7. Initial Receipt - Reserve Parachute (CONT).

(3) Maintaining grasp on canopy fabric near right steering line, move to leading edge of canopy.

(4) Grasp canopy fabric near line 7A attachment point. Pull steering line and line 7A. Compare lengths to ensure steering line is 15 ±1 inch longer than line 7A (figure 2-16). Repeat procedure for left steering line.

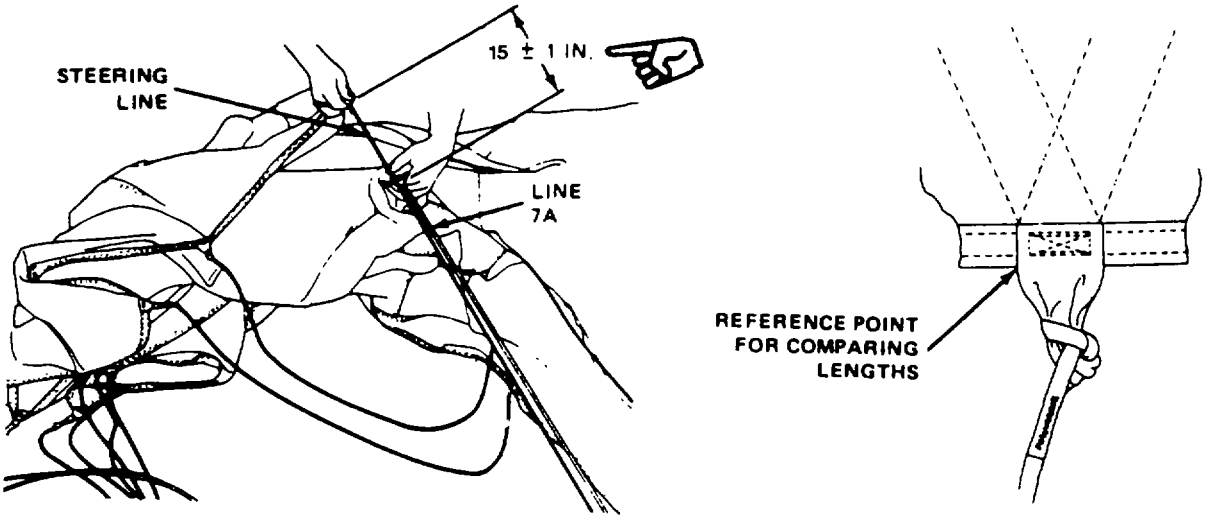


Figure 2-16. Comparing Steering Line and Line 7A.

(5) Move to trailing edge of canopy. Grasp canopy fabric near both main steering line attachment points (outside lines). Pull steering lines and compare to ensure lengths are equal within 1/2 inch (figure 2-17).

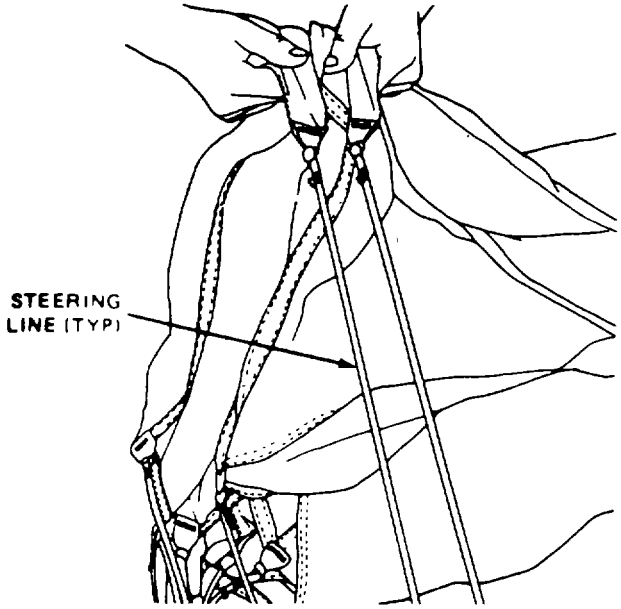


Figure 2-17. Comparing Steering Line Length.

(6) Remove toggle thong from finger-trapped loop.

(7) Move to leading edge of canopy and ensure connector links are held even with one another.

(8) Grasp canopy fabric near lines 7A and 7B attachment points. Stretch and compare lengths. Line 7B should be 3 ñ 1 inch longer than line 7A (figure 2-18).

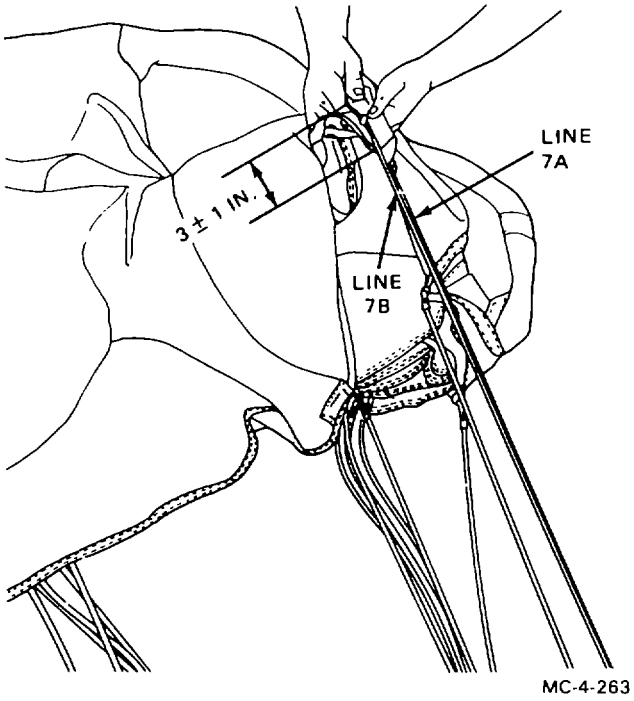


Figure 2-18. Comparing Lines 7A and 7B.

2-7. Initial Receipt - Reserve Parachute (CONT).

(9) Grasp canopy fabric near lines 7B and 7C attachment points. Stretch and compare lengths. Line 7C should be 9 ñ 1 inch longer than line 7B (figure 2-19).

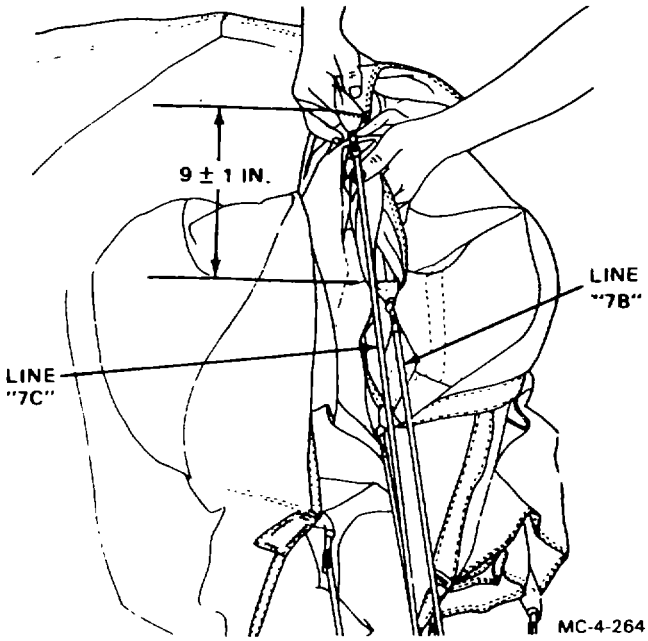


Figure 2-19. Comparing Lines 7B and 7C.

(10) Grasp canopy fabric near lines 7C and 7D attachment points. Stretch and compare lengths. Line 7D should be 12 ñ 1 inch longer than line 7C (figure 2-20).

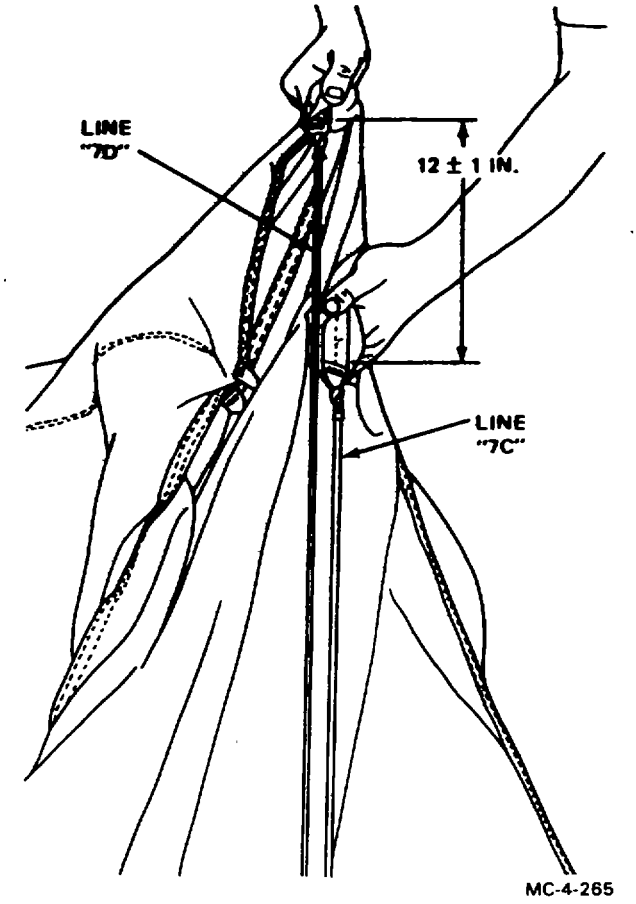


Figure 2-20. Comparing Lines 7C and 7D.

(11) Move to the trailing edge of the canopy and ensure connector links are held even with one another.

2-7. Initial Receipt - Reserve Parachute (CONT).

NOTE
Disregard any marks on the steering line.

(12) Grasp canopy fabric near right steering line attachment point and rotate to line 7D. Stretch and compare line lengths. Steering line should be 15 ñ 1 inch longer than line 7D (figure 2-21). Adjust knot formed in figure 2-13 to obtain this dimension. Trim the running end to the length of the toggle.

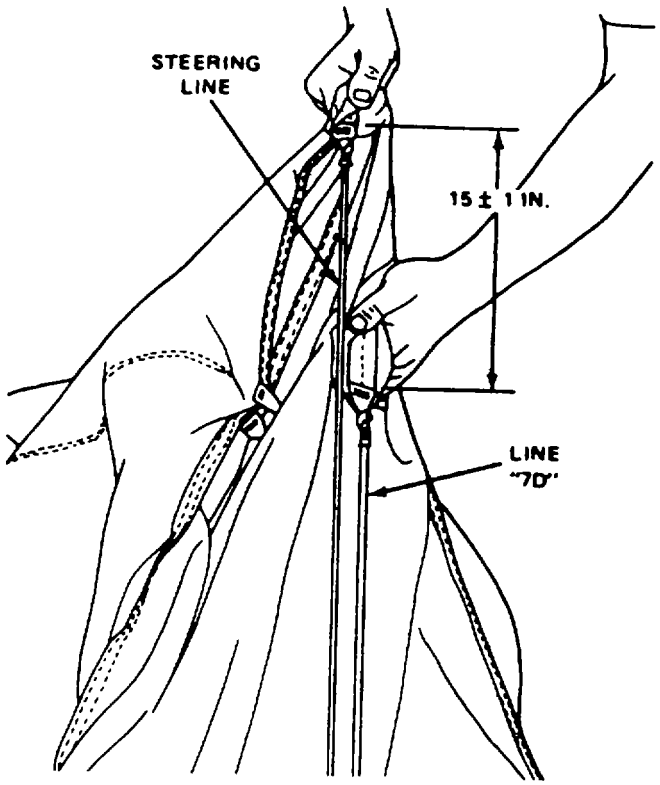


Figure 2-21. Comparing Steering Line and Line 7D.

(13) If the steering line is too short to attach the steering toggle with a knot, use the following alternate method of attachment:

(a) Remove the toggle from the steering line. After obtaining the 15-inch difference, mark the steering line at the top inside of the steering line guide ring with a suitable marker. This will be referred to as a base mark.

(b) Mark the steering line at 1/2 and 2 1/2 inches above the base mark. Clip the tip of the running end of the steering line at 45 degrees. Leave 1/16 inch of hot knifed (seared) edge.

(c) Install a short splicing aid on the steering line. Insert the splicing aid into the steering line at the 1/2-inch mark and exit at the 2 1/2-inch mark.

(d) Align the base mark with the steering toggle ring. Smooth the material in the finger trapped area of the steering line and sew with a 5/8-inch bartack starting 1/2 inch above the entry point. Pull a small amount of excess steering line from the finger trapped area and trim. Again, smooth the finger trapped area, securing the cut inside the finger trap.

NOTE

A 308 zig-zag machine may be used in lieu of a bartack sewing machine. Sew with size E nylon thread, 15 to 20 stitches per inch, not to exceed the width of the steering line, 1 3/4 inches long.

h. Perform spanwise line check as follows (figure 2-22):

(1) Beginning with either line 1A or 8A, compare each line in the A group to the line selected. The maximum allowable difference between that line and any other line is 1/2 inch.

(2) Compare corresponding lines. Compare line 1A to 8A, line 2A to 7A, and so on. The maximum allowable difference between corresponding lines is 1/2 inch.

(3) Repeat steps (1) and (2) with B, C, and D line groups and steering lines.

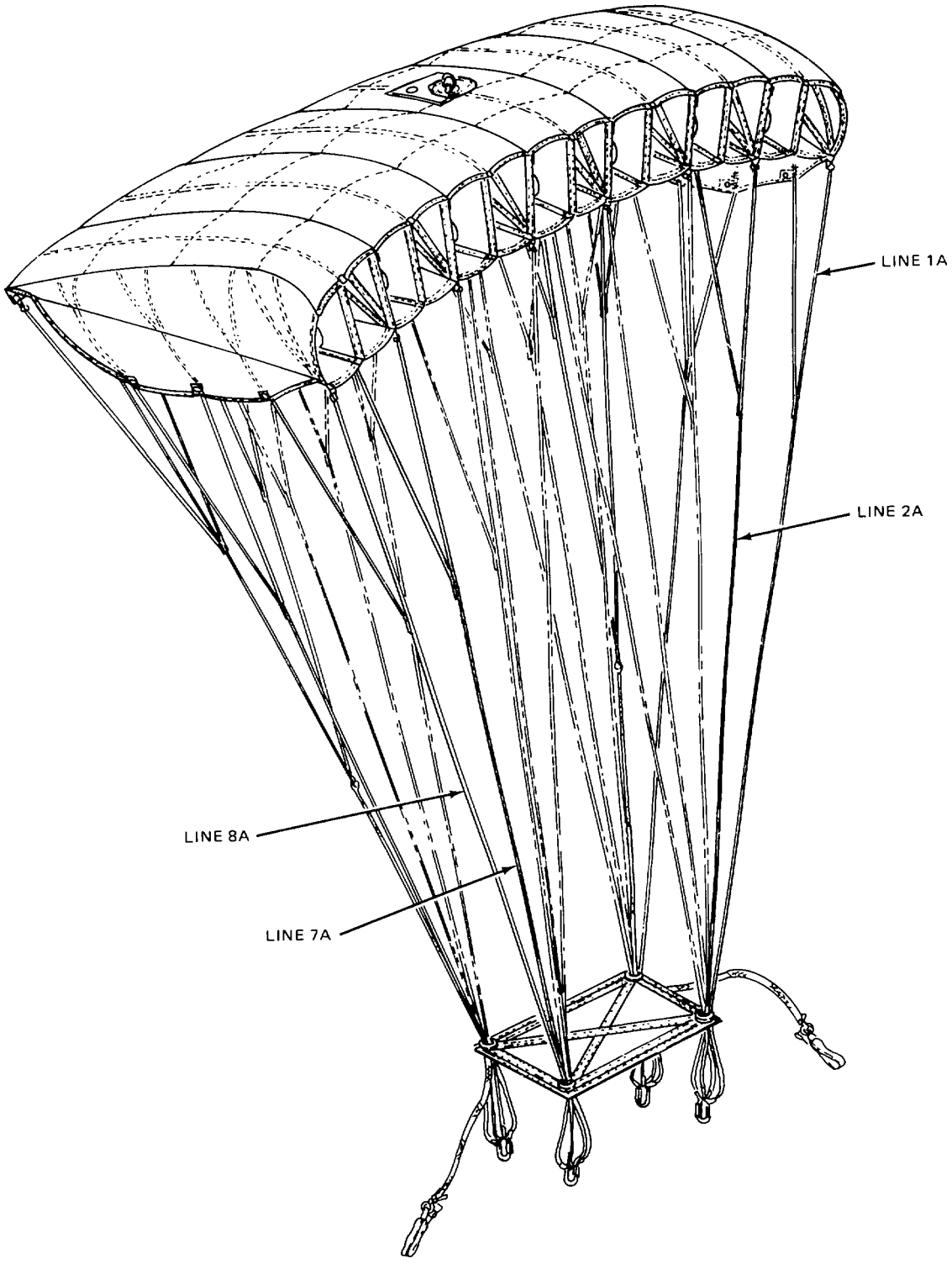


Figure 2-22. Spanwise Line Check

2-8. Initial Receipt - Main Parachute.

This task covers:

a. Ripcord Test
b. Lay out
c. Attachment of Canopy to Risers
d. Application of Markings
e. Attachment of Steering Lines to Steering Toggles
f. Attachment of Pilot Chute, Bridle Line, and Deployment Bag
g. Canopy Trim Check
h. Spanwise Line Check

Tools:

Ripcord Inspection Kit, Item 21, Appendix B
Needle, Tacking, Item 16, Appendix B
Wrench, 7/16-Inch, Open-End, Item 25, Appendix B
Tape Measure, Item 24, Appendix B

Materials/Parts:

Ink, Parachute Marking, Light Blue, MILL493, Item 14, Appendix D
Printing Set
Tape, Lacing, Nylon, MIL-T-43435, Item 22, Appendix D
Tape, Pressure-Sensitive, Yellow, 1/2-Inch Wide, Item 24, Appendix D

Personnel Required:

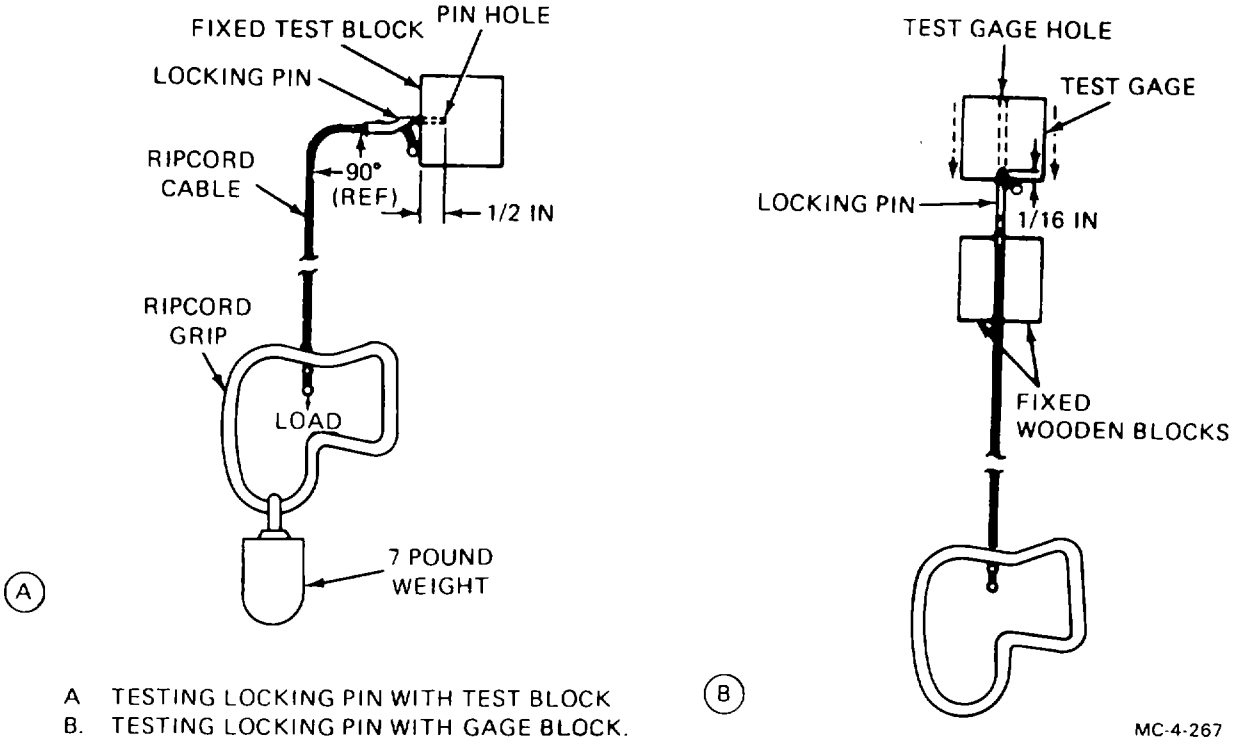
MOS/43E(1P) Parachute Rigger

Equipment Condition:

Stretch canopy and suspension lines full length in packing area.

a. Perform a ripcord test as follows:

(1) Insert 1/2 inch of locking pin end into hole of fixed ripcord locking pin test block (A, figure 2-23). Ensure the test block is firmly secured In the fixed position.



A TESTING LOCKING PIN WITH TEST BLOCK
B. TESTING LOCKING PIN WITH GAGE BLOCK.

Figure 2-23. Performing a Ripcord Pin Test.

(2) Attach a 7-pound weight to ripcord grip handle and suspend weight from handle, exercising care to apply load gradually without impact. Hands or lifting device, as applicable, must be fully removed from weight.

NOTE

The ripcord locking pin will withstand a 7-pound load without assuming a permanent set.

(3) Remove weight, rotate locking pin one-quarter turn, and test pin again by reapplying the load as prescribed in step (2).

(4) Repeat procedure in step (3) until locking pin has been tested in four positions and rotated one- quarter turn prior to each test.

(5) Remove weight from ripcord grip and remove locking pin from test block.

(6) Visually examine tested locking pin to ascertain if it was marred, cracked, or distorted during the test under load. If any defects are noted, remove ripcord from service.

2-8. Initial Receipt - Main Parachute (CONT).

(7) Place locking pin in vertical position with pin end facing up and either clamp the pin between two wooden blocks at a point below the pin shoulder (B, figure 2-23) or hold between thumb and index finger of one hand.

(8) Using test gage block, manually locate hole in the block over the end of the secured pin, allowing for 1/16-inch maximum insertion.

(9) With axis of gage block hole alined with axis of locking pin, release gage block and allow block to fall freely.

(10) When weight of gage block fails to cause full penetration of the pin into the gage block hole, the pin is excessively bent. Remove ripcord from service.

(11) Position ripcord grip on a fixed hook from a corner nearest weld (figure 2-24).

(12) Attach and suspend a 40-pound weight from opposite corner of grip nearest the weld. Ensure that total weight is suspended without impact. Hands or lifting device, as applicable, must be fully removed from weight.

(13) Using suitable illumination, visually inspect welded joint for cracks or breaks. If any cracks or breaks are detected in the welded area, remove ripcord from service.

(14) Remove weight from ripcord grip and remove grip from hook.

(15) A ripcord that has been tested according to above and is considered serviceable will be marked to indicate test accomplishment. Wrap two turns of 1/2-inch-wide yellow pressure sensitive tape around the center of the grip tubing at a point near the weld. However, ensure the tape wrapping does not cover welding joint.

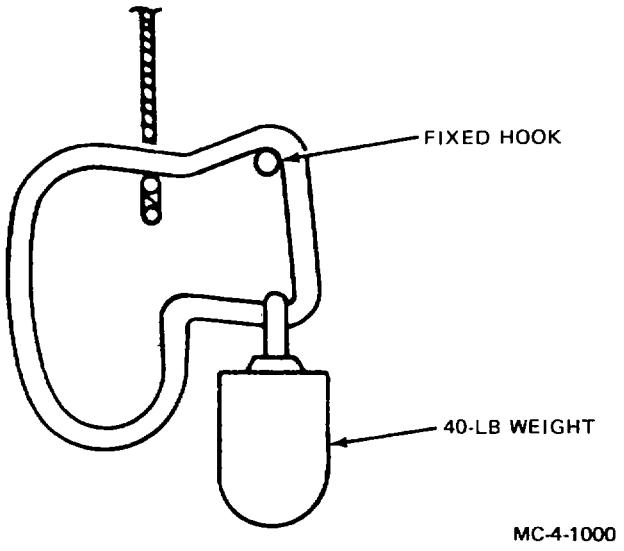
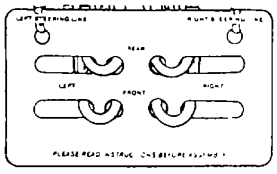


Figure 2-24. Performing a Ripcord Grip Weld Test.

b. Perform layout as follows:

(1) Lay out parachute on a clean dry surface with canopy positioned on its left side. Leading edge (nose) will be on right when viewed from riser end. Stretch lines full length with a helper positioned at riser end to check continuity and to hold lines taut.

(2) Grasp high points of each cell and flip canopy toward trailing edge. Canopy shall lie flat with trailing edge lines on left side when viewed from riser end (figure 2-25).



LINE ORGANIZING CARD

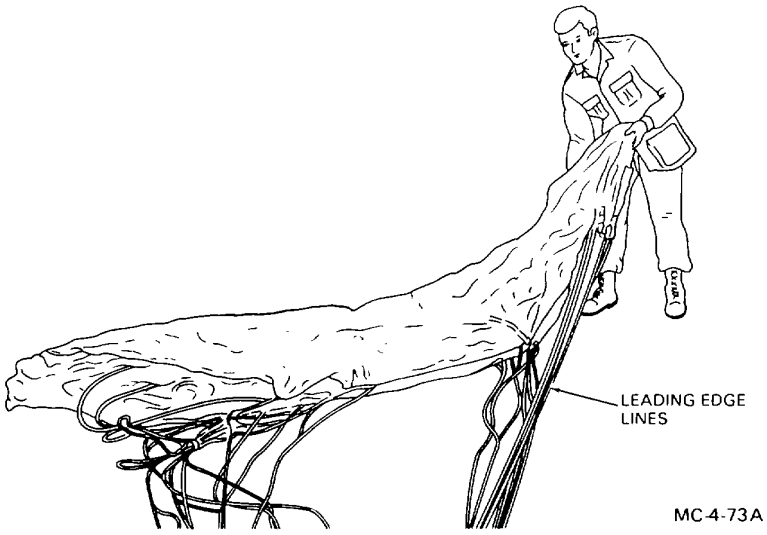


Figure 2-25. Initial Layout of Main Canopy.

(3) Remove any twists, turns, and tangles between suspension line groups.

(4) Starting with lines 8A and 8B, raise to a sufficient height to see if line 8A runs free from canopy through right front slider grommet to outside of right front riser connector link. Line 1A should run free through left front slider grommet to outside of left front riser connector link (figure 2-26).

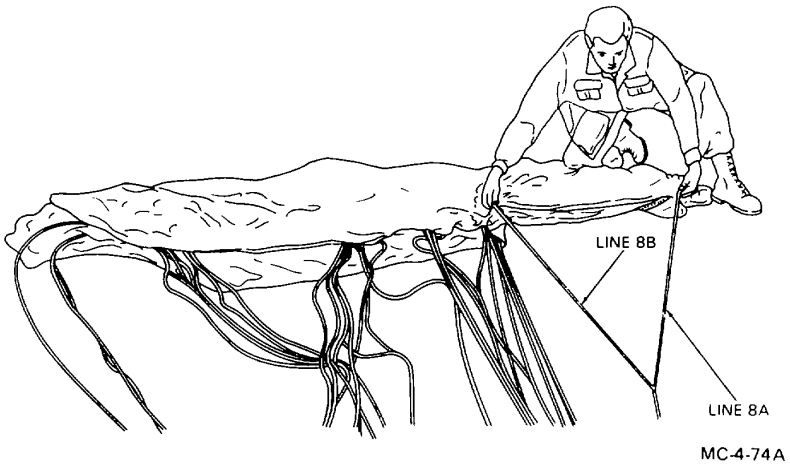


Figure 2-26. Tracing A Lines.

2-8. Initial Receipt - Main Parachute (CONT).

(5) Grasp lines 8C and 8D and raise to a sufficient height to see if line 8C runs free from canopy through right rear slider grommet to outside of right rear riser connector link. Line 1C should run free through left rear slider grommet to outside of left rear riser connector link (figure 2-27).

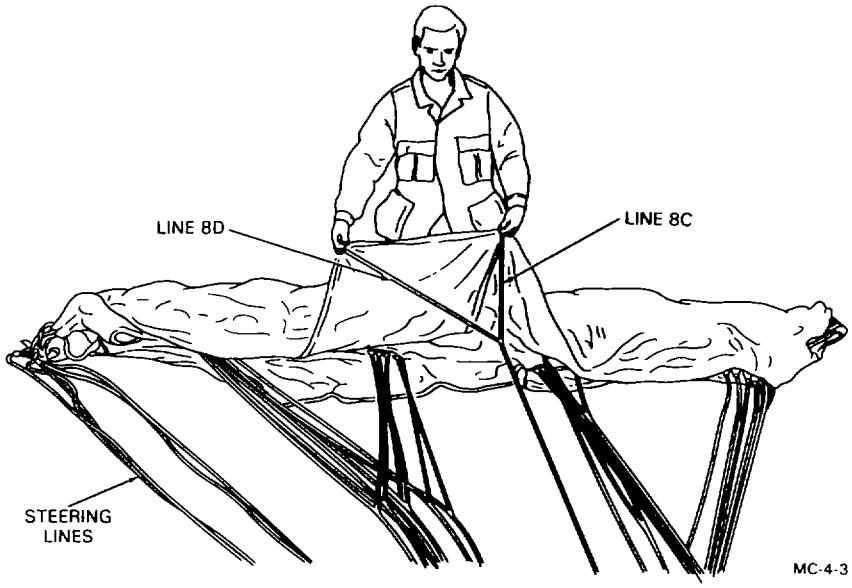


Figure 2-27. Tracing C Lines.

(6) Grasp steering lines and raise to a sufficient height to ensure they run free and clear from the tail through the proper slider grommets to the line organizing card (figure 2-28).

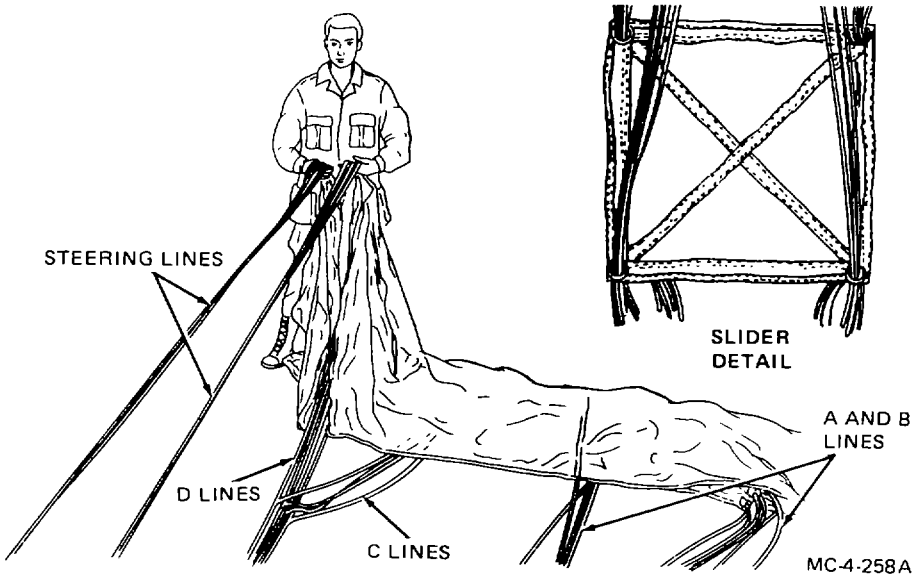


Figure 2-28. Tracing Steering Lines.

c. Attach canopy to risers as follows:

(1) Position risers at connector links.

NOTE

Connector link barrel nuts must face inboard and tighten downward.

(2) Remove connector links and steering lines from line organizing card and loosely connect connector links to proper riser.

(3) Perform a suspension line continuity check by tracing each line from canopy through proper slider grommet to proper riser connector link as follows:

(a) Right front suspension line group. Line 8A (outside) followed in sequence by 7A, 6A, 5A runs continuous from canopy through slider grommet to the inside of the connector link and back through slider grommet to canopy attachment point 5B.

(b) Left front suspension line group. Line 4A runs continuous from canopy through left front slider grommet to the inside left front connector link back through the slider grommet to canopy attachment point 4B followed in sequence by 3A, 2A, 1A (outside).

(c) Right rear suspension line group. Line 8C (outside) followed in sequence by 7C, 6C, 5C through the right rear slider grommet to the right rear riser connector link.

(d) Left rear suspension line group. Line 4C followed in sequence by 3C, 2C, 1C (outside) through the left rear slider grommet to the left rear riser connector link.

(4) Using 7/16-inch open end wrench, tighten barrel nut on connector links until firmly seated against flange.

2-8. Initial Receipt - Main Parachute (CONT).

(5) Hand tack each riser at connector link with one turn double nylon lacing tape tied below the connector link with an overhand knot (figure 2-29).

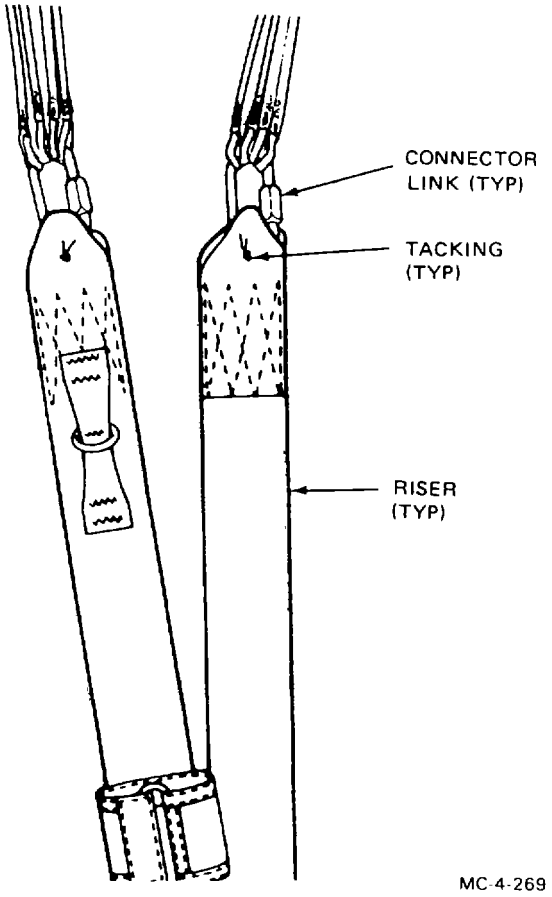


Figure 2-29. Main Riser Tackings.

d. Apply markings as follows:

NOTE

When a parachute component is placed in service, the month and year of date placed in service shall be marked on it.

(1) Canopy. On cell with data block.

(2) Risers. On front of front riser.

(3) Pilot chute. Anywhere on fabric area that will be visible after marking.

(4) Allow markings to dry 20 to 30 minutes.

e. Attach steering lines to steering toggles as follows:

(1) Pass steering lines through guide rings on rear risers, and then through rings on steering toggles.

(2) Temporarily secure steering lines to rings with a loose overhand knot against toggle ring (figure 2-30).

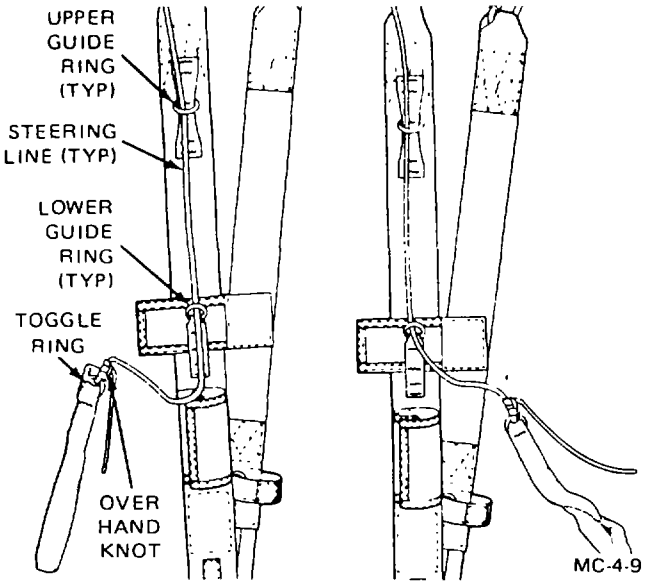


Figure 2-30. Steering Line Attachment.

NOTE

Final adjustment will be made during full-flight trim check (paragraph 2-8.g.(12)).

2-8. Initial Receipt - Main Parachute (CONT).

f. Attach pilot chute, bridle line, and deployment bag as follows (figure 2-31):

(1) Pass bridle line loop at ring end through deployment bag top grommet from outside to inside.

(2) Pass bridle line loop at ring end completely through bridle line attachment ring on top of canopy.

(3) Pass opposite end of bridle line and deployment bag through loop at ring end. Pull tight, forming a lark's head knot.

(4) Pass other loop end of bridle line through 1-inch loop at bottom end of pilot chute.

(5) Pass entire pilot chute through loop. Pull tight and form a lark's head knot.

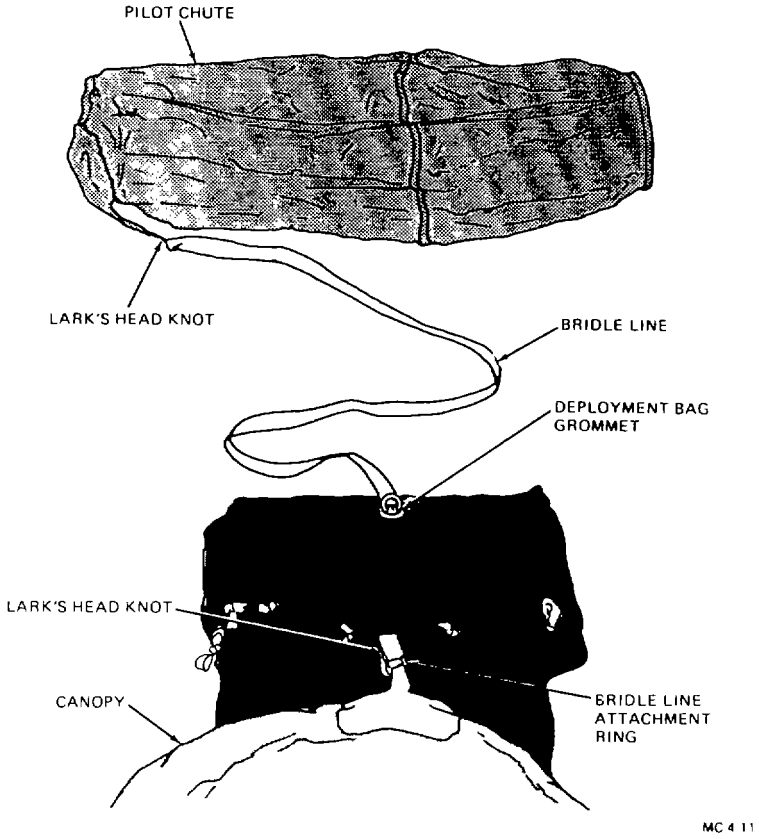


Figure 2-31. Attachment of Pilot Chute, Bridle Line, and Deployment Bag.

g. Perform canopy trim check as follows:

(1) Pull steering lines down until finger-trapped loops are below lower steering line guide rings (figure 2-32).

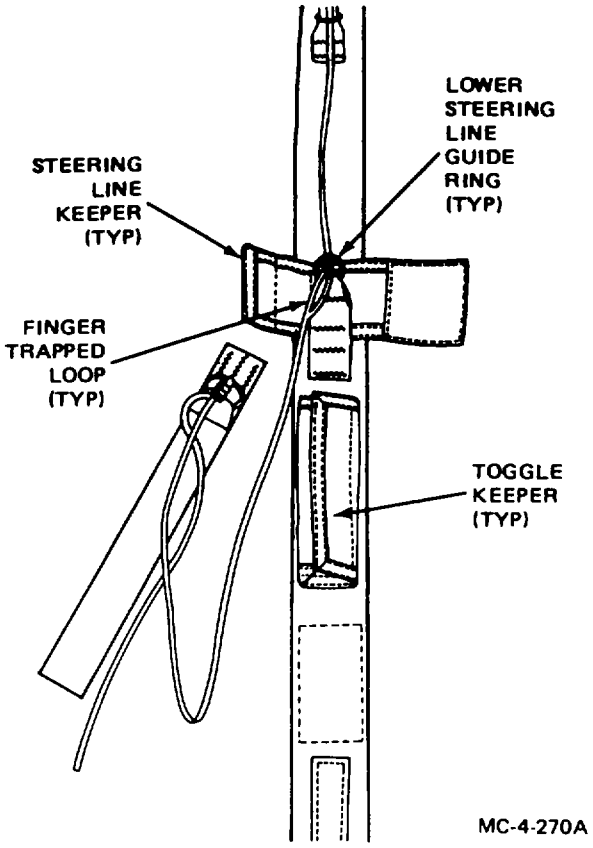


Figure 2-32. Steering Lines Pulled Down.

2-8. Initial Receipt - Main Parachute (CONT).

(2) Move right finger-trapped loop and riser strap to left riser strap. Insert toggle thong through both finger-trapped loops (figure 2-33).

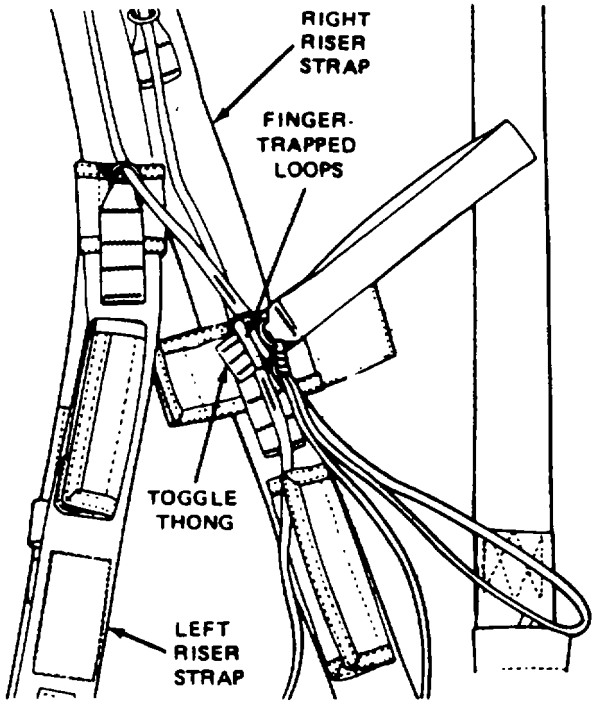


Figure 2-33. Toggle Inserted in Finger-Trapped Loops.

(3) Maintaining grasp on canopy fabric near right steering line, move to leading edge of canopy.

(4) Grasp canopy fabric near line 7A attachment point. Pull steering line and line 7A. Compare lengths to ensure steering line is 15 ± 1 inch longer than line 7A (figure 2-34). Repeat procedure for left steering line.

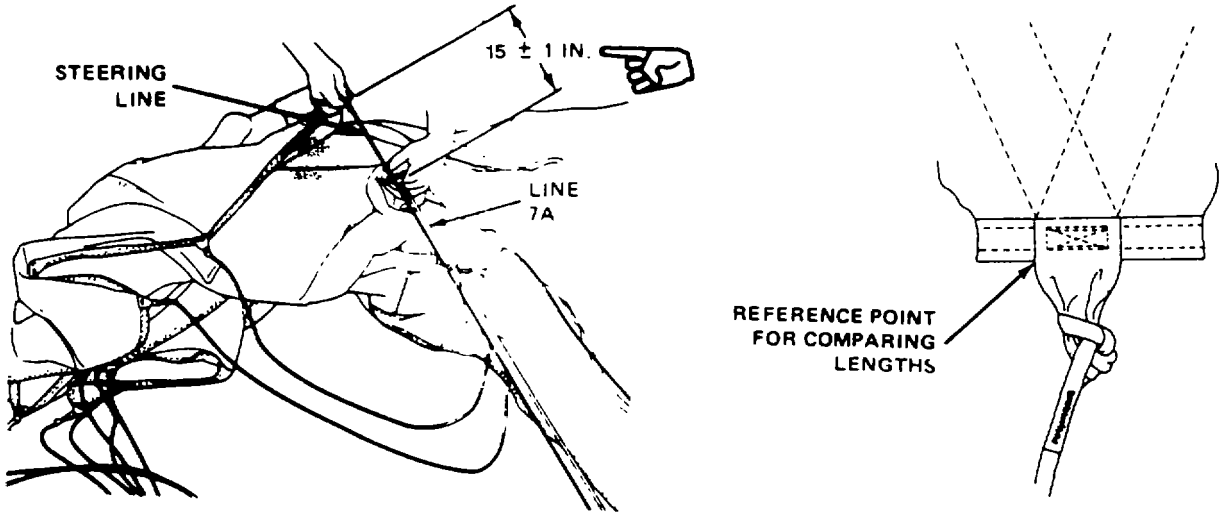


Figure 2-34. Comparing Steering Line and Line 7A.

(5) Move to trailing edge of canopy. Grasp canopy fabric near both main steering line attachment points (outside lines). Pull steering lines and compare to ensure lengths are equal within 1/2 inch (figure 2-35).

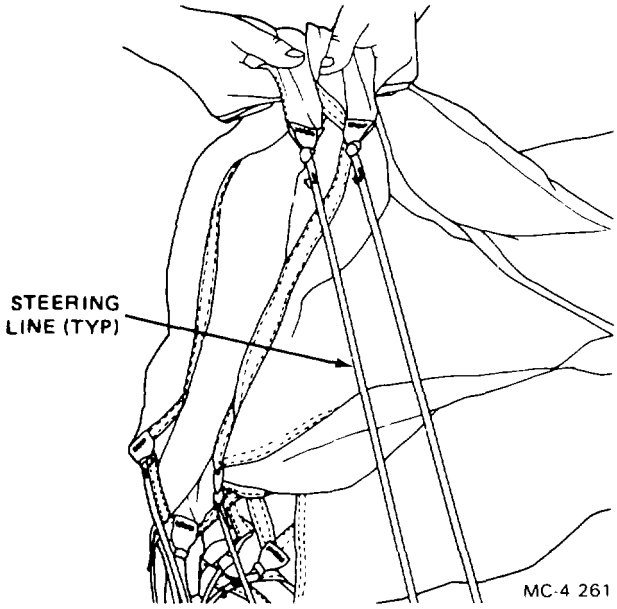


Figure 2-35. Comparing Steering Line Length.

(6) Remove toggle thong from finger-trapped loop.

(7) Move to leading edge of canopy and ensure connector links are held even with one another.

(8) Grasp canopy fabric near lines 7A and 7B attachment points. Stretch and compare lengths. Line 7B should be 3 ± 1 inch longer than line 7A (figure 2-36).

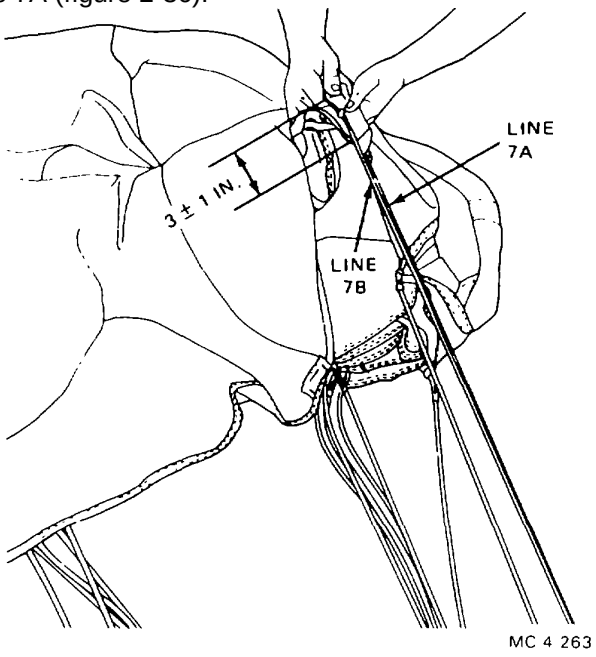


Figure 2-36. Comparing Lines 7A and 7B.

2-8. Initial Receipt - Main Parachute (CONT).

(9) Grasp canopy fabric near lines 7B and 7C attachment points. Stretch and compare lengths. Line 7C should be 9 ±1 inch longer than line 7B (figure 2-37).

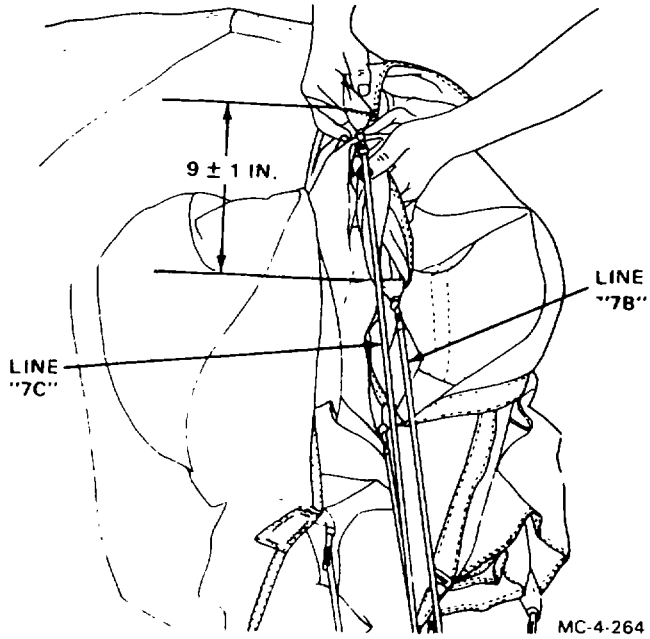


Figure 2-37. Comparing Lines 7B and 7C.

(10) Grasp canopy fabric near lines 7C and 7D attachment points. Stretch and compare lengths. Line 7D should be 12 ±1 inch longer than line 7C (figure 2-38).

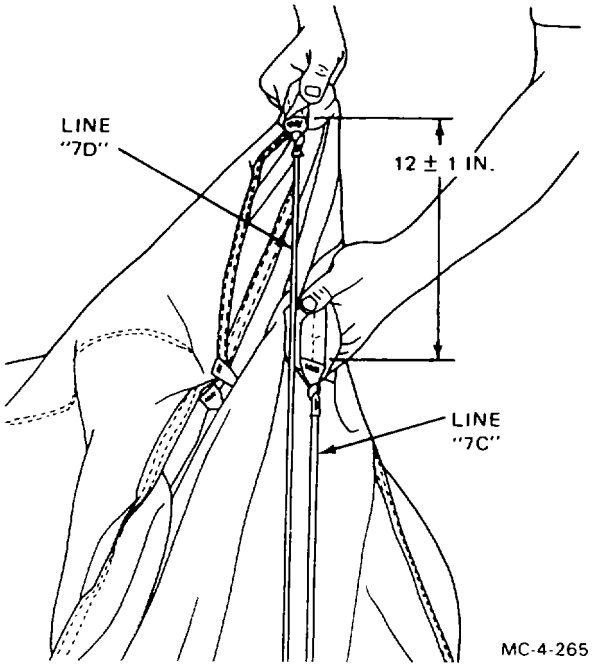


Figure 2-38. Comparing Lines 7C and 7D.

(11) Move to trailing edge of canopy and ensure connector links are held even with one another.

(12) Grasp canopy fabric near right steering line attachment point and rotate to line 7D. Stretch and compare line lengths. Steering line should be 15 ± 1 inch longer than line 7D (figure 2-39). Adjust knot formed in figure 2-30 to obtain this dimension. Trim the running end to the length of the toggle.

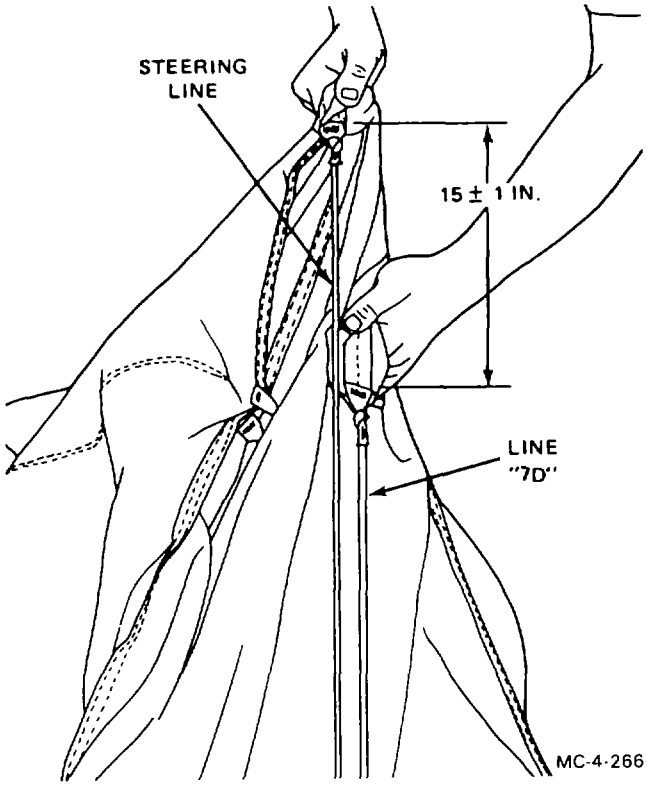


Figure 2-39. Comparing Steering Line and Line 7D.

h. Perform spanwise line check as follows (figure 2-40):

(1) Beginning with either line 1A or 8A, compare each line in the A group to the line selected. The maximum allowable difference between that line and any other line is 1/2 inch.

(2) Compare corresponding lines. Compare line 1A to 8A, line 2A to 7A, and so on. The maximum allowable difference between corresponding lines is 1/2 inch.

(3) Repeat steps (1) and (2) with B, C, and D line groups and steering lines.

2-8. Initial Receipt - Main Parachute (CONT).

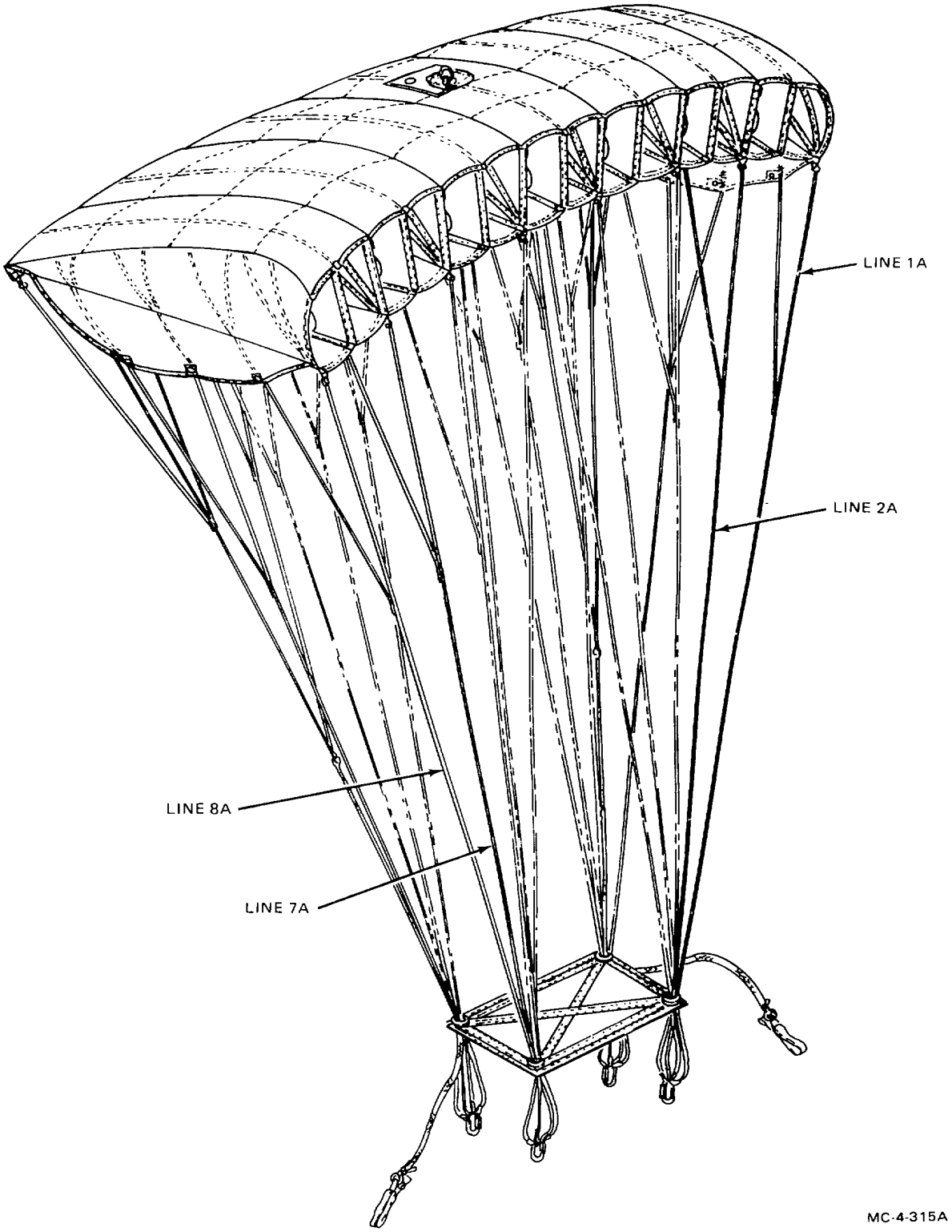


Figure 2-40. Spanwise Line Check

SECTION III. PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS)

2-9. PMCS Procedures. The following paragraphs describe preventive maintenance checks and services (PMCS) procedures on the unit and intermediate maintenance levels.

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

b. Frequency of Performing PMCS. PMCS is 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 interval.

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

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

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

e. Overage Items. During any inspection or at any time that an item is found to be overage (shelf/service life has expired as specified in TB 43-0002-43), the item is removed from service, condemned, and tagged in accordance with TB 750-126.

f. Conservation of Resources. To conserve time and labor, and to avoid evacuation to an intermediate maintenance activity, unit/detachment commanders may designate, in writing, rigger personnel to accomplish classification inspection of overage air delivery equipment.

g. Inspection Function Requirement. Normally, a technical/rigger-type inspection is performed by air delivery equipment maintenance personnel at a packing, rigging, or repair activity. The inspection of initial receipt items is performed as a separate function from packing or rigging activity; the item to be inspected is placed in proper layout on a packing table or suitable sized floor area. Should a defect or damage be discovered at any point during the inspection, the inspection is terminated and the applicable item is processed and forwarded to the repair activity. The repair activity, in turn, conducts a technical/rigger-type Inspection that is performed by only those parachute rigger personnel cited in AR 750-32. The repair activity inspection of personnel parachutes is made on a shadow table. Any defect discovered during a unit level repair activity Inspection which exceeds the capability of that activity requires the affected item to be evacuated to an Intermediate maintenance function for further determination of economic repair and repair accomplishment, if applicable.

NOTE

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

2-9. PMCS Procedures (CONT).

Table 2-1. Preventive Maintenance Checks and Services.

X - Before and after all repairs, and before packing (technical/rigger type inspection)
Y - After use (shakeout)
Z - Prior to issue (routine inspection)

ITEM NO.	INTERVAL			ITEM TO BE INSPECTED	Procedure
	X	Y	Z		
00				MC4 system	
01			•	Parachute packed for use	Check for serviceability and completeness of visible parts without opening container. Pack date in parachute log record.
02	•	•		Canopies and riser assemblies	Check for dampness, fungus, acid, grease, oil, foreign material, holes, cuts, tears, and broken lines as canopy is raised, lowered, and suspended during shakeout.
03	•	•		Canopy fabric materials	Check for legibility and completeness of marked data; dampness, fungus, dirt, acid, grease, oil, foreign material, rips, burns, cuts, breaks, frays, tears, holes, and loose or broken stitching on fabric and lines.
04	•			Hardware	Check for corrosion, rough spots, burrs, breaks, cracks, bends, and stripped or damaged threads.
05	•	•		Risers	Check for dampness, fungus, acid, grease, oil, dirt, foreign material, cuts, tears, and frays.
06	•	•		Riser fabric materials	Check for dampness, fungus, dirt, acid, grease, oil, foreign material, burns, cuts, tears, broken or loose stitching, excess line keepers, reserve static line release lanyard, main canopy release locking loop, and riser release rings.
07	•			Riser hardware	Check for corrosion, rough spots, burrs, breaks, cracks, bends, and stripped or damaged threads.
08	•	•		Pilot parachutes	Check for dampness, acid, grease, oil, dirt, foreign material, and broken springs.

Table 2-1. Preventive Maintenance Checks and Services.

X - Before and after all repairs, and before packing (technical/rigger type inspection)
Y - After use (shakeout)
Z - Prior to issue (routine inspection)

ITEM NO.	INTERVAL			ITEM TO BE INSPECTED	Procedure
	X	Y	Z		
09	•	•		Pilot parachute fabric materials	Check for dampness, fungus, acid, grease, oil, dirt, foreign material, rips, burns, cuts, frays, tears, holes, thin spots, and loose or broken stitching.
10	•			Pilot parachute hardware	Check for distorted or broken springs.
11	•	•	•	Harness/container assembly	Check for dampness, fungus, acid, grease, oil, dirt, cuts, and broken webbing.
12	•	•	•	Harness fabric materials	Check for dampness, fungus, acid, grease, oil, dirt, cuts, broken webbing, and loose or broken stitching.
13	•		•	Harness hardware	Check for corrosion, rough spots, burrs, and distortion.
14	•	•	•	Container assembly	Check for dampness, fungus, acid, oil, grease, dirt, foreign material, holes, and tears.
15	•	•	•	Container fabric materials	Check for dampness, fungus, acid, oil, grease, dirt, foreign material, cuts, tears, and holes.
16	•		•	Container hardware	Check for corrosion, rough spots, burrs, loose or missing grommets or snap fasteners.
17	•	•		Deployment bags	Check for dampness, fungus, acid, grease, oil, dirt, foreign material, cuts, holes, tears, broken or loose stitching, loose or missing grommets, and burrs/rough spots on grommets.
18	•		•	Ripcords	Check for corrosion, bends, fraying, broken strands, and security of swaged terminal balls and ripcord pins.

SECTION IV. MAINTENANCE PROCEDURES

2-10. General Information. The following paragraphs contain general information pertinent to unit and intermediate maintenance procedures.

a. Scope. This section contains maintenance procedures that 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

Personnel Required: (2)

43E(1P) Parachute Rigger

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a. Shakeout. Shakeout is accomplished by grasping the canopy at the tail seam and vigorously shaking all debris out of each cell.

b. Airing. Where dampness and mildew are prevalent, air delivery equipment is aired at frequent intervals according to the severity of the prevailing conditions. Parachutes that have been previously packed or are unpacked, which have been subjected to conditions of dampness or mildew, are 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 are not aired in direct sunlight. Airing may be accomplished by suspending or elevating the applicable item(s) in a manner that 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 type objects that would not cause damage.

2-12. Cleaning and Drying.

This task covers:

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

Materials/Parts:

Cloth, Abrasive, Item 3, Appendix D
Dishwashing Compound, Item 9, Appendix D
Lubricant, Solid Film, Item 15, Appendix D
Rag, Wiping, Item 19, Appendix D
Tetrachloroethylene, Item 25, Appendix D

Equipment Condition:

Lay out on packing table or other suitable area.

Special Environmental Condition:

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

Personnel Required

43E(1 P) Parachute Rigger

WARNING

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

CAUTION

If during the cleaning there exists a possibility that the substance to be removed contains acid or some other equally destructive ingredient, the item will be evacuated to intermediate 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 the soiled area with a clean cloth dampened with tetrachloroethylene.

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

NOTE

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

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

(1) Gently brush with a soft bristle brush.

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

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

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

(c) Rinse the cleaned area by repeating rubbing process with a clean portion of the cloth dampened with the dishwashing compound.

c. *Rinsing Parachute Assembly Immersed in Salt Water.* If the parachute or any of its components has been immersed in salt water in excess of 24 hours, it will be condemned. Additionally, if the parachute or any of its components has been immersed in salt water for a period less than 24 hours, but which cannot be rinsed within 36 hours after recovery, it will also be condemned. The parachute should be kept wet until rinsing. 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. With 36 hours after recovery, under the supervision of a qualified parachute rigger (43E), rinse the recovered parachute assembly as follows:

NOTE

This parachute features a cotton buffer patch on the top and bottom surfaces of the canopy. Do not condemn the canopy unless the rinsing criteria cannot be met.

(1) Place the parachute assembly in 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 MAC In Appendix B.

(7) Record any repairs, immersion, and rinsing in the parachute log record as shown in figures 2-4 and figure 2-5.

d. *Rinsing Parachute Assembly Immersed in Fresh Water*. Any parachute or its components that has been immersed in a fresh water lake, river, or stream do 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) *Uncontaminated fresh water.* If the parachute or its components has been immersed in uncontaminated fresh water, clean and dry 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.

NOTE

Do not dry fabric items in direct sunlight or by laying an item on the ground.

2-12. Cleaning and Drying (CONT).

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

(1) Suspend by risers in a well-ventilated room.

(2) Drying time may be reduced by using electric circulating fans.

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 discolor- ation and make fabric appear soiled.

2-13. Inspection.

This task covers:

a. Routine
b. Technical/Rigger-Type
c. In-storage

Personnel Required: (2)	*Equipment Condition:*
43E(1P) Parachute Rigger	Packed

a. *Routine Inspection.* A routine inspection is a visual check performed to ascertain the serviceability of all visible components of a parachute that is packed or rigged for use. The inspection is made on all components that can be inspected without opening the parachute pack. This inspection is administered by a parachute rigger prior to issue.

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

(1) *Overall inspection.* An overall inspection is made on the MC-4 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 verify that the Army Parachute Log Record (DA Form 10-42 or 3912) is enclosed. Remove the log record from the pocket and evaluate the recorded entries to verify compliance with paragraph 2-4d.

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

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

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

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

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

(a) *Metal.* Inspect for rust, corrosion, dents, bends, breaks, burrs, rough spots, sharp edges, wear, deterioration; damaged, loose, or missing grommets, safety pins, connector snap, hook eye, pack fastener; improper swaging or welding; loss of spring tension.

2-13. Inspection (CONT).

(b) *Cloth.* Inspect for breaks, burs, 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, bums, 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 bums, holes, cuts, tears, weak spots; looseness and deterioration.

(e) *Rubber and elastic.* Inspect for burns, cuts, holes, tears, weak spots; loss of elasticity and deterioration.

d. *In-Storage Inspection.* An in-storage inspection is a physical check conducted on a random sample of air delivery equipment that 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 also concerns 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 that is in storage is 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 is conducted only by parachute rigger personnel designated by local parachute maintenance officer.

2-14. Acidity Test.

This task covers: Acidity test

Tools:	*Personnel Required:*
Packing Paddle, Item 17, Appendix B	43E(1P) Parachute Rigger
Materials/Parts:	*Equipment Condition:*
Medicine Dropper, Item 17, Appendix D Spool with Color Chart, Item 20, Appendix D Three-Color pH Paper, Item 29, Appendix D	Unpacked. Lay out on packing table or other suitable area.

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

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

(1) Using a medicine dropper or equivalent type applicator, place one to two drops of water on the item in the intended test area. If water drops do not penetrate the material, gently rub the moistened area with a flat side of a clean metal packing paddle.

(2) Tear a suitable length of colorimetric pH paper from dispenser, place the piece of pH paper on the wetted area and press the full surface of the paper against the material with flat side of the packing paddle used in step (1) above. Ensure 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 2-12.

(4) After a packing paddle has been used as outlined in steps (1) and (2), above, thoroughly rinse and dry the paddle before using the paddle for any other functions.

2-15. Salt Water Contamination Test.

This task covers: Inspection

Personnel Required:	*Equipment Condition:*
43E(1P) Parachute Rigger	Lay out on packing table or other suitable area.

Inspection. Look for a white crystalline residue. If there is evidence of salt water/fresh water contamination, refer to paragraphs 2-12c. and 2-12d.

2-16. 3-Ring Release/Riser Inspection.

This task covers: Inspection

Personnel Required:	Equipment Condition:
43E(1P) Parachute Rigger	Lay out on packing table or other suitable area.

a. *3-Ring Release/Riser Inspection*. The following inspection should be used as a guideline to determine the serviceability of 3-ring release risers throughout the parachute's service life.

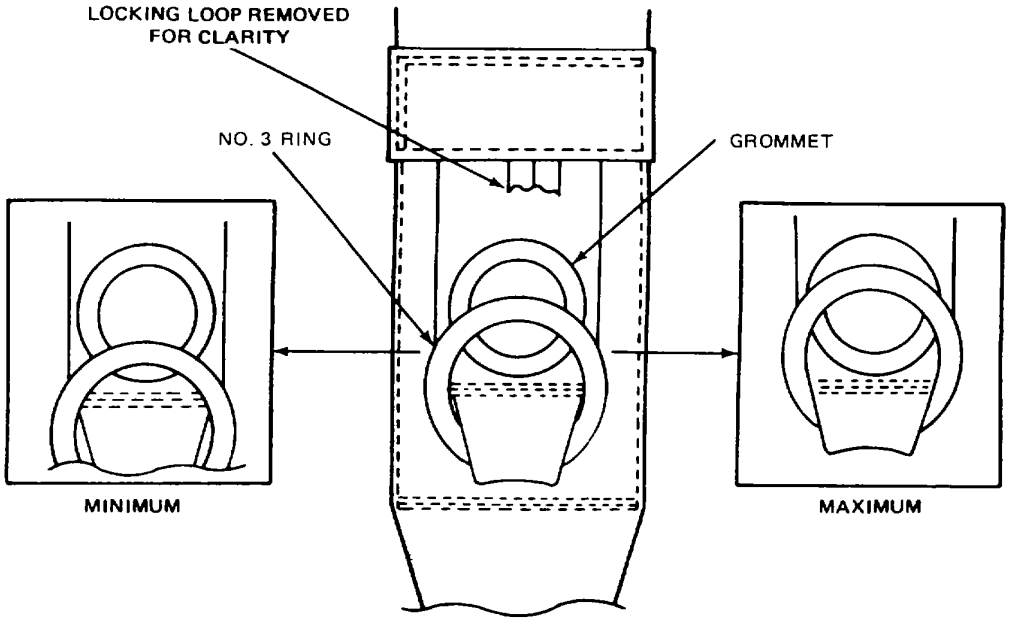
b. *Inspection Procedures*. Perform inspection as follows:

(1) Lay the riser to be inspected face up on a smooth flat surface. Flip the smallest metal ring (No. 3) up toward the top of the riser and then push down on it to firmly seat it in the webbing, securing it to the riser. The range of allowable relationships between the No. 3 ring and the grommet Is illustrated in figure 2-41.

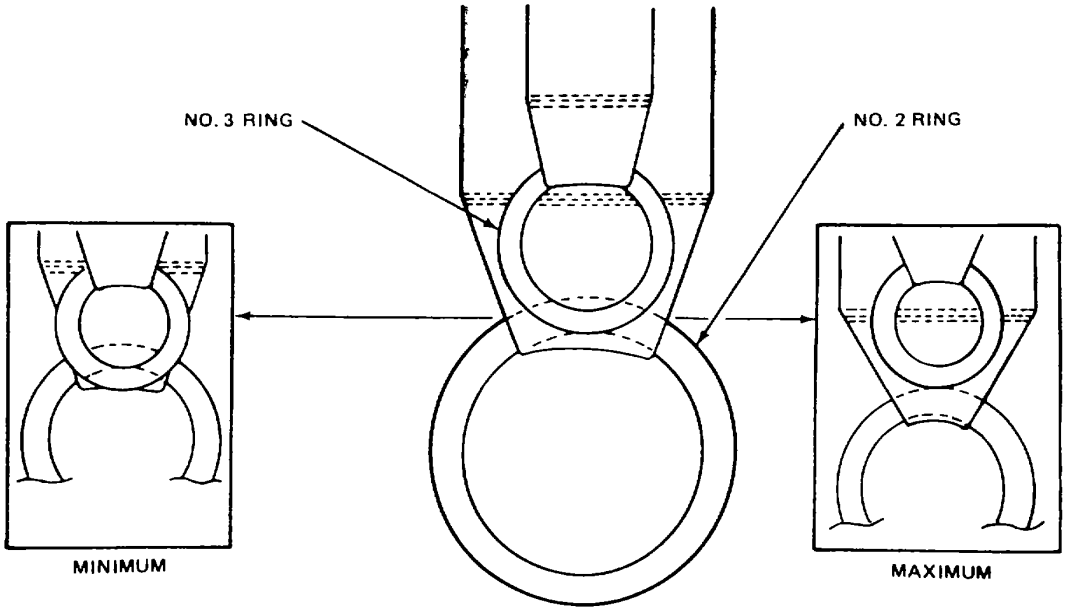
(2) If the riser is serviceable up to this point, flip the No. 3 ring down toward the bottom of the riser. Push down on the No. 3 and No. 2 rings (the next larger ring) to firmly seat them in the webbing, securing them to the riser. The range of allowable relationships between the No. 3 and No. 2 rings is illustrated in figure 2-41. The riser to be inspected must now be properly assembled to a harness to complete the inspection.

