

TECHNICAL MANUAL

OPERATORS
AND ORGANIZATIONAL
MAINTENANCE MANUAL
INCLUDING REPAIR PARTS AND SPECIAL
TOOLS LIST FOR HIGH ALTITUDE AIRDROP
RESUPPLY SYSTEM: 2,000 POUND CAPACITY

EQUIPMENT DESCRIPTION AND DATA
PAGE 1-3

OPERATING INSTRUCTIONS
PAGE 2-1

PREVENTIVE MAINTENANCE CHECKS AND
SERVICES
PAGE 2-3

MAINTENANCE PROCEDURES
PAGE 4-3

REPAIR PARTS AND SPECIAL TOOLS LIST
PAGE C-1

This copy is a reprint which includes current pages from Change 1.

CHANGE }
No. 1 }

HEADQUARTERS DEPARTMENT OF THE ARMY
DEPARTMENT OF THE AIR FORCE
WASHINGTON, D.C., 4 August 1986

**Operator's and Organizational Maintenance Manual
Including Repair Parts and Special Tools List
for**

HIGH ALTITUDE AIRDROP RESUPPLY SYSTEM: 2,000 POUND CAPACITY

TM 10-1670-265-12&P, 28 October 1982, is changed as follows:

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

Remove pages
4-61 and 4-62

Insert pages
4-61 and 4-62

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

By Order of the Secretaries of the Army, and the Air Force:

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DISTRIBUTION:

To be distributed in accordance with DA Form 12-25A, Operator and Organizational Maintenance Requirements for Airdrop Resupply System, High Altitude, 2000 lb Capacity (TM 10-1670-265-12&P)

WARNING**PRECAUTIONARY DATA**

Personnel performing operations, procedures, and practices which are included or implied in this technical manual shall observe the following instructions. Disregard of these warnings may result in serious or fatal injury to personnel. The altitude sensor parachute staging unit (ASPSU) contains a class C explosive in the cutter mechanism of the cutter module. Procedure steps shall be followed to prevent early activation and possible personal injury. When the security pin is pulled the explosive will discharge in 5 seconds.

Keep fingers or foreign objects away from webbing cutter slot at all times as blade could cause serious personnel injury.

Due to flammable properties and nylon-damaging substances, cleaning solvents other than tetrachloroethylene will not be used in the spot-cleaning of airdrop 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.

Insure that pressure chamber on ASPSU test set is depressurized before attempting to open chamber door as personnel injury may result.

For First Aid Treatment, refer to FM 21-11.

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**OPERATOR'S AND ORGANIZATIONAL
MAINTENANCE MANUAL
INCLUDING
REPAIR PARTS AND SPECIAL TOOLS LIST
FOR HIGH ALTITUDE AIRDROP RESUPPLY SYSTEM:
2,000 POUND CAPACITY**

**REPORTING ERRORS AND RECOMMENDING IMPROVEMENTS
ARMY**

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

AIR FORCE

Reports by US Air Force units should be submitted on AFTO Form 22, Technical Order Publication Improvement Report, and forwarded to the address prescribed above for the Army. An information copy of the prepared AFTO Form 22 shall be furnished to SAAMA/MMSTR, Kelly AFB, TX 78241.

		Page
CHAPTER 1.	INTRODUCTION.....	1-1
SECTION I.	General Information.....	1-1
SECTION II.	Equipment Description and Data	1-3
SECTION III.	Technical Principles of Operation	1-8
CHAPTER 2.	OPERATING INSTRUCTIONS	2-1
SECTION I.	Description and Use of Operator's Controls and Indicators	2-1
SECTION II.	Operator Preventive Maintenance Checks and Services (PMCS)	2-3
SECTION III.	Operation Under Usual Conditions	2-4
CHAPTER 3.	OPERATOR MAINTENANCE INSTRUCTIONS	3-1
CHAPTER 4.	ORGANIZATIONAL MAINTENANCE INSTRUCTIONS	4-1
SECTION I.	Repair Parts, Special Tools, TMDE, and Support Equipment.....	4-1
SECTION II.	Service Upon Receipt	4-1
SECTION III.	Preventive Maintenance Checks and Services (PMCS)	4-3
SECTION IV.	Troubleshooting.....	4-3
SECTION V.	Maintenance Procedures I	4-3
SECTION VI.	Maintenance Procedures for 57-Foot-Long Center Line	4.5
SECTION VII.	Maintenance Procedures for Altitude Sensor Parachute Staging Unit	4-13
SECTION VIII.	Maintenance Procedures for G- 12E 64-Foot-Diameter Cargo Parachute	4-47
SECTION IX.	Preparation for Storage or Shipment	4-85

		PAGE	ILLUS FIGURE
APPENDIX A	REFERENCES	A-1	
APPENDIX B	MAINTENANCE ALLOCATION CHART	B-2	
APPENDIX C	REPAIR PARTS AND SPECIAL TOOLS LIST.....	C-1	
SECTION I.	Introduction	C-1	
SECTION II.	Repair Parts	C-4	
GROUP 01.	57-Foot-Long Center Line	C-4	C-1
GROUP 02.	Altitude Sensor Parachute Staging Unit	C-5	C-2
GROUP 03.	G-12E 64-Foot-Diameter Cargo Parachute	C-6	C-3
SECTION III.	Special Tools' List.....	C-7	C-4
SECTION IV.	NSN, Part No., Index	C-8	
APPENDIX D	EXPENDABLE SUPPLIES AND. MATERIALS LIST	D-1	
	SUBJECT INDEX	Index 1	

LIST OF ILLUSTRATIONS

FIGURE NO.	TITLE	PAGE
1-1	High altitude airdrop resupply system (HAARS)	1-0

LIST OF TABLES

1-1	Equipment data	1-6
2-1	Altitude sensor parachute staging unit controls	2-1
2-2	Operator Preventative Maintenance Checks and Services ...	2-4
2-3	Barometric Pressure Setting	2-7

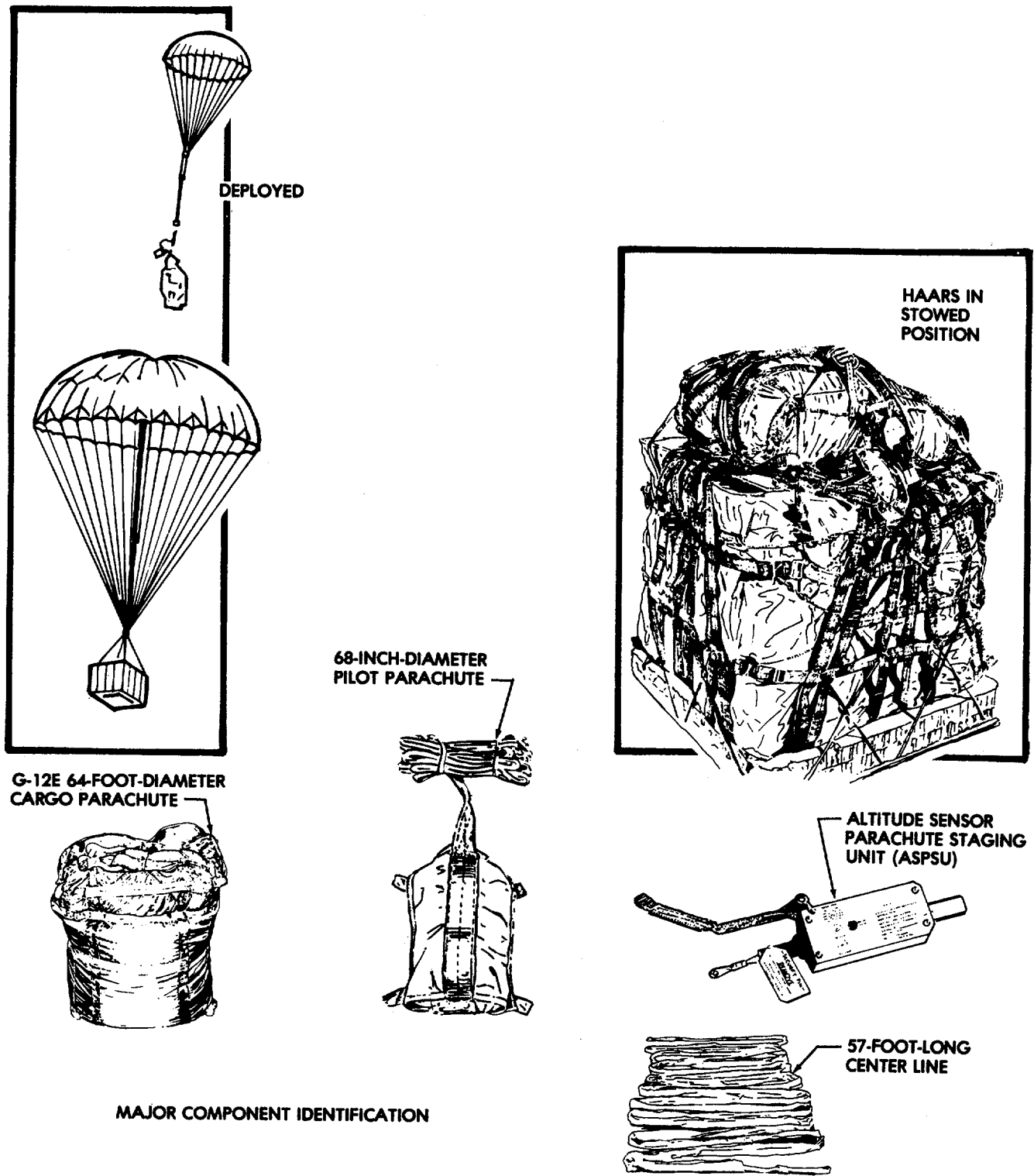


Figure 1-1. High altitude airdrop resupply system (HAARS).

CHAPTER 1
INTRODUCTION

SECTION I. GENERAL INFORMATION

1-1. Scope.

Type of Manual: Operator and Organizational

Equipment Name: High Altitude Airdrop Resupply System (HAARS)

Purpose of Equipment: Provide airdrops from high altitudes to avoid detection of aircraft from enemy ground forces.

1-2. Maintenance forms, records, and reports.

Department of the Army forms and procedures used for equipment maintenance will be those prescribed by, TM 38-750. The Army Maintenance Management System (TAMMS).

1-3. Reporting equipment improvement recommendations (EIR's). If your parachute system needs improvement, let us know. Send us an EIR. You, the user, are the only one who can tell us what you don't like about your equipment. Let us know why you don't like the design or performance. Put it on an SF 368 Quality Deficiency Report. Mail it to us at: Commander, US Army Troop Support and Aviation Materiel Readiness Command, ATTN: DRSTS-MPSD, 4300 Goodfellow Blvd., St. Louis, MO 63120. We'll send you a reply.

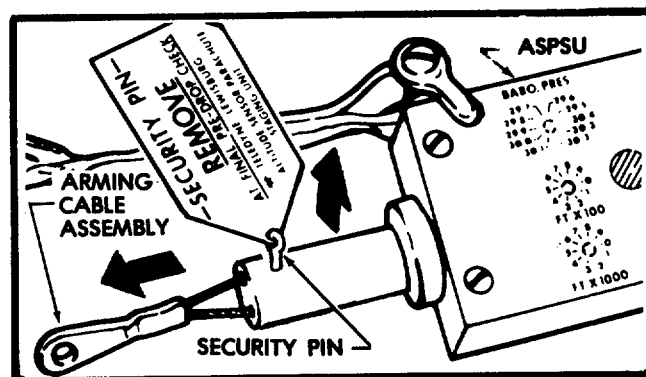
1-4. Destruction of Army materiel to prevent enemy use.

a. Instructions for destruction of the High Altitude Airdrop Resupply System are contained in TM 750- 244-1-1 / T.O. 13C3-1-10.

b. Instructions for destruction of the cutter module, (cutter), are contained in TM 750-244-5-1 and as follows:

WARNING

Explosive will discharge in 5 seconds.



- Pull out security pin.
- Pull arming cable assembly and get rid of Altitude Sensor Parachute Staging Unit (ASPSU) in an area away from personnel.
- After explosive has discharged, destroy the sensor module by destroying the printed circuit board.

1-5. Preparation for storage or shipment. For storage, refer to TM 740-90-1. Additional requirements are contained in TM 10-1670-201-23 T.O. 13C-1-41. Preparations for storage and shipment for the cutter module is contained in TM 9-1370-203-20&P.

1-6. Nomenclature cross-reference list.

Common Name	Official Nomenclature
HAARS	High Altitude Airdrop Resupply System
G-12E	G-12E 64-foot-diameter cargo parachute
68-inch Pilot chute	68-inch-diameter pilot parachute.
ASPSU	Altitude Sensor Parachute Staging Unit
A-23	High altitude container
Sensor	Sensor module
Cutter	Cutter module
Center Line	57-foot-long center line

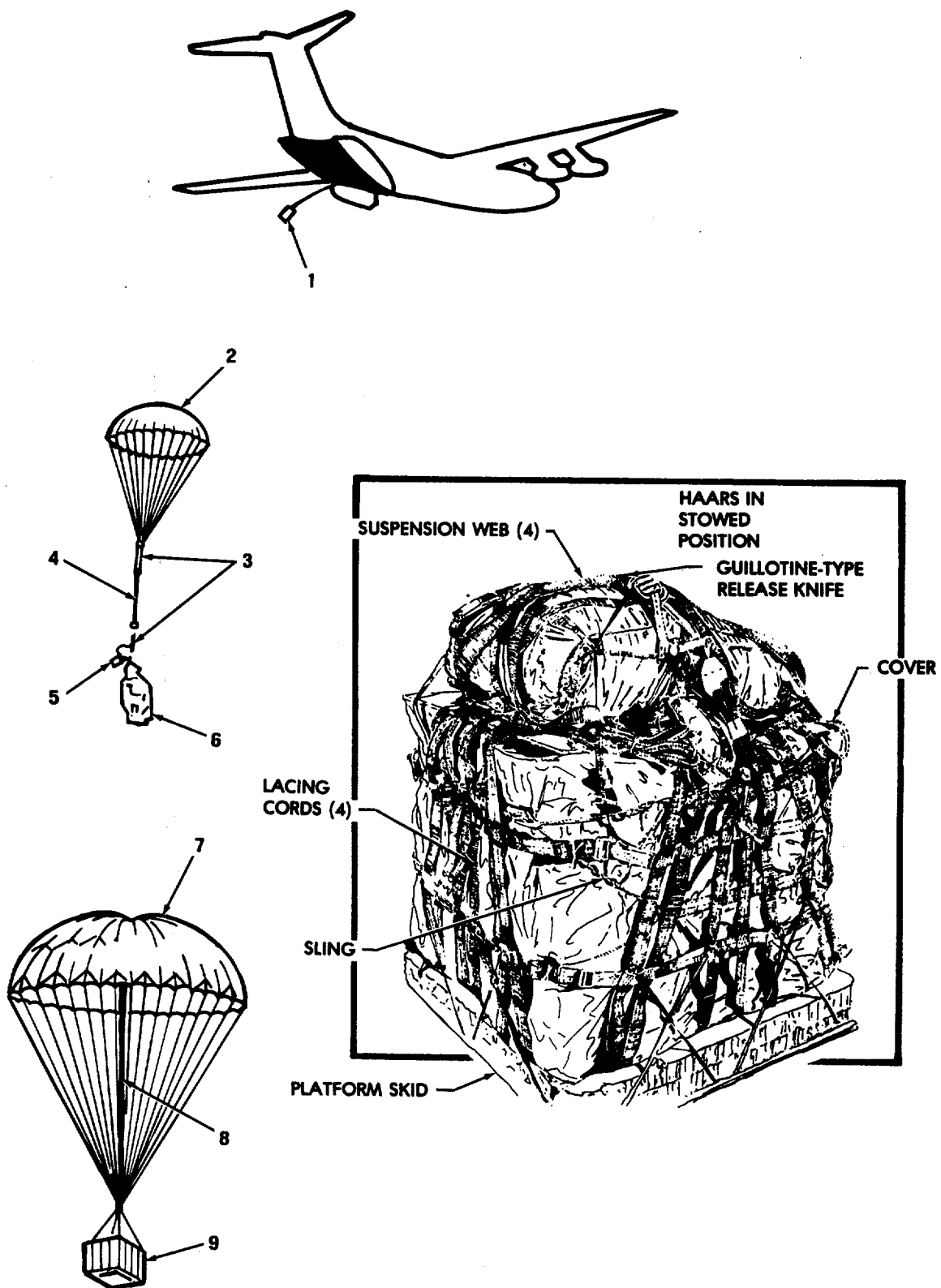
SECTION II. EQUIPMENT DESCRIPTION AND DATA**1-7. Equipment characteristics, capabilities, and features.****CHARACTERISTICS**

Delivers high altitude containers from an aircraft flying at an altitude of 2,000 - 25,000 feet.

CAPABILITIES AND FEATURES

- 2,000 pound capacity
- All weather operational
- Highly portable
- Components of the system
 - a. G-12E 64-foot-diameter cargo parachute with center line
 - b. 68-inch-diameter pilot parachute with 15-foot-long static line
 - c. Cover with lacing cords
 - d. High altitude container
 - e. High altitude container suspension webs (4)
 - f. High altitude container platform skid
 - g. 120-inch-long connector strap
 - h. Guillotine-type release knife
 - i. Altitude delay cutter
 - j. 60-inch-long connector straps (2)

1-8. Location and description of major components.



1-8. Location and description of major components (cont.)

15-FOOT-LONG STATIC LINE AND PILOT PARACHUTE BAG (1). The static line and parachute bag are a one-piece unit. Refer to TM 10-1670-215-23/T.O. 13C5-1-102 for more of a detailed description.

68-INCH-DIAMETER PILOT PARACHUTE (2). a 68-inch-diameter flat octagonal nylon canopy. Refer to TM 10-1670-215-23/T.O. 13C5-1-102 for more of a detailed description.

60-INCH-LONG-CONNECTOR STRAP (3). A 1 3/4-inch-wide type X nylon webbing with a loop formed at each end.

120-INCH-LONG CONNECTOR STRAP (4). A 1 3/4-inch-wide type X nylon webbing with a loop formed at each end.

ALTITUDE SENSOR PARACHUTE STAGING UNIT (ASPSU) (5). A mechanical device consisting of an explosive module, which contains a cutter, and a sensor module, containing electronic controls.

DEPLOYMENT BAG FOR G-12E CARGO PARACHUTE (6). A locking-closure type nylon duck bag. Refer to TM 10-1670-215-23/T.O. 13C5-1-102 for more of a detailed description.

G-12E 64-FOOT-DIAMETER CARGO PARACHUTE (7). A 64-foot-diameter flat-circular nylon canopy. Refer to TM 10-1670-215-23/T.O. 13C5-1-102 for more of a detailed description.

57-FOOT-LONG CENTER LINE (8). A 1-inch-wide, type V nylon webbing.

HIGH ALTITUDE CONTAINER (9). Consists of a sling, cover, four suspension webs, four lacing cords, and a plywood platform skid. Refer to TM 10-1670-240-20/T.O. 13C7-49-11 for more of a detailed description.

1-9. Differences between models. No model differences exist for the HAARS.

1-10. Equipment data. The equipment data summarizes the specific capabilities and limitations of the equipment and other critical data needed by the operator and organizational maintenance personnel for operation and maintenance of the HAARS.

TABLE 1-1. EQUIPMENT DATA

Equipment data pertaining to major components of the HAARS are listed in the following maintenance manuals:	
TM 10-1670-215-23/T.O. 13C5-1-102	
<ul style="list-style-type: none"> • Static line • 68-inch-diameter pilot parachute • G-12E cargo parachute and deployment bag 	
TM 10-1670-240-20/T.O. 13C7-49-11	
<ul style="list-style-type: none"> • High altitude container • 60-inch-long connector strap • 120-inch-long connector strap 	
Vent Pull-Down Center Line.	
Length	57 feet
Material	Type V 1-inch-wide nylon webbing
Altitude Sensor Parachute Staging Unit (ASPSU).	
Staging altitude	100 feet to 990 feet altitude activation range in 100 foot increments referenced to standard sea level barometric pressure
Accuracy	100 to 4,900 feet; ± 150 feet 5,000 to 9,900 feet; ±250 feet
Time to activation	3.0 to 115 seconds, following arming
Altitude selection	Two controls; Ft x 1000 and Ft x 100 Select thousands of feet 0 to 9 and hundreds of feet 0 to 9
Arming pin pull force	18 lbs., nominal; 12 lbs. minimum, 30 lbs. maximum
Local barometric pressure selection	One control; ten positions, labeled 29.5 to 30.4 inches of mercury, in 0.1 inch increments
Arming delay	3.5 seconds nominal; 3.0 seconds minimum, 4.0 seconds maximum
Operating life	a. Altitude Sensor Module, FTL3648-1: Until a malfunction occurs. b. Cutter Module, FTL3648-2; one (1) air drop
Storage environment	Temperature: -70°F (-57° C) to + 160°F (71° C) Humidity: up to 90% relative @ 104°F (40° C) Altitude: Sea level to 50,000 ft.
Operational environment	Temperature: -65°F (-54° C) to -120°F (49° C) Humidity: up to 90% relative @ 104° F (40° C) Altitude: Sea level to 30,000 ft.
Autoignition	ASPSU will not self activate when exposed to temperature up to 250°F (121.1°C)
Radio frequency interference	ASPSU operation not degraded by presence of electromagnetic energy or RF fields encountered in the air drop environment
Tag security	Tag and Safety Pin. Pulled prior to ASPSU arming.

1-11. Safety, Care and Handling. The ASPSU contains a class C explosive device (pyrotechnic). The following instructions shall be observed.

a. Safety

(1) Requirements for Safety. Requirements for safety, care, and handling of pyrotechnic items and accessories are included in TM 9-1300-206, TM 9-1370-201-12, and AR 385-64, as applicable.

(2) Specific Safety Precautions.

(a) Pyrotechnics are more dangerous than many other types of ammunition, because they are more easily activated. Items with primers should be guarded to prevent a blow on the primer, because such a blow could activate the item.

(b) Pyrotechnics must never be exposed to moisture. Items showing any signs of moisture should be forwarded to authorized personnel for disposal.

(c) Protect pyrotechnics from temperatures below -65°F (-54°C) or above 140°F (60°C).

(d) Pyrotechnics (except standard emergency use items) should not be left indefinitely in aircraft. They should be removed and restored to their original condition and packing.

b. Care and Handling

(1) Military pyrotechnics must be handled with care at all times. Besides the hazardous pyrotechnics composition, pyrotechnics are composed of sensitive elements, such as, friction compositions and primers.

(2) In order to keep military pyrotechnics in a serviceable condition and ready for immediate use, the following general rules apply.

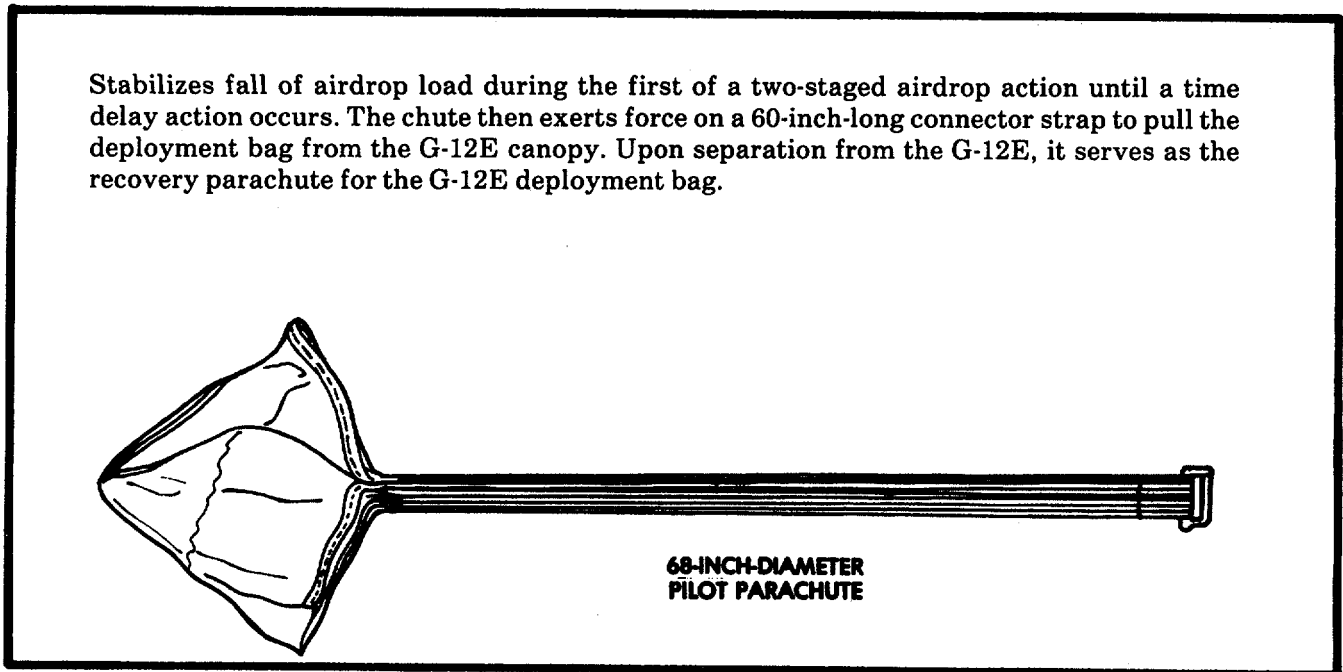
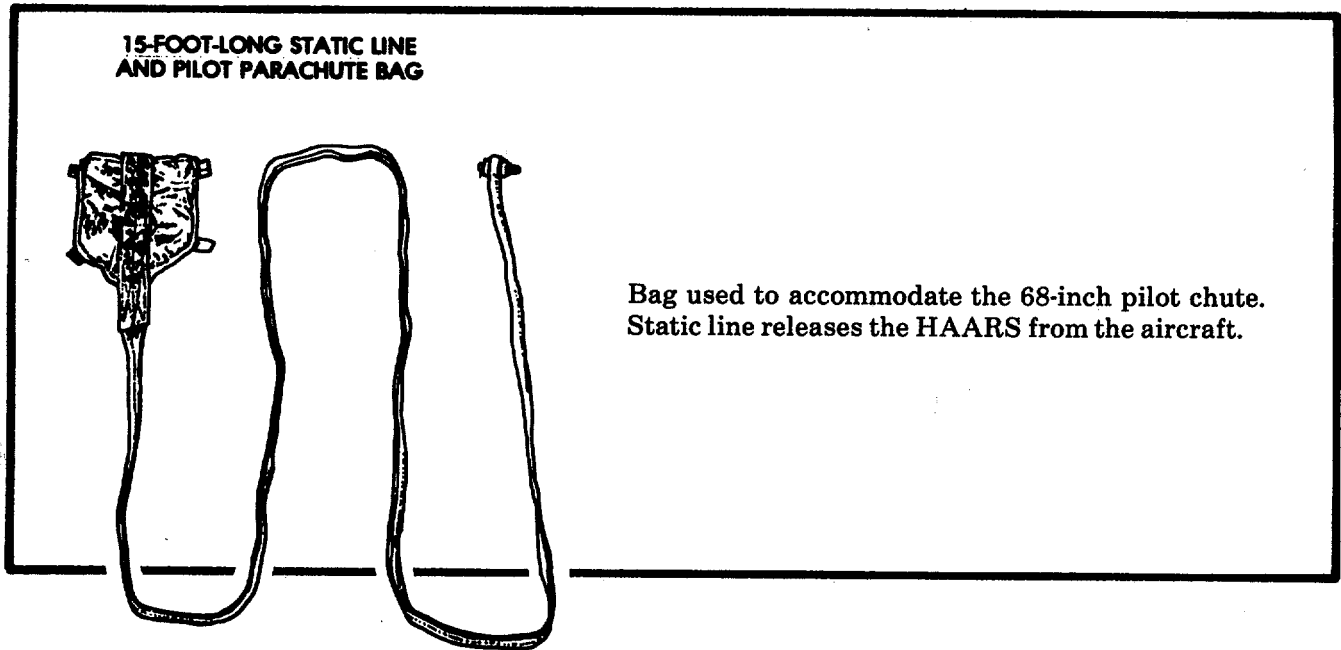
(a) Store pyrotechnics in a dry, well-ventilated place, out of direct sunlight, and protect against excessive or variable temperatures.

(b) Handle pyrotechnics with care and protect against shock.

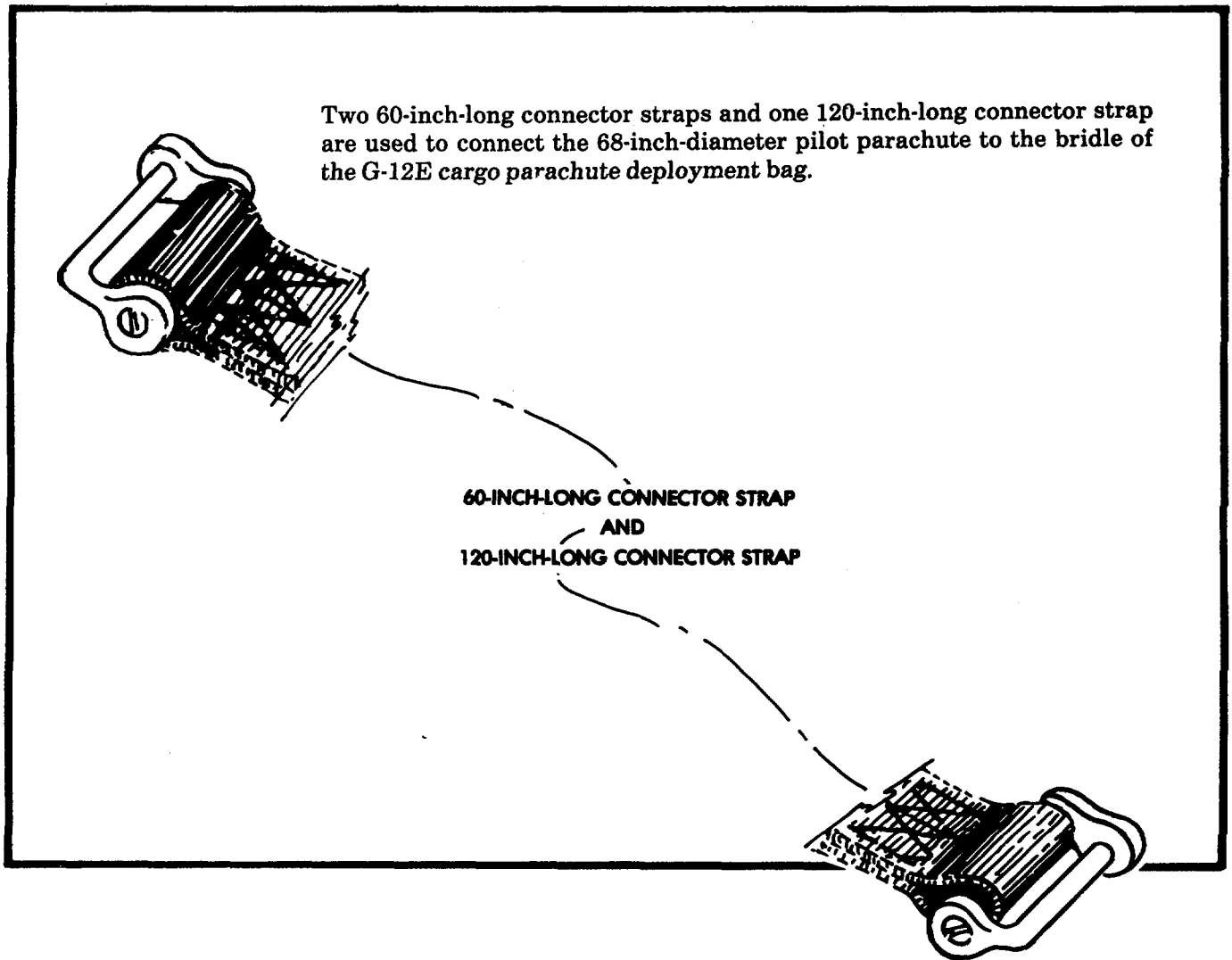
(c) Do not drop or throw boxed pyrotechnics.