(3) Look at the rear of the riser and with the weight (min 20 lb) of the parachute rig (minus main parachute) suspended by the riser to be inspected, grasp the release cable housing by the swaged terminal end fitting with the small grommet in it and slide the end fitting to one edge (either edge) of the riser. You must NOT be able to move the fitting (do not use excessive force to move the fitting) completely off the edge of the riser, thus ensuring the fabric locking loop is not too long. The length of the fabric locking loop should range as shown in figure 2-42.

2-16. 3-Ring Release/Riser Inspection (CONT).



LOCATION OF NO. 3 RING AND GROMMETS



LOCATION OF NO. 3 RING AND NO. 2 RING

MC4-272A

Figure 2-41. 3-Ring Release/Riser Inspection.

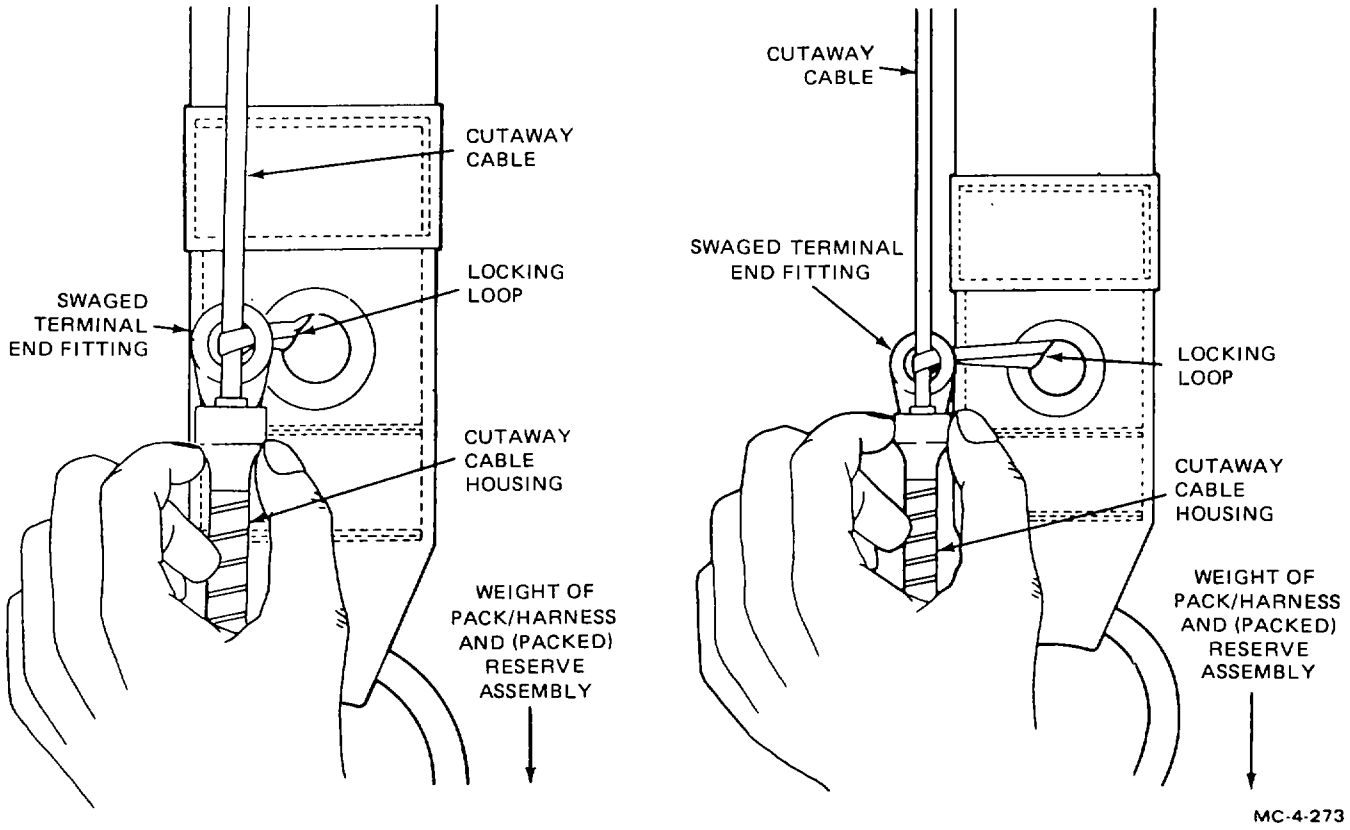


Figure 2-42. Locking Loop Inspection.

2-17. Packing Procedures-Reserve Parachute.

This task covers:

a. Pack-In-Process Inspection
b. Layout and Line Check
c. Flaking Canopy
d. Folding Canopy
e. Stowing Canopy and Suspension Lines
f. Closing Container

Tools:

Pins, Temporary Locking

Materials/Parts:

Cord, Nylon, MIL-C-5040, Item 8, Appendix D
Thread, Cotton, V-T-276, 24/4, Item 26, Appendix D

Personnel Required:

MOS/43E(1P) Parachute Rigger

Equipment Condition:

Stretch reserve canopy and suspension lines full length in packing area.

WARNING

Failure to detect areas of damage during packing, or failure to comply with the following procedure, may result in malfunction of the parachute and injury or loss of life to personnel.

NOTE

The parachute shall be repacked every 120 days.

a. The pack-in-process inspection shall be conducted by a rigger supervisor other than the packer during the applicable packing process. This inspection is required to ensure that only authorized packing procedures are used. The prescribed intervals to conduct the pack-in-process inspection are as follows:

(1) Proper layout

(a) Line check
(b) Canopy flaking completed

(2) Slider up

(a) Canopy s-folding complete
(b) Deployment brakes set and tacked
(c) Tail folding completed
(d) Slider pulled up and positioned

(3) *Canopy folding completed*-Nose fold

(4) *Suspension lines stowed*

(a) Locking stows completed
(b) Suspension lines stowed

(5) *Bridle needle fold completed*

(6) *Container side flaps closed*

(a) Bottom
(b) Right
(c) Left

(7) *Packing completed*

(a) Ripcord routed through static line pull ring and guide ring.
(b) Top flap closed
(c) All packing aids removed
(d) Log Record book filled out

b. Perform layout and line check as follows:

(1) Lay out parachute on a clean dry surface with canopy on its left side. Leading edge (nose) will be to the right when viewed from riser end. Stretch lines full length with a helper at riser end to check continuity and to hold lines taut.

(2) Grasp high points of each cell and, with high points in hand, flip canopy toward trailing edge. Canopy shall lie flat with trailing edge lines on left side when viewed from riser end (figure 2-43).

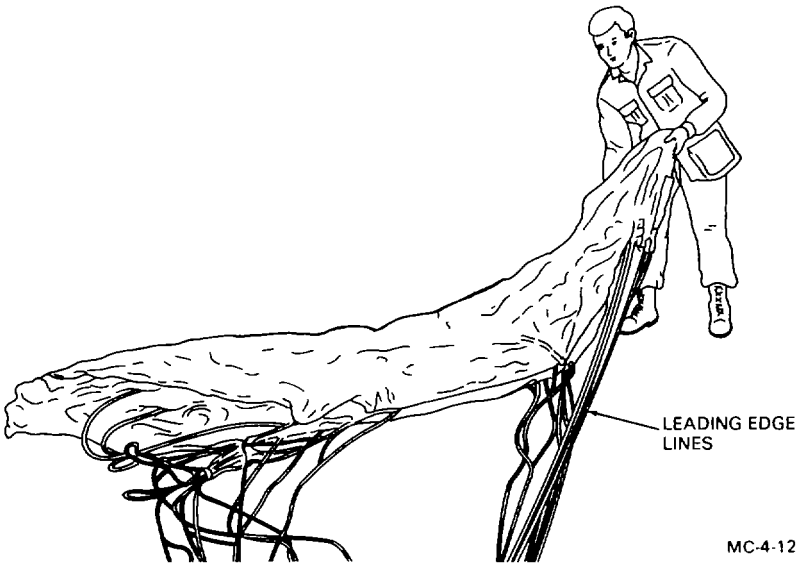


Figure 2-43. Layout of Canopy.

2-17. Packing Procedures-Reserve Parachute (CONT).

(3) Remove any twists, turns, and tangles between suspension line groups.

(4) Raise lines 8A and 8B a sufficient height to see if line 8A runs free from canopy to outside of right front riser connector link. Line 1A should run free to outside of left front riser connector link (figure 2-44).

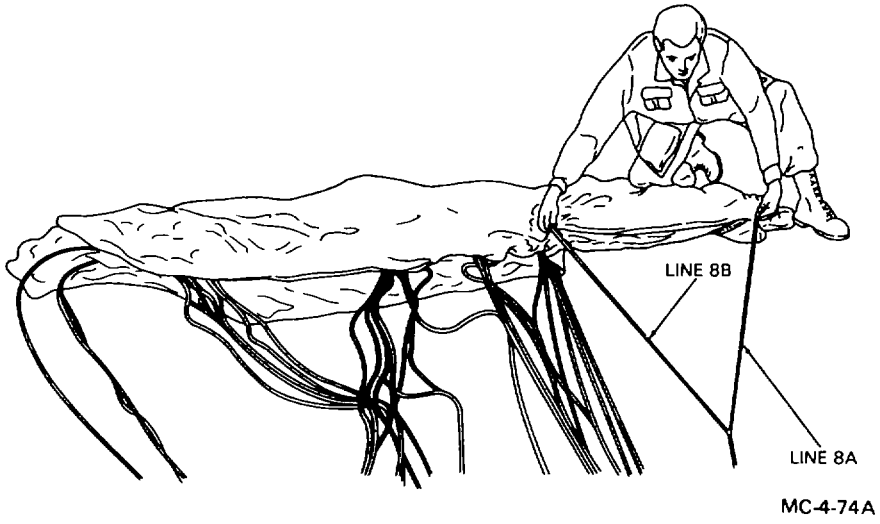


Figure 2-44. Tracing A Lines.

(5) Raise lines 8C and 8D a sufficient height to see if line 8C runs free from canopy to outside of right rear connector link. Line 1C should run free to outside of left rear connector link (figure 2-45).

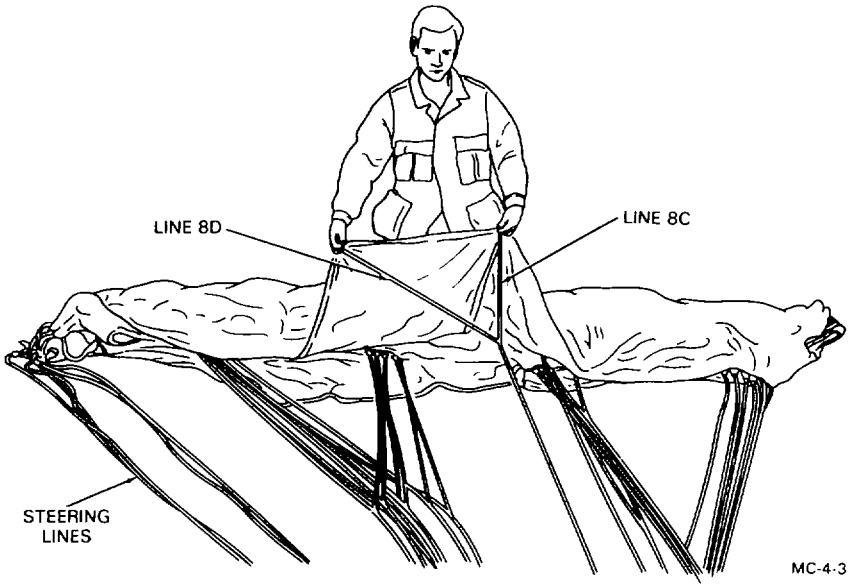


Figure 2-45. Tracing C Lines.

(6) Raise steering lines to ensure they run free from the A, B, C, and D lines (figure 2-46).

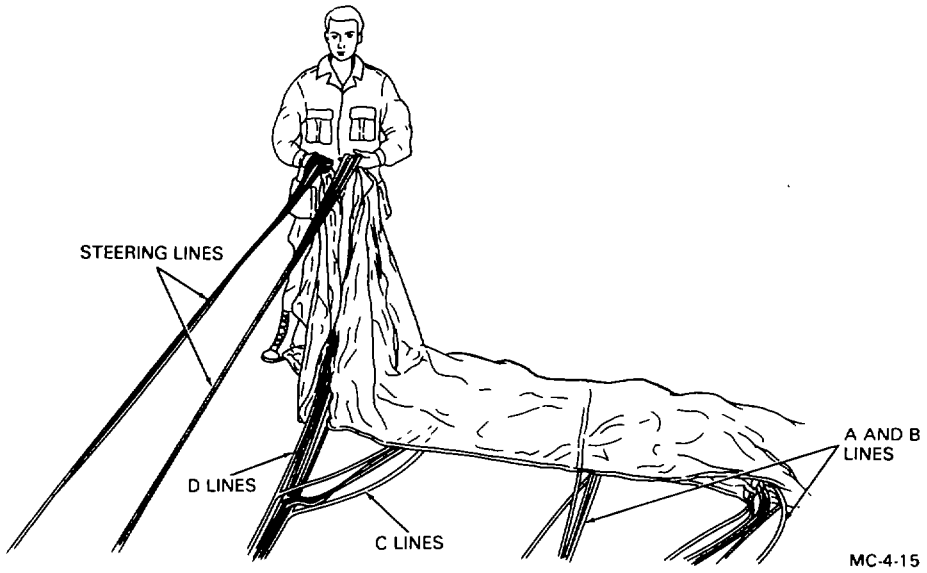


Figure 2-46. Tracing Steering Lines.

(7) Ensure steering lines run free through proper slider grommets, and then through proper steering line guide ring (figure 2-47).

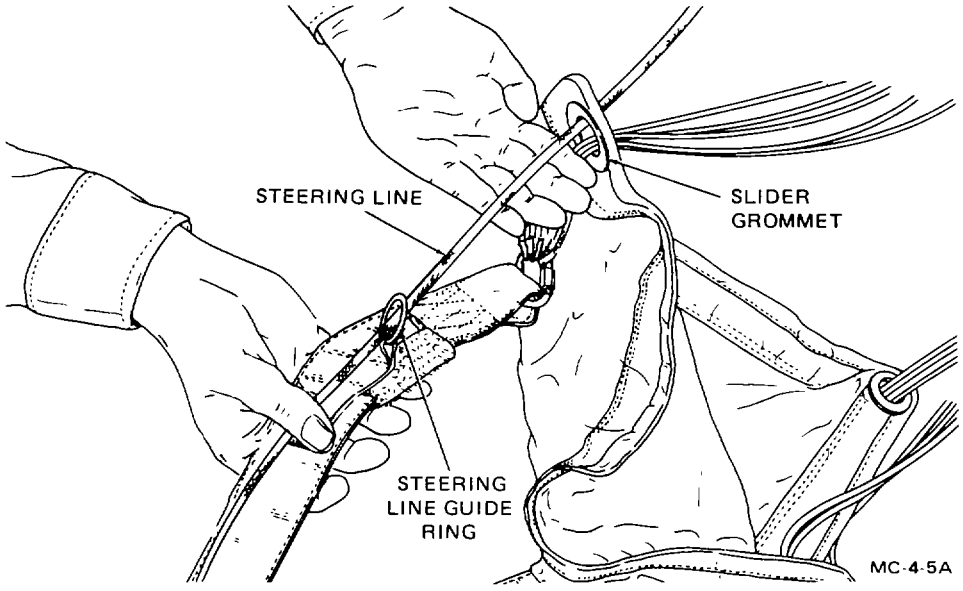


Figure 2-47. Tracing Steering Lines through Slider and Guide Rings.

2-17. Packing Procedures-Reserve Parachute (CONT).

c. Flake canopy as follows:

(1) Grasping tops of cells at high points, throw canopy toward risers (figure 2-48).

Figure 2-48. Canopy Thrown Toward Risers.

(2) Starting with high points on cell 1, pull out seam and smooth cell from leading edge to trailing edge (figure 2-49).

Figure 2-49. Flaking Cell 1.

(3) Continue to flake canopy by pulling out seams one by one on each remaining cell. Smooth each cell until all cells are flaked and all line groups are clearly separated (figure 2-50).

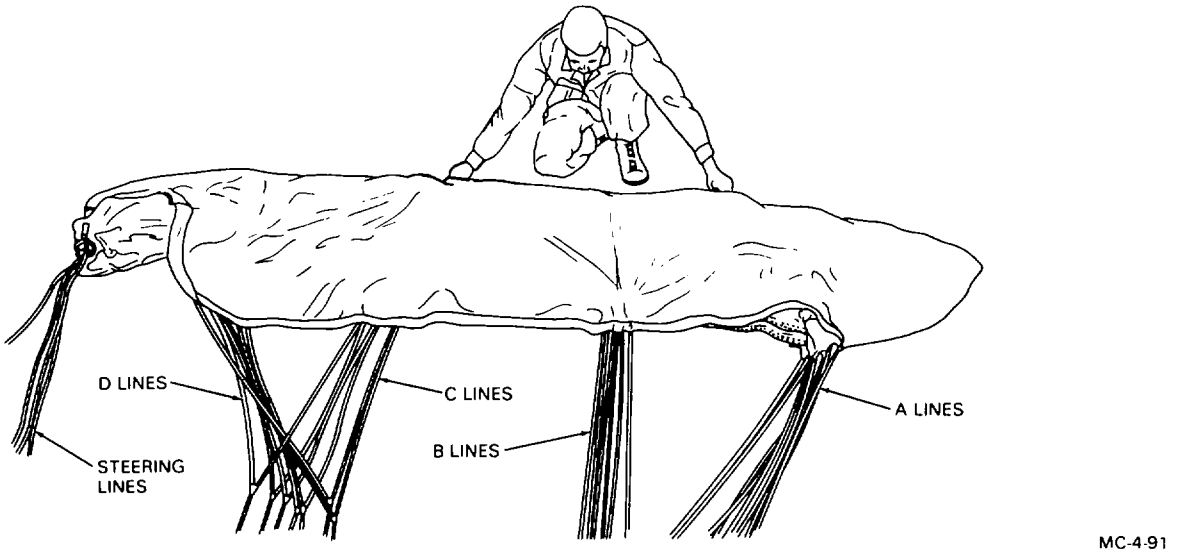


Figure 2-50. Cells Flaked and Line Groups Separated.

(4) Rigger check number 1.

d. Fold canopy as follows:

(1) Fold leading edge over canopy so cell openings are even with A lines. Keep lines taut (figure 2-51).

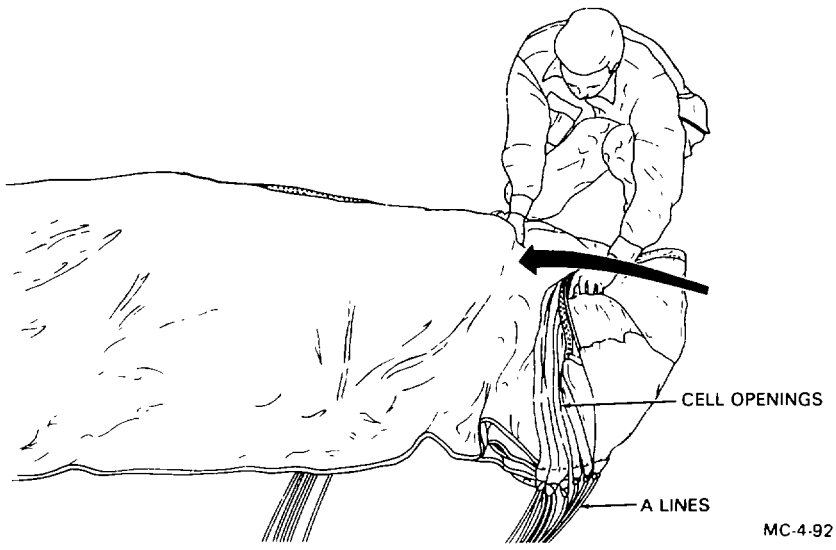


Figure 2-51. Leading Edge Folded Over Canopy.

2-17. Packing Procedures-Reserve Parachute (CONT).

(2) Grasp the high point of cell 1 and extend outward, smoothing out cell (figure 2-52).

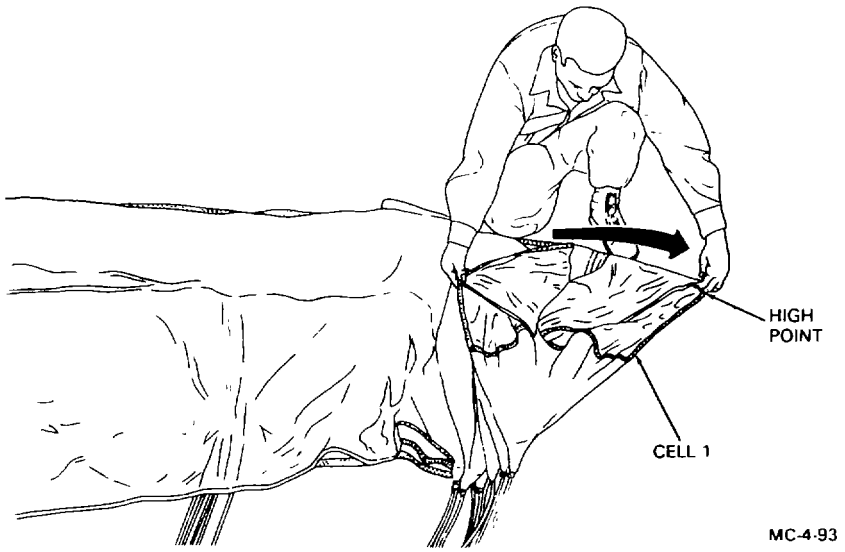


Figure 2-52. Extending Cell 1 Outward.

(3) Continue to grasp high point of each cell and extend outward, smoothing out each each cell and aligning all cell openings.

(4) Make a fold in line with the A line group and fold canopy nose under (figure 2-53).

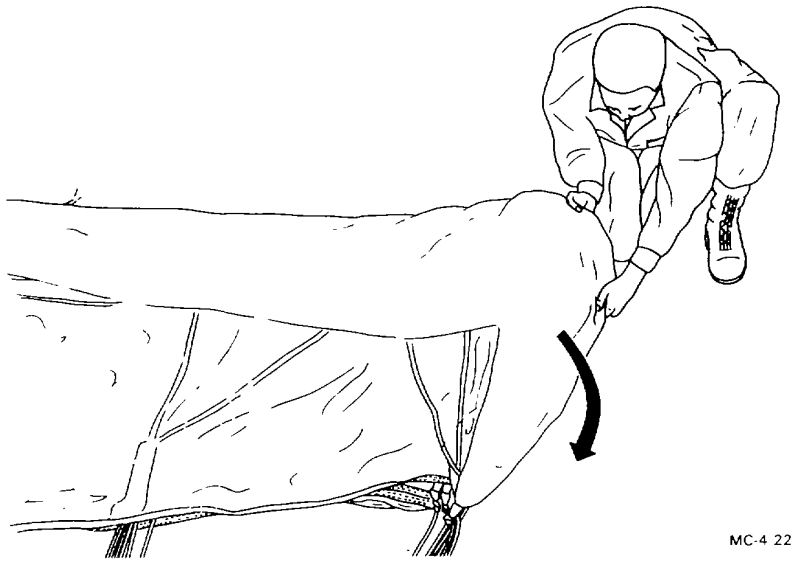


Figure 2-53. Folding Canopy Nose.

(5) Holding all the high points together directly in line with the B line group, make an S-fold so that the B line group is on top of the A line group. Ensure high points are kept taut (figure 2-54).

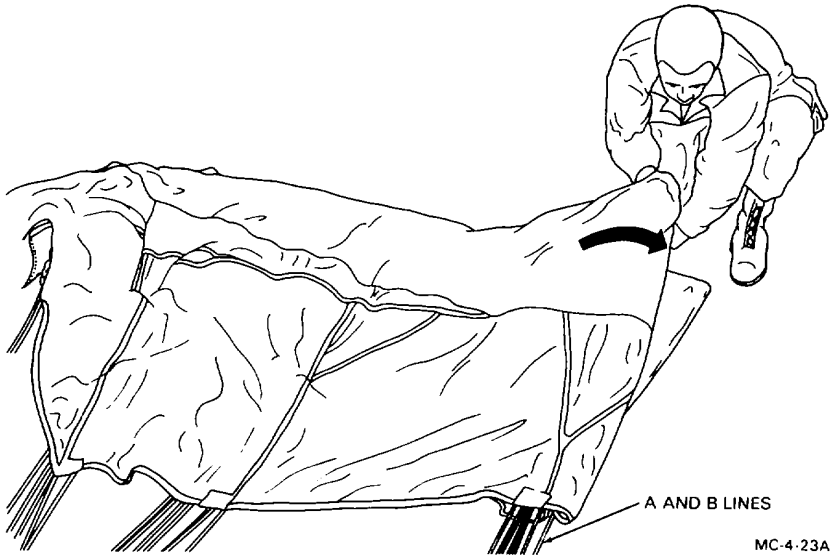


Figure 2-54. Folding B Lines onto A Lines.

(6) Holding all the high points together directly in line with the C line group, make an S-fold so that the C line group is on top of the A and B line groups. Ensure high points are kept taut (figure 2-55).

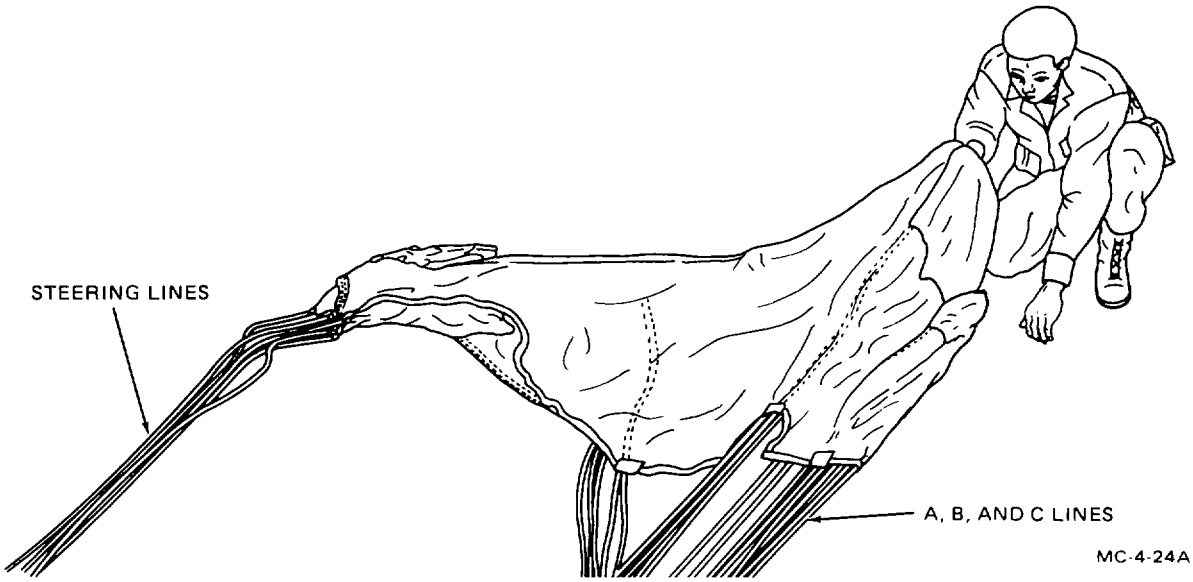


Figure 2-55. Folding C Lines onto A and B Lines.

2-17. Packing Procedures-Reserve Parachute (CONT).

(7) Holding all the high points together directly in line with the D line group, make an S-fold so that the D line group is on top of the A, B, and C line groups. Ensure high points are kept taut (figure 2-56).

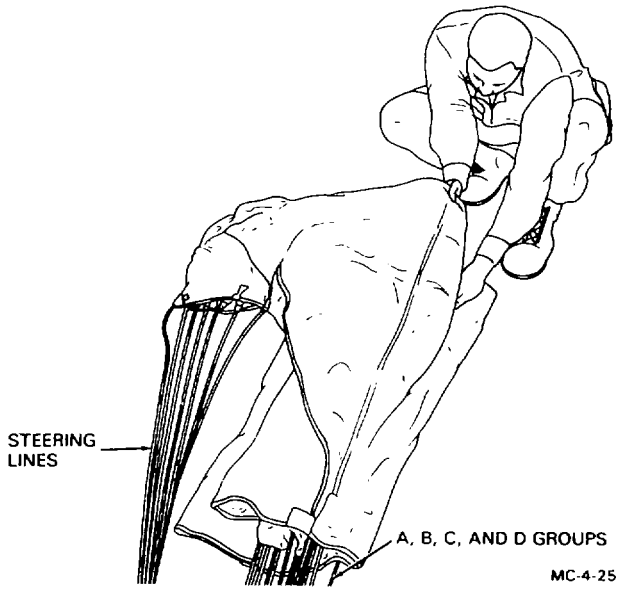


Figure 2-56. Folding D lines onto A, B, and C Lines.

(8) Clear the stabilizers by pulling them to the outside. Make sure that there are no lines wrapped around them. There are three stabilizer panels on each side (figure 2-57).

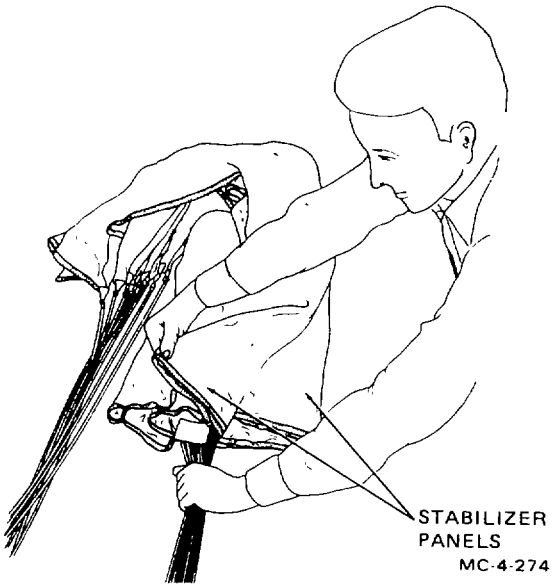


Figure 2-57. Clearing Stabilizer Panels.

(9) Set deployment brakes by opening excess line keeper on each rear riser and then pulling down on each toggle until each finger-trapped loop is through each steering line guide ring (figure 2-58).

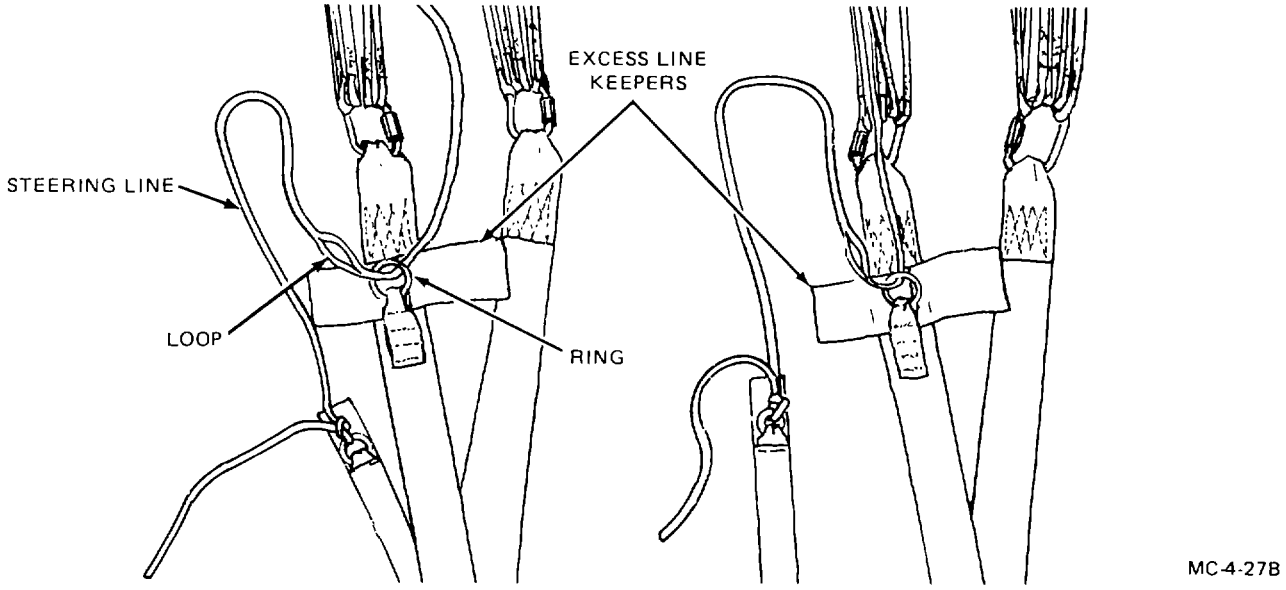


Figure 2-58. Setting Deployment Brakes.

(10) Insert stiffened top of each steering toggle through loop 1 inch. Safety-tack top center of steering toggle to center of riser with one turn of 24/4 cotton thread, double, encircling the steering line. Tie off each tacking with a surgeon's knot and a locking knot. Trim ends to 1/4 inch. Ensure each loop with stiffened end of toggle is seated firmly against ring on riser (figure 2-59).

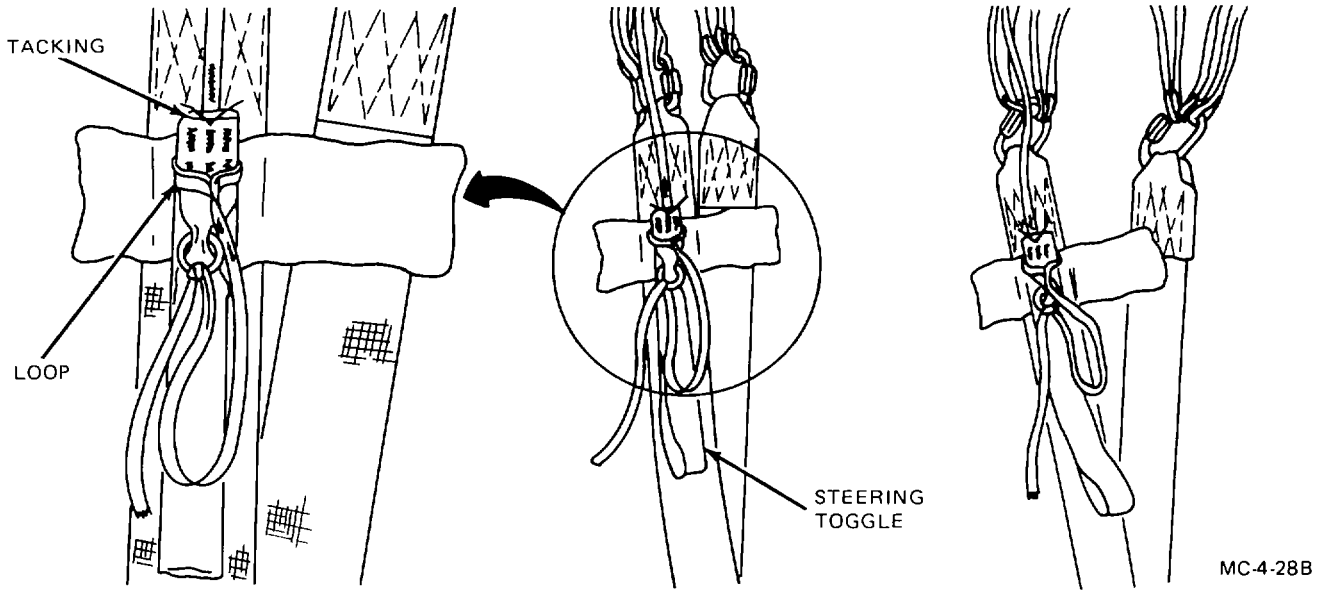


Figure 2-59. Tacking Steering Toggles.

2-17. Packing Procedures-Reserve Parachute (CONT).

(11) Using an S-fold, neatly stow excess line in excess line keeper alongside steering line guide ring. Ensure that S-fold loops do not extend above or below excess line keeper. Ensure that excess line is to the right (pile) side of the keeper (figure 2-60).

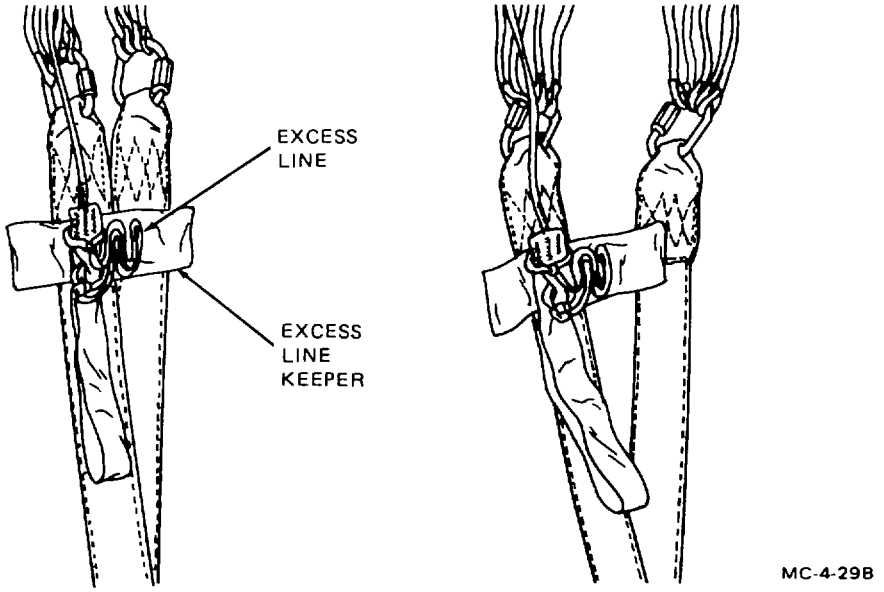


Figure 2-60. Stowing Excess Steering Line.

(12) Close excess line keepers (figure 2-1).

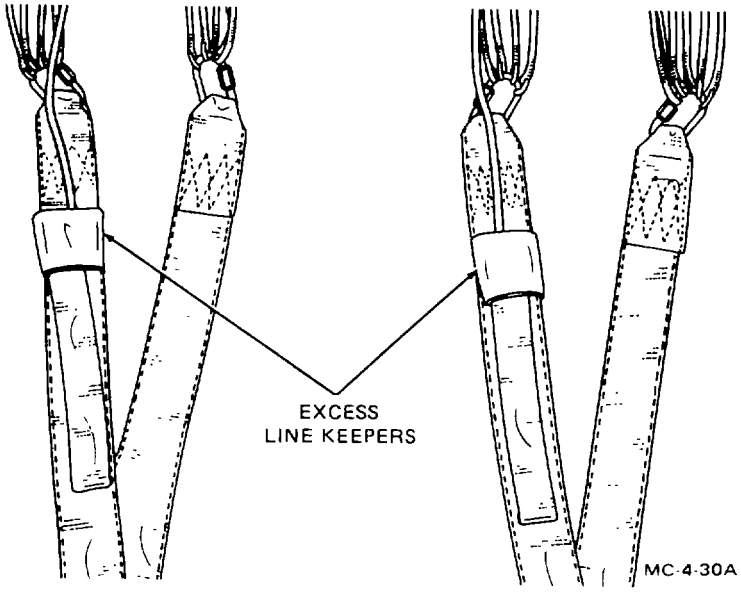


Figure 2-61. Steering Lines Stowed.

(13) Grasp uppermost steering line and pull taut. Flake and smooth tail seam. Position seam on folded canopy so steering line is on top of line groups A, B, C, and D (figure 2-62).

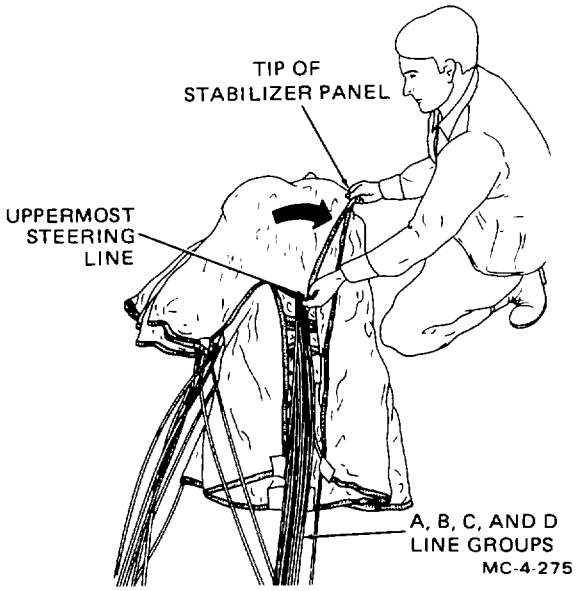


Figure 2-62. Flaking First Tail Seam.

(14) Continue to flake and smooth remaining tail seams. Lines should remain taut throughout procedure (figure 2-63).

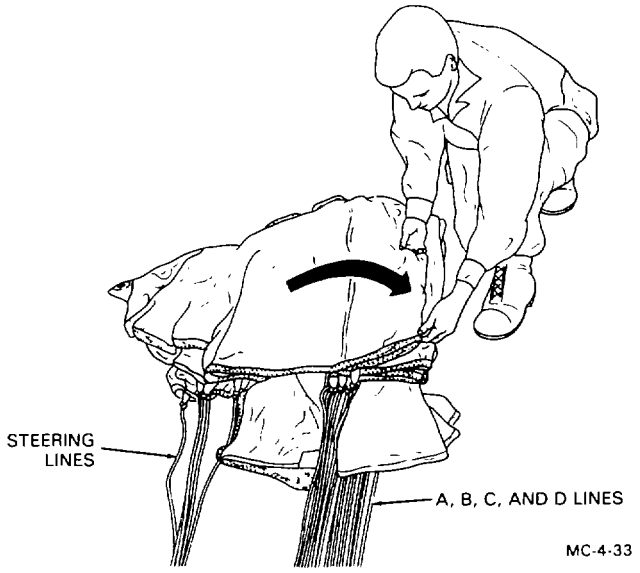


Figure 2-63. Flaking Remaining Tail Seams.

2-17. Packing Procedures-Reserve Parachute (CONT).

(15) When canopy is flaked, all steering lines should be on top of line groups A, B, C, and D. Ensure that bottom tail seam remains even with steering lines (figure 2-64).

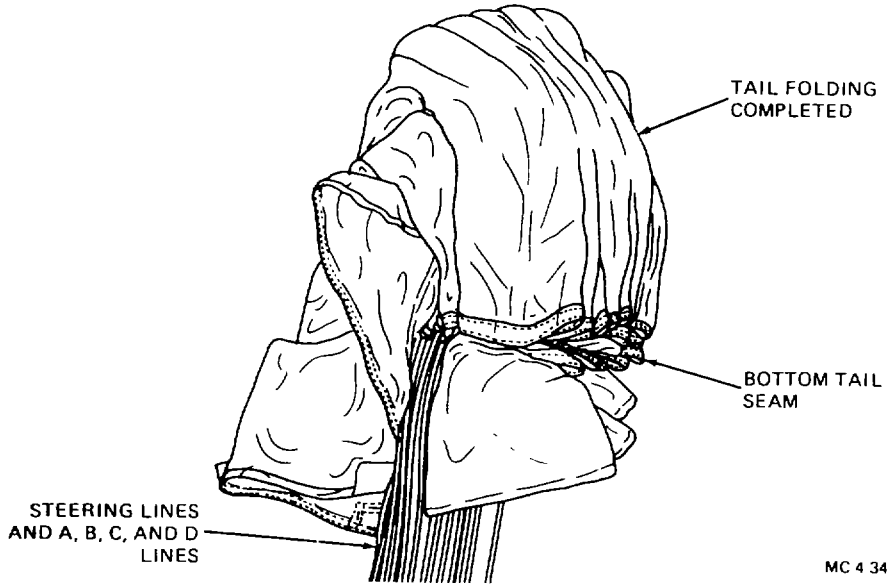


Figure 2-64. Canopy Flaking Completed.

(16) Grasping the top tail fold, count and fold back seven tail folds towards trailing edge of canopy. Tail of canopy should now be on top of folded canopy with seven folds on left and seven folds on right. Steering lines should remain taut and in the center (figure 2-65).

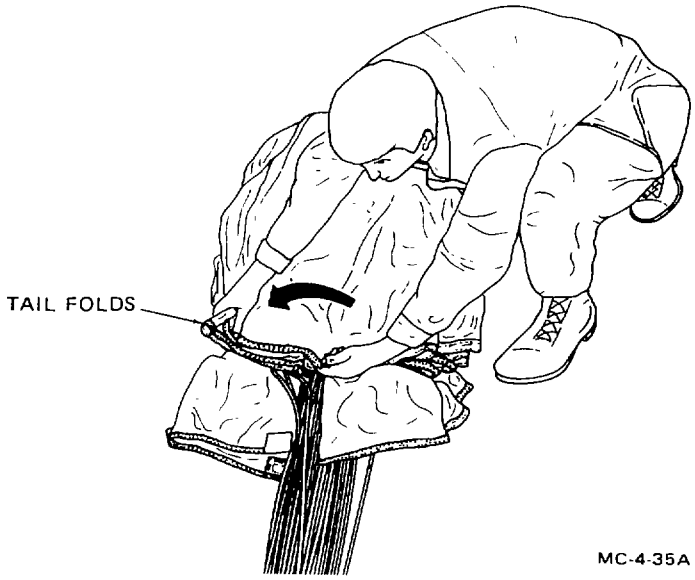


Figure 2-65. Tail Folds Placed on Canopy.

(17) Kneel on canopy at suspension line end. Spread center of tail one full section left and right of center of tail (figure 2-66).

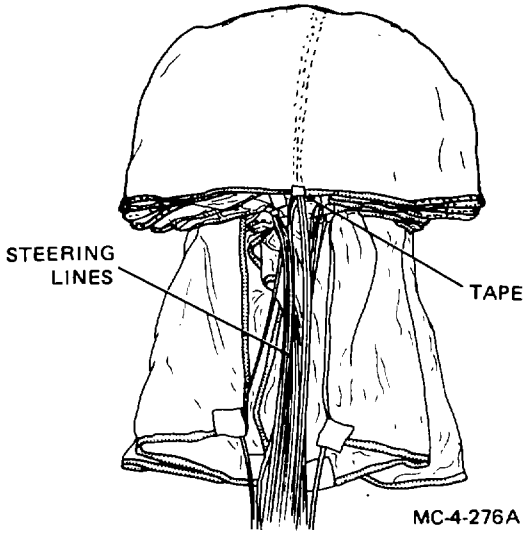


Figure 2-66. Spreading Center of Tail.

(18) Wrap center tail panel around canopy, keeping steering lines in center. Fold center tail panel around canopy until it is the width of deployment bag. Smooth out trapped air until canopy lies flat (figure 2-67).

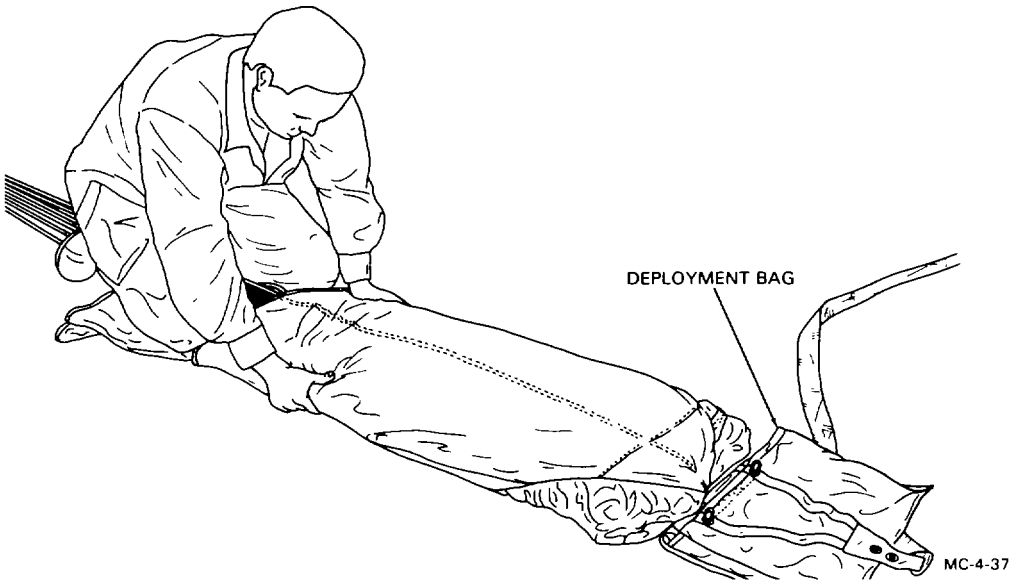


Figure 2-67. Tail Panel Wrapped Around Canopy.

2-17. Packing Procedures-Reserve Parachute (CONT).

(19) Place rear riser line groups to the outside of front riser line groups. Lay slider down flat between the line groups, with reinforcement tapes facing up. Ensure each line group from the canopy enters slider grommet from the top and exits out underneath slider.

(20) Grasp slider by top center, ensuring that reinforcement tapes appear on top side toward canopy. Bring slider up to the bottom of canopy, forming four distinct line groups. Ensure free movement along suspension lines (figure 2-68).

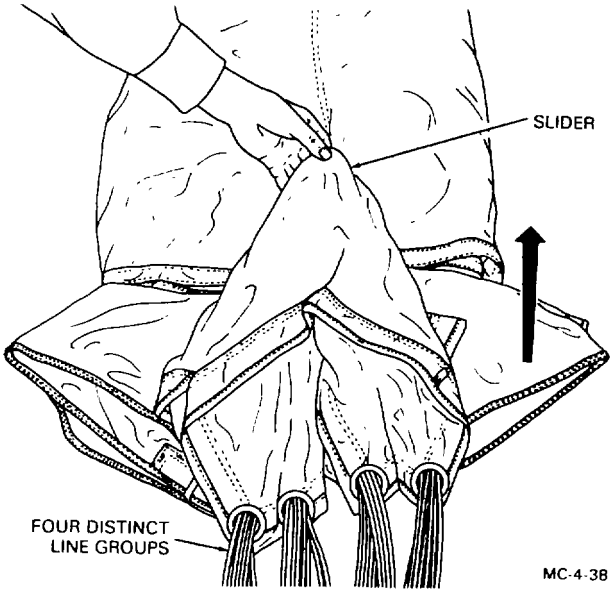


Figure 2-68. Slider Pulled Into Position.

(21) Rigger check number 2.

(22) Fold left stabilizer panels, then right stabilizer panels on slider at 45-degree angles (figure 2-69).

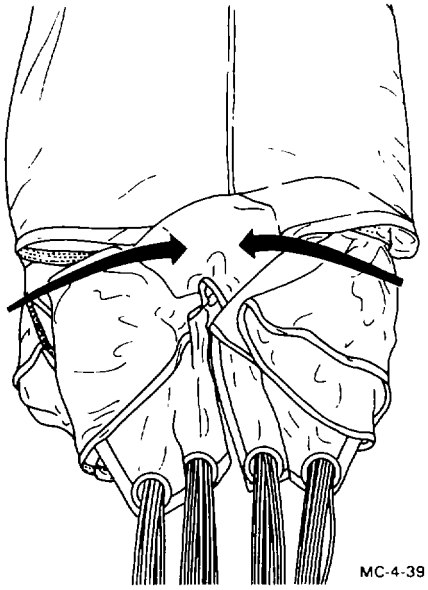


Figure 2-69. Folding Stabilizer Panels on Slider.

(23) Place hand on canopy approximately 10 inches from suspension lines. Grasp canopy at suspension lines in preparation for making first fold (figure 2-70).

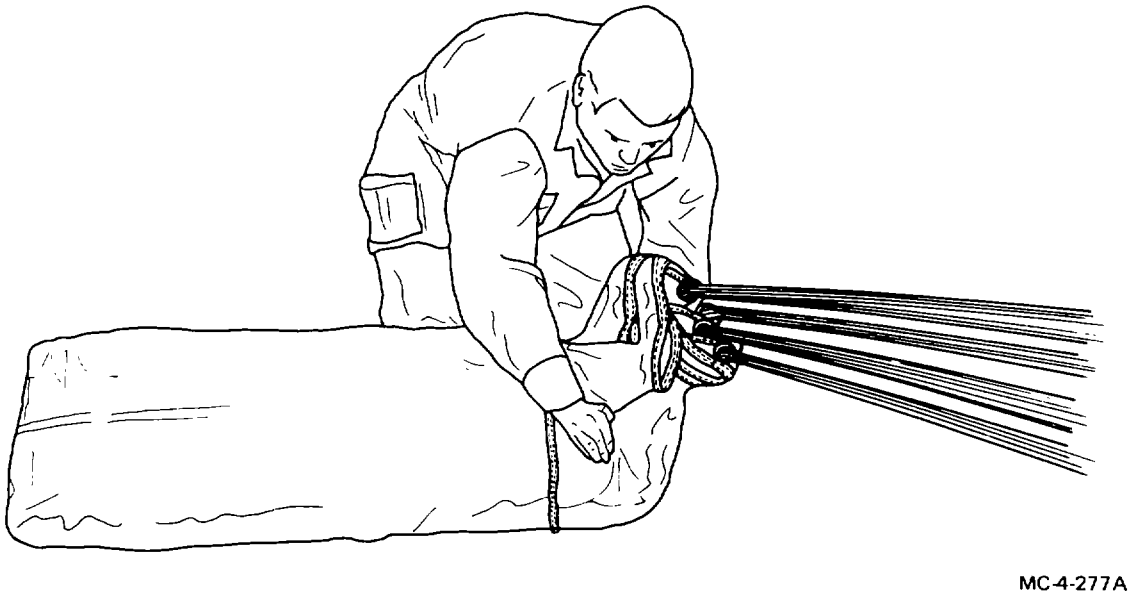


Figure 2-70. Preparing First Canopy Fold.

2-17. Packing Procedures-Reserve Parachute (CONT).

(24) S-fold bottom of canopy approximately 10 inches so that slider grommets are on top of canopy. Ensure all suspension lines remain taut (figure 2-71).

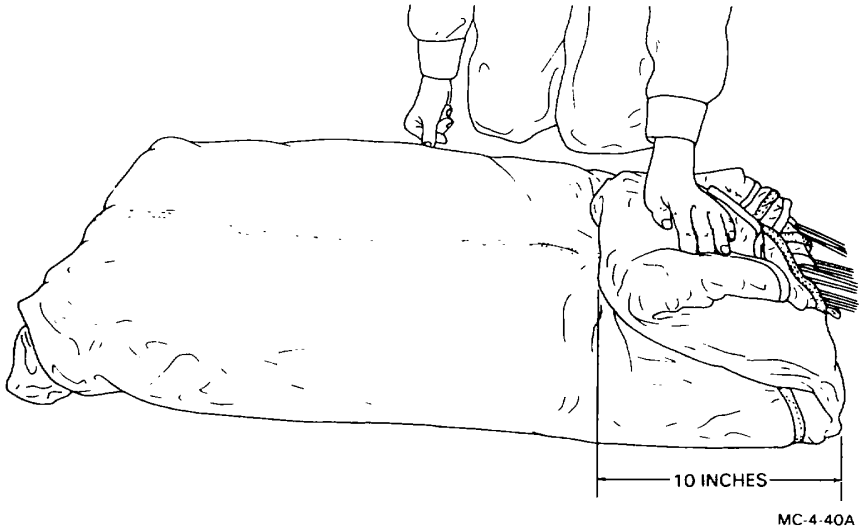


Figure 2-71. Bottom of Canopy S-Folded.

(25) Pull center of tail section up and over S-fold so that it is positioned over slider and stabilizers. Dress the canopy (figure 2-72).

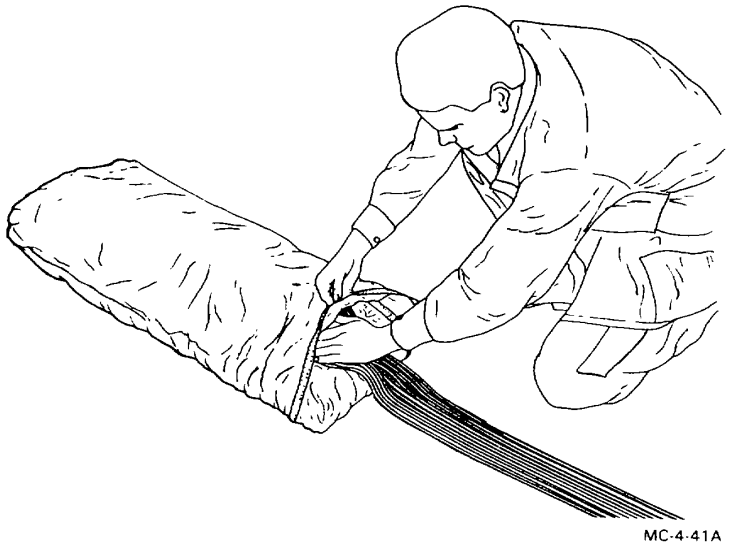


Figure 2-72. Tail Section Positioned Over S-Fold.

(26) Place hand one deployment bag length up from base of canopy. Grasp upper portion with other hand. Fold upper canopy over lower canopy (figure 2-73).

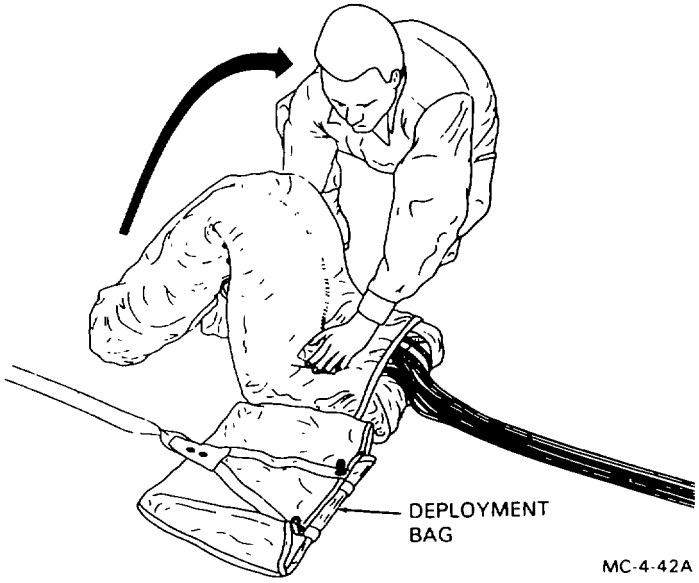


Figure 2-73. Upper Canopy Folded Over Lower Canopy.

(27) Locate the seven high points of the nose. Ensure each cell opening is completely exposed. Place three cell openings on each side with center split (figure 2-74).

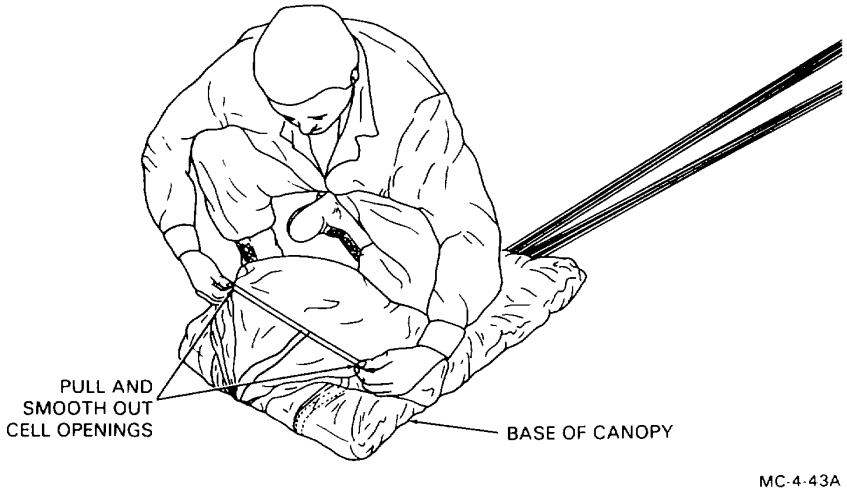


Figure 2-74. Exposing Nose Cell Openings.

(28) Rigger check number 3.

2-17. Packing Procedures - Reserve Parachute (CONT).

(29) Fold top portion of canopy over approximately 10 inches. This fold should be even with base of canopy (figure 2-75).

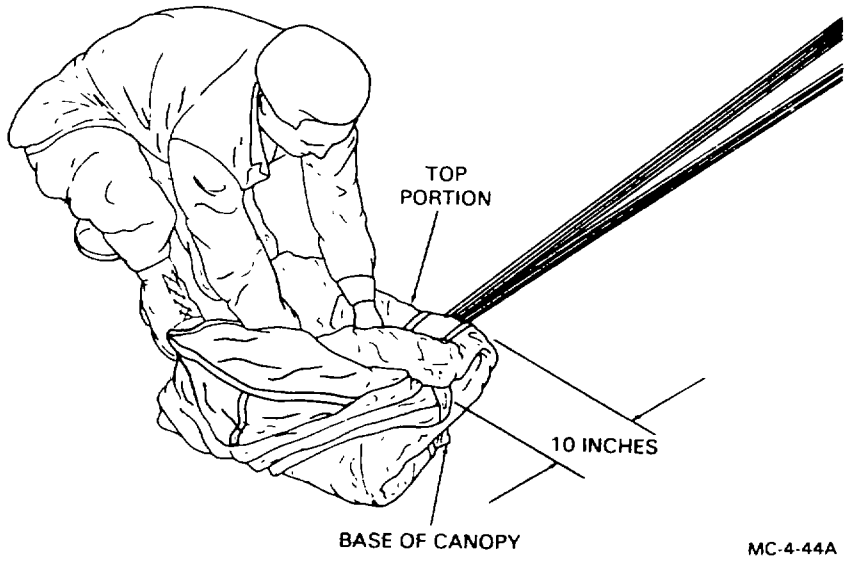


Figure 2-75. Top Portion of Canopy Folded Even with Base.

(30) Roll top fold toward nose of canopy an additional 10 inches. Position deployment bag over one comer (figure 2-76).

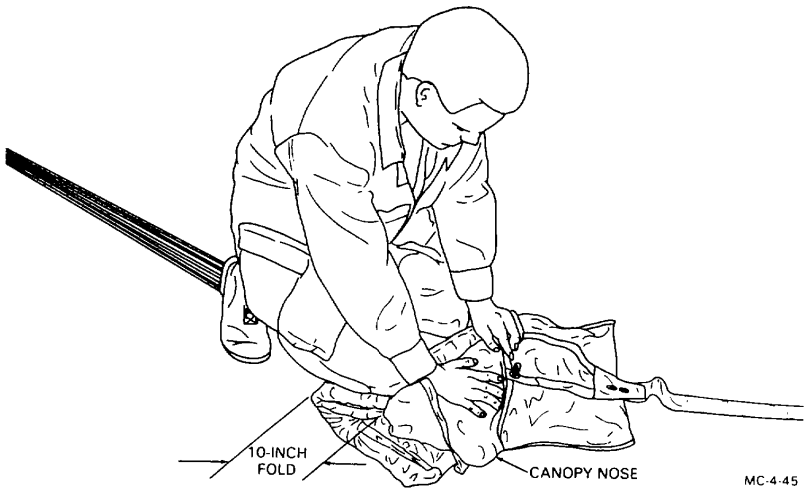


Figure 2-76. Final Canopy Fold.

e. Stow canopy and suspension lines as follows:

NOTE

Ensure slider grommets are not exposed past the tail of the base of the fold.

(1) Insert folded canopy into deployment bag. Work canopy into corners and fill outside edges of bag. Insert pull-up cord through each elastic loop. Pass pull-up cords through grommets in bag end flap (figure 2-77).

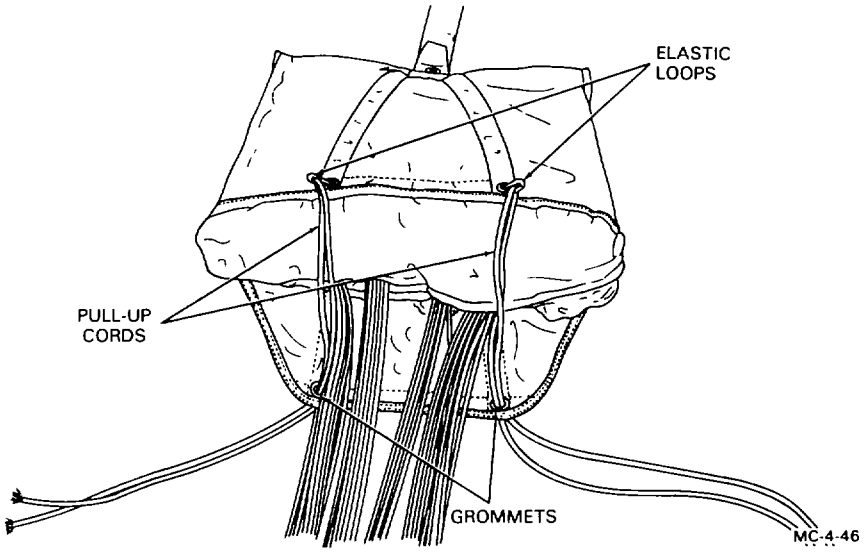


Figure 2-77. Stowing Canopy in Deployment Bag.

(2) Make first locking stow on the right by pulling elastic loop through right grommet and locking in place with first suspension line stow. Stow should not protrude more than 1 3/4 Inch through elastic loop (figure 2-78).

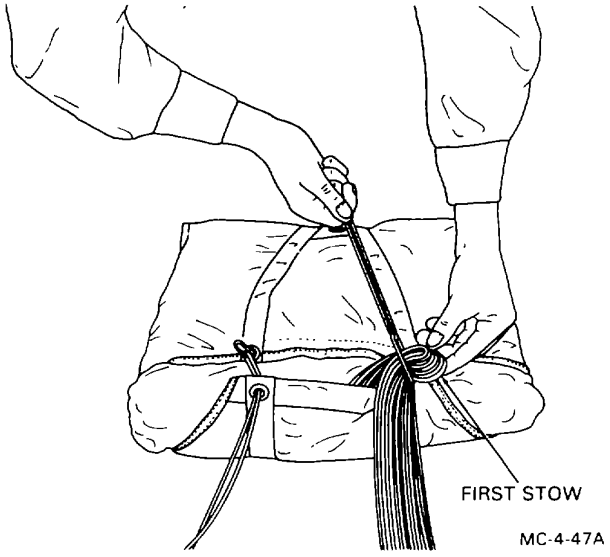


Figure 2-78. First Locking Stow.

2-17. Packing Procedures - Reserve Parachute (CONT).

(3) Make second locking stow on the left and remove pull-up cords (figure 2-79).

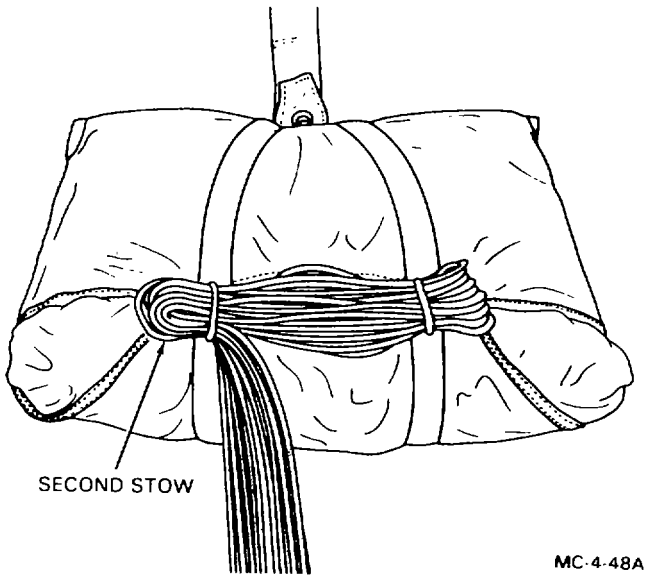


Figure 2-79. Second Locking Stow.

(4) Rotate deployment bag up and open suspension line retaining pocket (figure 2-80).

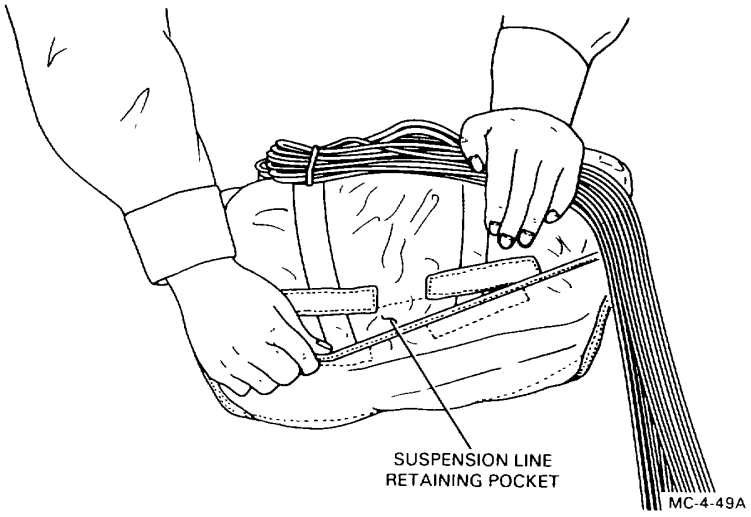


Figure 2-80. Opening Suspension Line Retaining Pocket.

(5) S-fold suspension lines into pocket from bottom to top, taking care not to put twists Into lines (figure 2-81).

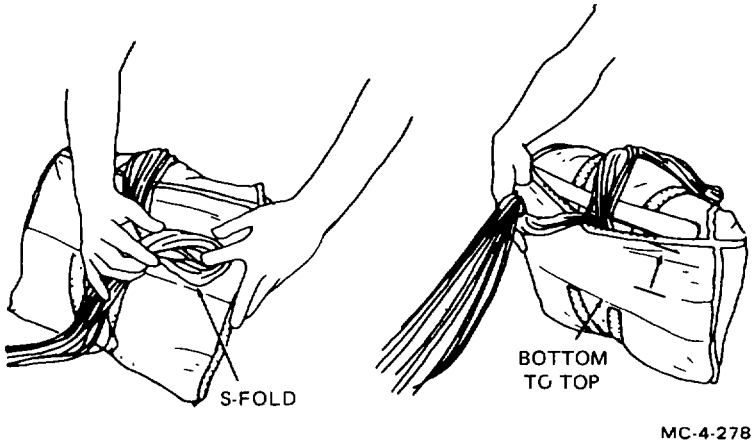


Figure 2-81. S-Folding Suspension Lines Into Pocket.

(6) Mate hook and pile tape on bag pocket with lines exiting center. Leave approximately 8 inches between bag and risers (figure 2-82).

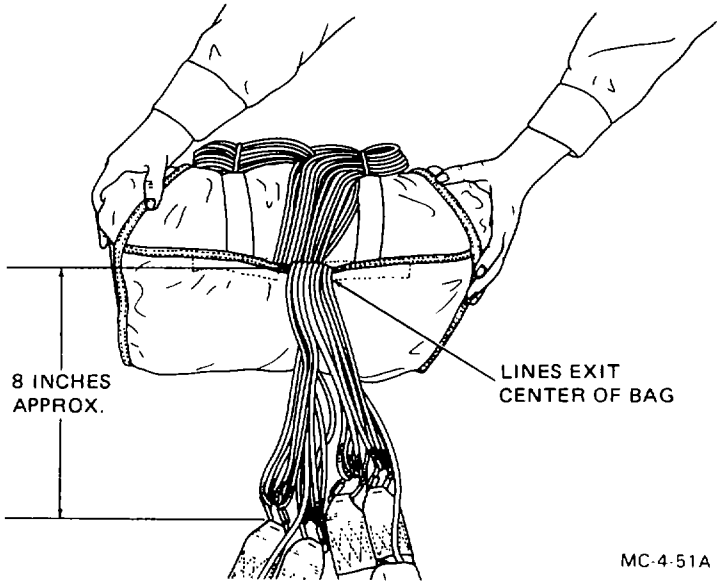


Figure 2-82. Suspension Lines Stowed.

(7) Rigger check number 4.

2-17. Packing Procedures - Reserve Parachute (CONT).

f. Close container as follows:

(1) Rotate deployment bag up and over main parachute compartment. Line stowage pocket will face up. Position risers in reserve container. Insert pull-up cords through ends of reserve closing loop and elastic locking loop. Measure length of elastic locking loop from washer to end of loop. Measurement must be no longer than 1 inch. (figure 2-83).