SECTION III. TECHNICAL PRINCIPLES OF OPERATION

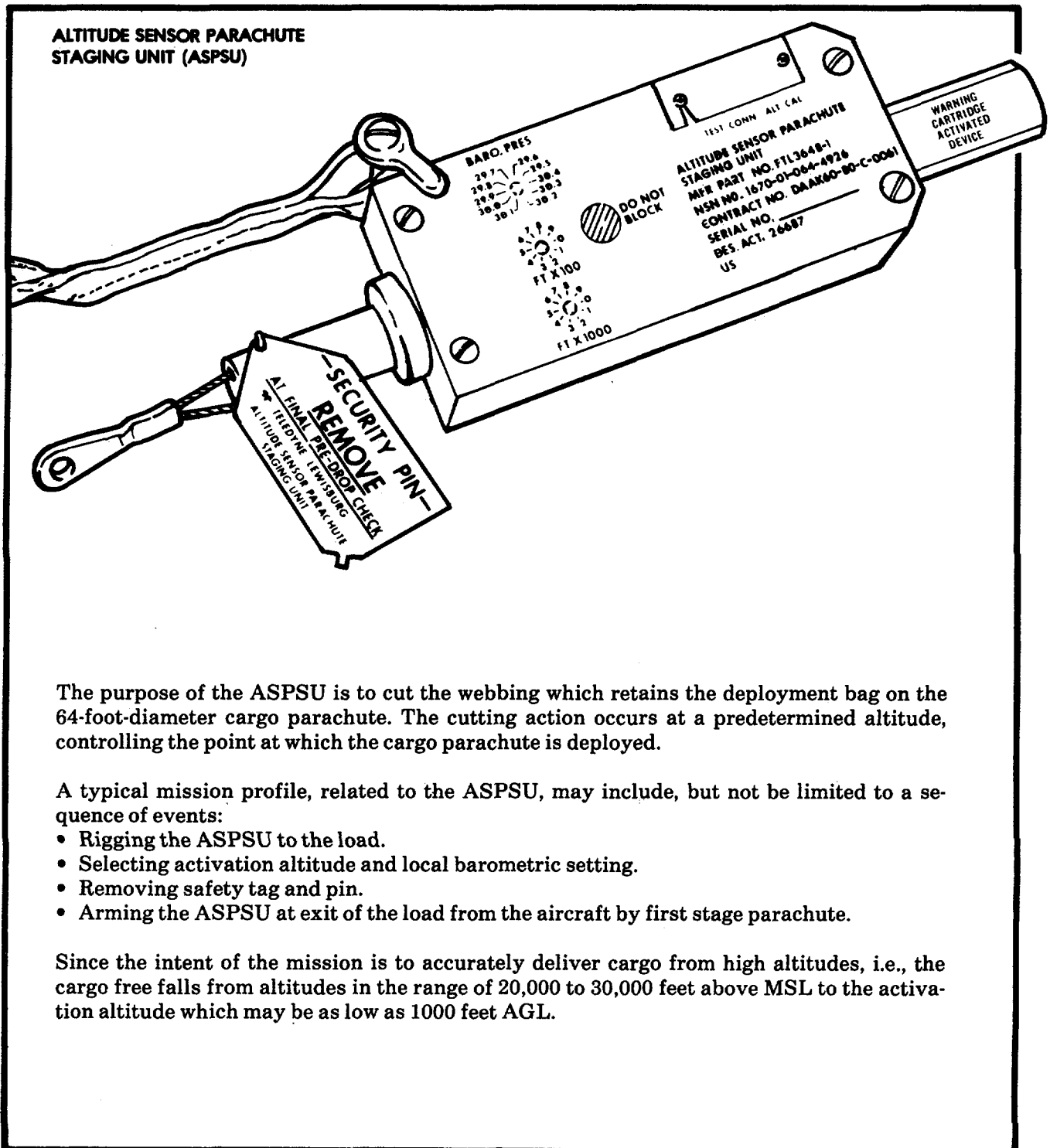
1-12. **Functional description.** This section contains a functional description of the HAARS operation.



1-12. Functional description (cont).



1-12. Functional description (cont).



The purpose of the ASPSU is to cut the webbing which retains the deployment bag on the 64-foot-diameter cargo parachute. The cutting action occurs at a predetermined altitude, controlling the point at which the cargo parachute is deployed.

A typical mission profile, related to the ASPSU, may include, but not be limited to a sequence of events:

- Rigging the ASPSU to the load.
- Selecting activation altitude and local barometric setting.
- Removing safety tag and pin.
- Arming the ASPSU at exit of the load from the aircraft by first stage parachute.

Since the intent of the mission is to accurately deliver cargo from high altitudes, i.e., the cargo free falls from altitudes in the range of 20,000 to 30,000 feet above MSL to the activation altitude which may be as low as 1000 feet AGL.

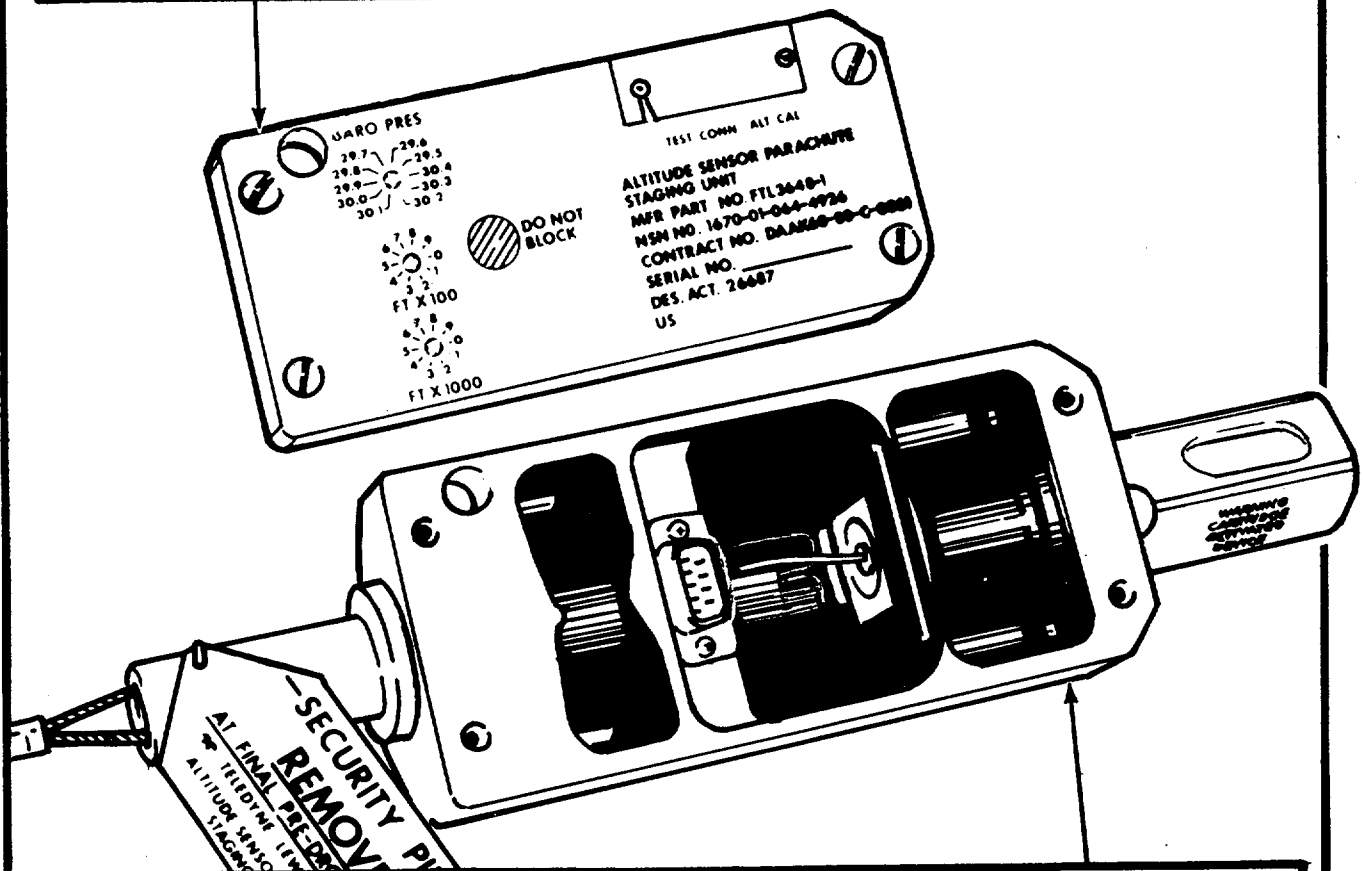
1-12. Functional description (cont).

**ALTITUDE SENSOR PARACHUTE
STAGING UNIT (ASPSU) (Con't)**

The ASPSU is a reusable altitude sensor module coupled to a refurbishable cutter/thermal battery module specifically designed to sever webbing in reefed, staged or other aerial cargo delivery systems.

The ASPSU is designed such that the reusable sensor module and one-time use cutter module are joined by four captive screws. Electrical interface between the two modules is provided by mated connectors.

The Altitude Sensor Module, FTL3648-1 is the reusable portion of the device which contains the sensor electronics, altitude activation controls and barometric set control. Test jacks are provided to permit non-destructive testing and calibration of the ASPSU.

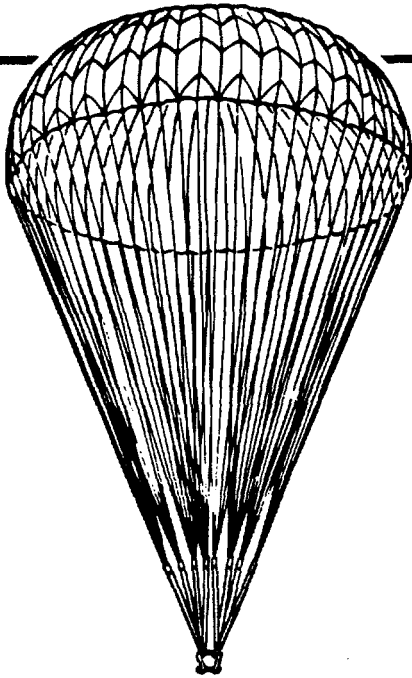


The Cutter Module, FTL3648-2 is a one-time use device which contains the thermal battery furnishing d.c. power to the sensor electronics, arming cable mechanism and webbing cutter.

1-12. Functional description (cont).

**DEPLOYMENT BAG FOR
G-12E CARGO PARACHUTE**

Retains the cargo parachute

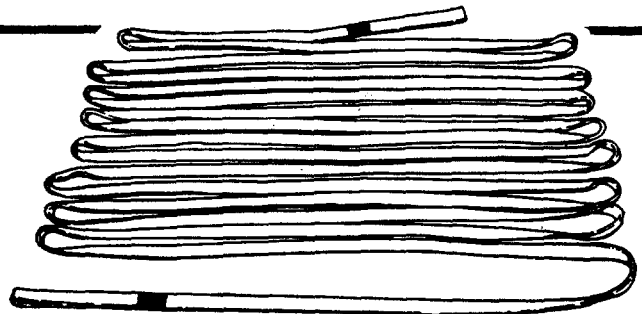


Provides the second of a two-stage airdrop action,
delivering the high altitude container on the drop-
zone.

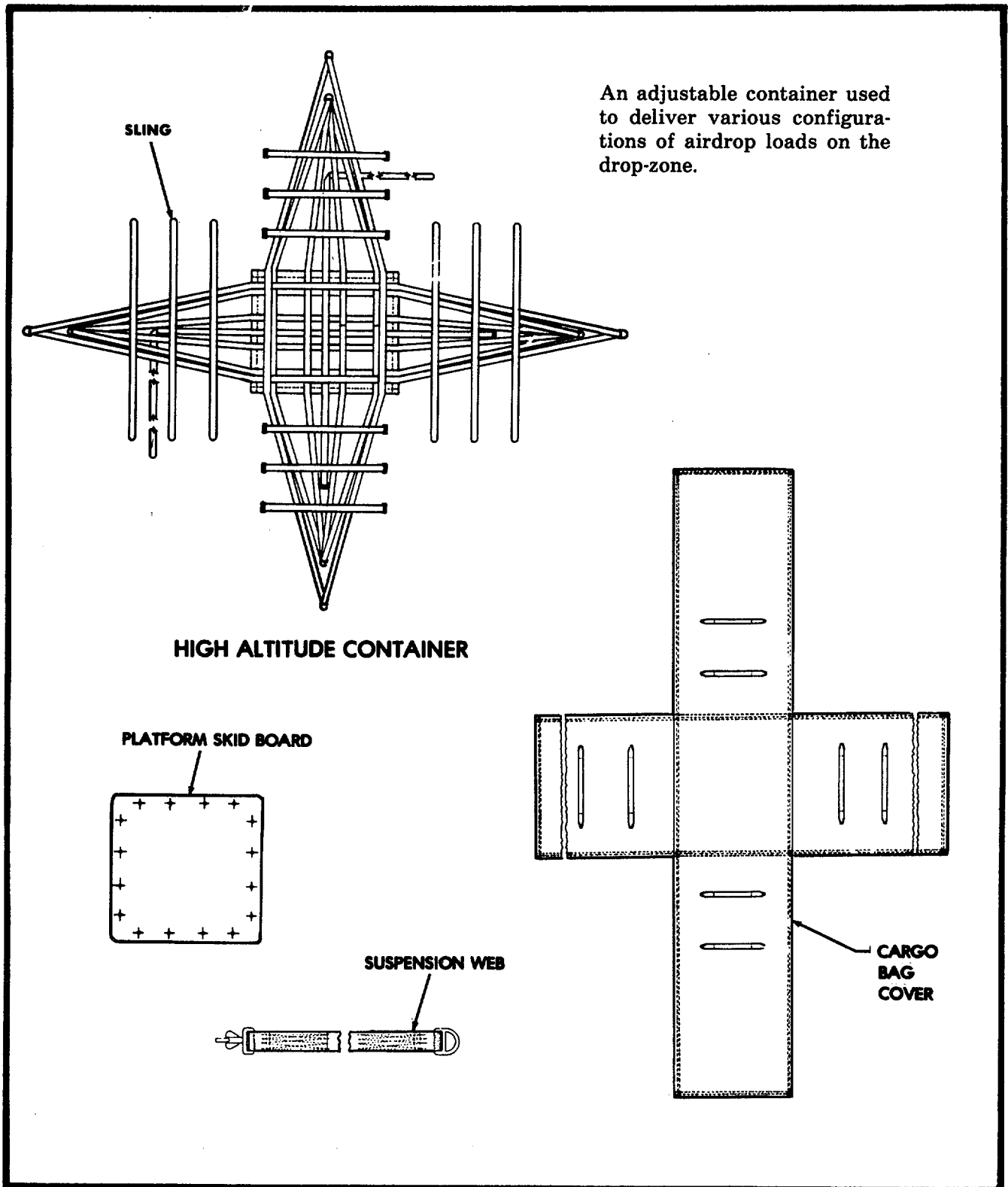
**G-12E 64-FOOT-DIAMETER
CARGO PARACHUTE**

The center line is installed on the G-12E cargo
parachute to open at a higher terminal velocity and
improve the consistency and reliability of canopy
deployment.

57-FOOT-LONG CENTER LINE



1-12. Functional description (cont).



CHAPTER 2
OPERATING INSTRUCTIONS

SECTION I.
DESCRIPTION AND USE OF OPERATOR'S CONTROLS AND INDICATORS

2-1. Altitude sensor parachute staging unit (ASPSU) controls.

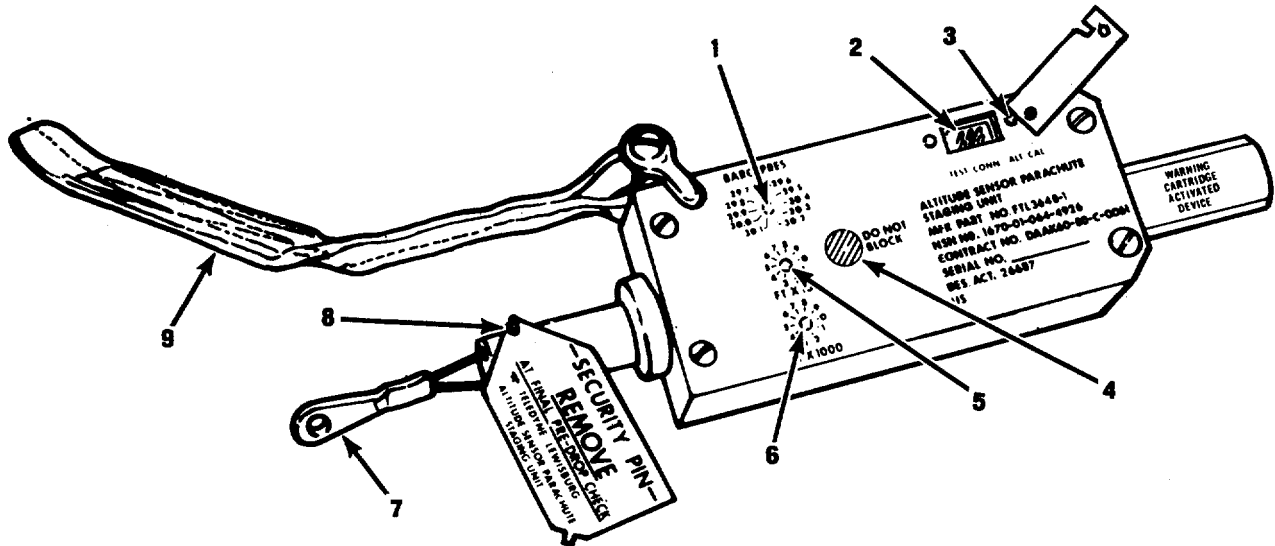


TABLE 2-1. ALTITUDE SENSOR PARACHUTE STAGING UNIT CONTROLS.

Key	Control or Indicator	Function
1	BAROMETER PRESSURE	Selector switch controls the ASPSU at the desired barometric pressure setting. The slot-head switch turns to 10 settings of 0.1 inch increments (29.5 to 30.4 inch of mercury).
2	TEST CONNECTOR	Supplies AC power to the ASPSU for Non-Destructive Testing.
3	ADJUSTMENT SCREW	Adjusts altitude accuracy set point during adjustment procedure.
4	PRESSURE RELEASE PORT	Allows barometric pressure buildup to escape.
5	FT x 100	Selector switch controls altitude sensor at the desired hundreds of feet setting. The slotted-head switch turns to 10 settings of 100 feet increments (0 to 9).
6	FT x 1000	Selector switch controls altitude sensor at the desired thousands of feet setting. The slotted-head switch turns to 10 settings of 1000 feet increments (0 to 9).

TABLE 2-1. ALTITUDE SENSOR PARACHUTE STAGING UNIT CONTROLS (CONT).

Key	Control or Indicator	Function
7	ARMING ASSEMBLY CABLE	An arming device which, when removed from the cutter module, allows activation of the DC thermal battery.
8	SECURITY PIN	Prevents discharge of DC thermal battery contained in cutter module of the ASPSU.
9	RETENTION LINE	Secures the ASPSU to the HAARS

SECTION II.
OPERATOR PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS)

2-2. General. While operating the HAARS system the required PMCS shall be followed. PMCS for the G- 12E and the 68-inch pilot chute are listed in TM 10-1670-215-23/T.O. 13C5-1-102. PMCS for the high altitude container are listed in TM 10-1670-240-20/T.O. 13C7-49-11. PMCS for the center line and ASPSU shall be accomplished in the following order:

a. BEFORE YOU OPERATE. Always keep in mind the CAUTIONS and WARNINGS. Perform your before (B) PMCS.

b. WHILE YOU OPERATE. Always keep in mind the CAUTIONS and WARNINGS. Perform your during (D) PMCS.

c. AFTER YOU OPERATE. Be sure to perform your after (A) PMCS.

d. IF YOUR ASPSU FAILS TO OPERATE. Turn the unit into supply as unserviceable. Report this action using the proper forms. See TM 38-750.

2-3. PMCS Procedures.

a. Table 2-2 provides a logical arrangement of maintenance checks and services. The purpose of the PMCS is to assure you that the ASPSU is operational.

b. PMCS will be performed before, during, and after operation thereby assuring that the center line and ASPSU will operate when needed; is operating prior to drop; and will be ready to operate when needed for another airdrop.

c. PMCS columnar entries in Table 2-2.

(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 check is to be performed.

(5) Equipment is not ready/available if: This column contains the reason that will cause the equipment to be classified as not ready/available.

TABLE 2-2. OPERATOR PREVENTIVE MAINTENANCE CHECKS AND SERVICES

ITEM NO	INTERVAL			ITEM TO BE INSPECTED	PROCEDURES CHECK FOR AND HAVE REPAIRED OR ADJUST AS NECESSARY	EQUIPMENT IS NOT READY/ AVAILABLE IF:
	B - Before	D - During	A - After			
1	*	*		Center line	Check for cuts, burns, abrasions, broken or missing stitches, foreign substance on line.	Cuts or foreign substance other than dirt.
2	*	*	*	Sensor	Check for dents or cracks. ②	
3	*	*	* ①	Cutter	Dents or cracks. Check to insure cutter has not been fired.	Prematurely fired.

① In the event the drop is canceled.

② If the dents or cracks are excessive, perform an operational test to determine whether the sensor is serviceable.

SECTION III. OPERATION UNDER USUAL CONDITIONS

2-4. Assembly and preparation for use. This action has been accomplished by organizational maintenance prior to issue. Air Force personnel aboard the aircraft are responsible for securing the HAARS prior to aircraft take-off.

2-5. Initial adjustments, daily checks, and self test. Routine checks shall be performed in accordance with Table 2-2. Self test and adjustments are not applicable for the operator.

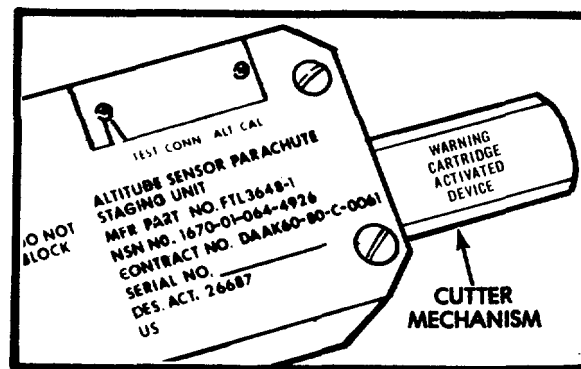
2-6. Operating procedures. To prepare the ASPSU for operation, perform steps a through d. These steps are performed on board the aircraft prior to the drop, with the unit rigged to the parachute system.

WARNING

The ASPSU contains a class C explosive in the cutter mechanism of the cutter module. Procedure steps a through d shall be followed to prevent early activation and possible personnel injury.

WARNING

Keep fingers or foreign objects away from webbing cutter slot at all times as blade could cause serious personnel injury.



NOTE

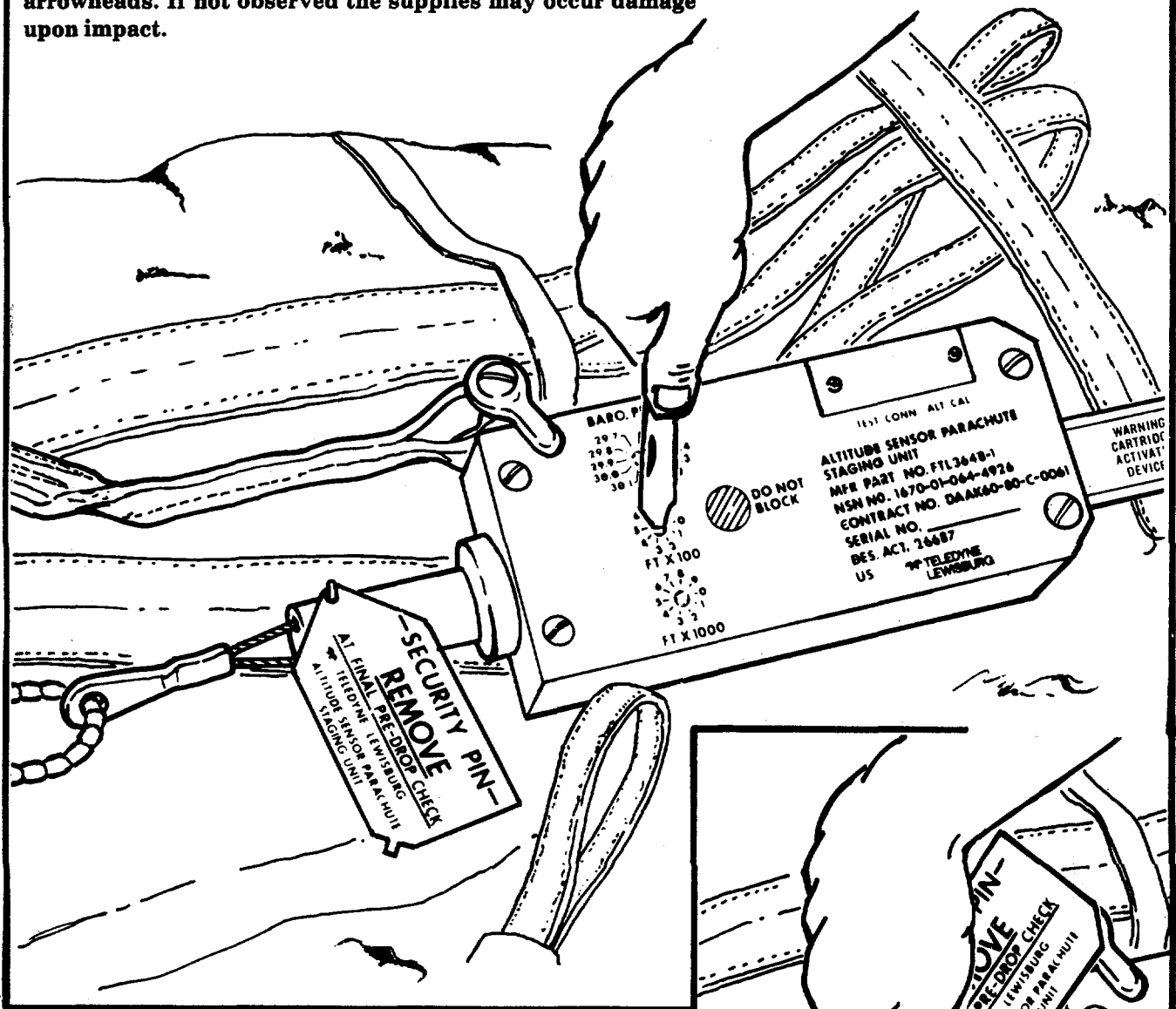
Use pocket knife (rigger's knife) NSN 5110-00-162-2205, to set all switches.

2-6. Operating procedures (cont).

- a. Set FT x 1000 to desired thousands of feet, 0 through 9.
- b. Set FT x 100 to desired hundreds of feet, 0 through 9.
- c. Set BARO. PRES. switch to local barometric pressure of drop zone.

CAUTION

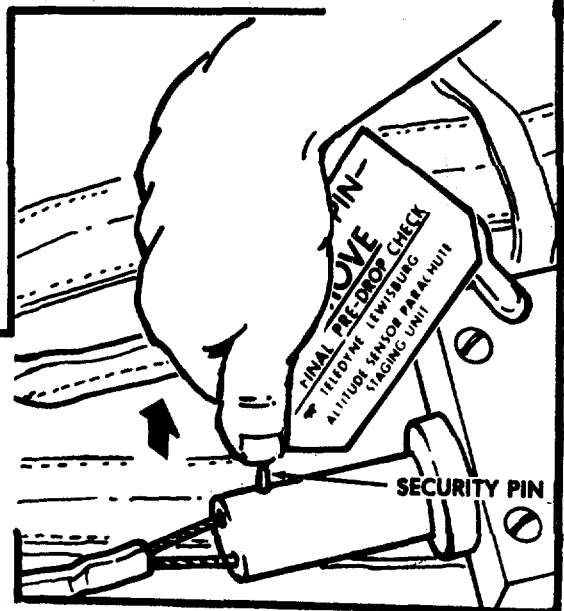
Carefully observe that correct positions have been selected prior to arming by checking alignment of markings to switch arrowheads. If not observed the supplies may occur damage upon impact.



- d. With ASPSU rigged to load at 6 min. warning remove security pin. Retain pin for reuse in the event the drop is cancelled.
- e. Deployment of the first stage parachute arms the ASPSU.

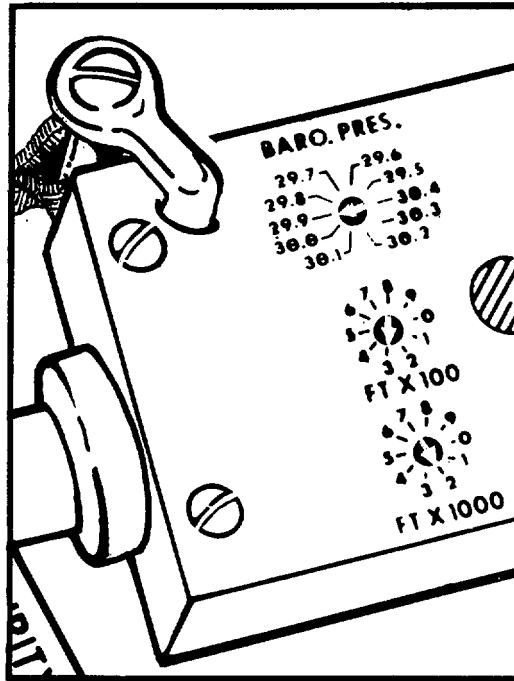
NOTE

This step applies operating voltage to the ASPSU. A thermal battery supplies the voltage which has an operating life of 115 seconds.



2-7. Setting altitude. Set sensor as follows:

- a. Determine drop zone elevation. (Example: Drop zone elevation of 400 ft.)
- b. Add 1900 ft. to drop zone elevation. This will allow 800 ft. for altitude loss during parachute opening and additional 600 ft. to- sensor location error and 500 ft. safety factor. (Example: 400 ft. + 1900 ft. = 2300 ft.)
- c. Set the total of a. and b. (400 + 1900 ft. = 2300 ft.) on the sensor dials.



Example:
Set arrow of FT x 1000 dial to 2.
Set arrow of FT x 100 dial to 3.

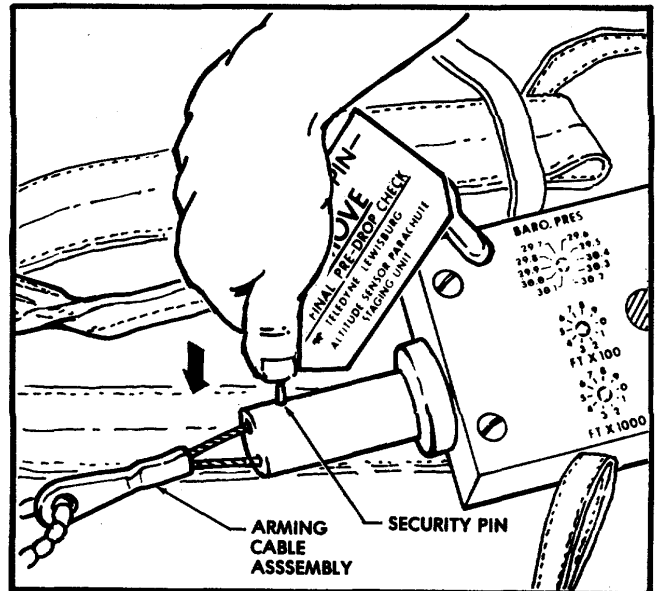
- d. Set BARO. PRES. arrow to the forecasted barometric pressure at drop zone at the time of the airdrop. Table 2-3 provides the proper setting.

TABLE 2-3. BAROMETRIC PRESSURE SETTING

Barometric Pressure is:	Set BARO. PRES. to:
29.54 or below.....	29.5
29.55 -29.64.....	29.6
29.65 -29.74.....	29.7
29.75 -29.84.....	29.8
29.85 -29.94.....	29.9
29.95 - 30.04.....	30.0
30.05 - 30.14.....	30.1
30.15-30.24.....	30.2
30.25 - 30.34.....	30.3
30.35 or higher.....	30.4

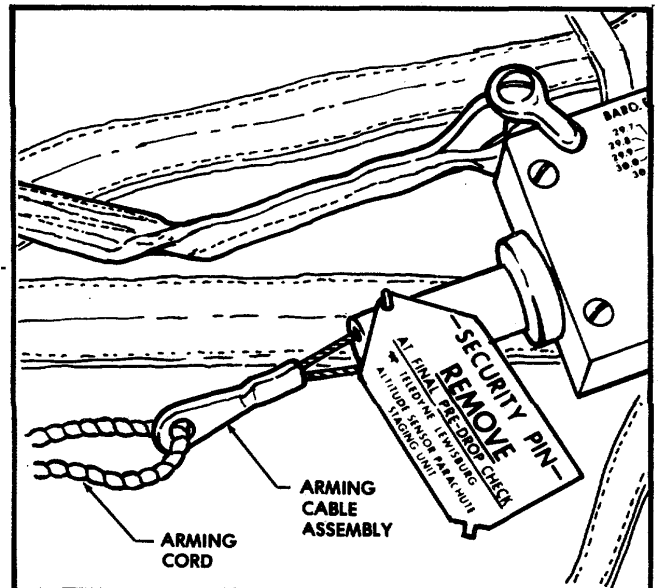
2-8. HAARS placed in standby condition.

Insert security pin into ASPSU securing the arming cable assembly.



2-9. HAARS placed in shutdown condition.

Remove arming cord from the eye of the arming cable assembly.



2-10. Operation of auxiliary equipment. The HAARS system does not require the use of auxiliary equipment.

2-11. Preparation for movement of the HAARS. This procedure shall be accomplished in accordance with FM 10-500.

2-12. Operation under unusual conditions. Unusual conditions requiring special operating instructions will not occur.

CHAPTER 3
OPERATOR MAINTENANCE INSTRUCTIONS

Operator maintenance does not apply to the HAARS System. If a condition is discovered which requires maintenance, report the condition to organizational maintenance.

CHAPTER 4
ORGANIZATIONAL MAINTENANCE INSTRUCTIONS

SECTION I.
REPAIR PARTS, SPECIAL TOOLS, TMDE, AND SUPPORT EQUIPMENT

4-1. Common tools and equipment. Common tools and equipment used in the packing of the G-12E and 68-inch pilot chute are prescribed in TM 10-1670-215-23/T.O. 13C5-1-102 and authorized by the applicable unit Table of Organizational Equipment (TOE). Field expedient items are detailed in TM 10-1670-201-23 T.O. 13C-1-41.

4-2. Special tools, TMDE, and support equipment. An ASPSU test set P/N FLT4240, NSN 1670-01-064-4925 provides testing of the ASPSU.

4-3. Repair parts. Repair parts are listed and illustrated in Appendix C of this manual.

SECTION II. SERVICE UPON RECEIPT

4-4. Service upon receipt. Refer to TM 10-1670-215-23/T.O. 13C5-1-102 for service upon receipt of the G-12 and 68-inch pilot chute. Instructions for the ASPSU are provided as follows:

4-5. Unpacking. Remove and discard packing from ASPSU.

4-6. Checking unpacked equipment.

a. Inspect the ASPSU for damage incurred during shipment. If the ASPSU has been damaged, report the damage on DD Form 6, Packing Improvement Report.

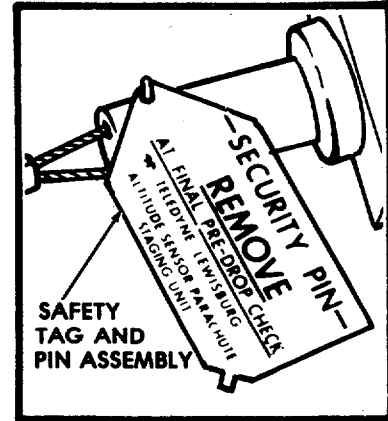
b. Check the equipment against the packing slip to see if the shipment is complete. Report all discrepancies in accordance with the instructions of TM 38-750.

4-7. Deprocessing unpacked equipment. Not required for the ASPSU.

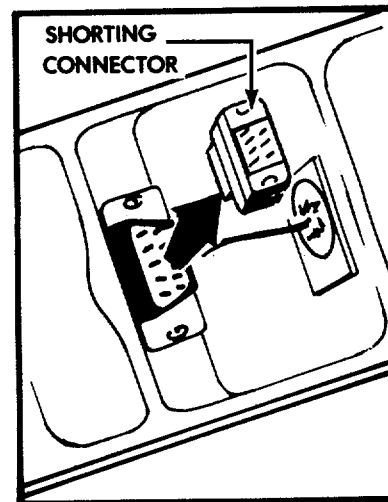
4-8. Installation instructions.

- a. Tools required.
Rigger's knife, NSN 5110-00-162-2205
- b. Assembly of ASPSU.

(1) Insure safety tag and pin assembly is securely attached to the arming cable assembly.

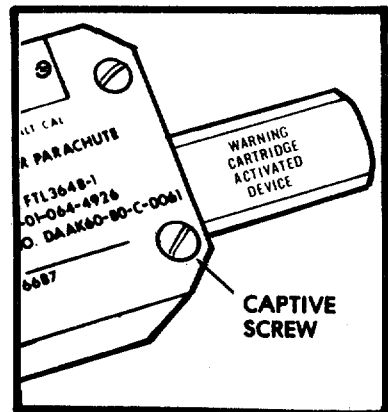


(2) Remove and discard the shorting connector from the cutter module.



(3) Join the two modules together by aligning modules using the beveled end of each and the retainer holes as guides. Pressing the units together mates the electrical interface connector.

(4) Lock the two modules together by screwing down the four captive screws until tight.



NOTE
Installation of retainer line will not be performed until ASPSU is rigged on the HAARS.

SECTION III. PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS)

4-9. All PMCS required for the ASPSU are listed in Table 2-2. PMCS for the G-12E and the 68-inch pilot chute are listed in TM 10-1670-215-23/T.O. 13C5-1-102 and the high altitude container PMCS are listed in TM 10-1670-240-20/T.O. 13C7-49-11.

SECTION IV. TROUBLESHOOTING

4-10. Troubleshooting does not apply to the HAARS System. Maintenance tests and adjustments are performed using the ASPSU test set P/N FLT4240 prior to the rigging of the HAARS. If adjustment cannot be accomplished, turn the unit into supply as unserviceable and obtain a serviceable unit.

SECTION V. MAINTENANCE PROCEDURES

4-11. Maintenance procedures.

a. Scope. This section contains maintenance procedures which are the responsibility of the organizational 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 the 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.

c. Parachute maintenance. Maintenance procedures for the G-12E and the 68-inch pilot chute are provided in TM 10-1670-215-23/T.O. 13C5-1-102.

SECTION VI.
MAINTENANCE PROCEDURES FOR 57-FOOT-LONG CENTER LINE

4-12. Center line - Inspect.

4-12

This task covers: Inspection

INITIAL SETUP

Personnel Required:

43E (10) parachute rigger

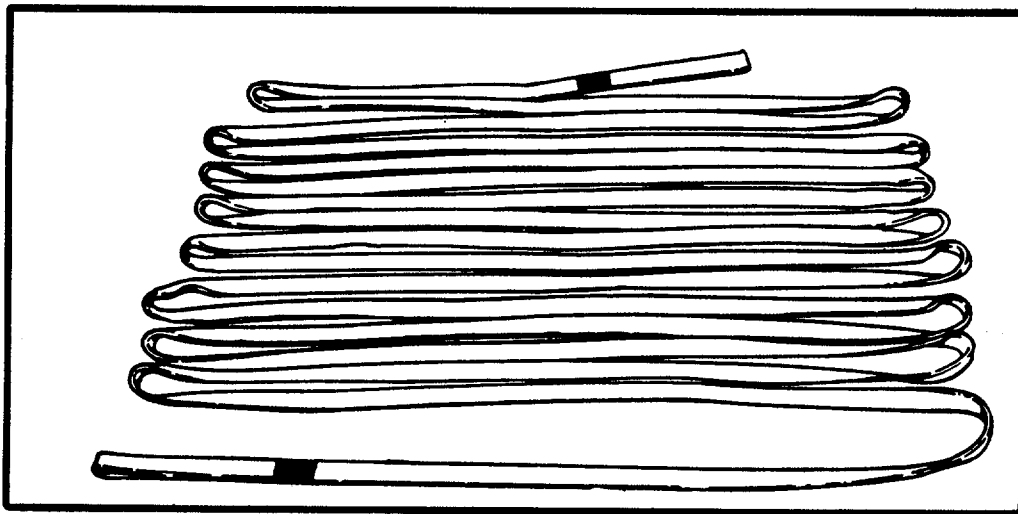
Reference Information:

TM 10-1670-201-23 T.O. 13C-1-41

NOTE

The instructions pertain to the functional group number sequence 01 in the MAC and the RPSTL.

INSPECTION



1. Foreign material and stains inspection. Inspect 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. Inspect for breaks, burns, cuts, frays, holes, snags, tears, incorrect weaving, and sharp edges formed from searing; loose missing or broken stitching, tacking, whipping, and weaving; weak spots, wear, and deterioration.

END OF TASK

4-13. Center line - Service

4-13

This task covers: Cleaning

INITIAL SETUP

Tools:

Brush, scrub, household, NSN 7920-00-282-2470

Materials:

Tetrachloroethylene - item 1, Appendix D
Dish washing compound - item 2, Appendix D
Rag, wiping - item 3, Appendix D

Personnel Required:

43E (10) parachute rigger

Reference Information:

TM 10-1670-201-23 T.O. 13C-1-41

Equipment Condition:

Para. 4-15 Center line removed from G-12E.

Special Environmental Condition:

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

General Safety Instructions:

WARNING

Due to flammable properties and nylon-damaging substances, cleaning solvents other than tetrachloroethylene will not be used in the spot-cleaning of airdrop 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 a direct support maintenance activity for determination as to the nature of the substance and item disposition. If the substance cannot be identified or if normal repair procedures will not eliminate all traces of chemical or acid damage, the applicable item will be condemned.

NOTE:

The instructions pertain to the functional group number sequence 01 in the MAC and RPSTL.

GO TO NEXT PAGE

4-13. Center line - Service (Cont)

4-13

CLEANING

1. **General.** Cleaning should be held to a minimum and performed only when it is necessary to eliminate a possible malfunction or material deterioration.
2. **Cleaning.** The cleaning procedures are as follows:
 - a. **Brushing.** Gently brush with a soft-bristle brush.
 - b. **Spot-cleaning.**

WARNING

Due to flammable properties and nylon-damaging substances, cleaning solvents other than tetrachloroethylene will not be used in the spot-cleaning of airdrop 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 a direct support 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.

Tetrachloroethylene:

- (1) Spot - clean by rubbing the soiled area with a clean cloth dampened with tetrachloroethylene (Item 1, Appendix D).
- (2) Rinse the cleaned area by repeating the rubbing process with the clean portion of the cloth dampened with the cleaning solvent.
- (3) Do not wring out the rinsed area if an excess amount of cleaning solvent is applied. Allow the item to dry thoroughly.

Dishwashing detergent:

- (1) Tetrachloroethylene may be substituted by a solution composed of one-half cup of hand dishwashing detergent (Item 2, Appendix D) dissolved in one gallon of warm water.
- (2) Rinse the cleaned area with fresh, clean water and allow to dry thoroughly.
- (3) Do not wring out the material which has been cleaned and rinsed.

GO TO NEXT PAGE

4-13. Center line - Service (Cont)

4-13

CLEANING (Cont)

c. Drying.

- (1) Suspend or elevate in a well ventilated room or in a heated drying room.
- (2) Drying time may be reduced by using electric circulating fans.
- (3) When heat is used, the heat temperature shall not exceed 160°F (73°C). The preferred temperature is 140°F (60° C).
- (4) Fabric or woolen items will not be dried in direct sunlight or by laying an item out on the ground, except in an emergency.

END OF TASK

4-14. Repair

4-14

This task covers: Repair

INITIAL SETUP

Tools:

Heavy duty sewing machine Model 733

Materials:

Thread - Item 4, Appendix D

Ink - Item 13, Appendix D

Personnel Required:

43E (10) Parachute rigger

Reference Information:

TM 101670-201-23/T.O. 13C-1-41

Equipment Condition:

Para. 4-15 Center line removed from G-12E.

Para. 4-13 Center line cleaned.

NOTE:

The instructions pertain to the functional group number sequence 01 in the MAC and RPSTL.

REPAIR

1. Stitching. Stitch and restitch with thread (Item 4, Appendix D) which matches the color of the original stitching, when possible. Lock all straight stitching by backstitching at least 1/2 inch. Restitch by overstitching each end of the stitch formation by 1/2 inch. Restitch directly over the original stitching, following the original stitch pattern as closely as possible.

2. Marking and Restenciling. As required, restencil identification marks using the procedures in TM 10-1670-201-23 T.O. 13C-1-41. The number to be stenciled is "11-1-568". Use ink marking (Item 13, Appendix D).

END OF TASK

4-15. Center line - Replace

4-15

This task covers: Removal and installation

INITIAL SETUP

Tools:

Fan, circulating NSN 4140-00-833-5068

Personnel Required: 3 (for installation)

43E (10) parachute rigger

Reference Information:

TM 10-1670-215-23/T.O. 13C5-1-102

NOTE:

The instructions pertain to the functional group number sequence 01 in the MAC and RPSTL.

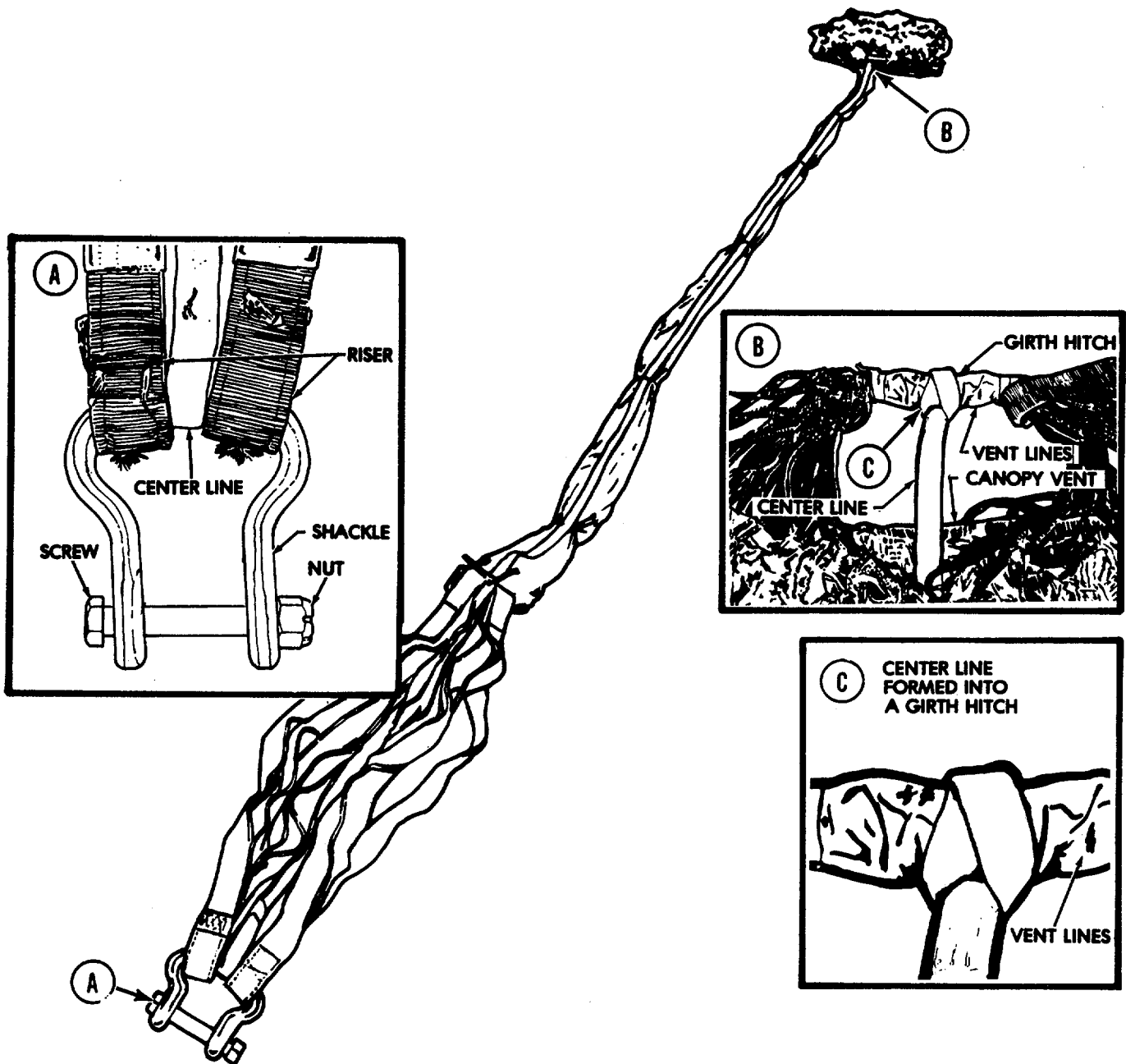
GO TO NEXT PAGE

4-15. Center line - Replace (Cont)

4-15

REMOVAL

1. Remove nut and screw from shackle (clevis).
2. Remove one of the risers from the clevis.
3. Remove center line from clevis.
4. Replace riser on clevis and assemble the screw and nut on the clevis.



5. Loosen girth-hitch from around the canopy vent lines and pull the remainder of the center line back through the loop.

END OF TASK

4-15. Center line - Replace (Cont)

4-15

INSTALLATION

1. Installation occurs at time of packing.
2. For installation instructions refer to paragraph 4-21.

END OF TASK

4-12

SECTION VII.
MAINTENANCE PROCEDURES FOR ALTITUDE
SENSOR PARACHUTE STAGING UNIT (ASPSU)

4-16. ASPSU - Inspect

4-16

This task covers: Inspection

INITIAL SETUP

Personnel Required:

43E (10) Parachute rigger

Equipment Condition:

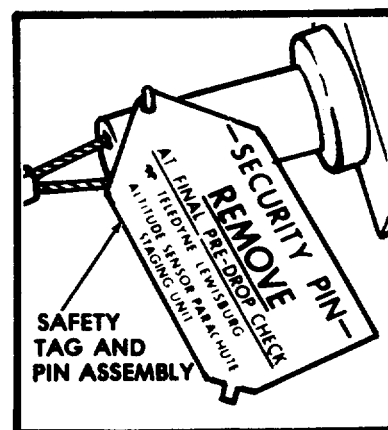
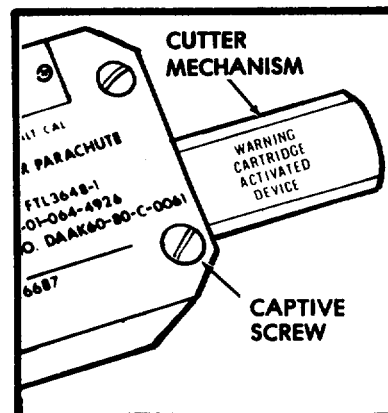
Para. 4-8 Sensor and cutter assembled.

NOTE:

The instructions pertain to the functional group number sequence 02 in the MAC and RPSTL.

INSPECTION

1. Insure that the cutter mechanism has not been fired. (You should not be able to see the blade.)
2. Insure that the four captive screws are tight.
3. Insure that the safety tag and pin assembly is securely attached.
4. Inspect for dents, cracks, or foreign material.



END OF TASK

4-17. ASPSU - Test

4-17

This task covers: Testing

INITIAL SETUP

Test Equipment:

ASPSU test set FLT4240

Tools:

Rigger's knife NSN 5110-00-162-2205

Screwdriver, cross tip NSN 5120-00-234-8912

Screwdriver, plane tip NSN 5120-00-979-4557

Materials:

Webbing - Item 5, Appendix D. (Required for destructive test only.)

Personnel Required:

43E (10) parachute rigger

Reference Information:

TM 10-1670-266-13&P

TB 750-126

Equipment Conditions:

External power of ASPSU test set must be connected to 115 VAC @ 60 5 Hz

Special Environmental Conditions:

Temperature: Room Ambient, 70°F ± 10°F
(22°C ± 4°C)

Humidity: Room Ambient, 55% normal

TESTING

1. General information.

a. Functional description of ASPSU

(1) ASPSU Overall Function Description. The mechanically joined modules constitute the ASPSU. Electrical interface between the modules is effected by a mated connector pair when the two modules are joined. The interface supplies d.c. voltage from the thermal battery to operate the sensor electronics which in turn furnishes the command signal to activate (fire) the webbing cutter.

(2) Electronic Circuit Function. The altitude sensor electronics is a single printed circuit card assembly mounted in the altitude sensor module. The electronics perform the primary function of sensing altitude, or atmospheric pressure, and converts this pressure to a calibrated d.c. voltage which is further conditioned to provide a signal to activate the webbing cutter.

GO TO NEXT PAGE

General Safety Instructions:

WARNING

Always insure that the ASPSU test set is depressurized before attempting to open chamber door as personnel injury may result.

WARNING

The altitude sensor parachute staging unit (ASPSU) contains a class C explosive in the cutter mechanism of the cutter module. Procedure steps shall be followed to prevent early activation and possible personnel injury.

WARNING

When connecting the ASPSU arming cable, do not pull on cable as force in excess of 18 lbs. may cause the ASPSU to activate resulting in personnel injury.

NOTE:

The instructions pertain to the functional group number sequence 02 in the MAC and RPSTL.

4-17. ASPSU - Test (Cont)

4-17

TESTING (Cont)

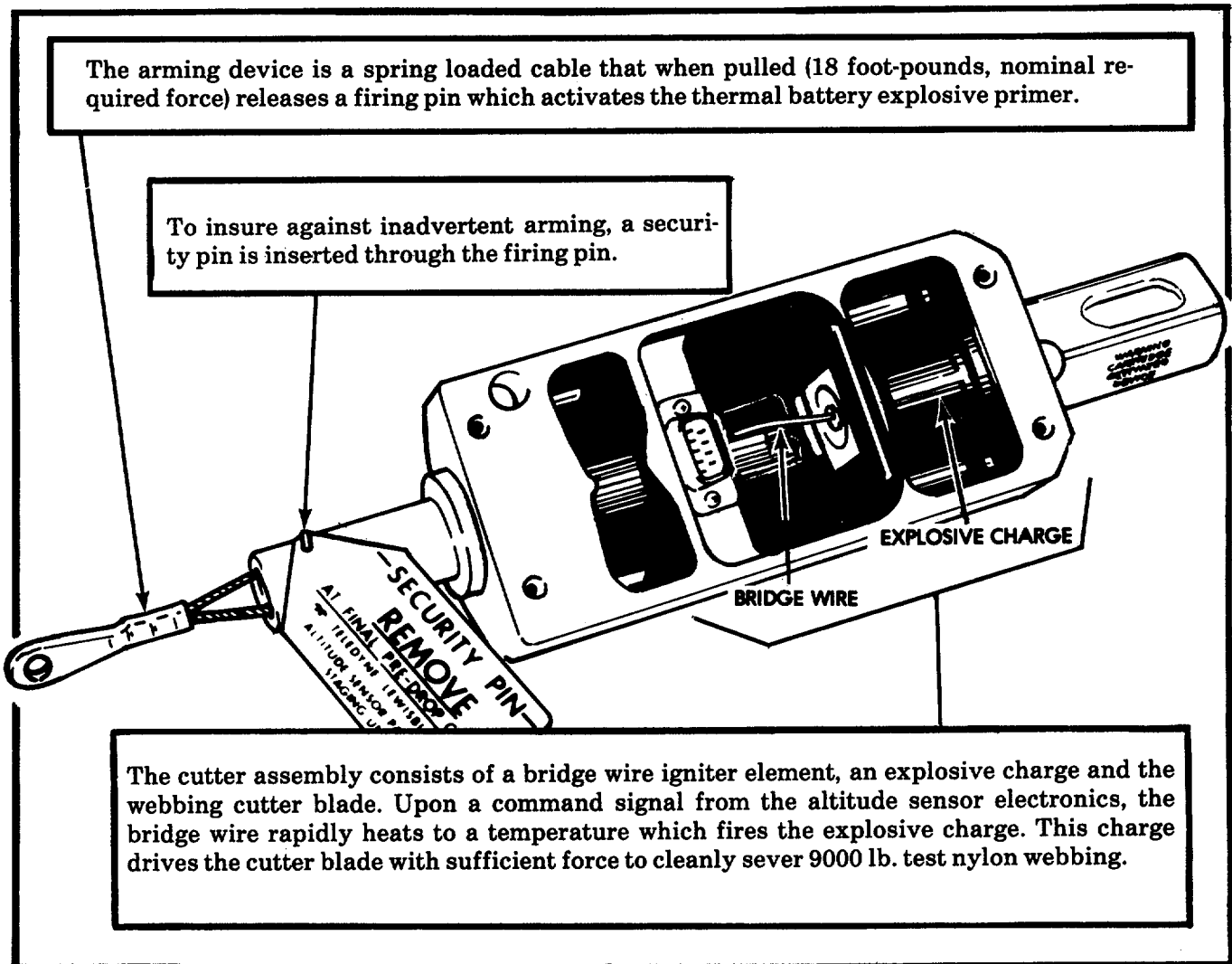
1. General information (Cont).

a. Functional description of ASPSU (Cont).

(3) Mechanical Operation. The mechanical elements of the ASPSU are housed in the cutter module.

These elements are:

- Arming cable/firing pin assembly
- Webbing cutter.



GO TO NEXT PAGE

4-17. ASPSU - Test (Cont)

4-17

TESTING (Cont)

1. General information (Cont).

b. Test modes. Two testing modes exist. The two modes are:

- Operational test
- Destruction test (actual firing of the ASPSU)

(1) Operational Test. In this test mode, the Altitude Sensor and Cutter Module are mated together in the airdrop configuration and installed in the test chamber of the ASPSU test set. A test cable, from the test set, is employed to provide an electrical interface. With the ASPSU installed in the test chamber, a vacuum pump and associated chamber controls on the test set are used to raise the chamber to a simulated altitude (reduced pressure). Simulated altitude is displayed on the test sets altimeter. The simulated altitude represents an environment identical to that encountered on board an aircraft. Activation of the sensor module as it passes through the set altitude is indicated by illumination of the FIRE lamp.

(2) Destructive Testing. In this test mode, the ASPSU is armed with a vacuum cylinder/pull mechanism controlled by the test sets front panel switch, ASPSU ARM, which pulls the ASPSU firing pin. Chamber control is identical to that employed for operational testing. Additional chamber controls on the test set permit a decrease in chamber altitude at a fixed rate. As the altitude passes through that selected is the activation altitude on ASPSU, the ASPSU fires, thus severing a section of test nylon webbing. This event is correlated to the altimeter reading to verify the accuracy of the ASPSU.

END OF GENERAL INFORMATION

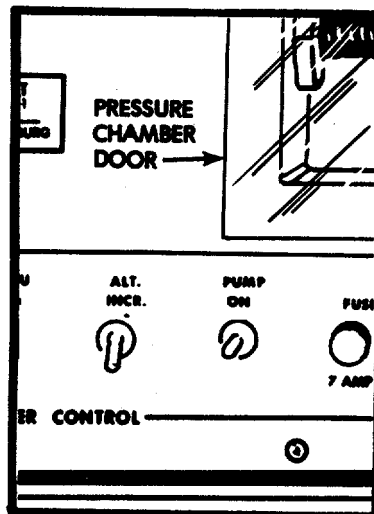
2. Operational test procedure. This test is conducted before the ASPSU is rigged to the HAARS.

a. Test set preparation.

(1) Electrical hookup. Remove and connect the 115 VAC power cable in the ASPSU test set in accordance with TM 10-1670-266-13&P.

NOTE

Insure that all test set switches are in the OFF or DOWN position.



(2) Raise the pressure chamber door.

(3) Check fuses and lights in accordance with TM 10-1670-266-13&P.

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4-17. ASPSU - Test (Cont)

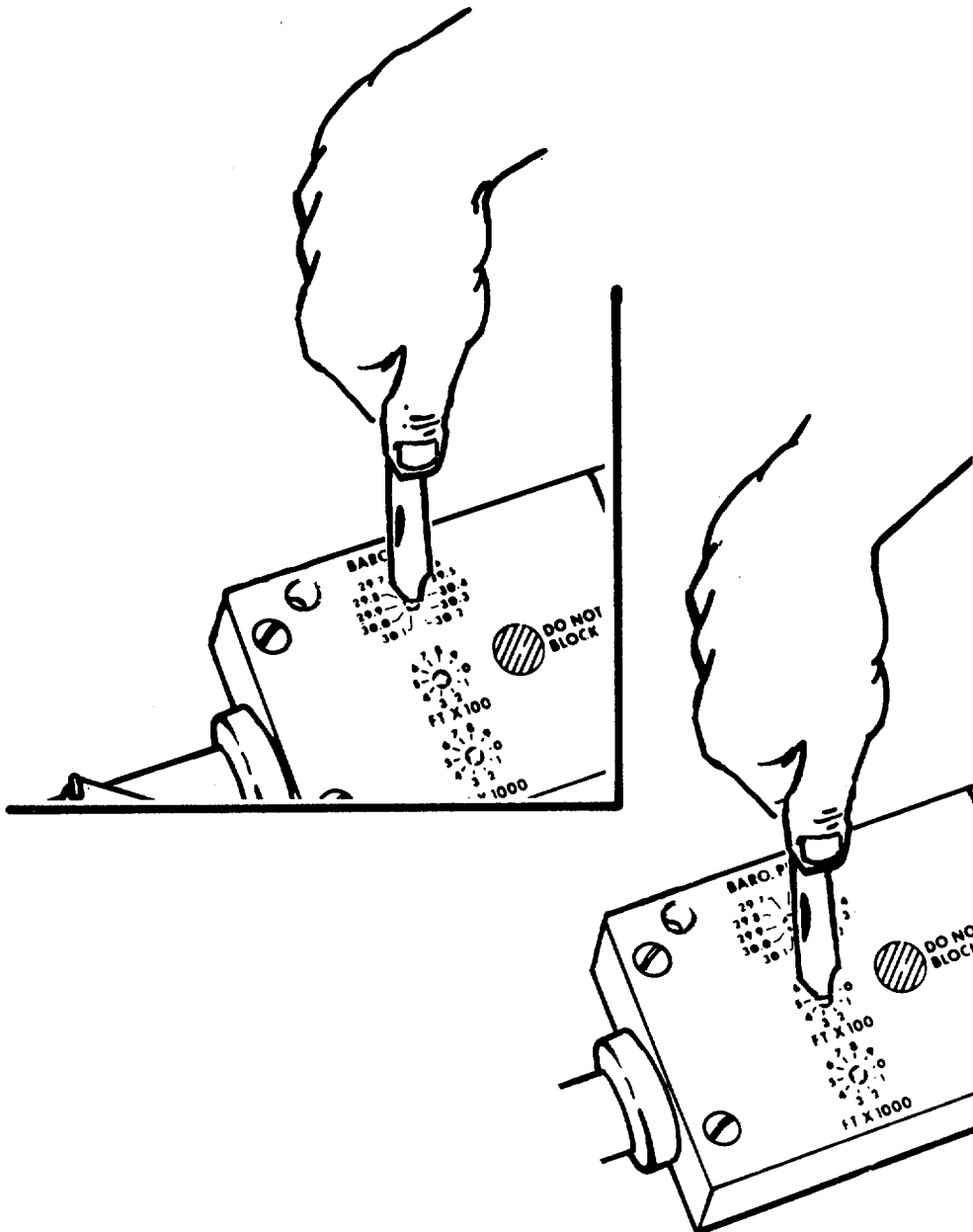
4-17

TESTING (Cont)

2. Operational test procedures (Cont).

b. ASPSU test preparation.

- (1) Set BARO. PRES. switch on ASPSU to 29.9 with your rigger's knife.
- (2) Set altitude switches on ASPSU to firing altitude of specified drop zone.



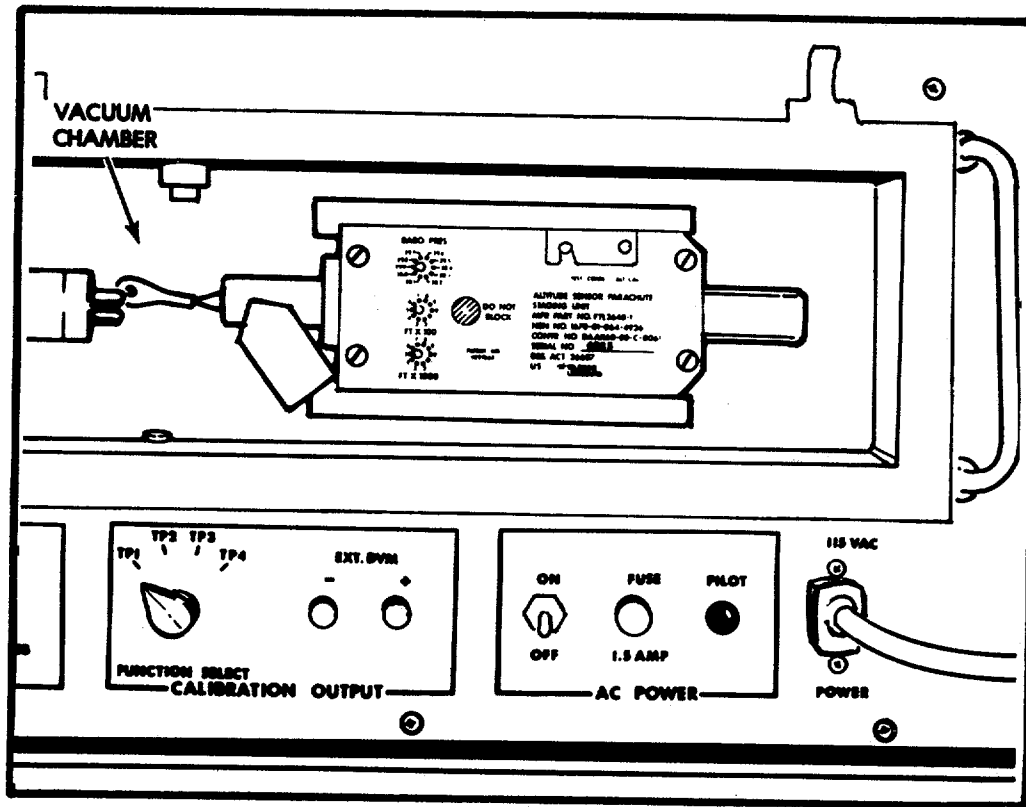
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4-17. ASPSU - Test (Cont)

4-17

TESTING (Cont)

2. Operational test procedures (Cont).
 - b. ASPSU test preparation (Cont).
 - (3) Insert assembled ASPSU into the test set vacuum chamber.