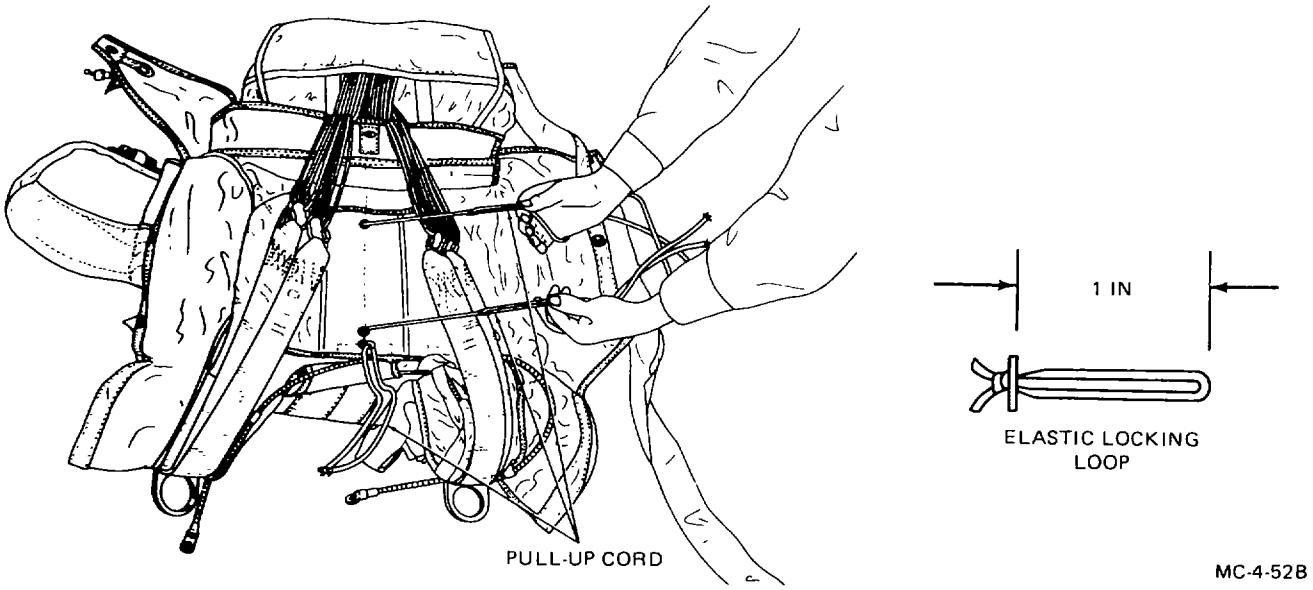


Figure 2-83. Pull-up Cords Inserted.

(2) Rotate deployment bag into reserve parachute compartment. Line stowage pocket will face down and bridle line will exit top of container. Suspension line locking stow faces toward main parachute compartment (figure 2-84).

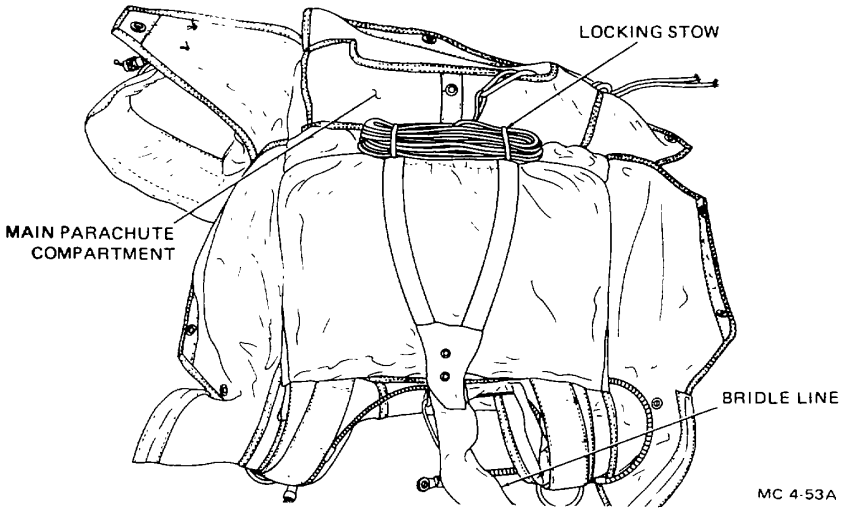


Figure 2-84. Deployment Bag in Container.

(3) Route pull-up cord with closing loop through Inside grommet on bridle line. Route pull-up cord with elastic loop through outside grommet on bridle line (figure 2-85).

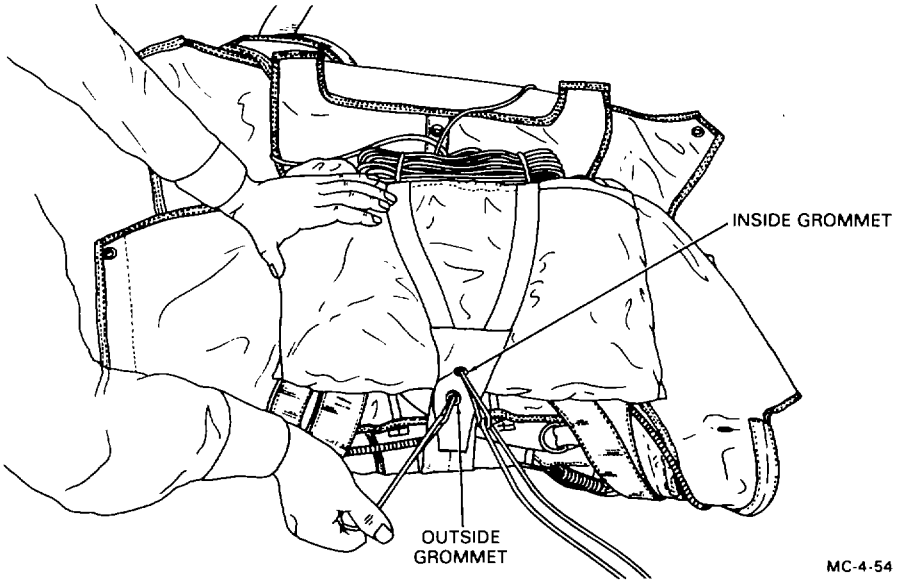


Figure 2-85. Pull-up Cords Routed through Bridle Line Grommets.

(4) Prepare to form a needle fold in bridle line by first folding bridle back over itself approximately **4** inches above bag (figure 2-86).

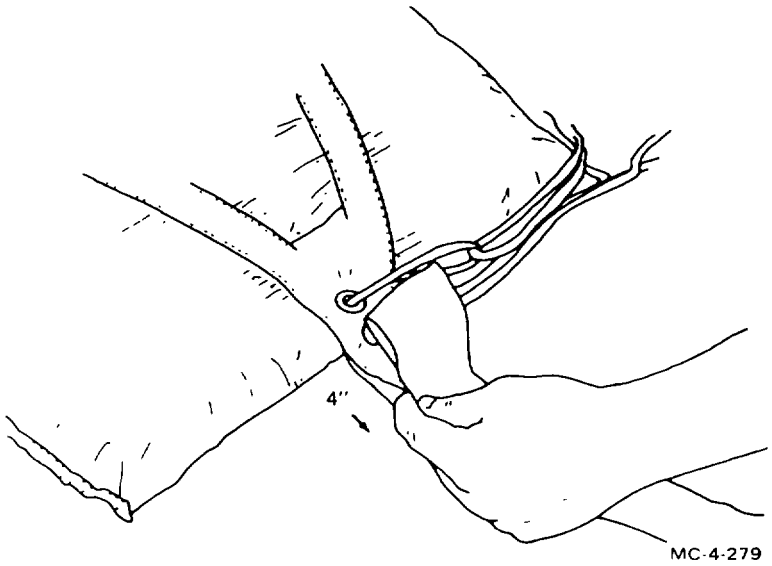


Figure 2-86. Preparing Needle Fold.

2-17. Packing Procedures - Reserve Parachute (CONT).

(5) Continue to make needle fold by folding first 4-inch fold at a 45degree angle (figure 2-87).

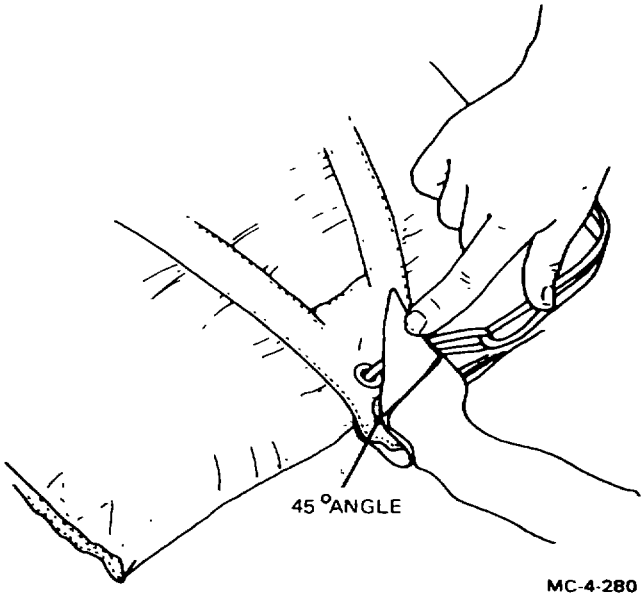


Figure 2-87. 45-Degree Angle Fold.

(6) Fold previous 45degree fold in half (figure 2-88).

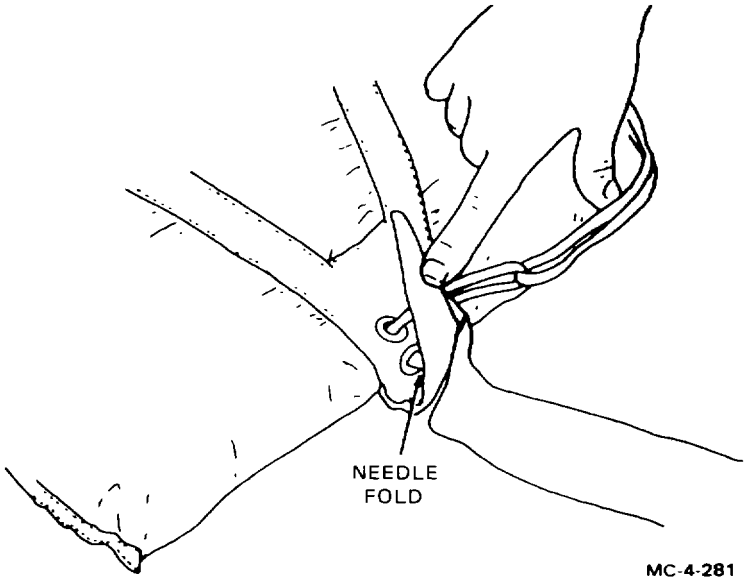


Figure 2-88. Needle Fold Completed.

(7) Insert needle fold through elastic locking loop with aid of pull-up cord. Fold should extend no more than 1 inch through loop. Remove pull-up cord (figure 2-89).

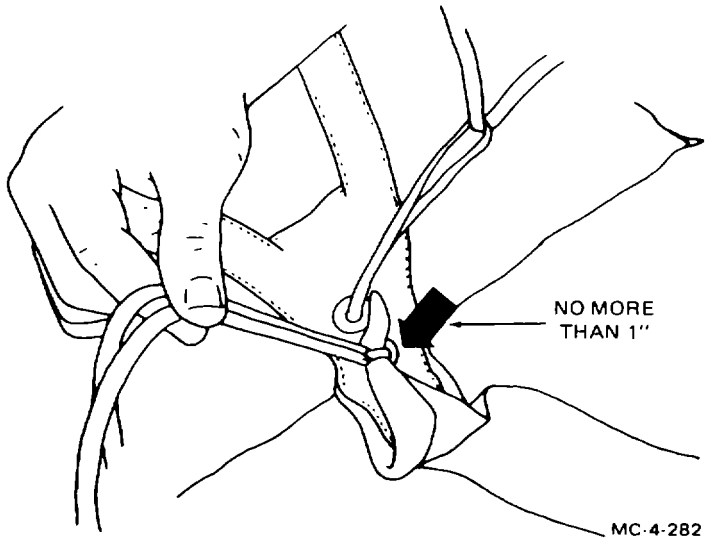


Figure 2-89. Needle Fold in Elastic Locking Loop.

(8) Rigger check number 5.

(9) S-fold bridle line on top of deployment bag (figure 2-90).

Figure 2-90. Bridle Line S-Folded.

2-17. Packing Procedures - Reserve Parachute (CONT).

(10) Center pilot chute on S-fold and then route pull-up cords through lower pilot chute grommet tabs. Insert properly flagged temporary locking pins (figure 2-91).

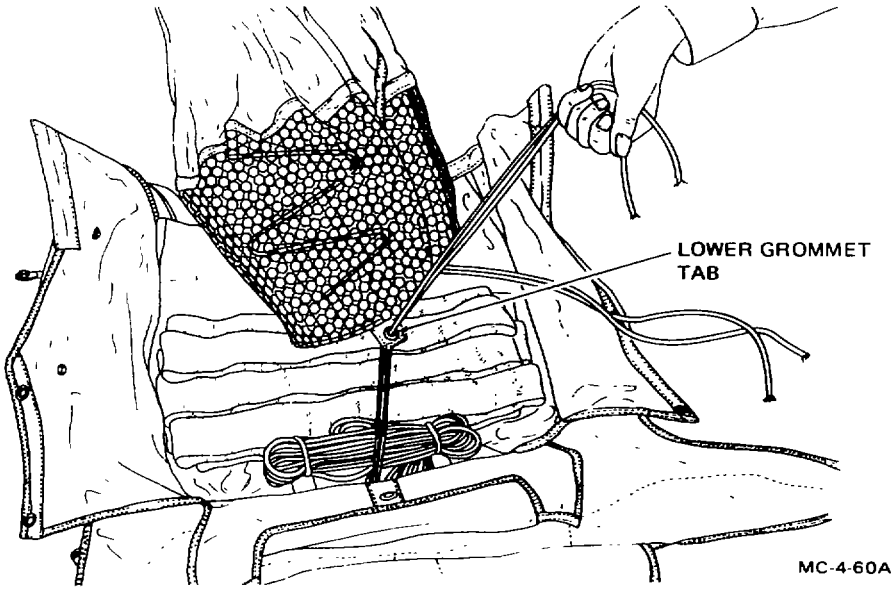


Figure 2-91. Pull-up Cords Through Lower Grommet Tabs.

NOTE

At no time is it permissible to use an aid other than your hands to close the container.

(11) Route pull-up cords through upper pilot chute grommet tabs. Compress pilot chute, ensuring that canopy fabric is clear of grommets and closing loops. Canopy fabric may be distributed to left and right sides of pilot chute. Pull closing loops up through tabs and insert temporary locking pins (figure 2-92).

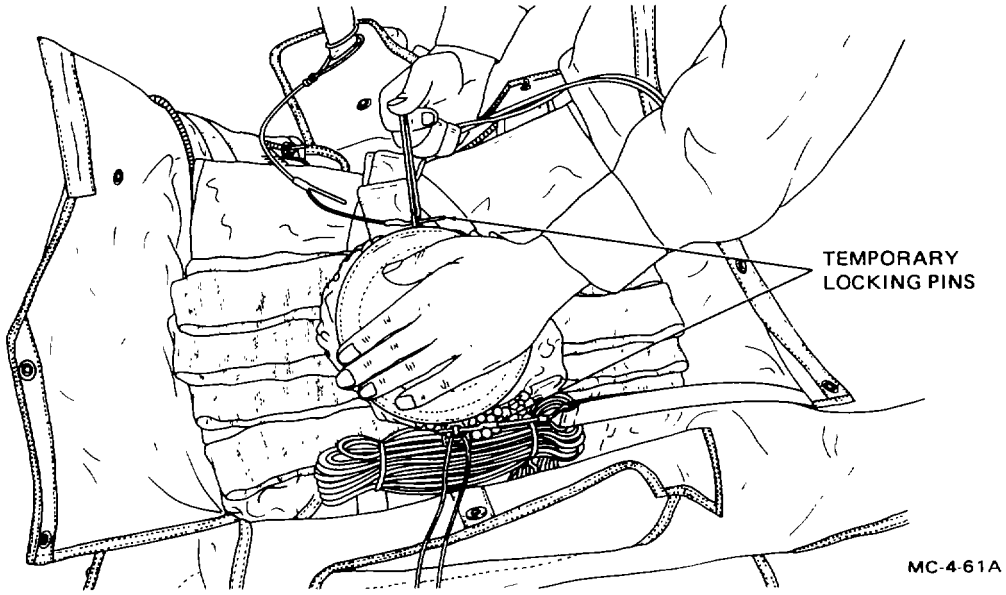


Figure 2-92. Pull-up Cords Through Upper Grommet Tabs.

(12) Route pull-up cord through grommet in bottom flap. Pull up closing loop and reinsert temporary locking pin (figure 2-93).

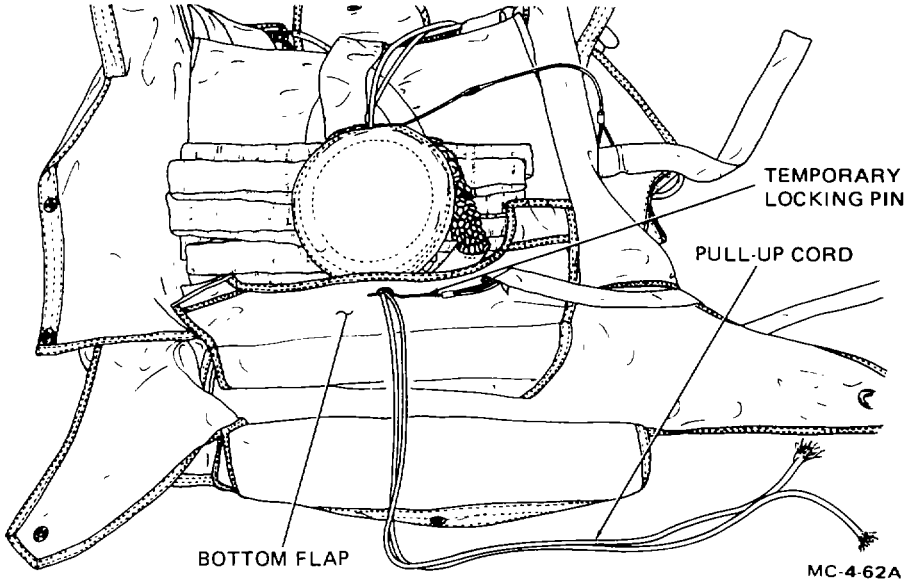


Figure 2-93. Closing Bottom Flap.

2-17. Packing Procedures - Reserve Parachute (CONT).

(13) Route pull-up cords through grommets in right side flap. Pull up closing loops and reinsert temporary locking pins (figure 2-94).

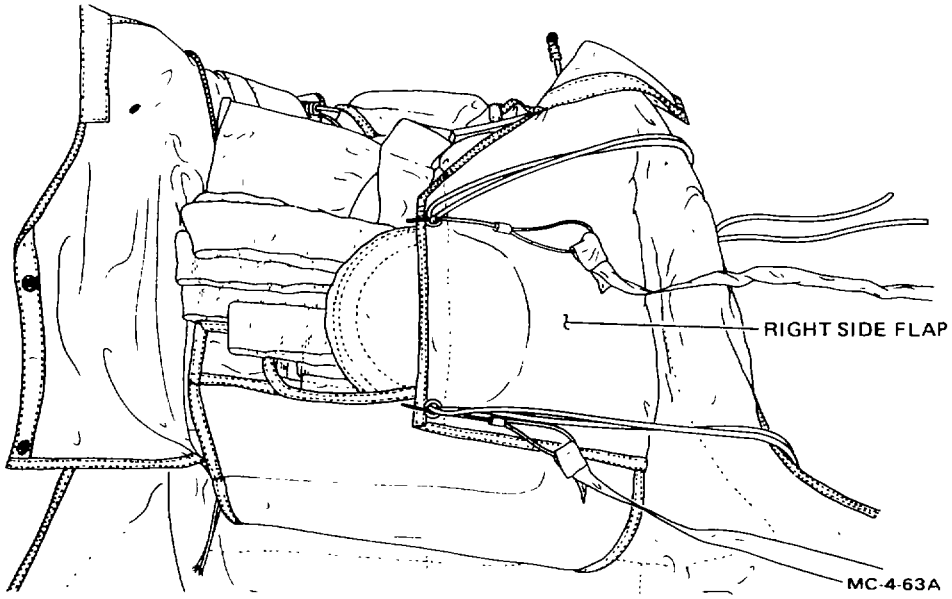


Figure 2-94. Closing Right Side Flap.

(14) Route pull-up cords through grommets in left side flap. Pull up closing loops and reinsert temporary locking pins (figure 2-95).

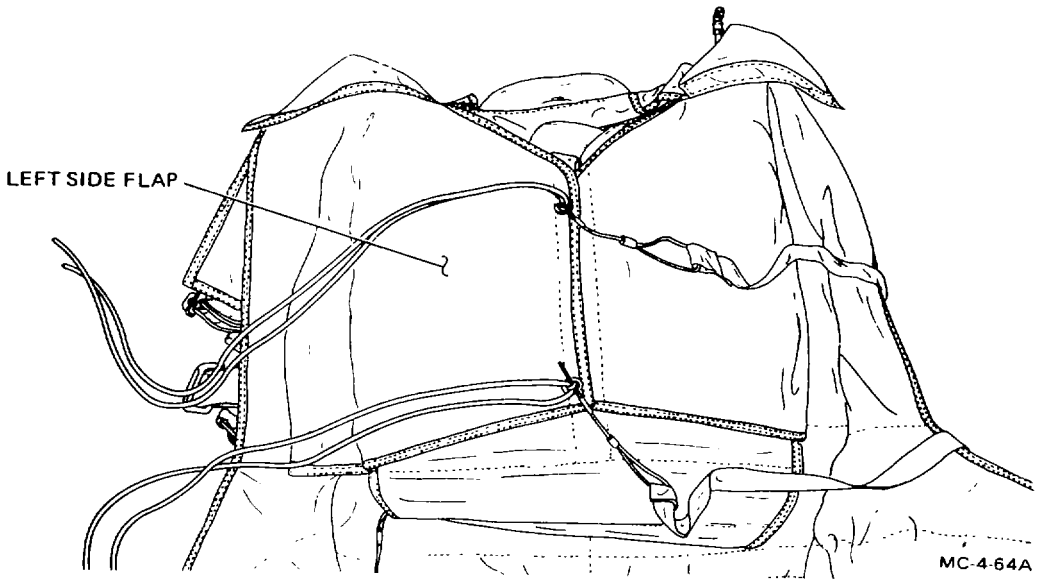


Figure 2-95. Closing Left Side Flap.

(15) Rigger check number 6.

(16) Ensure reserve ripcord is through ripcord housing and insert ripcord grip in ripcord pocket. Insert reserve ripcord cable through reserve static line pull ring, then through reserve static line guide ring. Mate static line and container hook and pile tapes (figure 2-96).

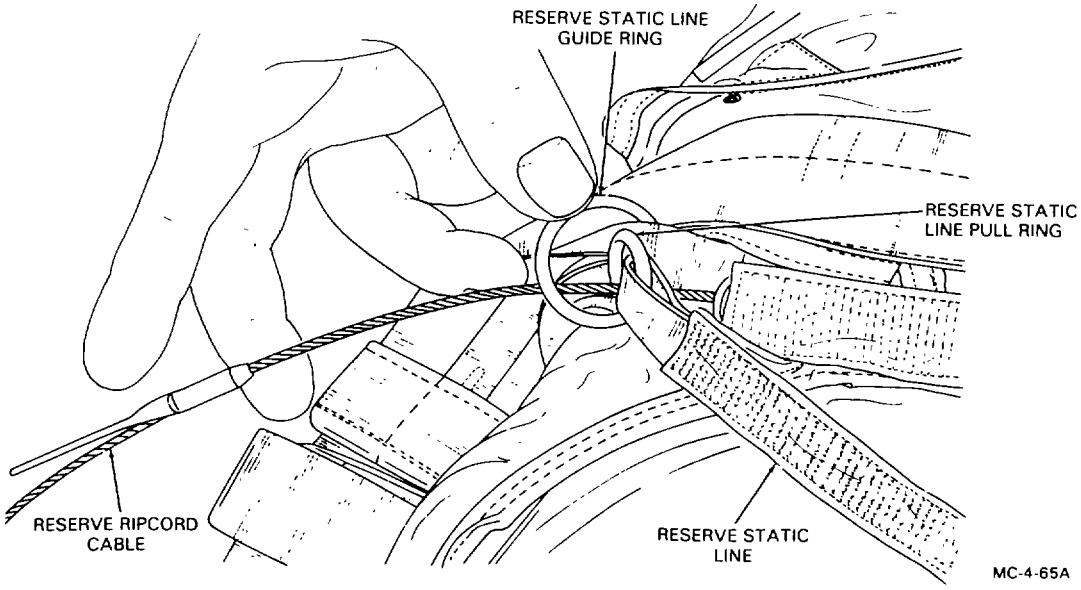


Figure 2-96. Reserve Ripcord Cable Installed.

(17) Route pull-up cords through grommets in top flap, pull up closing loops, and reinsert temporary locking pins (figure 2-97).

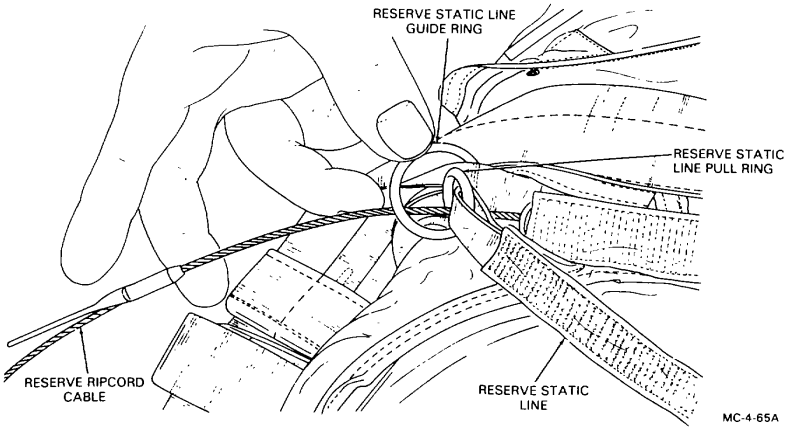


Figure 2-97. Closing Top Flap.

2-17. Packing Procedures - Reserve Parachute (CONT).

(18) Remove top temporary locking pin and insert top ripcord pin into closing loop. Remove bottom temporary locking pin and insert bottom ripcord pin into closing loop. Center straight portion of ripcord pins in dosing loops and ensure that shoulders of pins remain outside grommets. Remove push-up cords by routing underneath ripcord pins (figure 2-98).

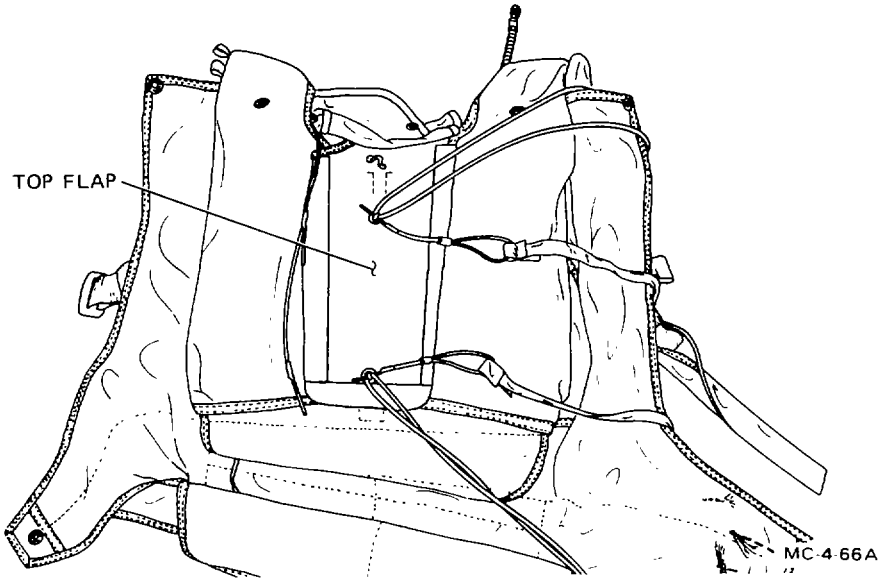


Figure 2-98. Ripcord Pins in Closing Loops

NOTE

The following ripcord pull tests are performed on all MC-4 systems on a one time-only basis.

(19) Place parachute in test fixture or anthropometric device (torso) simulating the 5 to 95 percent man or a live subject. The device shall hold parachute securely in a position with the mouth of ripcord pocket facing down (along vertical axis).

(20) Secure ripcord cable by hand to prevent ripcord pin withdrawal when weight is applied.

(21) A 20-pound weight attached to the center of ripcord grip (care shall be exercised not to impose an impact load) shall readily withdraw ripcord grip from pocket. When ripcord grip has been removed from pocket, carefully remove 20-pound weight.

(22) Rotate parachute so that open end of ripcord housing faces down with ripcord cable in a vertical position.

(23) Attach a 27-pound weight to ripcord grip. Remove safety (your hand) securing the ripcord cable. The weight shall readily activate the parachute by withdrawing ripcord pins from locking loops.

(24) After inspection has been completed and the specified requirements are met, make initial entries in Army Parachute Log Record.

NOTE

Parachute systems that do not pass the inspection will be removed from service.

(25) Re-close container in accordance with steps (10) through (18).

(26) Remove Army Parachute Log Record from log record pocket on underside of ripcord pin protector flap and make required entries. Reinsert log record into log record pocket. Close ripcord pin protector flap. Dress the container (figure 2-99).

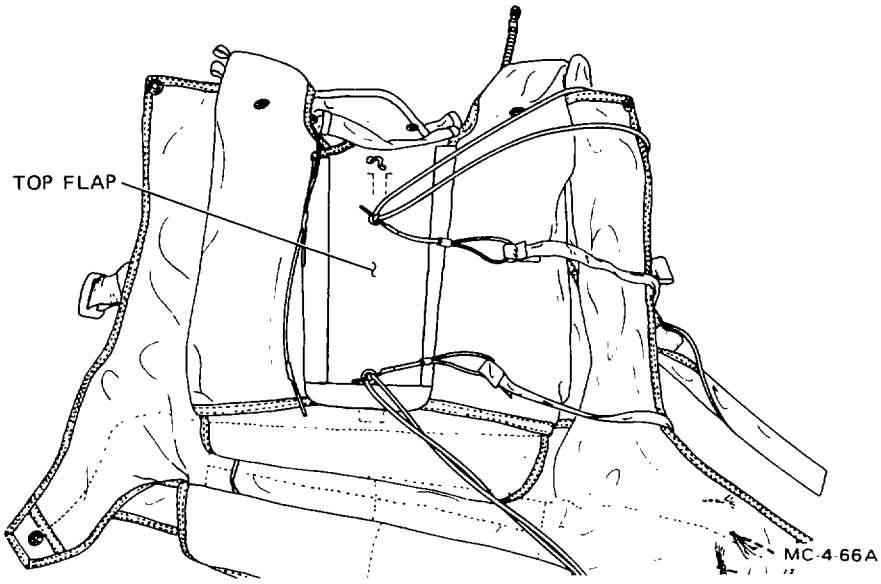


Figure 2-99. Container Closed and Dressed.

(27) Rigger check number 7

2-18. Packing Procedures - Main Parachute.

This task covers:

a. Pack-In-Process Inspection
b. Attaching Risers to Harness
c. Layout and Line Check
d. Setting Deployment Brakes
e. Flaking Canopy
f. Folding Canopy
g. Stowing Canopy in Deployment Bag
h. Stowing Suspension Lines
i. Closing Container
j. Installing Ripcord Release

Tools:

Pins, Temporary Locking, Item 18, Appendix B

Materials/Parts

Cord, Cotton, Size 24/4, Item 6, Appendix D

Cord, Nylon, MIL-C-5040, Item 8, Appendix D

Personnel Required:

MOS/43E(1P) Parachute Rigger

Equipment Condition:

Stretch canopy and suspension lines full length in packing area. Position container at risers with main and reserve compartments up and reserve compartment facing toward canopy and risers.

WARNING

Failure to detect areas of damage during packing, or failure to comply with the following procedure, may result in malfunction of the parachute and injury or loss of life to personnel.

NOTE

The parachute shall be repacked every 120 days.

a. The pack-in-process inspection shall be conducted by a rigger supervisor, other than the packer, during the applicable packing process. This inspection is required to ensure that only authorized packing procedures are used. The prescribed intervals to conduct the pack-in-process inspection are as follows:

(1) *Proper layout.*

(a) Line check complete
(b) Deployment brakes set

(c) Main canopy release ripcord installed
(d) Risers attached to harness

(e) Canopy flaking complete

(2) *Slider up.*

(a) Canopy S-folding complete

(b) Tail folding complete

(c) Slider pulled up and positioned

(3) *Four locking stows.*

(a) Canopy folding complete

(b) Deployment bag locking stows complete

(4) *Suspension lines stowed.*

(5) *Packing completed.*

(a) Container closed (bottom, left, right, top)

(b) All packing aids removed

(c) Log record book filled out

(6) *Automatic ripcord release installed.*

b. Attach risers to harness as follows:

(1) Insert main and reserve ripcord cables through respective housings. Insert ripcord grips into ripcord pockets. Insert single point release cable through cable housings. Mate hook tape on grip with pile tape on harness. Attach reserve static line to container with reserve static line pull ring facing top of container. Pass reserve ripcord cable through reserve static line pull ring and then through reserve static line guide ring (figure 2-100).

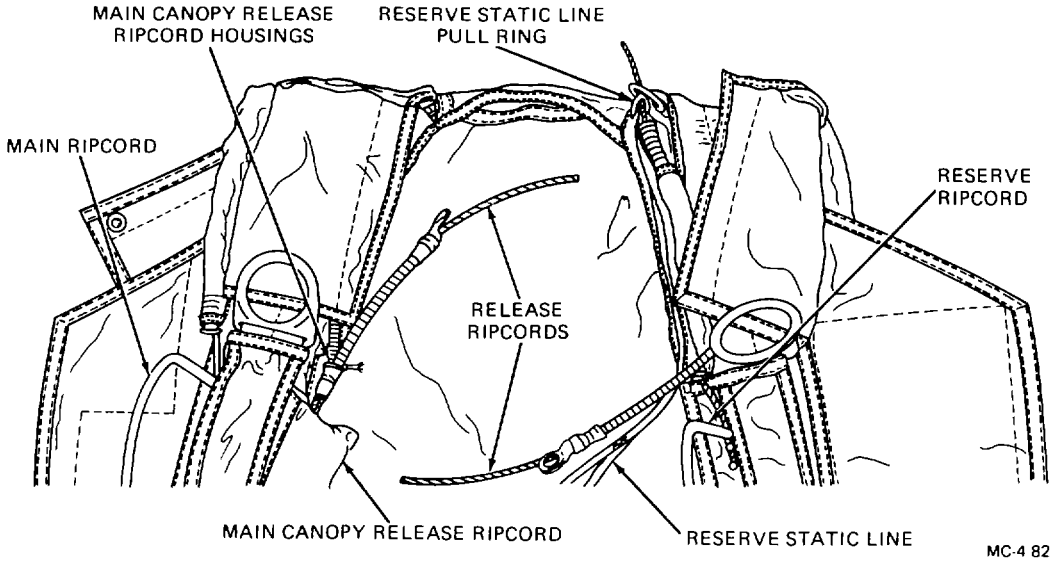


Figure 2-100. Ripcord Cables and Static Line Installed.

2-18. Packing Procedures - Main Parachute (CONT).

(2) Position right riser on harness above main ripcord and pass large ring on riser through large harness ring (figure 2-101).

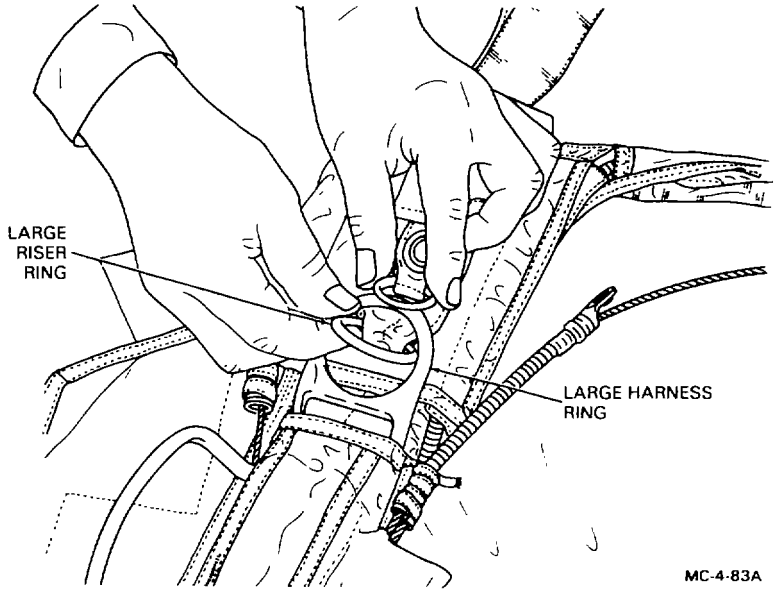


Figure 2-101. Large Riser Ring through Large Harness Ring.

(3) Pass small riser ring through large riser ring. Position small riser ring over riser grommet (figure 2-102).

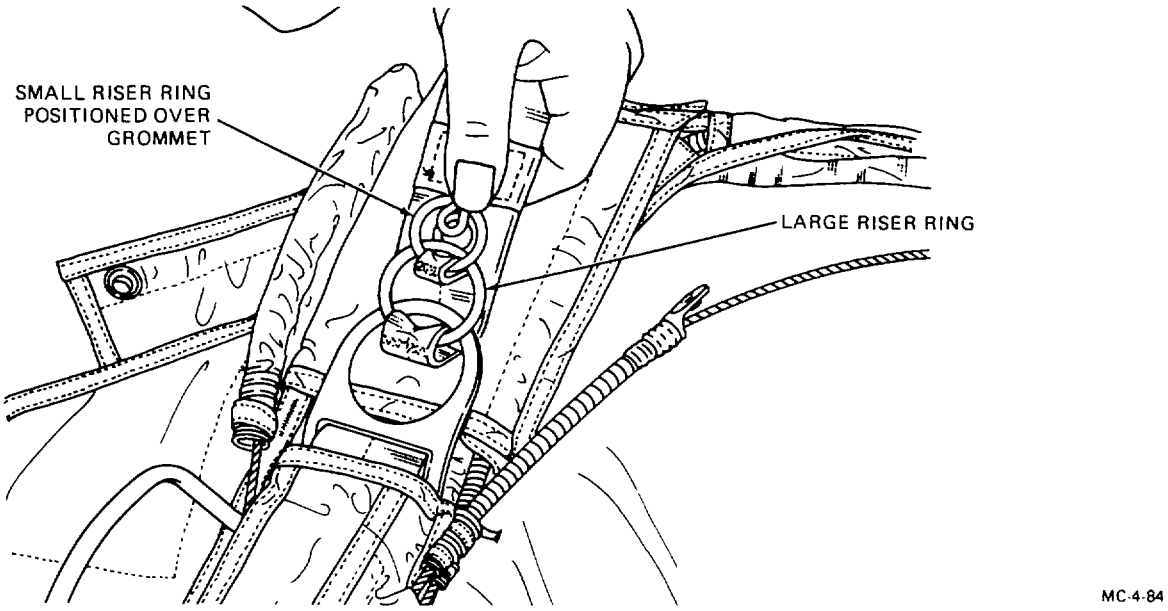


Figure 2-102. Small Riser Ring through Large Riser Ring.

(4) Pass locking loop over small riser ring and down through riser grommet. Ensure riser locking loop is not twisted. Insert locking loop through eye on end of cable housing (figure 2-103).

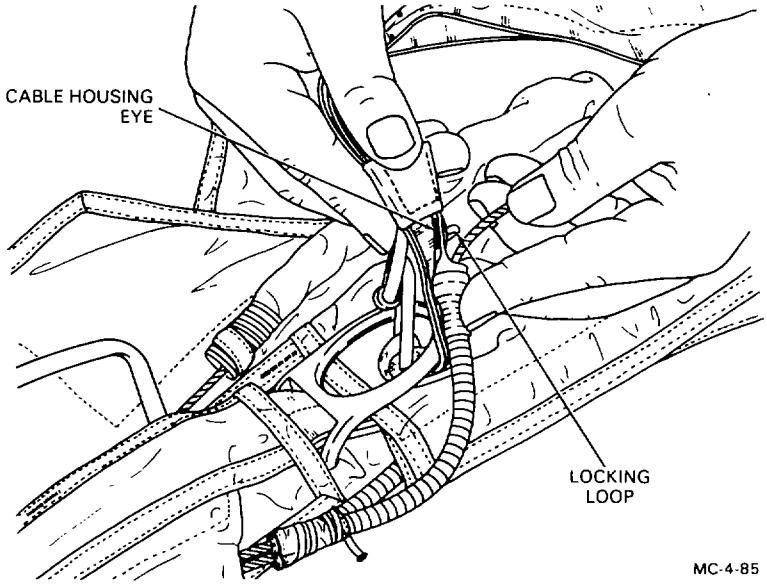


Figure 2-103. Locking Loop through Cable Housing Eye.

(5) Pass main canopy release cable through locking loop and insert main canopy release cable in riser stowage channel (figure 2-104).

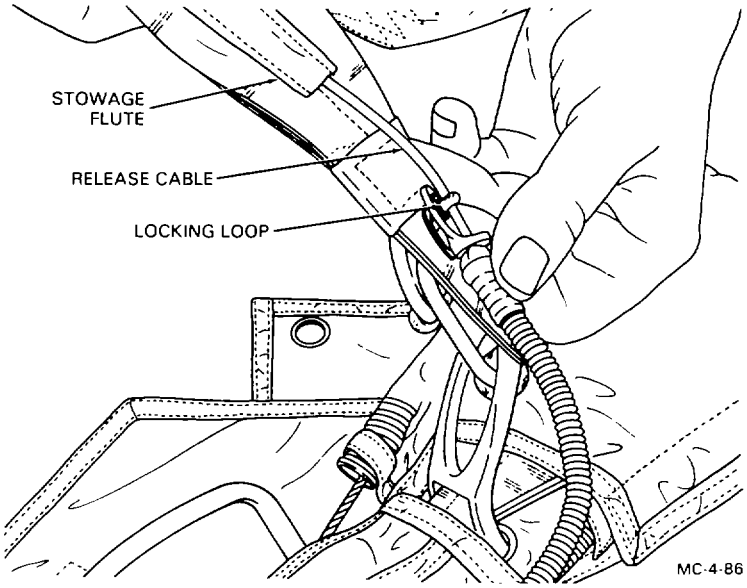


Figure 2-104. Release Cable in Riser Stowage Channel.

2-18. Packing Procedures - Main Parachute (CONT).

(6) Attach left riser to harness in same manner as in steps (2) through (5).

(7) Connect reserve static line ring to reserve static line release shackle (figure 2-105).

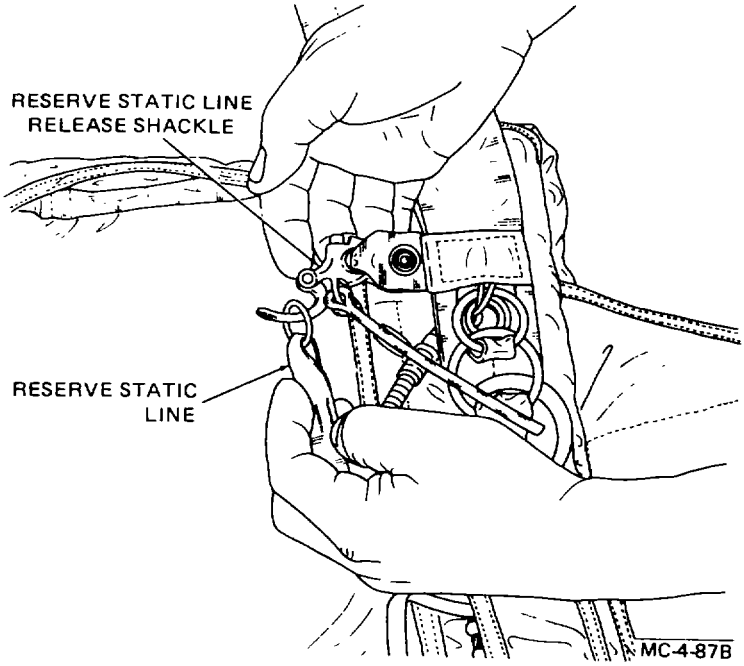


Figure 2-105. Reserve Static Line Ring Connected to Release Shackle.

(8) Mate snap on reserve static line release lanyard to riser snap (figure 2-106).

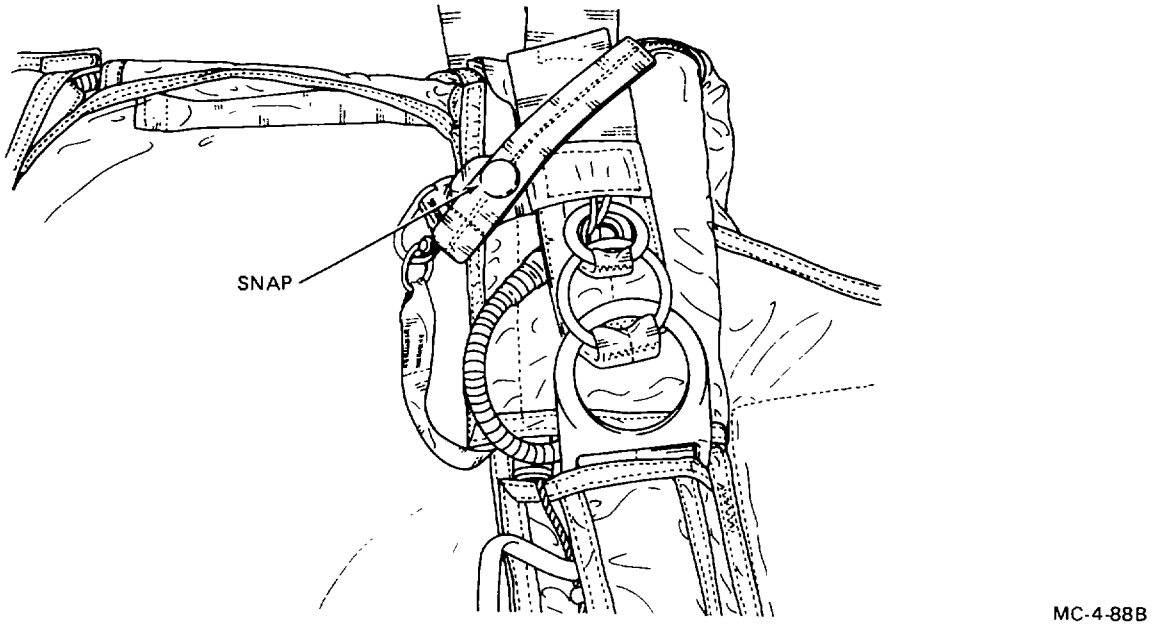


Figure 2-106. Release Lanyard Mated to Riser Snap.

c. Perform layout and line check as follows:

(1) Lay out parachute on a clean dry surface with canopy on its left side. Leading edge (nose) will be on right when viewed from riser end. Stretch lines full length.

(2) Grasp high points of each cell and flip canopy toward trailing edge. Canopy shall lie flat with trailing edge lines on left side when viewed from riser end (figure 2-107).

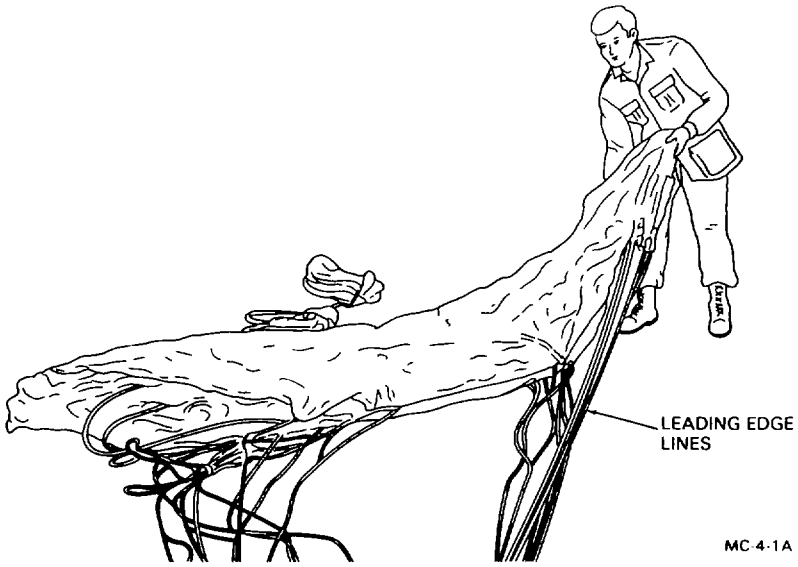


Figure 2-107. Layout of Canopy.

(3) Remove any twists, turns, and tangles between suspension line groups.

2-18. Packing Procedures - Main Parachute (CONT).

(4) Raise lines 8A and 8B a sufficient height to see if line 8A runs free from canopy to outside of right front riser connector link. Line 1A should run free to outside of left front riser connector link (figure 2-108).

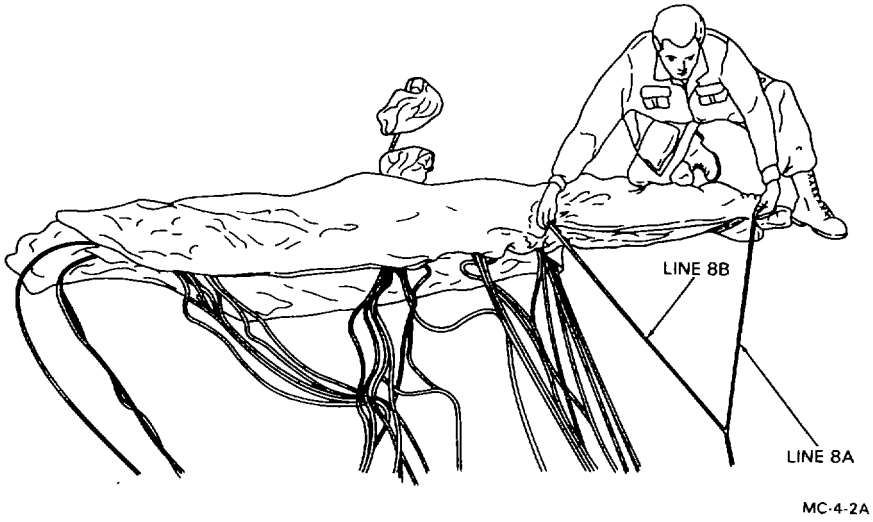


Figure 2-108. Tracing A Lines.

(5) Raise lines 8C and 8D a sufficient height to see if line 8C runs free from canopy to outside of right rear connector link. Line 1C should run free to outside of left rear connector link (figure 2-109).

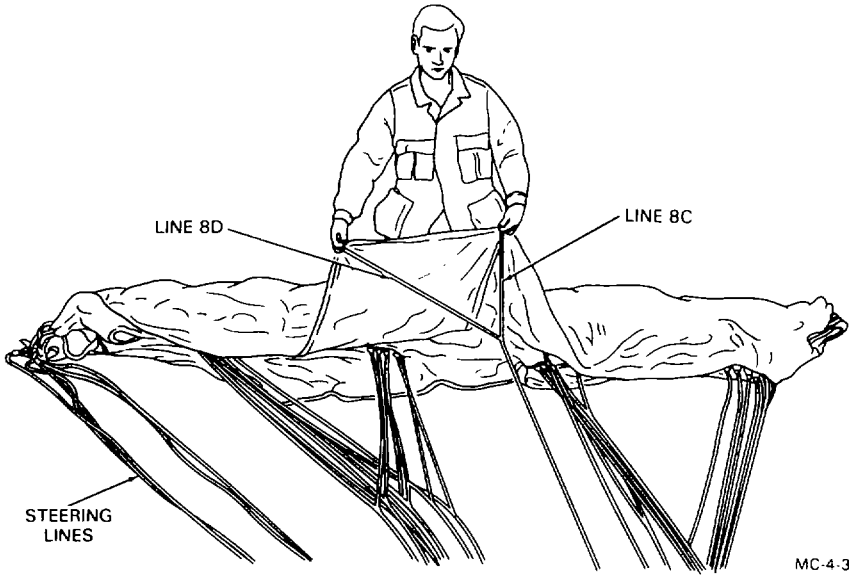


Figure 2-109. Tracing C Lines.

(6) Raise steering lines a sufficient height to ensure they run free from the A, B. C, and D lines (figure 2-110).

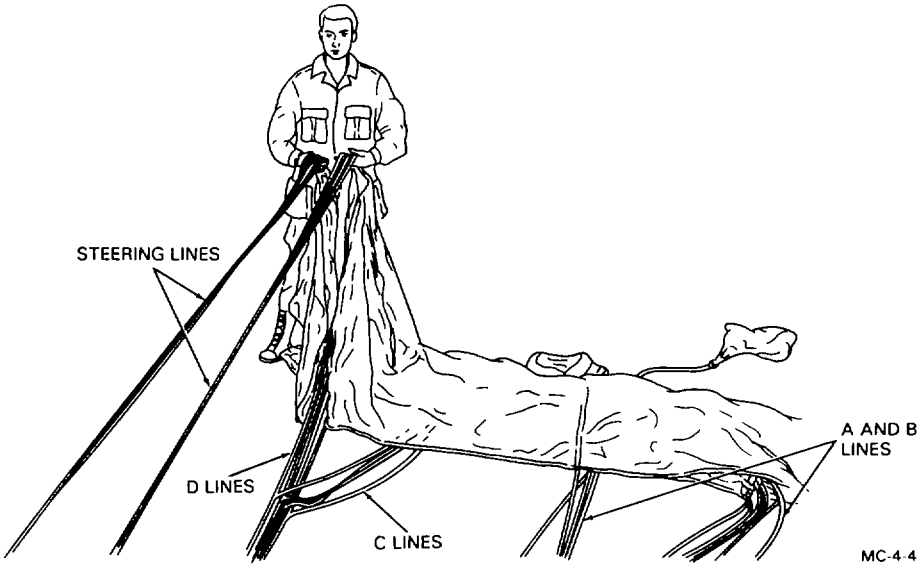


Figure 2-110. Tracing Steering Lines.

(7) Ensure steering lines pass through proper slider grommets and then through proper steering line guide rings (figure 2-111).

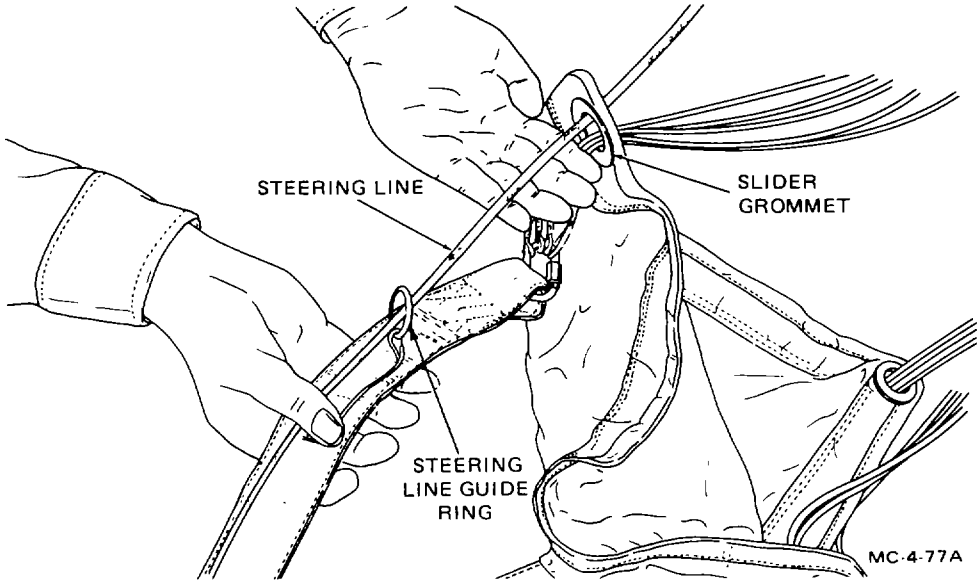


Figure 2-111. Tracing Steering Lines through Slider and Guide Rings.

2-18. Packing Procedures - Main Parachute (CONT).

d. Set deployment brakes as follows:

(1) Open excess steering line keeper. Pull steering line down until finger-trapped loop is through steering line guide ring (figure 2-112).

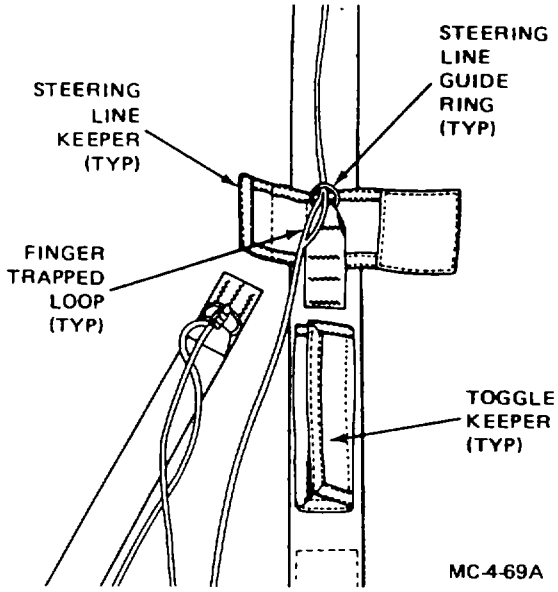


Figure 2-112. Setting Deployment Brakes.

(2) Insert top of steering toggle through loop 1 inch (figure 2-113).

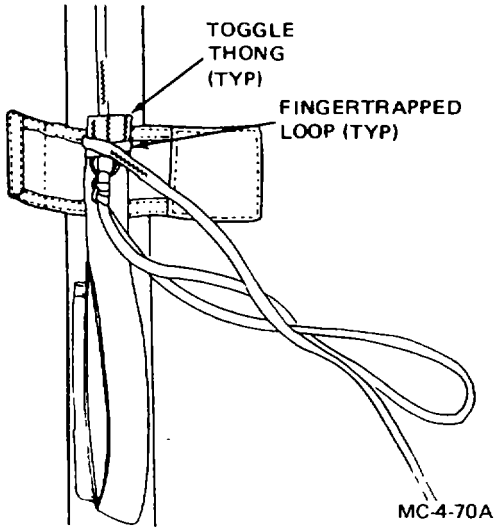


Figure 2-113. Steering Toggle Inserted in Finger-Trapped Loop.

(3) S-fold each steering line and neatly stow excess line alongside each ring, ensuring that no folded loops extend above or below excess steering line keepers. Ensure that excess line is to the right (pile) side of the keeper. Close excess steering line keepers (figure 2-114).

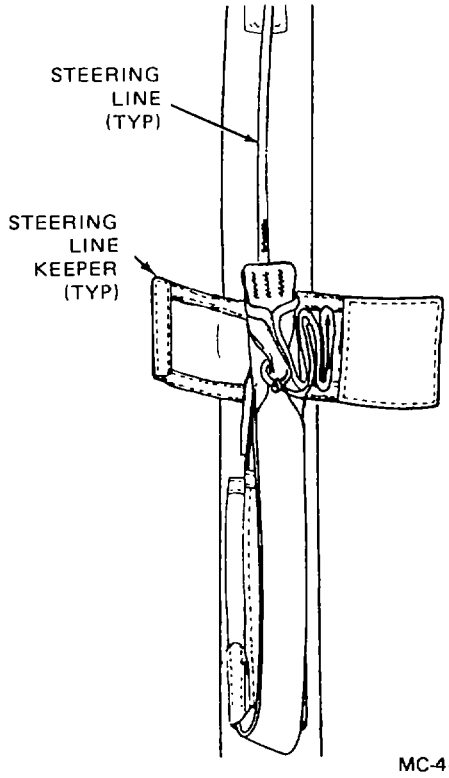


Figure 2-114. Stowing Excess Steering Line.

(4) Close toggle keepers, enclosing only bottom portion of each toggle (figure 2-115).

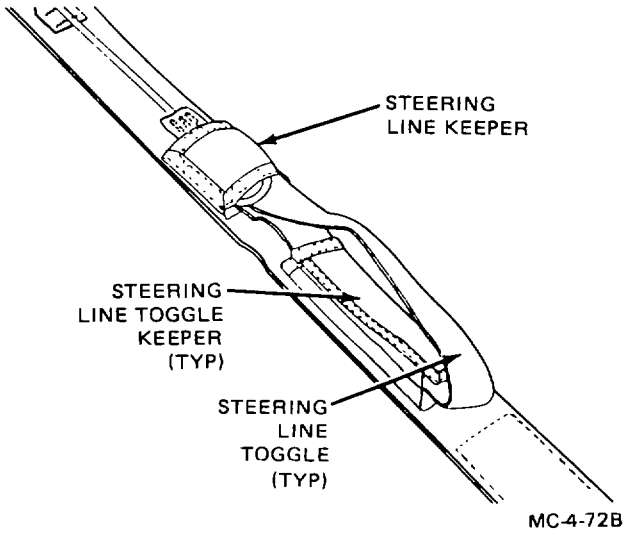


Figure 2-115. Stowing Steering Line Toggles.

2-18. Packing Procedures - Main Parachute (CONT).

NOTE

Steps (5) through (12) provide installation instructions for optional toggle extenders.

(5) Thread attaching loop end of toggle extender down through keeper attaching loop (figure 2-116).

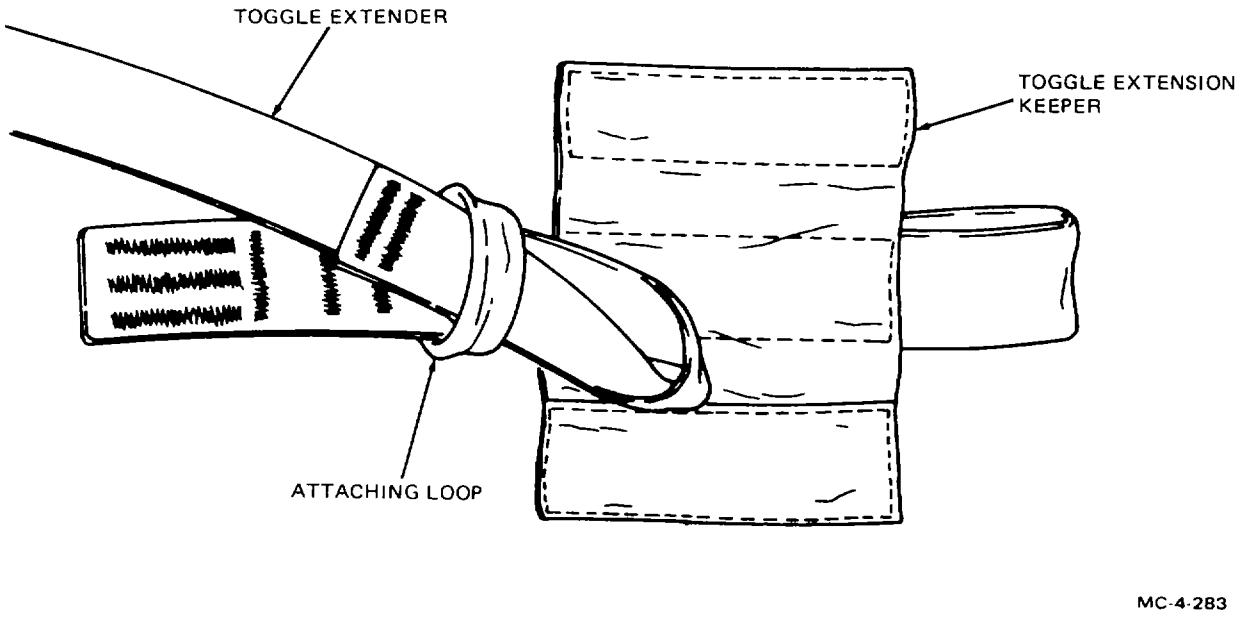


Figure 2-116. Toggle Extender through Toggle Keeper Loop.

(6) Thread hand loop end of toggle extender through toggle extender attaching loop and pull tight, forming a lark's head knot. Ensure a smooth, flat knot is achieved (figure 2-117).

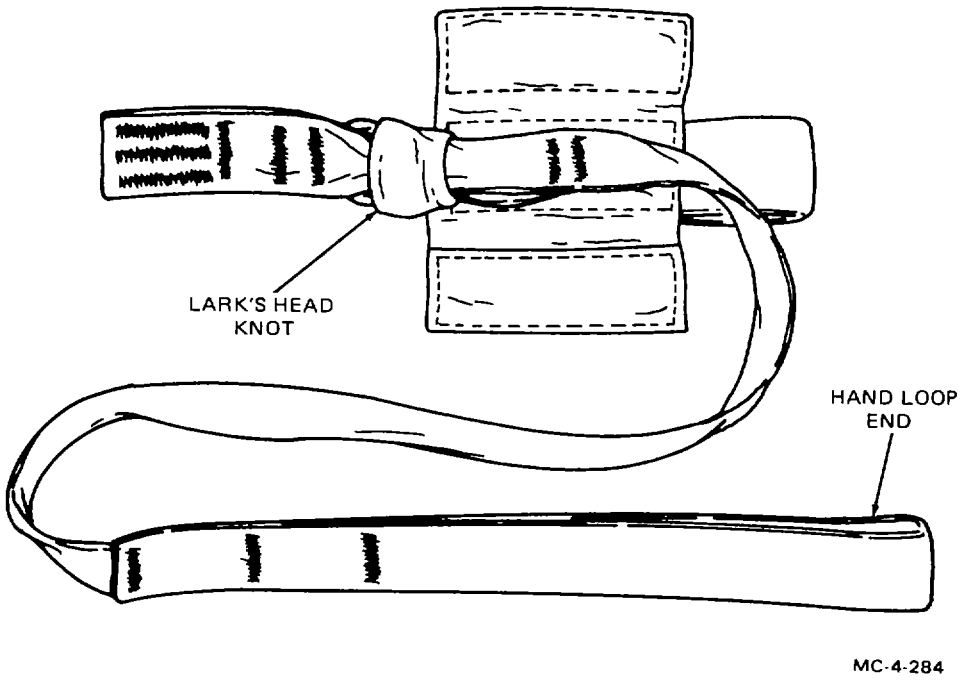


Figure 2-117. Toggle Extender Attached to Toggle Keeper.

(7) Ensuring that there are not twists, fold hand loop end of toggle extender towards locking end of toggle, aligning bartack number 1 with bottom edge of toggle keeper (figure 2-118).

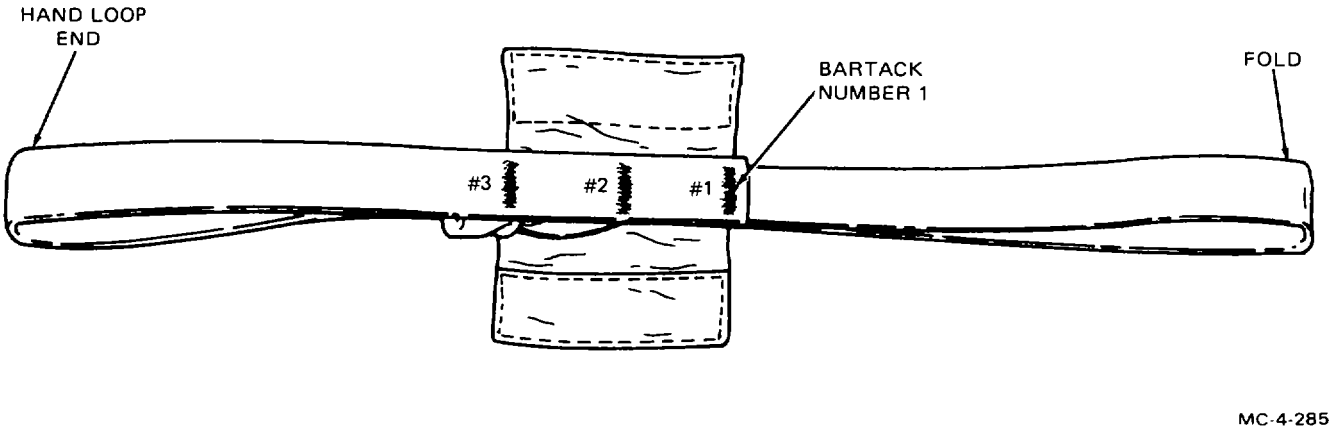


Figure 2-118. Toggle Extender, First Fold.

2-18. Packing Procedures - Main Parachute (CONT).

(8) Make another fold by folding loop in half towards bartack number 1 (figure 2-119).

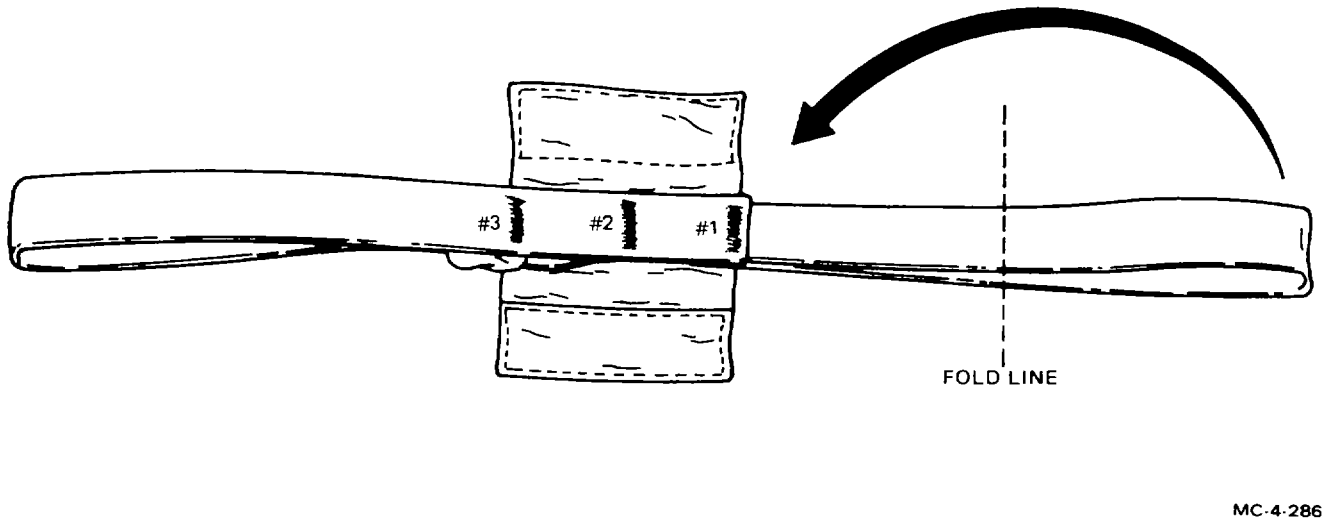


Figure 2-119. Toggle Extender, Second Fold.

(9) Make third fold towards bartack number 3, ensuring fold line is even with bottom edge of toggle keeper (figure 2-120).

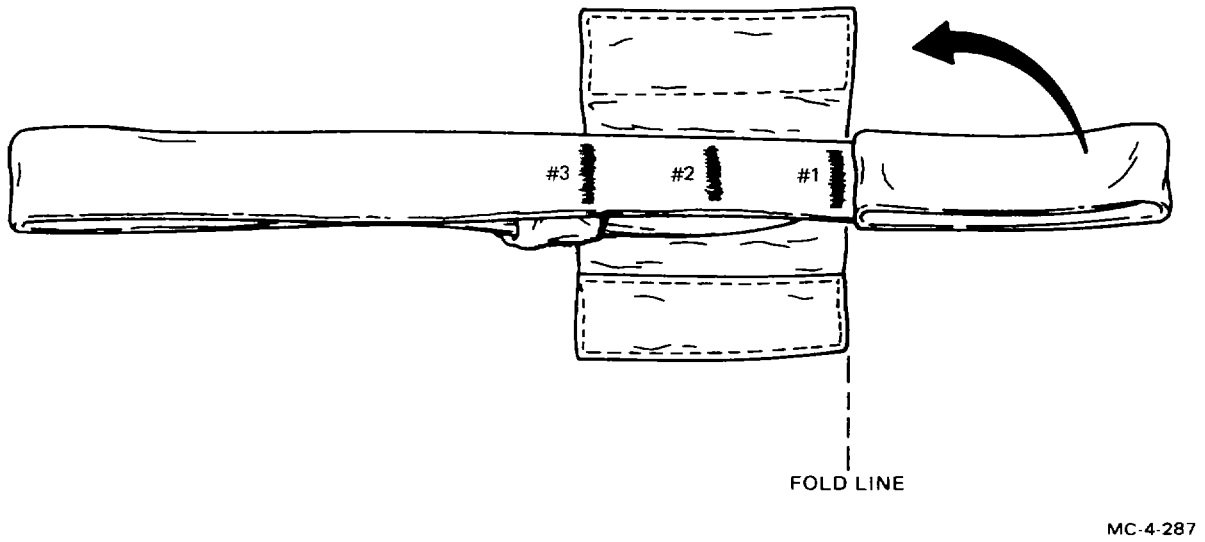


Figure 2-120. Toggle Extender, Third Fold.

(10) Fold hand loop end of toggle extender on top of previous folds (figure 2-121).

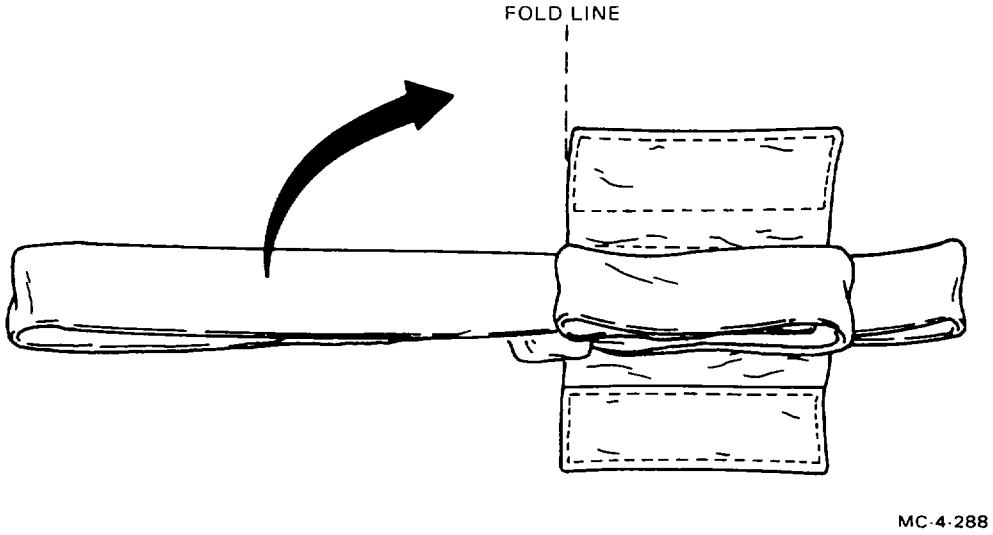


Figure 2-121. Toggle Extender, Final Fold.

(11) Ensure that all folds are tight and without twists. Close hook and pile fastener tapes of toggle extender keeper. Tack top and bottom of keeper closed with one turn cotton 24/4-cord, double. Tack through both thicknesses of keeper and one layer of the folded toggle extender (figure 2-122).

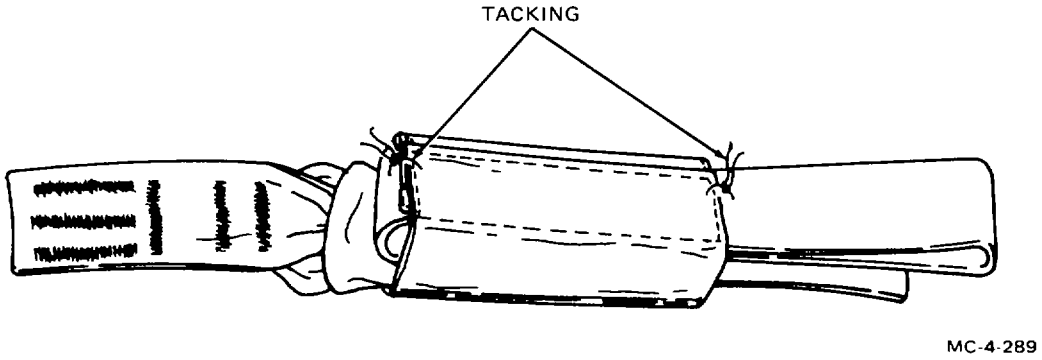


Figure 2-122. Toggle Extender Rigged and Tacked.

(12) Install toggle extenders in the same manner as steering toggles are installed in steps (1) through (4).

2-18. Packing Procedures - Main Parachute (CONT).

e. Flake canopy as follows:

(1) Grasp tops of cells at high points. Throw canopy toward risers (figure 2-123).

Figure 2-123. Canopy Thrown Toward Risers.

(2) Starting with high points on cell 1, pull out seam and smooth cell from leading edge to trailing edge (figure 2-124).

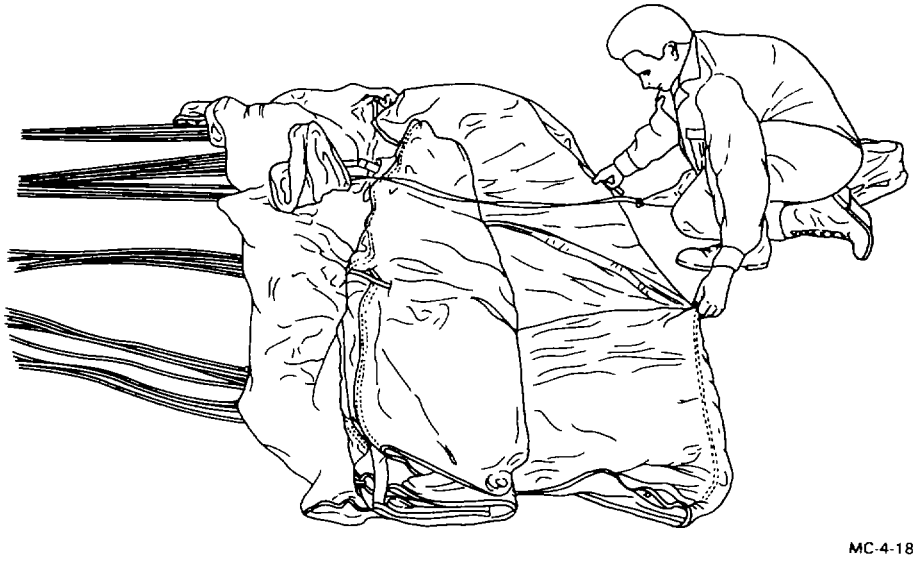


Figure 2-124. Flaking Cell 1.

(3) Continue to flake canopy by pulling out seams, one by one, on each remaining cell. Smooth each cell until all cells are flaked and all line groups are clearly separated (figure 2-125).

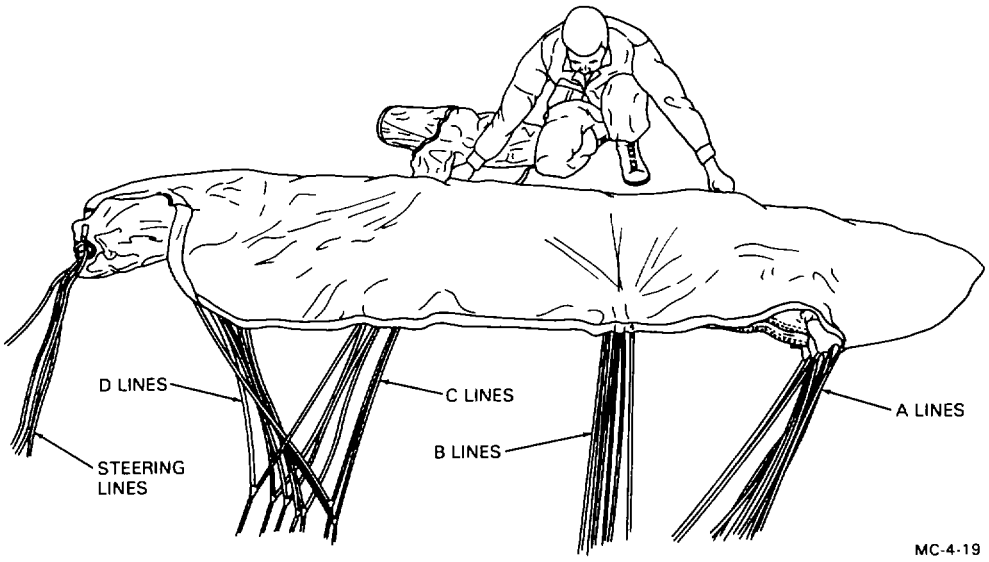


Figure 2-125. Cells Flaked and Line Groups Separated.

f. Fold canopy as follows:

(1) Fold leading edge over canopy so cell openings are even with A lines. Keep lines taut (figure 2-126).

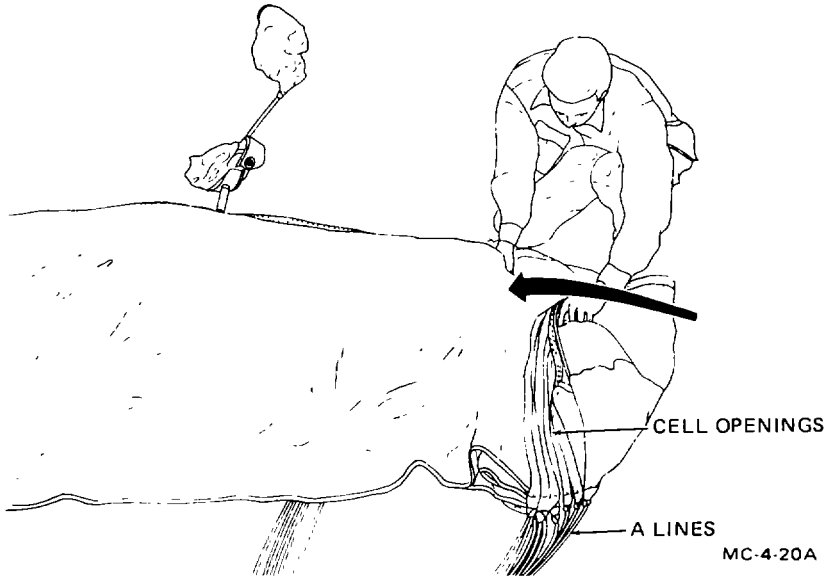


Figure 2-126. Leading Edge Folded Over Canopy.

2-18. Packing Procedures - Main Parachute (CONT).

(2) Grasp high point of cell 1 and extend outwards, smoothing out cell (figure 2-127).

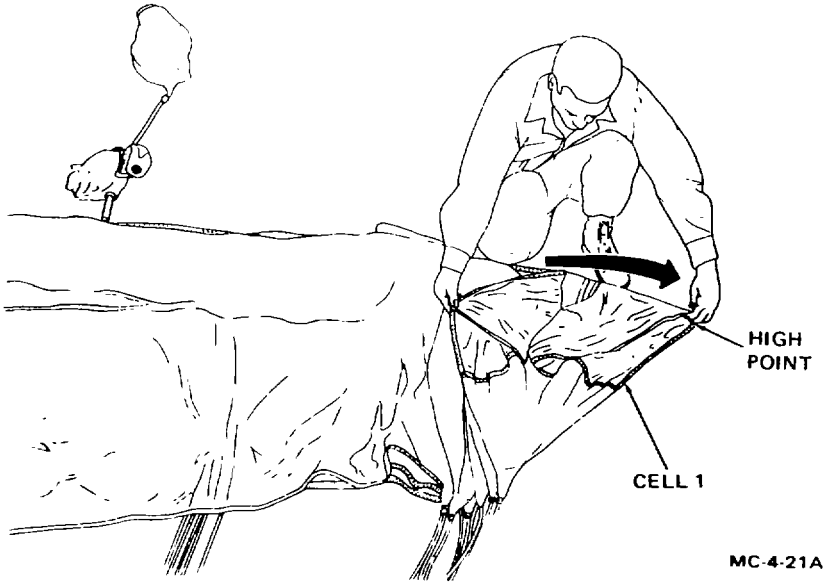


Figure 2-127. Extending Cell I Outward.

(3) Continue to grasp high point of each cell and extend outward, smoothing out each cell and aligning a cell openings (figure 2-128).

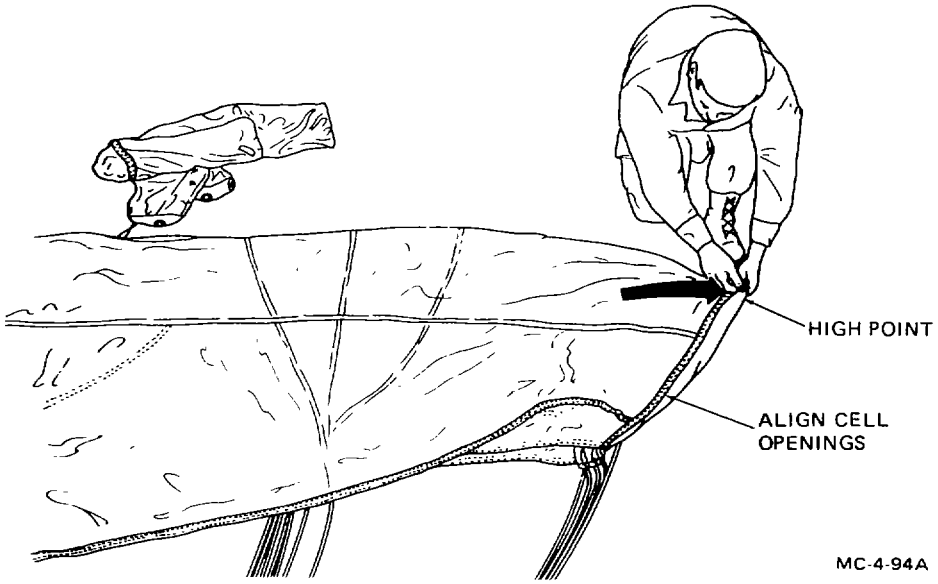


Figure 2-128. Cells Extended and Aligned.

(4) Rigger check number 1.

(5) Grasp all cells at nose of canopy and form a fold line two-thirds of the way back between A and B lines. Keep lines taut (figure 2-129).

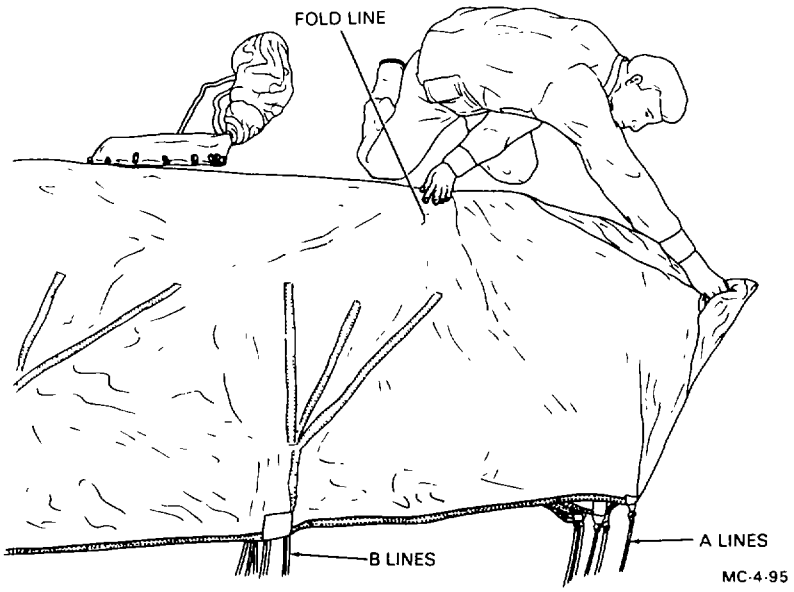


Figure 2-129. Forming First Canopy Fold.

(6) Rotate nose of canopy over on top of remainder of canopy (figure 2-130).

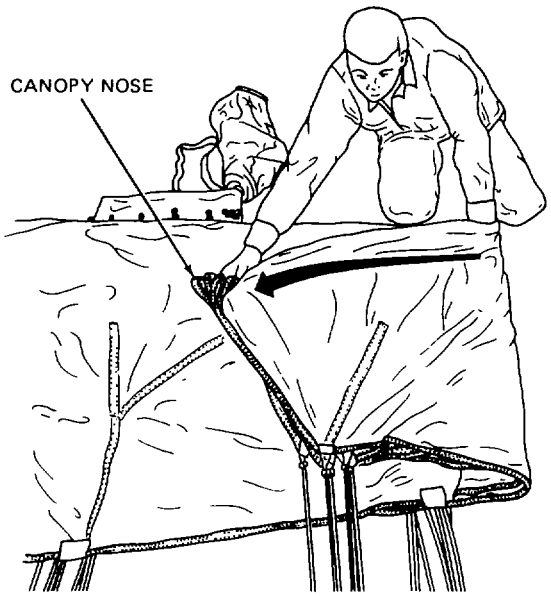


Figure 2-130. Rotating Nose of Canopy.

2-18. Packing Procedures - Main Parachute (CONT).

(7) Make another fold towards front of canopy so that A lines are directly in line with B lines. Keep lines taut (figure 2-131).

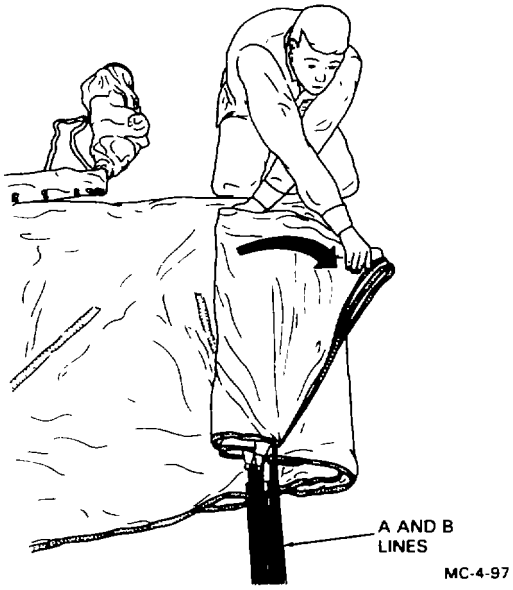


Figure 2-131. A Lines Folded onto B Lines.

(8) Fold nose of canopy back to edge of previous fold. Ensure A lines remain in line with B lines, and that lines are kept taut (figure 2-132).

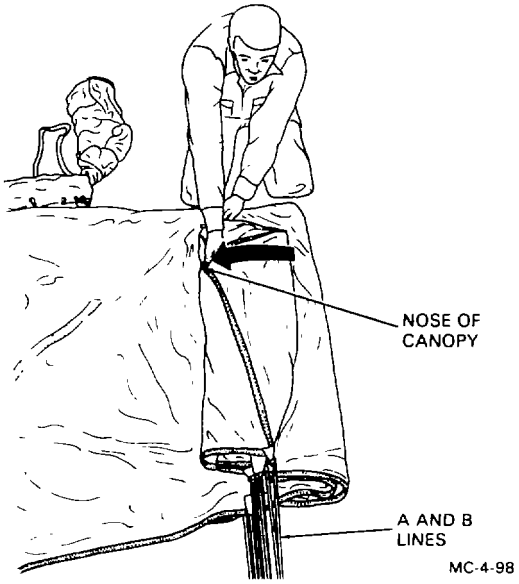


Figure 2-132. Canopy Nose Folding Completed.

(9) Holding all high points together in line with C line group, make an S-fold placing C line group on top of A and B line groups. Ensure high points are kept taut (figure 2-133).

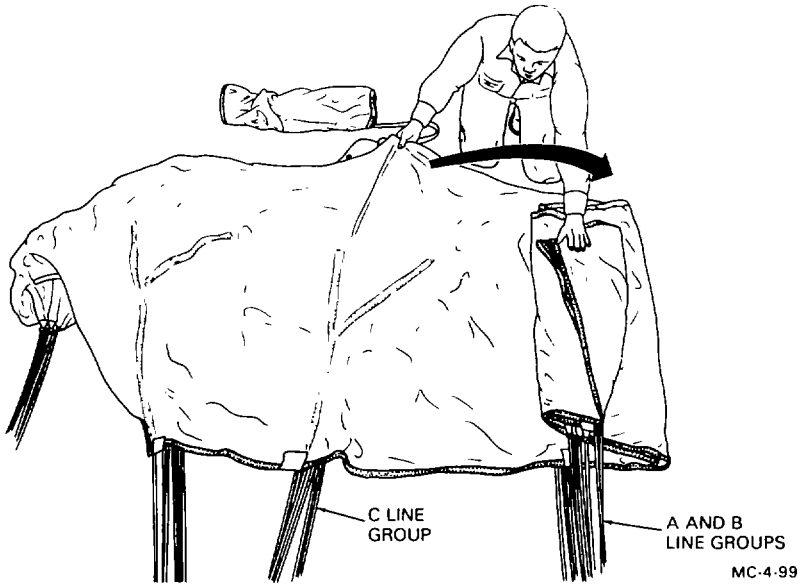


Figure 2-133. S-Folding C Lines onto A and B Lines.

(10) Holding all high points together in line with D line group, make an S-fold placing D line group on top of A, B, and C line groups. Ensure high points are kept taut (figure 2-134).

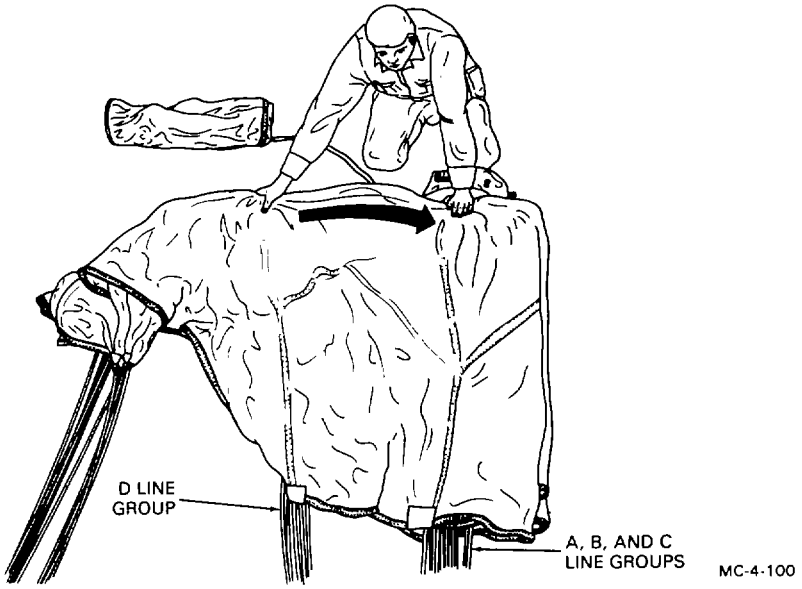


Figure 2-134. S-Folding D Lines onto A, B, and C Lines.

2-18. Packing Procedures - Main Parachute (CONT).

(11) With right hand on top of all folds, reach under and pull slack out of D lines (figure 2-135).

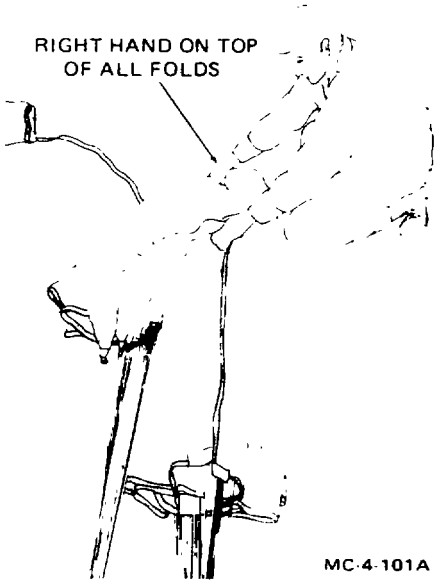


Figure 2-135. Pulling Slack from D Lines.

(12) Holding line groups together, pull out and straighten the four stabilizer panels on right side. The fourth stabilizer is inside the third stabilizer. Ensure tape is visible and no stabilizer material is in a line group (Figure 2-136).

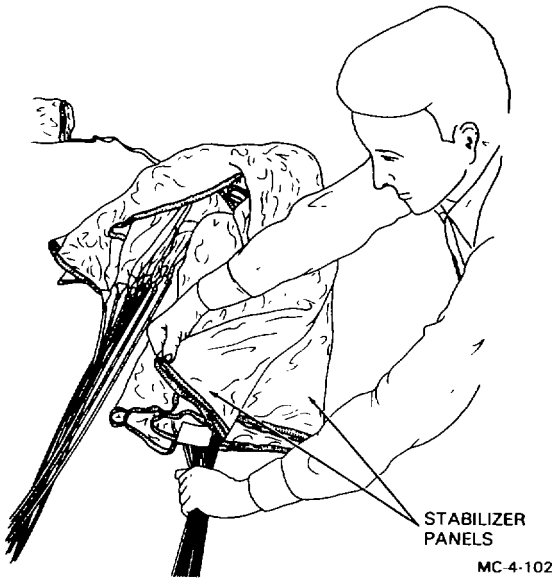


Figure 2-136. Clearing Right Stabilizer Panels.

(13) Clear the two stabilizer panels on left side in the same manner. Ensure tape is visible and no stabilizer material is in a line group (figure 2-137).

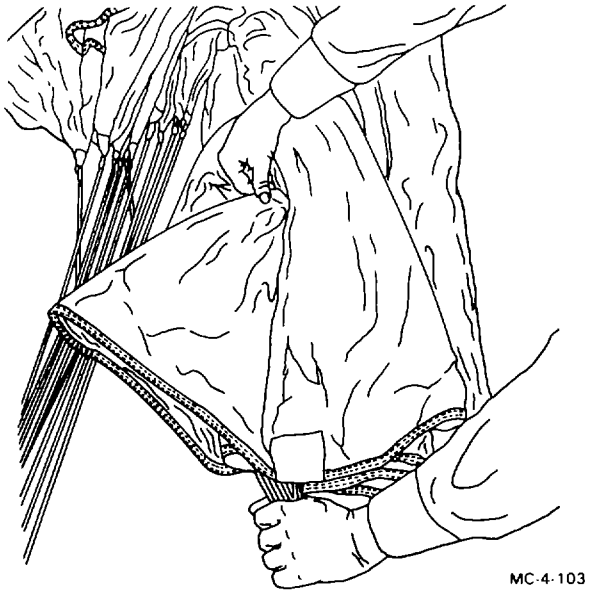


Figure 2-137. Clearing Left Stabilizer Panels.

(14) Grasp uppermost steering line and pull taut. Place steering line on top of line groups A, B, C, and D. Fold tip portion of stabilizer panel to the outside (figure 2-138).

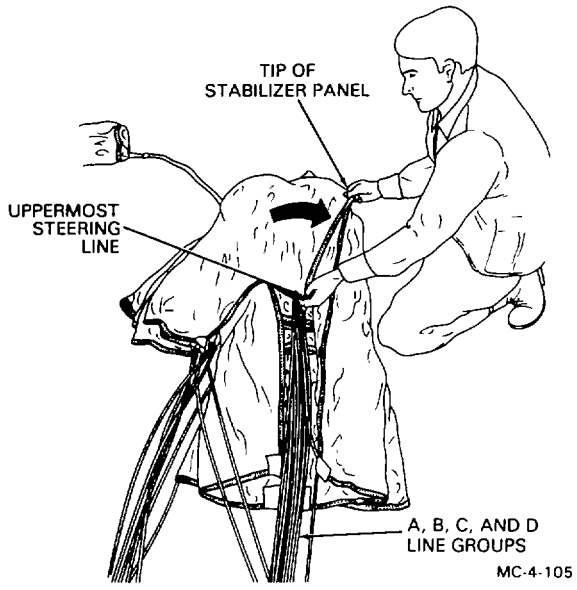


Figure 2-138. Folding Tip of Stabilizer Panel.

2-18. Packing Procedures - Main Parachute (CONT).

(15) Continue to place each steering line in this group on top of line groups A, B, C, and D. Fold the panel between each steering line to the outside. Keep lines taut (figure 2-139).

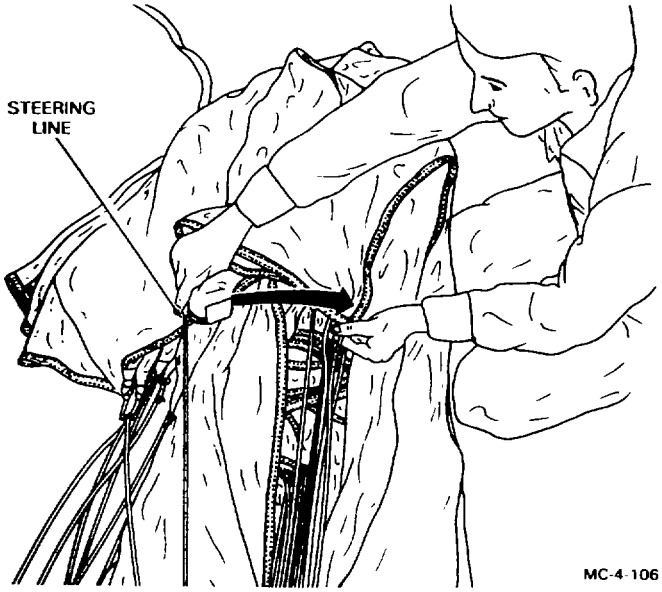


Figure 2-139. Folding Panels between Steering Lines.

(16) Continue folding center of tail by placing seams to the center of canopy and folding panels to the outside (figure 2-140).

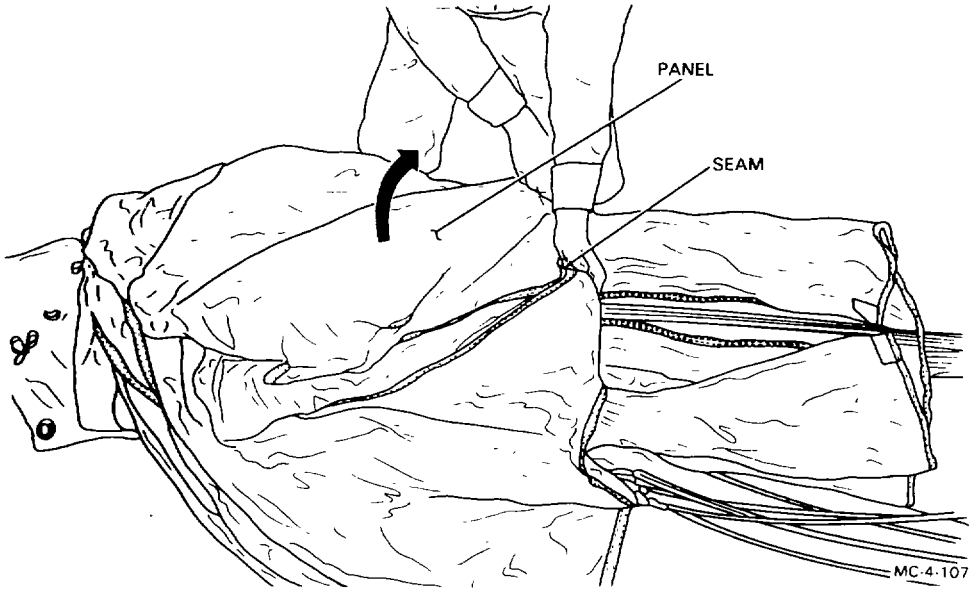


Figure 2-140. Folding Center of Tail.

(17) Place steering lines on other side of canopy on top of suspension lines and fold panels to the outside in the same manner as first steering line group. Keep steering lines taut at all times (figure 2-141).

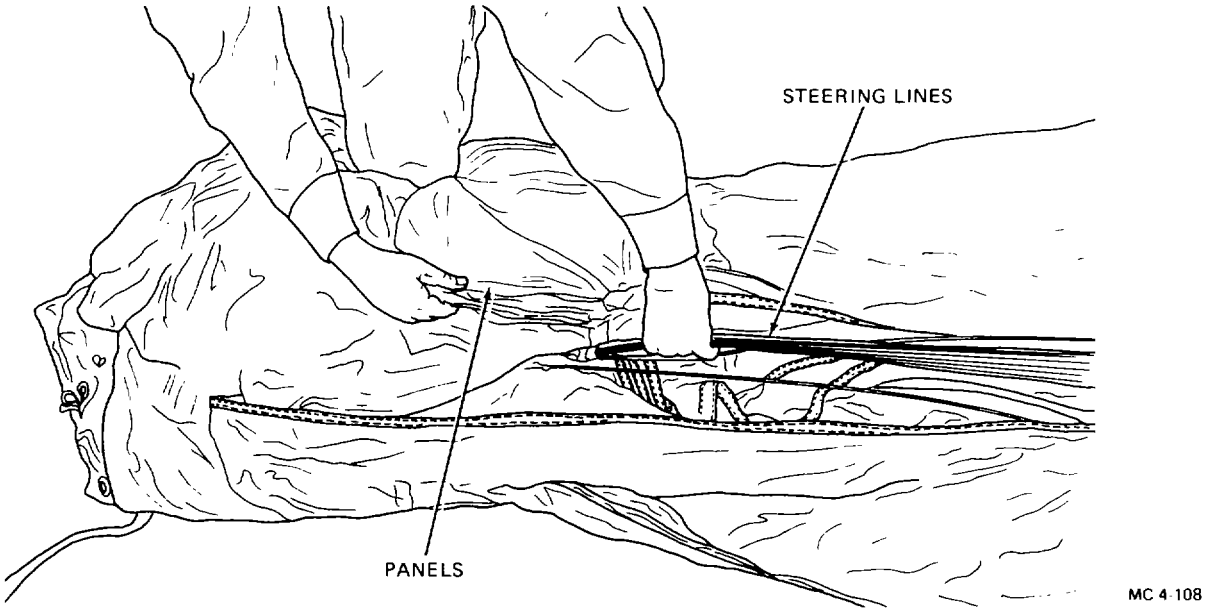


Figure 2-141. Folding Panels between Steering Lines.

(18) When opposite side is reached, pull stabilizer panel to the outside and pull slack out of steering lines (figure 2-142).

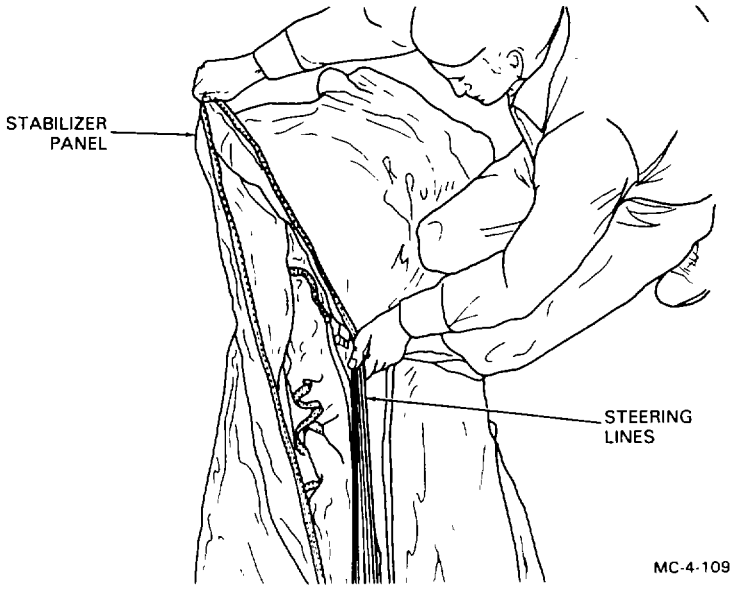


Figure 2-142. Folding Tip of Stabilizer Panel.

2-18. Packing Procedures - Main Parachute (CONT).

(19) Find center tape on trailing edge. This tape indicates center of canopy. Fold half of folded tail back (figure 2-143).

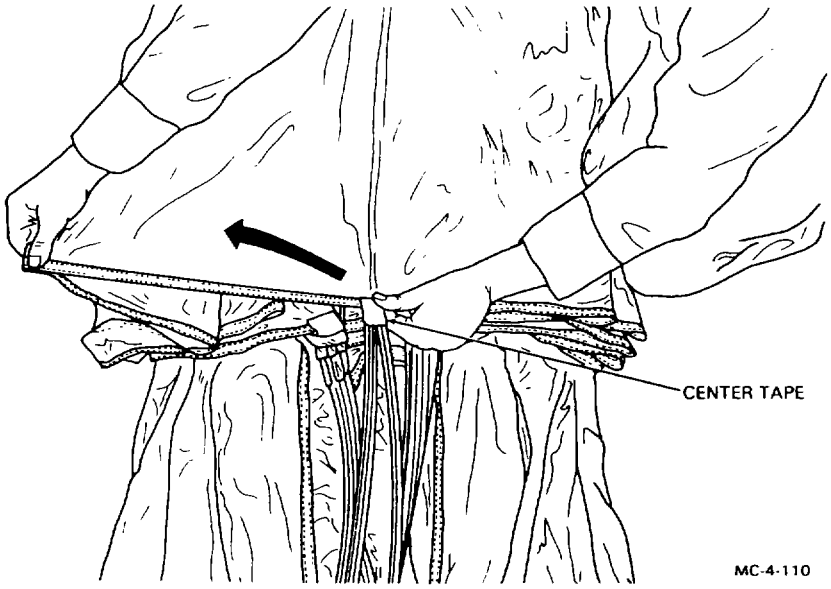


Figure 2-143. Folding Back Half of Folded Tail.

(20) Keep tape in center of canopy. Check that steering lines are taut and in center of canopy. Spread center of tail one full section left and right of center of tail (figure 2-144).

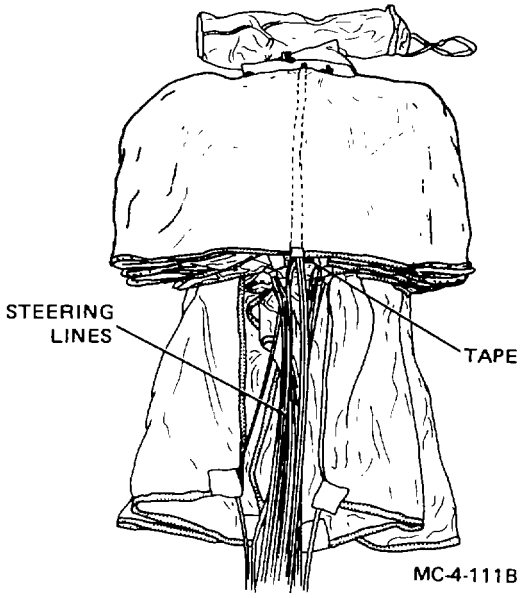


Figure 2-144. Steering Lines Taut in Center of Canopy.

(21) Fold center tail panel around canopy until it is the approximate width of deployment bag. Smooth out trapped air until canopy lies flat. Keep steering lines in the center (figure 2-145).

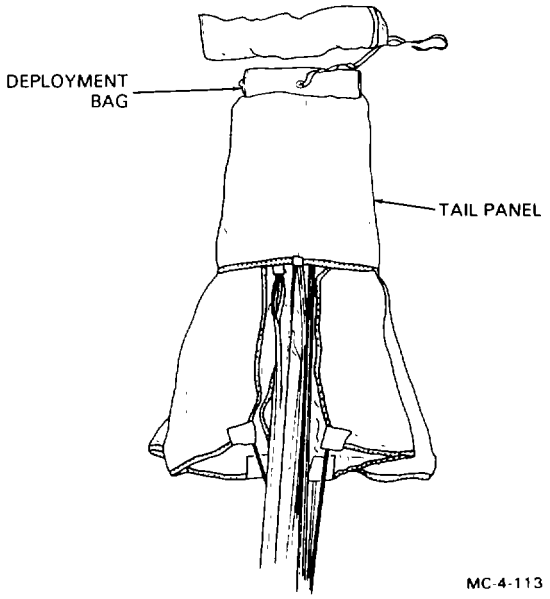


Figure 2-145. Tail Panel Wrapped Around Canopy.

(22) Place rear riser line groups to the outside of front riser line groups. Lay slider down flat between line groups, with reinforcement tapes facing up. Ensure each line group from the canopy enters slider grommet from the top and exits out underneath slider.

(23) Grasp slider by the top center, ensuring that reinforcement tapes appear on the top side toward the canopy. Bring slider up to the bottom of canopy, ensuring free movement along suspension lines (figure 2-146).

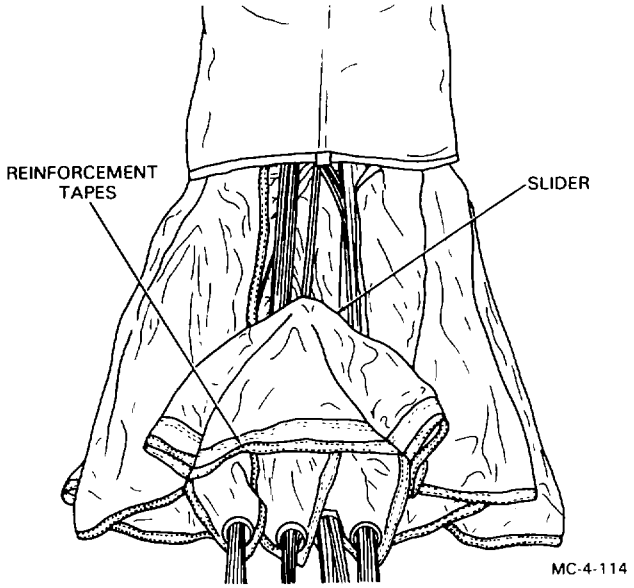


Figure 2-146. Slider Pulled Into Position.

(24) Rigger check number 2.

2-18. Packing Procedures - Main Parachute (CONT).

(25) Fold stabilizer panels, left then right, over slider (figure 2-147).

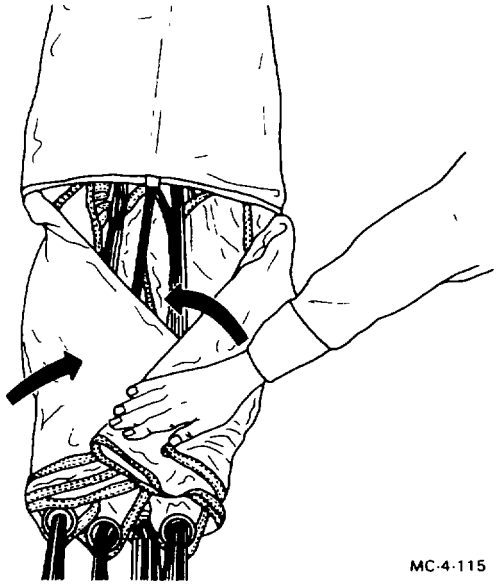


Figure 2-147. Folding Stabilizer Panels on Slider.

(26) Place hand on canopy approximately 10 inches from suspension lines. Grasp canopy at suspension lines in preparation for making first fold (figure 2-148).

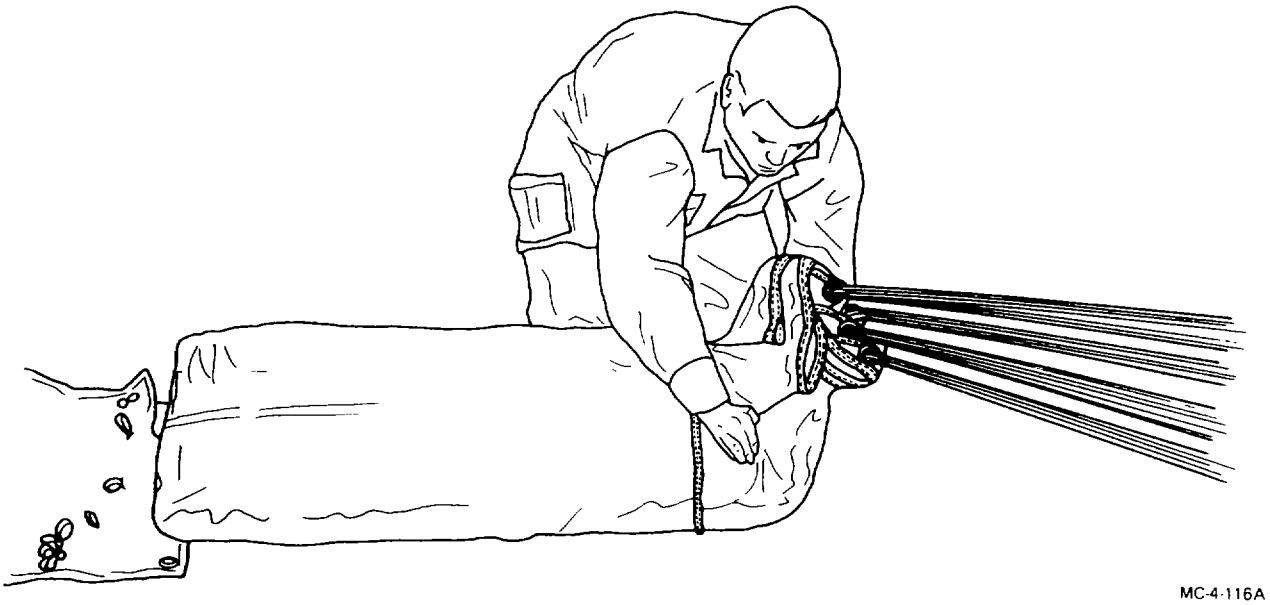


Figure 2-148. Preparing First Canopy Fold.

(27) S-fold suspension line end toward deployment bag end. Maintain an approximate 10-inch fold (figure 2-149).

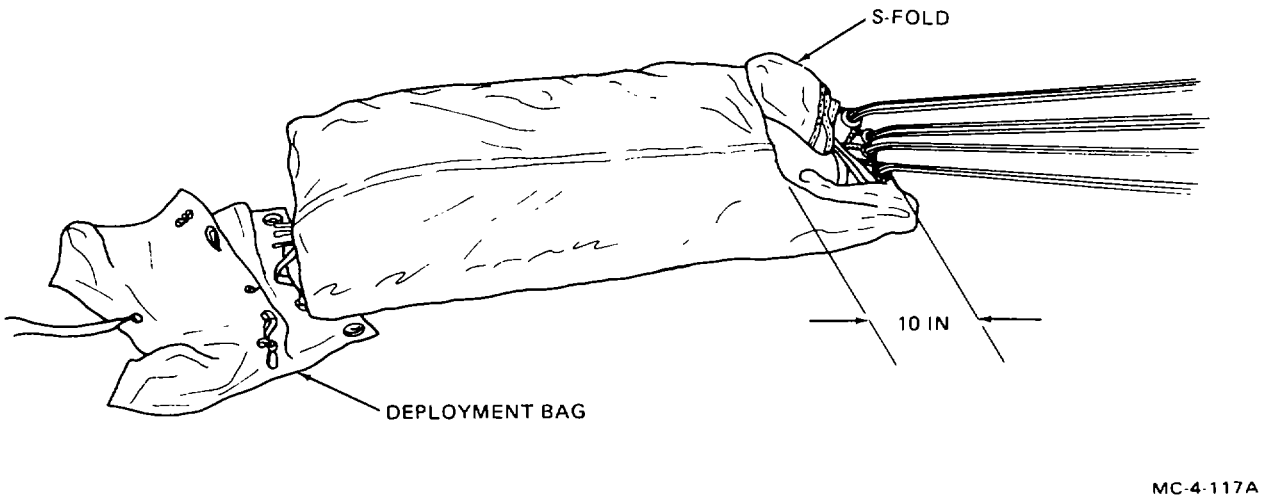


Figure 2-149. Bottom of Canopy S-Folded.

(28) Place hand firmly on canopy at suspension line end. Place other hand under canopy approximately 10 inches from end of first S-fold (figure 2-150).

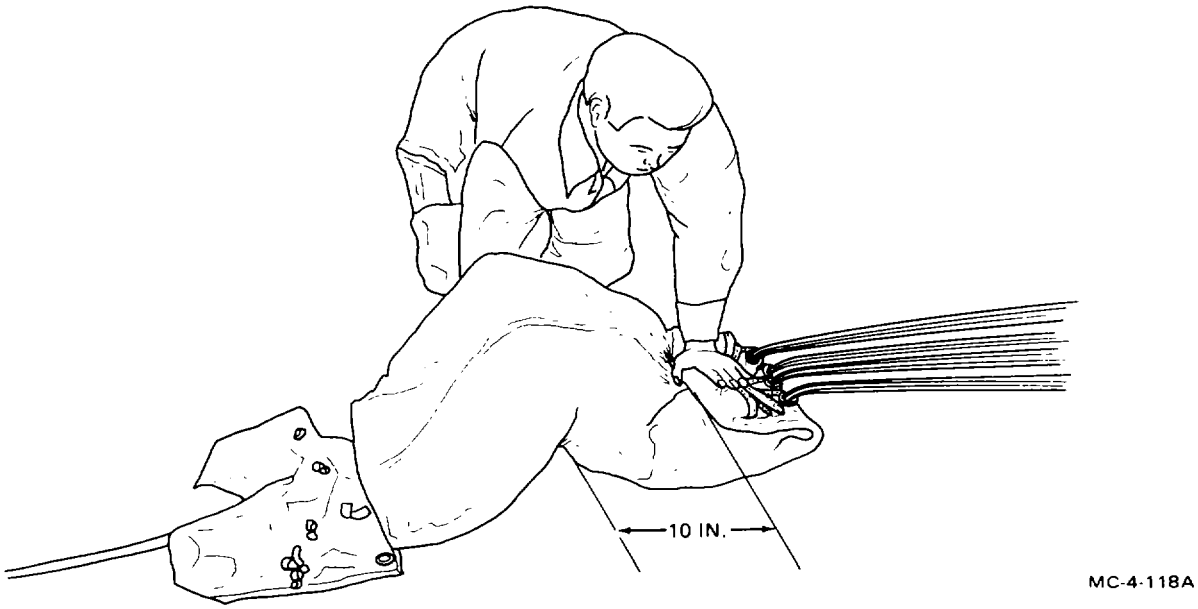


Figure 2-150. Forming Second S-Fold.

2-18. Packing Procedures - Main Parachute (CONT).

(29) S-fold deployment bag end toward suspension line end. Maintain a finished fold approximately the width of deployment bag (figure 2-151).

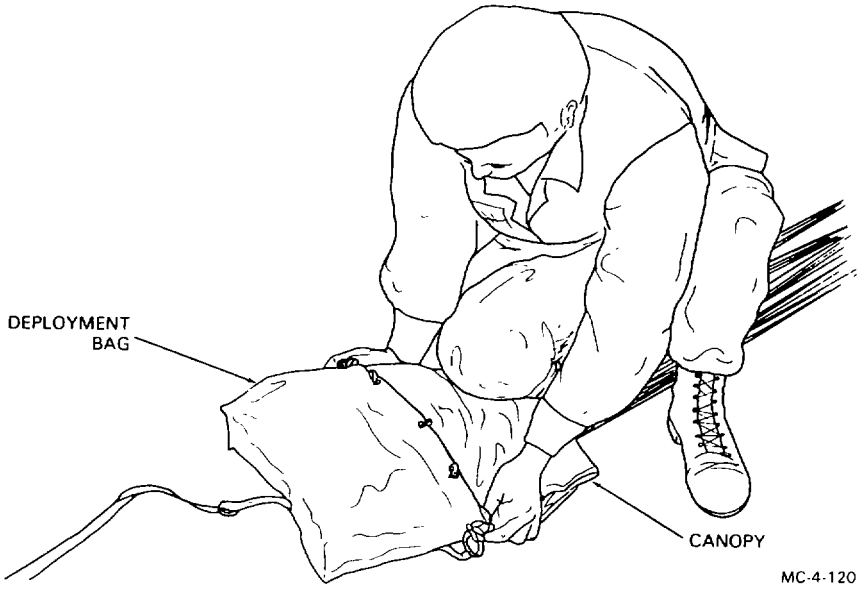


Figure 2-151. Final Canopy Fold.

g. Stow canopy in deployment bag as follows:

(1) Place one knee on folded canopy. Smooth out canopy removing all trapped air. Begin to pull deployment bag over canopy (figure 2-152).

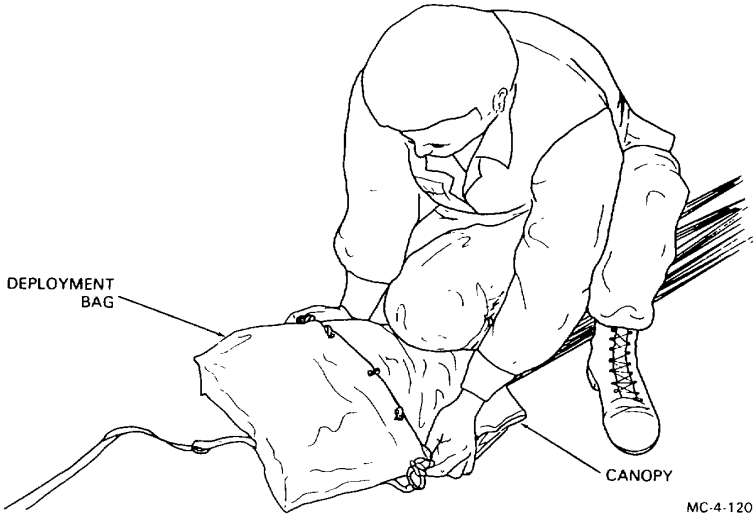


Figure 2-152. Pulling Deployment Bag over Canopy.

(2) Fully insert canopy into deployment bag. Work canopy into corners of bag. Remove slack in bridle line until attachment ring on canopy is flush with grommet on bag. Clear any visible canopy material from bridle (figure 2-153).

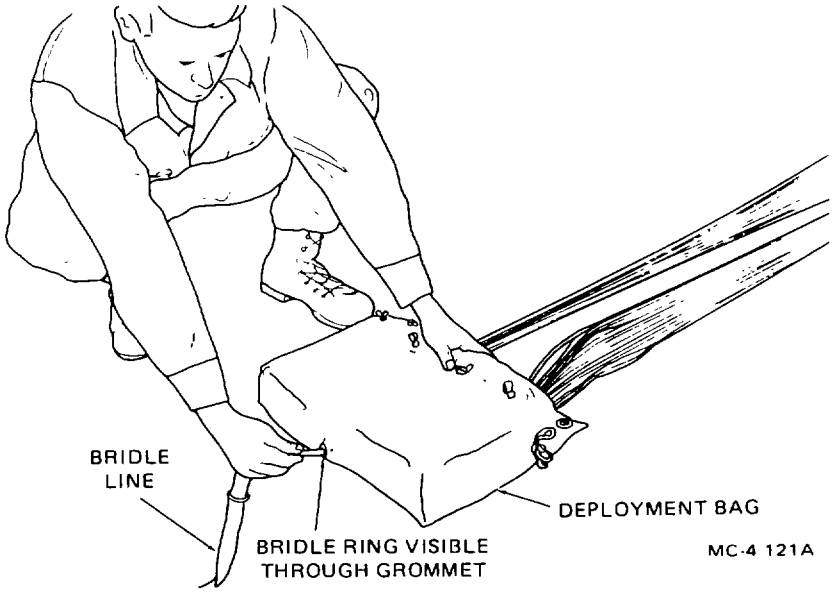


Figure 2-153. Canopy Stowed in Deployment Bag.

h. Stow suspension lines as follows:

(1) Starting with center two grommets, close locking flap by passing heavy duty retainer bands through grommets. Make first suspension line locking stow on right side. Lines should extend through retainer band 1 inch at each stow (figure 2-154).

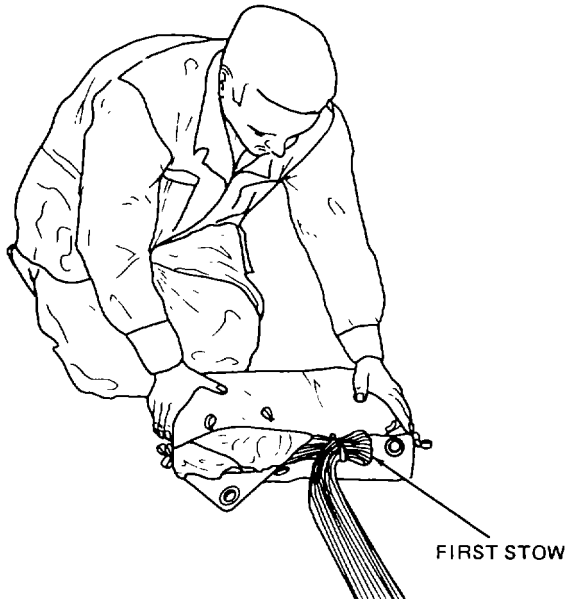


Figure 2-154. First Suspension Line Locking Stow.

2-18. Packing Procedures - Main Parachute (CONT).

(2) Make second suspension line locking stow in retainer band opposite first stow on left side (figure 2-155).

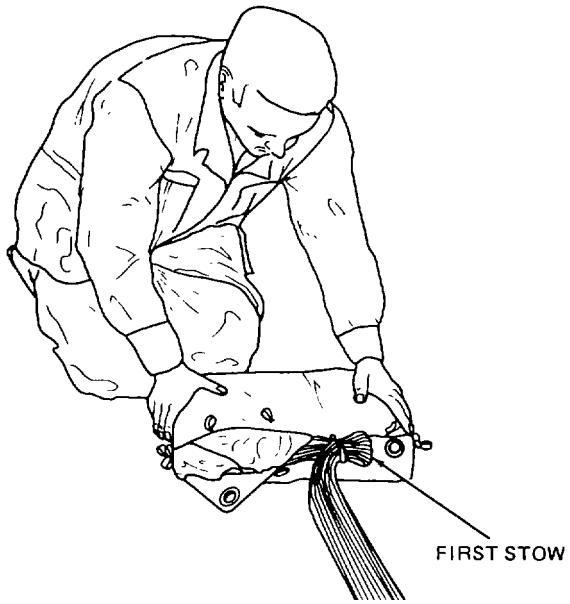


Figure 2-155. Second Suspension Line Locking Stow.

(3) Finish locking deployment bag by passing retainer bands through the two outboard grommets, then make third and fourth suspension line locking stows (figure 2-156).

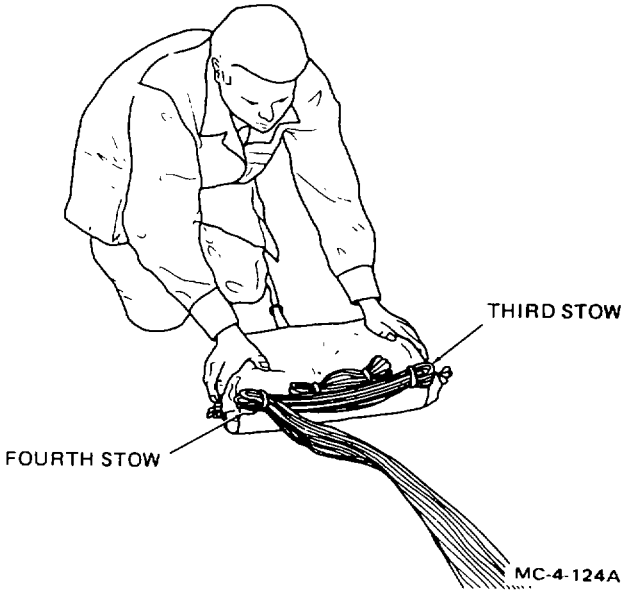


Figure 2-156. Third and Fourth Suspension Line Locking Stows.

(4) Rigger check number 3.

(5) Continue to stow suspension lines, alternating stows in right and left retainer bands until approximately 12 inches of line remains (figure 2-157).

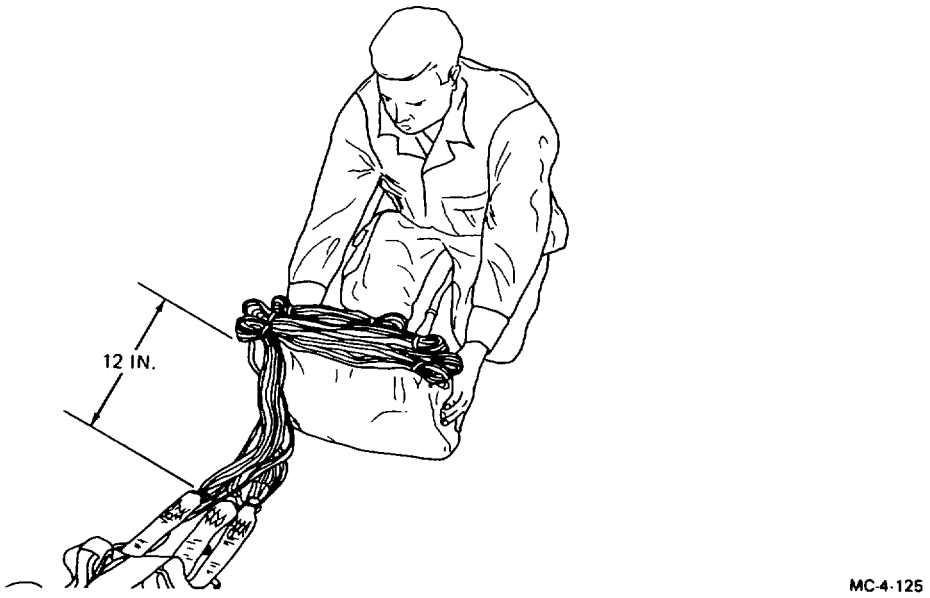


Figure 2-157. Suspension Lines Stowed.

(6) Rigger check number (4).

i. Close container as follows:

(1) Insert pull-up cord through loop in main closing loop (figure 2-158).

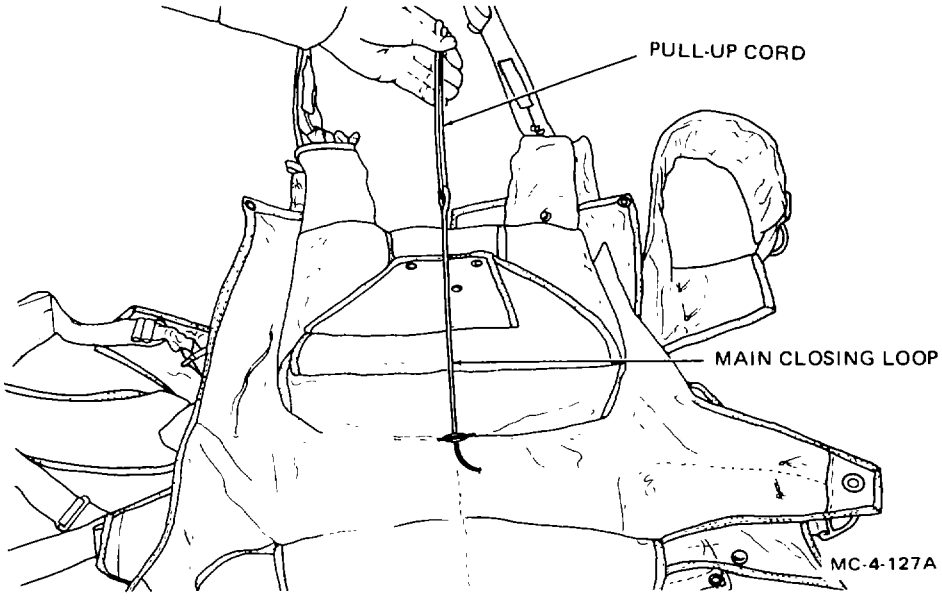


Figure 2-158. Pull-Up Cord Installed.

2-18. Packing Procedures - Main Parachute (CONT).

(2) Rotate deployment bag and suspension lines over container. Position risers along sides of reserve parachute container, continuing along sides of main container, with steering toggles facing inward (figure 2-159).

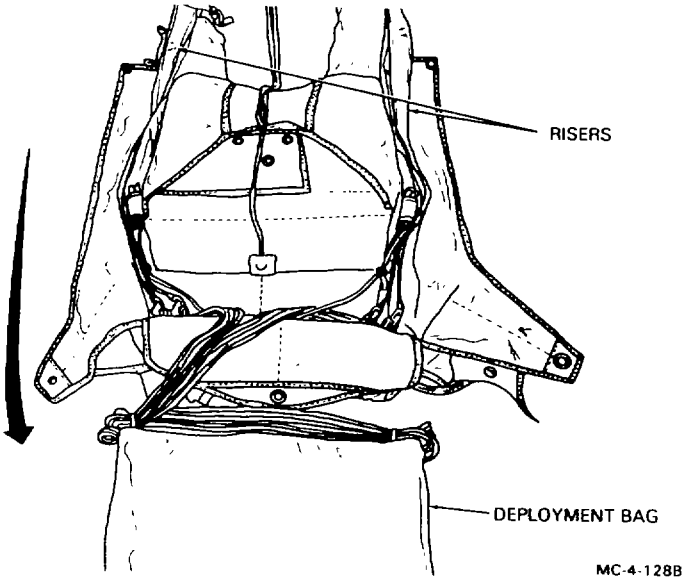


Figure 2-159. Deployment Bag and Suspension Lines Rotated Over Container.

(3) Position deployment bag and suspension lines into container. Position suspension lines so they face bottom of main parachute container. Route bridle line out over reserve chute (figure 2-160).

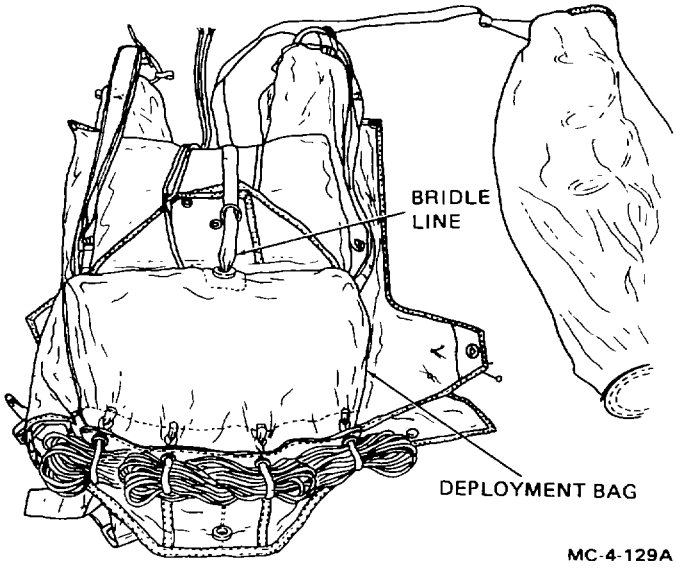


Figure 2-160. Deployment Bag in Container.

(4) Fold bridle line on top of deployment bag no wider than spring of pilot chute (figure 2-161).

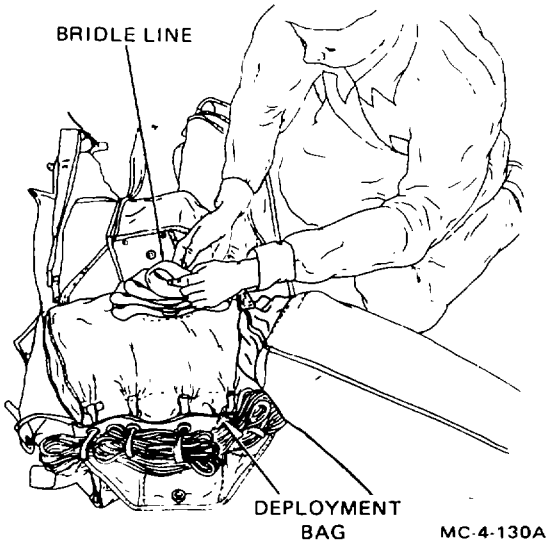


Figure 2-161. Bridle Line Folded on Deployment Bag.

(5) Position pilot chute on center of deployment bag over folded bridle. Grasp pilot chute and gather In canopy material (figure 2-162).

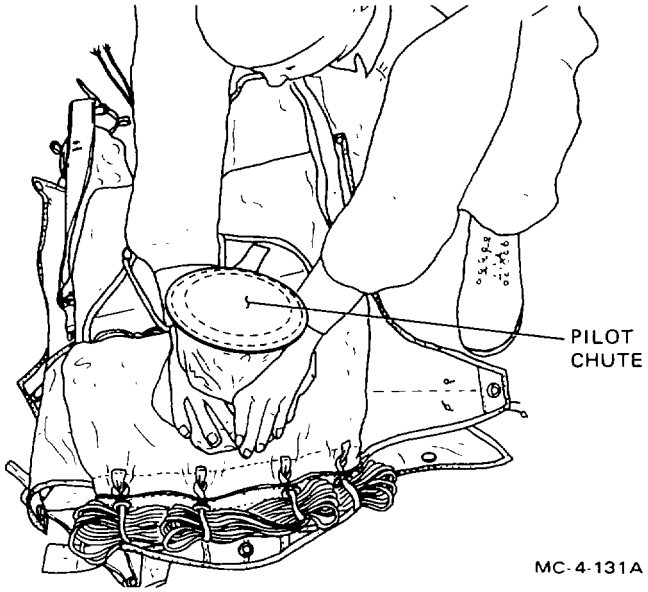


Figure 2-162. Pilot Chute Positioned on Deployment Bag.

2-18. Packing Procedures - Main Parachute (CONT).

(6) Compress pilot chute. Place knee on compressed pilot chute and route pull-up cord over pilot chute crown and through grommet on bottom flap. Pull main dosing loop up through grommet and insert temporary locking pin (figure 2-163).

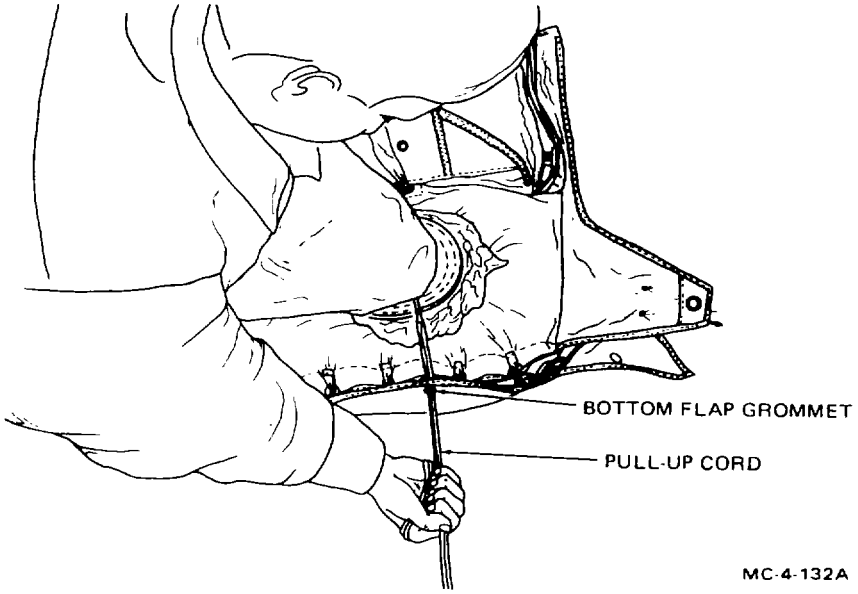


Figure 2-163. Closing Bottom Flap.

(7) Route pull-up cord through grommet in left side flap, right side flap, and top flap. Use temporary locking pin at each flap (figure 2-164).

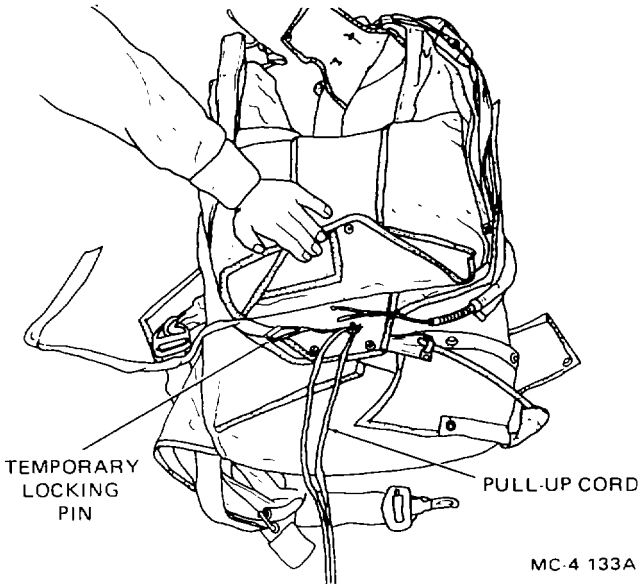


Figure 2-164. Container Closed.

(8) Remove temporary locking pin and insert ripcord locking pin into main closing loop. Remove pullup cord.

NOTE

The following ripcord pull tests are performed on all MC-4 systems on a onetime-only basis.

(9) Place parachute in test fixture or anthropometric device (torso) simulating the 5 to 95 percent man or a live subject. The device shall hold parachute securely In a position with the mouth of ripcord pocket facing down (along vertical axis).

(10) Secure ripcord cable by hand to prevent ripcord pin withdrawal when weight is applied.

(11) A 20-pound weight attached to the center of ripcord grip (care shall be exercised not to impose an impact load) shall readily withdraw ripcord grip from pocket. When ripcord grip has been removed from pocket, carefully remove 20-pound weight.

(12) Rotate parachute so that open end of ripcord housing faces down with ripcord cable in a vertical position.

(13) Attach a 27-pound weight to ripcord grip. Remove safety (your hand) securing the ripcord cable. The weight shall readily activate the parachute by withdrawing ripcord pin from locking loop.

(14) After Inspection has been completed and the specified requirements are met, make initial entries In Army Parachute Log Record.

NOTE

Parachute systems that do not pass the inspection will be removed from service.

(15) Re-close container in accordance with steps (4) through (8).

2-18. Packing Procedures - Main Parachute (CONT).

(16) Remove Army Parachute Log Record from log record pocket on underside of reserve ripcord pin protector flap and make the required entries. Reinsert the log record into the log record pocket. Close ripcord pin protective flap and riser protective covers (figure 2-165).