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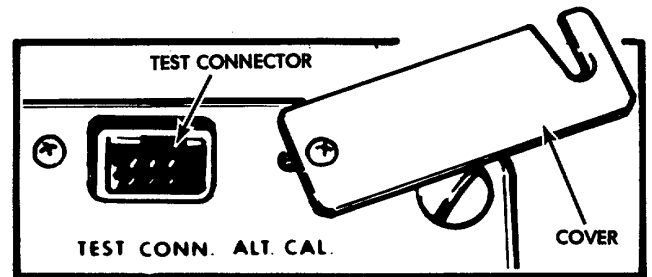
4-17. ASPSU - Test (Cont)

4-17

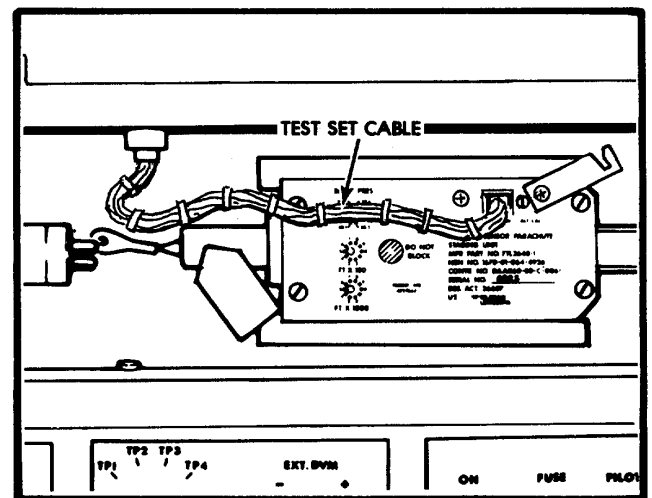
TESTING (Cont)

- 2. Operational test procedures (Cont).
 - b. ASPSU test preparation (Cont).

(4) Loosen two small screws with your cross tip screwdriver, and swing cover open to expose test connector.

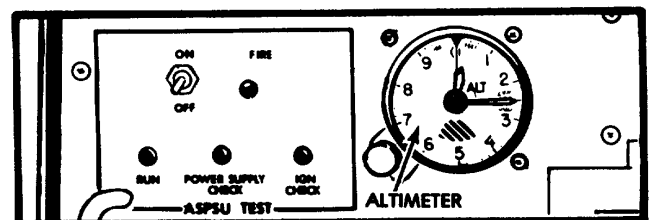


(5) Connect the test set cable furnished with the test set.



(6) Close the pressure chamber door.

(7) Set altimeter barometric setting to 29.92 inches of mercury.



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4-17. ASPSU - Test (Cont)

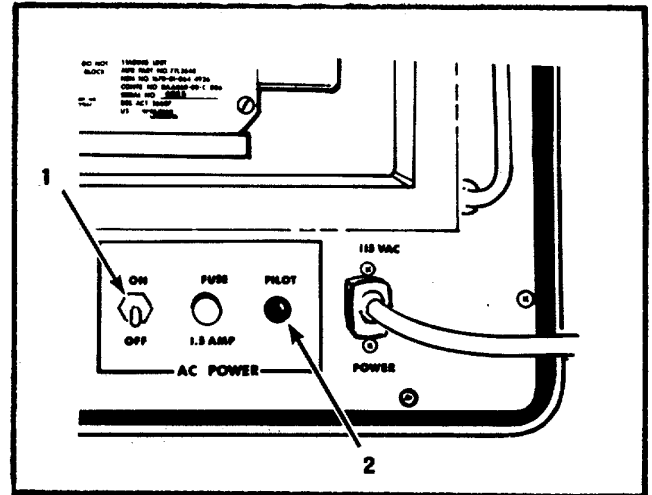
4-17

TESTING (Cont)

2. Operational test procedures (Cont).

c. Testing.

(1) Place the AC POWER switch (1) on the test set to the ON position. The PILOT light (2) should come on.



(2) Place PUMP switch (3) to the ON position.

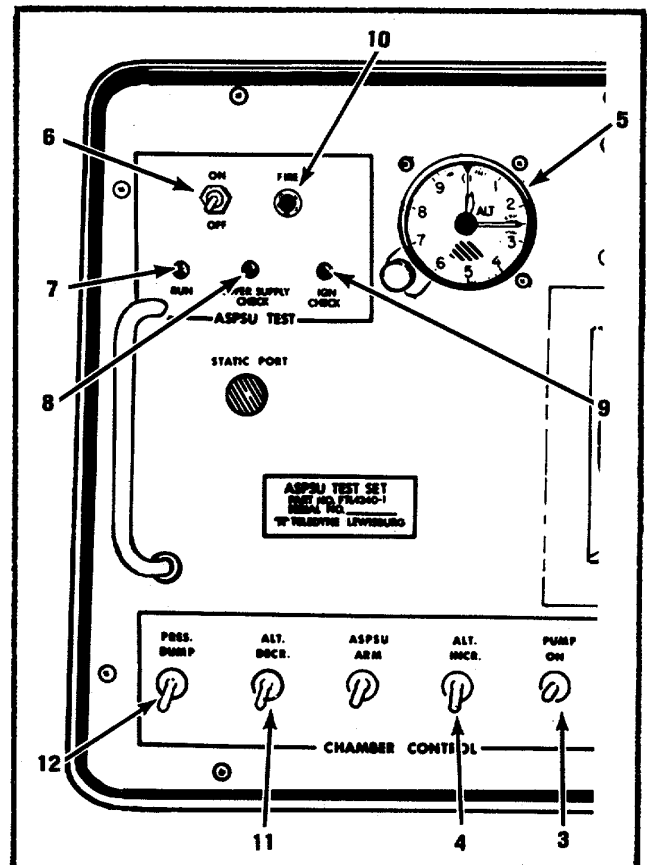
(3) Place ALT. INCR. switch (4) in the up position.

NOTE

If altimeter fails to rise, apply light hand pressure to the chamber door.

(4) Observe altimeter (5). When altimeter reaches 10,000 feet, place ALT. INCR. switch in the down position.

(5) Place ASPSU TEST switch (6) to the ON position. Both the green RUN light (7) and POWER SUPPLY CHECK light (8) should come on.



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4-17. ASPSU - Test (Cont)

4-17

TESTING (Cont)

2. Operational test procedures (Cont).

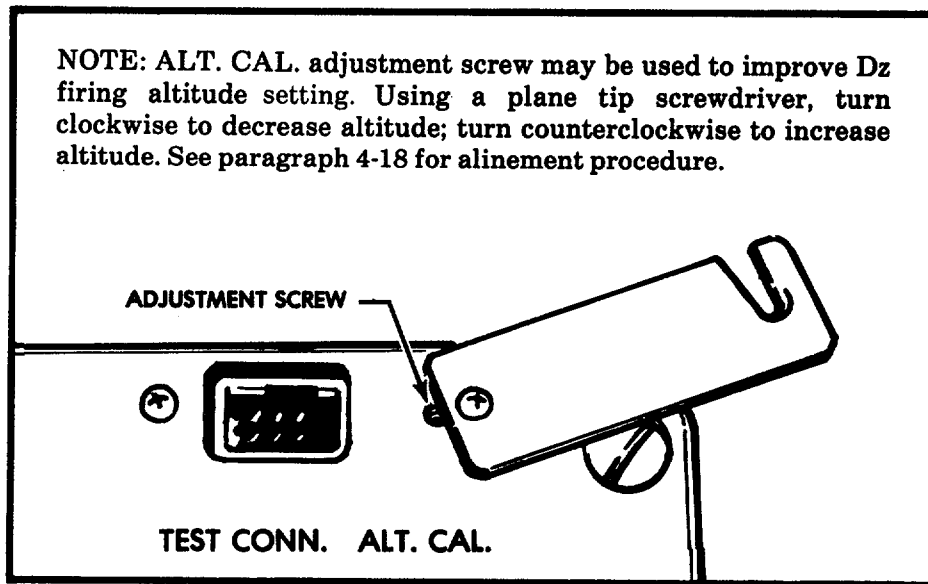
c. Testing (Cont).

(6) The IGN CHECK red light (9) should be on. This verifies that the cutter ignition circuit is complete.

(7) If the IGN CHECK fails to light the cutter is bad and must be replaced. To remove the ASPSU from the tester, proceed to step d. Replace unserviceable cutter and repeat paragraphs 4-16 and 4-17.

(8) Observe altimeter and FIRE indicator (10). Place ALT. DECR. switch (11) to up position, read and record the altitude at which the FIRE indicator lights. If the FIRE indicator lights within following tolerances, it may be used.

Dz Firing Altitude	Fire Altitude Tolerances
9,900 feet	±250 ft.
9,000 feet	±250 ft.
7,000 feet	±250 ft.
5,000 feet	±250 ft.
3,500 feet	±150 ft.
1,000 feet	±150 ft.



Further readings as follows, are required to assure that the bellows are adjusting to various barometric pressure changes.

GO TO NEXT PAGE

4-17. ASPSU - Test (Cont)

4-17

TESTING (Cont)

- 2. Operational test procedure (Cont).
- c. Testing (Cont).

LOW PRESSURE READING

- (9) Return ASPSU TEST switch (6) to the OFF position. Turn PUMP switch (3) to the off position.
- (10) Place PRES. DUMP switch (12) to the up position to depressurize chamber.
- (11) Place AC POWER switch (1) to the OFF position.

WARNING

Always insure that the ASPSU test set is depressurized before attempting to open chamber door as personnel injury may result.

- (12) Raise the ASPSU test set pressure chamber door.

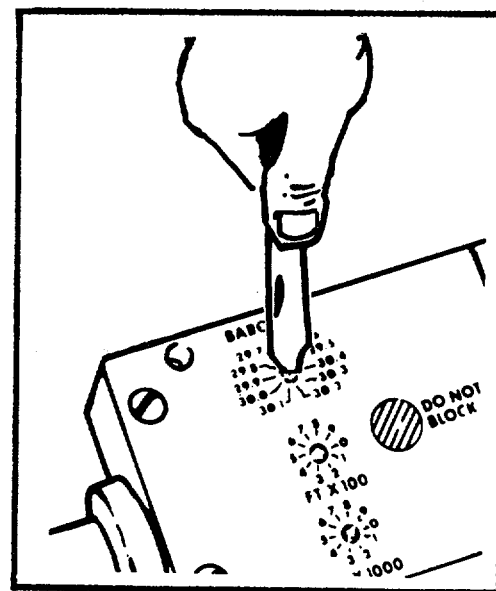
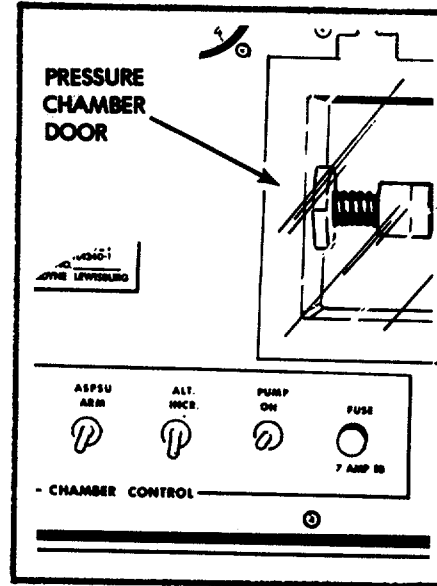
- (13) Return ALT. DECR. switch (11) to the down position. Place the PRES. DUMP switch (12) to the down position.

- (14) Set BARO. PRES. switch on ASPSU to 29.5.

- (15) Close the pressure chamber door.
- (16) Repeat steps c1 through c9 above and record the altitude at which the FIRE indicator lights.

NOTE

Fire altitudes and recorded data will reflect a difference in altitude relative to the initial altitude checks. This difference should correspond directly to the difference between 29.9 and 29.5 inches of mercury or an increase in FIRE altitude of +400' ±250' for altitudes of 9,900' to 5,000' and +400' ±150' for altitudes of 4,900' to 100'.



GO TO NEXT PAGE

4-17. ASPSU - Test (Cont)

4-17

TESTING (Cont)

2. Operational test procedures (Cont).
 - c. Testing (Cont).

HIGH PRESSURE READING

- (17) Repeat steps c10 through c14 above.
- (18) Set BARO. PRES. switch on ASPSU to 30.4.
- (19) Close the pressure chamber door.
- (20) Repeat steps c1 through c9 above and record the altitude at which the FIRE indicator lights.

NOTE

Fire altitudes and recorded data will reflect a difference in altitude relative to the initial altitude checks. This difference should correspond directly to the difference between 29.9 and 29.6 inches of mercury. Note that FIRE altitudes are decreased from initial altitude checks by -500' \pm 250' for altitudes of 9,900' to 5,000' and -500' \pm 150' for altitudes of 4,900' to 100'.

GO TO NEXT PAGE

4-17. ASPSU - Test (Cont)

4-17

TESTING (Cont)

2. Operational test procedures (Cont.

d. ASPSU test shutdown.

(1) Return ASPSU TEST switch (6) to the OFF position. Turn PUMP switch (3) to the off position.

(2) Place PRES. DUMP switch (12) to the up position to depressurize chamber.

(3) Place AC POWER switch (1) to the OFF position.

WARNING

Always insure that the ASPSU test set is depressurized before attempting to open chamber door as personnel injury may result.

(4) Raise the ASPSU test set pressure chamber door.

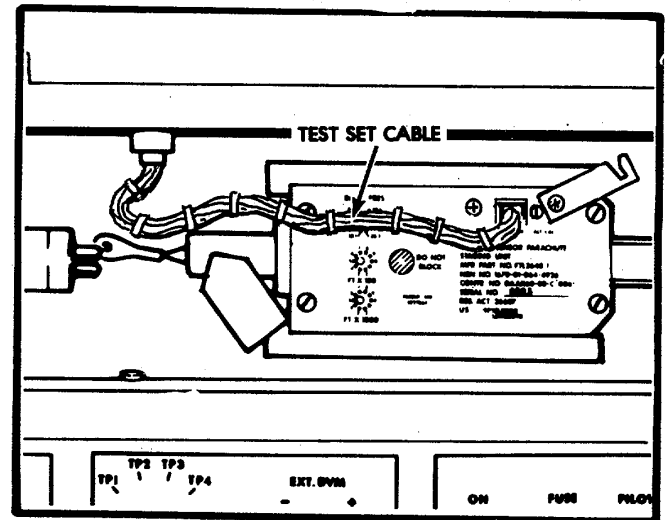
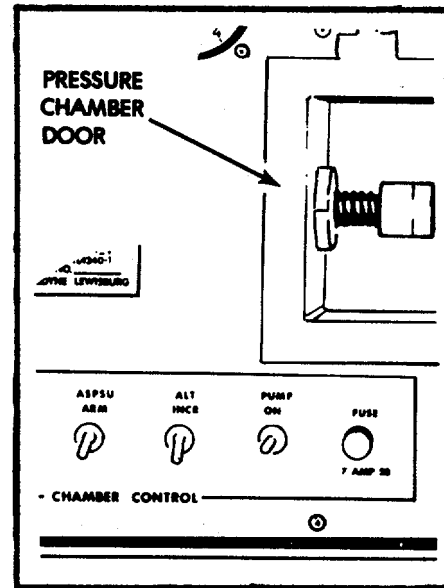
(5) Return ALT. DECR. switch (11) to the down position. Place the PRES. DUMP switch (12) to the down position.

(6) Disconnect the test set cable from the ASPSU and the test set.

(7) Close test connector cover on ASPSU and tighten two screws.

(8) Lift ASPSU from test set.

(9) Tag the ASPSU or defective modules in accordance with TB 750-126.



e. Test set shutdown.

(1) Close the ASPSU test set pressure chamber door.

(2) Disconnect the 115 VAC power cable from the ASPSU test set and stow in accordance with TM 10-1670-266-13&P.

(3) Stow the test set cable in accordance with TM 10-1670-266-13&P.

END OF TASK

4-17. ASPSU - Test (Cont)

4-17

TESTING (Cont)

3. Destructive test procedure. This test is only conducted if lot is considered bad.

WARNING

The altitude sensor parachute staging unit (ASPSU) contains a class C explosive in the cutter mechanism of the cutter module. Procedure steps shall be followed to prevent early activation and possible personnel injury.

a. Test set preparation.

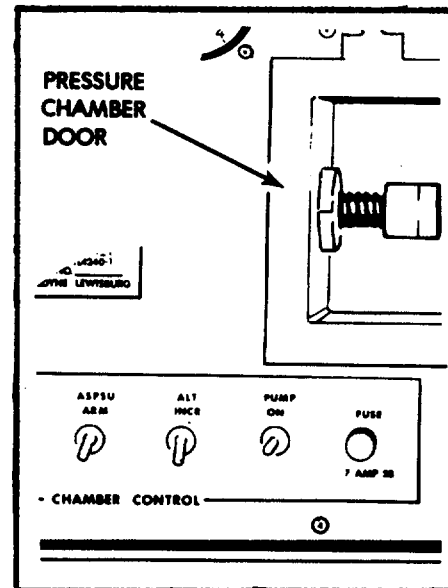
(1) Electrical hookup. Remove and connect the 115 VAC power cable in the ASPSU test set in accordance with TM 10-1670-266-13&P.

NOTE

Insure that all test set switches are in the OFF or DOWN position.

(2) Raise the ASPSU test set pressure chamber door.

(3) Check fuses and lights in accordance with TM 10-1670-266-13&P.



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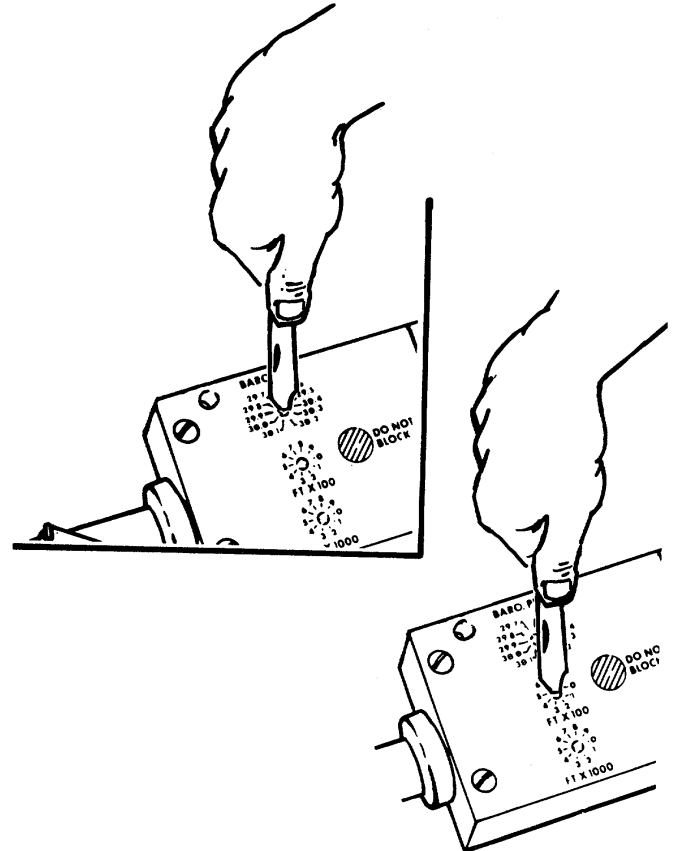
4-17. ASPSU - Test (Cont)

4-17

TESTING (Cont)

3. Destructive test procedures (Cont).
 - b. ASPSU test preparation.

(1) Set BARO. PRES. Switch on ASPSU to 29.9 with your rigger's knife.



(2) Set altitude switches on ASPSU to firing altitude of specified drop zone.

GO TO NEXT PAGE

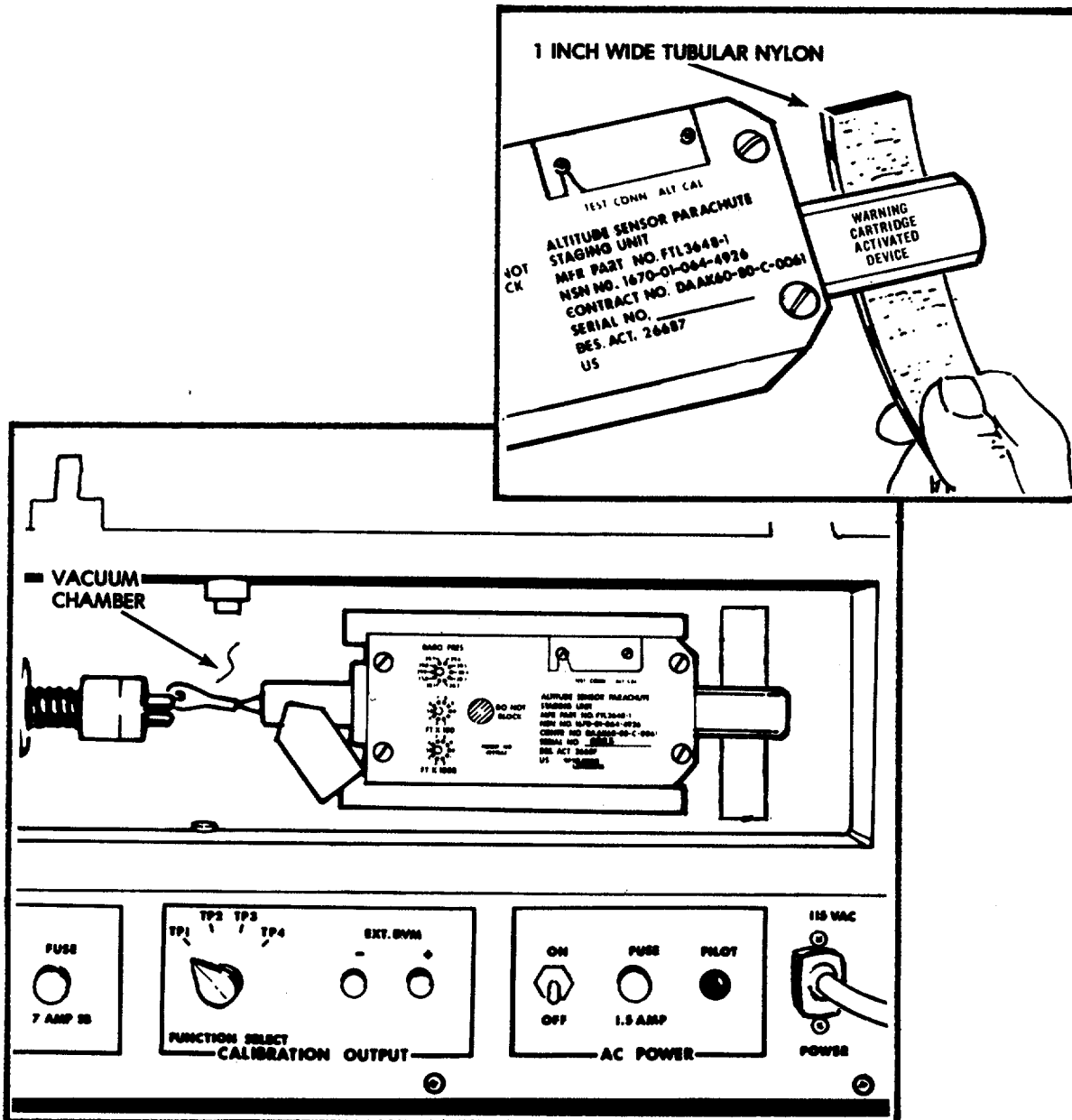
4-17. ASPSU - Test (Cont)

4-17

TESTING (Cont)

- 3. Destructive test procedures (Cont).
- b. ASPSU test preparation (Cont).

(3) Place a 6-inch length of nylon webbing (Item 5, Appendix D) into the cutter mechanism so that the free ends extend approximately 2 1/2" on either side.



(4) Insert assembled ASPSU and webbing into the test set vacuum chamber.

GO TO NEXT PAGE

4-17. ASPSU - Test (Cont)

4-17

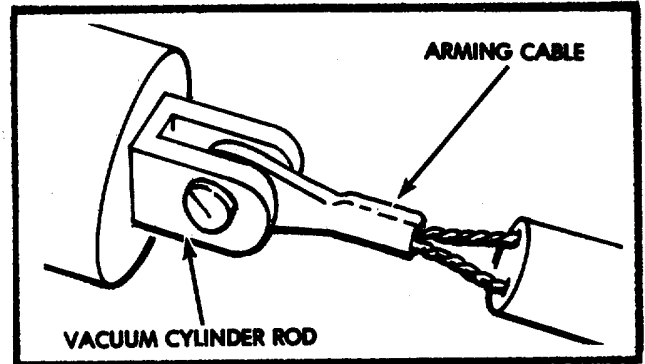
TESTING (Cont)

3. Destructive test procedures (Cont).
 - b. ASPSU test preparation (Cont).

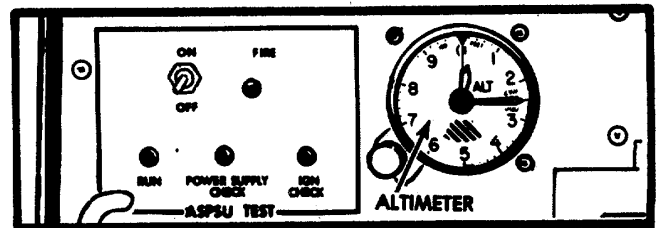
WARNING

When connecting the arming cable, do not pull on arming cable as force in excess of 18 lbs. may cause the ASPSU to activate resulting in personnel injury.

- (5) Connect the ASPSU arming cable to the vacuum cylinder rod.
- (6) Pull security pin.



- (7) Close the pressure chamber door.
- (8) Set altimeter barometric setting to 29.92 inches of mercury.



GO TO NEXT PAGE

4-17. ASPSU - Test (Cont)

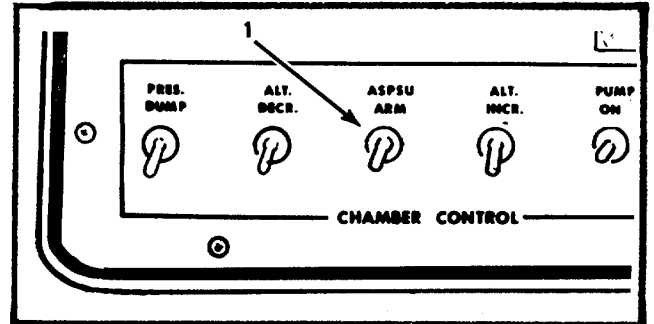
4-17

TESTING (Cont)

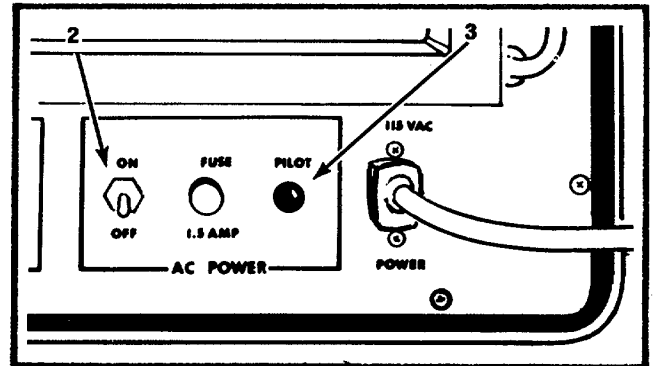
3. Destructive test procedures (Cont).

c. Testing.

(1) Insure the ASPSU ARM switch (1) is in the down position.

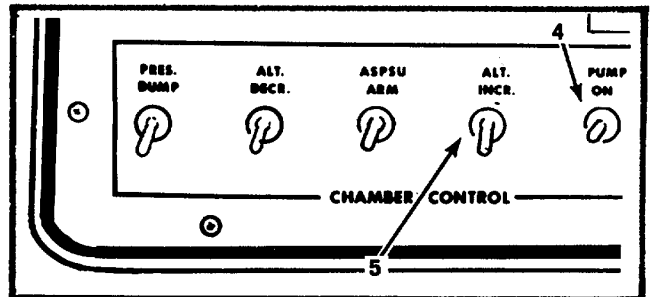


(2) Place the AC POWER switch (2) on the test set to the ON position. The PILOT light (3) should come on.



(3) Place PUMP switch (4) to the ON position.

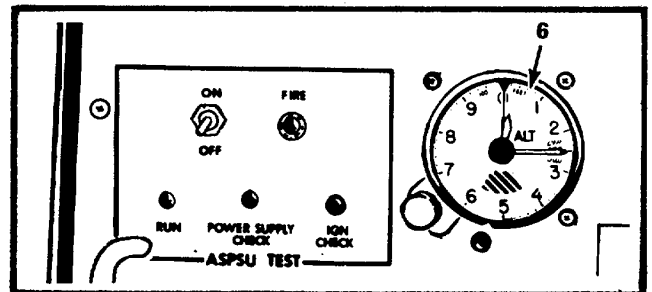
(4) Place ALT. INCR. switch (5) in the up position.



NOTE

If altimeter fails to rise, apply light hand pressure to the chamber door.

(5) Observe altimeter (6). When altimeter reaches 10,000 feet, place ALT. INCR. switch in the down position.



GO TO NEXT PAGE

4-17. ASPSU - Test (Cont)

4-17

TESTING (Cont)

3. Destructive test procedures (Cont).
c. Testing (Cont).

NOTE

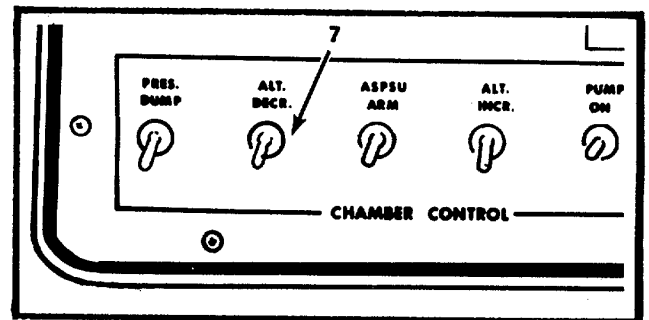
The following step activates the thermal battery which will supply power to the ASPSU for only 116 seconds. Step 7 below must be accomplished within 115 seconds after arming the ASPSU.

- (6) Place the ASPSU ARM switch in the up position. Verify that the arming cable has been pulled out from the ASPSU approximately 1 inch.

- (7) Place the ALT. DECR. switch (7) in the up position.

- (8) Observe altimeter as it approaches the firing altitude of the specified drop zone and note when the ASPSU fires.

- (9) If cutter fails to fire, report failure to the appropriate agency.



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4-17. ASPSU - Test (Cont)

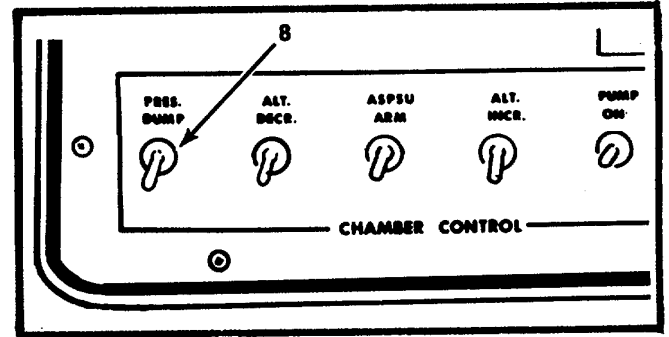
4-17

TESTING (Cont)

3. Destructive test procedure (Cont).
- d. ASPSU test shutdown.
- (1) Place PUMP switch to the off position.
 - (2) Place PRES. DUMP switch (8) to the up position.
 - (3) Place AC POWER switch to the OFF position.

WARNING

Always insure that the ASPSU test set is depressurized before attempting to open chamber door as personnel injury may result.



- (4) Raise the ASPSU test set pressure chamber door.
 - (5) Disconnect the vacuum cylinder rod from the arming cable.
 - (6) Lift the ASPSU from the test set.
 - (7) Remove nylon webbing from chamber and inspect the severed ends for a completed, unfrayed cut.
- e. Test set shutdown.
- (1) Close the ASPSU test set pressure chamber door.
 - (2) Disconnect the 115 VAC power cable from the ASPSU test set and stow in accordance with TM 10-1670-266-13&P.
 - (3) Stow mounting brackets in accordance with TM 10-1670-266-13&P.

END OF TASK

4-18. ASPSU - ALINE

4-18

This task covers: Alinement

INITIAL SETUP

Test Equipment:

ASPSU test set FLT4240

Tools:

Rigger's knife NSN 5110-00-162-2205

Screwdriver, cross tip NSN 5120-00-234-8912

Screwdriver, plane tip NSN 5120-00-979-4557

Personnel Required:

43E (10) Parachute rigger

Reference Information:

TM 10-1670-266-13&P

TB 750-126

Equipment Conditions:

External power of ASPSU test set must be connected to
115 VAC @ 60 ± 5 Hz

Special Environmental Conditions:

Temperature: Room Ambient, 70°F ±10°F
(22°C ± 44°C)

Humidity: Room Ambient, 55% normal

General Safety Instructions:

WARNING

Always insure that the ASPSU test set is depressurized before attempting to open chamber door as personnel injury may result.

WARNING

The altitude sensor parachute staging unit (ASPSU) contains a class C explosive in the cutter mechanism of the cutter module. Procedure steps shall be followed to prevent early activation and possible personnel injury.

NOTE:

The instructions pertain to the functional group number sequence 02 in the MAC and RPSTL.

GO TO NEXT PAGE

4-18. ASPSU - Aline (Cont)

4-18

ALINEMENT (Cont)

NOTE

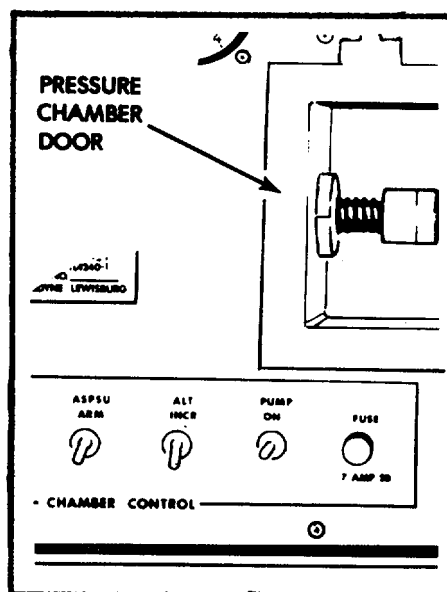
The following step-by-step instructions cover the alinement of the ASPSU. However, if you have been performing an operational test and have been referred to this paragraph for an alinement, you are to proceed from step 4 below.