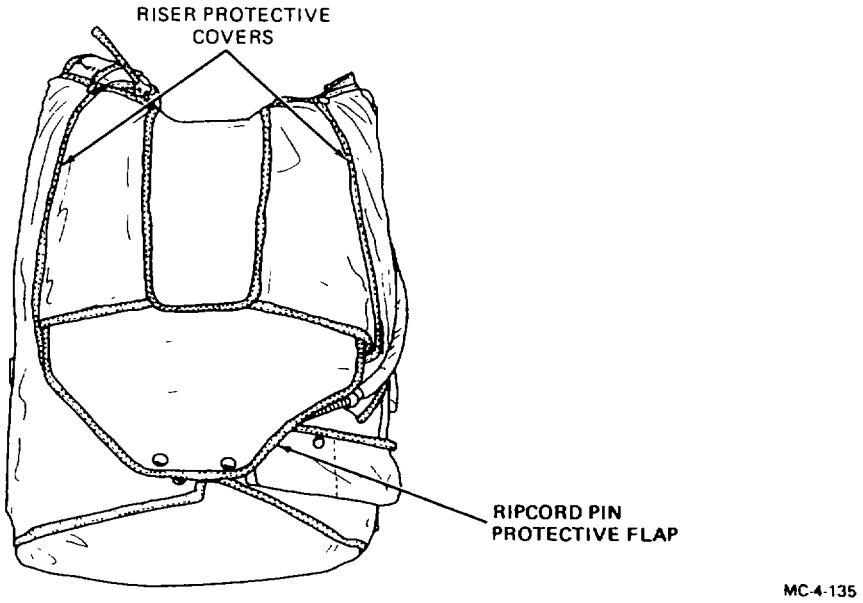


Figure 2-165. Packing Completed.

(17) Rigger check number 5.

j Install ripcord release as follows:

(1) Align rectangular key on end of power cable housing and insert in corresponding slot in base plate (figure 2-166).

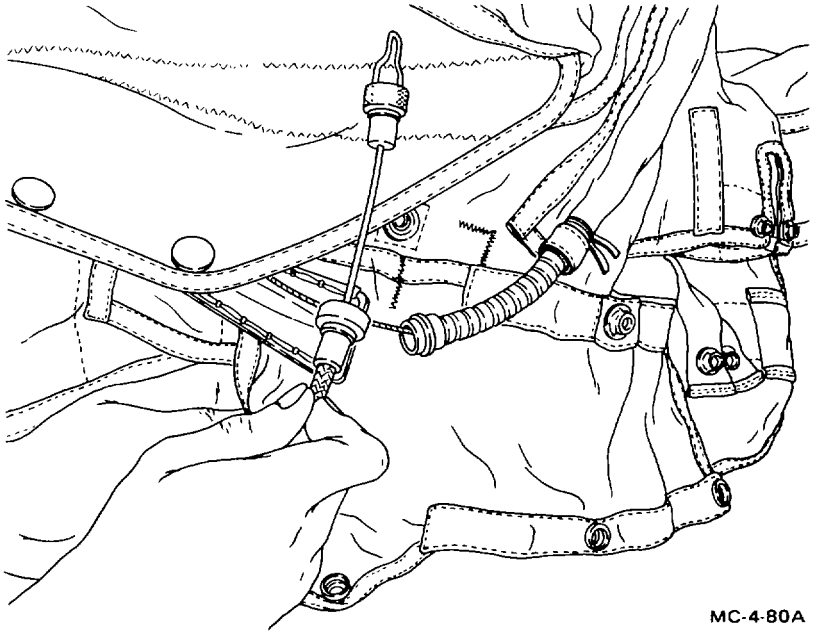


Figure 2-166. Power Cable Housing Inserted in Base Plate.

(2) Turn housing 90 degrees counterclockwise and lock in place (figure 2-167).

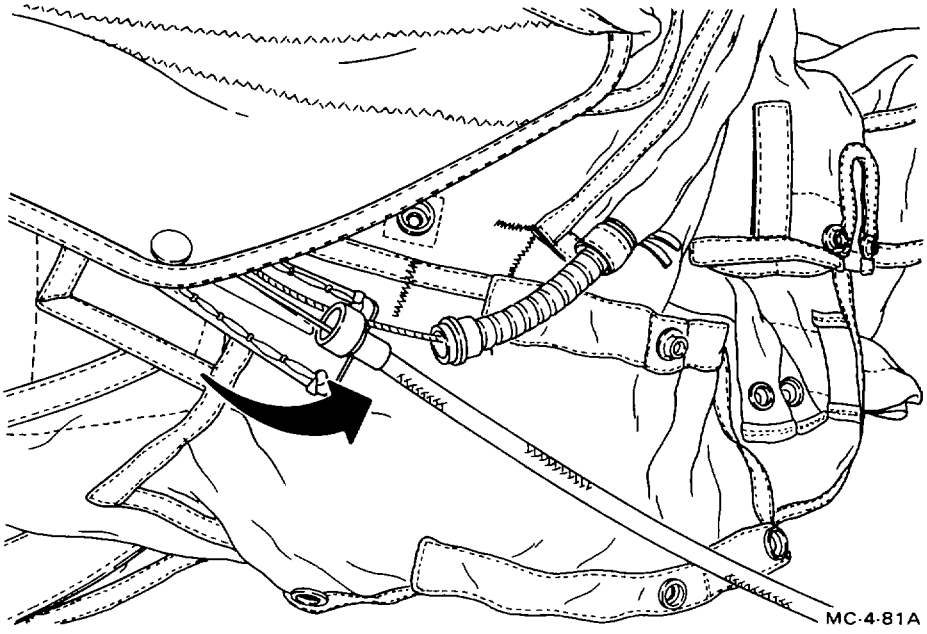


Figure 2-167. Housing Locked in Place.

2-18. Packing Procedures - Main Parachute (CONT).

(3) Insert ripcord release into ripcord release pocket (figure 2-168).

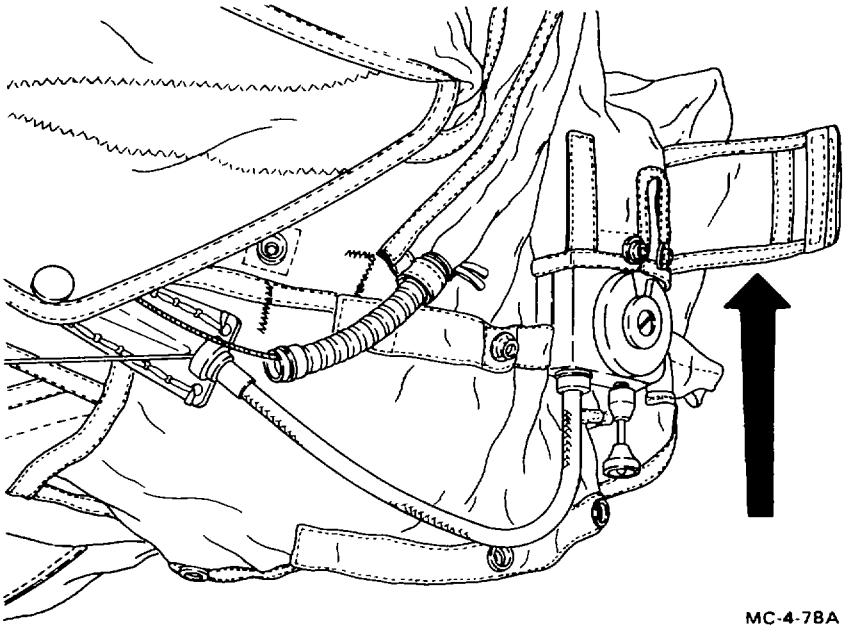


Figure 2-168. Ripcord Release Inserted in Pocket.

(4) Mate snap fasteners on securing straps to fasteners on pocket (figure 2-169).

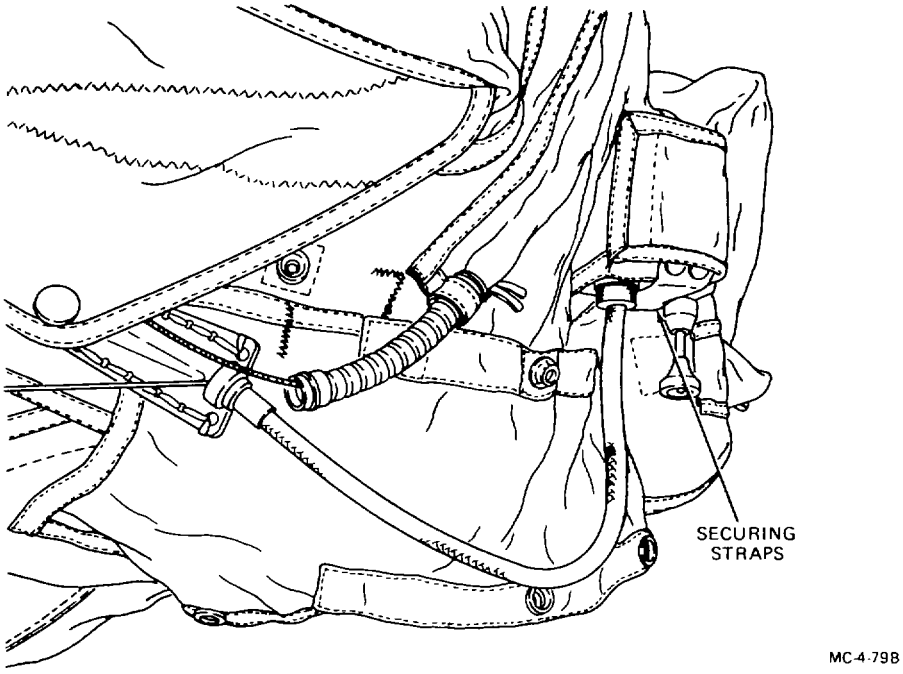


Figure 2-169. Ripcord Release Pocket Closed.

(5) Remove ripcord locking pin from main closing loop and Insert temporary locking pin. Insert ripcord locking pin into power cable withdrawal hook. Remove temporary locking pin and insert ripcord locking pin into main closing loop (figure 2-170).

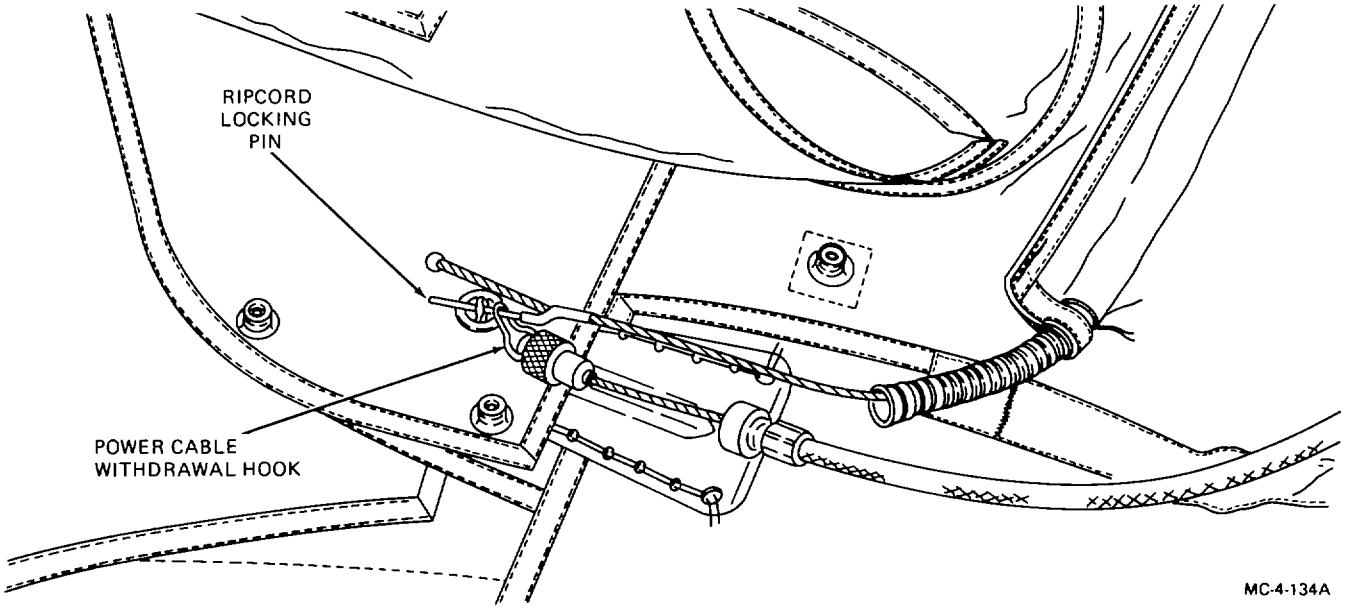


Figure 2-170. Power Cable Withdrawal Hook Installed.

(6) Rigger check number (6).

(7) Close ripcord pin protective flap, cable housing protective flap, and riser protective covers (figure 2-171).

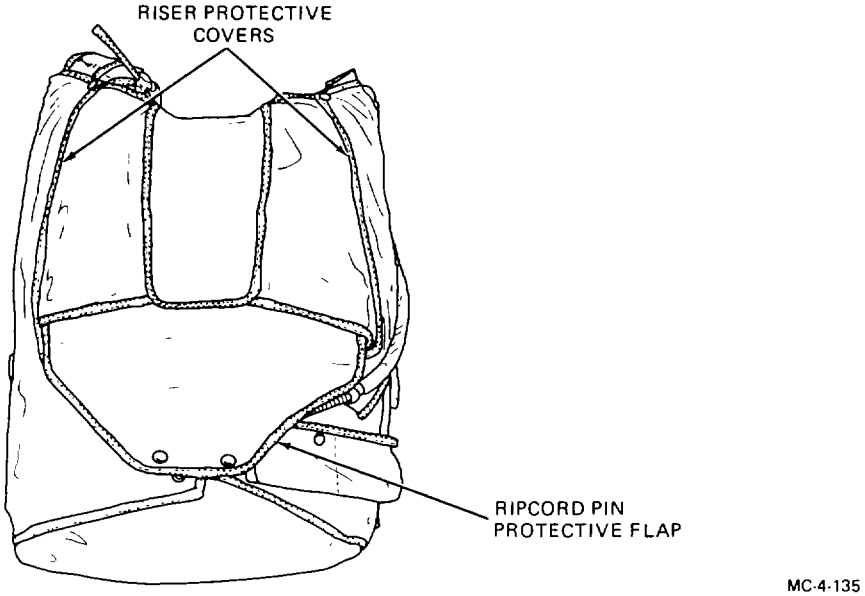


Figure 2-171. Automatic Ripcord Release Installation Completed.

SECTION V. REPAIR

NOTE

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

2-19. Repair Procedures.

This task covers:

a. Basting and Temporary Tacking
b. Stitching and Restitching
c. Darning
d. Zig-Zag Sewing
e. Patching

Tools:

Specified in paragraph applicable to the item being repaired.

Materials/Parts:

Specified in paragraph applicable to the item being repaired.

Personnel Required:

43E Parachute Rigger

Equipment Condition:

Unpacked. Canopy with defects recorded and clean.

NOTE

Sewing requirements 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 is 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 that has been sewn.

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

(1) Basting and temporary tacking should be made using thread that is of a contrasting color to the material being worked.

(2) Basting/temporary tacking is performed using a single strand of size A nylon thread or ticket No. 24/4 cotton thread.

(3) When basting, do not tie knots at any point in the thread length. Also, the sewing should be made with two stitches per inch.

(4) Immediately upon completion of a repair, remove a previously made basting or temporary tacking.

2-19. Repair Procedures (CONT).

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

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

Table 2-2. Sewing Machine Code Symbols.

Code symbol	Sewing machine
LD	SEWING MACHINE, INDUSTRIAL: General sewing; 301 stitch; light duty; NSN 3530-01-177-8590.
MD ZZ	SEWING MACHINE, INDUSTRIAL: Zig-Zag; 308 stitch; medium duty; NSN 3530-01-181-1421.
LD ZZ	SEWING MACHINE, INDUSTRIAL: Zig-Zag; 308 stitch; light duty; NSN 3530-01-181-1420.
HD	SEWING MACHINE, INDUSTRIAL: General sewing; 301 stitch; heavy duty; NSN 3530-01-177-8588.
MD	SEWING MACHINE, INDUSTRIAL: General sewing; 301 stitch; medium duty, NSN 3530-01-177-8591.
DN	SEWING MACHINE, INDUSTRIAL: Darning; lock stitch; NSN 3530-01-177-8589.
LHD	SEWING MACHINE, INDUSTRIAL: 301 stitch; light heavy duty; NSN 3530-01-186-3079.
ND	SEWING MACHINE, INDUSTRIAL: 301 stitch; double-needle; NSN 3530-01-182-2873.
BT	SEWING MACHINE, INDUSTRIAL: Bartack; Singer class 69-11 or equal (local purchase).

Table 2-3. Stitching and Restitching Specifications.

Component	Recommended sewing machine (code symbol)	Stitches per inch	Thread size
Container/Harness			
Panels/Closing Flaps	LD, DN	7-11	E
Binding Tape, 3/4 In.	LD, MD, ZZ, BT	7-11/42	E
Tape, Hook, and Pile	LD, MD, BT	7-11/42	E
Pocket, ARR (FF-2)	LD, ZZ	7-11	E
Binding Tape	LD	7-11	E
Flap, Main, Top Closing	LD	7-11	E
Binding Tape	LD	7-11	E
Ripcord Pocket, Main			
Binding Tape	LD, ZZ	7-11	E
Ripcord Pocket, Reserve			
Binding Tape	LD, ZZ	7-11	E
Protective Cover, ARR, Power Cable			
Binding Tape	LD, BT	7-11/42	E
Tape, Hook and Pile	LD, BT	7-11/42	E
Protective Cover, Reserve			
Ripcord Pins			
Binding Tape	LD	7-11	E
Tape, Hook and Pile	LD	7-11	E
Pocket, Log Record	LD	7-11	E
Flap, Reserve, Top Closing	LD	7-11	E
Tape, Hook and Pilot	LD	7-11	E
Carrying Handle	ZZ, BT	42	E
Loops, Weapon, Tie Down	ZZ	7-11	E
Pilot Chute Bridle Line	BT, LD	42/7-11	E
Deployment Bag, Main	LD, MD, DN	7-11	E
Canopy	DN	A	
Panel, Top/Bottom	LD, MD	7-11	E
Panel, Stabilizer	LD, MD, BT	7-11/42	E
Panel, Cotton Cloth	LD, MD	7-11	E
Ribs	LD, MD	7-11	E
Binding Tape	LD, MD	7-11	E
Slider Stop Reinforcement	LD, MD, BT	7-11/42	E
Line, Suspension	BT, ZZ	42	E
Line, Steering	BT	42	E
Tape, Reinforcement	LD, ND	7-11	E

2-19. Repair Procedures (CONT).

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

Component	Recommended sewing machine (code symbol)	Stitches per inch	Thread size
Slider	LD, MD	7-11	E
Binding Tape	LD, MD	7-11	E
Cloth, Nylon, Type I	DN, LD	7-11	A/E
Risers (restitch as req'd)	LD, ZZ, BT	7-11/42	E
Keeper, Guide Ring	BT, ZZ	42	E
Tape, Trim Tab	LD, BT	7-11/42	E
Channel, Release Cable	LD, MD	7-11	E
Keeper, Toggle	LD, BT	7-11/42	E
Cover, Steering Line	LD, MD	7-11	E
Tape, Hook and Pile	LD, MD	7-11	E

(2) *Other parachute items.* Stitching and restitching on the other parachute items constructed from cloth, canvas, and webbing should be accomplished with thread that 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 (not more than 1/2 inch), where there is at least 1/2 inch between the damage and a sewn seam. A darning repair may be made either by hand or sewing machine, depending upon the method preferred and the availability of equipment. However, a darning machine should be used to darn small holes and tears where fabric is missing. In stabilizer panels only, machine darning will be used to repair holes, rips, and tears up to 3/4 inch. A darning repair will be performed using the following procedures, as appropriate:

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

(a) Using an authorized marking aid of contrasting color, mark a square around the damaged area and ensure that the marking is at least 1/4 inch back from each edge of the damaged area.

(b) Darn damaged area by sewing the material in a back and forth manner, using size A or E nylon thread.

(c) Turn material and stitch back and forth across stitching made in (b) above until hole or tear is completely darned (figure 2-172).

(d) If applicable, restencil informational data or identification marks using the criteria in paragraph 2-21.

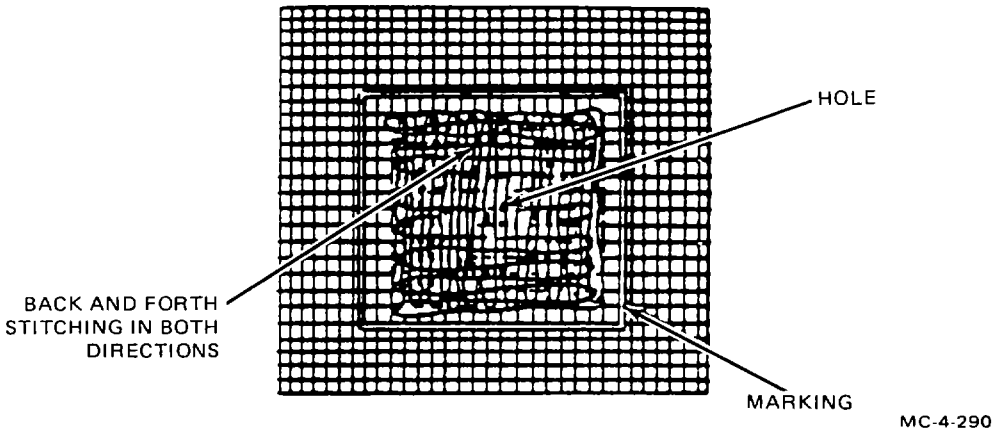


Figure 2-172. Darning Method Using a Darning Sewing Machine.

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

(a) Using an authorized marking aid of contrasting color, mark a square around the damaged area and ensure that the marking is at least 1/4 inch back from each edge of the damaged area.

2-19. Repair Procedures (CONT).

(b) Using darning needle and a length of size A or E nylon thread, begin darning at one corner of marked area. Working parallel with the marking, pass needle and thread back and forth through material until opposite diagonal corner of marked area is reached (A, figure 2-173).

(c) Turn material and weave needle and thread back and forth across stitching made in (b) above until hole is completely darned (B, figure 2-173).

(d) If applicable, restencil informational data or identification marks as outlined in paragraph 2-21.

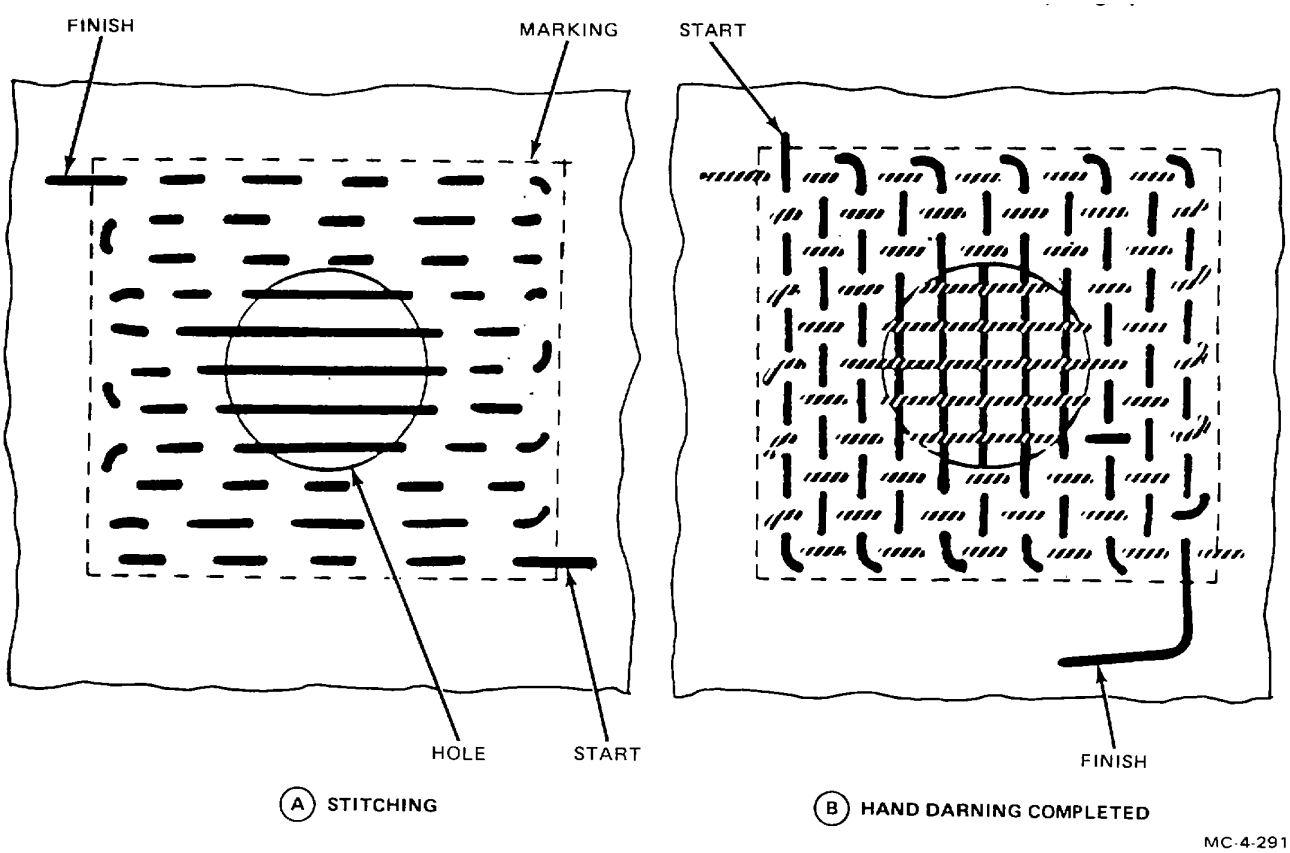


Figure 2-173. Hand Darning Method.

d. Zig-zag Sewing. (Refer to tables 2-2 and 2-3.) Components of the MC-4, except parachute canopy, 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 is accomplished using a zig-zag sewing machine as follows:

(1) Set sewing machine to maximum stitch width.

(2) Beginning at a point 1/4 inch beyond one end of cut or tear, stitch lengthwise along damaged area to a point 1/4 inch beyond opposite end of cut or tear (A, figure 2-174). The cited stitching procedure also applies to an L-shaped cut or tear (B, figure 2-174).

(3) If applicable, restencil informational data or identification marks as prescribed in paragraph 2-21.

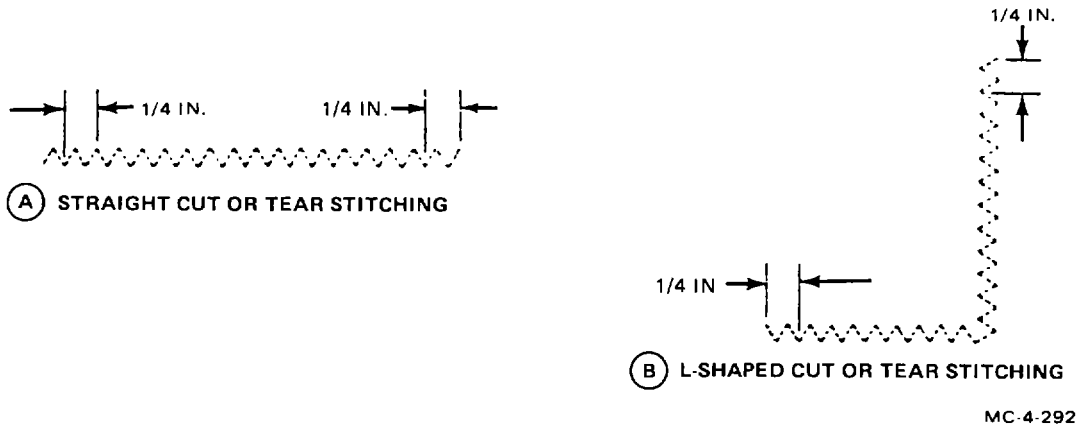


Figure 2-174. Repair Method Using a Zig-Zag Sewing Machine .

e. Patching Procedures. Patching Is a procedure used to repair holes that cannot be darned.

(1) Parachute canopy patching limitations. The following is a list of patching limitations for the MC-4 parachute canopy.

(a) A patch will not be applied to a damaged area that has been previously patched.

(b) There is no limitation to the number of patches or the size of the patch to each canopy section, rib, or stabilizer. A canopy section is defined as the area between sewn seams. A rib and a stabilizer are each considered as one section. Patching will not exceed 50 percent of a section. A finished basic patch shall not be closer than 1 inch from a sewn seam. However, determination should be made as to the lowest economical method to be used (i.e., two or more patches versus one large patch or one large patch versus a section replacement).

NOTE

Patches must be cut with their edges parallel to the warp and weft of the fabric and are to be applied with the warp and weft threads parallel to those of the material under repair.

2-19. Repair Procedures (CONT).

(2) Canopy damage chart. A canopy damage chart (figure 2-175) is provided for local reproduction. The canopy damage chart is used to record canopy damage and repair action.

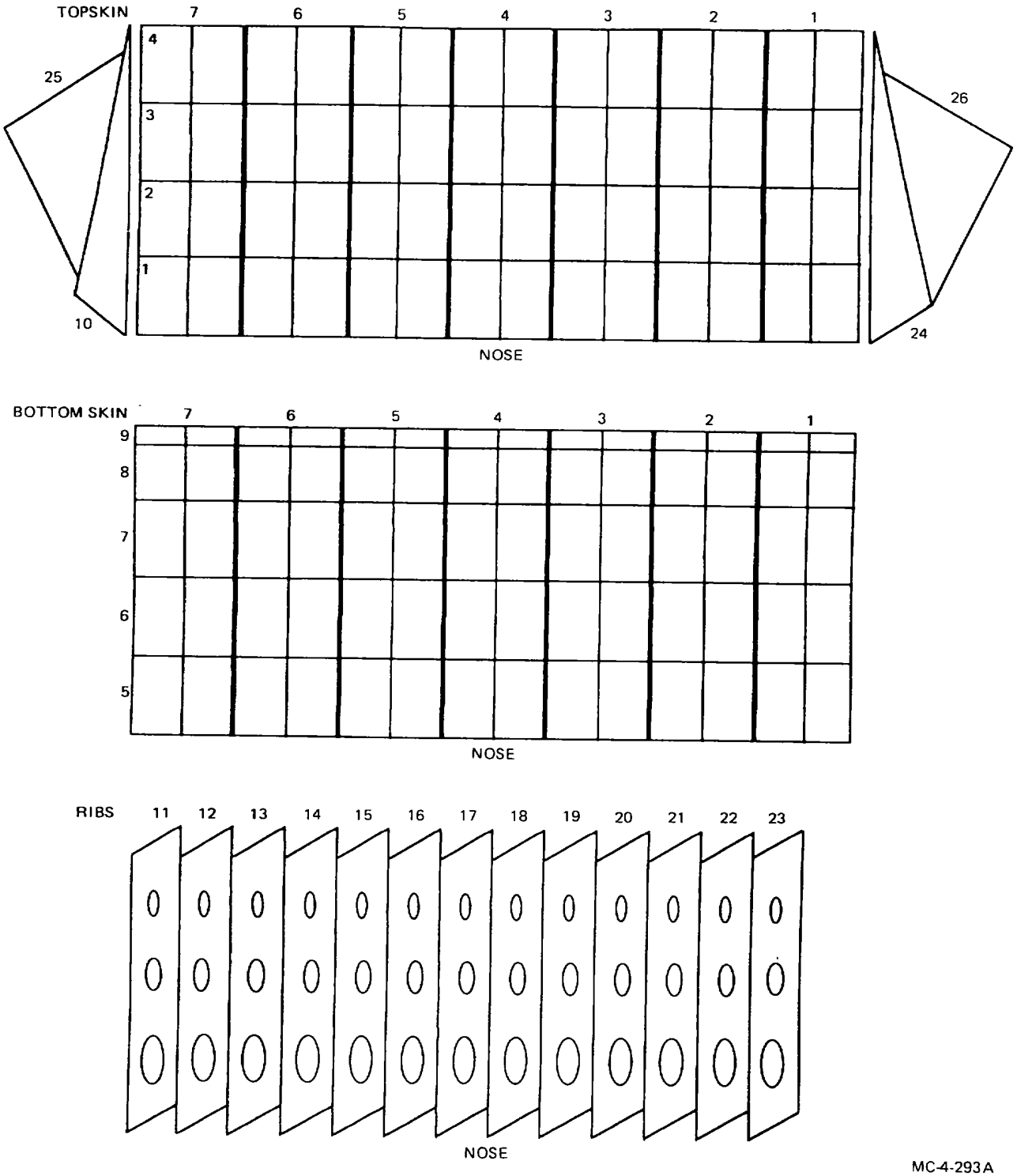


Figure 2-175. Canopy Damage Chart.

(3) Making a basic patch. A basic patch is used to repair damaged cloth when the finished patch is no closer than 1 inch from a stitched seam or stitched tape. Should a damaged area be closer than 1 inch to the cited areas, a miscellaneous patch will be made as detailed in paragraph (4). The basic patch is applied by sewing. The patch is applied to the inside of the canopy. The deployment bag is patched on the outside. (The basic patch is shown In figure 2-176.) Apply a basic patch as follows:

NOTE

A basic patch applied to the parachute canopy will be square or rectangular in shape. Adhesive nylon parachute mending cloth will not be used. Ensure proper thread tension is used to prevent distortion of the canopy.

(a) Place reparable item on repair table, smooth the fabric around damaged area, and secure item to table with pushpins. Do not pin damaged area.

(b) Using an authorized marking aid of contrasting color, mark a square or rectangle around area to be patched.

(c) Cut damaged area fabric along the lines made in (b) 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 is performed using procedures In paragraph 2-19a.

(e) Using same type material as in original construction, mark and cut a patch 2-1/2 inches wider and longer than inside measurements of prepared hole.

(f) Center patch material over prepared hole.

(g) Make a 1/2-inch foldunder on each edge of patch material and pin in position. Baste patch to prepared area. Basting is performed using procedures in paragraph 2-19a.

(h) Remove pushpins securing canopy to repair table and secure patch by stitching, using the applicable details in figure 2-174 and paragraph 2-19b. Make the first row of stitching completely around patch. Turn canopy over and make a second row of stitching, ensuring that locking stitches are on opposite sides of patch. Stitching is performed in accordance with paragraph 2-19b.

(i) If applicable, restencil informational data according to procedures in paragraph 2-21.

2-19. Repair Procedures (CONT).

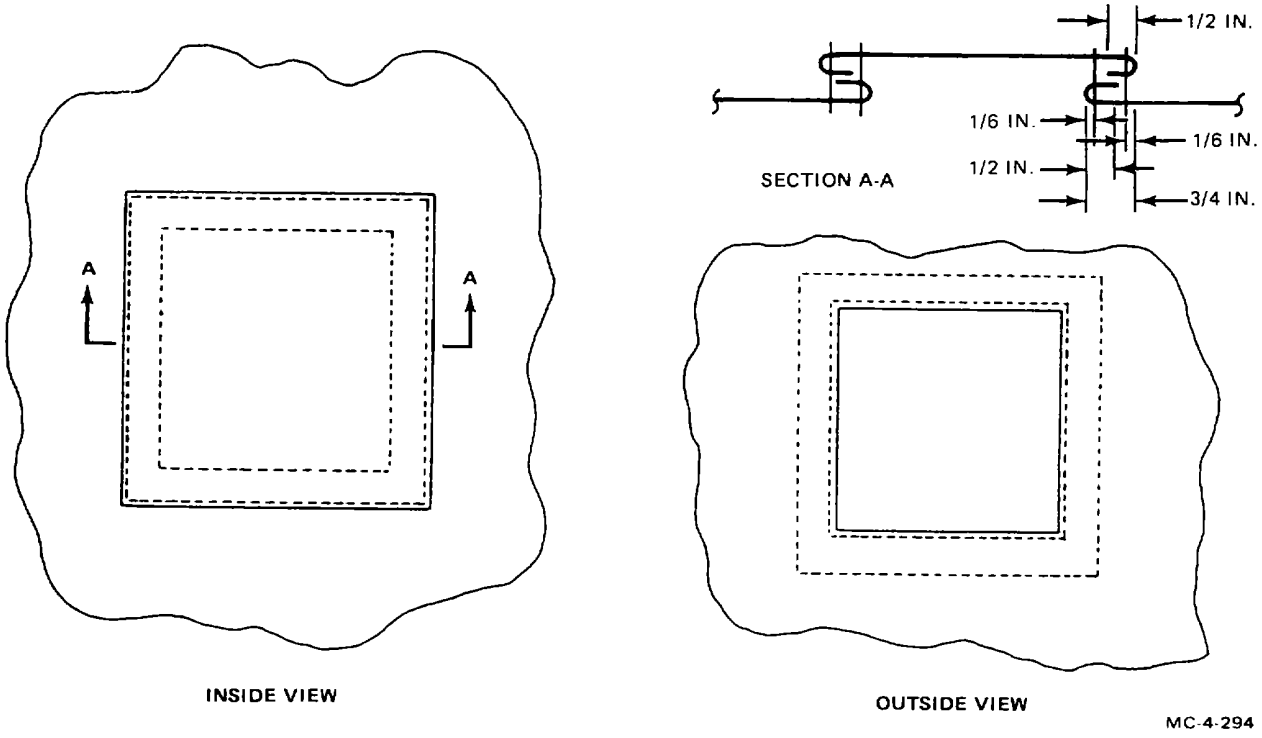


Figure 2-176. Basic Patch Application.

(4) *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 or a reinforced seam. Ascertain the type of patch required for the canopy using the details in figure 2-177. A canopy section that cannot be patched with a basic patch as outlined in paragraph (3), above, is patched with a miscellaneous patch. Apply a miscellaneous patch to a section as follows:

NOTE

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

(a) Place canopy inside out on repair table, smooth the fabric around damaged area, and secure damaged section to table with pushpins. Do not pin damaged area of section.

(b) As required, cut applicable stitching to remove or lay aside items that may interfere with patching process.

(c) Using an authorized marking aid of contrasting color, mark damaged area. Make the mark 1/2 inch from any adjacent seam or reinforced seam, except where the width of the foldback is limited by the width of the reinforced seam.

(d) Prepare damaged area hole by cutting along marks made in (c), above. Also make a diagonal cut at each corner of formed hole to permit a foldback of each raw edge.

(e) To complete hole preparation, make a 1/2-inch foldback of each raw edge. Pin and baste each edge foldback using procedures in paragraph 2-19a.

(f) Using same type material as in original canopy construction, mark and cut a patch 2-1/2 inches wider and longer than inside measurements of prepared hole.

(g) Center patch material over prepared hole.

(h) Make a 1/2-inch foldunder on each edge of patch material and pin patch material in position. Baste patch to prepared area. Basting is performed using procedures in paragraph 2-19a.

(i) Remove pushpins securing canopy to repair table and secure patch by stitching according to the details in figure 2-177, using stitching specifics outlined in tables 2-2 and 2-3. Make the first row of stitching completely around the edges of the patch. Turn canopy right side out and make a second row of stitching, ensuring that locking stitches are on opposite sides of patch. Stitching is performed in accordance with paragraph 2-19b.

(j) Reposition canopy items removed or laid aside in (b), above, in the original location and secure each item to canopy by restitching according to original construction details and paragraph 2-19b.

(k) If applicable, restencil informational data according to procedures in paragraph 2-21.

2-19. Repair Procedures (CONT).

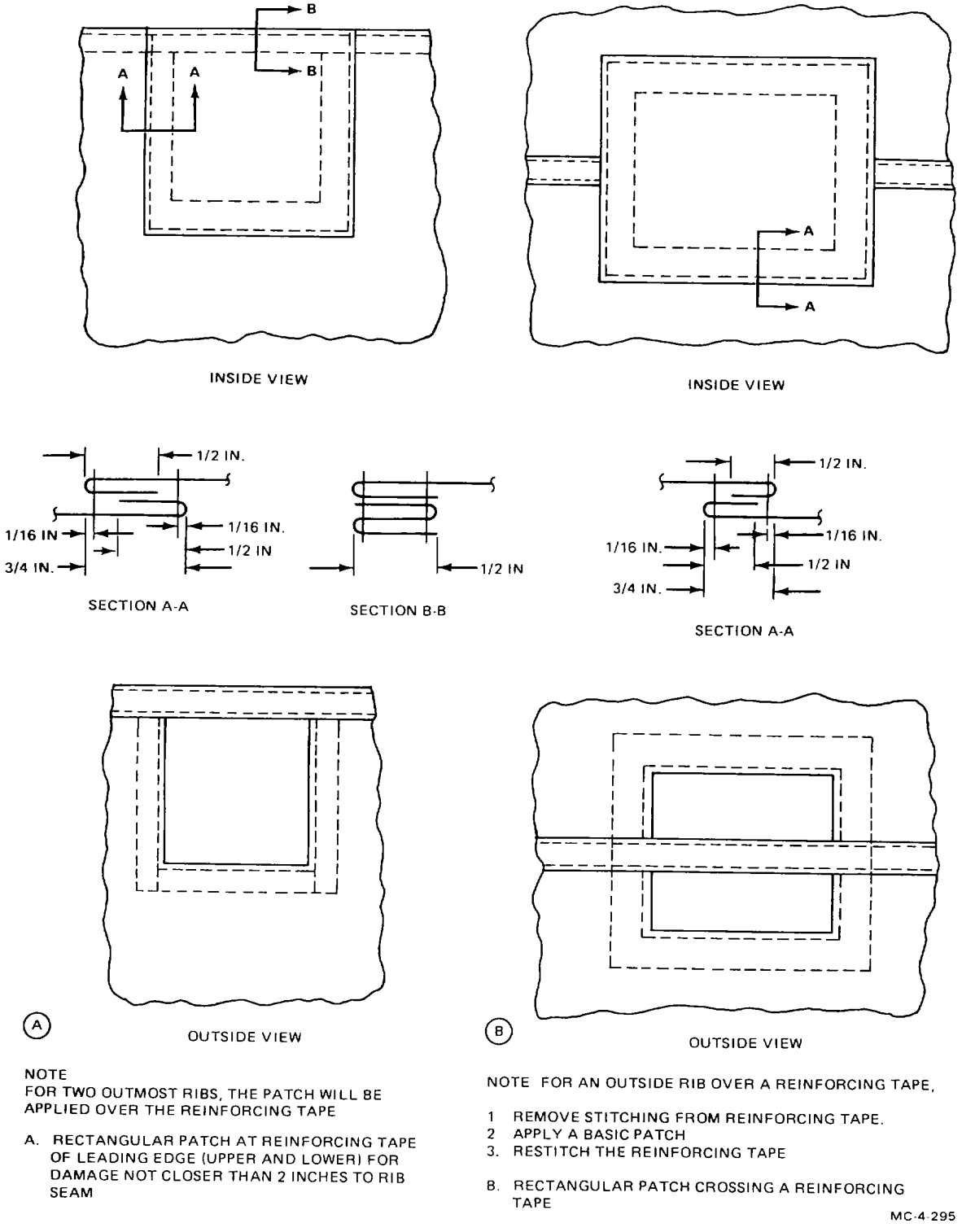


Figure 2-177. Miscellaneous Canopy Patches. (Sheet 1 of 2)

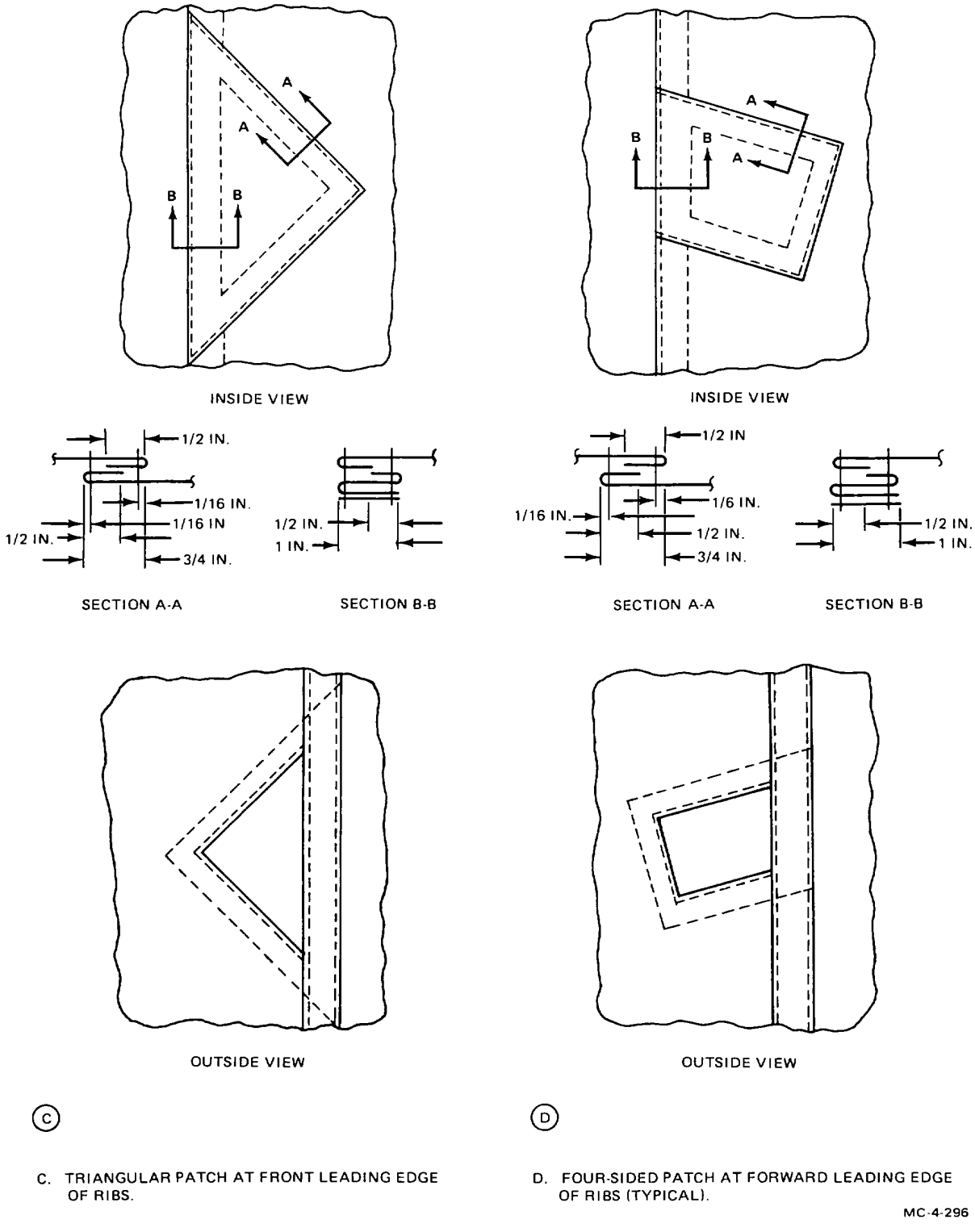


Figure 2-177. Miscellaneous Canopy Patches. (Sheet 2 of 2)

2-20. Searing and Waxing.

This task covers:

a. Searing

b. Waxing

Tools:

Electric Pot, Melting, Item 10, Appendix B
Knife, Hot, Metal, Item 14, Appendix B

Materials/Parts:

Beeswax, Item 1, Appendix D
Wax, Paraffin, Item 30, Appendix D

Personnel Required:

43E Parachute Rigger

Equipment Condition:

Unpacked

CAUTION

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

NOTE

Fabric materials such as cord, tape, and webbing that is cut for use in the maintenance of the MC4 parachute will normally be heat-seared or dipped in a melted wax mixture, as applicable, to prevent the material from fraying or unraveling. However, in some instances the preparation of the material may not be necessary and will be specified accordingly.

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

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

2-21. Marking and Restenciling.

This task covers:

a. Marking

b. Restenciling

Materials/Parts:

Brush, Stenciling, Item 2, Appendix D
Ink, Marking, Item 13, Appendix D
Marker, Felt Tip, Black, Item 16, Appendix D
Pen, Ball Point, Item 18, Appendix D
Stencil Board, Oiled, Item 21, Appendix D

Personnel Required:

43E Parachute Rigger

Equipment Condition:

Lay out on packing table or other suitable area.

NOTE

Stenciling should be used whenever possible. A ballpoint pen or felt tip marker should be used only where stenciling is not possible, or when stenciling devices are not available. However, only felt tip markers that contain parachute marking Ink and marked "FOR PARACHUTE MARKING' is authorized for use in marking the MC-4. Any type ball point pen using black or blue ink may be used for marking on labels only.

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

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

b. Restenciling. Proceed as follows:

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

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

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

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

2-22. Main Pilot Chute Bridle Line or Deployment Bag.

This task covers:

a. Removal

b. Installation

Materials/Parts:

Bag, Deployment, P/N 11-13521
Bridle, Pilot Chute, Main, P/N 11-1-3523

Equipment Condition:

Lay out on packing table or other suitable area.

Personnel Required:

MOS/43E(2P) Parachute Rigger

a. Removal Remove main pilot chute bridle line or deployment bag as follows:

(1) Loosen bridle line lark's head knot enough so that pilot chute can be passed through loop in end of bridle line (figure 2-178).

(2) Remove bridle line from loop at bottom end of pilot chute.

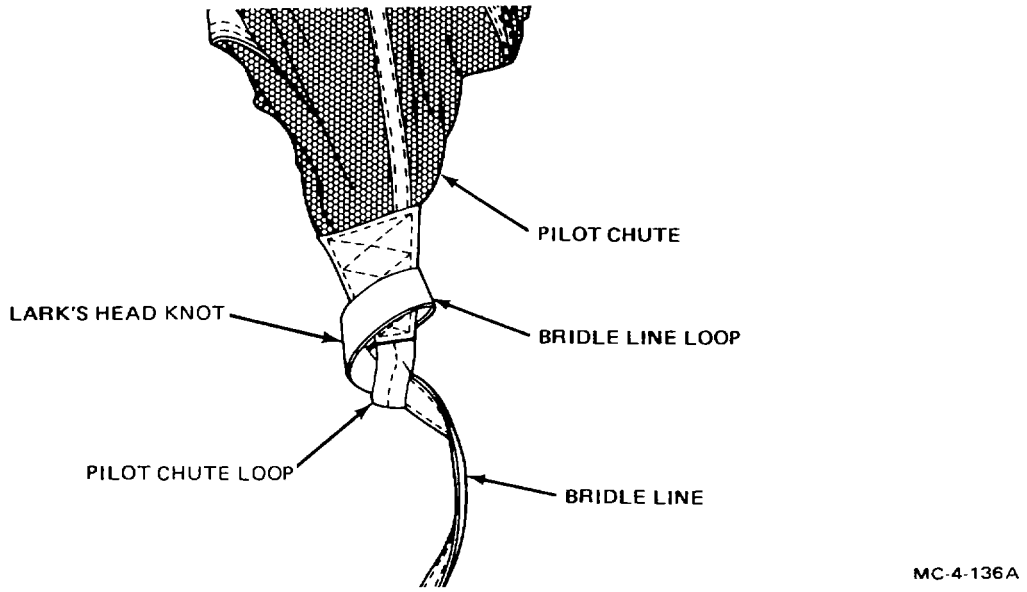


Figure 2-178. Removing Main Pilot Chute.

(3) Loosen bridle line lark's head knot at canopy attachment ring (figure 2-179).

(4) Pass deployment bag and opposite end of bridle line through bridle line loop.

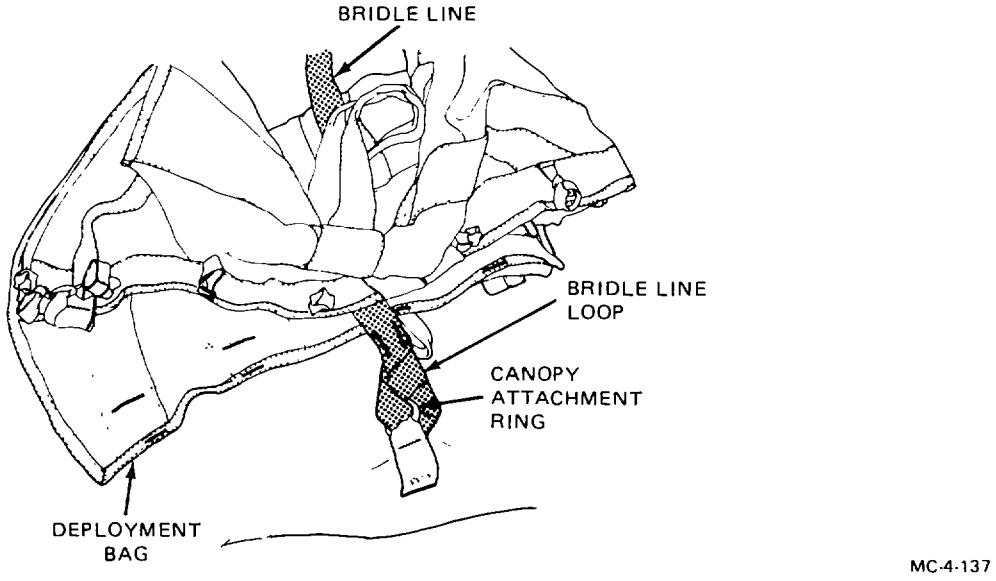


Figure 2-179. Removing Bridle Line and Deployment Bag.

(5) Remove bridle line from canopy attachment ring and deployment bag.

2-22. Main Pilot Chute Bridle Line or Deployment Bag (CONT).

b. Installation. Install main pilot chute bridle line or deployment bag as follows:

(1) Pass bridle line loop at ring end through deployment bag from outside to inside (figure 2-180).

(2) Pass bridle line loop at ring end completely through canopy attachment ring.

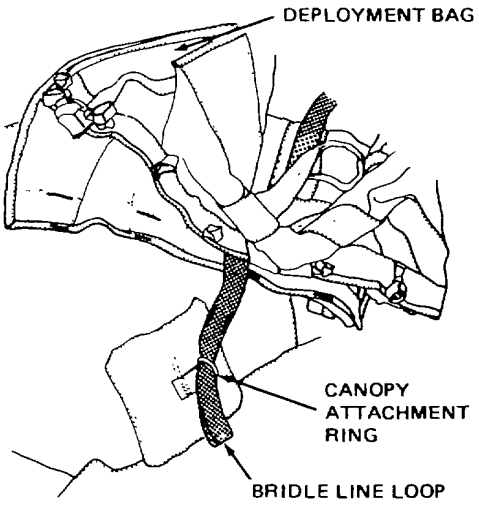


Figure 2-180. Bridle Line Loop through Deployment Bag and Canopy Attachment Ring.

(3) Pass opposite end of bridle line and deployment bag through bridle line loop and pull tight, forming a lark's head knot.

(4) Pass bridle line through loop at bottom end of pilot chute (figure 2-181).

(5) Pass pilot chute through loop at end of bridle line and pull tight, forming a lark's head knot.

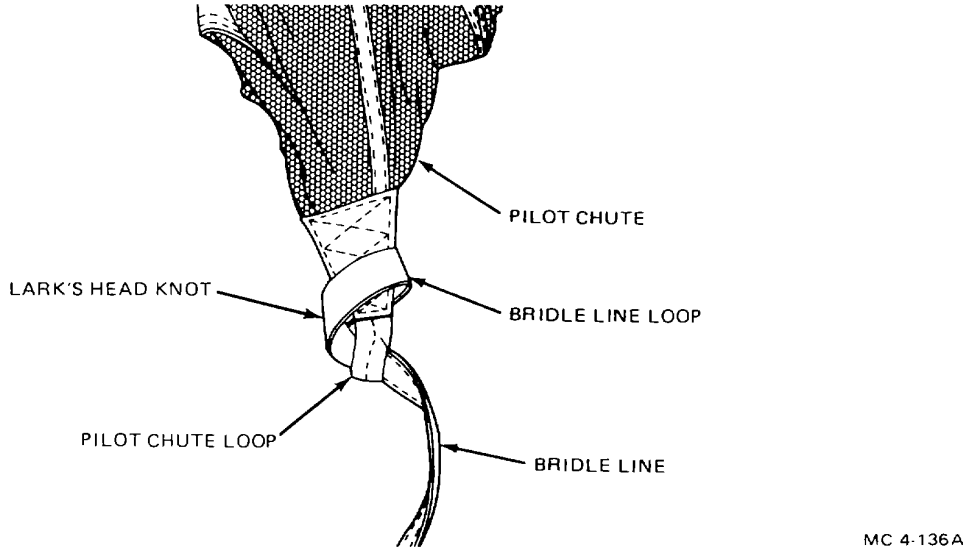


Figure 2-181. Attaching Bridle Line to Pilot Chute.

2-23. Main Pilot Chute.

This task covers:

a. Repair

b. Replacement

Tools:	*Personnel Required*:
Needle, Darning	MOS/43E Parachute Rigger
Materials/Parts:	*Equipment Condition*:
Pilot Chute, Main, P/N 11-1-3522 Thread, Nylon, V-T-295, Size A, Item 27, Appendix D	Lay out on packing table or other suitable area.

a. Repair. Repair damaged pilot chute mesh fabric by hand darning in accordance with paragraph 2-19c.

b. Replacement. Replace main pilot chute as follows:

(1) Loosen bridle line lark's head knot enough so that pilot chute can be passed through loop in end of bridle line (figure 2-182).

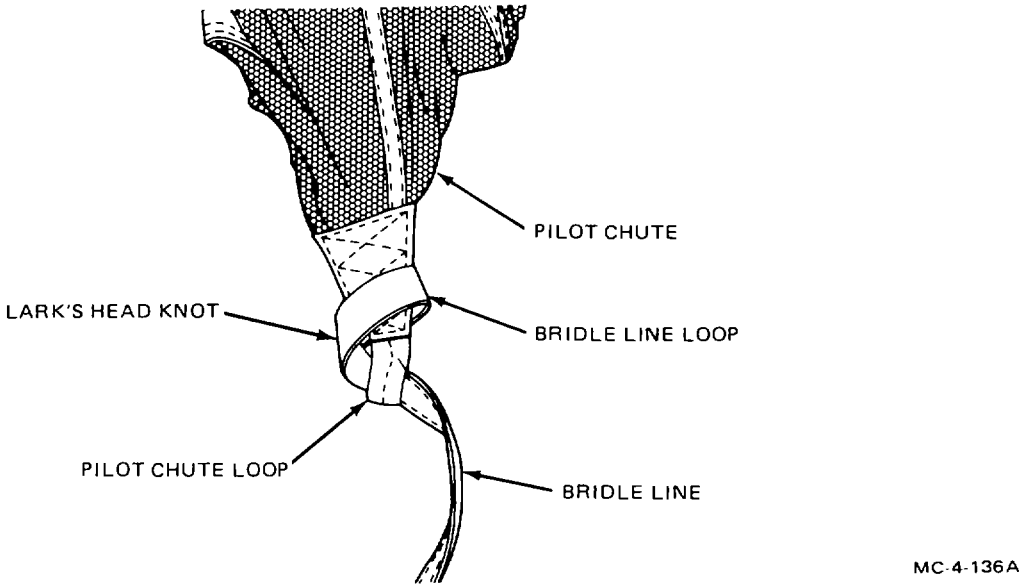


Figure 2-182. Main Pilot Chute Replacement.

2-23. Main Pilot Chute (CONT).

(2) Remove bridle line from loop at bottom end of pilot chute.

(3) Pass bridle line through loop at bottom end of replacement pilot chute.

(4) Pass plot chute through loop at end of bridle line and pull tight forming a lark's head knot.

2-24. Main Deployment Bag.

This task covers: Repair

Tools:

Die Set, Spur Grommet No. 5, Item 8, Appendix B
Mallet, Large Leather, Item 15, Appendix B
Pliers, Large, Diagonal Cut, Item 19, Appendix B
Sewing Machine, Light Duty (Table 2-2)
Shears, Item 22, Appendix B
area. Bridle line removed from deployment

Materials/Parts:

Cloth, Nylon, MIL-C-7219, Type III, Class 3, Black, Item 4, Appendix D
Grommet, Metallic, No. 5, MIL-G-16491, Type III, Class 2
Grommet, Metallic, Spur Washer, No. 5, MIL-G-16491, Type III, Class 2
Thread, Nylon, V-T-295, Size E, Item 28, Appendix D

Personnel Required:

MOS/43E Parachute Rigger

Equipment Condition:

Lay out on packing table or other suitable bag.

a. Restitching. Sew over loose or broken stitching on original stitch line with size E nylon thread. New stitching shall extend 3/4 inch beyond affected area in both directions.

NOTE

For stitching, use stitch type 301, FED-STD-751, 7 to 11 stitches per inch.

b. Patching. Apply a basic or miscellaneous patch, as required, in accordance with paragraph 2-19e.

c. Bridle Grommet Replacement. Replace bridle grommet as follows:

(1) Cut crimped edge of damaged grommet at three or four points.

(2) Remove grommet and washer.

2-24. Main Deployment Bag (CONT).

(3) Cover hole in deployment bag with square patch of nylon cloth that is 3/8-inch larger than grommet washer (figure 2-183).

(4) Turn edges under 1/4 inch and sew to deployment bag with size E nylon thread, 7 to 11 stitches per inch, type 301. Stitch patch on all four sides with two rows of stitching.

(5) Cut a 5/8-inch diameter hole (No. 5 punch) in center of patch.

(6) Place grommet washer on inside of patch. Place grommet on outside of patch.

(7) Lock grommet and grommet washer in place with die set.

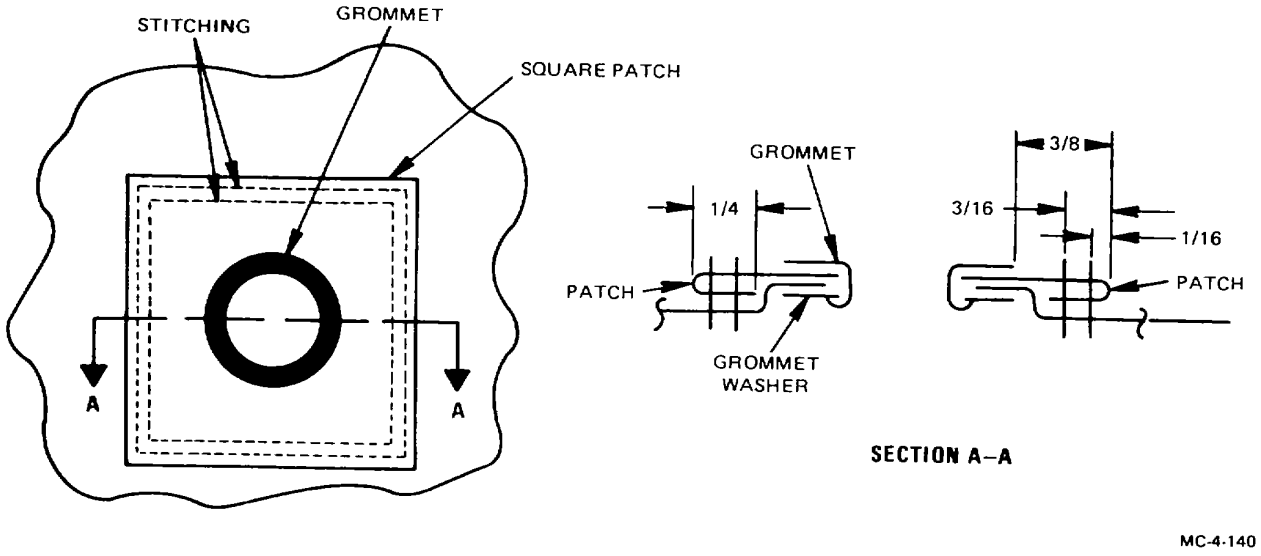


Figure 2-183. Deployment Bag Bridle Grommet Replacement.

2-25. Reserve Pilot Chute or Reserve Deployment Bag and Bridle Line.

This task covers:

a. Removal

b. Installation

Materials/Parts:

Deployment Bag and Bridle Assembly, P/N 11-1-3544
Pilot Chute, Reserve, P/N 11-1-3545

Equipment Condition:

Lay out on packing table or other suitable area.

Personnel Required:

MOS/43E Parachute Rigger

a. *Removal.* Remove reserve pilot chute or deployment bag and bridle assembly as follows:

(1) Loosen reserve deployment bag bridle line lark's head knot enough so that bridle line and deployment bag can be passed through loop in end of bridle line (figure 2-184).

(2) Remove reserve deployment bag bridle line at bottom end of pilot chute.

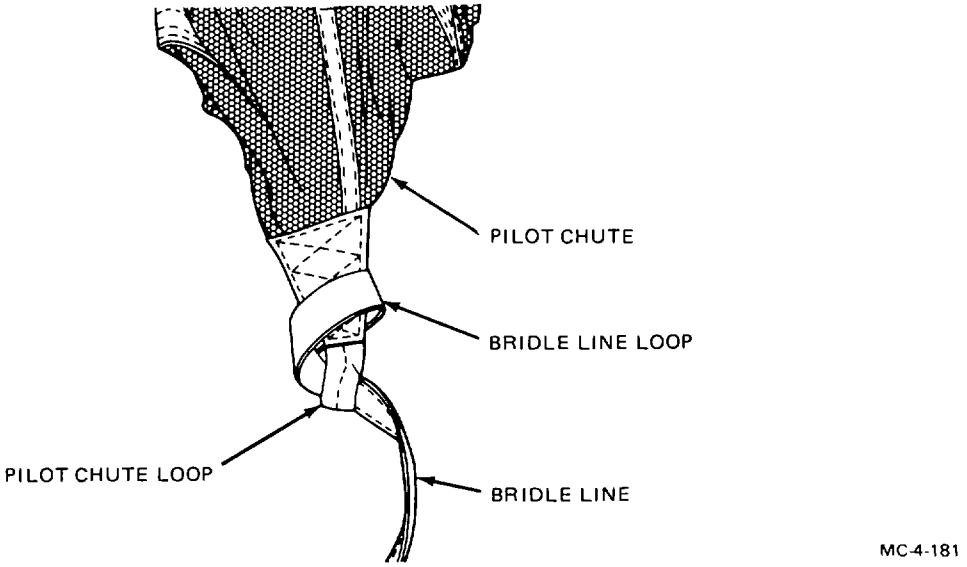


Figure 2-184. Reserve Pilot Chute or Deployment Bag and Bridle Line Replacement

2-25. Reserve Pilot Chute or Reserve Deployment Bag and Bridle Line (CONT).

b. *Installation.* Install reserve pilot chute or deployment bag and bridle line as follows:

(1) Pass bridle line through loop at bottom end of pilot chute.

(2) Pass deployment bag through loop at end of bridle line and pull tight, forming a lark's head knot.

2-26. Safety Stow Loop.

This task covers:

a. Removal b. Installation

Materials/Parts:

Loop, Safety Stow, P/N 11-1-3533

Equipment Condition:

Lay out on packing table or other suitable area.

Personnel Required:

MOS/43E Parachute Rigger

a. Removal. Remove safety stow loop as follows:

(1) Pull both ends of safety stow loop down through grommets on reserve deployment bag (figure 2-185).

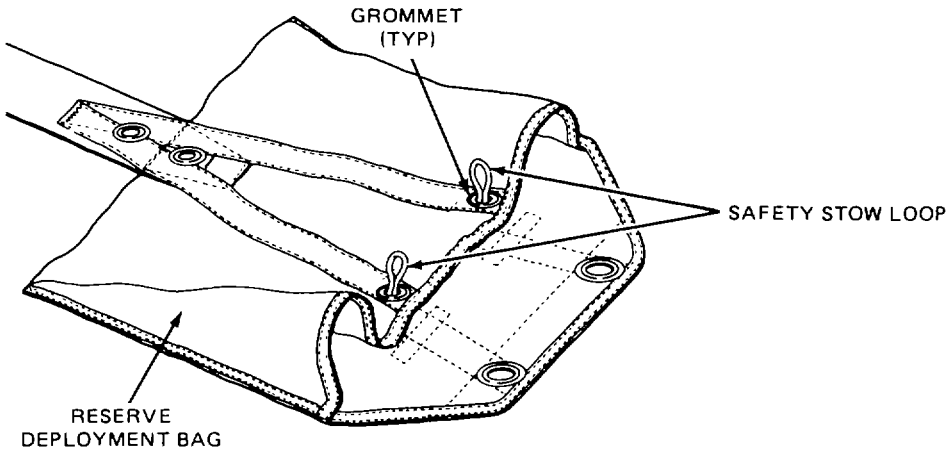


Figure 2-185. Pulling Safety Stow Loop through Grommets.

2-26. Safety Stow Loop (CONT).

(2) Pull safety stow loop completely through guide channel. Cut safety stow loop before discarding. This will prevent inadvertent re-use (figure 2-186).

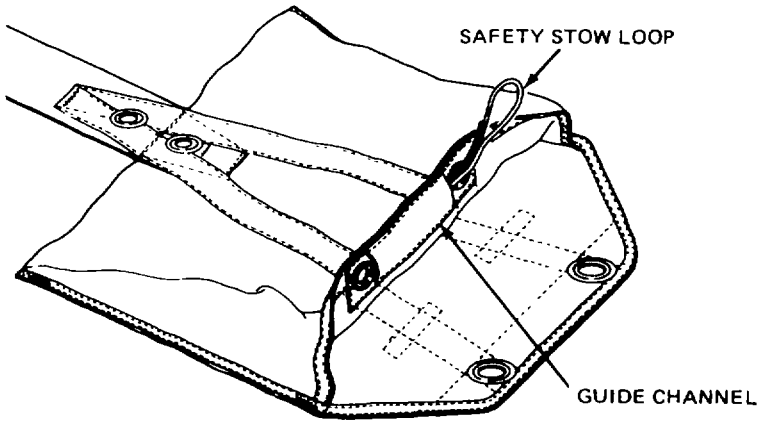


Figure 2-186. Removing Safety Stow Loop.

b. Installation. Install safety stow loop as follows:

(1) Insert safety stow loop through guide channel in reserve deployment bag, then center splice on loop between grommets (figure 2-187).

(2) Thread both ends of loop up through corresponding grommets.

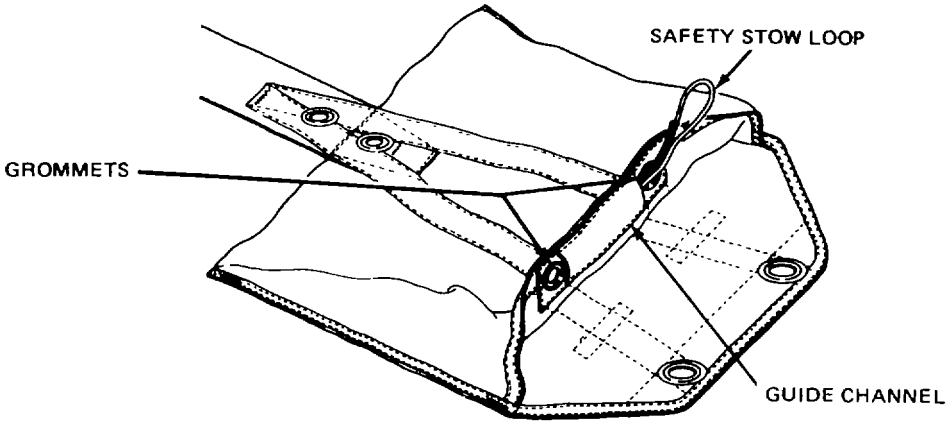


Figure 2-187. Safety Stow Loop Installation.

2-27. Canopy.

This task covers: Repair

Tools:

Sewing Machine, Bartack (Table 2-2)
Sewing Machine, Darning (Table 2-2)
Sewing Machine, Double Needle (Table 2-2)
Sewing Machine, Light Duty (Table 2-2)
Sewing Machine, Medium Duty (Table 2-2
Shears, Item 22, Appendix B
Stitch Removal Tool, Item 23, Appendix B
Tape Measure, Item 24, Appendix B

Materials/Parts:

Cloth, Nylon Ripstop, MIL-C-44378, Type I, Item 5, Appendix D
Tape, Nylon, MIL-T-5038, Type III, Class I, 3/4-inch wide, Item 23, Appendix D
Thread, Nylon, V-T-295, Size A, Item 27, Appendix D
Thread, Nylon, V-T-295, Size E, Item 28, Appendix D

Personnel Required:

MOS/43E Parachute Rigger

Equipment Condition:

Lay out on packing table or other suitable area.

a. Darning and Patching. Repair canopy by darning, patching, or restenciling (as required) in accordance with paragraphs 2-19 and 2-21. Stitching and darning is specified in table 2-3.

b. Seam Repair. Repair seams by restitching in accordance with paragraph 2-19, using a light duty sewing machine. Use figure 2-188 as a guide for construction of the applicable seam.

c. Reinforcement Tape Replacement. Repair damaged reinforcement tape as follows:

(1) Carefully remove stitches and remove damaged tape.

(2) If adjacent canopy material is damaged, patch in accordance with paragraph 2-19.

(3) Cut new reinforcement tape 4 inches longer than damaged area. Center new reinforcement tape over damaged area. Using a light duty sewing machine, sew in place with size E nylon thread using original stitch pattern.

2-27. Canopy (CONT).

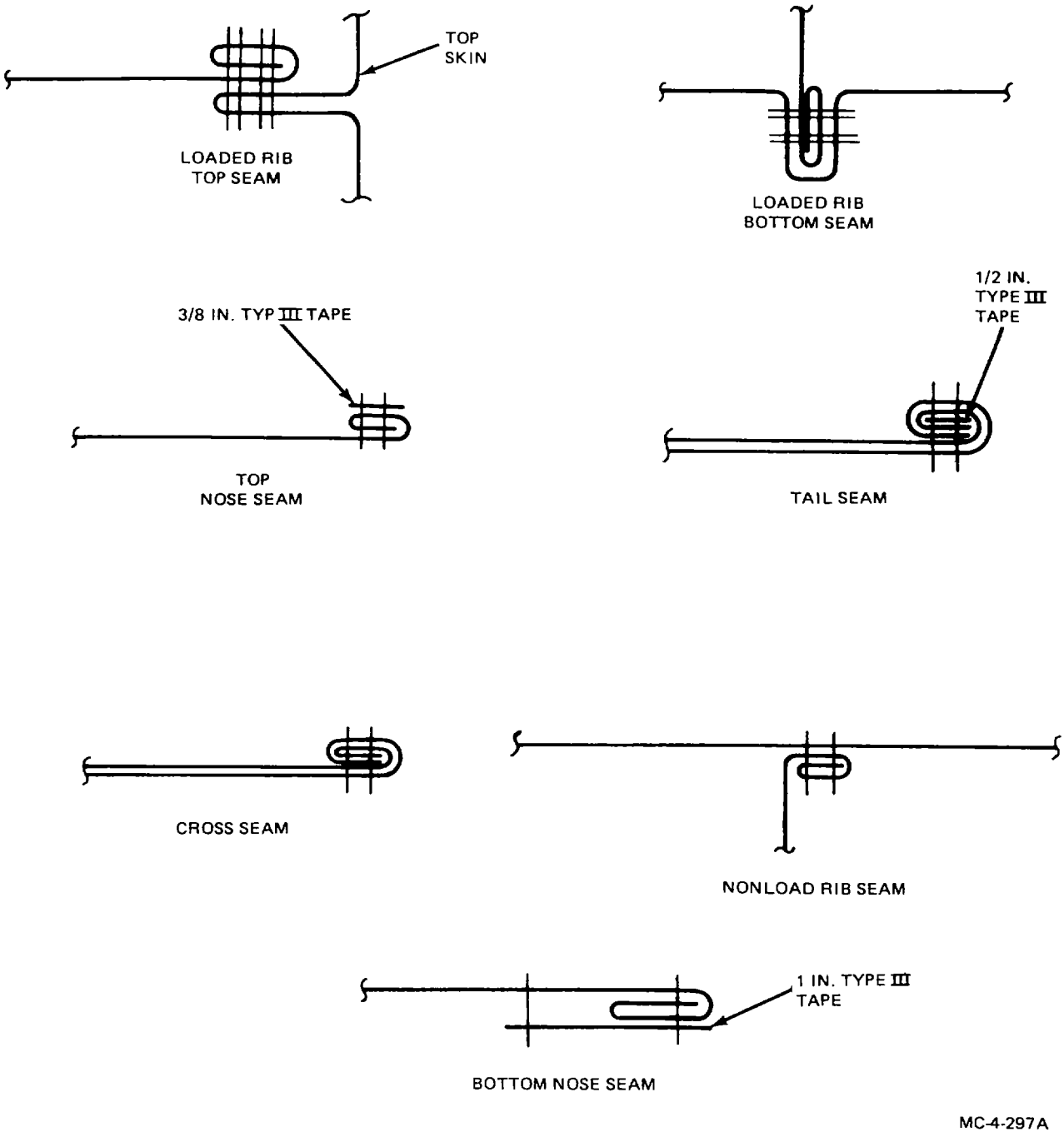


Figure 2-188. Seam Repair.

2-28. Main Canopy.

This task covers: Replacement

Tools:

Needle, Tacking, Item 16, Appendix B
Shears, Item 22, Appendix B
Wrench, 7/16-Inch, Open End, Item 25, Appendix B

Materials/Parts:

Canopy, Main, P/N 11-1-3518-0
Tape, Lacing, Nylon, MIL-T-43435, Item 22, Appendix D

Personnel Required:

MOS/43E Parachute Rigger

Equipment Condition:

Lay out on packing table or other suitable area. Remove pilot chute, deployment bag, and bridle bag, and bridle line (paragraphs 2-22 and 2-23).

Follow-Up Procedure:

Rig canopy (paragraph 2-8).

a. Remove steering lines from toggle rings by untying overhand knots (figure 2-189).

b. Remove steering lines from guide rings on rear risers.

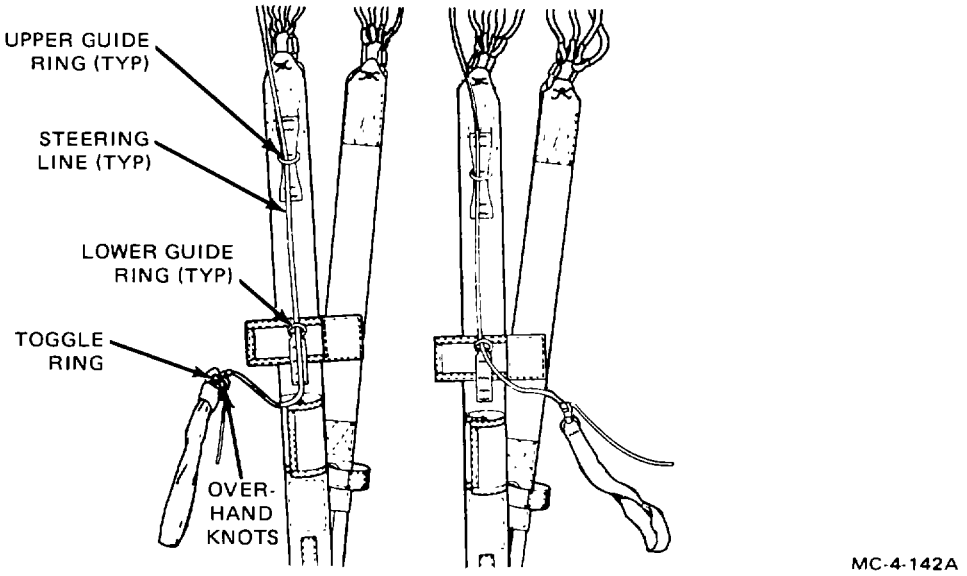


Figure 2-189. Removing Steering Lines.

2-28. Main Canopy (CONT).

c. Cut and remove tackings on risers below connector links (figure 2-190).

d. Loosen barrel nuts on connector links with 7/16-inch open end wrench.

e. Remove connector links from risers.

f. Perform follow-up procedure.

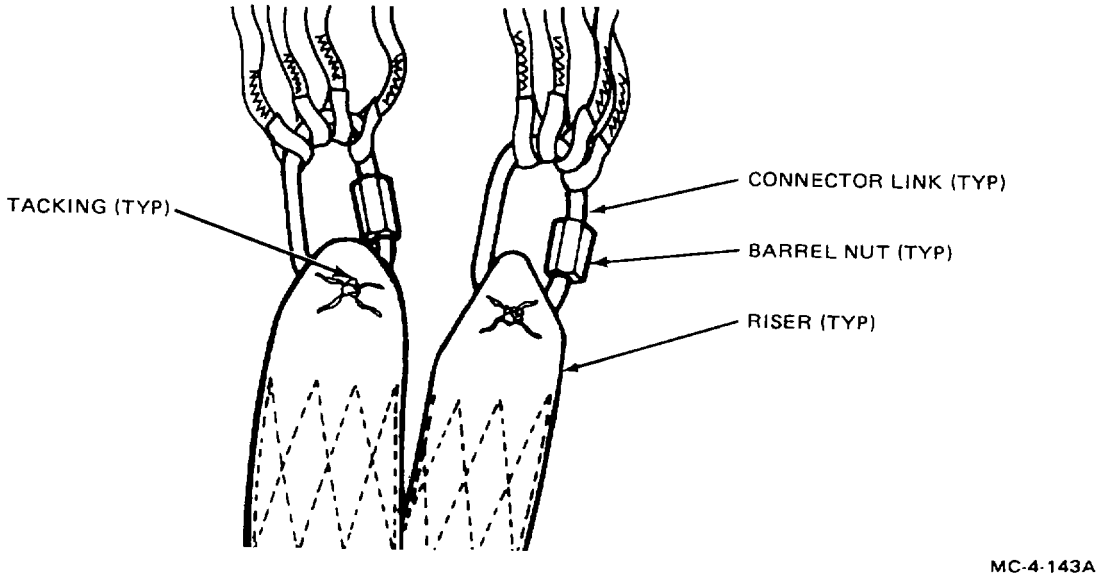


Figure 2-190. Removing Connector Links from Risers.

2-29. Reserve Canopy.

This task covers: Replacement

Tools:

Needle, Tacking, Item 16, Appendix B
Shears, Item 22, Appendix B
Wrench, 7/16-Inch, Open End, Item 25, Appendix B

Materials/Parts:

Canopy, Reserve, P/N 11-1-3518-1
Tape, Lacing, Nylon, MIL-T-43435, Item 22, Appendix D
Thread, Cotton, V-T-276, 24/4, Item 26, Appendix D

Personnel Required:

MOS/43E Parachute Rigger

Equipment Condition:

Lay out on packing table or other suitable area.

Follow-Up Procedure:

Rig Canopy (paragraph 2-7).

a. Cut and remove tackings securing toggles and steering lines to risers.

b. Remove steering lines from toggle rings by untying overhand knots (figure 2-191).

c. Remove steering lines from guide rings on rear risers.

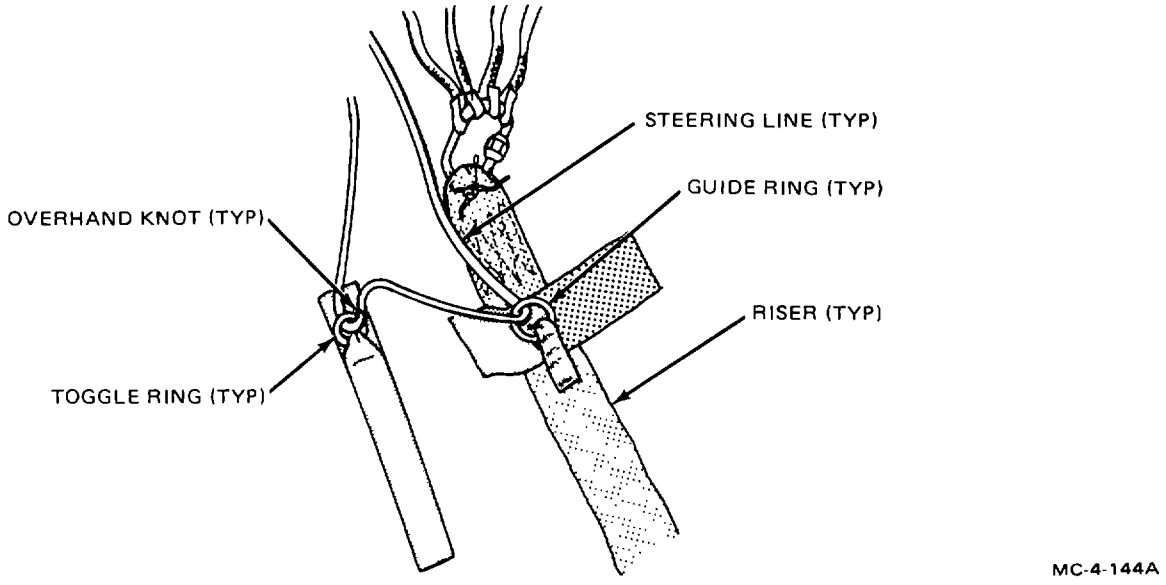


Figure 2-191. Removing Steering Lines.

2-29. Reserve Canopy (CONT).

d. Cut and remove tackings on risers below connector links (figure 2-192).

e. Loosen barrel nuts on connector links with 7/16-inch open end wrench.

f. Remove connector links from risers.

g. Perform follow-up procedure.

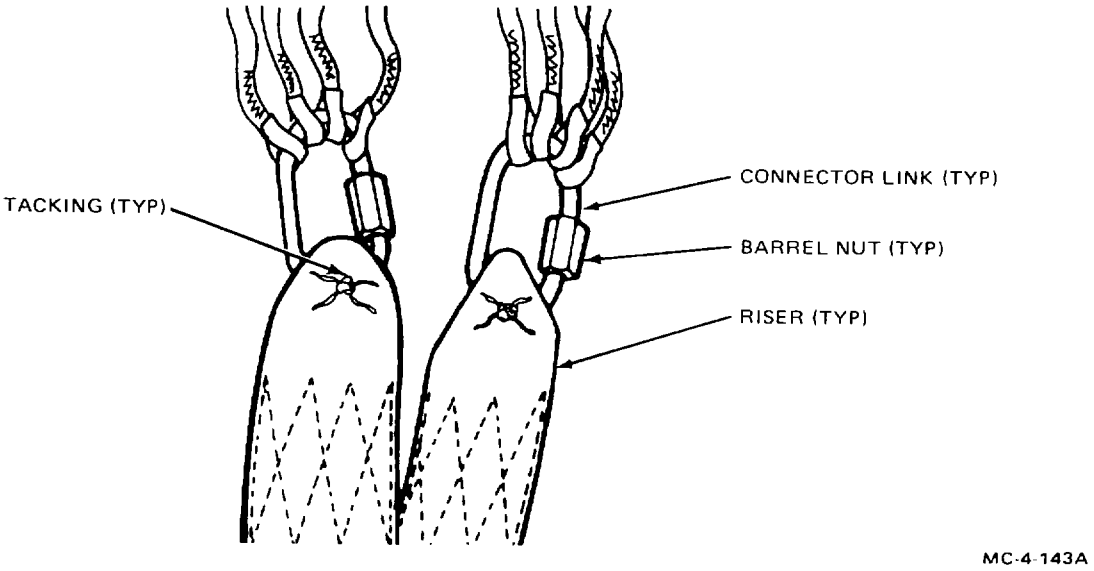


Figure 2-192. Removing Connector Links from Risers.

2-30. Suspension Lines (Lines AB4 and AB5 Only).

This task covers: Replacement

Tools:

Sewing Machine, Bartack (Table 2-2)
Shears, Item 22, Appendix B
Tape Measure, Item 24, Appendix B

Materials/Parts:

Cord, Dacron, 600-Pound, T-C-2754, Type I, Item 7, Appendix D
Thread, Nylon, V-T-295, Size E, Item 28, Appendix D

Personnel Required:

MOS/43E Parachute Rigger

Equipment Condition:

Lay out on packing table or other suitable area.

Follow-Up Procedure:

Continuity check and canopy trim check (paragraphs 2-7c and g or 2-8c and g).

NOTE

Suspension line replacement is done at the direct support (intermediate) level as outlined in the Maintenance Allocation Chart (MAC).

This procedure applies only to lines AB4 and AB5 which in each case are one continuous line, running from the forward center cell (A lines) of the canopy to the inboard side of the front connector links, then back to the forward center cell (B lines) of the canopy.

2-30. Suspension Lines (Lines AB4 and AB5 Only) (CONT).

a. Find the approximate mid-point of replacement line. Position midpoint at inboard (barrel side) of connector link. Secure line to connector link with bartack stitch. Bartack begins 3/4 ± 1/8 inch from end of loop and is 5/8-inch long by 1/8-inch wide (figure 2-193).

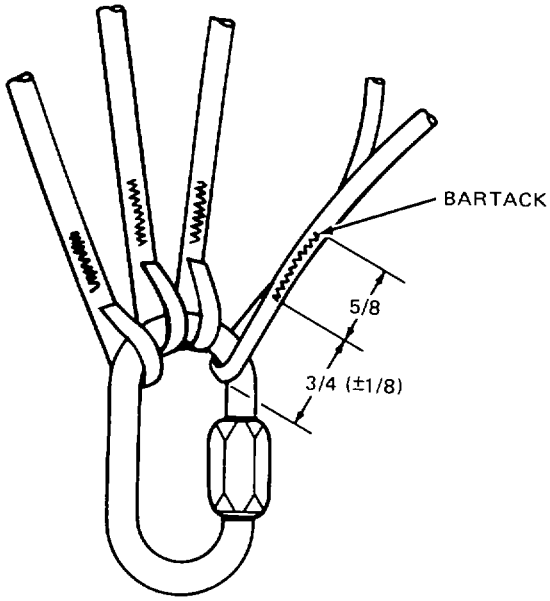


Figure 2-193. Suspension Line Attached to Connector Link.

b. Route both free ends of line through front slider grommet to proper canopy attachment points. Tie free end of line to attachment loop with a french locking knot. Adjust line to proper trim using other lines in the group as reference (figure 2-194).

c. When adjusted, lay free end of line on top of main line and secure with 5/8-inch by 1/8-inch bartack placed as close to knot as possible. Trim line 1/16 inch from bartack.

d. Perform follow-up procedure.

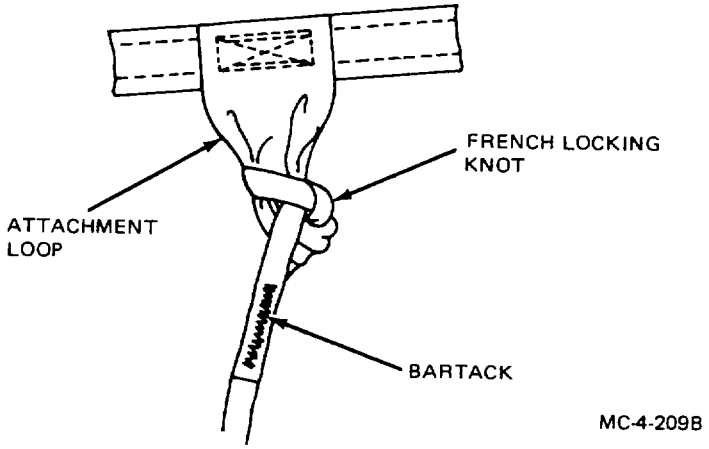


Figure 2-194. Suspension Line Attached to Canopy.

2-31. Suspension Line Sets (Preferred Method).

This task covers: Replacement

Tools:

Needle, Tacking, Item 16, Appendix B
Sewing Machine, Bartack (Table 2-2)
Shears, Item 22, Appendix B
Wrench, 7/16-Inch, Open-Ended, Item 25, Appendix B

Materials/Parts:

Suspension Line Set, P/N 11-1-3699
Tape, Lacing, Nylon, MIL-T-43435, Item 22, Appendix D
Thread, Nylon, V-T-295, Size E, Item 28, Appendix D

Personnel Required:

MOS/43E Parachute Rigger

Equipment Condition:

Canopy in proper layout (paragraphs 2-17b or 2-18c).

Follow-Up Procedure:

Continuity check and canopy trim check (paragraphs 2-7c and g or 2-8c and g).

NOTE

Suspension line replacement is done at the direct support (intermediate) level as outlined in the Maintenance Allocation Chart (MAC).

Replacement of suspension lines as a set is the preferred method. If suspension line sets are not available, replacement of individual lines from bulk material is authorized. Refer to paragraph 2-32.

a. With canopy in proper layout, place replacement connector link adjacent to connector link with damaged line(s).

b. Using old lines as a guide, route replacement lines through proper slider grommet to appropriate canopy attachment points and mark lines.

2-31. Suspension Line Sets (Preferred Method) (CONT).

c. Cut and remove old lines from attachment loops. Route replacement lines through attachment loops, and with mark centered in loop, secure with a french locking knot (figure 2-195).

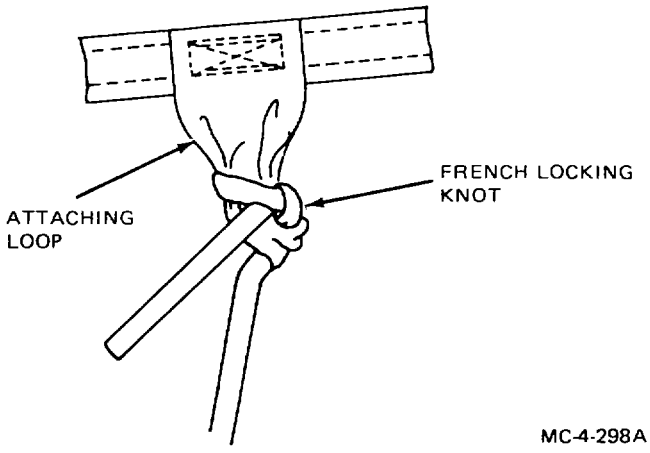


Figure 2-195. Replacement Line Secured with French Locking Knot.

d. Cut and remove tackings on risers below connector links (figure 2-196).

e. Loosen barrel nuts on connector links with 7/16-inch open end wrench.

f. Remove connector links from risers and discard old lines.

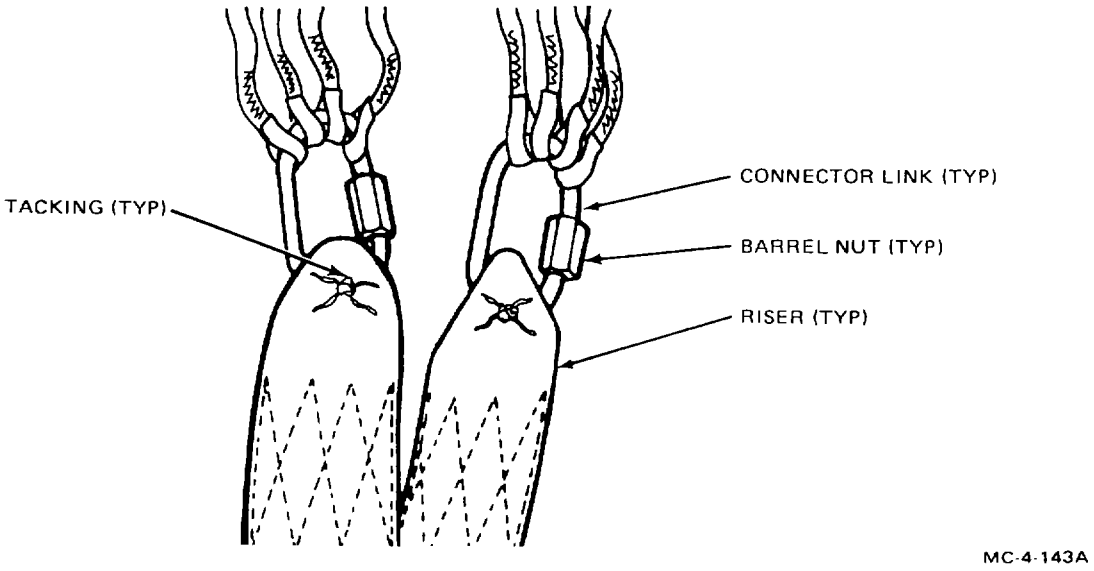


Figure 2-196. Changing Connector Links at Risers.

g. Connect connector links to risers. Connector link barrel nuts must face inboard and tighten downward.

h. Using 7/16-inch open end wrench, tighten barrel nut on connector links until firmly seated against flange.

i. Hand tack each riser at connector link with one turn double nylon lacing tape (figure 2-196).

j. Perform a canopy trim check in accordance with paragraph 2-7g or 2-8g, as applicable. Adjust lengths of suspension lines at french locking knots to achieve required results.

k. When adjusted, lay free end of line on top of main line and secure with a 5/8-inch by 1/8-inch bartack placed as close to the knot as possible. Trim line 1/16 inch from bartack (figure 2-197).

l. Perform follow-up procedure.

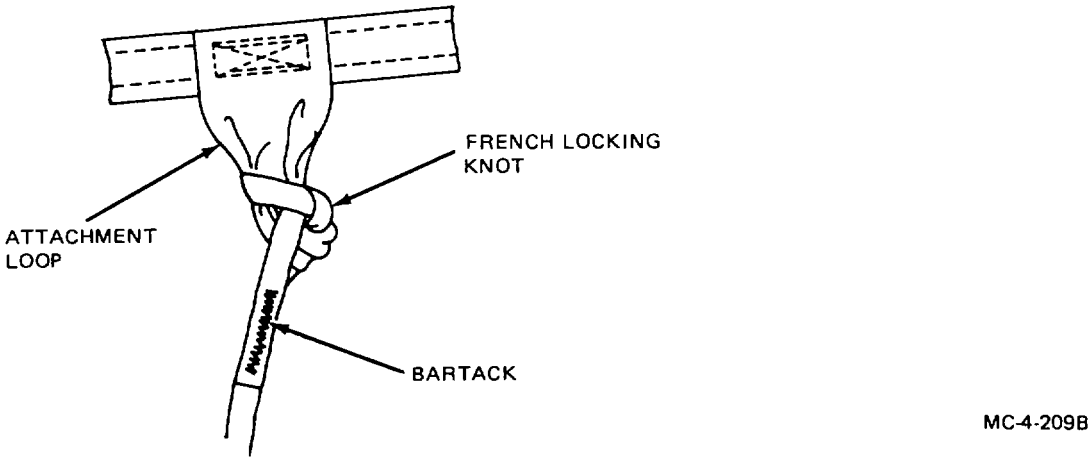


Figure 2-197. Suspension Line Attached to Canopy.

2-32. Suspension Lines/Cascaded Lines (Alternate Method).

This task covers: Replacement

Tools:

Finger Trap Tool, Item 11, Appendix B
Sewing Machine, Bartack (Table 2-2)
Shears, Item 22, Appendix B
Tape Measure, Item 24, Appendix B

Materials/Parts:

Cord, Dacron, 600-Pound, TC-2754, Type I, Item 7, Appendix D
Thread, Nylon, V-T-295, Size E, Item 28, Appendix D

Personnel Required:

MOS/43E Parachute Rigger

Equipment Condition:

Lay out on packing table or other suitable area.

Follow-Up Procedure:

Continuity check and canopy trim check (paragraphs 2-7c and g or 2-8c and g).

NOTE

Suspension line replacement is done at the direct support (intermediate) level as outlined in the Maintenance Allocation Chart (MAC).

This procedure is authorized only if pre-manufactured suspension line sets are unavailable.

This procedure applies to all lines except lines AB4 and AB5. To replace lines AB4 and AB5, refer to paragraph 2-30.

a. Main Suspension Lines. Replace main suspension lines as follows:

(1) Trim end of replacement line with scissors and taper approximately 1/4 inch. Route line through connector link and finger-trap 3 inches of line forming a 3/4 ± 1/8-inch loop at connector link (figure 198).

(2) Secure line with a 5/8-inch by 1/8-inch bartack beginning 1/8 inch from loop.

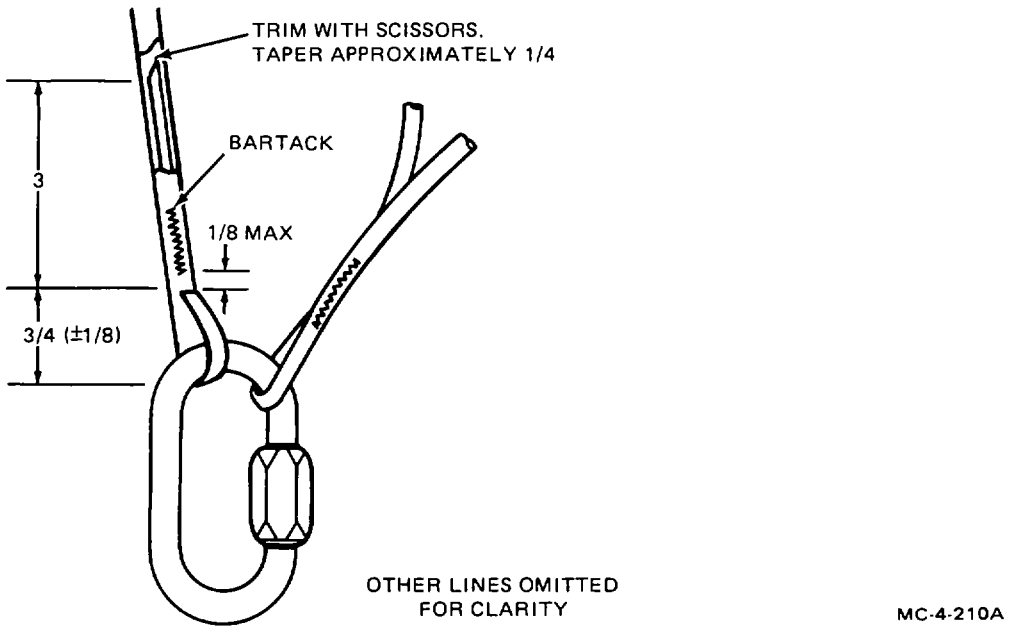


Figure 2-198. Suspension Line Attached to Connector Link.

(3) Route free end of line through proper slider grommet to appropriate canopy attachment point. Tie free end of line to attachment loop with a french locking knot. Adjust line to the proper trim using the other lines In the group as reference (figure 2-199).

(4) When adjusted, lay free end of line on top of main line and secure with a 5/8-inch by 1/8-inch bartack placed as close to knot as possible. Trim line 1/16 inch from bartack.

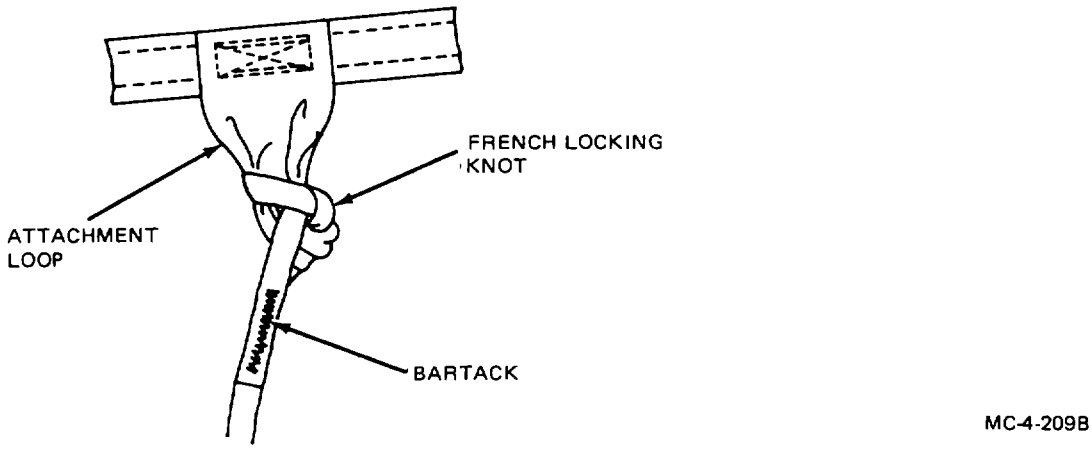


Figure 2-199. Suspension Line Attached to Canopy.

2-32. Suspension Lines/Cascaded Lines (Alternate Method) (CONT).

b. Cascaded Suspension Lines. Replace cascaded suspension lines as follows:

(1) Lay replacement cascaded line on top of main line in same location as old line. Secure cascaded line to main line with two 5/8-inch by 1/8-inch bartacks, located 1/8 inch apart. Sear cut cascaded line 1/16 inch from end of bartack (figure 2-200).

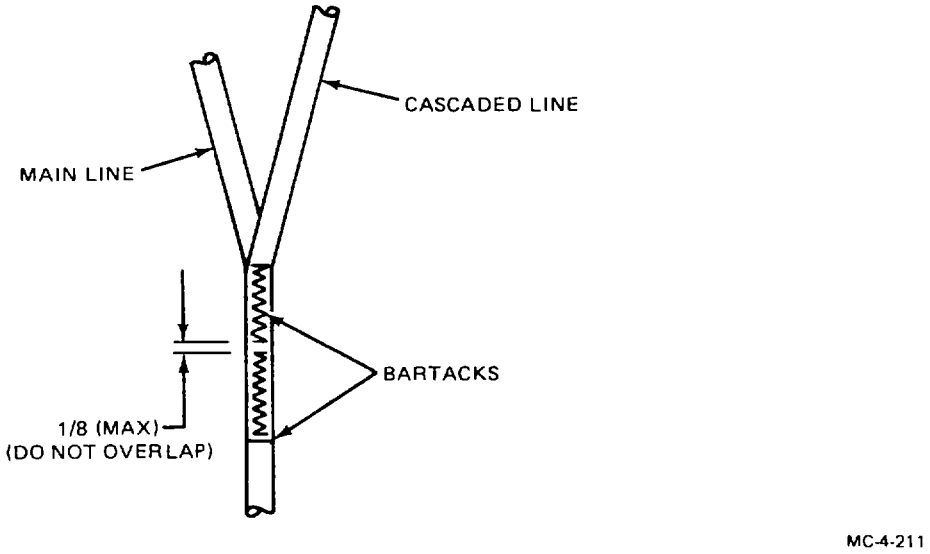


Figure 2-200. Cascaded Line Attached to Main Line.

(2) Tie free end of cascaded line to canopy attachment loop with a french locking knot. Adjust line to proper trim using other lines in group as reference (figure 2-201).

(3) When adjusted, lay free end of line on top of main line and secure with a 5/8-inch by 1/8-inch bartack placed as close to knot as possible. Trim line 1/16 inch from bartack.

(4) Perform follow-up procedure.

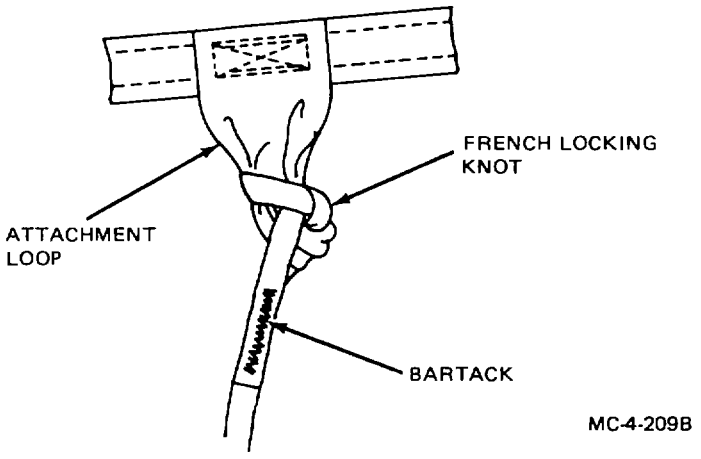


Figure 2-201. Cascaded Line Attached to Canopy.

2-33. Steering Lines.

This task covers: Replacement

Tools:

Sewing Machine, Bartack (Table 2-2)
Shears, Item 22, Appendix B

Materials/Parts:

Steering Line Set, Main, P/N 11-1-3700-0
Steering Line Set, Reserve, P/N 11-1-3700-1
Thread, Nylon, V-T-295, Size E, Item 28, Appendix D

Personnel Required:

MOS/43E Parachute Rigger

Equipment Condition:

Lay out on packing table or other suitable area.

Follow-Up Procedure:

Initial Receipt (paragraphs 2-7f or 2-8e).

NOTE

Steering line replacement is done at the direct support (intermediate) level as outlined in the Maintenance Allocation Chart (MAC).

a. Lay out upper steering lines at their corresponding attachment loops. Route lines through attachment loops, adjust in accordance with paragraphs 2-7f or 2-8e, and secure with a french locking knot (figure 2-202).

b. Apply equal tension to all lines and adjust trim.

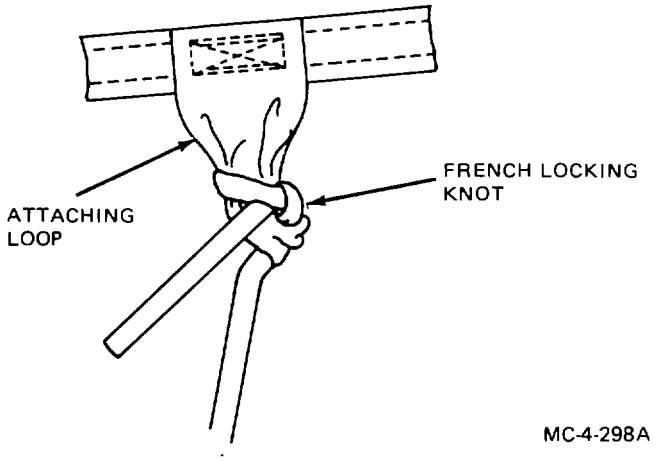


Figure 2-202. Replacement Line Secured with French Locking Knot.

2-33. Steering Lines (CONT).

c. When adjusted, lay free ends of lines on top of main lines and secure with a 5/8-inch by 1/8-inch bartack placed as close to knot as possible. Trim lines 1/16 inch from bartack (figure 2-203).

d. Perform follow-up procedure.

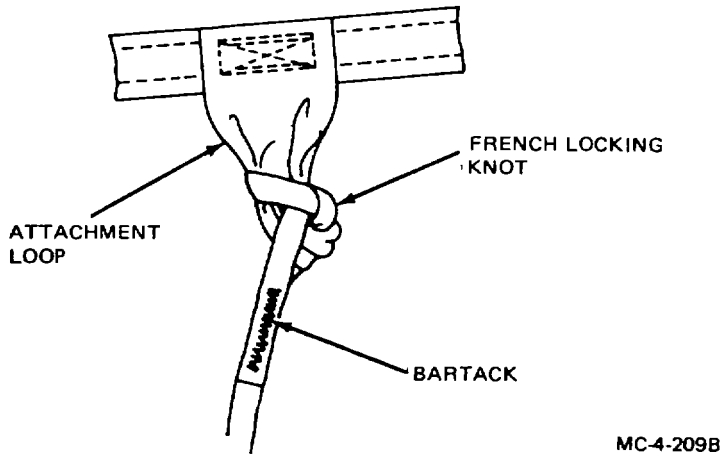


Figure 2-203. Steering Lines Attached to Canopy.

2-34. Slider.

This task covers:

a. Repair b. Replacement

Tools:

Die Set, Spur Grommet No. 8, Item 9, Appendix B
Mallet, Large Leather, Item 15, Appendix B
Needle, Tacking, Item 16, Appendix B
Pliers, Large, Diagonal Cut, Item 19, Appendix B
Sewing Machine, Darning (Table 2-2)
Sewing Machine, Light Duty (Table 2-2)
Sewing Machine, Medium Duty (Table 2-2)
Shears, Item 22, Appendix B
Tape Measure, Item 24, Appendix B
Wrench, 7/16-Inch, Open End, Item 25, Appendix B

Materials/Parts:

Steering lines removed from riser guide rings.
Cloth, Nylon, Ripstop, MIL-C-44378, Item 5, Appendix D
Grommet, Metallic, No. 8, MIL-G-16491, Type III, Class 2
Grommet, Metallic, Spur Washer, No. 8, MIL-G-16491, Type III, Class 2

Materials/Parts (CONT):

Slider, P/N 11-1-3531
Tape, Lacing, Nylon, MIL-T-43435, Item 22, Appendix D
Thread, Nylon, V-T-295, Size A, Item 27, Appendix D
Thread, Nylon, V-T-295, Size E, Item 28, Appendix D

Personnel Required:

MOS/43E Parachute Rigger

Equipment Condition:

Lay out on packing table or other suitable area.

Follow-Up Procedure:

Initial receipt (paragraph 2-7 or 2-8).

a. Repair. Slider repair is limited to restitching, darning, patching (basic patch only), and grommet replacement.

(1) Restitching, darning, and patching. Repair slider by restitching, darning, or patching (basic patch only) in accordance with paragraph 2-19. Darning is limited to two darns per slider; patching is limited to one basic patch per slider.

2-34. Slider (CONT).

(2) Grommet replacement. Replace damaged grommets as follows:

NOTE

No reinforcement of fabric around grommet hole is permitted. If grommet cannot be replaced without reinforcement, slider replacement is required.

(a) Cut crimped edge of damaged grommet at three or four points.

(b) Remove grommet and washer.

(c) Lock replacement grommet and grommet washers in place with die set.

b. Replacement. Replace unserviceable slider as follows:

(1) Cut and remove tackings from risers (figure 2-204).

(2) Using a 7/16-inch open end wrench, loosen barrel nuts on connector links and remove risers.

(3) Remove connector links and steering lines from risers.

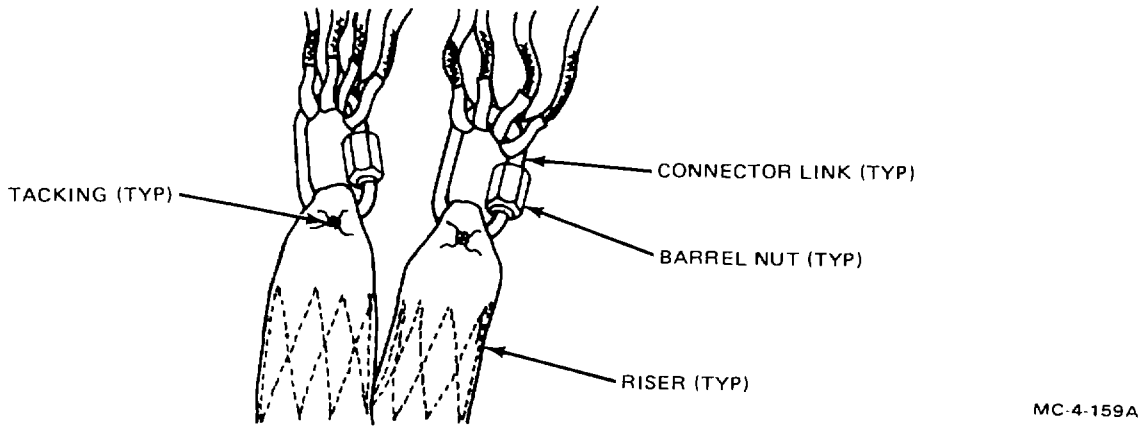


Figure 2-204. Removing Risers and Lines from Connector Links.

(4) Remove slider from suspension lines and steering lines.

NOTE

Ensure 28-inch side of slider faces to front or leading edge of canopy.

(5) Insert suspension lines, steering lines, and connector links through corresponding grommets on slider. Slider is installed with reinforcement tapes facing toward canopy (figure 2-205).

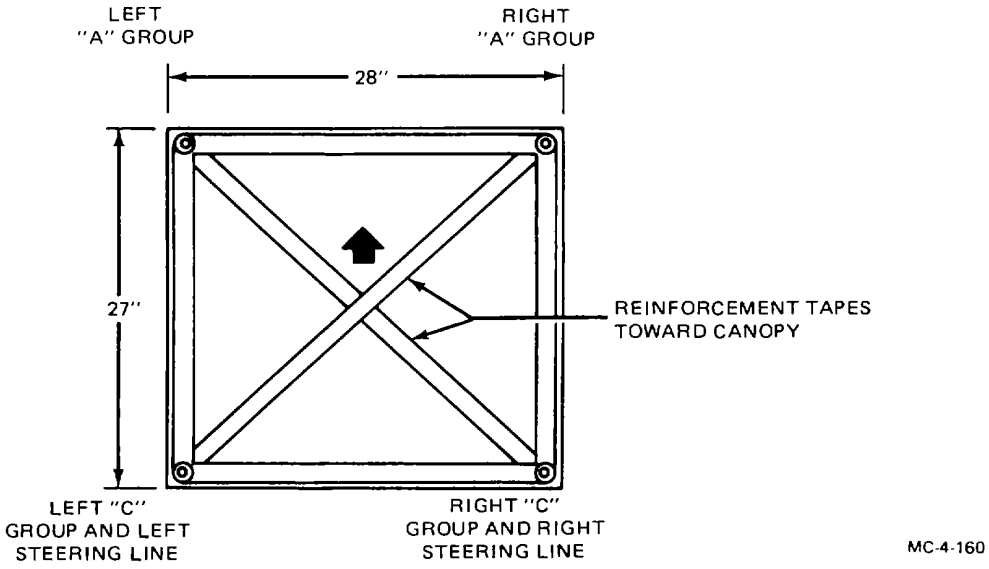


Figure 2-205. Slider Orientation.

(6) Position connector links so that barrels face inboard and tighten downward (figure 2-206).

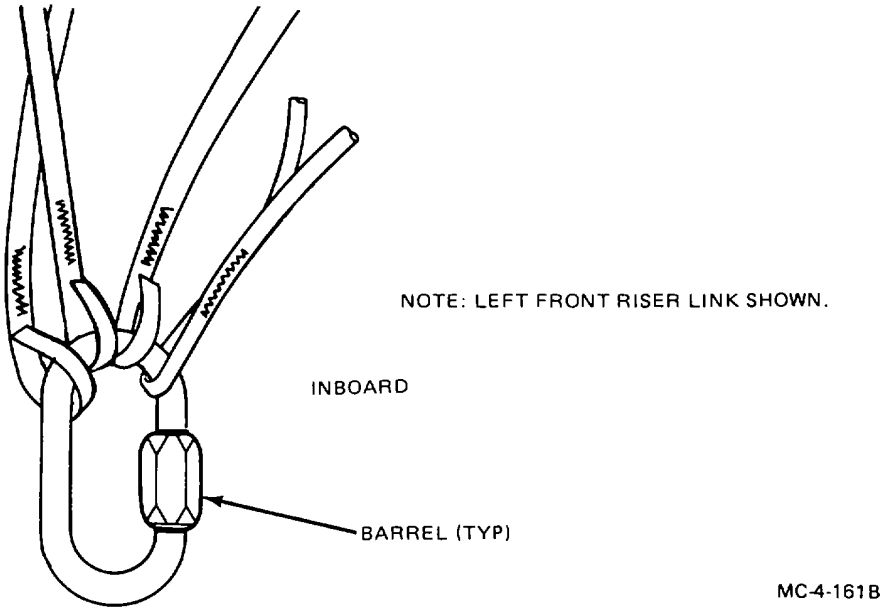


Figure 2-206. Connector Link Orientation.

2-34. Slider (CONT).

(7) Install risers onto applicable connector links (figure 2-207).

(8) Using a 7/16-inch open end wrench, tighten barrel nuts on connector links until firmly seated against flanges.

(9) Hand tack each riser at connector link with one turn double nylon lacing tape.

(10) Perform follow-up procedure.

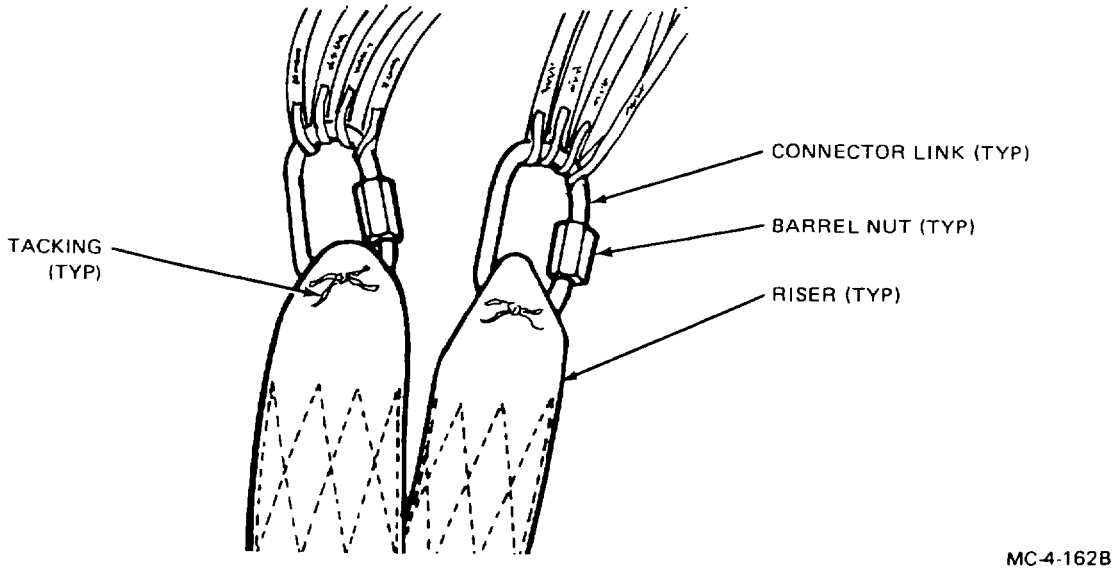


Figure 2-207. Risers Installed and Tacked.

2-35. Connector Links.

This task covers: Replacement

Tools:

Needle, Tacking, Item 16, Appendix B
Shears, Item 22, Appendix B
Wrench, 7/16-Inch, Open-End, Item 25, Appendix B

Materials/Parts:

Link, Connector, 11-1-3699-1
Tape, Lacing, Nylon, MIL-T-43435, Item 22, Appendix D

Personnel Required:

MOS/43E Parachute Rigger

Equipment Condition:

Lay out on packing table or other suitable area.

Follow-Up Procedure:

Initial receipt (paragraph 2-7 or 2-8).

a. Cut and remove tackings from risers (figure 2-208).

b. Using a 7/16-inch open end wrench, loosen barrel nuts on connector links and remove risers.

c. Remove suspension lines from connector links and discard unserviceable links.

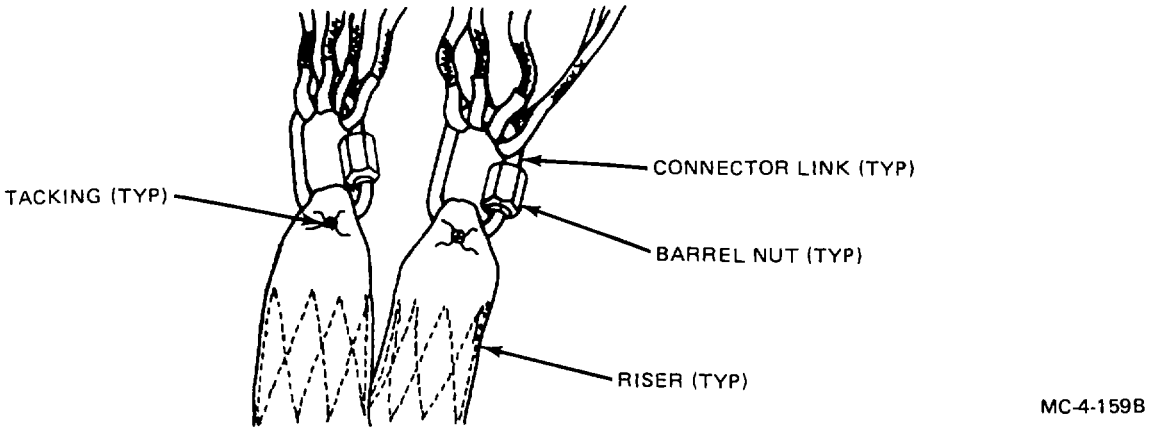


Figure 2-208. Removing Risers and Lines from Connector Links.

2-35. Connector Links (CONT).

d. Position replacement links so that barrels face inboard and tighten downward. Attach suspension lines to their corresponding connector links without crossing (figure 2-209).

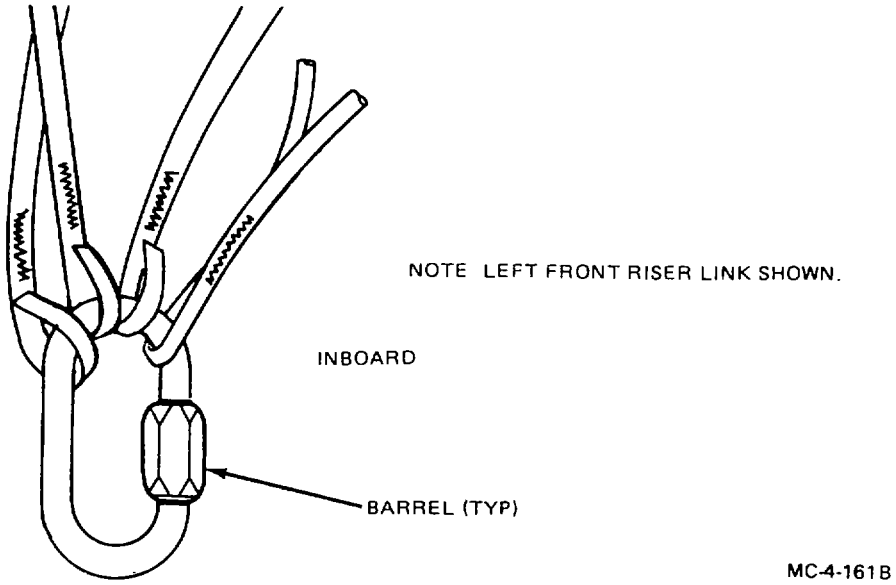


Figure 2-209. Suspension Lines Attached to Connector Links.

e. Install risers onto applicable connector links (figure 2-210).

f. Using a 7/16-inch open end wrench, tighten barrel nuts on connector links until firmly seated against flanges.

g. Hand tack each riser at connector link with one turn double nylon lacing tape.

h. Perform follow-up procedure.

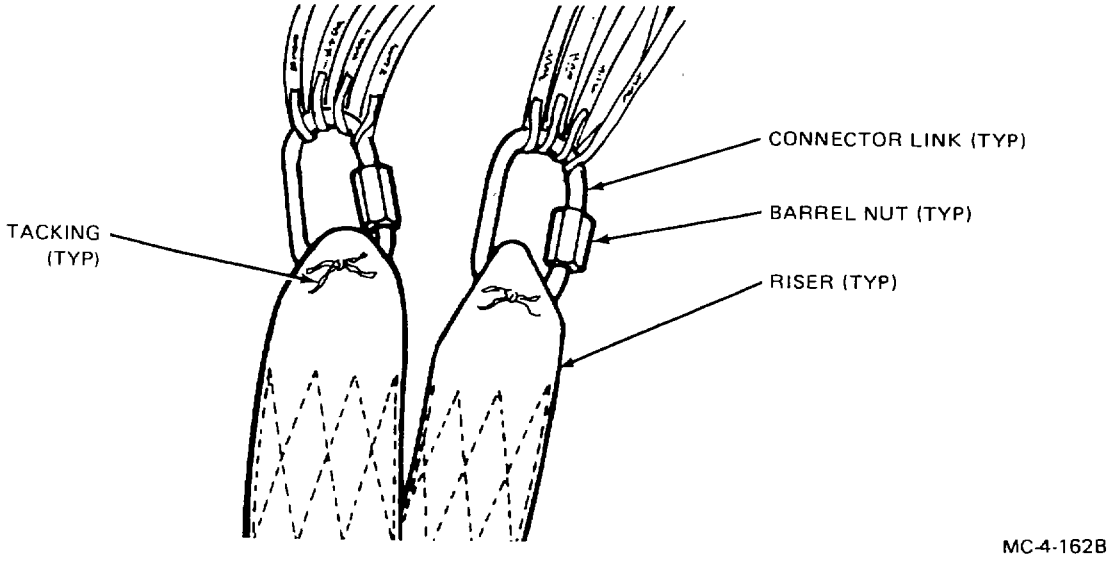


Figure 2-210. Risers Installed and Tacked.

2-36. Main Risers.

This task covers: Replacement

Tools:

Needle, Tacking, Item 16, Appendix B
Shears, Item 22, Appendix B
Wrench, 7/16-Inch, Open-End, Item 25, Appendix B

Materials/Parts:

Riser, 3-Ring, MC-4, P/N 11-1-3519
Tape, Lacing, Nylon, MIL-T-43435, Item 22, Appendix D

Personnel Required:

MOS/43E Parachute Rigger

Equipment Condition:

Lay out on packing table or other suitable area.

Follow-Up Procedure:

Initial Receipt (paragraphs 2-8b through 2-8e).

NOTE

Risers will be replaced in pairs.

a. Remove overhand knots on rear riser steering toggles (figure 2-211).

b. Pull steering lines up through toggle rings and guide rings.

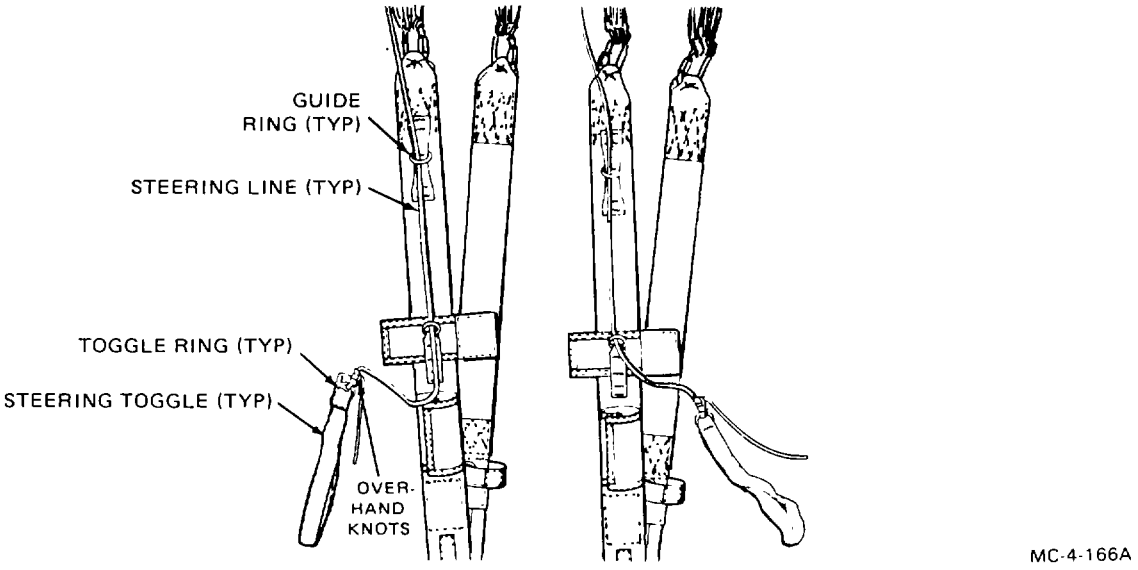


Figure 2-211. Steering Line Removal.

2-36. Main Risers (CONT).

c. Cut and remove tackings from unserviceable risers (figure 2-212).

d. Using a 7/16-inch open end wrench, loosen barrel nuts on connector links and remove risers.

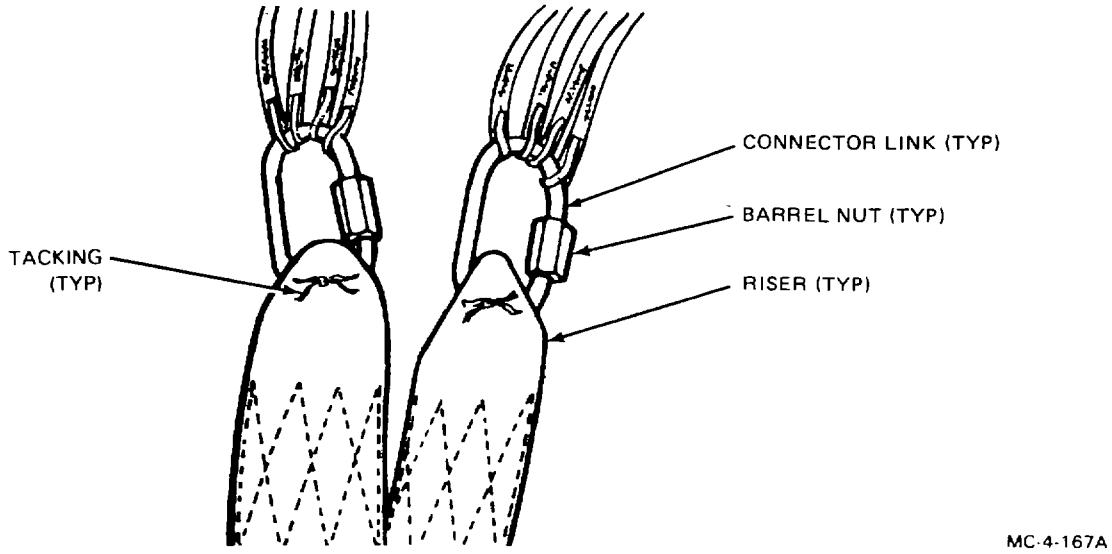


Figure 2-212. Removing Risers from Connector Links.

e. Open snap fastener on reserve static line shackle (figure 2-213).

f. Remove static line from shackle.

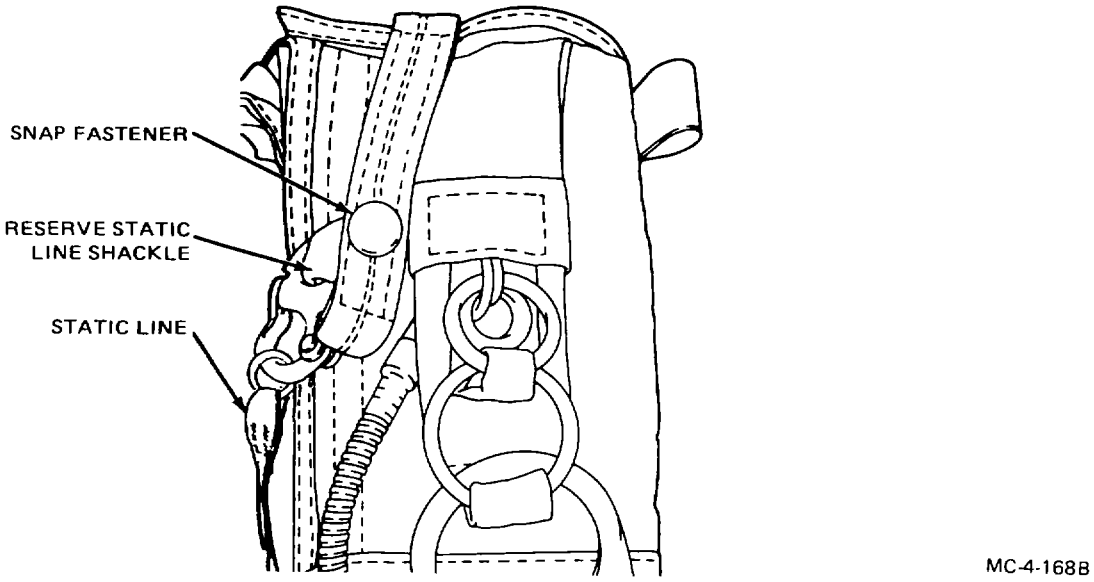


Figure 2-213. Removing Reserve Static Line from Shackle.

g. Pull main canopy release ripcord (figure 2-214). This allows the two rings on the risers to disengage from base ring and complete removal of risers.

h. Test replacement risers in accordance with paragraph 2-16.

I. Compare replacement risers, ensuring there is not more than 1/2 inch difference in length.

j. Route main canopy release cables through appropriate housings (figure 2-214). Mate hook fastener on main canopy release ripcord to pile fastener on main ripcord pocket.

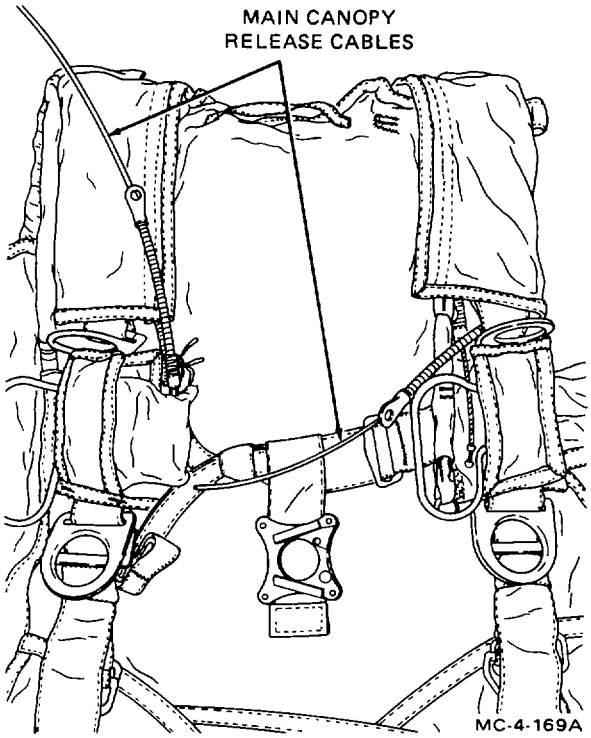


Figure 2-214. Removal of Risers and Installation of Release Cables.

2-36. Main Risers (CONT).

k. Position left riser on left side of harness and right riser on right side of harness.

l. Position medium sized ring on riser behind and through base ring on harness; then rotate upward (figure 2-215).

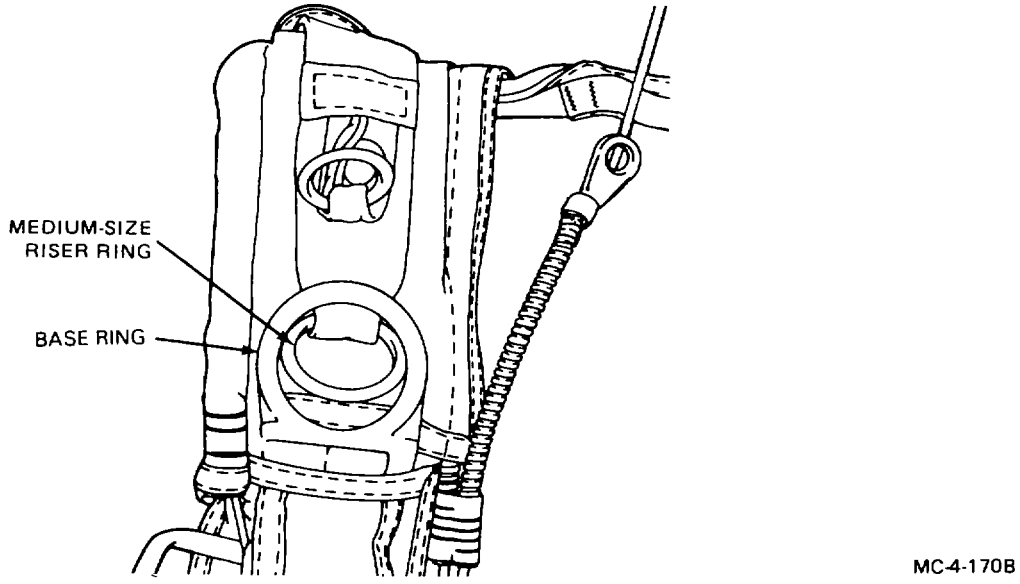


Figure 2-215. Riser Ring through Base Ring.

m. Position small ring on riser behind and through medium sized ring on riser; then rotate upward (figure 2-216).

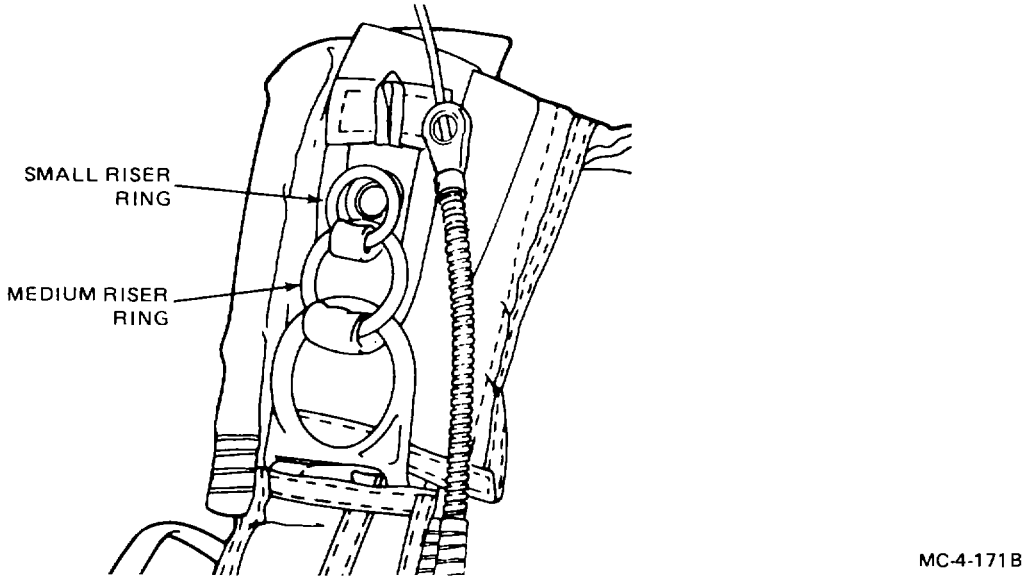


Figure 2-216. Small Riser Ring through Medium Riser Ring.

n. Route locking loop over and through small ring; then down through grommet on riser (figure 2-217).

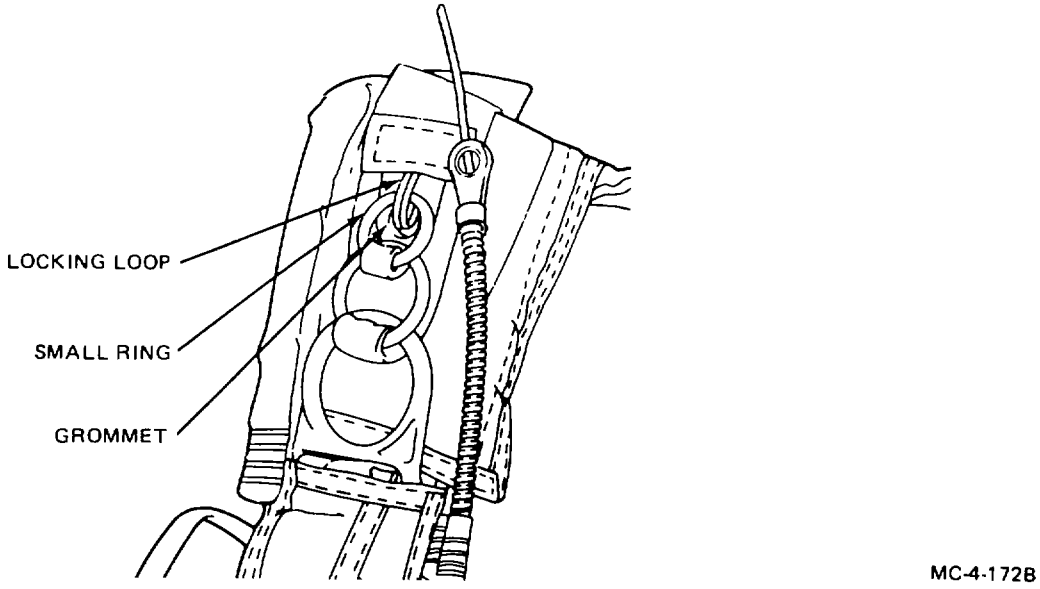


Figure 2-217. Locking Loop through Small Ring and Grommet.

o. Route locking loop through end fitting of main canopy release housing. Ensure flat portion of end fitting Is against riser. Route main canopy release cable through locking loop (figure 2-218).

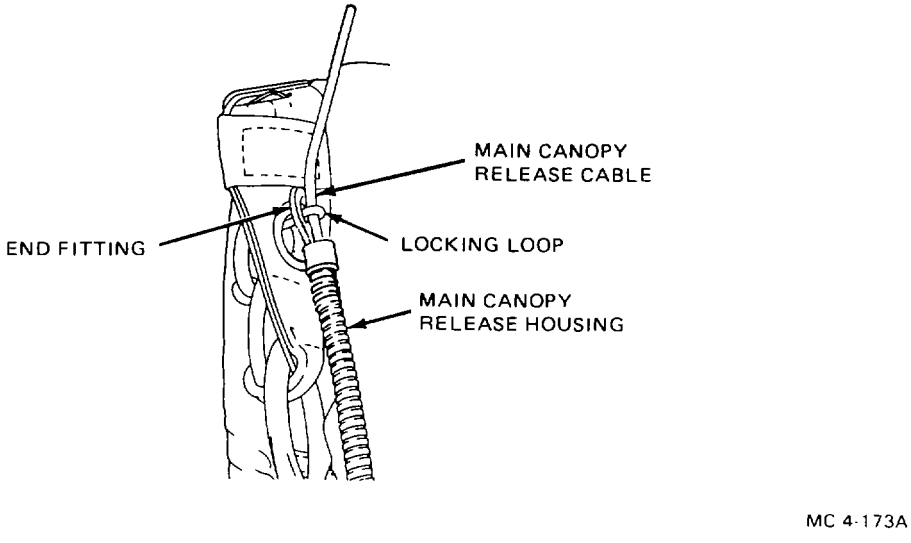


Figure 2-218. Main Canopy Release Cable through Locking Loop.

2-36. Main Risers (CONT).

p. Pull main canopy release cable completely through locking loop and stow in channel provided on riser (figure 2-219).

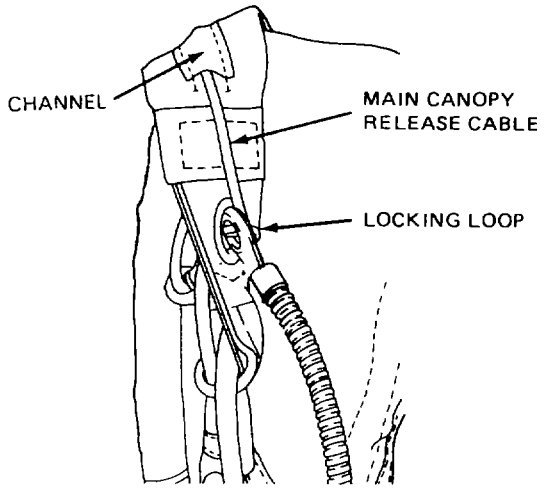


Figure 2-219. Stowing Main Canopy Release Cable.

q. Repeat steps l. through p. to attach the other riser.

r. Install static line in shackle and close snap fastener (figure 2-220).

s. Perform follow-up procedure.