1. Test set preparation.
 - a. Electrical hookup. Remove and connect the 115 VAC power cable in the ASPSU test set in accordance with TM 10-1670-266-13&P.

NOTE

Insure that all test set switches are in the OFF or DOWN position.

- b. Raise the pressure chamber door.
- c. Check fuses and lights in accordance with TM 10-1670-266-13&P.



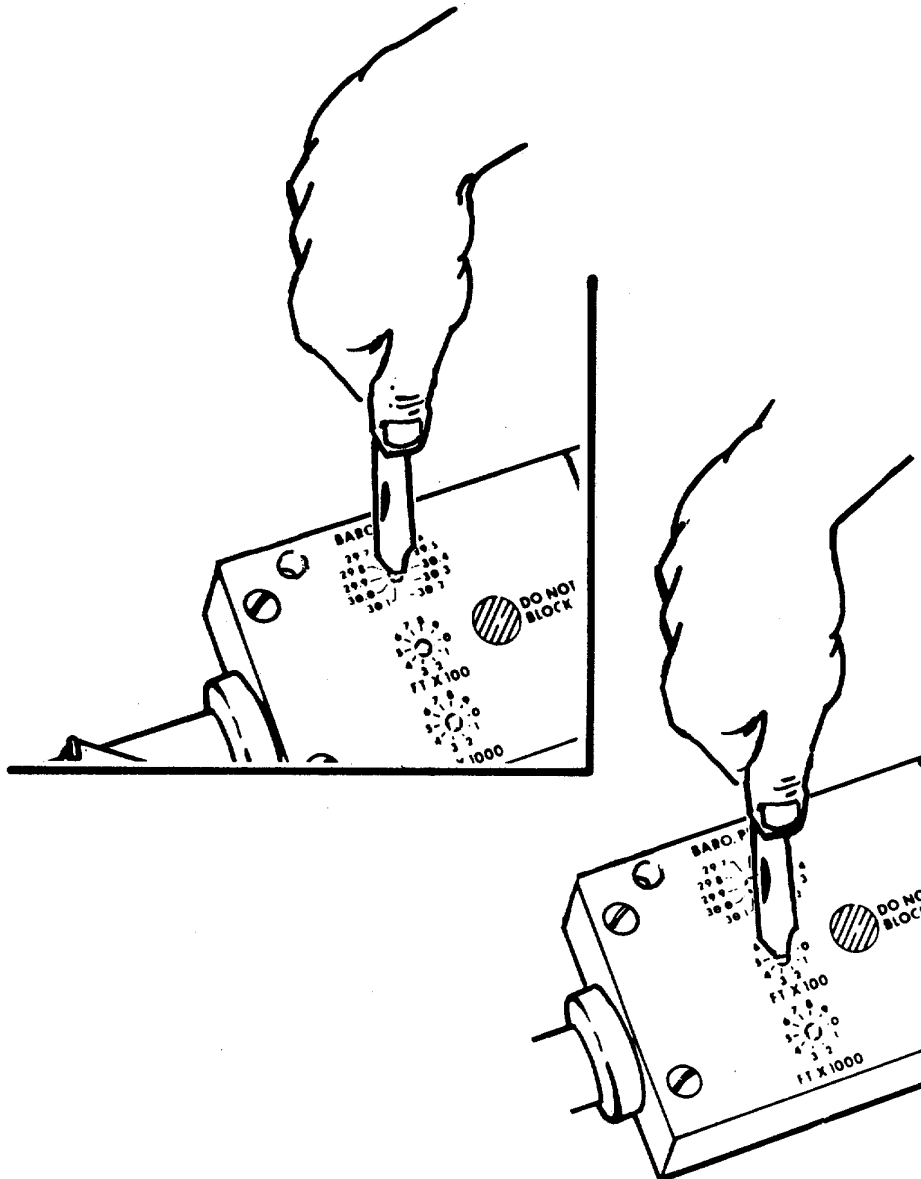
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4-18. ASPSU - Aline (Cont)

4-18

ALINEMENT (Cont)

2. ASPSU alinement preparation.
 - a. Set BARO. PRES. switch on ASPSU to 29.9 with your rigger's knife.



- b. Set altitude switches on ASPSU to firing altitude of specified drop zone.

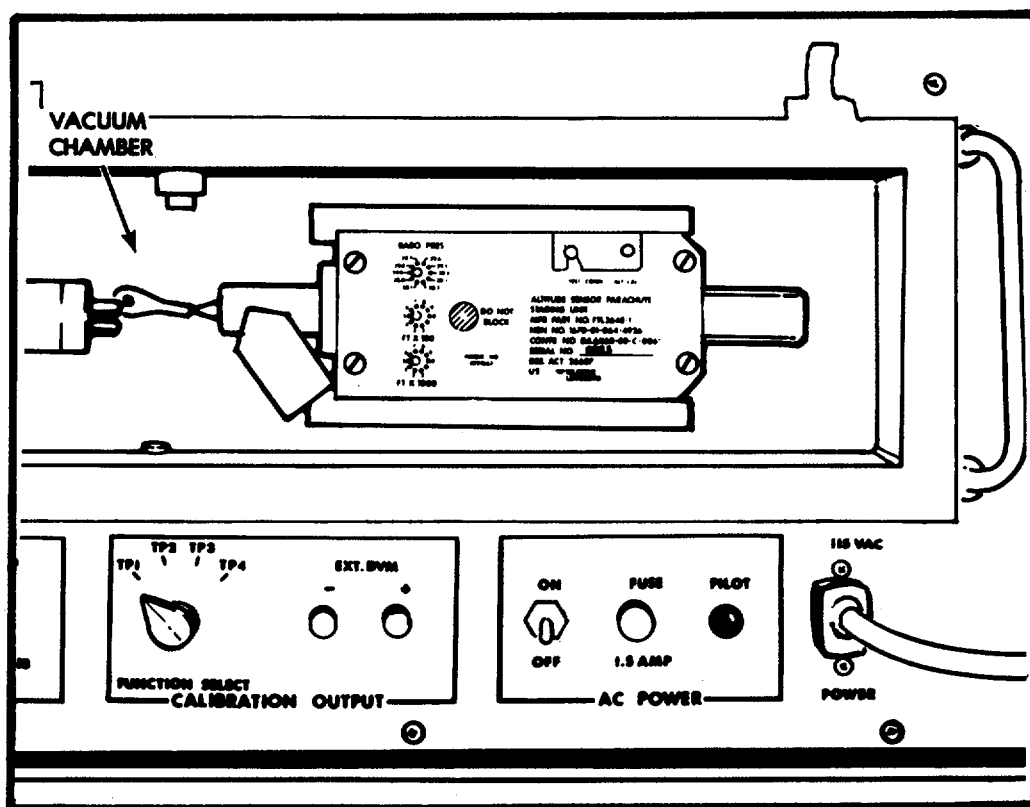
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4-18. ASPSU - Aline (Cont)

4-18

ALINEMENT (Cont)

2. ASPSU alinement preparation (Cont).
 - c. Insert assembled ASPSU into the test set vacuum chamber.



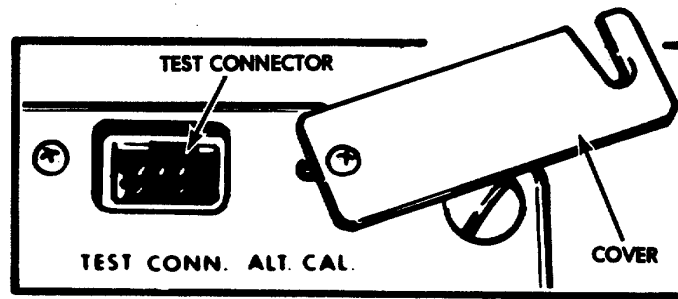
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4-18. ASPSU - Aline (Cont)

4-18

ALINEMENT (Cont)

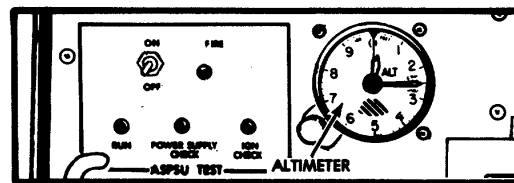
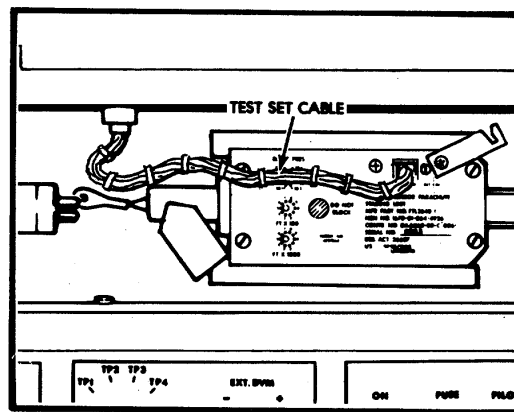
2. ASPSU alinement preparation (Cont).
 - d. Loosen two small screws with your cross tip screwdriver and swing cover open to expose test connector.



- e. Connect the test set cable furnished with the test set.

NOTE

The mated connector must be properly alined with the connector in the ASPSU.



- f. Close the pressure chamber door.
 - g. Set altitude barometric setting to 29.92 inches of mercury.

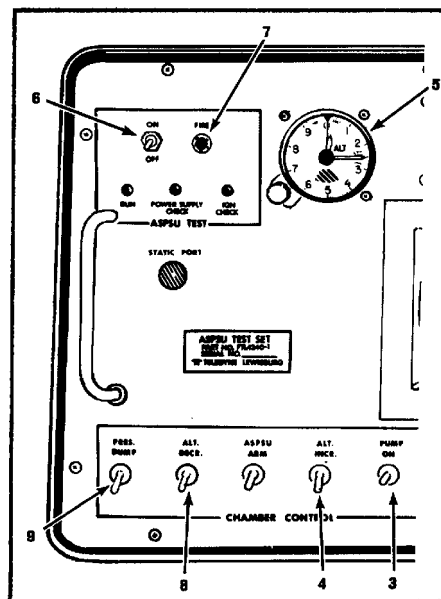
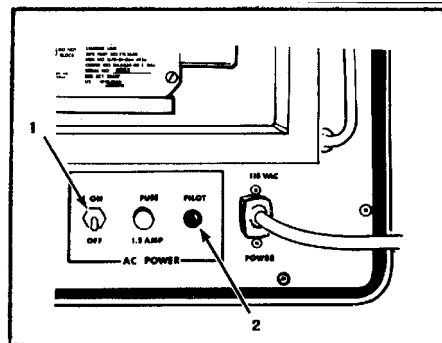
GO TO NEXT PAGE

4-18. ASPSU - Aline (Cont)

4-18

ALINEMENT (Cont)

3. ASPSU alinement check.
 - a. Place the AC POWER switch (1) on the test set to the ON position. The PILOT light (2) should come on.



- b. Place PUMP switch (3) to the ON position.
- c. Place ALT. INCR. switch (4) in the up position.

NOTE

If altimeter fails to rise, apply light hand pressure to the chamber door.

- d. Observe altimeter (5). When altimeter reaches 10,000 feet, place ALT. INCR. switch in the down position.
- e. Place ASPSU TEST switch (6) to the ON position.

GO TO NEXT PAGE

4-18. ASPSU - Aline (Cont)

4-18

ALINEMENT (Cont)

3. ASPSU alinement check (Cont).

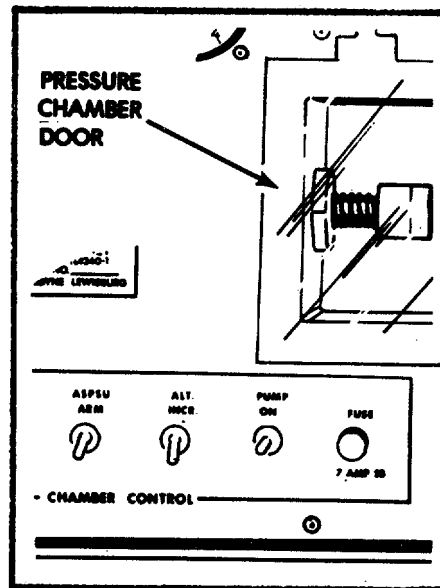
f. Observe altimeter and FIRE indicator (7). Place ALT. DECR. switch (8) to up position, read and record the altitude at which the FIRE indicator lights.

The FIRE indicator should light within the following tolerances:

Dz Firing Altitude	Fire Altitude Tolerances
9,900 feet	+ 250 ft.
9,000 feet	+ 250 ft.
7,000 feet	+ 250 ft.
5,000 feet	+ 250 ft.
3,500feet	+ 150ft.
1,000 feet	+ 150 ft.

4. ASPSU Alinement.

- a. Return ASPSU TEST switch (6) to the OFF position. Turn PUMP switch (3) to the off position.
- b. Place PRES. DUMP switch (9) to the up position to depressurize chamber. Place AC POWER switch (1) to the OFF position.



WARNING

Always insure that the ASPSU test set is depressurized before attempting to open chamber door as personnel injury may result.

- c. Raise the ASPSU test set pressure chamber door.

GO TO NEXT PAGE

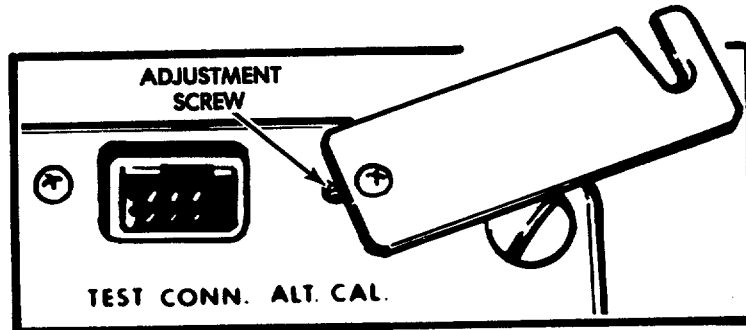
4-18. ASPSU - Aline (Cont)

4-18

ALINEMENT (Cont)

4. ASPSU Alinement (Cont).

- d. Turn ALT. CAL. adjustment screw clockwise to decrease altitude; turn



- e. Close the pressure chamber door.

f. Repeat steps 3 and 4 above until altitude error is within acceptable limits. If the ASPSU can not be alined, replace with a serviceable unit from stock.

NOTE

If you had been performing an operational test, proceed to paragraph 4-17, step 2c(9). However, if the ASPSU has been replaced, proceed to paragraph 4-17, step 2.

GO TO NEXT PAGE

4-18. ASPSU - Aline (Cont)

4-18

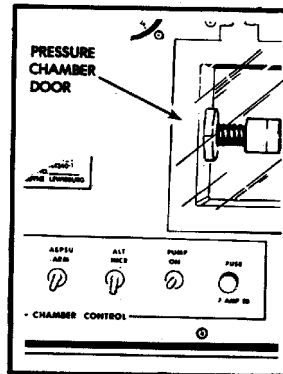
ALINEMENT (Cont)

5. ASPSU alinement shutdown.
 - a. Return ASPSU TEST switch (6) to the OFF position. Turn PUMP switch (3) to the off position.
 - b. Place PRES. DUMP switch (9) to the up position to depressurize chamber.
 - c. Place AC POWER switch (1) to the OFF position.

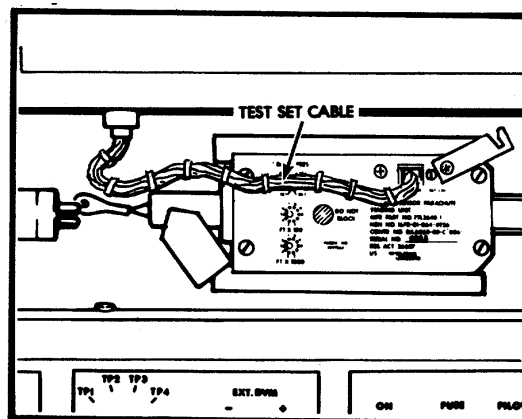
WARNING

Always insure that the ASPSU test set is depressurized before attempting to open chamber door as personnel injury may result.

- d. Raise the ASPSU test set pressure chamber door.



- e. Return ALT. DECR. switch (8) to the down position. Place the PRES. DUMP switch (9) to the down position.



- f. Disconnect the test set cable from the ASPSU and the test set.
- g. Close test connector cover on ASPSU and tighten two screws.
- h. Lift ASPSU from test set.
- i. Tag the ASPSU in accordance with TB 750-126.

GO TO NEXT PAGE

4-18. ASPSU - Aline (Cont)

4-18

ALINEMENT (Cont)

6. Test set shutdown.
 - a. Close the ASPSU test set pressure chamber door.
 - b. Disconnect the 115 VAC power cable from the ASPSU test set and stow in accordance with TM 10-1670-266-13&P.
 - c. Stow the test set cable in accordance with TM 10-1670-266-13&P.

END OF TASK

4-19. ASPSU - Service

4-19

This task covers: Cleaning

INITIAL SETUP

Tools:

Brush, scrub, household NSN 7920400-282-2470

Materials:

Paper clip - item 6, Appendix D
Rag, wiping - item 3, Appendix D

Personnel Required:

4SE (10) parachute rigger

Reference Information:

TM 10-1670-201-23 T.O. 13C-1-41

NOTE:

The instructions pertain to the functional group number sequence 02 in the MAC and RPSTL.

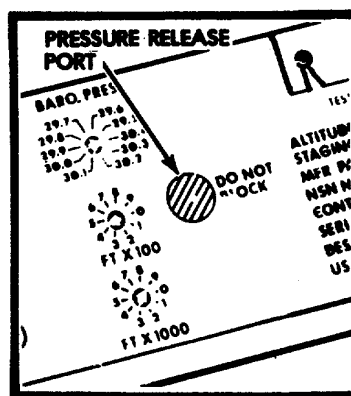
CLEANING

1. General. Cleaning should be held to a minimum and performed only when it is necessary to eliminate a possible malfunction or material deterioration.
2. Cleaning. The cleaning procedures are as follows:
 - a. Brushing. Gently brush with a soft-bristle brush.
 - b. Spot-cleaning. Spot-clean by rubbing the soiled area with a clean damp rag (Item 3, Appendix D).
 - c. Drying. Dry the ASPSU surface with a clean rag.
 - d. Cleaning the pressure release port. In the event that mud or other foreign objects are blocking the pressure release port, clean as follows:
 - (1) Hold the ASPSU with the port opening facing down

CAUTION

Damage can occur to the bellows if items used to clear the port are inserted into the port hole more than 3/8 inch.

- (2) Clear the port hole of mud or foreign objects using a paper clip (item 6, Appendix D), or another suitable item.



END OF TASK

4-20. ASPSU -Replace

4-20

This task covers: Disassembly, Inspection, and Reassembly

INITIAL SETUP

Tools:

Rigger's knife NSN 5110-00-162-2205

WARNING

Keep fingers or foreign objects away from webbing cutter slot at all times as blade could cause serious personnel injury.

Personnel Required:

43E (10) Parachute rigger

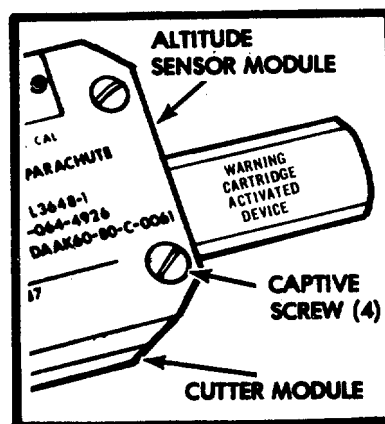
General Safety Instructions

NOTE:

The instructions pertain to the functional group number sequence 02 in the MAC and RPSTL.

DISASSEMBLY

1. Loosen 4 captive screws.
2. Grasp both modules and pull apart.
3. Discard the fired cutter module.



END OF TASK

4-20. ASPSU -Replace (Cont)

4-20

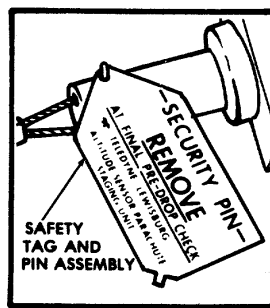
INSPECTION

1. Inspect sensor module for dents or cracks.
2. Inspect new cutter module for dents or cracks. Insure that the cutter has not been fired.

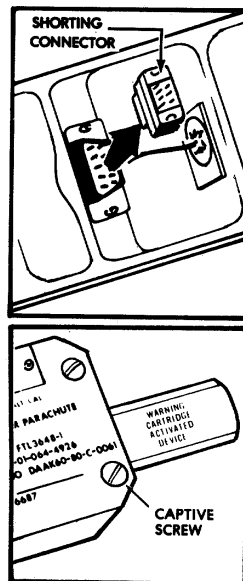
END OF TASK

REASSEMBLY

1. Insure safety tag and pin assembly is securely attached to the arming cable assembly.



2. Remove and discard the shorting connector from the cutter module.



3. Join the two modules together by aligning modules using the beveled end of each and the retainer holes as guides. Pressing the units together mates the electrical interface connector.
4. Lock the two modules together by screwing down the four captive screws until tight.

NOTE

Installation of retainer line will not be performed until ASPSU on the HAARS.

END OF TASK

SECTION VIII.
MAINTENANCE PROCEDURES FOR
G-12E 64-FOOT-DIAMETER CARGO PARACHUTE

4-21. G-12E - SERVICE

4-21

This task covers: Packing

INITIAL SETUP

Tools:

Tension jack NSN 3950-00-235-4239
Line separator NSN 1670-00-092-8660
Fan, circulating NSN 4140-00-833-5068
Rigger's knife NSN 5110-00-162-2205
Stencil set, marking NSN 7520-00-298-7043
Brush, stencil NSN 7520-00-248-9285

Materials:

Cloth - Item 7, Appendix D
Thread - Item 8, Appendix D
Webbing - Item 9, Appendix D
Strap - Item 10, Appendix D
Tape - Item 11, Appendix D
Webbing - Item 12, Appendix D
Ink - Item 13, Appendix D

Personnel Required: (3)

43E (10) Parachute rigger

Reference Information:

TM 10-1670-215-23/T.O. 13C5-1-102

Special Environmental Conditions

Clean smooth floor with a stationary post or equivalent at each end. The floor must be large enough to accommodate the 64- foot- diameter parachute.

NOTE:

The instructions pertain to the functional group number sequence 03 in the MAC and RPSTL.

1. General information.

A pack-in-process inspection shall be conducted by a rigger supervisor, other than the packer, during the parachute packing process. This inspection is required to insure that only authorized packing procedures are used. The prescribed intervals to conduct the pack-in process inspection for the high altitude airdrop resupply system G-12E parachute are as follows:

- a. After canopy is placed in proper layout.
- b. Upon completion of center line attachment to canopy vent.
- c. Gore folding completed.
- d. Canopy, suspension line, and connector link ties completed.
- e. Canopy stowage completed.
- f. Stowage of suspension lines, center line, and risers completed.
- g. Deployment bag closure completed.

END OF GENERAL INFORMATION

2. Place G-12 parachute in proper layout in accordance with TM 10-1670-215-23/T.O.13C5-1-102.

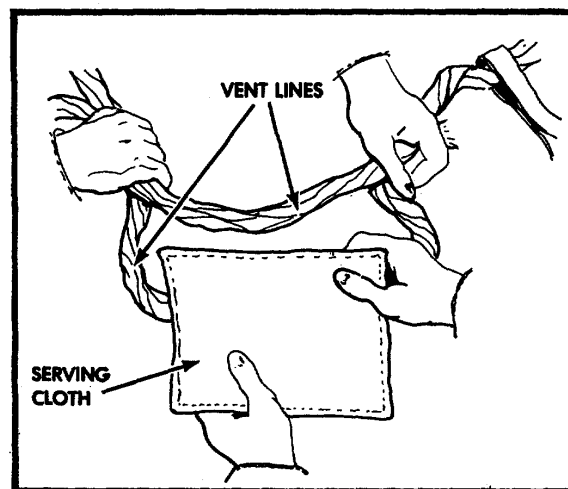
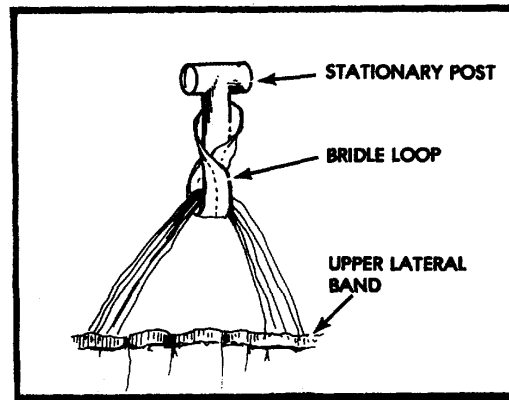
GO TO NEXT PAGE

4-21. G-12E - SERVICE (Cont)

4-21

PACKING (Cont.)

3. Servicing the canopy vent.
 - a. Remove the canopy bridle loop from stationary post, insuring that the dressed upper lateral band is not disturbed.
 - b. Slide the bridle loop to one side.



- c. Cut an 8-inch-wide by 12-inch-long piece of cloth, (Item 7, Appendix D).
 - d. Divide the center of the canopy vent lines into two equal groups and insert 3 inches of the cloth between the two groups.

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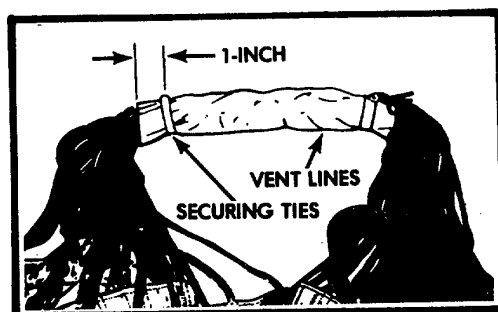
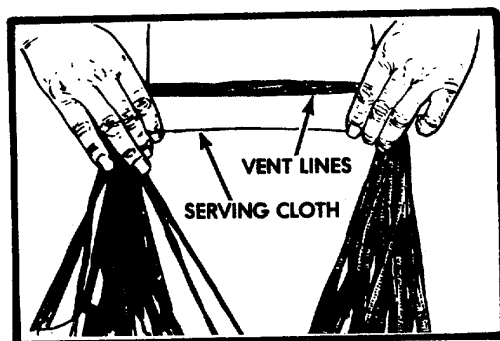
4-21. G-12E - SERVICE (Cont)

4-21

PACKING (Cont.)

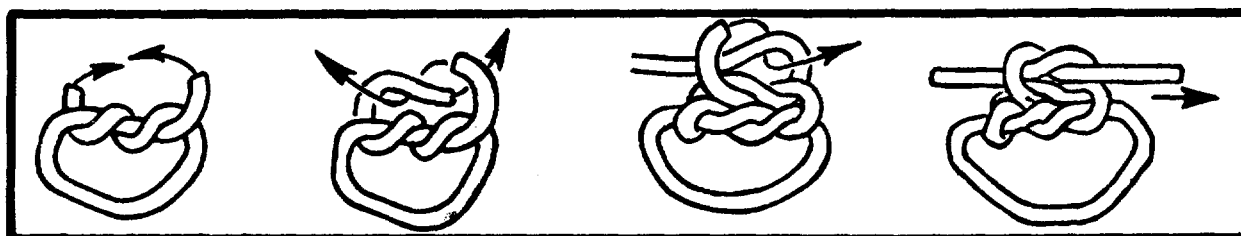
3. Servicing the canopy vent (cont).

e. Extend the opposite end of the cloth down toward the inside of the vent lines and around both vent line groups to serve the vent lines.



f. At a point 1 inch back from each outside edge of the vent line serving cloth, secure each end by making a tie around the vent lines with webbing, (Item 9, Appendix D).

g. Secure each tie with a surgeon's knot and a locking knot. Trim tie ends to 2-inches.



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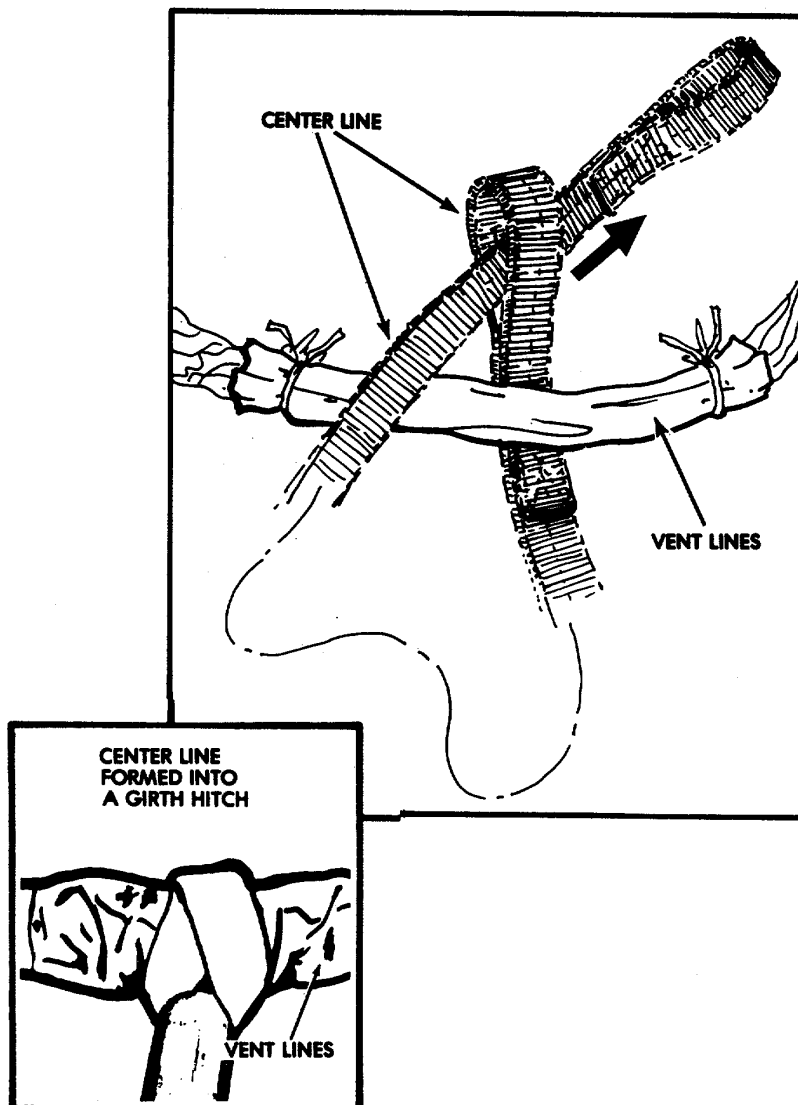
4-21. G-12E - SERVICE (Cont)

4-21

PACKING(Cont.)

4. Attaching center line to canopy vent lines.

- a. Pass one loop of the center line around the center of the vent lines.
- b. Pass the opposite end of the center line through the end loop routed around the vent lines and draw the center line length through the loop until a snug girth hitch is formed around the vent lines.



- c. S-fold the center lines, and place them as far as possible inside the canopy.

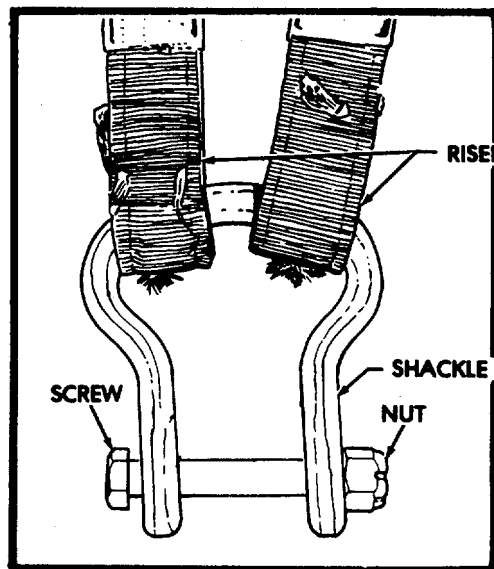
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4-21. G-12E - SERVICE (Cont)

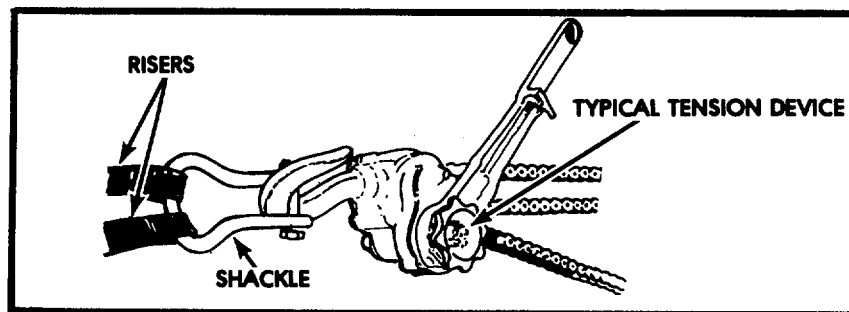
4-21

PACKING (Cont.)

5. Applying tension.
 - a. Reconnect the canopy bridle loop to the stationary post.
 - b. Insure that the two risers are attached to the body of a 3/4-inch shackle (clevis) and the applicable nut and screw are installed on the clevis.



- c. Connect the 3/4-inch clevis to a tension device and apply tension.



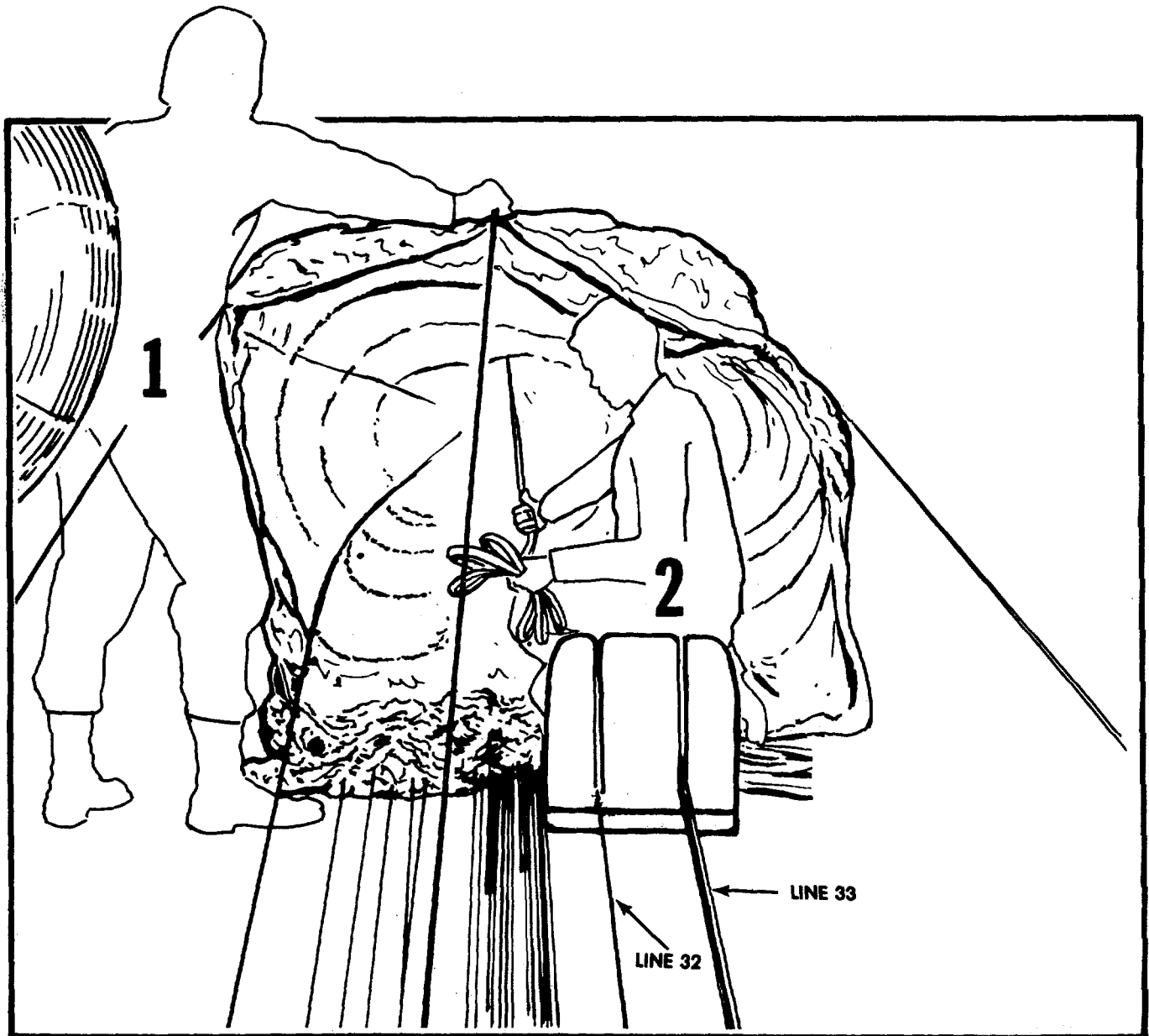
NOTE

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

GO TO NEXT PAGE

PACKING (Cont.)

6. Folding the gores. Fold canopy gores into two groups of 32 gores each as follows:



GO TO NEXT PAGE

4-21. G-12E - SERVICE (Cont)

4-21

PACKING (Cont.)

6. Folding the gores (cont).

NOTE

All directional references to right or left called for in the packing procedures, will be from the riggers view.

- a. At a point 10 feet below the canopy skirt, position a large circulating fan in a manner that will allow the fan airstream to partially inflate the canopy. Turn fan on.
- b. With the fan operating and rigger number 1 holding the canopy skirt at least shoulder high to allow the canopy to partially inflate, rigger number 2 will move through the canopy inside to the canopy vent and pull the center line length back through the canopy to within approximate 6 inches of the skirt of the canopy.
- c. Insure all twists are removed from the center line length and the line is located between suspension lines 32 and 33.
- d. Temporarily position center line inside the canopy until gore folding is completed to preclude entanglement with the suspension lines.
- e. Turn fan off.

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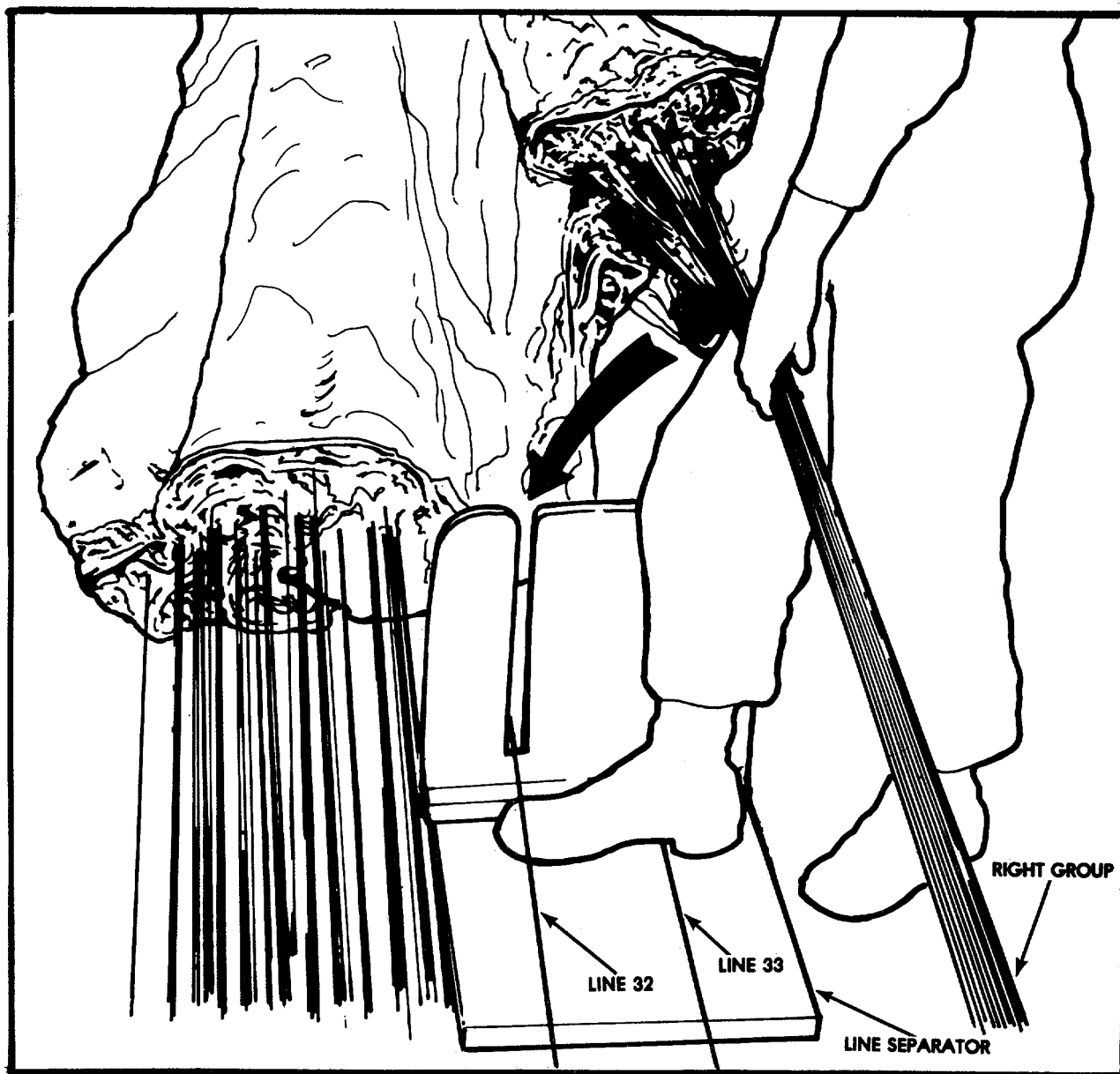
4-21. G-12E - SERVICE (Cont)

4-21

PACKING (Cont.)

6. Folding the gores (cont).

f. While holding line 33 in position in the line separator, pick up the right suspension line group and throw the right group of gores and lines over the left group of gores and lines.



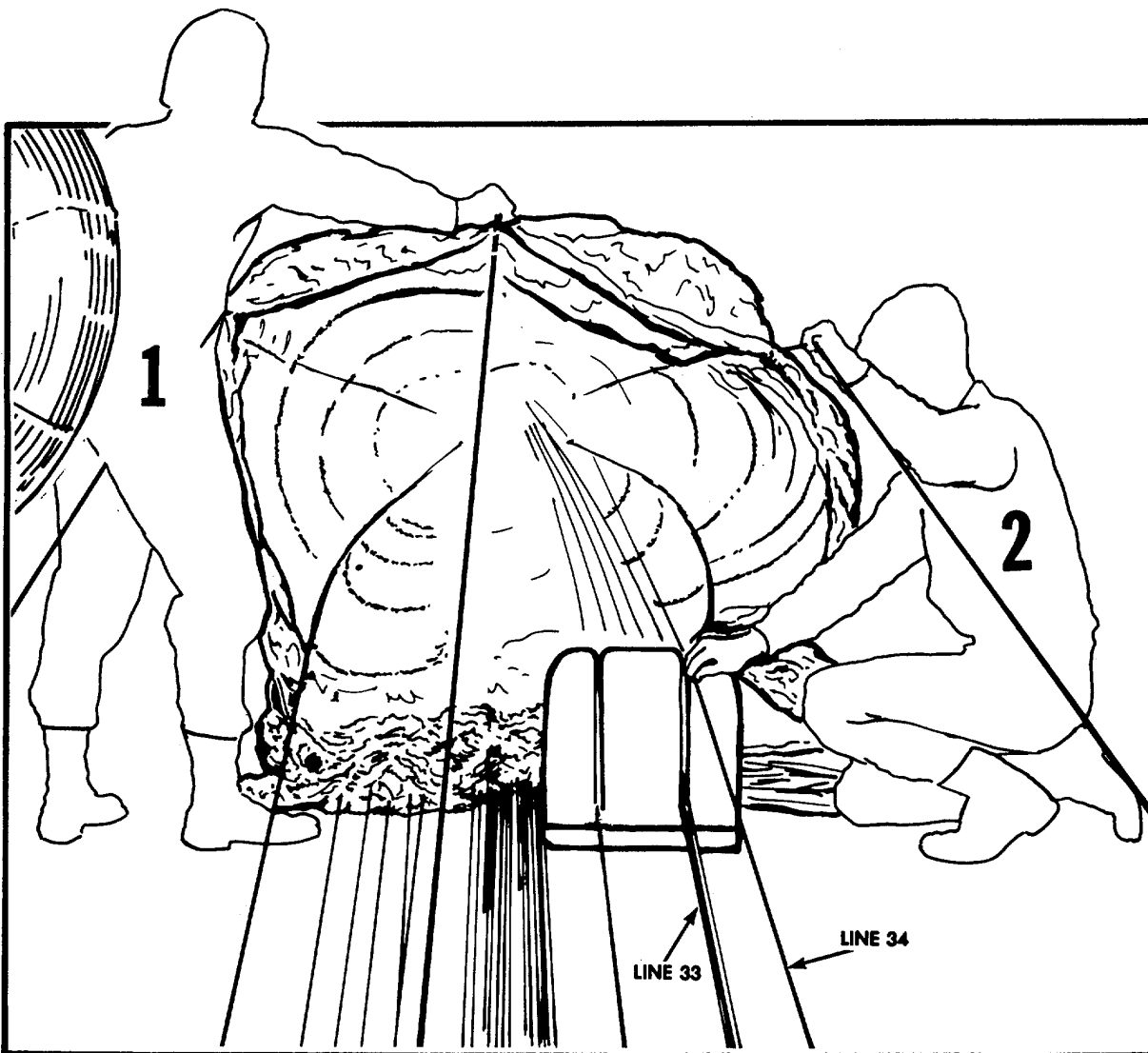
GO TO NEXT PAGE

4-21. G-12E - SERVICE (Cont)

4-21

PACKING(Cont.)

6. Folding the gores (cont).



- g. Turn fan on.
- h. To fold the first gore of the right group, rigger number 1 passes line 34 to rigger number 2 who places the line on top of line 33 in the right slot of the line separator.
- i. Insure that while placing line 34 into the line separator, the gore between lines 33 and 34 deflates and lies flat in a folded fashion.
- j. Fold the remainder of the right gore group, placing lines 35 through 64 in the right slot of the line separator.
- k. Turn fan off.

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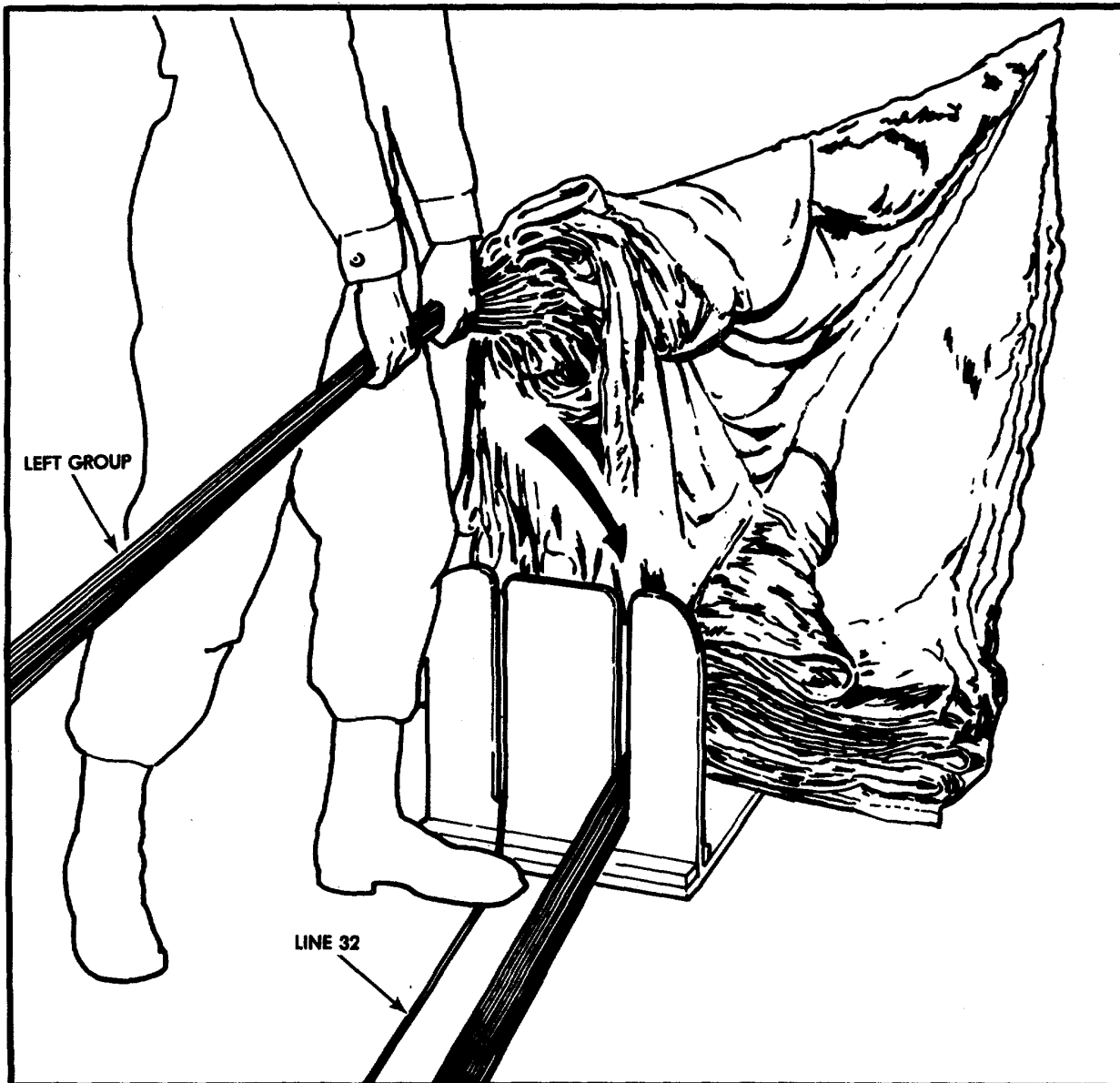
4-21. G-12E - SERVICE (Cont)

4-21

PACKING (Cont.)

6. Folding the gores (cont).

I. While holding line 32 in the line separator, pick up the left suspension line group and throw the left group of gores and lines over the folded right group of gores and lines.



GO TO NEXT PAGE

4-21. G-12E - SERVICE (Cont)

4-21

PACKING (Cont.)

6. Folding the gores (cont).

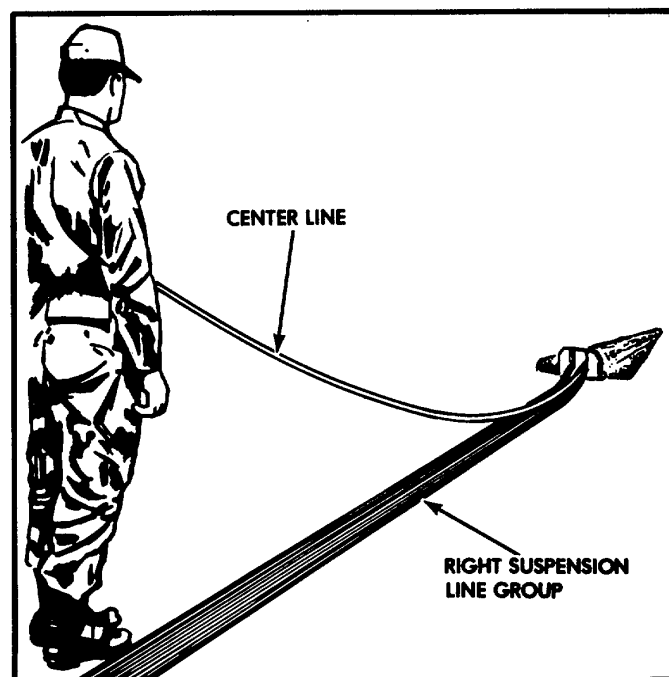
m. Turn fan on.

n. The left gore group is folded in the same manner as the right group, rigger number 1 passes line 31 to a second man who places the line on top of line 92 in the left slot of the line separator.

o. Insure that while placing line 31 into the line separator, the gore between lines 31 and 32 deflates and lies flat in a folded fashion.

p. Fold the remainder of the left gore group, until all of the suspension lines of the left group are in the left slot of the line separator.

q. Turn fan off.



r. Remove the running end of the canopy center line from within the canopy skirt.

s. Place the center line in the right slot of the line separator.

t. Extend the center line length along the length of the right suspension line group.

u. Insure that the canopy skirt does not become disarranged during removal of the center line.

v. Insure that all twists are removed from the portion of the center line extending below the canopy skirt.

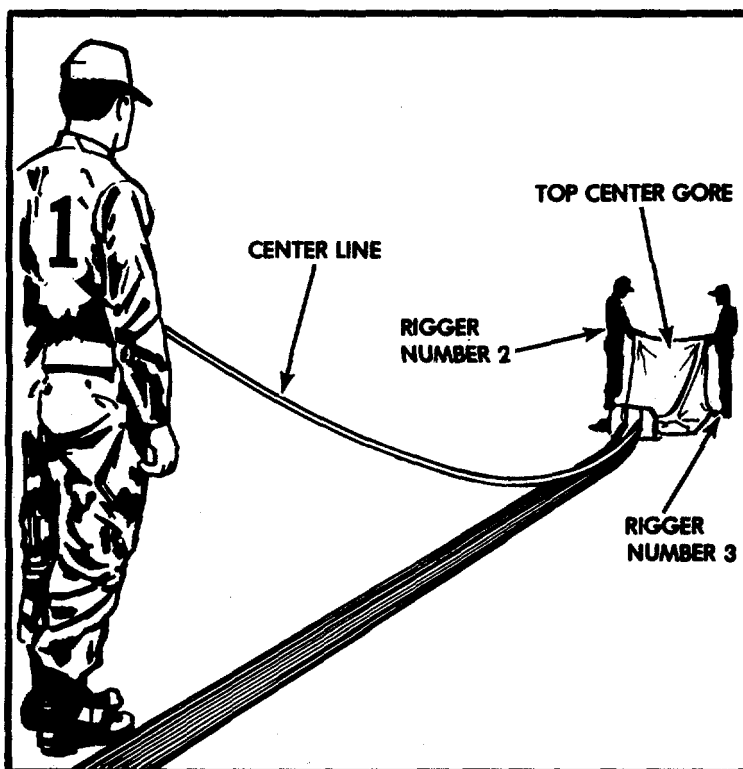
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4-21. G-12E - SERVICE (Cont)

4-21

PACKING (Cont.)

7. Effecting canopy vent pull-down.
 - a. Release tension device and remove the canopy bridle loop from the stationary post.



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

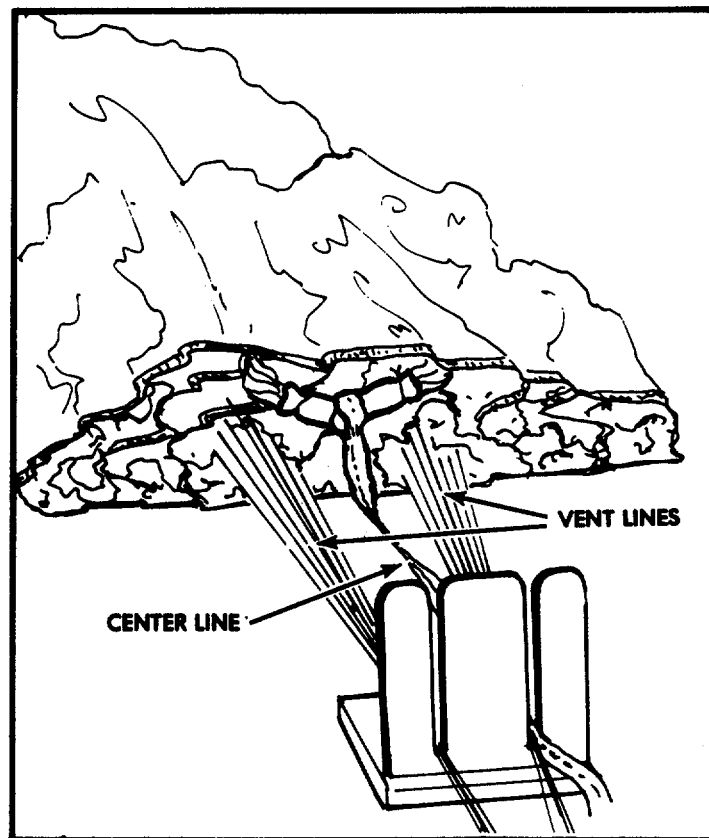
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4-21. G-12E - SERVICE (Cont)

4-21

PACKING (Cont.)

7. Effecting canopy vent pull-down (cont).



e. Rigger number 1 stops pulling on the center line when the served portion of the canopy vent lines becomes aligned with the canopy skirt.

f. Riggers 2 and 3 lay the top center gore back down on the canopy, insuring that the gore is dressed along the lower edge and each side.

g. Place the center line on top of the right suspension line group. The running end loop of the center line should be located 6 to 9 inches below the 3/4-inch clevis.

h. Remove tension device from clevis.

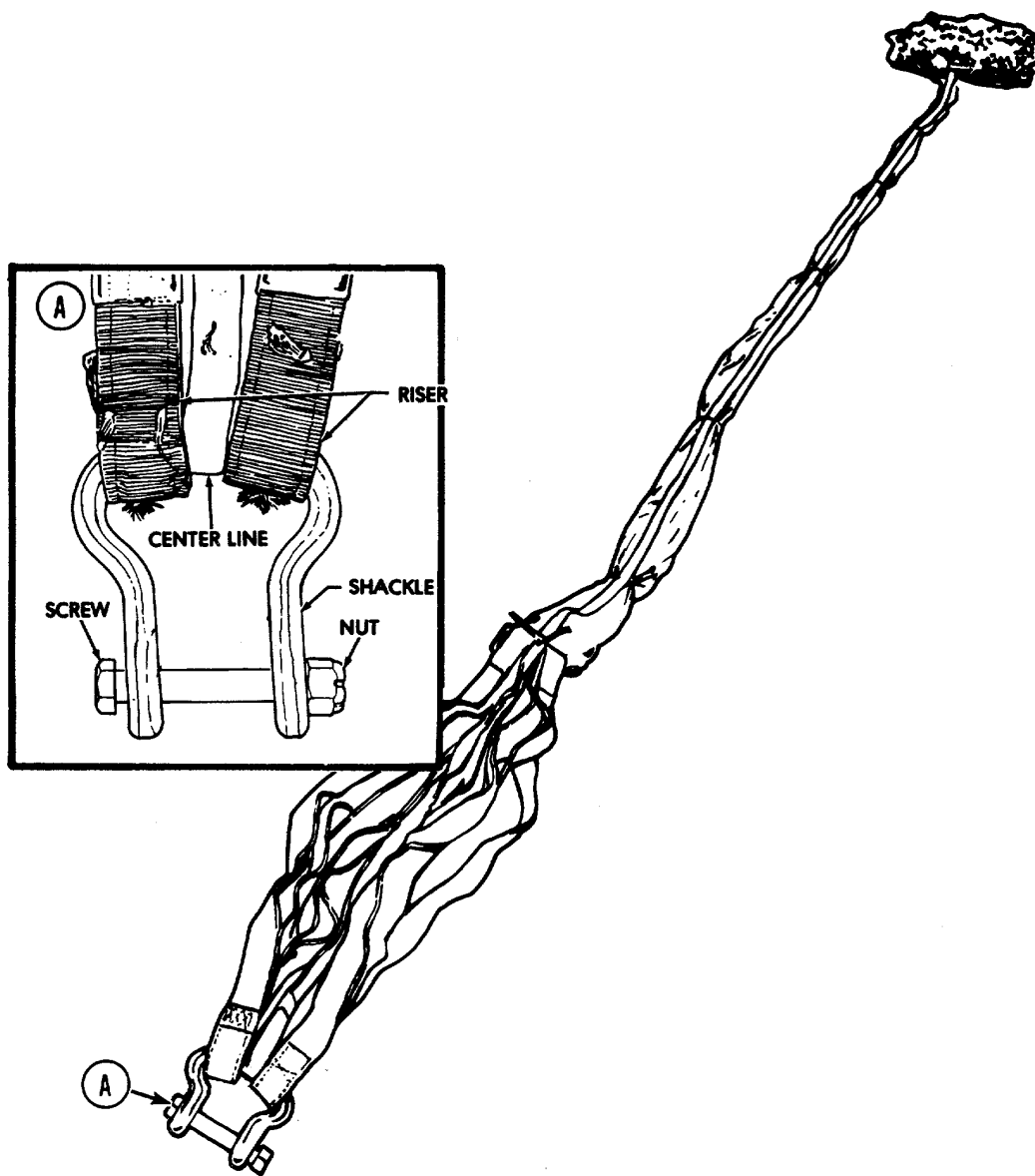
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4-21. G-12E - SERVICE (Cont)

4-21

PACKING (Cont.)

7. Effecting canopy vent pull-down (cont).
 - i. Remove nut and screw from clevis.
 - j. Remove one of the risers from the clevis.
 - k. Install center line running end loop on clevis.
 - l. Replace riser on clevis and assemble the screw and nut on the clevis.



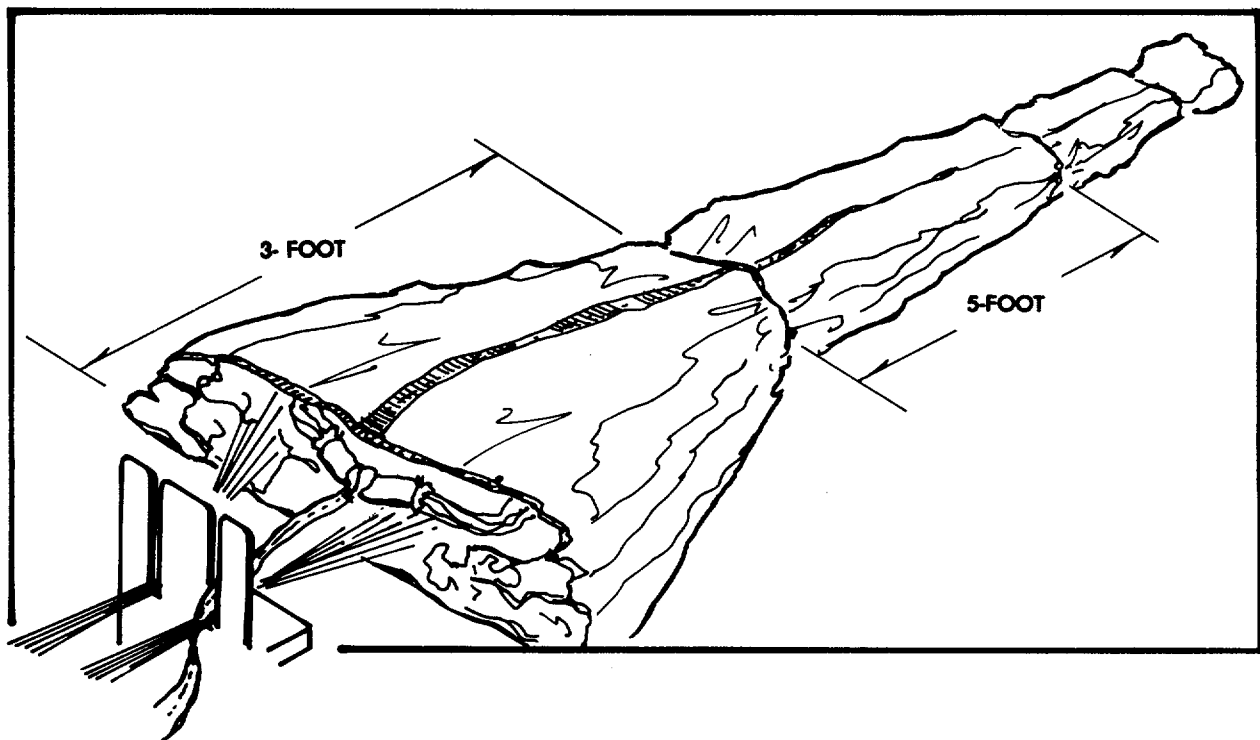
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PACKING (Cont.)

8. Tying the canopy, suspension lines, and center line.

CANOPY

- a. Beginning at a point 3 feet above the canopy skirt reinforcement (lower lateral band), tie the canopy using one turn single cotton thread (Item 8, Appendix D).
- b. Secure the tie with a surgeon's knot and a locking knot. Trim the tie ends to 2 inches.
- c. Repeat steps a and b above at subsequent 5-foot intervals along the remaining length of the canopy.



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4-21. G-12E - SERVICE (Cont)

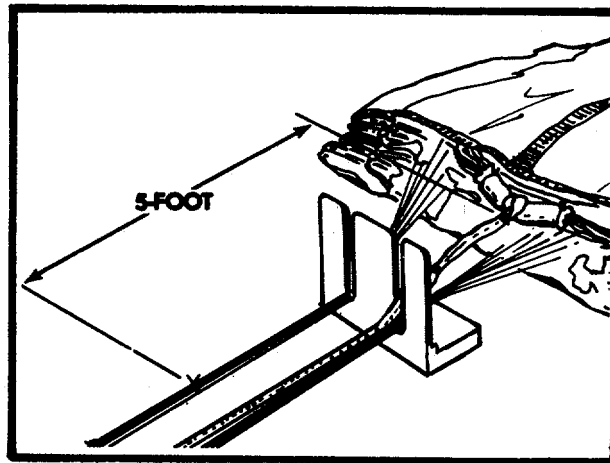
4-21

PACKING (Cont.)

8. Tying the canopy, suspension lines, and center line (cont).

LEFT SUSPENSION LINE GROUP

- d. At a point 5 feet below the skirt reinforcement, tie the left suspension line group using one turn single cotton thread (Item 8, Appendix D).
- e. Secure the tie with a surgeon's knot and a locking knot. Trim the tie ends to 2 inches.
- f. Remove the line separator from the suspension lines.