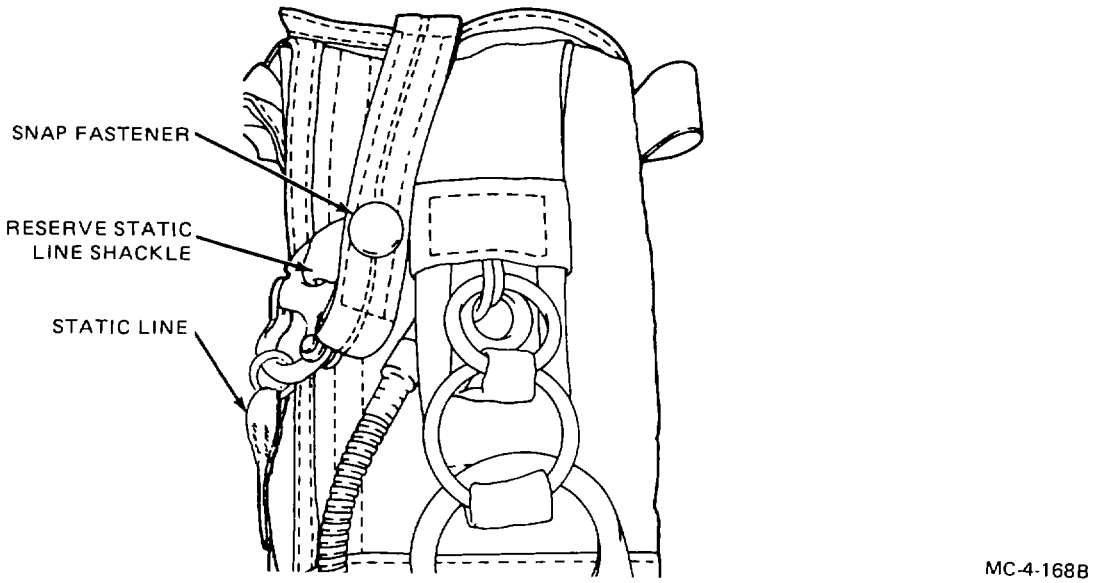


Figure 2-220. Installing Static Line.

2-37. Main Canopy Release Cable Channel.

This task covers:

a. Repair

b. Replacement

Tools:

Sewing Machine, Light Duty (Table 2-2)
Shears, Item 22, Appendix B
Stitch Removal Tool, Item 23, Appendix B

Materials/Parts:

Tape, Nylon, MIL-T-5038, Type III, Class 1, 3/4-Inch Wide, Item 23, Appendix D
Thread, Nylon, V-T-295, Size E, Item 28, Appendix D

Personnel Required:

MOS/43E Parachute Rigger

Equipment Condition:

Lay out on packing table or other suitable area.

a. Repair. If loose or broken threads are present, restitch with size E nylon thread in accordance with paragraph 2-19.

b. Replacement. Replace damaged release cable channel as follows:

(1) Remove damaged nylon tape by carefully removing stitching securing it to riser (figure 2-221).

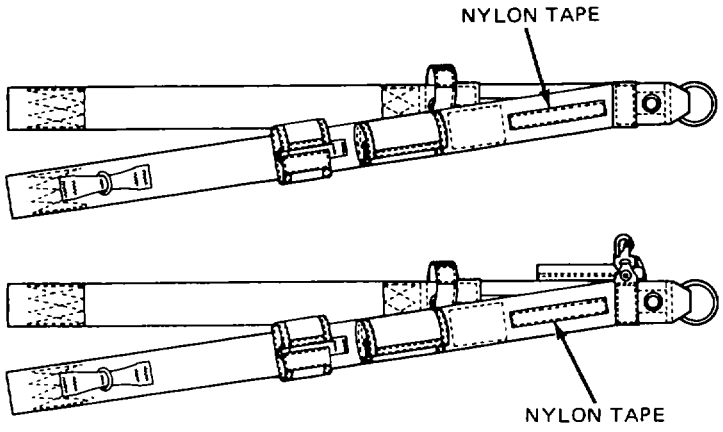


Figure 2-221. Removing Release Cable Channel.

2-37. Main Canopy Release Cable Channel (CONT).

(2) Using a 7-inch length of nylon tape, locate replacement tape directly over location where previously removed.

NOTE

For stitching, use stitch type 301, FED-STD-751, 7 to 11 stitches per inch.

(3) Fold ends of tape under 1/2 inch and sew in place with nylon thread. Stitch over edge; then backstitch 1/2 inch (figure 2-222).

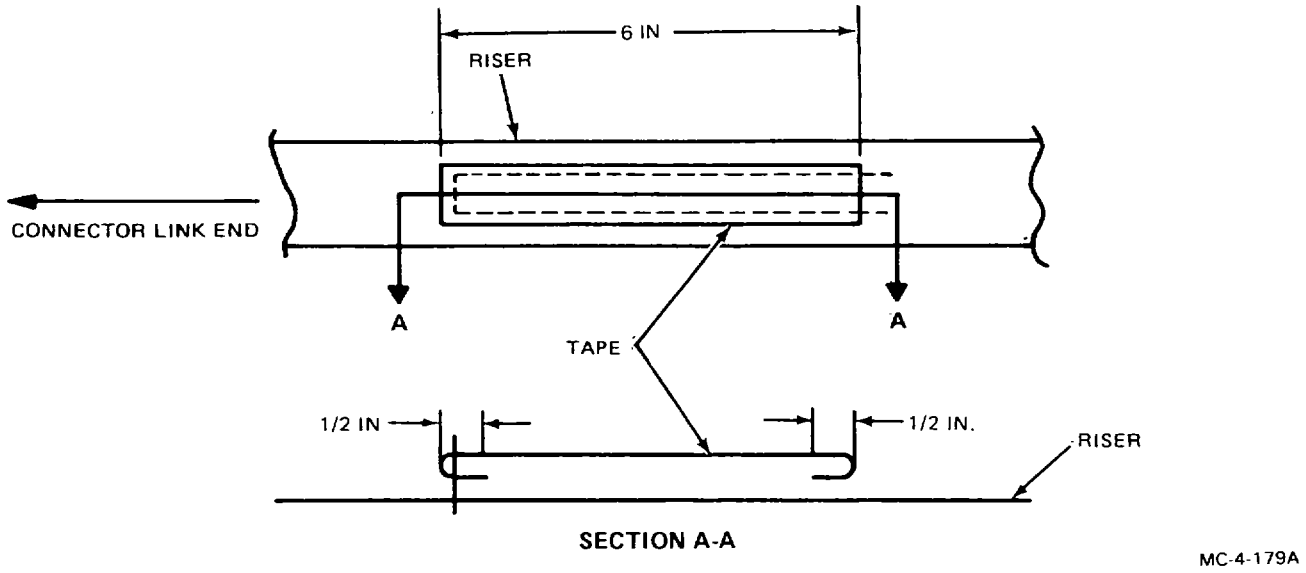


Figure 2-222. Release Cable Channel Replacement.

2-38. Riser Hook and Pile Tapes.

This task covers:

a. Repair

b. Replacement

Tools:

Sewing Machine, Light Duty (Table 2-2)
Shears, Item 22, Appendix B
Stitch Removal Tool, Item 23, Appendix B

Materials/Parts:

Fastener Tape, Hook, 1-Inch Wide, MIL-F-21840, Type II, Class 1, Item 10, Appendix D
Fastener Tape, Pile, 1-Inch Wide, MIL-F-21840, Type II, Class 1, Item 11, Appendix D
Fastener Tape, Pile, 2-Inch Wide, MIL-F-21840, Type II, Class 1, Item 12, Appendix D
Thread, Nylon, V-T-295, Size E, Item 28, Appendix D

Personnel Required:

MOS/43E Parachute Rigger

Equipment Condition:

Lay out on packing table or other suitable area.

a. Repair. If loose or broken threads are present, restitch with size E nylon thread in accordance with paragraph 2-19.

b. Replacement. Replace damaged hook and pile tapes as follows:

NOTE

Damaged hook and pile tapes must be replaced in complete lengths.

(1) Remove damaged tape by carefully removing stitching securing it to keeper.

(2) Locate replacement tape directly over location where previously removed.

NOTE

For stitching, use stitch type 301, FED-STD-751, 7 to 11 stitches per inch.

(3) Sew in place with size E nylon thread using original stitch pattern.

2-39. Harness/Container.

This task covers:

a Repair

b. Replacement

Tools:

Sewing Machine, Darning (Table 2-2)

Materials/Parts:

Harness/Container Assembly, P/N 11-1-3517
Thread, Nylon, V-T-295, Size E, Item 28, Appendix D

Personnel Required:

MOS/43E Parachute Rigger

Equipment Condition:

Lay out on packing table or other suitable area. Canopies deployed.

Follow-Up Procedure:

Service upon receipt (paragraph 2-7 or 2-8).

a. Repair. Container fabric repair is limited to machine darning in areas of double nylon duck fabric. The damaged area may not exceed 1/2 inch and stitching will extend 1/4 inch beyond the damage. A maximum of two dams per flap/panel, not closer than 4 inches to each other, is authorized. Accomplish machine darning In accordance with paragraph 2-19 and the above limitations.

b. Replacement. Replace unserviceable harness/container as follows:

(1) Open snap fastener on reserve static line shackle and remove static line from shackle (figure 2-223).

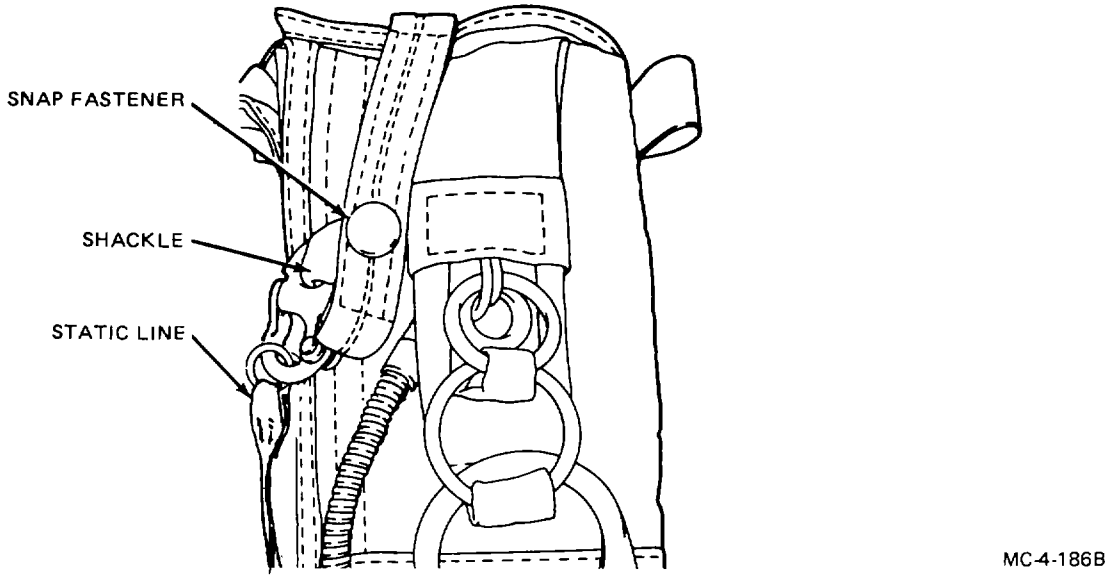


Figure 2-223. Removing Static Line from Shackle.

(2) Pull main canopy release ripcord (figure 2-224). This allows the two rings on the risers to disengage from base ring, completing removal of main risers.

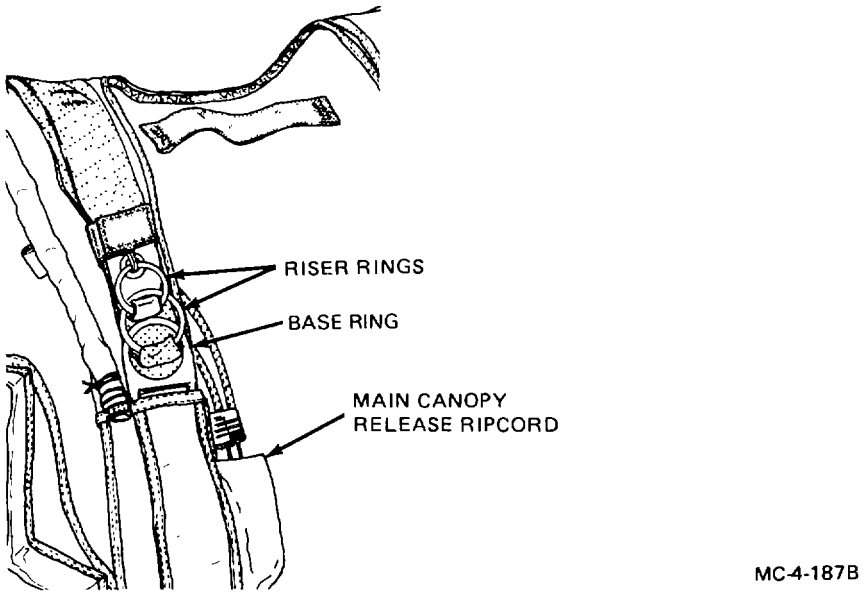


Figure 2-224. Removing Main Risers.

(3) On reserve risers, remove steering lines from toggle rings by untying overhand knots (figure 2-225).

(4) Pull steering lines through guide rings on rear risers.

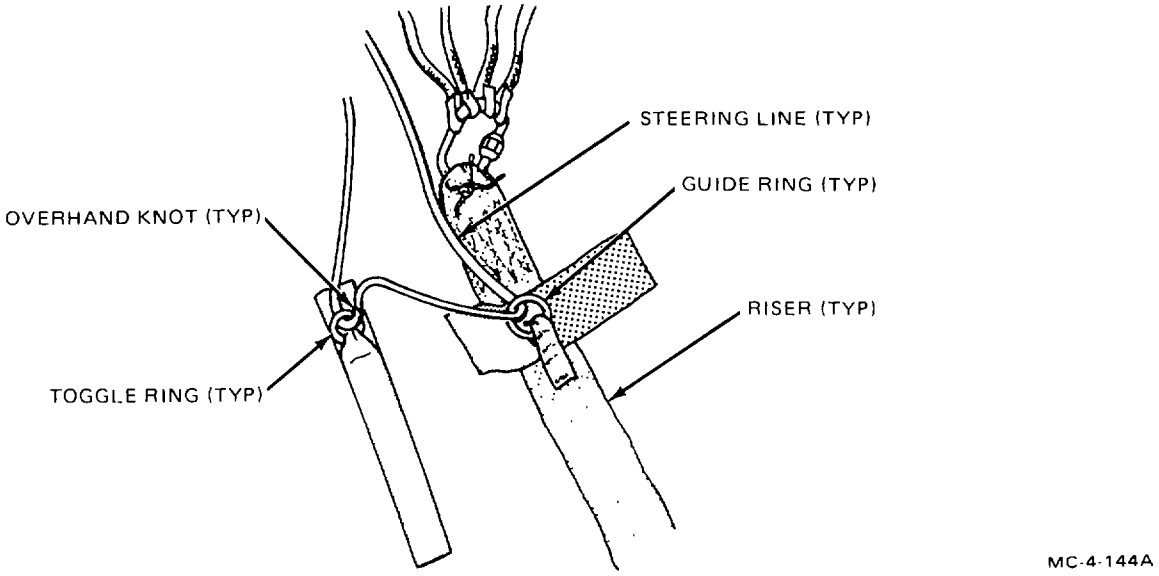


Figure 2-225. Removing Steering Lines from Rear Risers.

2-39. Harness/Container (CONT).

(5) Cut and remove tackings from risers (figure 2-226).

(6) Using a 7/16-inch open end wrench, loosen barrel nuts on connector links.

(7) Remove connector links from risers.

(8) Perform follow-up procedure.

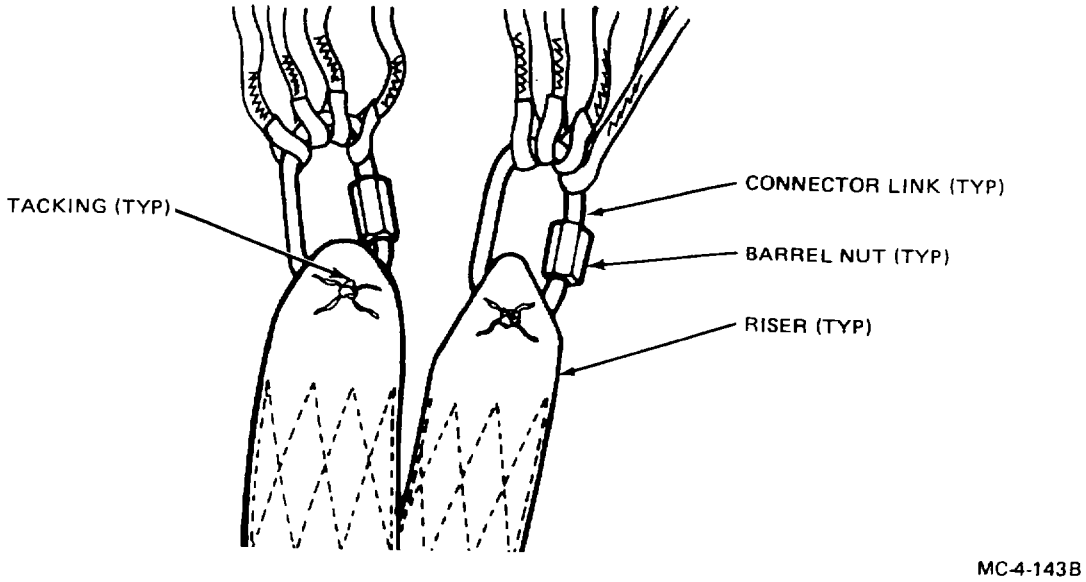


Figure 2-226. Removing Connector Links from Risers.

2-40. Harness/Container Hook and Pile Tapes.

This task covers:

a. Repair

b. Replacement

Tools:

Sewing Machine, Light Duty (Table 2-2)
Shears, Item 22, Appendix B
Stitch Removal Tool, Item 23, Appendix B

Materials/Parts:

Fastener Tape, Hook, 1-Inch Wide, MIL-F-21840, Type II, Class 1, Item 10, Appendix D
Fastener Tape, Pile, 1-Inch Wide, MIL-F-21840, Type II, Class 1, Item 11, Appendix D

Personnel Required:

MOS/43E Parachute Rigger

Equipment Condition:

Lay out on packing table or other suitable area.

a. Repair. If loose or broken threads are present, restitch with size E nylon thread in accordance with paragraph 2-19.

b. Replacement. Replace damaged hook and pile tapes as follows:

NOTE

Damaged hook and pile tapes must be replaced in complete lengths.

(1) Remove damaged tape by carefully removing stitching securing it to container.

(2) Locate replacement tape directly over location where previously removed.

NOTE

For stitching, use stitch type 301, FED-STD-751, 7 to 11 stitches per inch.

(3) Sew in place with size E nylon thread using original stitch pattern.

2-41. Grommets.

This task covers:

a. Repair

b. Replacement

Tools:

Die Sets, Spur Grommet, No. 0, 2, 5, and 8, Items 6, 7, 8, and 9, Appendix B
Knife, Hot, Metal, Item 14, Appendix B
Mallet, Large Leather, Item 15, Appendix B
Pliers, Large, Diagonal Cut, Item 19, Appendix B
Sewing Machine, Medium Duty (Table 2-2)
Shears, Item 22, Appendix B

Materials/Parts:

Grommets, Metallic, No. 0, 2, 5, and 8, MIL-G-16491, Type III, Class 2
Grommets, Metallic, Spur Washer, No. 0, 2, 5, and 8, MIL-G-16491, Type III, Class 2

Materials/Parts (CONT):

Thread, Nylon, V-T-295, Size E, Item 28, Appendix D
Webbing, Nylon, MIL-W-4088, Type II, Item 31, Appendix D

Personnel Required:

MOS/43E Parachute Rigger

Equipment Condition:

Lay out on packing table or other suitable area.

a. Repair. Repair grommets as follows:

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

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

NOTE

Reinforcement is allowed only on the bottom, left, and right closing flaps of the reserve parachute container.

(3) If fabric area around original grommet has been damaged, repair area by applying a reinforcement patch to outside of flap. Use a 1-inch square of seared MIL-W-4088 nylon webbing.

b. Replacement. Replace grommets as follows:

(1) Remove original grommet as follows:

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

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

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

(3) Position grommet on die with barrel facing up and place washer over grommet barrel. Ensure grommet barrel and washer are aligned to prevent off-center setting of grommet.

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

2-42. Snap Fasteners.

This task covers:

a. Repair

b. Replacement

Tools:

Anvil, Chuck Fastener, Item 1, Appendix B
Chuck, Items 2 and 3, Appendix B
Die, Items 4 and 5, Appendix B
Holder, Die Fastener, Item 12, Appendix B
Key, Socket Head Set, Item 13, Appendix B
Knife, Hot, Metal, Item 14, Appendix B
Mallet, Large Leather, Item 15, Appendix B
Pliers, Large, Diagonal Cut, Item 19, Appendix B
Sewing Machine, Medium Duty (Table 2-2)
Shears, Item 22, Appendix B

Materials/Parts:

Fastener, Snap, Button, MS27980
Fastener, Snap, Eyelet, MS27980

Materials/Parts (CONT):

Fastener, Snap, Socket, MS27980-6B
Fastener, Snap, Stud, MS27980-7B
Thread, Nylon, V-T-295, Size E, Item 28, Appendix D
Webbing, Nylon, MIL-W-4088, Type II, Item 31, Appendix D

Personnel Required:

MOS/43E Parachute Rigger

Equipment Condition:

Lay out on packing table or other suitable area.

a. Repair. Snap fastener repair is limited to reseating, which will be accomplished using the applicable procedures and tools prescribed in paragraph b., below.

b. Replacement. A snap fastener that is defective or cannot be reseated will be replaced with a serviceable item from stock. However, if only one part of a fastener is defective, such as the socket or stud, just that particular portion of the fastener assembly requires replacement. Replace a damaged snap fastener as follows:

(1) *Original snap fastener removal.*

(a) Cut crimped edge of applicable snap fastener assembly part at three or four points with diagonal cutters.

(b) Using a suitable type tool, pry back fastener crimped edges and remove applicable defective fastener parts.

NOTE

Reinforcement is not authorized on the inner top main container closing flap or In the area of the left riser static line snap fastener.

(2) Reinforcement of original snap fastener area. If fabric area around original snap fastener is damaged, repair area by applying a reinforcement patch to the outside of the material. Use a 1-inch square of seared MIL-W-4088 nylon webbing.

(3) Hand-held method. Proceed as follows:

(a) Place selected chuck in open end of holder and secure chuck in place using locking screw located on one side of holder. Then place the die into anvil (figure 2-227).

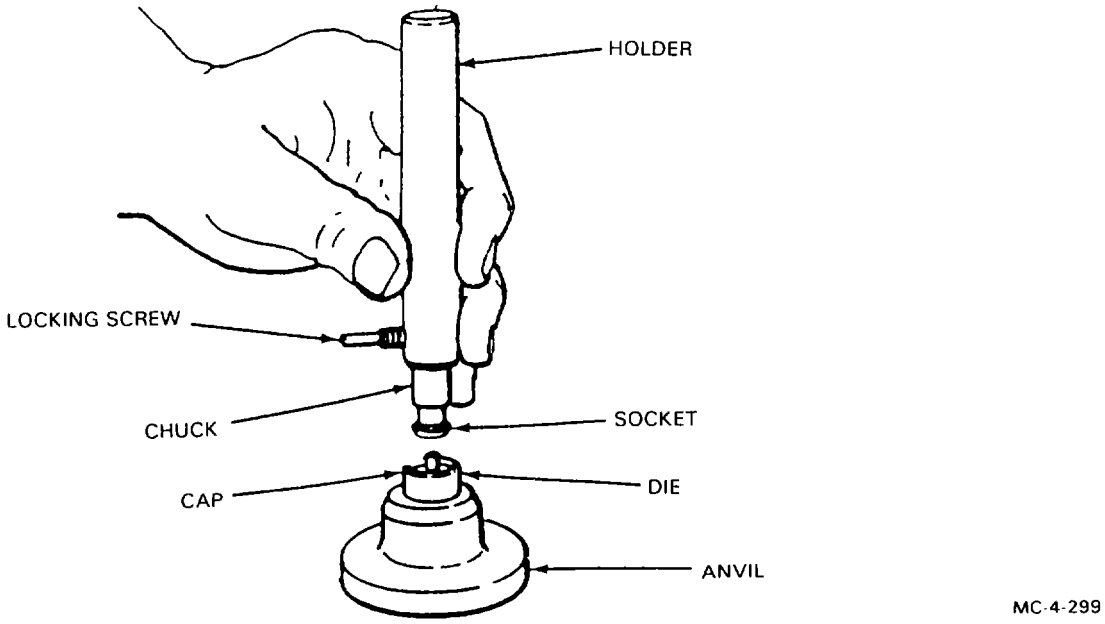


Figure 2-227. Hand Held Tools with Snap Fastener Components Prepared for Use.

NOTE

In most instances, a chuck will be installed in the hand held holder and a die will be placed In the anvil. However, there may be some occasions that require the location of the chuck and die to be reversed. This situation may also apply to the hand or foot operated press.

(b) Fit socket or stud, as applicable, on chuck lower end. Place cap or post, as applicable, on die with barrel facing up.

(c) Position material over barrel of cap or post. Ensure that fastener socket or stud is located on proper side of material for subsequent fastener engagement.

2-42. Snap Fasteners (CONT).

(d) Place socket or stud on barrel of cap or post. With a mallet, strike holder, clinching the two snap fastener components to material.

(e) Remove clinched snap fastener components from chuck and die set and check seating of joined components. If applicable components are not properly seated, repeat procedures in step (d), above.

(f) Check engagement of installed snap fastener components with opposite mating components to ensure open and closed snapping process without hinderance. If snap engaging process cannot be accomplished without difficulty, replace opposite mating snap fastener components using procedures in steps (a) through (e), above.

(g) As required, remove chuck and die from applicable snap fastener tools by reversing procedures in (a), above.

(4) Hand or foot operated press method. Installation of a snap fastener assembly by hand or foot operated press (figure 2-228) may be accomplished using the procedures in step (3), above, except one uses the hand or foot to press the two pieces together, and the check and die will be secured within the applicable press assembly using the available locking screws.

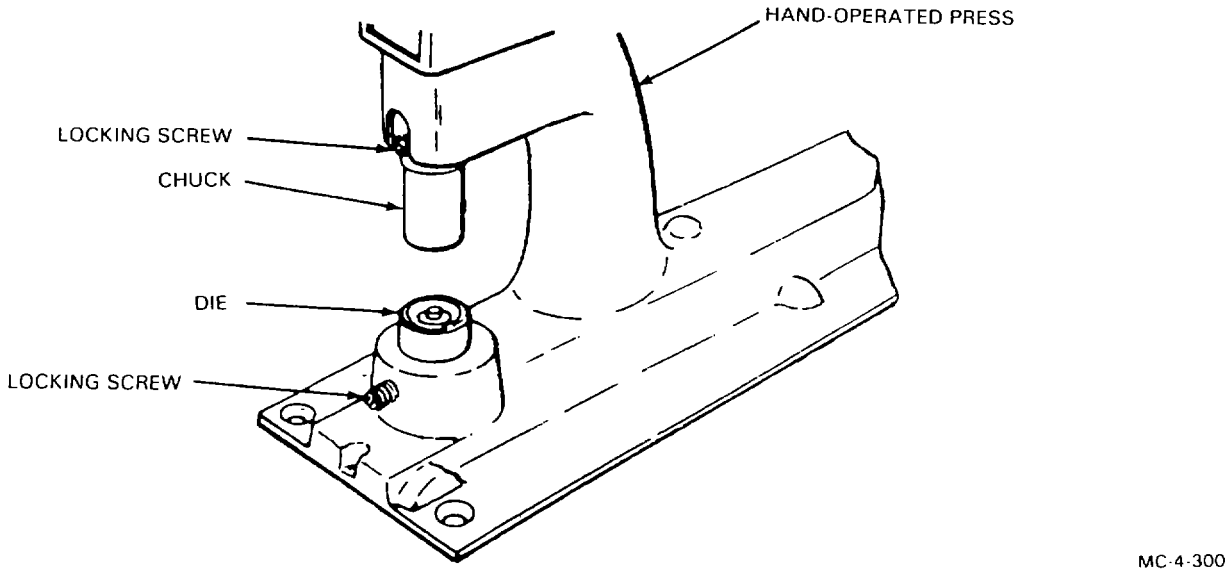


Figure 2-228. Chuck and Die Installed in Hand Operated Press.

2-43. Main Ripcord Pocket.

This task covers:

a. Repair

b. Replacement

Tools:

Sewing Machine, Bartack (Table 2-2)
Sewing Machine, Light Duty (Table 2-2)
Sewing Machine, Zig-Zag (Table 2-2)
Shears, Item 22, Appendix B
Stitch Removal Took, Item 23, Appendix B

Materials/Parts:

Pocket, Main Ripcord, P/N 11-1-3568
Thread, Nylon, V-T-295, Size E, Item 28, Appendix D

Personnel Required:

MOS/43E Parachute Rigger

Equipment Condition:

Lay out on packing table or other suitable area. Main ripcord and main canopy release ripcord removed.

Follow-Up Procedure:

Ripcord Pull-Force Check.

a. *Repair*. Main ripcord pocket repair is limited to restitching. Restitch over original stitch pattern using nylon thread, size E, 7 to 11 stitches per inch.

2-43. Main Ripcord Pocket (CONT).

b. *Replacement.* Replace an unserviceable main ripcord pocket as follows:

(1) Carefully remove stitching (straight and zig-zag) attaching main ripcord pocket to container (figure 2-229). Remove unserviceable pocket.

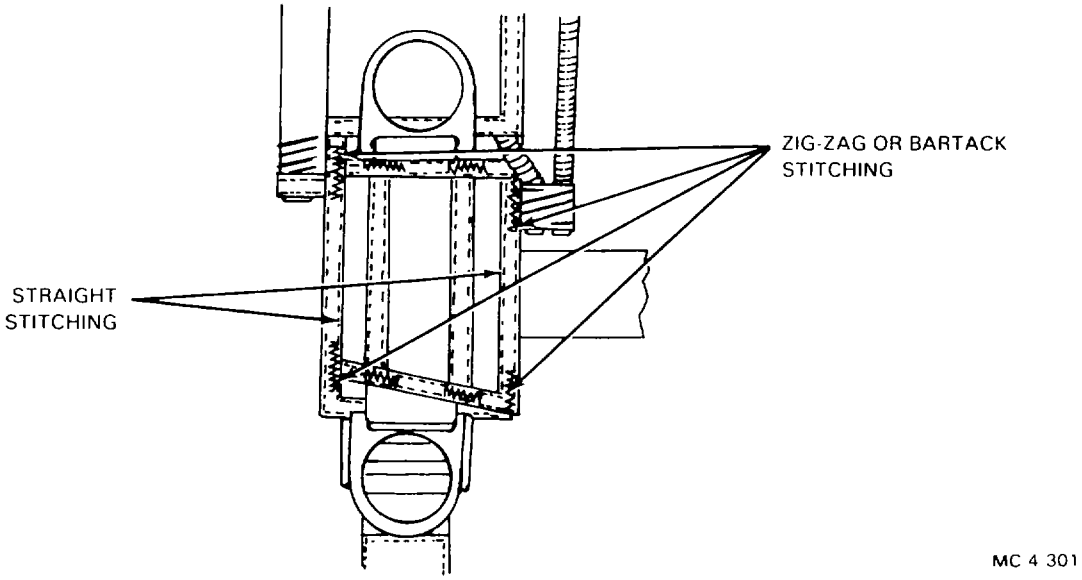


Figure 2-229. Main Ripcord Pocket Replacement.

(2) Place replacement ripcord pocket in position on container directly over position of removed pocket. Pocket is installed under tape on outside edge of container.

(3) Sew in place on inside and outside edges of container using two rows of stitching, stitch type 301, FED-STD-751, 7 to 11 stitches per inch.

(4) Reinforce four corners with zig-zag or bartack stitching, type 308, FED-STD-751, 8 to 12 stitches per inch.

(5) Perform follow-up procedure.

2-44. Reserve Ripcord Pocket.

This task covers:

a. Repair

b. Replacement

Tools:

Sewing Machine, Bartack (Table 2-2)
Sewing Machine, Light Duty (Table 2-2)
Sewing Machine, Zig-Zag (Table 2-2)
Shears, Item 22, Appendix D
Stitch Removal Took, Item 23, Appendix D

Materials/Parts:

Pocket, Reserve Ripcord, P/N 11-1-3567
Thread, Nylon, V-T-295, Size E, Item 28, Appendix D

Personnel Required:

MOS/43E Parachute Rigger

Equipment Condition:

Lay out on packing table or other suitable area. Reserve ripcord removed.

Follow-Up Procedure:

Ripcord Pull-Force Check.

a. *Repair.* Reserve ripcord pocket repair is limited to restitching. Restitch over original stitch pattern using nylon thread, size E, 7 to 11 stitches per inch.

2-44. Reserve Ripcord Pocket (CONT).

b. *Replacement*. Replace an unserviceable reserve ripcord pocket as follows:

(1) Carefully remove stitching (straight and zig-zag) attaching reserve ripcord pocket to container (figure 2-230). Remove unserviceable pocket.

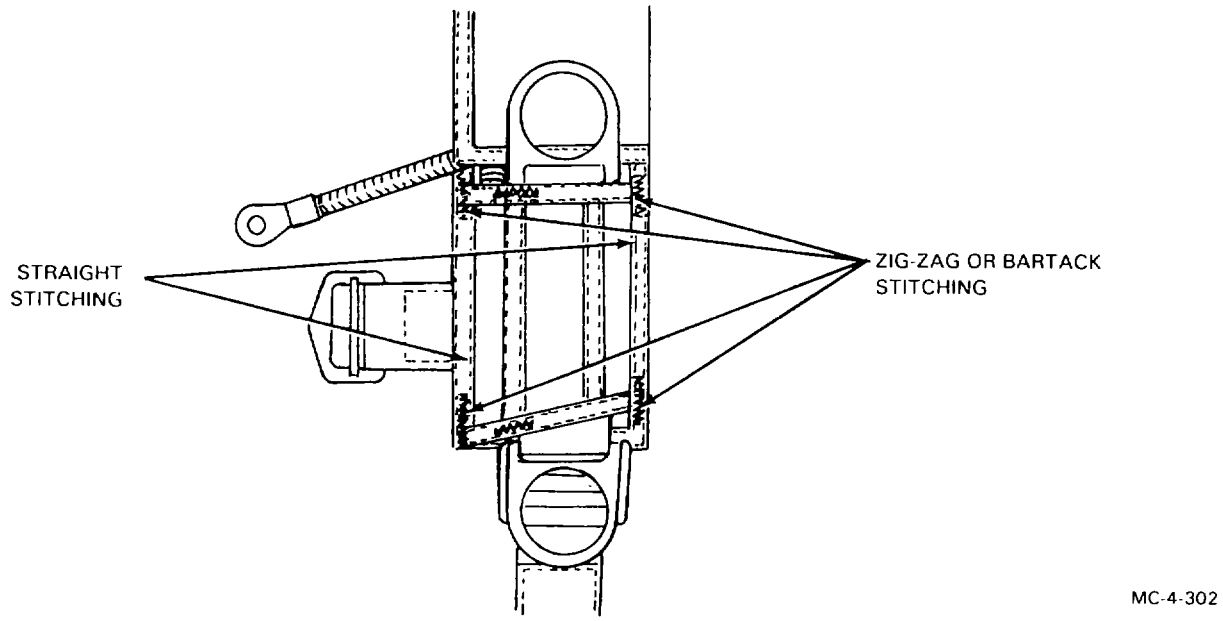


Figure 2-230. Reserve Ripcord Pocket Replacement.

(2) Place replacement ripcord pocket in position on container directly over position of removed pocket. Pocket is installed under tape on outside edge of container.

(3) Sew in place on inside and outside edges of container using two rows of stitching, stitch type 301, FED-STD-751, 7 to 11 stitches per inch.

(4) Reinforce four corners with zig-zag or bartack stitching, type 308, FED-STD-751, 8 to 12 stitches per inch.

(5) Perform follow-up procedure.

2-45. Main Canopy Release Ripcord and Housings.

This task covers: Replacement

Tools:

Needle, Tacking, Item 16, Appendix B
Shears, Item 22, Appendix B
Tape Measure, Item 24, Appendix B

Materials/Parts:

Housing, Main Release, P/N 11-1-3551-1, Long
Housing, Main Release, P/N 11-1-3551-0, Short
Ripcord, Main Release, P/N 11-1-3526
Tape, Lacing, Nylon, MIL-T-43435, Item 22, Appendix D

Personnel Required:

MOS/43E Parachute Rigger

Equipment Condition:

Lay out on packing table or other suitable area.

a. Pull main release ripcord (figure 2-231) from its keeper and remove ripcord from housings.

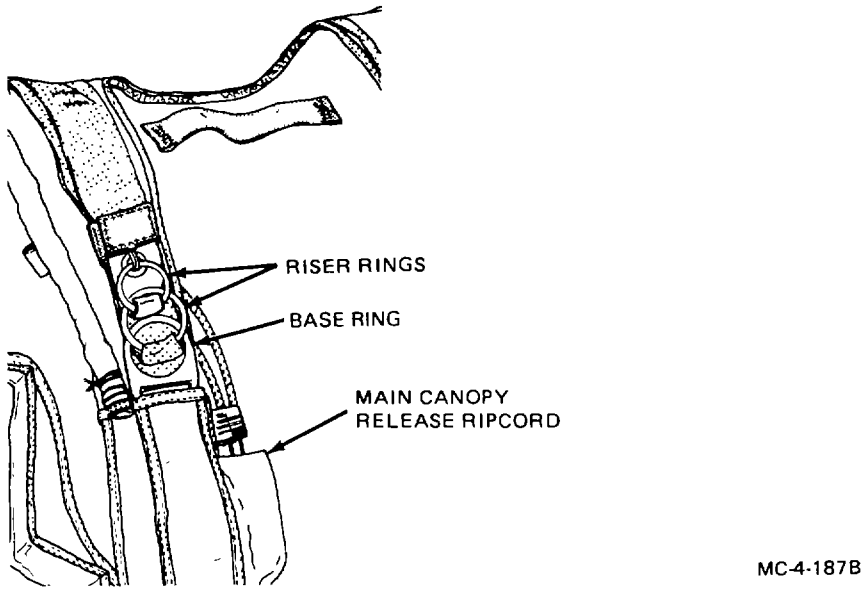


Figure 2-231. Removing Main Release Ripcord.

2-45. Main Canopy Release Ripcord and Housings (CONT).

b. Carefully cut and remove tacking securing housings in harness keeper (figure 2-232).

c. Remove short housing from keeper.

d. Open hook and pile tapes to expose long housing.

e. Carefully cut and remove tacking securing long housing to upper harness diagonal.

f. Pull long housing through keepers and remove from harness.

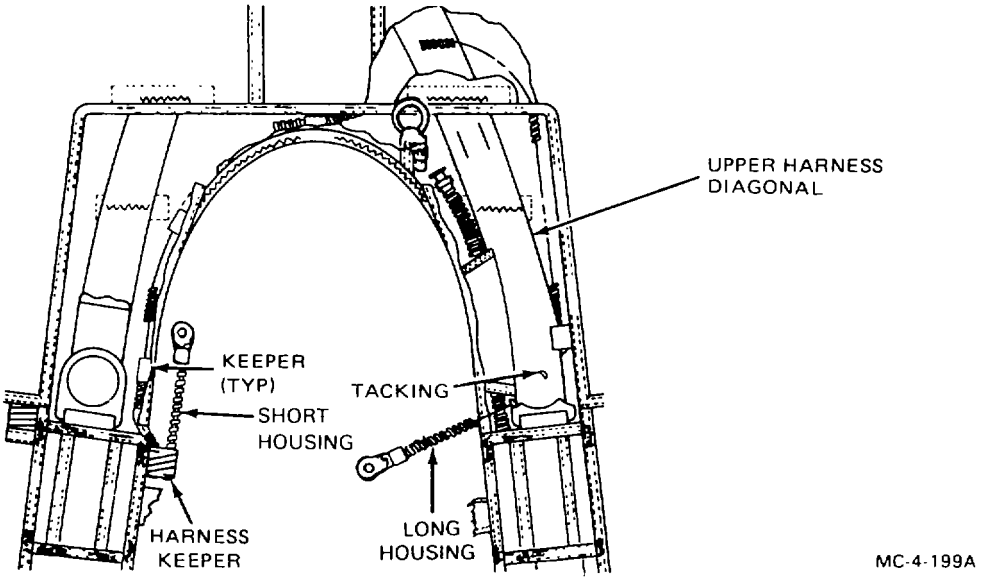


Figure 2-232. Main Canopy Release Housings.

g. Route replacement long housing through four harness keepers and behind attachment point of upper harness diagonal and container (figure 2-233).

h. Position housing so that 5-1/4 inches exists between center of terminal fitting and inside edge of upper harness diagonal.

i. Tack housing in position from underside of upper harness diagonal strap. Use two turns of nylon lacing tape, doubled. Secure with a surgeon's knot and locking knot. Trim free ends 3/4 Inch from knot.

j. Position replacement short housing and opposite end of long housing in keeper next to main ripcord pocket. Tack housings In place from rear of keeper. Use nylon lacing tape, doubled. Make one turn around short housing, three turns around both housings, then one turn around long housing. Secure with surgeon's knot and locking knot. Trim free ends 3/4 inch from knot.

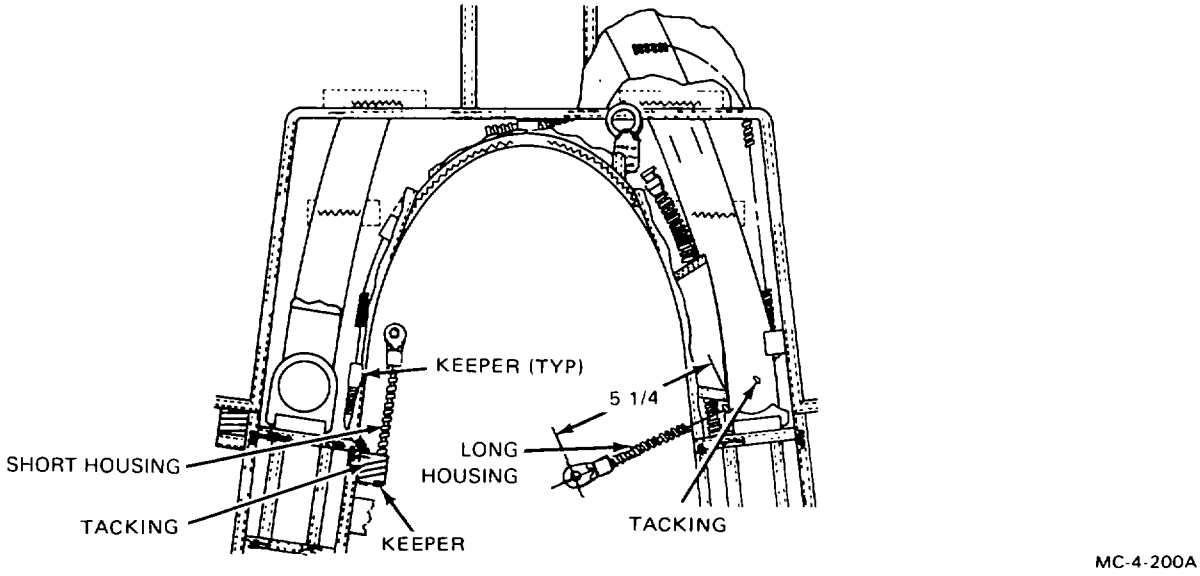


Figure 2-233. Main Canopy Release Housings Installed and Tacked.

2-46. Reserve Ripcord Housing.

This task covers: Replacement

Tools:

Needle, Tacking, Item 16, Appendix B
Shears, Item 22, Appendix B
Tape Measure, Item 24, Appendix B

Materials/Parts:

Housing, Ripcord, 11-Iinch, P/N 11-1-3517-10
Tape, Lacing, Nylon, MIL-T43435, Item 22, Appendix D

Personnel Required:

MOS/43E Parachute Rigger

Equipment Condition:

Lay out on packing table or other suitable area.

a. Remove reserve ripcord grip from pocket and pull, removing ripcord cable from housing.

b. Carefully cut and remove two tackings securing housing to container and remove housing (figure 2-234).

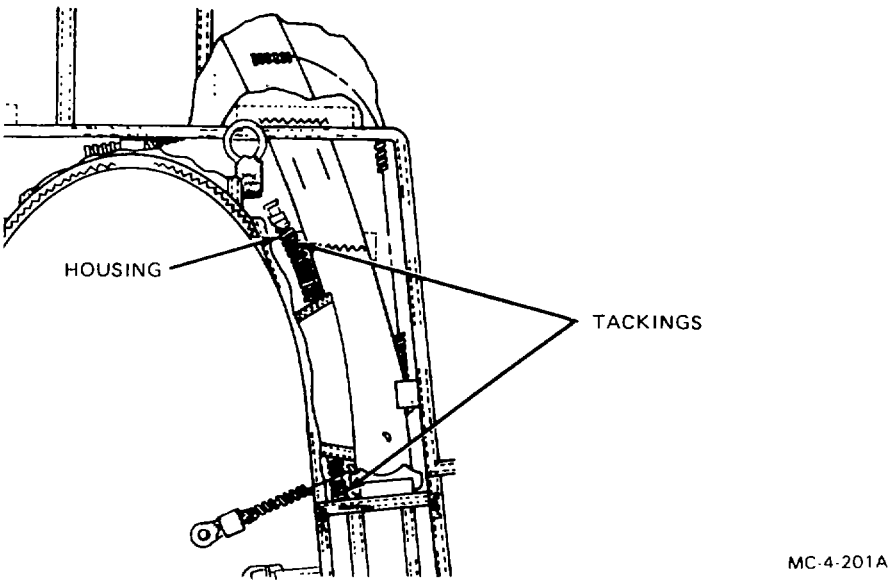


Figure 2-234. Removing Reserve Ripcord Housing.

c. Insert replacement ripcord housing through cover on container (figure 2-235).

d. Tack lower end of housing in position from underside of container. Use five turns of nylon lacing tape, doubled. Fifth turn is placed over fourth turn around groove in ferrule. Secure with surgeon's knot and locking knot. Trim free ends 3/4 inch from knot.

e. Leaving 1 inch of housing free to flex, tack other end of housing in position from underside of container. Use five turns of nylon lacing tape, doubled. Fifth turn Is placed over fourth turn at ferrule end. Secure with surgeon's knot and locking nut. Trim free ends 3/4 Inch from knot.

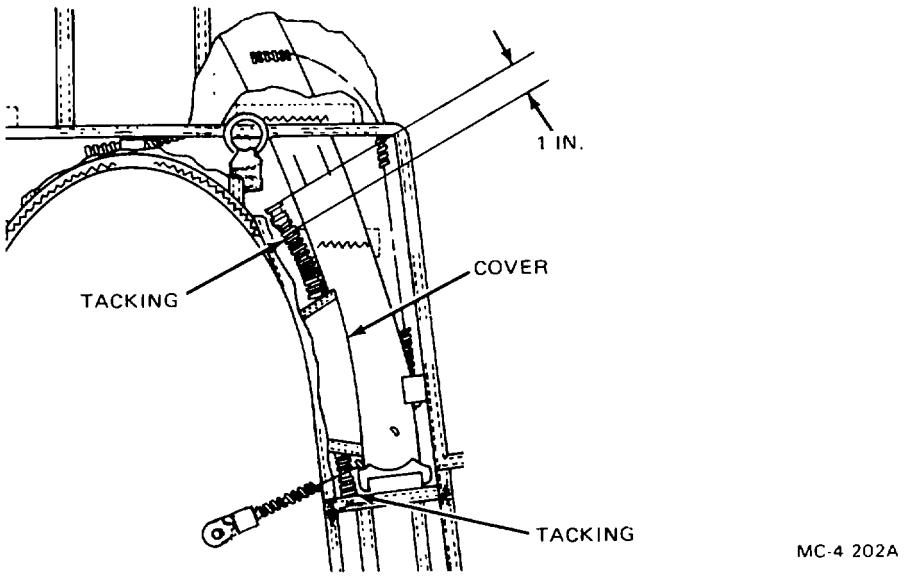


Figure 2-235. Installing Reserve Ripcord Housing.

2-47. Main Ripcord Housing.

This task covers: Replacement

Tools:

Needle, Tacking, Item 16, Appendix B
Shears, Item 22, Appendix B
Tape Measure, Item 24, Appendix B

Materials/Parts:

Housing, Ripcord, 33-Inch, P/N 11-1-3517-13
Tape, Lacing, Nylon, MIL-T-43435, Item 22, Appendix D

Personnel Required:

MOS/43E Parachute Rigger

Equipment Condition:

Lay out on packing table or other suitable area.

a. Remove main ripcord grip from pocket and pull, removing ripcord cable from housing.

b. Carefully cut and remove tacking at upper end of housing (figure 2-236).

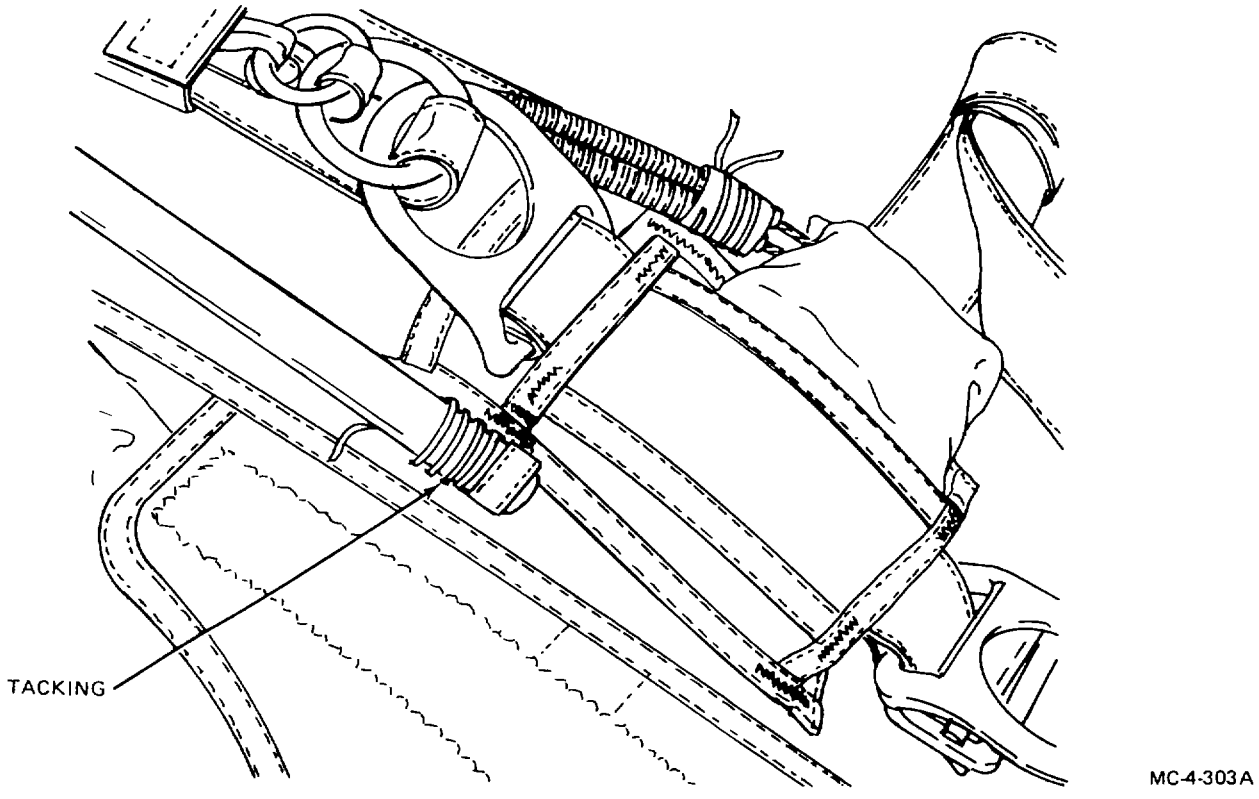


Figure 2-236. Main Ripcord Housing, Upper Tacking Removal.

c. At lower end of housing, carefully cut and remove tackings from housing and housing cover (figure 2-237). Remove housing from cover.

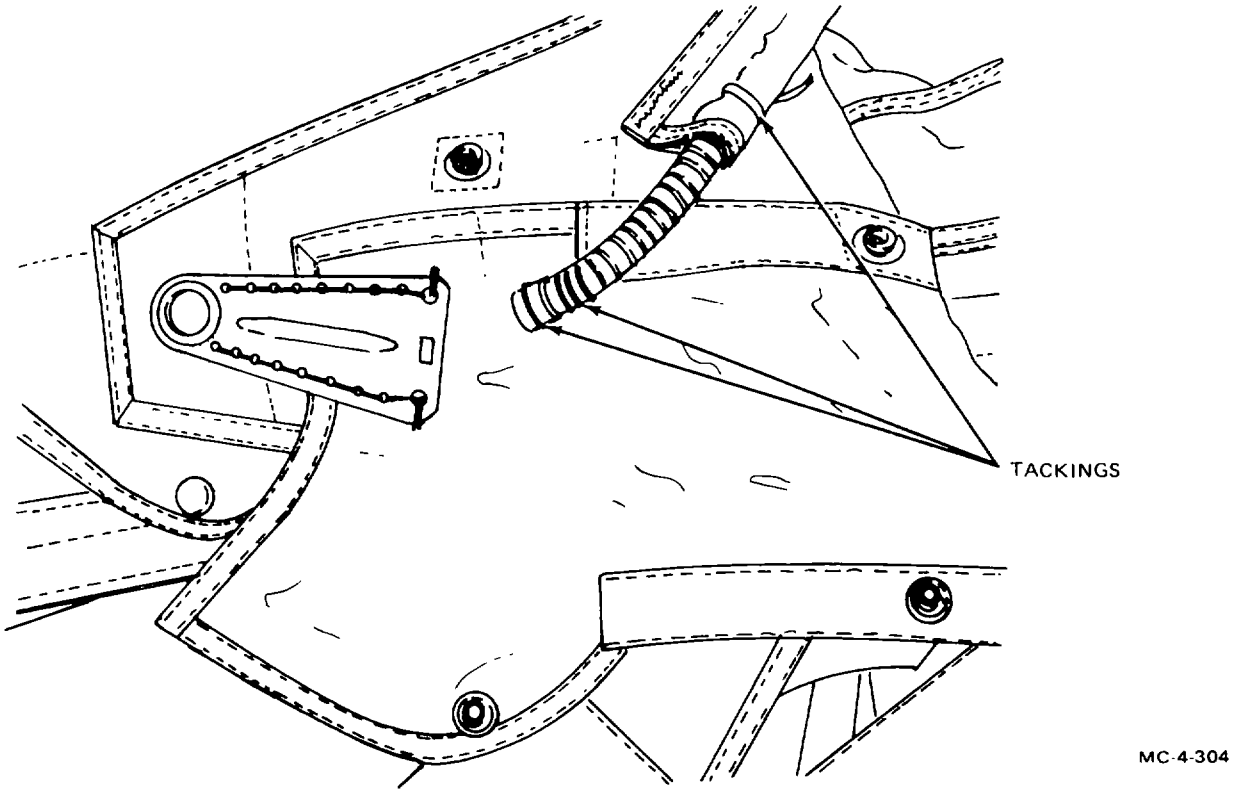


Figure 2-237. Main Ripcord Housing, Lower Tacking Removal.

2-47. Main Ripcord Housing (CONT).

d. Insert replacement ripcord housing through cover on container. Align upper end of housing with end of housing cover and tack in place from underside of cover (figure 2-238). Use four turns of nylon lacing tape, doubled. Secure with surgeon's knot and locking knot. Trim free ends 3/4 inch from knot.

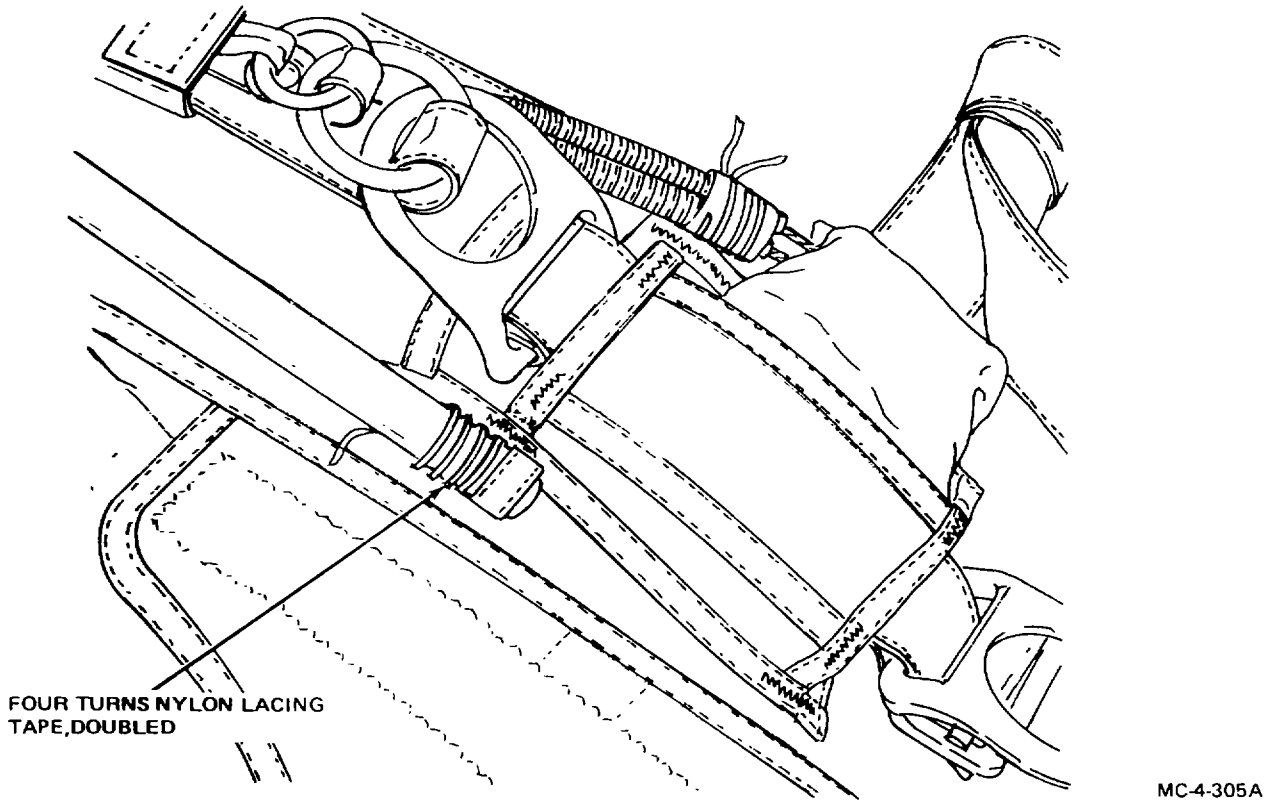


Figure 2-238. Main Ripcord Housing, Upper Tacking.

e. Tack other end of cover around housing with one turn of nylon lacing tape, doubled (figure 2-239). Secure with surgeon's knot and locking knot. Trim free ends 3/4 inch from knot. Tack lower end of housing to container with four turns of nylon lacing tape, doubled. Secure with surgeon's knot and locking knot. Trim free ends 3/4 inch from knot.

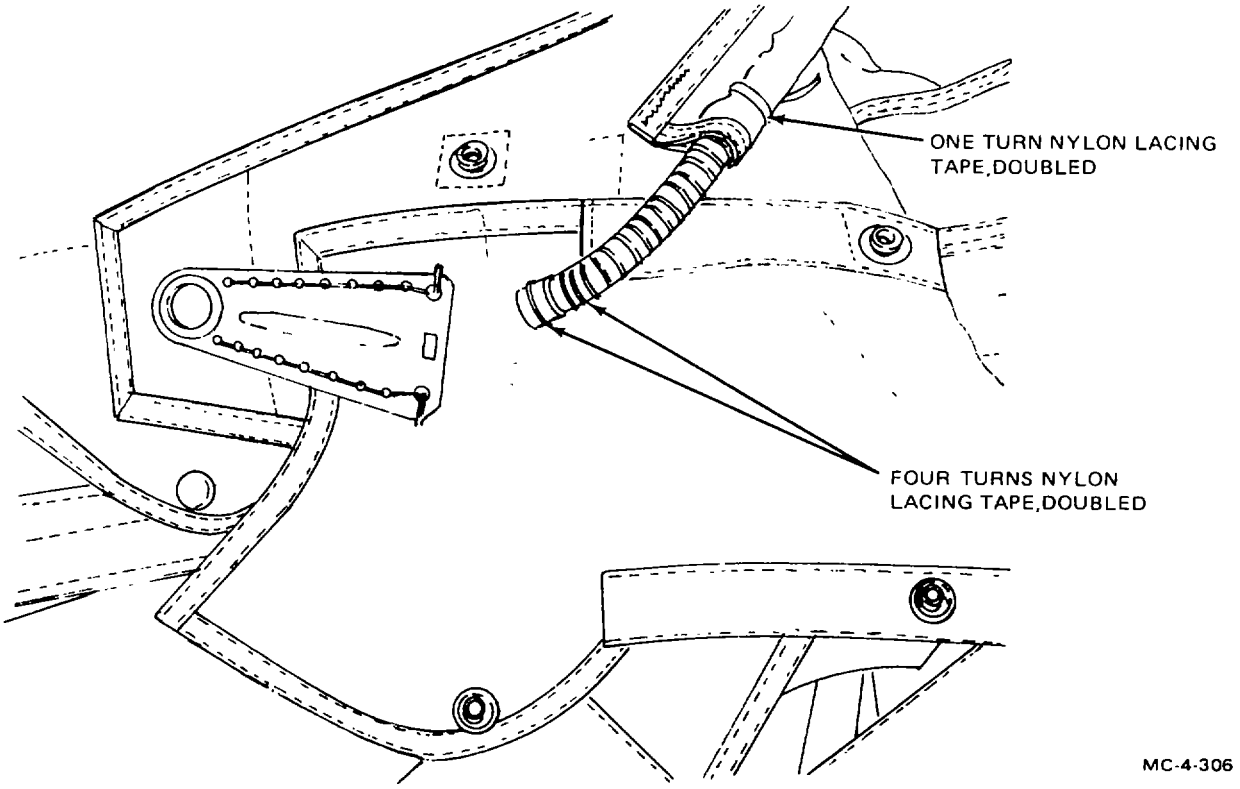


Figure 2-239. Main Ripcord Housing, Lower Tackings.

2-48. Base Plate.

This task covers: Replacement

Tools:

Needle, Tacking, Item 16, Appendix B
Shears, Item 22, Appendix B

Materials/Parts:

Base Plate, P/N 11-13566
Tape, Lacing, Nylon, MIL-T-43435, Item 22, Appendix D

Personnel Required:

MOS/43E Parachute Rigger

Equipment Condition:

Lay out on packing table or other suitable area. Main canopy removed from container.

a. Carefully cut and remove tackings securing base plate to container side flap (figure 2-240). Remove base plate.

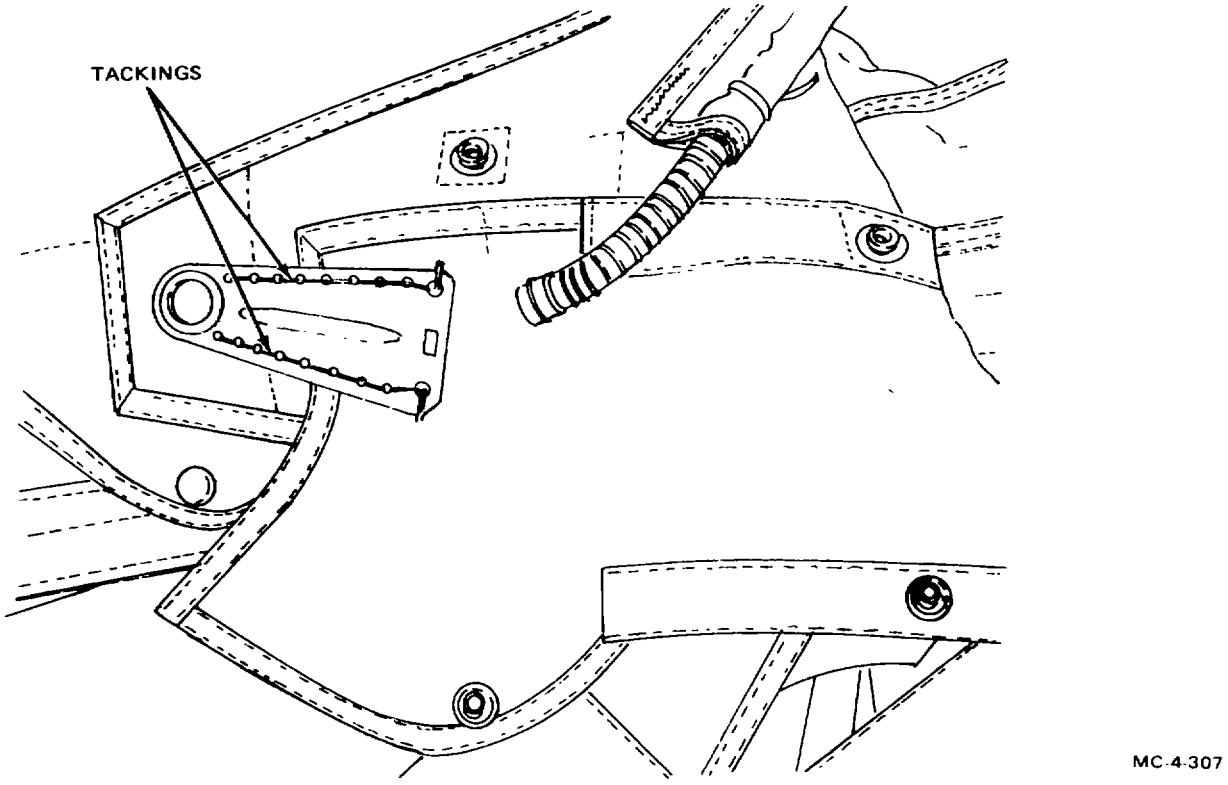


Figure 2-240. Base Plate Removal.

b. Position replacement base plate in same location as unserviceable base plate.

c. Tack base plate to side flap using nylon lacing tape, single (figure 2-241). Starting on inside of side flap, pass lacing tape up through one of the large round holes on wide end of base plate. Continue to stitch through holes on that side of base plate until opposite end is reached, then return stitching through holes back to starting point. Secure with surgeon's knot and locking knot. Trim free ends 3/4 inch from knot.

d. Repeat step c. on other side of base plate.

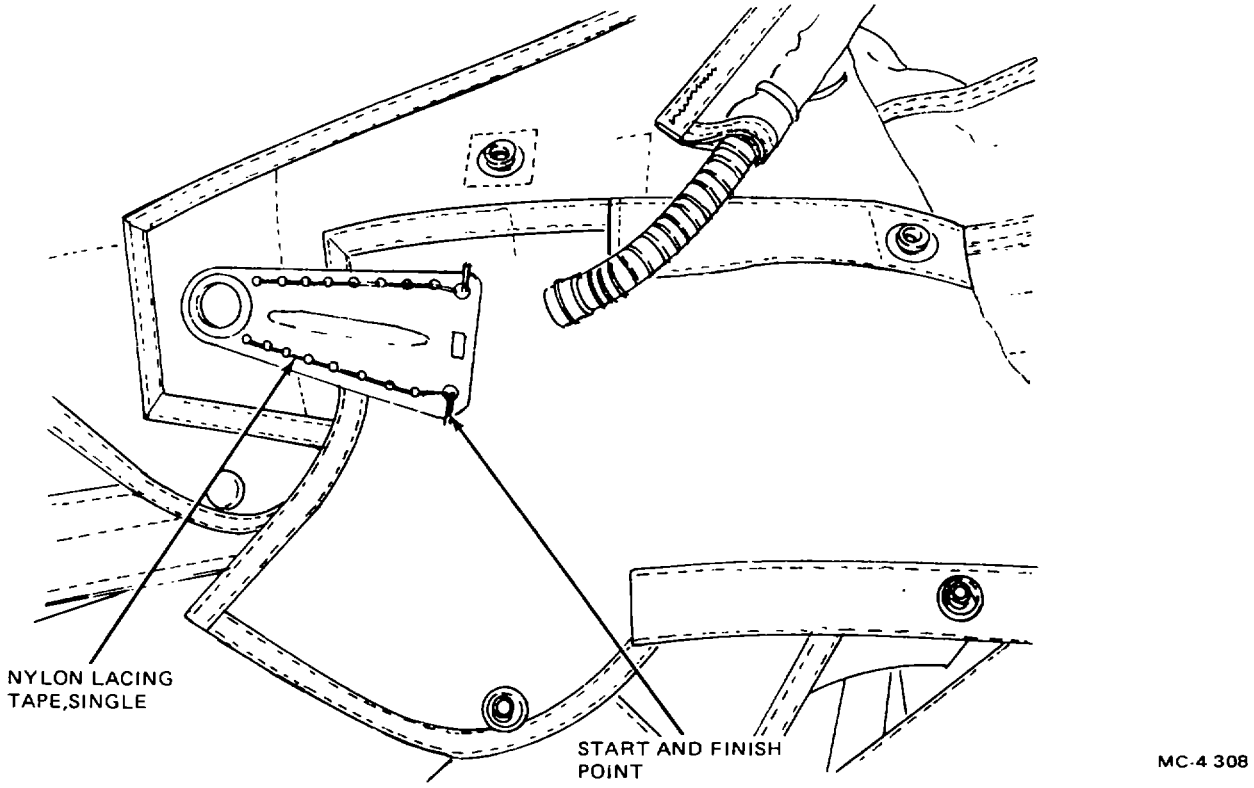


Figure 2-241. Base Plate Installation.

SECTION VI. PREPARATION FOR STORAGE OR SHIPMENT

2-49. Storage.

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

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

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

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

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

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

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

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

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

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

c. *Storage Specifics for Parachutes*. In addition to the storage requirements stipulated in b., above, the following is a list of specifics that 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.

2-50. In-Storage Inspection.

This task covers: In-storage inspection

Personnel Required:	*Equipment Condition:*
MOS/43E(1P) Parachute Rigger	Unpacked

a. *General Information*. An in-storage inspection is a physical check conducted on a random sample of parachutes that are located in storage.

b. *Intervals*. MC-4 parachutes in storage will be inspected at least once every 180 calendar days and at more frequent intervals if prescribed by the local parachute maintenance officer.

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

(1) Check the parachute for proper identification.

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

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

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

2-51. Shipment.

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

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

c. *Other Shipping Instructions*. Parachutes destined for domestic or overseas shipment will be packaged and marked in accordance with AR 700-15, AR 55-45, TM 38-230-1, and TM 38-230-2. Shipment of parachutes will be accomplished in accordance with TM 10-1670-201-23 T.O. 13C-1-41/NAVAIR 13-1-17.

2-52. Accordion Folding/Rigger Rolling.

a. *Accordion Folding.* Personnel parachute canopy assemblies that are not packed for use should be accordion folded prior to entry into storage. To accordion fold a parachute canopy assembly, perform the following:

(1) Place parachute in proper layout. Tie risers or connector links with log record book.

(2) Fold tail and nose toward center in approximately 10 to 12-inch folds until they meet.

(3) Move slider up to bottom of canopy and daisy-chain suspension lines.

(4) Fold lines, slider, and stabilizer panels toward top of canopy, keeping lines centered on canopy.

(5) Fold canopy in half top to bottom, then in half left to right.

(6) Tie folded canopy top to bottom and left to right using 1/4-inch cotton cord.

(7) Tag assembly in accordance with DA PAM 738-751.

b. *Rigger Rolling.* Personnel parachute assemblies will be rigger rolled prior to being sent to or returned from a parachute repair activity for ease of handling to prevent suspension line entanglement. MC-4 parachutes are rigger rolled in the same manner as accordion folding.

APPENDIX A
REFERENCES

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

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

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

A-3. Technical Manuals.

General Maintenance of Parachutes and Other Airdrop Equipment .....TM 10-1670-201 -23/ TO 13C-1-41 / NAVAIR 13-1-17
Organizational and DS Maintenance Including Repair Parts and Special Tools List for MC-3 Free-Fall Personnel Parachute System .....TM 10-1670-264-13&P
Sewing Machines for the Repair of Parachutes and Allied Equipment .....TM 10-3530-202-24
Preservation, Packaging, and Packing of Military Supplies and .....TM 38-230-1/
Equipment (Vols 1 and 2).....TM 38-230-2
Procedures for the Destruction of Air Delivery Equipment to Prevent Enemy Use .....TM 43-0002-1
Storage and Materials Handling .....TM 743-200-1
Procedures for the Destruction of Life Support Equipment to Prevent Enemy Use .....TM 750-244-1-2

A-4. Field Manuals.

First Aid for Soldiers .....FM 21-11
Military Free-Fall Parachuting .....FM 31-19

A-5. Army Regulations.

Dictionary of United States Army Terms .....AR 310-25
Authorized Abbreviations and Brevity Codes .....AR 310-50
Accident Reporting and Records .....AR 385-40
Military Standard Transportation and Movement Procedures (MILSTAMP) .....AR 55-45
Preserving, Packaging, Packing and Marking of Items of Supply .....AR 700-15
Army Material 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
Use of Material Condition Tags and Labels on Army Aeronautical and Air Delivery Equipment .....TB 43-750-126

A-7. Joint Regulations.