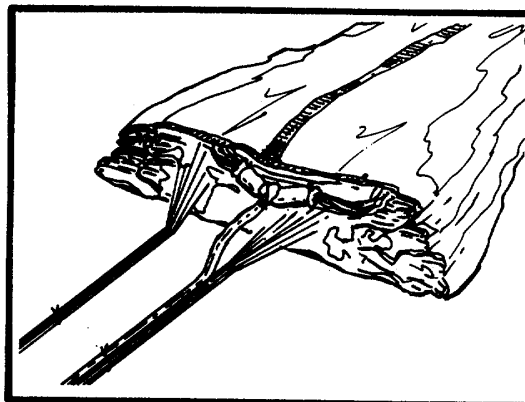


RIGHT SUSPENSION LINE GROUP

- g. Repeat steps d and e above but include the center line

NOTE

The center line will be placed on top.



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4-21. G-12E - SERVICE (Cont)

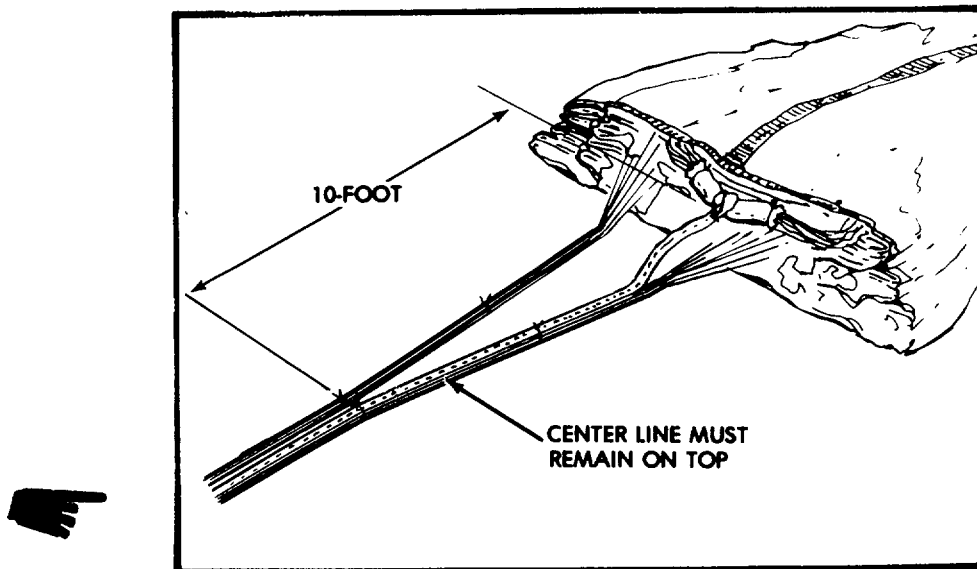
4-21

PACKING (Cont.)

8. Tying the canopy, suspension lines, and center line (cont).

COMBINED SUSPENSION LINE GROUPS

- h. Beginning at a point 10 feet below the skirt reinforcement, tie both groups of suspension lines and the center line (Item 8, Appendix D).
- i. Secure the tie with a surgeon's knot and a locking knot. Trim the tie ends to 2 inches.
- j. Repeat steps h and i above at subsequent 10-foot intervals along the remaining length of the suspension lines.

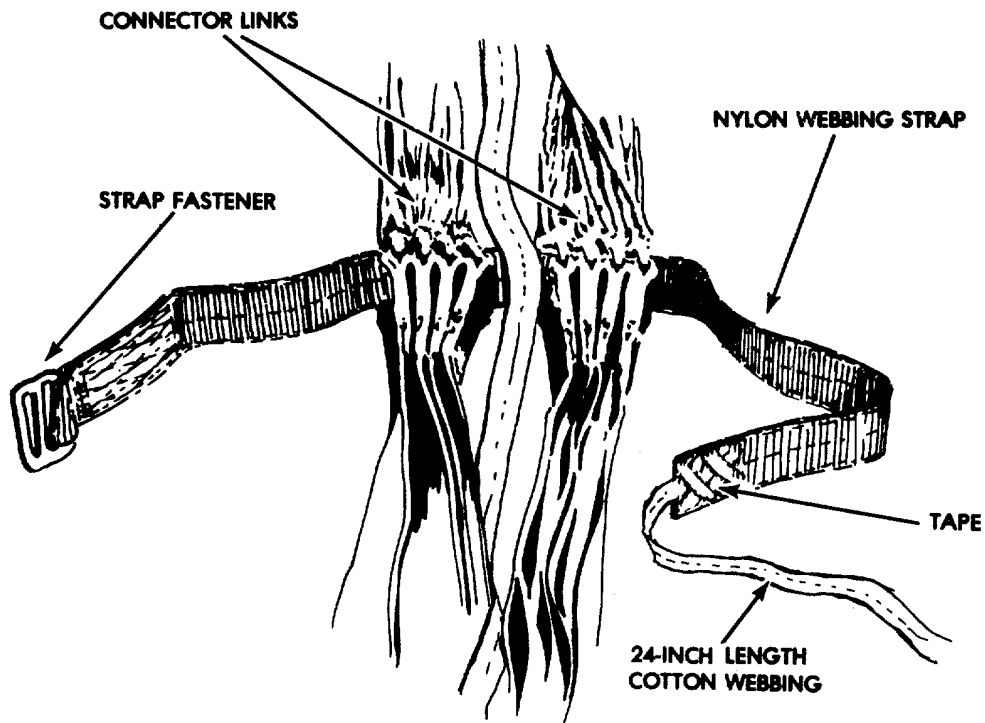


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PACKING (Cont.)

9. Tying the connector link assemblies.

a. Release the strap fastener on the nylon webbing strap threaded through the connector link assembly.



b. Attach a 24-inch length of cotton webbing (Item 9, Appendix D) to the running end of the nylon webbing strap with tape (Item 10, Appendix D).

c. Pull nylon webbing strap through the connector link assemblies which, in turn, will insert the taped cotton webbing into the connector link assemblies. Leave the cotton webbing in the link assemblies.

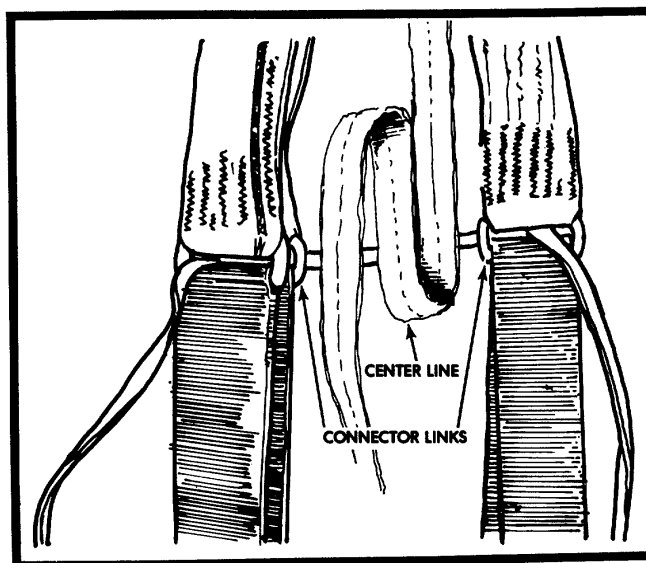
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4-21. G-12E - SERVICE (Cont)

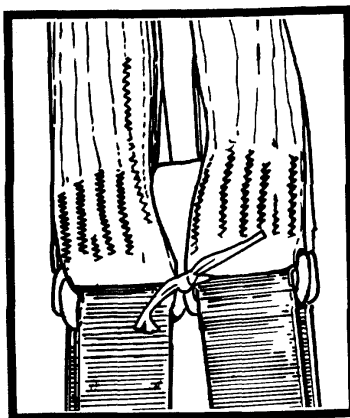
4-21

PACKING (Cont.)

9. Tying the connector link assemblies (cont).
 - d. Remove the taped cotton webbing from the nylon webbing strap. Remove and discard the tape.
 - e. Stack each of the two groups of connector link assemblies.
 - f. S-fold the slack in the center line between the two stacks of connector link assemblies.



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



GO TO NEXT PAGE

4-21. G-12E - SERVICE (Cont)

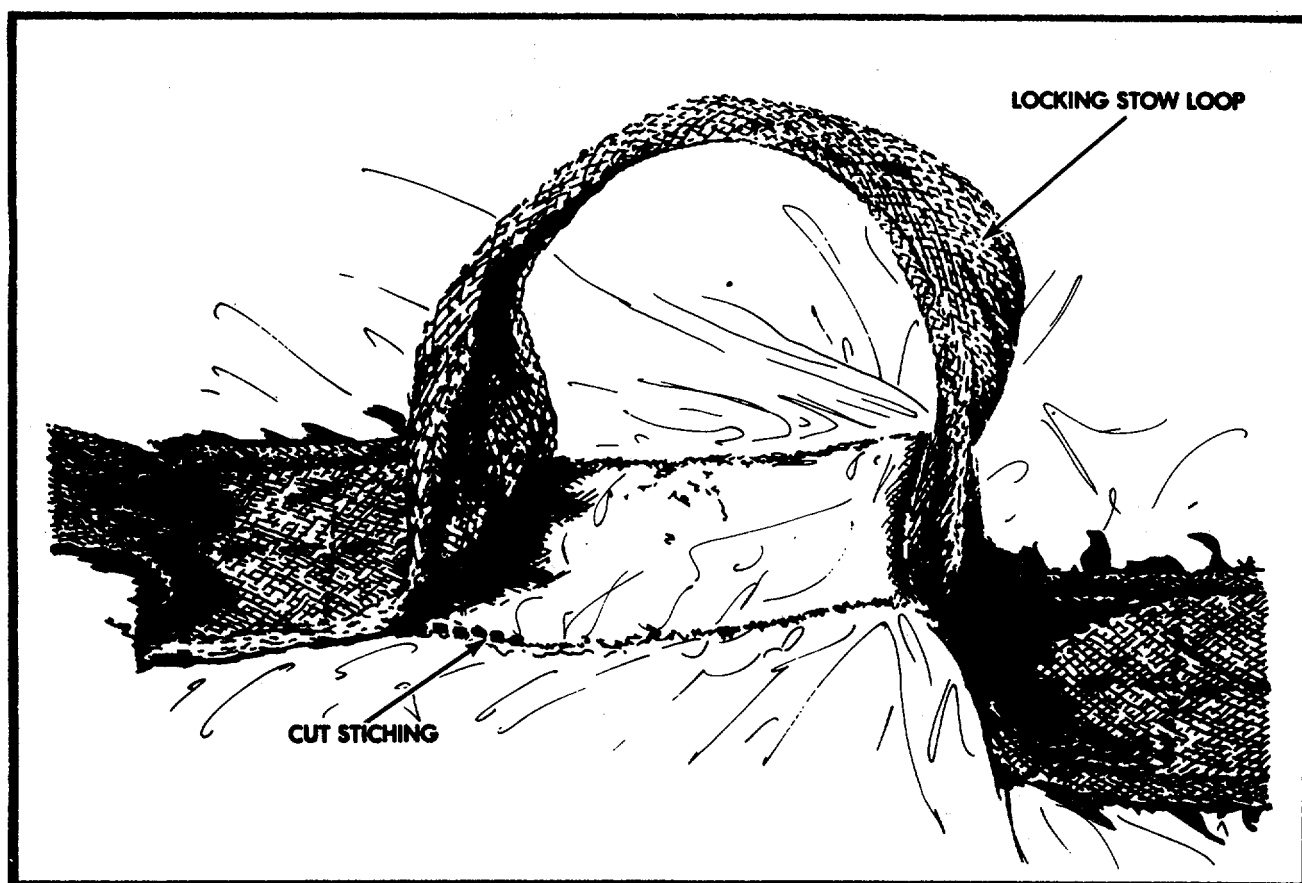
4-21

PACKING (Cont.)

10. Deployment Bag Alteration, In order for the locking stow loops on the G-12E deployment bag to accommodate the locking stows which will include the center line, each loop on a G-12 deployment bag will have to be slightly altered. If the deployment bag has not been altered, proceed as follows:

a. Enlarge each locking stow loop by cutting 3/4 to 1 1/2 inches of stitching on one end of the loop with your rigger's knife.

b. Insure that the stitching is cut only on one end, and that the length of cut stitching does not exceed 1 1/2 inches.



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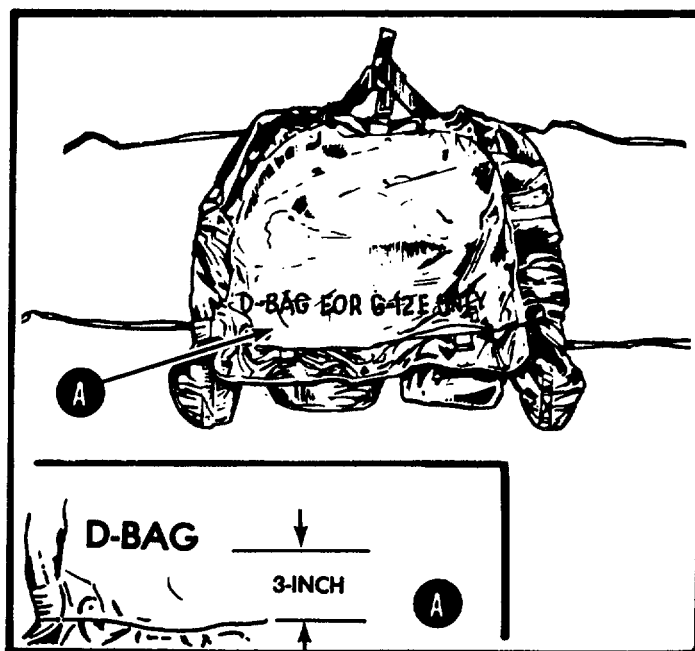
4-21. G-12E - SERVICE (Cont)

4-21

PACKING (Cont.)

10. Deployment Bag Alteration (cont).

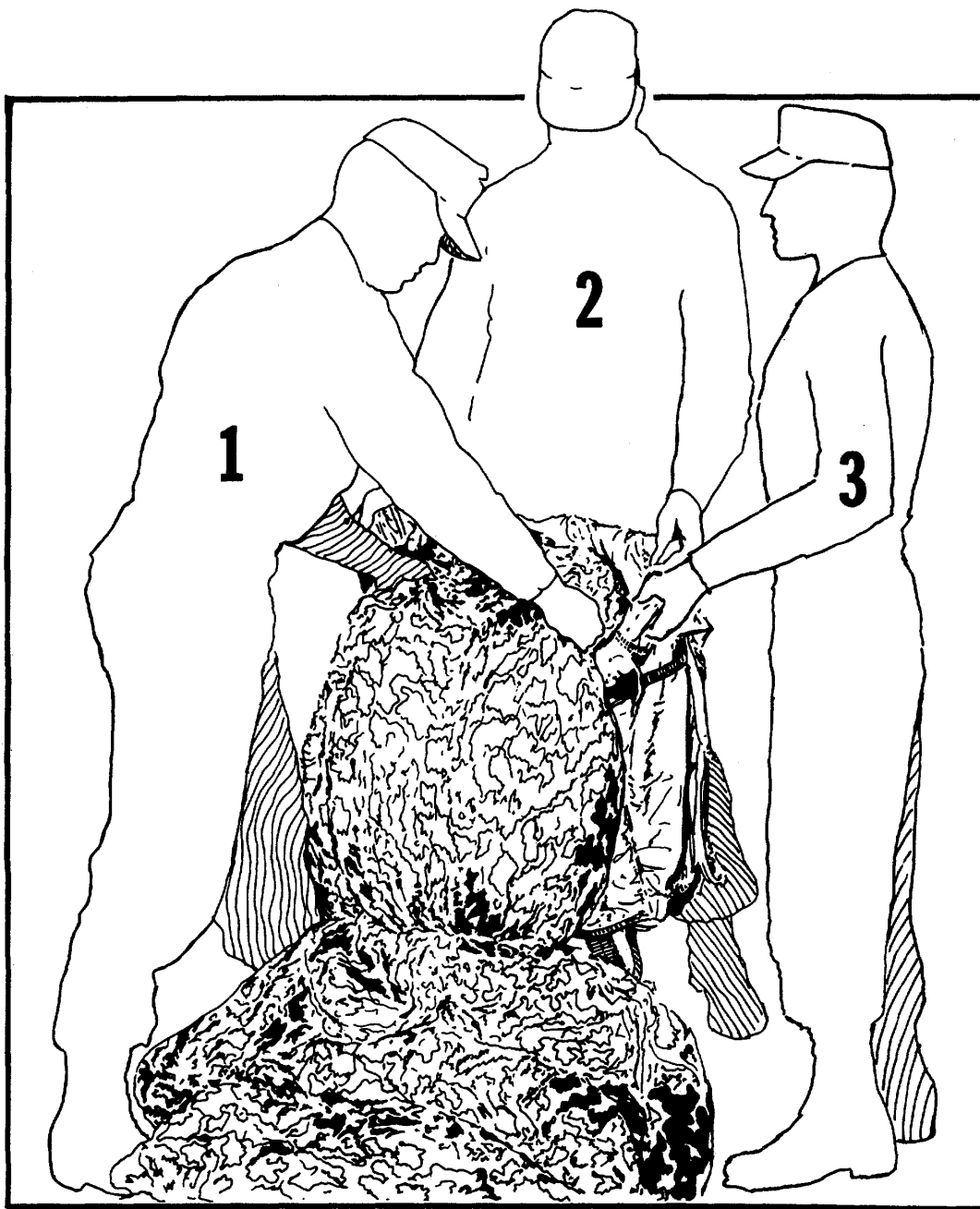
c. Stencil "D-BAG FOR G-12E ONLY" on the riser extension protector flap, 3 inches from the edge of open end. Stencil 1-inch letters with a stencil brush, ink (Item 13, Appendix D), and a stencil marking set.



GO TO NEXT PAGE

PACKING (Cont.)

11. Stowing the canopy.



GO TO NEXT PAGE

4-21. G-12E - SERVICE (Cont)

4-21

PACKING (Cont.)

11. Stowing the canopy (cont).

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



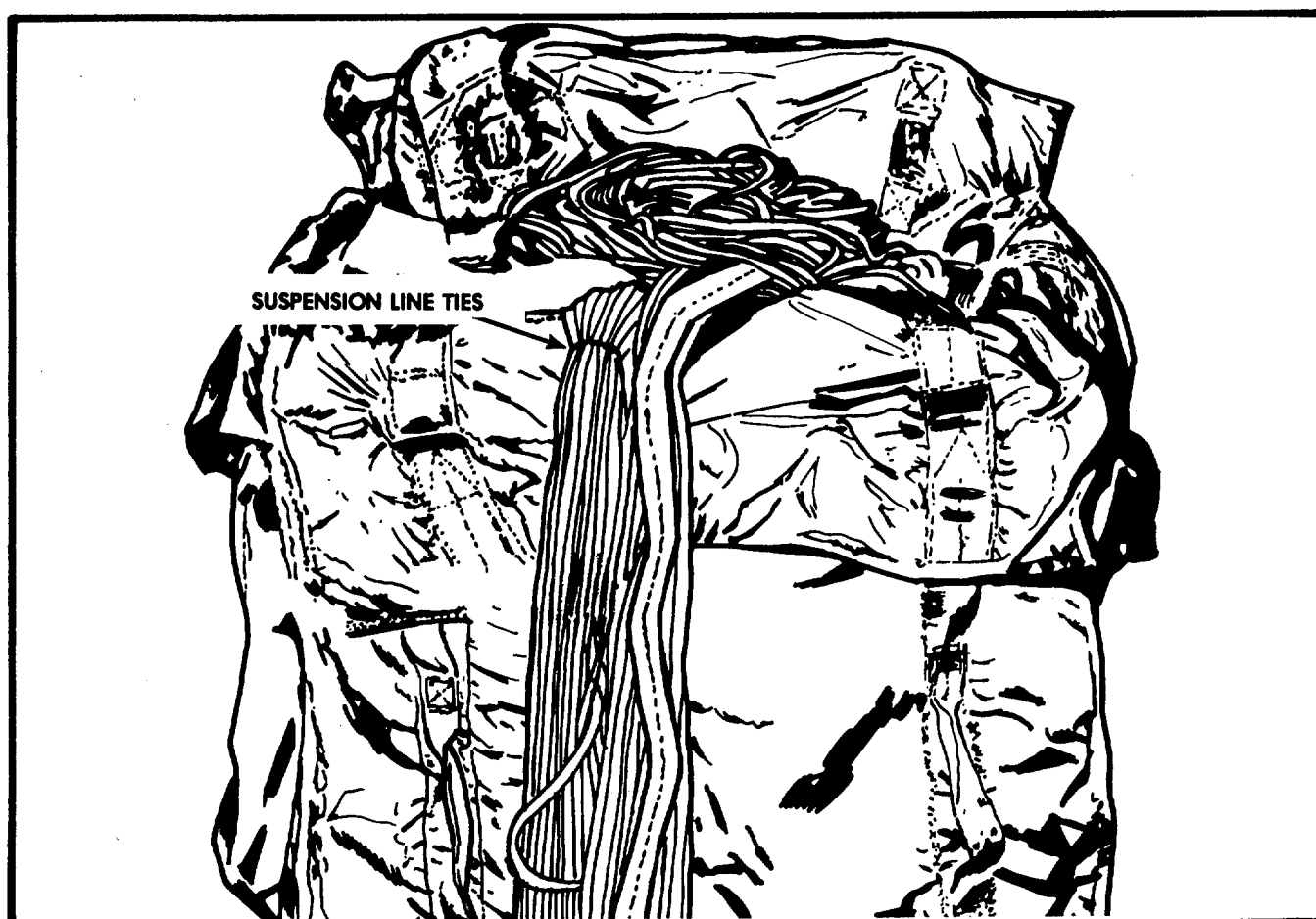
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PACKING (Cont.)

11. Stowing the canopy (cont).

g. Rigger number 1 continues to stow the two suspension line groups by S-folding the lines on top of the stowed canopy until the two individual suspension line group ties, located 5 feet below the canopy skirt, are positioned at the edge of the bag open end.



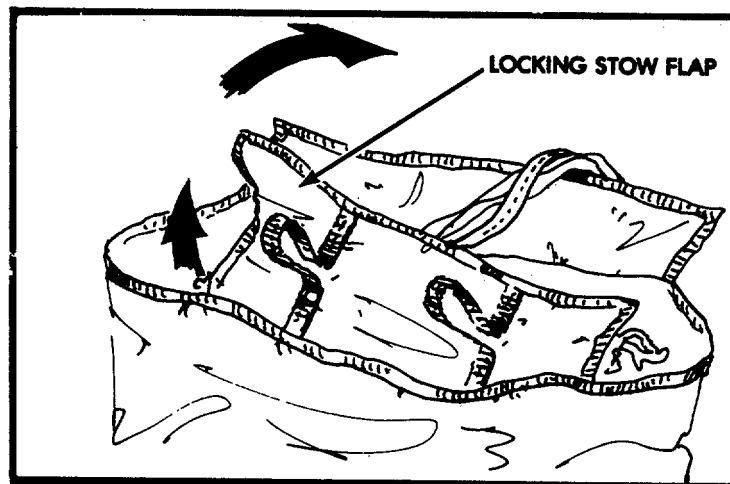
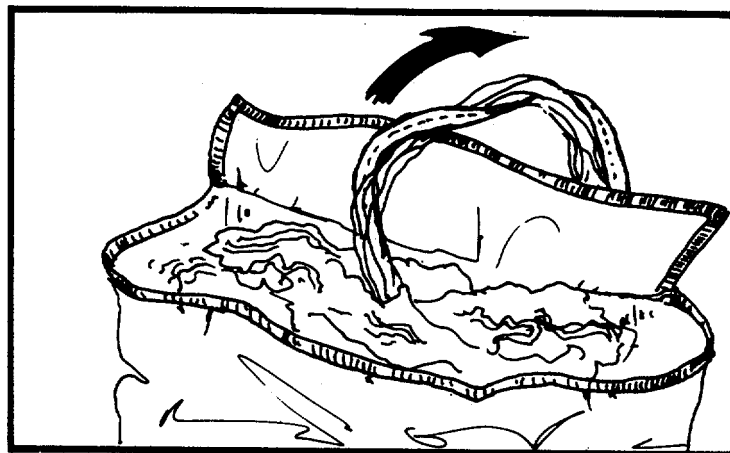
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PACKING (Cont.)

12. Stowing the suspension lines, center line, and risers.

a. Preparation for locking stows.

(1) Rigger number 1 positions the suspension lines.



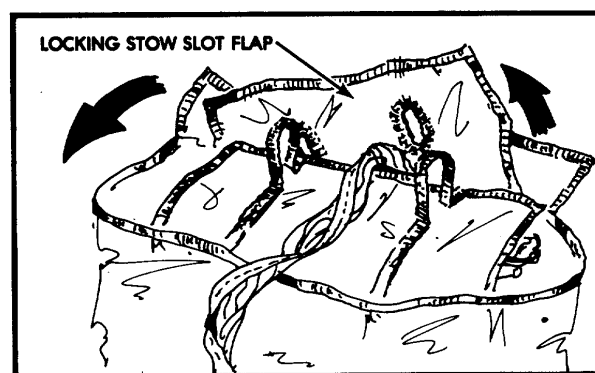
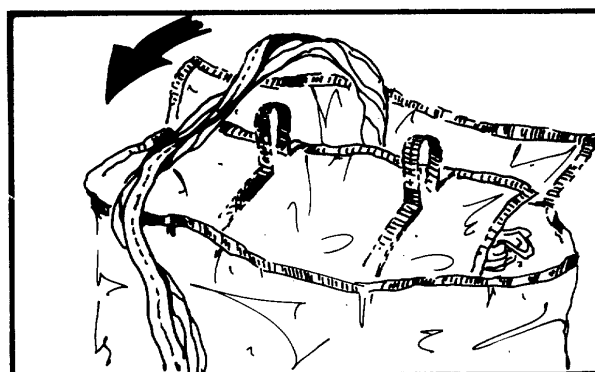
(2) Riggers number 2 and 3 pull out and position the locking stow flat.

GO TO NEXT PAGE

PACKING (Cont.)

12. Stowing the suspension lines, center line, and risers (cont).

(3) Rigger number 1 repositions the suspension line.



(4) Riggers number 2 and 3 pull out and position the locking stow slot flap.

(5) Insure that the locking stow loops are inserted through the respective locking slots.



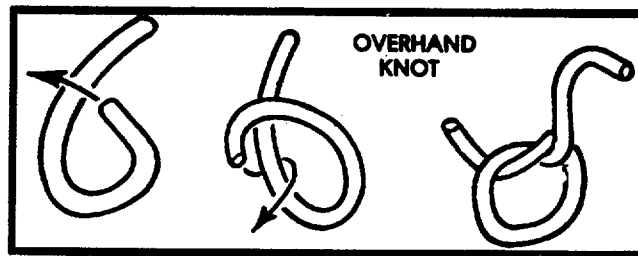
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PACKING (Cont.)

12. Stowing the suspension lines, center line, and risers (cont).

(6) Cut a 36-inch length of tubular nylon webbing (Item 12, Appendix D), or equivalent, with your rigger's knife.

(7) Double the webbing length and make an overhand knot in the aligned webbing ends.

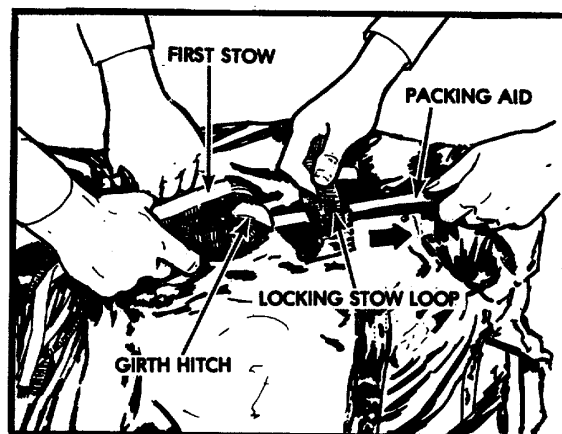


b. Locking stow.

(1) Encircle the suspension lines and center line with the webbing and make a girth-hitch in the webbing at a point 15 inches from the closed flaps of the bag.

(2) Thread the webbing and through the right locking stow loop.

(3) Make the first locking stow by pulling the webbing and suspension lines, including the center line, through the locking stow loop.

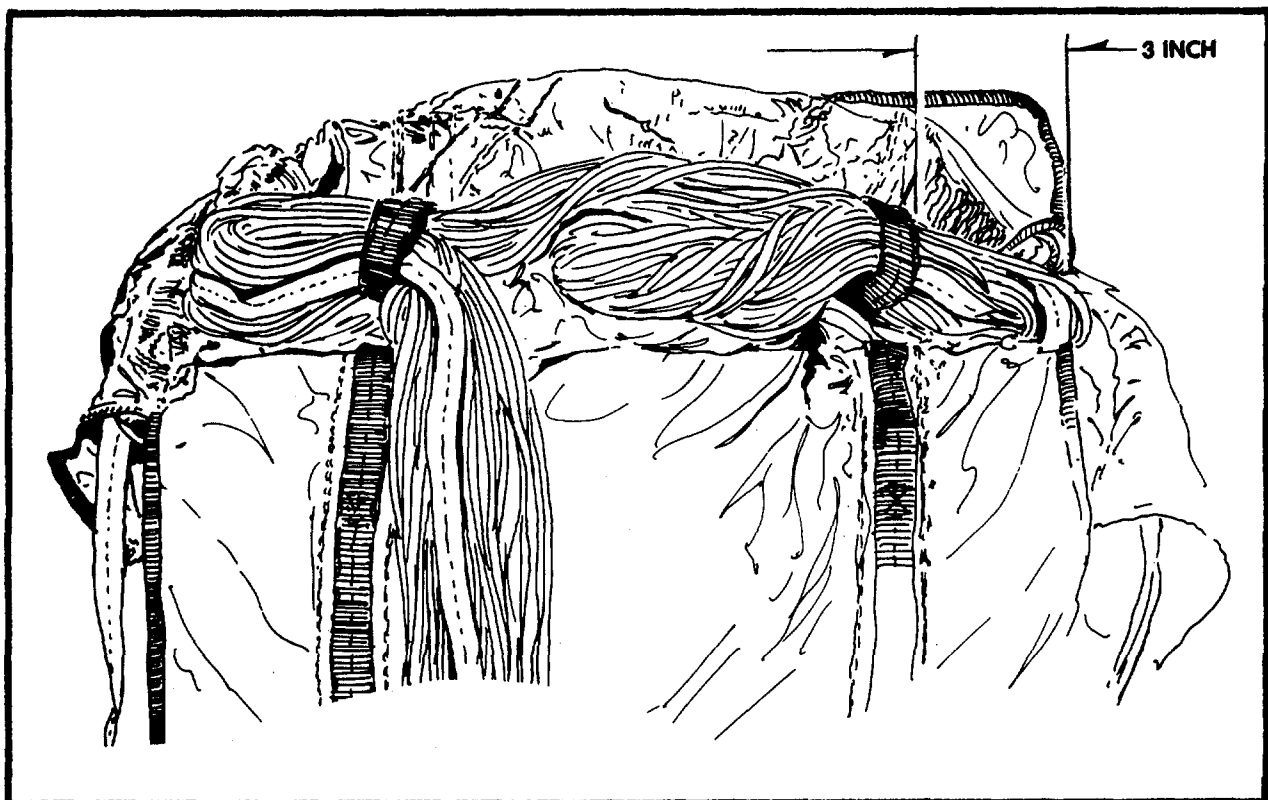


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PACKING (Cont.)