Defense Disposal Manual	DOD 4160.21-M
Joint Airdrop Inspection Records, Malfunction Investigations and Activity Reporting	AR 59-4/ AFR 55-10/ OPNAVINST 4360-24B/ MCO 13480-1B

A-8. Forms

Technical Order System Publication Improvement Report and Reply	AFTO Form 22
Parachute Log Record	DA Form 10-42/ DA Form 3912/ AFTO Form 391
Recommended Changes to Publications	DA Form 2028
Equipment Inspection and Maintenance Worksheet	SF Form 2404
Packing Improvement Report	SF Form-364
Quality Deficiency Report	SF Form 368/ AFR 900-4/ MCO 1650.17

APPENDIX B
MAINTENANCE ALLOCATION CHART

SECTION I. INTRODUCTION

B-1. General.

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

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

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

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

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

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

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

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

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

e. *Align*. To adjust specified variable elements of an item to bring about optimum or desired performance.

f. *Calibrate*. To determine and cause corrections to be made or to be adjusted on instruments or test, measuring, and diagnostic equipments used in precision measurement. Consists of comparisons of two instruments, one of which is a certified standard of known accuracy, to detect and adjust any discrepancy In the accuracy of the instrument being compared.

g. *Removal/Install*. To remove and install the same item when required to perform service or other maintenance functions. Install may be the act of emplacing, seating, or fixing into position a spare, repair part, or module (component or assembly) in a manner to allow the proper functioning of an equipment or system.

h. *Replace*. To remove an unserviceable item and install a serviceable counterpart in its place. "Replace" is authorized by the MAC and is shown as the 3d position code of the SMR code.

B-2. Maintenance Functions (CONT).

i. *Repair*. The application of maintenance services, including fault location/troubleshooting, removal/ installation, and disassembly/assembly procedures, and maintenance actions to identify troubles and restore serviceability to an item by correcting specific damage, fault, malfunction, or failure in a part, subassembly, module (component or assembly), end item, or system.

j. *Overhaul*. That maintenance effort (service/action) prescribed to restore an item to a completely serviceable/operational condition as required by maintenance standards In appropriate technical publications (i.e., DMWR). Overhaul is normally the highest degree of maintenance performed by the Army. Overhaul does not normally return an item to like new condition.

k. *Rebuild*. Consists of those services/actions necessary for the restoration of unserviceable equipment to a like new condition In accordance with original manufacturing standards. Rebuild is the highest degree of material maintenance applied to Army equipment. The rebuild operation includes the act of returning to zero those age measurements (hours/miles, etc.) considered in classifying Army equipment/components.

B-3. Explanation of Columns in the MAC, Section II.

a. *Column 1, Group Number*. Column 1 lists functional group code numbers the purpose of which is to identify maintenance significant components, assemblies, subassemblies, and modules with the next higher assembly. End item group number shall be '00".

b. *Column 2, Component/Assembly*. Column 2 contains the names of components, assemblies, subassemblies, and modules for which maintenance is authorized.

c. *Column 3. Maintenance Function*. Column 3 lists the functions to be performed on the item listed in Column 2. (For detailed explanation of these functions, see paragraph B-2.)

d. *Column 4. Maintenance Level*. Column 4 specifies, by the listing of work time figure in the appropriate subcolumn(s), the level of maintenance authorized to perform the function listed in Column 3. This figure represents the active time required to perform that maintenance function at the indicated level of maintenance. If the number or complexity of the tasks within the listed maintenance function vary at different maintenance levels, appropriate work time figures will be shown for each level. The work time figure represents the average time required to restore an item (assembly, subassembly, component, module, end item, or system) to a serviceable condition under typical field operating conditions. This time includes preparation time (including any necessary disassembly/assembly time), troubleshooting/fault location time, and quality assurance/quality control time in addition to the time required to perform the specific tasks identified for the maintenance functions authorized in the maintenance allocation chart. The symbol designations for the various maintenance levels are as follows:

C - Operator or crew
O - Unit Maintenance
F - Intermediate Direct Support Maintenance
H - Intermediate General Support Maintenance
D - Depot Maintenance

e. *Column 5. Tools and Equipment*. Column 5 specifies by code, those common tools sets (not individual tools) and special tools, TMDE, and support equipment required to perform the designated function.

f. *Column 6. Remarks*. This column shall, when applicable, contain a letter code, in alphabetic order, which shall be keyed to the remarks contained in Section IV

B-4. Explanation of Columns in Tool and Test Equipment Requirements, Section III.

a. *Column 1, Reference Code*. The tool and test equipment reference code correlates with a code used in the MAC, Section II, Column 5.

b. *Column 2, Maintenance Category*. The lowest category of maintenance authorized to use the tool or test equipment.

c. *Column 3. Nomenclature*. Name or identification of the tool or test equipment.

d. *Column 4. National Stock Number*. The National stock number of the tool or test equipment.

e. *Column 5. Tool Number*. The manufacturer's part number.

B-5. Explanation of Column in Remarks, Section IV.

a. *Column 1, Reference Code*. The code recorded in column 6, Section II.

b. *Column 2, Remarks*. This column lists information pertinent to the maintenance function being performed as indicated in the MAC, Section II.

SECTION II. MAINTENANCE ALLOCATION CHART
MC-4 RAM AIR PARACHUTE SYSTEM

(1)	(2)	(3)	(4)					(5)	(6)
GROUP NUMBER	COMPONENT/ ASSEMBLY	MAINTENANCE FUNCTION	MAINTENANCE LEVEL					TOOLS AND EQUIPMENT	REMARKS
			C	O	F	H	D		
00	MC-4 RAM AIR PARACHUTE SYSTEM							See Section III this appendix	
01	DEPLOYMENT BAG, MAIN	Inspect Repair Replace		0.1 0.5 0.1				See Section III this appendix	A
0101	GROMMET	Inspect Replace		0.1 0.3					A
0102	SUPPORT WEBBING	Inspect Repair		0.1 0.2					AE
02	DEPLOYMENT SYSTEM, RESERVE	Inspect Replace		0.2 0.1				See Section III this appendix	A
0201	PILOT PARACHUTE	Inspect Replace		0.1 0.2					A
0202	DEPLOYMENT BAG AND BRIDLE ASSEMBLY	Inspect Replace		0.1 0.2					A
0203	SAFETY LOOP	Inspect Replace		0.1 0.2					A
03	CANOPY, MAIN	Service Inspect Repair Replace		1.0 0.5 1.5 1.0				See Section III this appendix	A B C D E
0301	SUSPENSION LINES	Inspect Replace		0.3	 1.0				A
0302	STEERING LINES	Inspect Replace		0.3	 1.0				A

SECTION II. MAINTENANCE ALLOCATION CHART
MC-4 RAM AIR PARACHUTE SYSTEM

(1)	(2)	(3)	(4)					(5)	(6)
GROUP NUMBER	COMPONENT/ ASSEMBLY	MAINTENANCE FUNCTION	MAINTENANCE LEVEL					TOOLS AND EQUIPMENT	REMARKS
			C	O	F	H	D		
0303	CASCADE LINE	Inspect Replace		0.3	 1.0				A
0304	SLIDER	Inspect Repair Replace		0.1 0.3 0.1					A E
04	CANOPY RESERVE	Service Inspect Repair Replace		1.0 0.5 1.5 1.0				See Section III this appendix	A B C D E
0401	SUSPENSION LINES	Inspect Replace		0.3	 1.0				A
0402	STEERING LINES	Inspect Replace		0.3	 1.0				A
0403	CASCADE LINE	Inspect Replace		0.3	 1.0				A
0404	SLIDER	Inspect Repair Replace		0.1 0.3 0.1					A E
05	RISERS, MAIN	Inspect Repair Replace		0.1 0.5 0.5				See Section III this appendix	A E
0501	CABLE FLUTE	Inspect Repair Replace		0.1 0.2 0.5					A E
0502	KEEPERS	Inspect Repair Replace		0.1 0.2 0.5					A E

SECTION II. MAINTENANCE ALLOCATION CHART
MC-4 RAM AIR PARACHUTE SYSTEM

(1)	(2)	(3)	(4)					(5)	(6)
GROUP NUMBER	COMPONENT/ ASSEMBLY	MAINTENANCE FUNCTION	MAINTENANCE LEVEL					TOOLS AND EQUIPMENT	REMARKS
			C	O	F	H	D		
06	HARNESS/ CONTAINER ASSEMBLY	Inspect Service Repair Replace		0.5 1.0 1.0 1.0				See Section III this appendix	A B E
0601	GROMMETS	Inspect Repair Replace		0.1 0.3 0.3					
0602	SNAP FASTENERS	Inspect Repair Replace		0.1 0.3 0.3					
0603	RIPCORD POCKET, MAIN	Inspect Repair Replace		0.1 0.2 0.5					A G
0604	RIPCORD POCKET, RESERVE	Inspect Repair Replace		0.1 0.2 0.5					A G
0605	POCKET, FF-2	Inspect Repair		0.1 0.2					A E

SECTION III. TOOL AND TEST EQUIPMENT REQUIREMENTS

TOOL OR TEST EQUIPMENT REF CODE (1)	MAINTENANCE CATEGORY (2)	NOMENCLATURE (3)	NATIONAL NATO STOCK NUMBER (4)	PN TOOL NUMBER (5)
1	0	Anvil, Chuck Fastener	5120-00-357-6181	9902
2	0	Chuck	5120-00-144-2084	1410
3	0	Chuck	5120-00-144-2088	1412
4	0	Die	5120-00-090-4412	1401
5	0	Die	5120-00-144-2097	1407
6	0	Die Set, Spur Grommet, No. 0		
7	0	Die Set, Spur Grommet, No. 2	5120-00-221-1148	
8	0	Die Set, Spur Grommet, No. 5	5120-00-221-1151	
9	0	Die Set, Spur Grommet, No. 8		
10	0	Electric Pot, Melting	5120-00-242-1276	W6441
11	0	Finger Trap Tool		
12	0	Holder, Die Fastener	5120-00-357-6177	192
13	0	Key, Socket Head Set	5120-00-729-6392	GGG-K-275
14	0	Knife, Hot, Metal	3439-00-197-7656	4025
15	0	Mallet, Large Leather	5120-00-293-3397	GGG-H-33
16	0	Needle, Tacking	8315-00-262-3733	FF-N-100
17	0	Packing Paddle	1670-00-764-6381	11-1-0152
18	0	Pins, Temporary Locking		
19	0	Pliers, Large, Diamond Cut	5110-00-222-2708	GGG-P-468
20	0	Press, Hand	5120-00-880-0619	
21	0	Ripcord Inspection Kit	1670-00-910-3866	11-1-0595

TOOL OR TEST EQUIPMENT REF CODE (1)	MAINTENANCE CATEGORY (2)	NOMENCLATURE (3)	NATIONAL NATO STOCK NUMBER (4)	PN TOOL NUMBER (5)
22	0	Shears	5110-00-223-6370	GGG-5-278
23	0	Stitch Removal Tool		
24	0	Tape Measure	5210-00-1824797	W7312
25	0	Wrench, 7/16-Inch, Open-End	5120-00-228-9505	

SECTION IV. REMARKS

Reference Code	Remarks/Notes
A	Inspect is a technical-rigger type inspection.
B	Service is cleaning of 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.
F	Repair by darning, retacking, restitching, splice edge binding, and repairing grommets. Replacement of parts authorized for unit maintenance.
G	Perform ripcord pocket test.

APPENDIX C
REPAIR PARTS AND SPECIAL TOOLS LIST

SECTION I. INTRODUCTION

C-1. Scope. This manual lists and authorizes spare and repair parts; special tools; special test, measurement, and diagnostic equipment (CMDE); and other special support equipment required for performance of organizational, direct support, and general support maintenance of the MC4 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. 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.

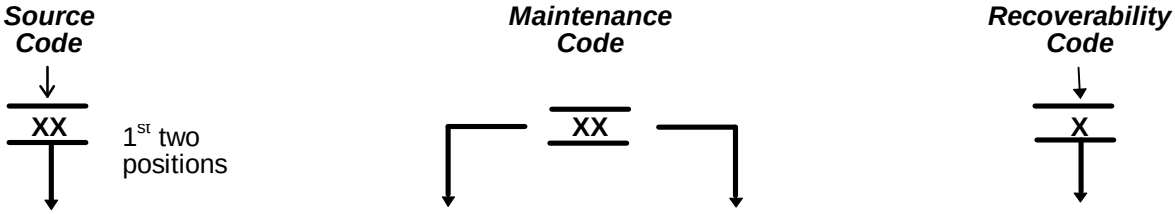
b. *Section III. Special Tools List*. (Not Applicable). No special tools are required to assemble the MC-4 parachute. Common tools are listed in Appendix B, Section II because they are required for performance of packing and maintenance procedures/tasks. These tools are authorized under Chapter 2, paragraph 2-1 of this manual.

c. *Section IV. Cross-Reference Indexes*. A list, In National Item Identification Number (NIIN) sequence, of all National Stock Numbers (NSN) appearing in the listings, 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 (Section II).

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.

C-3. Explanation of Columns (Section II) (CONT).

(1) *Source Code*. The source code tells you how to get an item needed for maintenance, repair, or overhaul of an end item/equipment. Source codes are always the first two positions of the SMR code. 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.
KD KF KB	Items with these codes are not to be requested/requisitioned individually. They re 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 Unit/AVUM Level)	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 this RPSTL. H 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.
MF-	(Made at DS/AVUM Level)	
MH-	(Made at GS Level)	
ML-	(Made at Specialized Repair Activity (SRA))	
MD-	(Made at Depot)	
AO-	(Assembled by Unit/AVUM Level)	Items with these codes are not to be requested/ requisitioned individually. The puts that make up the assembled item must be requisitioned or fabricated and assembled at the level of maintenance indicated by the source code. H the 3rd position code of the SMR code authorizes you to replace the item, but the source code indicates the items are assembled at a higher level, order the item from the higher level of maintenance.
AF-	(Assembled by DS/AVIM Level)	
AH-	(Assembled by GS Category)	
AL-	(Assembled by SRA)	
AD-	(Assembled by Depot)	

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 codes, except for those source coded 'XA" or those aircraft support items restricted by requirements of AR 700-42.

(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 organizational or aviation unit maintenance.
O	Organizational or aviation unit category can remove, replace, and use the item.
F	Direct support or aviation intermediate level can remove, replace, and use the item.

Code	Application/Explanation
H	General support level can remove, replace, and use the item.
L	Specialized repair activity can remove, replace, and use the item.
D	Depot level can remove, replace, and use the item.

C-3. Explanation of Columns (Section II) (CONT).

(b) The maintenance code entered in the fourth position tells whether or not the item is to be repaired and identifies the lowest maintenance level with the capability to do complete repair (i.e., perform all authorized repair functions.) (NOTE: Some limited repair may be done on the item at a lower level of maintenance, if authorized by the Maintenance Allocation Chart (MAC) and SMR code.) This position will contain one of the following maintenance codes.

Code	Application/Explanation
O	Organizational or aviation unit is the lowest level that can do complete repair of the item.
F	Direct support or aviation intermediate 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 Code	Application/Explanation
Z	Nonreparable item. When unserviceable, condemn and dispose of the item at the level of maintenance shown in 3d position of SMR Code.
O	Reparable item. When uneconomically reparable, condemn and dispose of the item at organizational or aviation unit level.
F	Reparable item. When uneconomically reparable, condemn and dispose of the item at the direct support or aviation intermediate level.
H	Reparable item. When uneconomically reparable, condemn and dispose of the item at the general support level.
D	Reparable item. When beyond lower level repair capability, return to depot. Condemnation and disposal of item not authorized below depot level.

Recoverability Code		Application/Explanation
L	————	Reparable item. Condemnation and disposal not authorized below specialized repair activity (SRA).
A	————	Item requires special handling or condemnation procedures because of specific reasons (e.g., precious metal content, high dollar value, critical material, or hazardous material). Refer to appropriate manuals/directives for specific instructions.

c. *FSCM (Column (3)).* The Federal Supply Code for Manufacturer (FSCM) Is a 5-digit numeric code which is used to identify the manufacturer, distributor, or Government agency, etc., that supplies the item.

d. *Part Number (Column (4)).* Indicates the primary number used by the manufacturer (individual, company, firm, corporation, or Government activity), which controls the design and characteristics of the item by means of its engineering drawings, specifications standards, and inspection requirements to identify an item or range of items.

NOTE

When you use 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 Cl (C) - Confidential, Phy Sec Cl (S) - Secret, Phy Sec Cl (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 4, Special Information).

(8) In the Special Tools List section, the basis of issue (BOI) appears as the last line(s) in the entry for 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.

C-3. Explanation of Columns (Section II) (CONT).

(9) The statement 'End of Figure' appears just below the last item description in Column 5 for a given figure in Section II.

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. Special Information.

a. The 'Usable on code' title appears in the lower right comer of column (5). Description. Usable on codes are shown In the right hand margin of the description column.

b. Bulk materials required to manufacture items are listed in the Bulk Material Group of this manual. NSNs for bulk materials are also referenced in the description column of the line item entry for the item to be manufactured/fabricated. Detailed manufacturing instructions for items source coded to be manufactured or fabricated are found in this manual.

c. Detailed assembly instructions for items source coded to be assembled from component spare/repair parts are found in this manual. Items that make up the assembly are listed immediately following the assembled item entry.

d. Line item entries for repair parts kits and sets appear as the last entries in the repair parts listing for the figure in which their parts are listed as repair parts.

e. Items which have the word Bulk in the figure number column will have an index number shown in the item number column. This index number is furnished for use as a cross-reference between the National Stock Number/Part Number Index and the bulk material list in Section II.

f. In the repair parts list, some items are indented to show that they are a component or components of the item under which they are indented.

C-5. Explanation of Columns (Section IV).

a. *National Stock Number (NSN) Index.*

(1) *Stock number column*. 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.

NSN

5305-01-574-1467

NIIN

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.

(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) *Part number column*. Indicates the primary number used by the manufacturer (individual, firm, corporation, or Government activity), which controls the design and characteristics of the item by means of its engineering drawings, specifications standards, and inspection requirements to identify an item or range of items.

(3) *Stock number column*. This column lists the NSN for the associated-part number and manufacturer identified in the part number and FSCM columns to the left.

(4) *Fig. column*. This column lists the number of the figure where the item is identified/located in Sections II and III.

(5) *Item column*. The item number is that number assigned to the item as it appears in the figure referenced in adjacent figure number column.

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 functional group or subfunctional group to which the item belongs. This Is necessary since figures are prepared for functional groups and subfunctional groups, and listings are divided into the same groups.

(2) *Second*. Find the figure covering the functional group or subfunctional group to which the item belongs.

(3) *Third*. Identify the item on the figure and note the item number of the item.

(4) *Fourth*. Refer to the Repair Parts List for the figure to find the line item entry for the item number noted on the figure.

C-6. How to Locate Repair Parts (CONT).

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 the National Item Identification Number (NIIN)* sequence. The part numbers in the Part Number index are listed in ascending alphanumeric sequence. Both indexes cross-reference you to the illustration figure and item number of the item you are looking for.

NSN

*The NIIN consists of the last 9 digits of the NSN (i.e., 5305-01675-1467).

NIIN

(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.

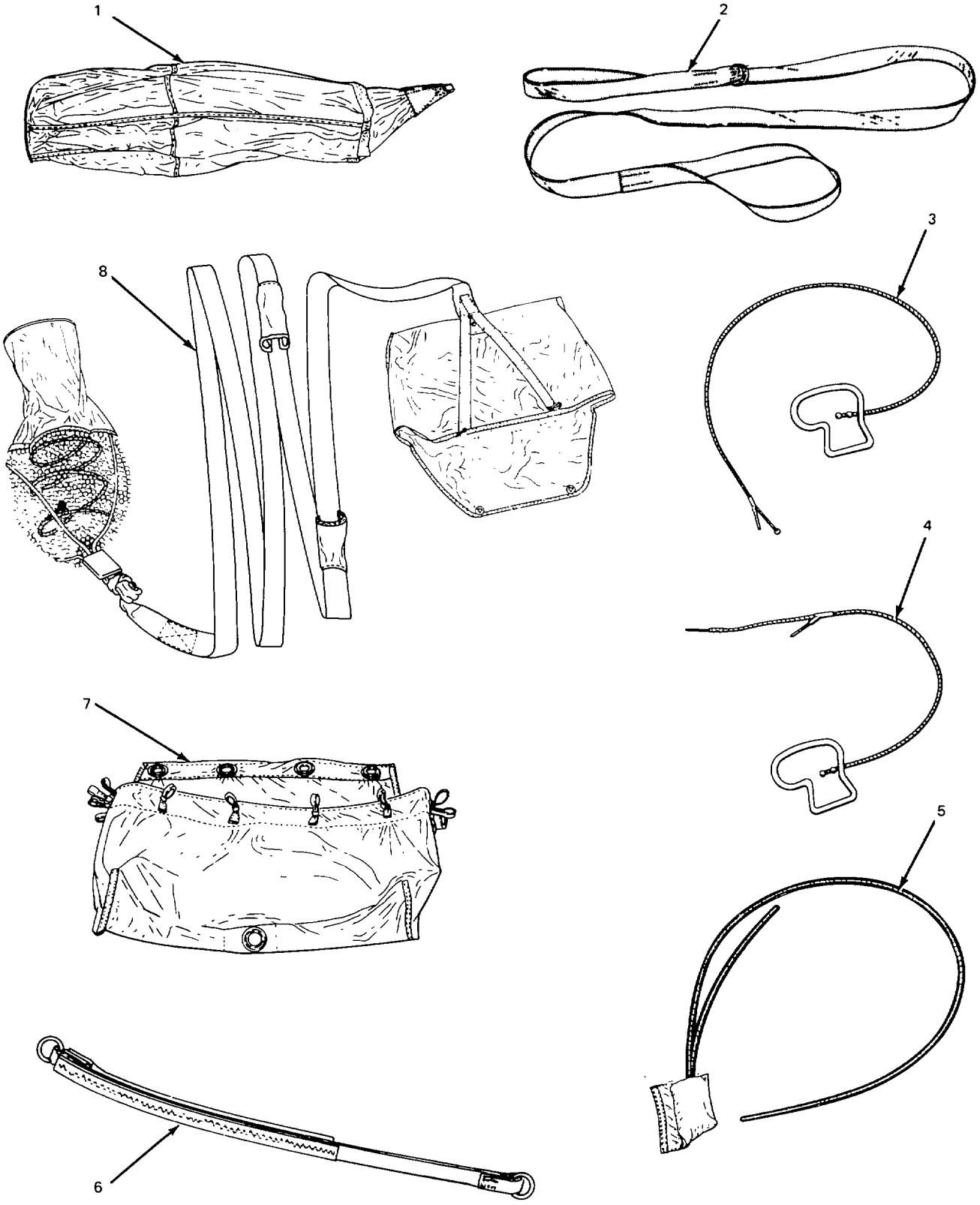


Figure C-1. MC-4 Ram Air Parachute System (Sheet 1 of 2)

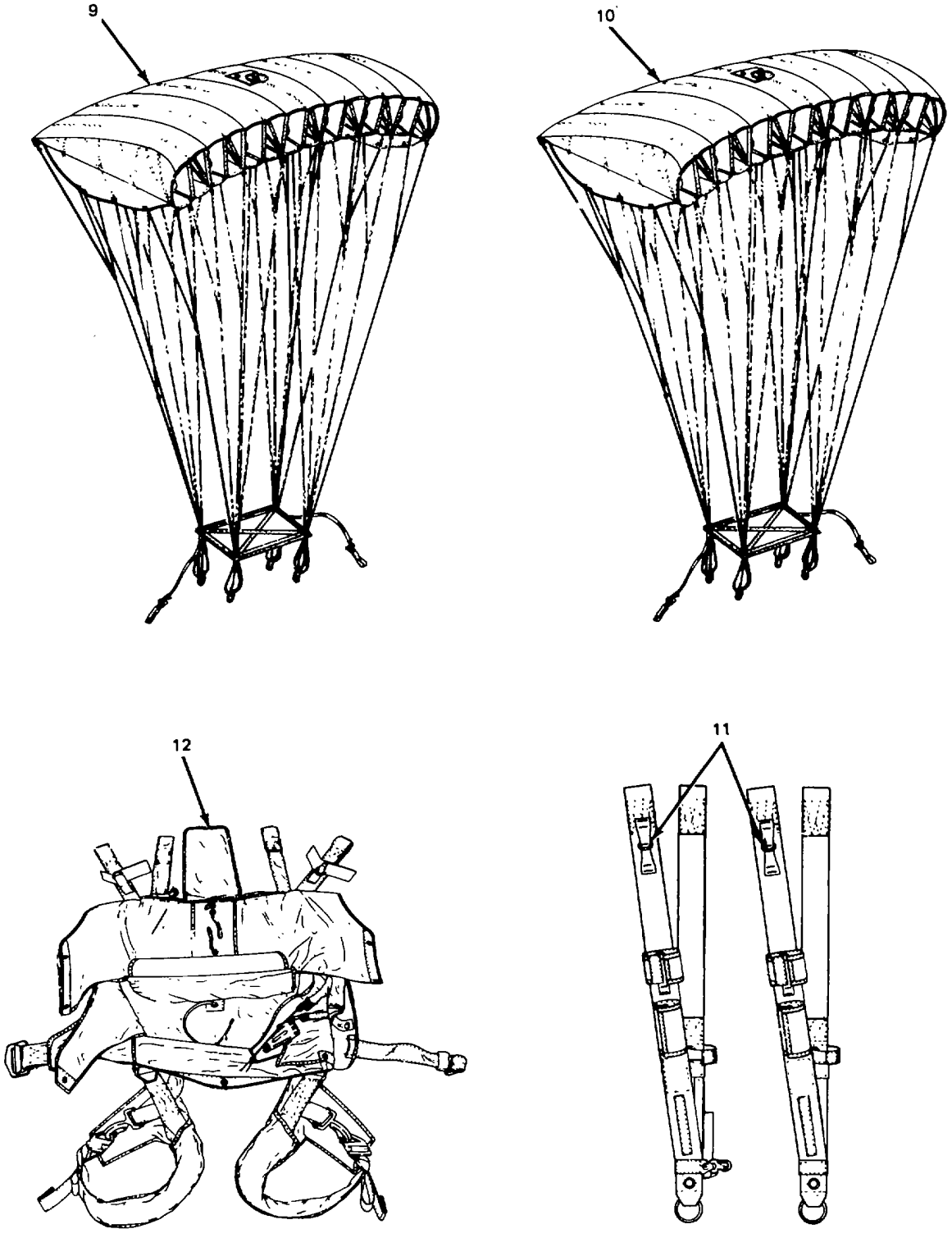


Figure C-1. MC-4 Ram Air Parachute System (Sheet 2)

SECTION II. REPAIR PARTS LIST

(1) ITEM NO.	(2) SMR CODE	(3) FSCM	(4) PART NUMBER	(5) DESCRIPTION AND USABLE ON CODES (UOC)	(6) QTY
				GROUP 00 PARACHUTE SYSTEM, MC-4	
				FIG. C-1 PARACHUTE SYSTEM, RAM AIR, MC-4 11-1-3516	
1	PAOOO	81337	11-1-3522	PILOT CHUTE, MAIN.....	1
2	PAOZZ	81337	11-1-3523	BRIDLE, PILOT CHUTE, MAIN.....	1
3	PAOZZ	81337	11-1-3524	RIPCORD, MAIN.....	1
4	PAOZZ	81337	11-1-3525	RIPCORD, RESERVE.....	1
5	PAOZZ	81337	11-1-3526	RIPCORD, MAIN RELEASE.....	1
6	PAOZZ	81337	11-1-3527	STATIC LINE, RESERVE	1
7	PAOOO	81337	11-1-3521	DEPLOYMENT BAG, MAIN	1
8	PAOZZ	81337	11-1-3520	DEPLOYMENT SYSTEM RESERVE	1
9	PAOOO	81337	11-1-3518	CANOPY, MAIN	1
10	PAOOO	81337	11-1-3518-1	CANOPY, RESERVE	1
11	PAOOO	81337	11-1-3519	RISERS, MAIN	2
12	PAOOO	81337	11-1-3517	HARNESS/CONTAINER	1
				END OF FIGURE	

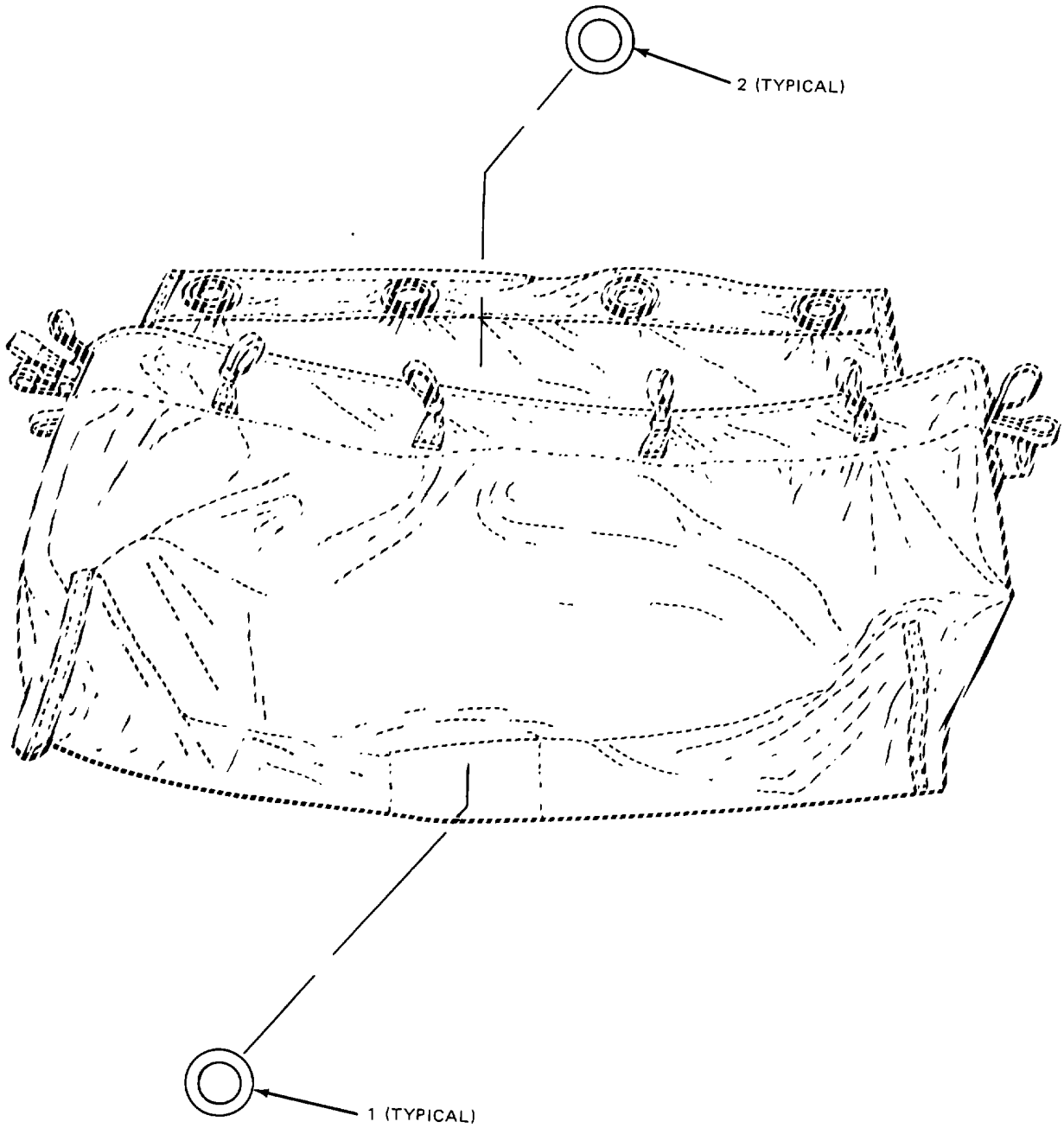


Figure C-2. Main Deployment Bag

(1) ITEM NO.	(2) SMR CODE	(3) PART FSCM	(4) NUMBER	(5) DESCRIPTION AND USABLE ON CODES (UOC)	(6) QTY
				GROUP 01 DEPLOYMENT BAG, MAIN	
				FIG. C-2 DEPLOYMENT BAG, MAIN 11-1-3521	
1	PAOZZ			GROMMET, METALLIC, GROMMET, #5	1
2	PAOZZ			GROMMET, METALLIC, SPUR WASHER, #5	1
				END OF FIGURE	

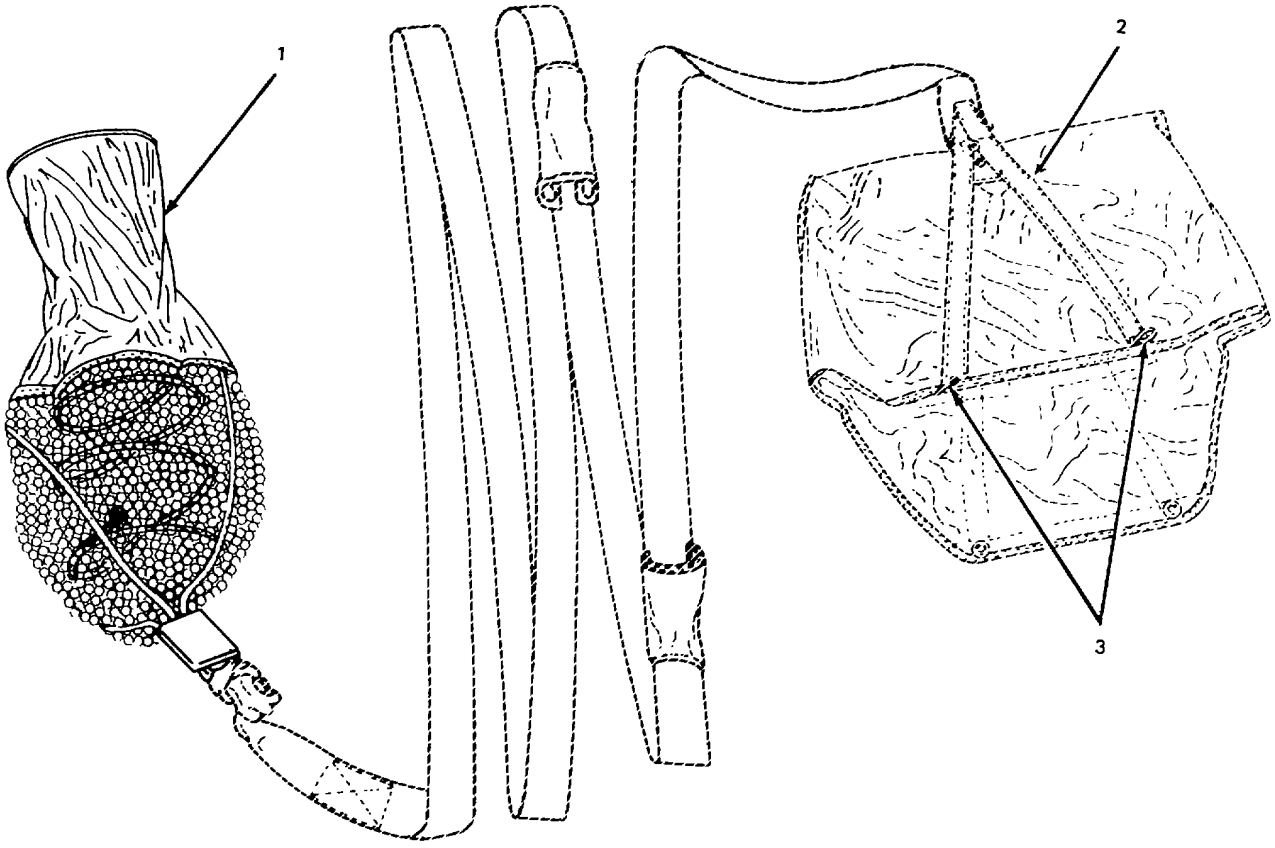


Figure C-3. Reserve Deployment System

(1) ITEM NO.	(2) SMR CODE	(3) FSCM	(4) PART NUMBER	(5) DESCRIPTION AND USABLE ON CODES (UOC)	(6) QTY
				GROUP 02 DEPLOYMENT SYSTEM, RESERVE	
				FIG. C-3 DEPLOYMENT SYSTEM, RESERVE 11-1-3520	
1	PAOZZ	81337	11-1-3545	PILOT CHUTE, RESERVE	1
2	PAOZZ	81337	11-1-3544	DEPLOYMENT BAG AND BRIDLE ASSY	1
3	PAOZZ	81337	11-1-3533	LOOP, SAFETY STOW	1
				END OF FIGURE	

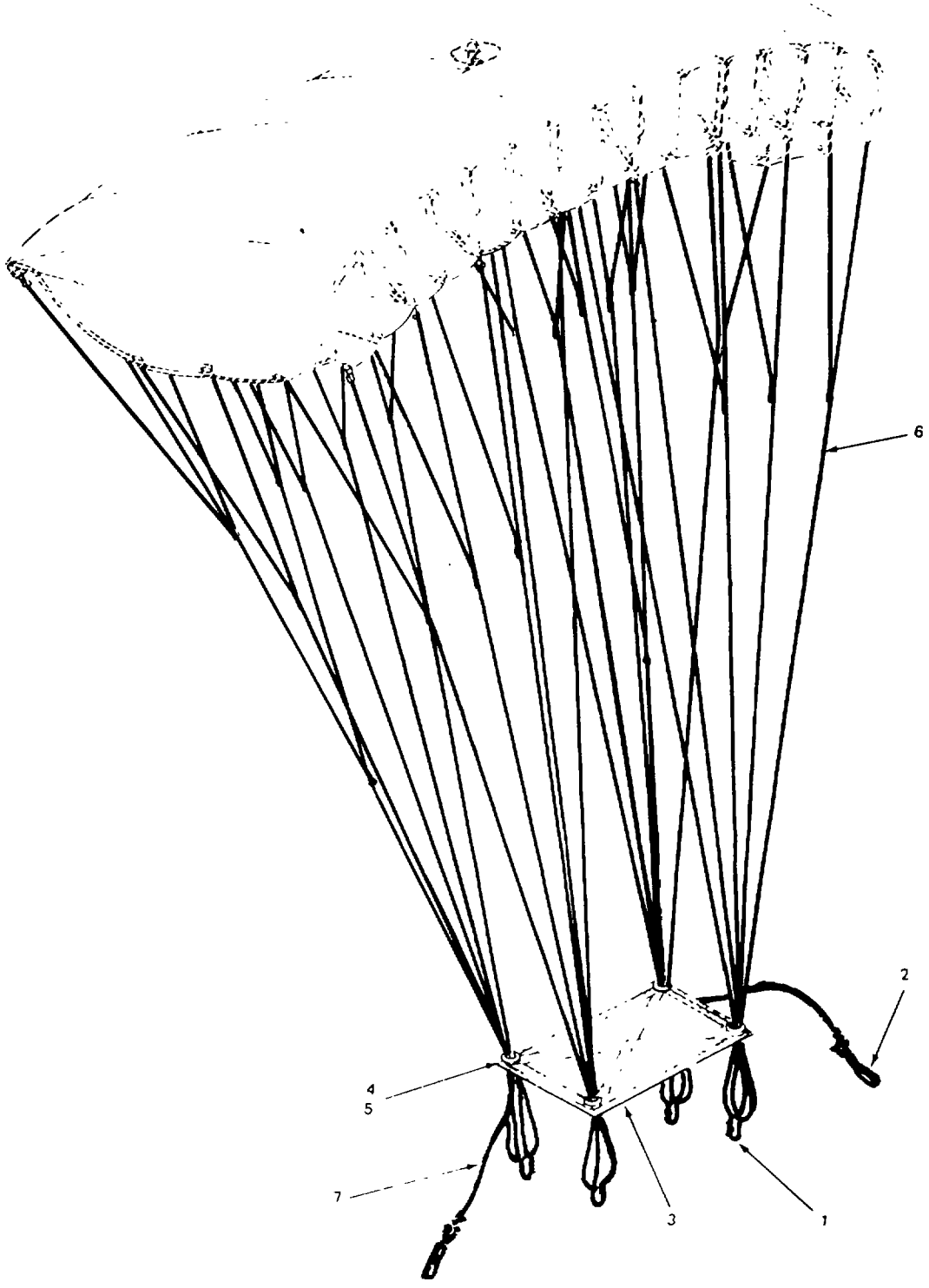


Figure C-4. Main Canopy

(1) ITEM NO.	(2) SMR CODE	(3) FSCM	(4) PART NUMBER	(5) DESCRIPTION AND USABLE ON CODES (UOC)	(6) QTY
				GROUP 03 CANOPY, MAIN	
				FIG. C-4 CANOPY, MAIN 11-1-3518-0	
1	PAOZZ	81337	11-1-3699-1	LINK, CONNECTOR, #6 ..	4
2	PAOZZ	81337	11-1-3532	TOGGLE, SOFT	2
3	PAOOO	81337	11-1-3531	SLIDER, 27 IN. BY 28 IN	1
4	PAOZZ			.GROMMET, METALLIC, GROMMET #8	4
5	PAOZZ			.GROMMET, METALLIC, SPUR WASHER, #8	4
6	PAFZZ	81337	11-1-3699	SUSPENSION LINES, SET	1
7	PAFZZ	81337	11-13700-0	STEERING LINES, MAIN, SET	1
				END OF FIGURE	

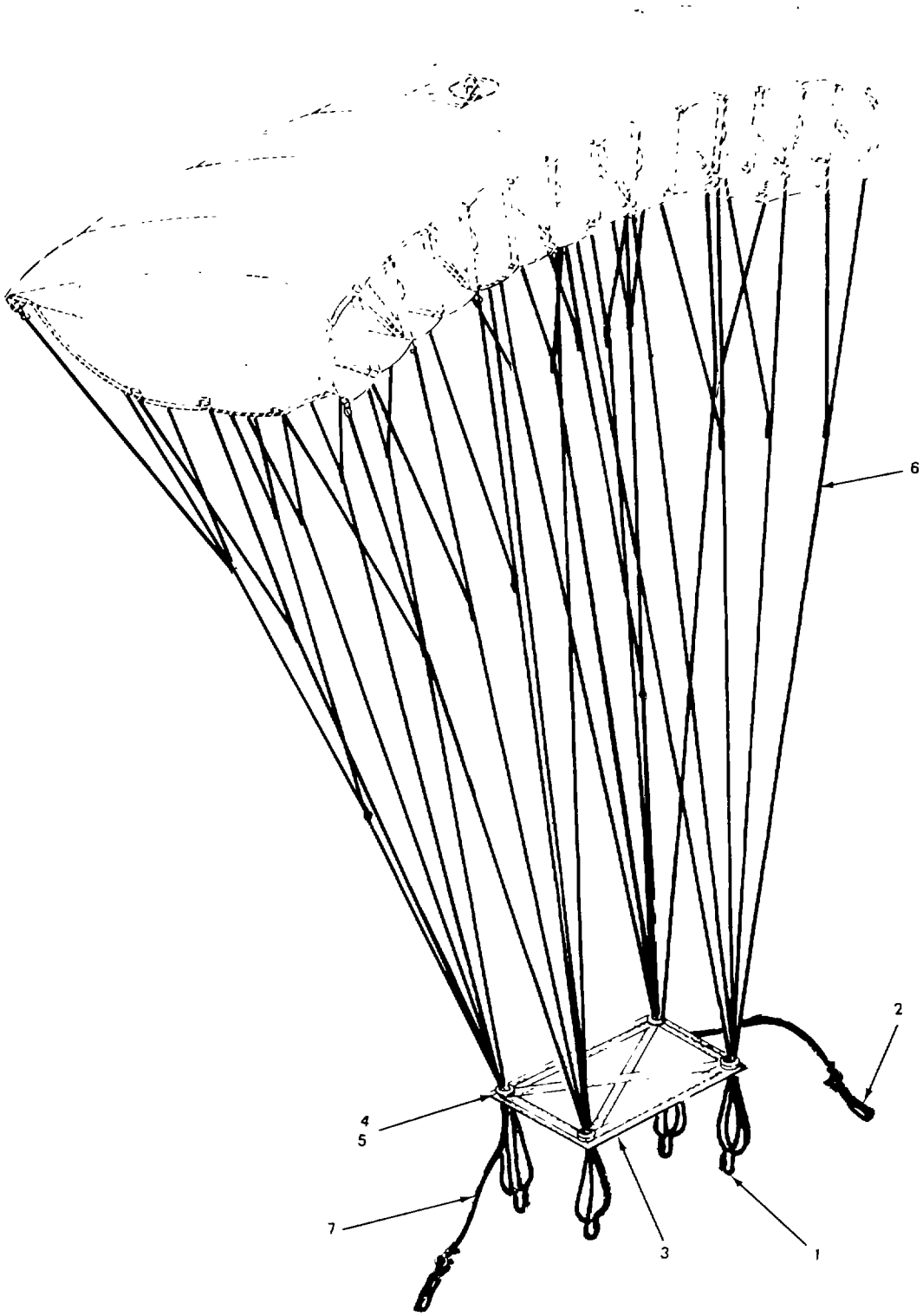


Figure C-5. Reserve Canopy

(1) ITEM NO.	(2) SMR CODE	(3) FSCM	(4) PART NUMBER	(5) DESCRIPTION AND USABLE ON CODES (UOC)	(6) QTY
				GROUP 04 CANOPY, RESERVE	
				FIG. C-5 CANOPY, RESERVE 11-1-3518-1	
1	PAOZZ	81337	11-1-3699-1	LINK, CONNECTOR, #6	4
2	PAOZZ	81337	11-1-3532	TOGGLE, SOFT	2
3	PAOOO	81337	11-1-3531	SLIDER, 27 IN. BY 28 IN 1	
4	PAOZZ			.GROMMET, METALLIC, GROMMET #8	4
5	PAOZZ			.GROMMET, METALLIC, SPUR WASHER, #8.	4
6	PAFZZ	81337	11-1-3699	SUSPENSION LINES, SET	1
7	PAFZZ	81337	11-1-3700-1	STEERING LINES, RESERVE, SET	1
				END OF FIGURE	

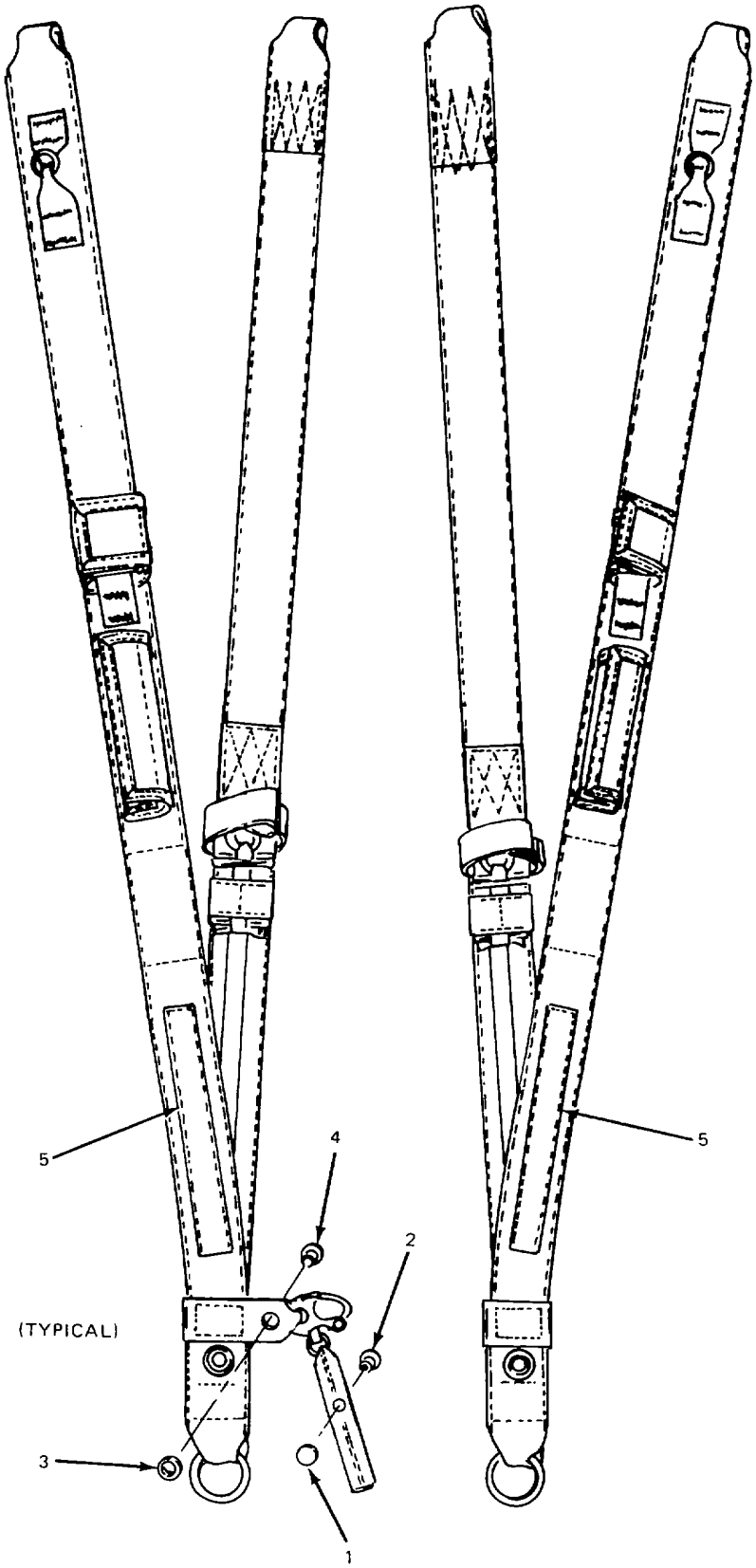


Figure C-6. Main Risers

(1) ITEM NO.	(2) SMR CODE	(3) PART FSCM	(4) NUMBER	(5) DESCRIPTION AND USABLE ON CODES (UOC)	(6) QTY
				GROUP 05 RISERS, MAIN FIG. C-6 RISERS, MAIN 11-1-3519	
1	PAOZZ	96906	MS27980	FASTENER, SNAP, BUTTON	1
2	PAOZZ	96906	MS27980-6B	FASTENER, SNAP, SOCKET	1
3	PAOZZ	96906	MS27980	FASTENER, SNAP, EYELET	1
4	PAOZZ	96906	MS27980-7B	FASTENER, SNAP, STUD	1
5	MOOOO	81337		CHANNEL, MAIN CANOPY RELEASE CABLE, MAKE FROM TAPE, NYLON ,MIL-T-5-38, TYPE III, CLASS 1,3/4 IN. WIDE, THREAD, NYLON, V-T-295, SIZE E	2
				END OF FIGURE	

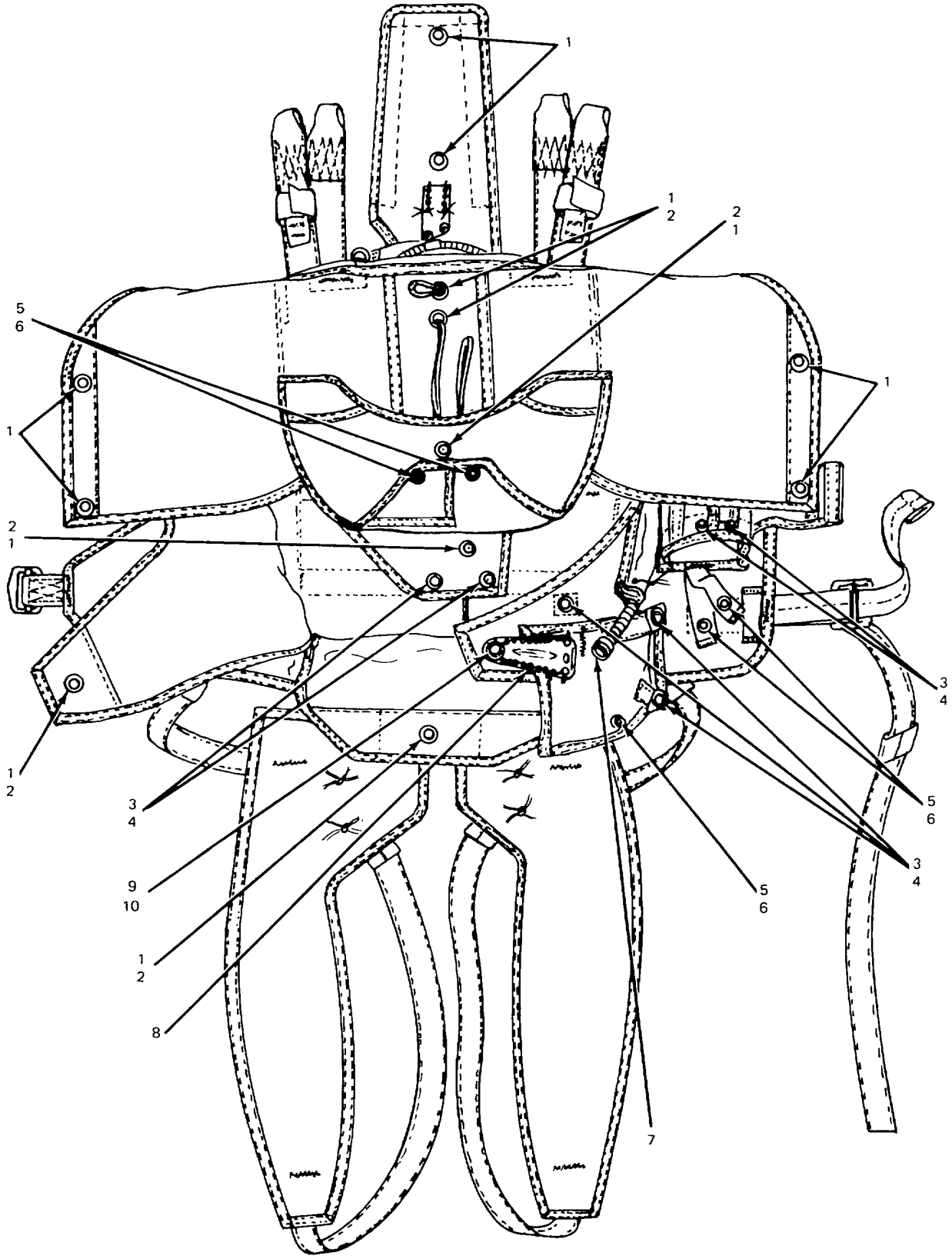


Figure C-7. Hamess/Container (Sheet 1 of 2)

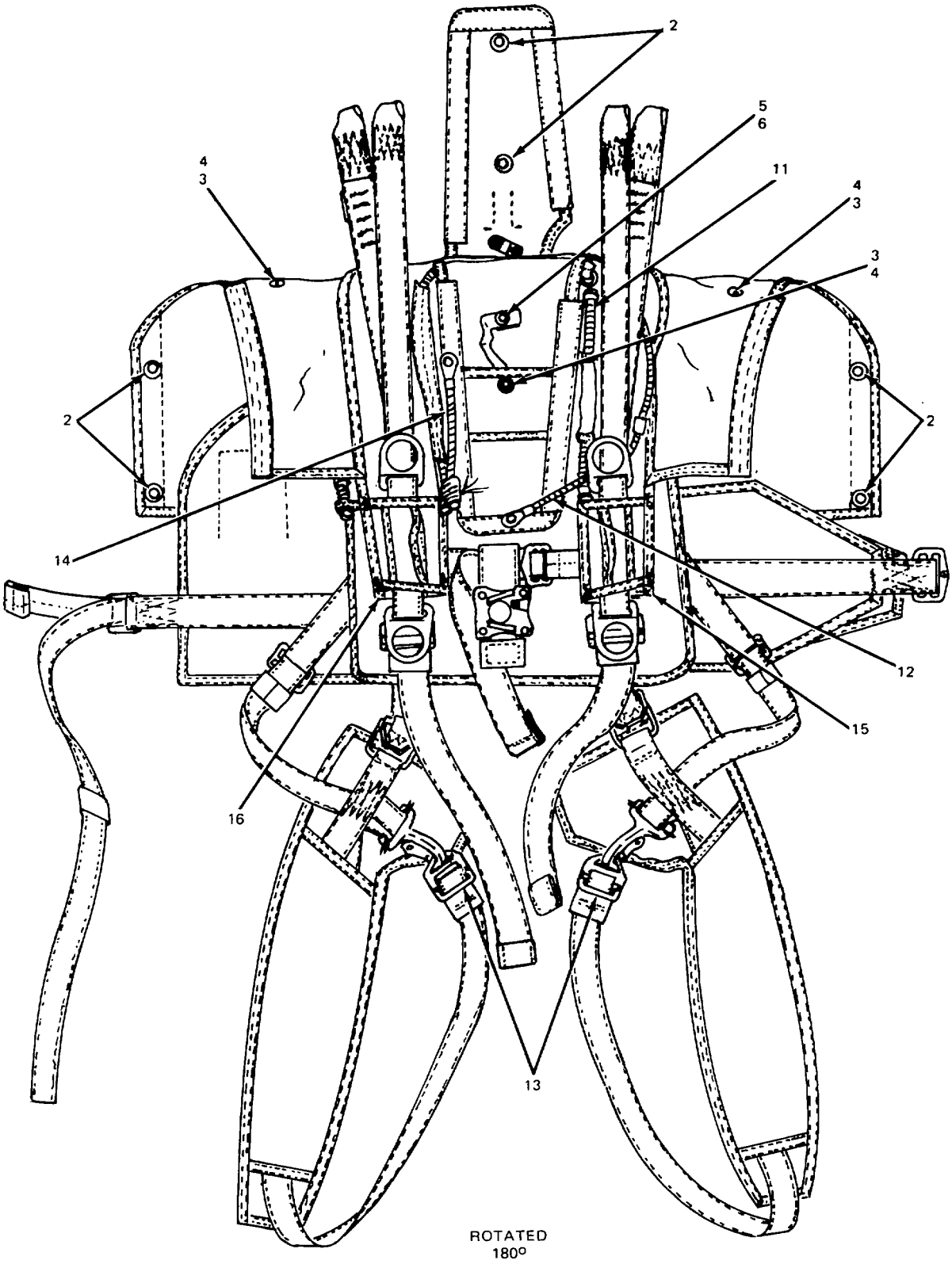


Figure C-7. Harness/Container (Sheet 2 of 2)

SECTION II. REPAIR PARTS LIST

(1) ITEM NO.	(2) CODE	(3) SMR FSCM	(4) PART NUMBER	(5) DESCRIPTION AND USABLE ON CODES (UOC)	(6) QTY
				GROUP 06 HARNESS/CONTAINER	
				FIG. C-7 HARNESS/CONTAINER 11-1-3517	
1	PAOZZ			GROMMET, METALLIC, SPUR, WASHER, #0	12
2	PAOZZ			GROMMET, METALLIC, GROMMET, #0	12
3	PAOZZ	96906	MS27980-7B	FASTENER, SNAP, STUD	10
4	PAOZZ	96906	MS27980	FASTENER, SNAP, EYELET	10
5	PAOZZ	96906	MS27980-6B	FASTENER, SNAP, SOCKET	10
6	PAOZZ	96906	MS27980	FASTENER, SNAP, BUTTON	10
7	XB	81337	11-1-3517-13	HOUSING, RIPCORD, 33-INCH	1
8	XB	81337	11-1-3566	STIFFENER, NAVY, BASE ONLY	1
9	PAOZZ			GROMMET, METALLIC, GROMMET, #2.....	1
10	PAOZZ			GROMMET, METALLIC, SPUR WASHER, #2.....	1
11	XB	81337	11-1-3517-10	HOUSING, RIPCORD, 11-INCH	1
12	XB	81337	11-1-3551-1	HOUSING, MAIN RELEASE, 41-INCH	1
13	PAOZZ	96906	MS70113-1	RING, V, QUICK FIT	2
14	XB	81337	11-1-3551	HOUSING, MAIN RELEASE, 51/2-INCH	1
15	PAOZZ	81337	11-1-3567	POCKET, RESERVE RIPCORD	1
16	PAOZZ	81337	11-1-3568	POCKET, MAIN RIPCORD	1
				END OF FIGURE	

(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-C44378	CLOTH, NYLON RIPSTOP, TYPE I	
2	PAOZZ	81349	MIL-C-7219	CLOTH, NYLON, TYPE III, CLASS 3, BLACK	
3	PAOZZ	T-C-2754		CORD, DACRON, 600-POUND, TYPE I	
4	PAOZZ	81349	MIL-F-21840	TAPE, FASTENER, HOOK, TYPE II ,CLASS 1..... 1 INCH WIDE.....	
5	PAOZZ	81349	MIL-F-21840 1 INCH WIDE	TAPE, FASTENER, PILE, TYPE II, CLASS 1, ...	
6	PAOZZ	81349	MIL-F-21840	TAPE, FASTENER, PILE, TYPE II, CLASS 1, ... 2 INCH WIDE.....	
7	PAOZZ	81349	MIL-T-5038	TAPE, NYLON, TYPE III, CLASS 1	
8	PAOZZ	80244	MIL-T-43435	TAPE, NYLON LACING	
9	PAOZZ	81348	V-T-276	THREAD, COTTON, SIZE 24/4	
10	PAOZZ	81348	V-T-295	THREAD, NYLON, SIZE E	
				END OF FIGURE	

SECTION III. SPECIAL TOOLS LIST

NOT APPLICABLE

SECTION IV. CROSS-REFERENCE INDEXES

NATIONAL STOCK NUMBER INDEX

STOCK NUMBER	FIG.	ITEM	STOCK NUMBER	FIG.	ITEM
8315-00-176-8082	BULK	7	1670-01-330-3738	C-1	6
8310-00-261-9741	BULK	9	1670-01-330-3740	C-3	3
8310-00-262-2772	BULK	10	1670-01-330-3743	C-1	5
5325-00-285-6250	C-6	2	1670-01-330-3744	C-4	3
5325-00-359-6844	C-6	1	1670-01-330-3745	C-4	7
4020-00-753-6555	BULK	8	1670-01-330-3746	C-4	6
8305-00-765-2863	BULK	2	1670-01-330-3747	C-1	1
5325-00-842-1879	C-6	4	1670-01-330-3748	C-3	2
8305-01-315-7955	BULK	1	1670-01-331-5423	C-3	1
1670-01-330-3279	C-1	10	1670-01-332-3916	C-1	9
1670-01-330-3280	C-1	12	1670-01-334-7597	C-1	7
1670-01-330-3281	C-1	4	1670-01-342-5135	C-4	2
1670-01-330-3282	C-1	3	1670-01-342-7686	C-1	8
1670-01-330-3283	C-1	2	1670-01-342-7696	C-7	16
1670-01-330-3284	C-1	11	1670-01-343-2946	C-7	15
1670-01-330-3691	C-4	1	1670-01-359-9485	BULK	3

CROSS-REFERENCE INDEXES

PART NUMBER INDEX

FSCM	PART NUMBER	STOCK NUMBER	FIG.	ITEM
81349	MIL-C-44378	8305-01-315-7955	BULK	1
81349	MIL-C-7219	8305-00-765-2863	BULK	2
81349	MIL-F-21840		BULK	4
81349	MIL-F-21840		BULK	5
81349	MIL-F-21840		BULK	6
80244	MIL-T-43435	4020-00-753-6555	BULK	8
81349	MIL-T-5038	8315-00-176-8082	BULK	7
96906	MS27980	5325-00-359-6844	C-6	1
96906	MS27980		C-6	3
96906	MS27980		C-7	4
96906	MS27980		C-7	6
96906	MS27980-6B	5325-00-285-6250	C-6	2
96906	MS27980-6B		C-7	5
96906	MS27980-7B	5325-00-842-1879	C6	4
96906	MS27980-7B		C-7	3
96906	MS70113-1		C-7	13
81348	T-C-2754	4020-01-359-9485	BULK	3
81348	V-T-276	8310-00-261-9741	BULK	9
81348	V-T-295	8310-00-262-2772	BULK	10
81337	11-1-3517	1670-01-330-3280	C-1	12
81337	11-1-3517-10		C-7	11
81337	11-1-3517-13		C-7	7
81337	11-1-3518	1670-01-332-3916	C-i	9
81337	11-1-3518-1	1670-01-330-3279	C-i	10
81337	11-1-3519	1670-01-330-3284	C-i	11
81337	11-1-3520	1670-01-342-7686	C-i	8
81337	11-1-3521	1670-01-334-7597	C-1	7
81337	11-1-3522	1670-01-330-3747	C-i	1
81337	11-1-3523	1670-01-330-3283	C-i	2
81337	11-1-3524	1670-01-330-3282	C-1	3
81337	11-1-3525	1670-01-330-3281	C-i	4
81337	11-1-3526	1670-01-330-3743	C-1	5
81337	11-1-3527	1670-01-330-3738	C-i	6
81337	11-1-3531	1670-01-330-3744	C-4	3
81337	11-1-3531		C-5	3

FSCM	PART NUMBER	STOCK NUMBER	FIG.	ITEM
81337	11-1-3532	1670-01-342-5135	C4	2
81337	11-1-3532		C-5	2
81337	11-1-3533	1670-01-330-3740	C-3	3
81337	11-1-3544	1670-01-330-3748	C-3	2
81337	11-1-3545	1670-01-331-5423	C-3	1
81337	11-1-3551		C-7	14
81337	11-1-3551-1		C-7	12
81337	11-1-3566		C-7	8
81337	11-1-3567	1670-01-343-2946	C-7	15
81337	11-1-3568	1670-01-342-7696	C-7	16
81337	11-1-3699	1670-01-330-3746	C4	6
81337	11-1-3699		C-5	6
81337	11-1-3699-1	1670-01-330-3691	C4	1
81337	11-1-3699-1		C-5	1
81337	11-1-3700	1670-01-330-3745	C-4	7
81337	11-1-3700-1		C-5	7

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APPENDIX D

EXPENDABLE/DURABLE SUPPLIES AND MATERIALS LIST

SECTION I. INTRODUCTION

D-1. Scope. This appendix lists expendable supplies and materials you will need to maintain the MC-4 Parachute. These items are authorized to you by CTA 50-970, Expendable Items (Except Medical, Class V, Repair Parts, and Heraldic Items).

D-2. Explanation of Columns.

a. Column (1) Item Number. This number is assigned to the entry in the listing and is referenced in the narrative Instructions to identify the material (e.g., 'Use Cloth, Abrasive, Item 8, App. D").

b. Column (2) Level. This column identifies the lowest level of maintenance that requires the listed item. (Enter as applicable.)

C - Operator/Crew
O - Organizational Maintenance Unit Maintenance
F - Direct Support Maintenance Intermediate Maintenance
H - General Support Maintenance Intermediate Maintenance
D - Depot Maintenance

c. Column (3) National Stock Number. This is the National stock number assigned to the item; use it to request or requisition the item.

d. Column (4) Description. Indicates the Federal item name, and, if required, a description to identify the item.

e. Column (5) Unit of Measure (U/M). Indicates the measure used in performing the actual maintenance function. This measure Is expressed by a two-character alphabetical abbreviation (e.g., ea, in, pr). If the unit of measure differs from the unit of issue, requisition the lowest unit of issue that will satisfy your requirements.

SECTION II. EXPENDABLE/DURABLE SUPPLIES AND MATERIALS LIST

(1) Item Number	(2) Level	(3) National Stock Number	(4) Description	(5 U/M
1	0	9160-00-253-1171	Beeswax	LB
2	0	7520-00-248-9285	Brush, Stenciling	EA
3	0	5350-00-221-0872	Cloth, Abrasive	YD
4	0	8305-00-765-2863	Cloth, Nylon, MIL-C-7219, Type III, Class 3, Black	YD
5	0	8305-01-315-7955	Cloth, Nylon Ripstop, MIL-C-44378, Type I	YD
6	0		Cord, Cotton, Size 24/4	
7	0		Cord, Dacron, 600-Pound, T-C-2754, Type I	
8	0	4020-00-246-0688	Cord, Nylon, MIL-C-5040	YD
9	0	7930-00-281-4731	Dishwashing Compound	SA
10	0		Fastener Tape, Hook, 1-Inch Wide, MIL-F-21840, Type II, Class 1	
11	0		Fastener Tape, Pile, 1-Inch Wide, MIL-F-21840, Type II, Class 1	
12	0		Fastener Tape, Pile, 2-Inch Wide, MIL-F-21840, Type II, Class 1	
13	0	7510-00-634-6583	Ink, Marking	BT
14	0	7510-00-634-6583	Ink, Parachute Marking, Light Blue, MIL-1-6903	BT
15	0	915000-168-2000	Lubricant, Solid Film	
16	0	7520-00-973-1059	Marker, Felt Tip, Black	BX
17	0		Medicine Dropper	
18	0	7520-01-060-5820	Pen, Ball Point	BX
19	0	7920-00-205-3570	Rag, Wiping	BE

SECTION II. EXPENDABLE/DURABLE SUPPLIES AND MATERIALS LIST

(1) Item Number	(2) Level	(3) National Stock Number	(4) Description	(5 U/M
20	0		Spool with Color Chart	RL
21	0	9310-00-160-7858	Stencil Board, Oiled	SH
22	0	4020-00-753-6555	Tape, Lacing, Nylon, MIL-T-43435	YD
23	0	8315-00-176-8082	Tape, Nylon, MIL-T-5038, Type III, Class 1, 3/4-Inch Wide	YD
24	0	7510-00-550-7175	Tape, Pressure-Sensitive, Yellow, 1/2-Inch Wide	YD
25	0	6810-00-270-9982	Tetrachloroethylene	DR
26	0	8310-00-261-9741	Thread, Cotton, V-T-276, 24/4	TU
27	0	8310-00-262-3324	Thread, Nylon, V-T-295, Size A	TU
28	0	8310-00-262-2772	Thread, Nylon, V-T-295, Size E	TU
29	0		Three-Color pH Paper	RL
30	0	9160-00-285-2044	Wax, Paraffin	LB
31	0		Webbing, Nylon, MIL-W-4088, Type II	

APPENDIX E

ILLUSTRATED LIST OF MANUFACTURED ITEMS

Complete instructions for making items authorized to be manufactured or fabricated are located in Chapter 2, Section V of this manual.

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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 decigram = .035 ounce
1 decagram = 10 grams = .35 ounce
1 hectogram = 10 decagrams = 3.52 ounces
1 kilogram = 10 hectograms = 2.2 pounds
1 quintal = 100 kilograms = 220.46 pounds
1 metric ton = 10 quintals = 1.1 short tons

Liquid Measure

1 centiliter = 10 milliters = .34 fl. ounce
1 deciliter = 10 centiliters = 3.38 fl. ounces
1 liter = 10 deciliters = 33.81 fl. ounces
1 dekaliter = 10 liters = 2.64 gallons
1 hectoliter = 10 dekaliters = 26.42 gallons
1 kiloliter = 10 hectoliters = 264.18 gallons

Square Measure

1 sq. centimeter = 100 sq. millimeters = .155 sq. inch
1 sq. decimeter = 100 sq. centimeters = 15.5 sq. inches
1 sq. meter (centare) = 100 sq. decimeters = 10.76 sq. feet
1 sq. dekameter (are) = 100 sq. meters = 1,076.4 sq. feet
1 sq. hectometer (hectare) = 100 sq. dekameters = 2.47 acres
1 sq. kilometer = 100 sq. hectometers = .386 sq. mile

Cubic Measure

1 cu. centimeter = 1000 cu. millimeters = .06 cu. inch
1 cu. decimeter = 1000 cu. centimeters = 61.02 cu. inches
1 cu. meter = 1000 cu. decimeters = 35.31 cu. feet

Approximate Conversion Factors

To change	*To*	*Multiply by*	*To change*	*To*	*Multiply by*
inches	centimeters	2.540	ounce-inches	Newton-meters	.007062
feet	meters	.305	centimeters	inches	.394
yards	meters	.914	meters	feet	3.280
miles	kilometers	1.609	meters	yards	1.094
square inches	square centimeters	6.451	kilometers	miles	.621
square feet	square meters	.093	square centimeters	square inches	.155
square yards	square meters	.836	square meters	square feet	10.764
square miles	square kilometers	2.590	square meters	square yards	1.196
acres	square hectometers	.405	square kilometers	square miles	.386
cubic feet	cubic meters	.028	square hectometers	acres	2.471
cubic yards	cubic meters	.765	cubic meters	cubic feet	35.315
fluid ounces	milliliters	29,573	cubic meters	cubic yards	1.308
pints	liters	.473	milliliters	fluid ounces	.034
quarts	liters	.946	liters	pints	2.113
gallons	liters	3.785	liters	quarts	1.057
ounces	grams	28.349	liters	gallons	.264
pounds	kilograms	.454	grams	ounces	.035
short tons	metric tons	.907	kilograms	pounds	2.205
pound-feet	Newton-meters	1.356	metric tons	short tons	1.102
pound-inches	Newton-meters	.11296			

Temperature (Exact)

°F	Fahrenheit temperature	5/9 (after subtracting 32)	Celsius temperature	°C

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