12. Stowing the suspension lines, center line, and risers (cont).

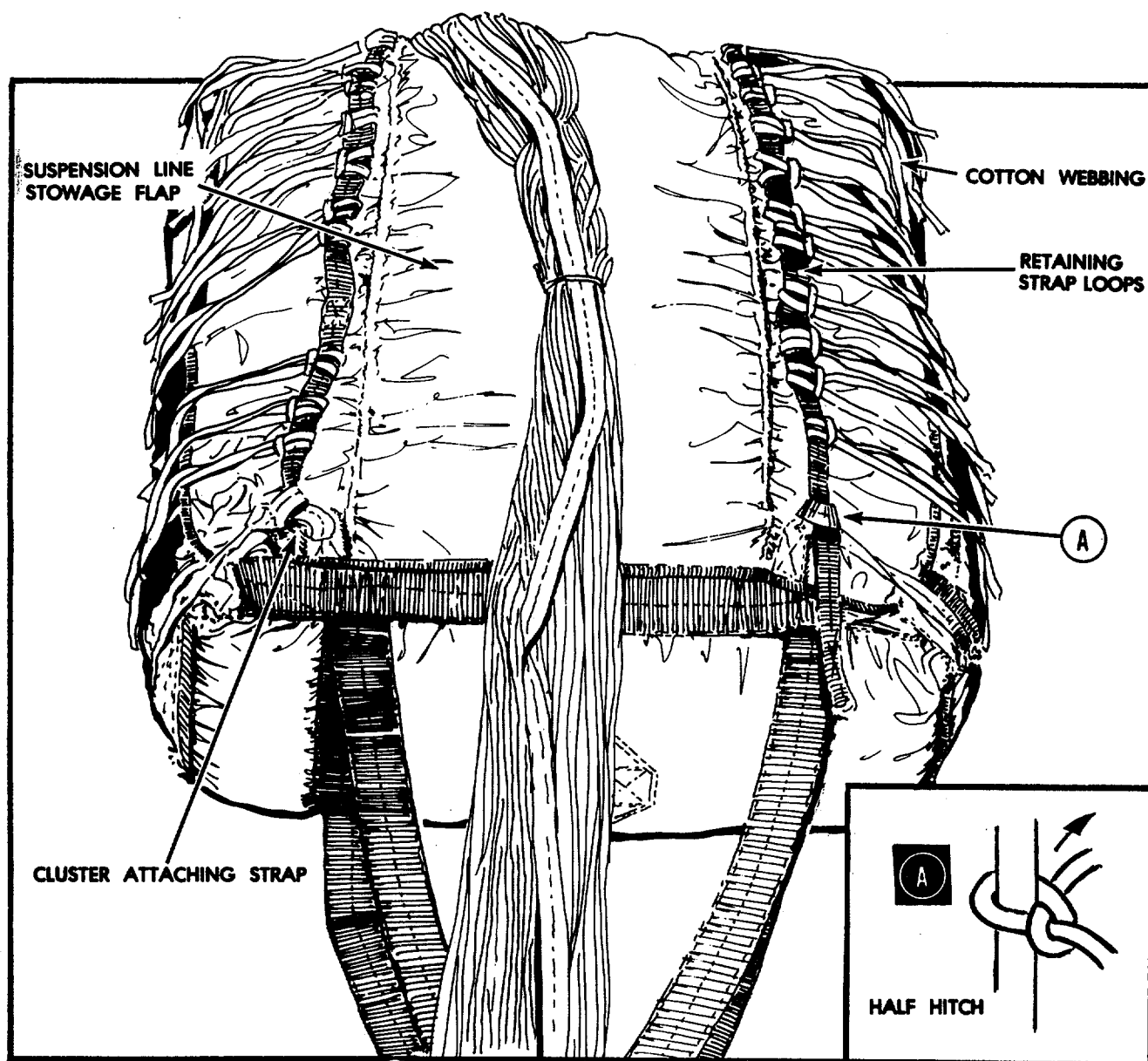
- (4) Form a 3-inch loop beyond the locking stow loop.
- (5) Remove the webbing.
- (6) Repeat steps (1) through (5) above and make the second locking stow in the left locking stow loop.



GO TO NEXT PAGE

PACKING (Cont.)

12. Stowing the suspension lines, center line, and risers (cont).



GO TO NEXT PAGE

PACKING (Cont.)

12. Stowing the suspension lines, center line, and risers (cont).

c. Preparation for stowing lines.

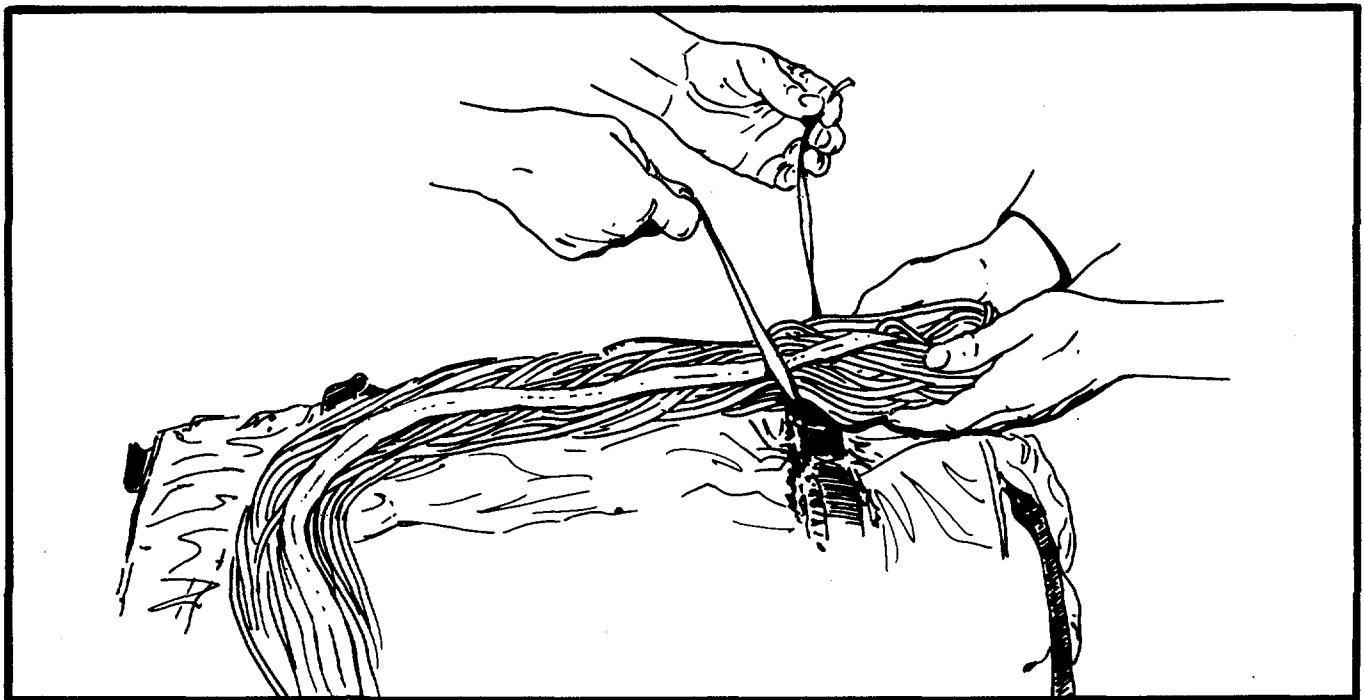
- (1) Lay the deployment bag flat on the floor, exposing the suspension line retaining strap loops.
- (2) Using the two cluster attaching straps, at the bottom of the bag, temporarily secure the suspension line stowage flap. Tie each strap with a half hitch.
- (3) Cut a minimum of twenty-four 18-inch lengths of webbing (Item 9, Appendix D), with your rigger's knife, for use as suspension line stow ties.
- (4) Secure three each webbing to each loop on the suspension line stowage panel by making a girth-hitch.
- (5) Insure that the ends of each webbing length are alined and positioned toward the outer edges of the bag.

d. Stowing lines and risers.

- (1) Position the suspension lines and center line from the left locking stow to the first loop at the upper right corner of the stowage flap.
- (2) Form the first line stow by making and S-fold in the lines at the edge of the line stowage flap.
- (3) Secure with the first length of webbing making a surgeon's knot and a locking knot.

NOTE

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



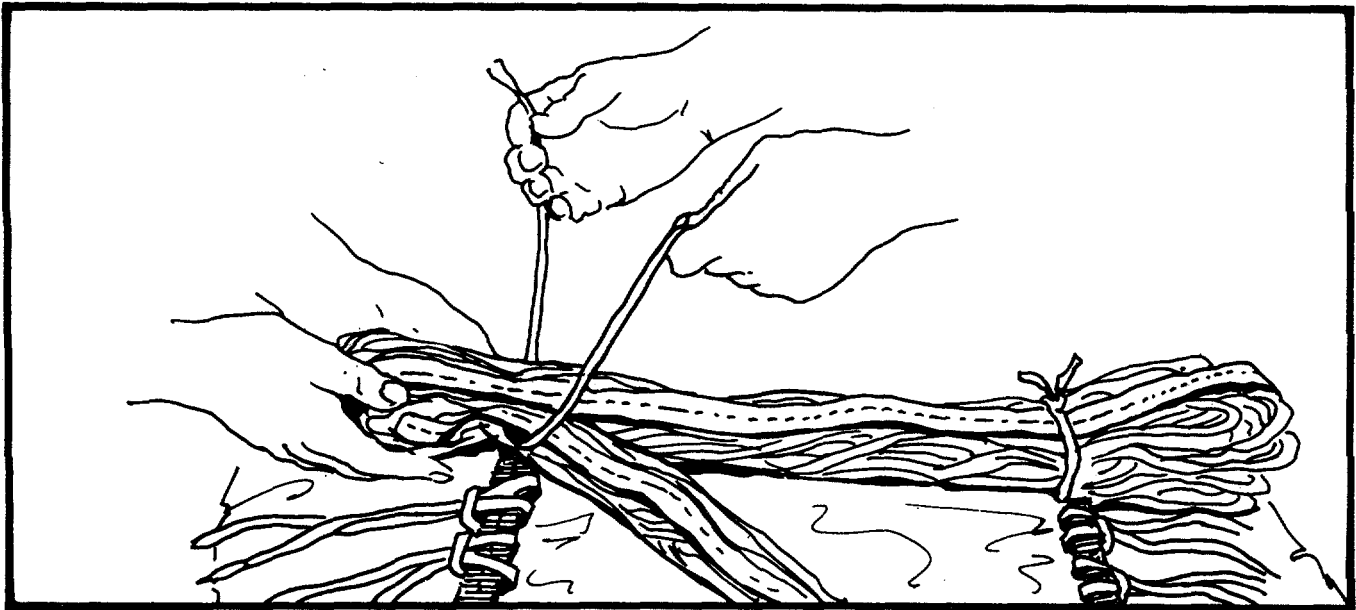
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PACKING (Cont.)

12. Stowing the suspension lines, center line, and risers (cont).

d. Stowing lines and risers (Cont.)

- (4) Extend the lines to the first webbing loop at the upper left corner of the stowage flap.
- (5) Form and secure the second line stow as outlined in steps (2) and (3) above.
- (6) Continue stowing and securing the remaining length of lines by stowing alternately from right to left.



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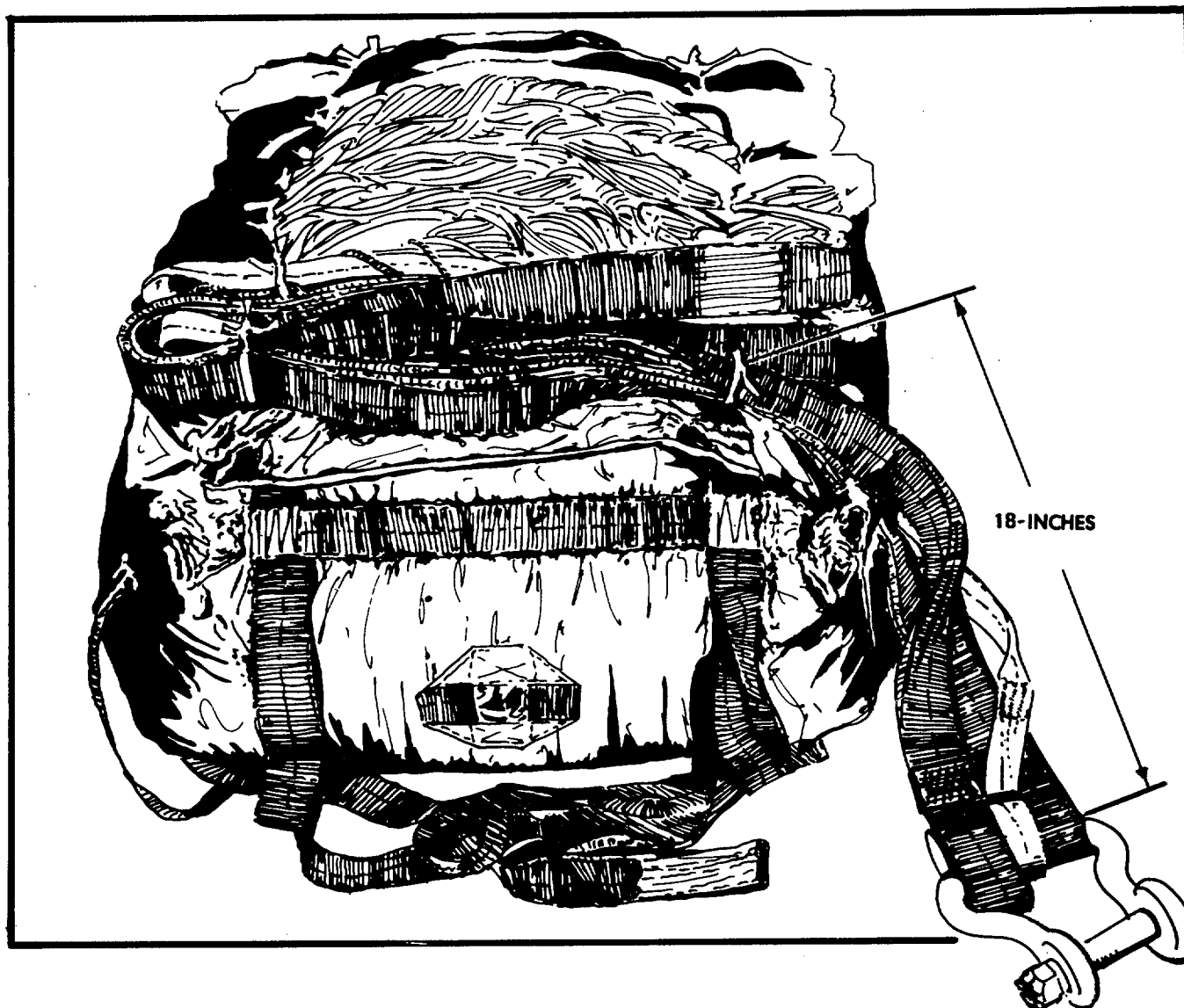
PACKING (Cont.)

12. Stowing the suspension lines, center line, and risers (cont).

d. Stowing lines and risers (Cont.)

(7) Stow the risers and remaining lines to a point 18-inches from the clevis. An S-fold is not made in the last stow.

(8) Trim all the webbing ends to 2-inches.



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4-21. G-12E -SERVICE (Cont)

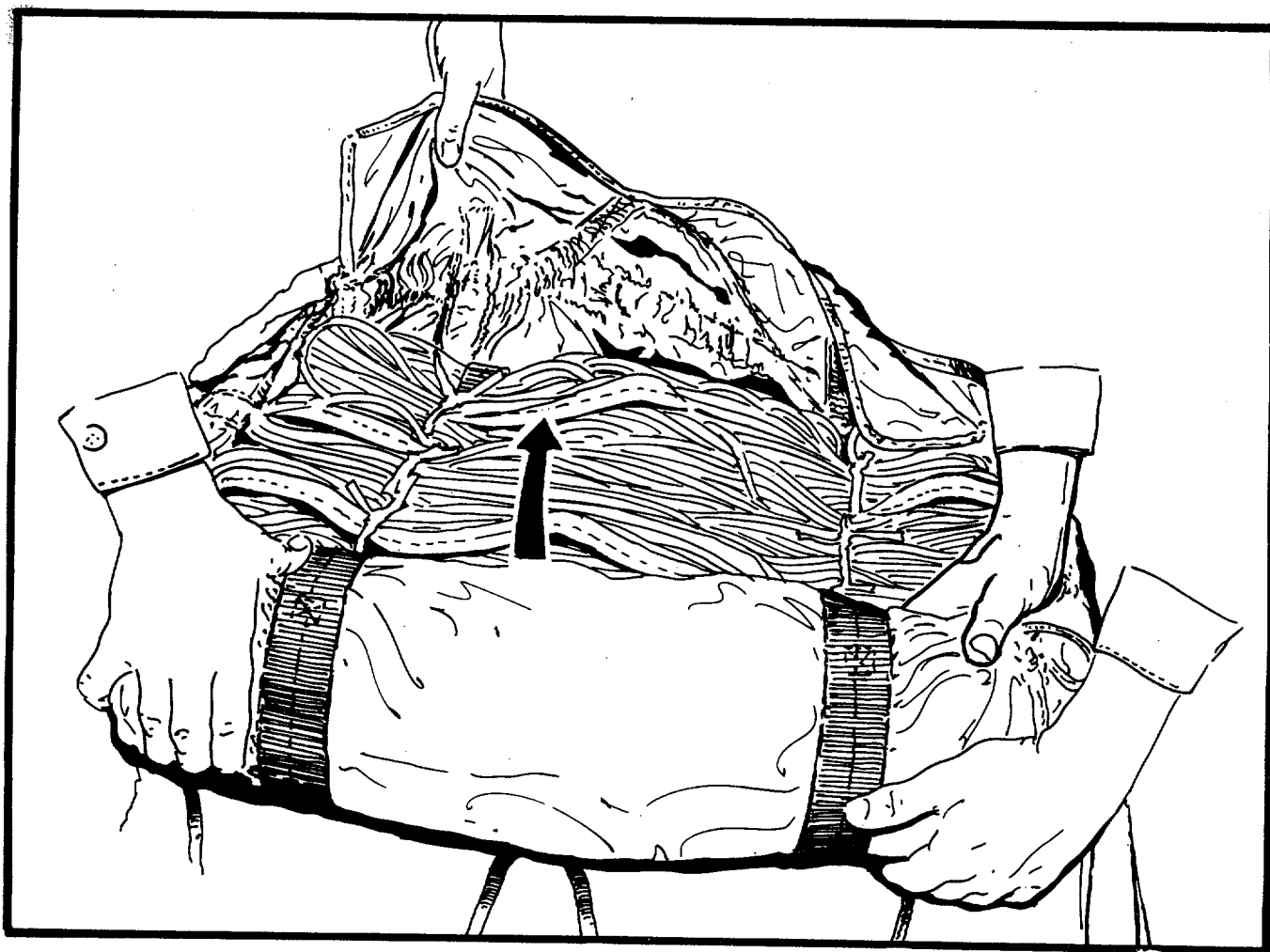
4-21

PACKING (Cont.)

13. Closing the deployment bag.

a. Securing the suspension line stowage flap.

- (1) Remove the two cluster attaching straps securing the suspension line stowage flap at the bottom of the bag.
- (2) Riggers number 1 and 2, positioned on each side of the bag, roll the stowage flap.



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4-21. G-12E -SERVICE (Cont)

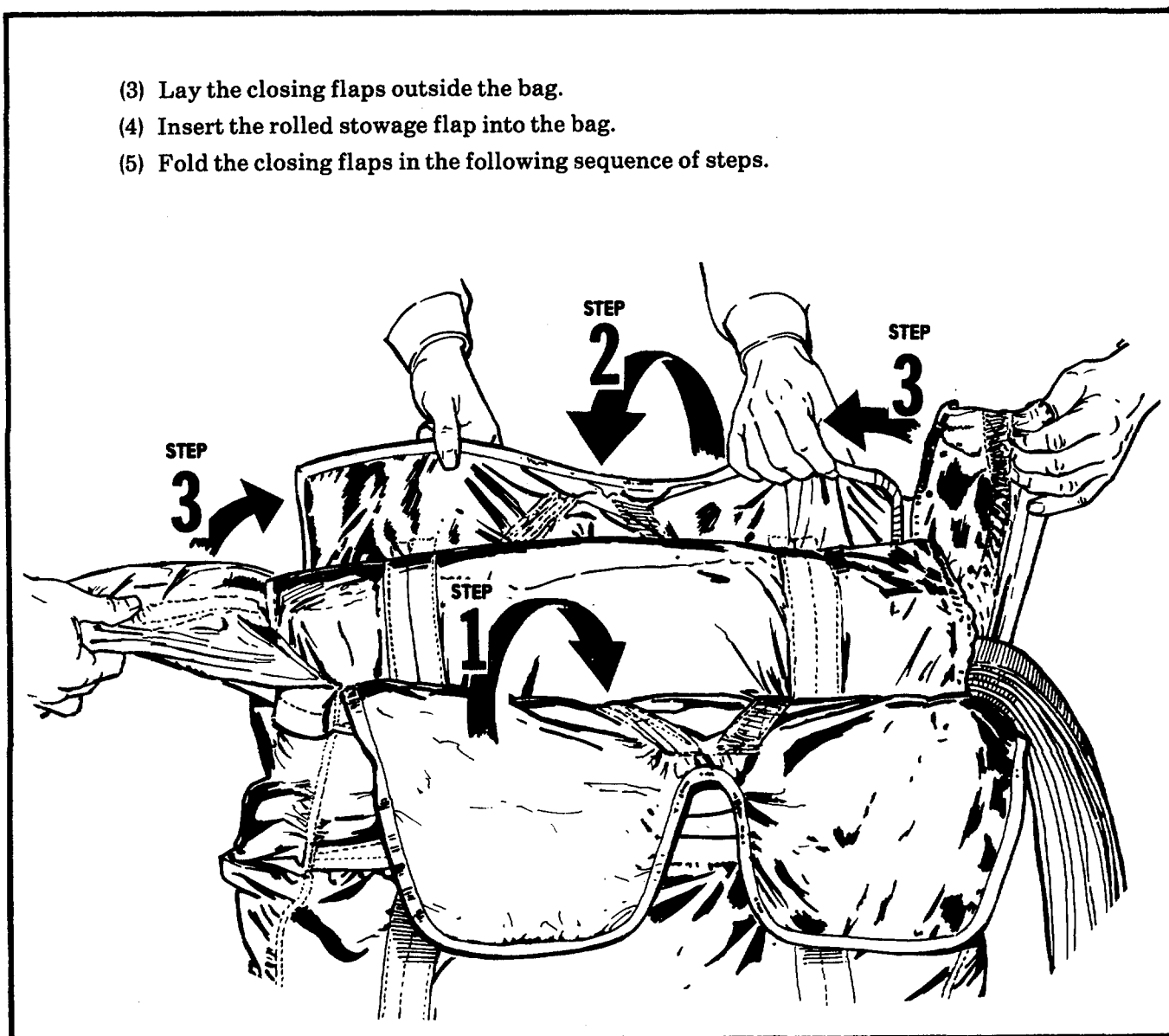
4-21

PACKING (Cont.)

13. Closing the deployment bag (cont).

a. Securing the suspension line stowage flap (Cont).

- (3) Lay the closing flaps outside the bag.
- (4) Insert the rolled stowage flap into the bag.
- (5) Fold the closing flaps in the following sequence of steps.



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PACKING (Cont.)

13. Closing the deployment bag (cont).

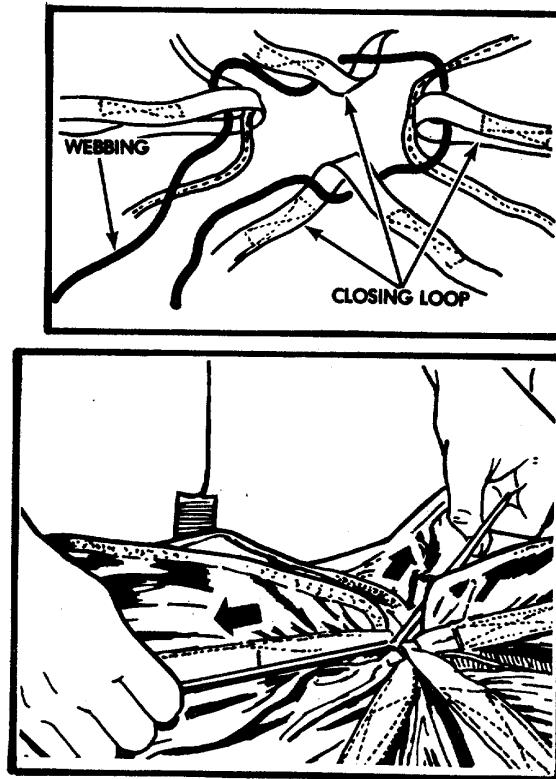
b. Securing the bag closing flap loops.

CAUTION

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

(1) Cut two each 24-inch length of webbing (Item 9, Appendix D) with your rigger's knife.

(2) Rigger number 1 passes an end of one of the webbing lengths through the closing loop on each of the four bag closing flaps.



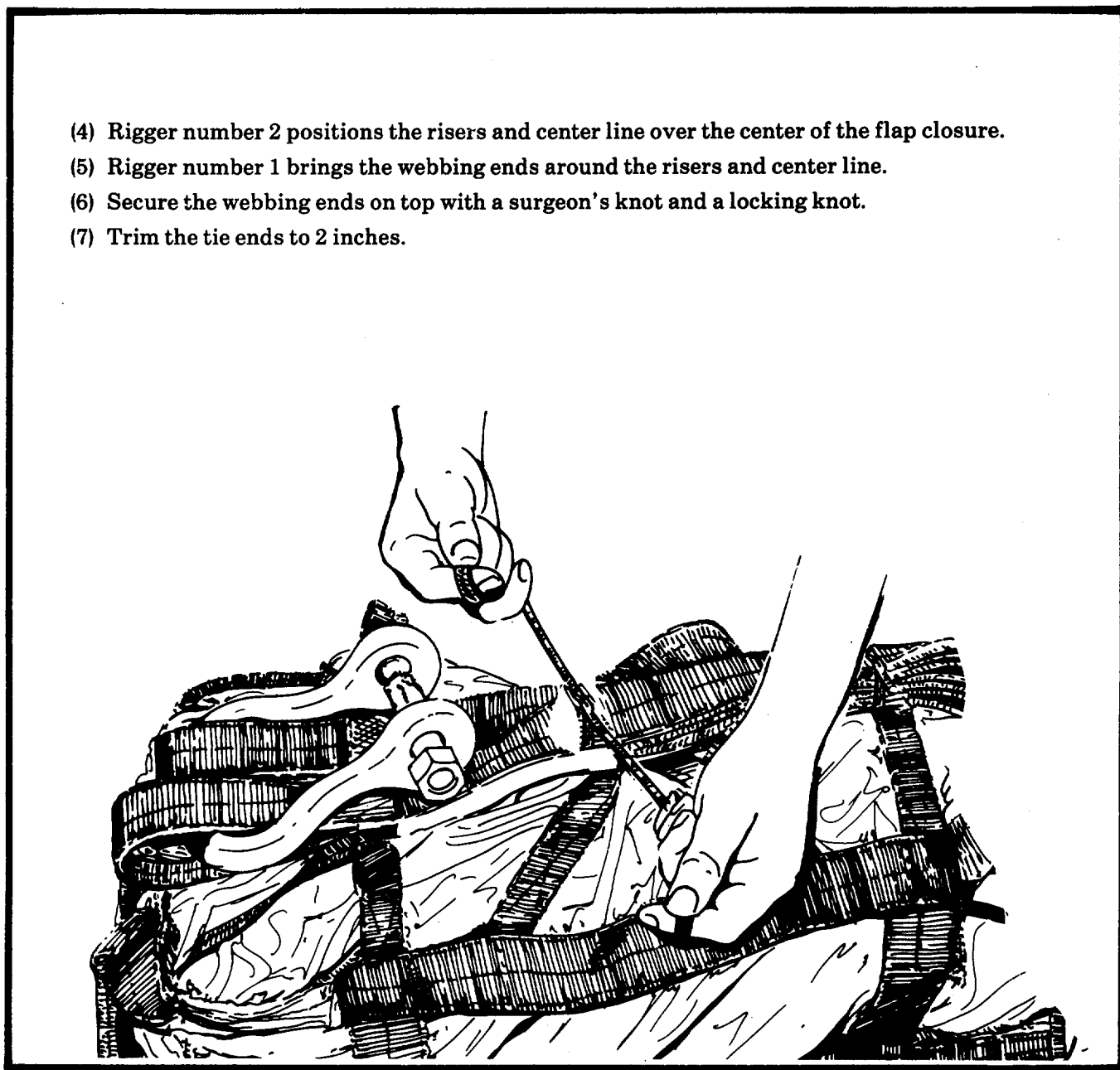
(3) Pull the webbing ends to draw the closing loops together.

PACKING (Cont.)

13. Closing the deployment bag (cont).

b. Securing the closing flap loops (Cont.)

- (4) Rigger number 2 positions the risers and center line over the center of the flap closure.
- (5) Rigger number 1 brings the webbing ends around the risers and center line.
- (6) Secure the webbing ends on top with a surgeon's knot and a locking knot.
- (7) Trim the tie ends to 2 inches.



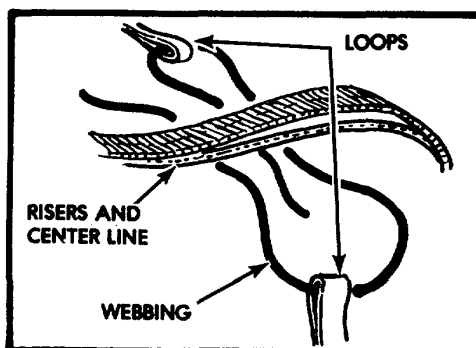
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PACKING (Cont.)

13. Closing the deployment bag (cont).

c. Securing the right secondary bag loops.

(1) Pass one end of the second length of webbing through one loop and under the secured risers and center line.



(2) Pass the webbing end through the opposite loop.

(3) Secure the webbing end, on top of the risers and center line, with a surgeon's knot and locking knot.

(4) Trim the tie ends to 2 inches.



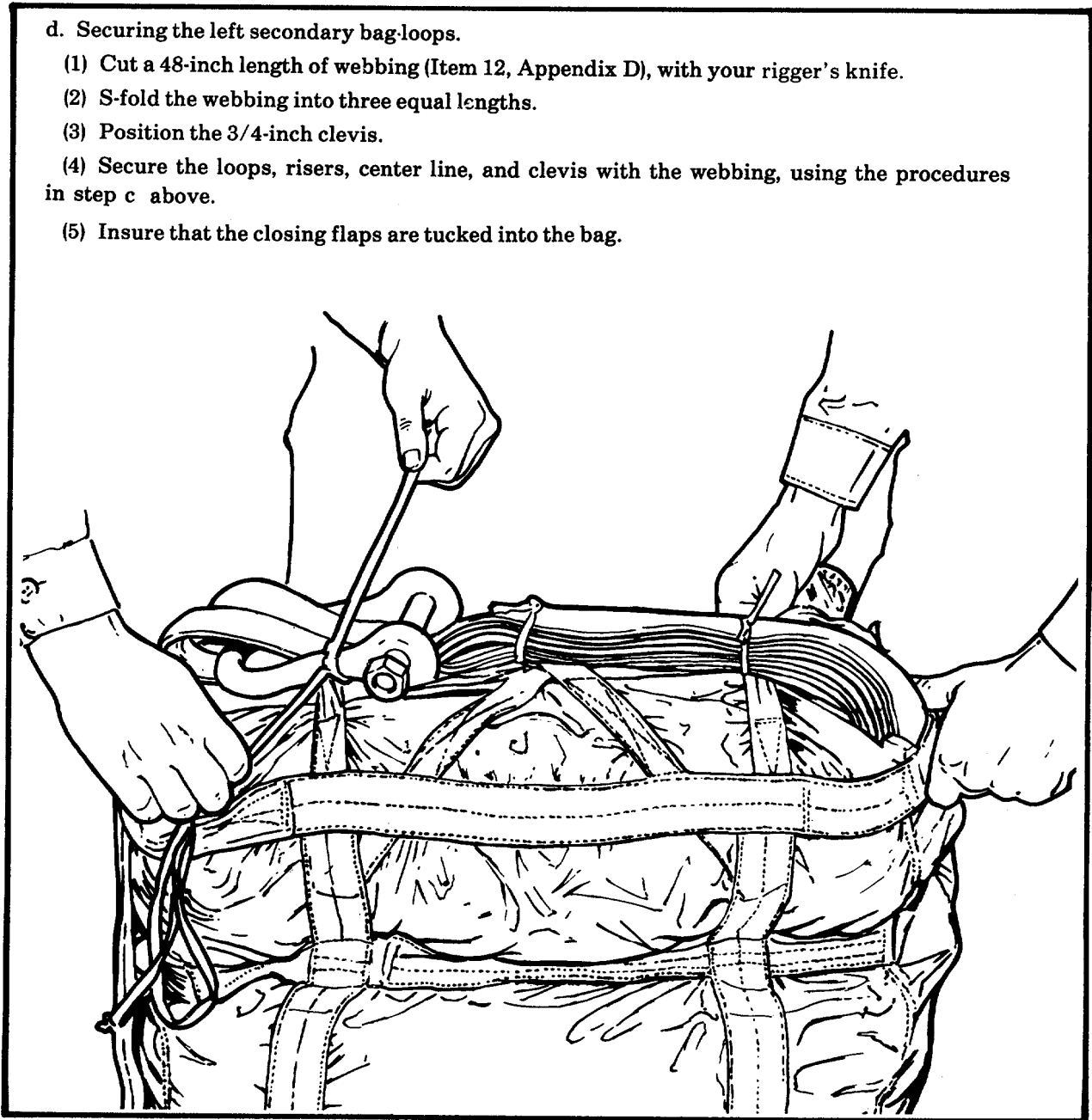
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PACKING (Cont.)

13. Closing the deployment bag (cont).

d. Securing the left secondary bag-loops.

- (1) Cut a 48-inch length of webbing (Item 12, Appendix D), with your rigger's knife.
- (2) S-fold the webbing into three equal lengths.
- (3) Position the 3/4-inch clevis.
- (4) Secure the loops, risers, center line, and clevis with the webbing, using the procedures in step c above.
- (5) Insure that the closing flaps are tucked into the bag.



GO TO NEXT PAGE

4-21. G-12E -SERVICE (Cont)

4-21

PACKING (Cont.)

14. Army parachute log record. Remove the log record (DA Form 10-42 or 3912), from-the parachute inspection data pocket (log record pocket), on the canopy riser and record the pack data as prescribed in TM 10-1670-201-23 T.O. 13C-1-41. Return the record to the pocket upon completion of entries.

15. Pack the 68-inch diameter pilot parachute in accordance with TM 10-1670-215-23/T.O. 13C5-1-102.

END OF TASK

SECTION IX.
PREPARATION FOR STORAGE OR SHIPMENT

4-22. Administrative Storage.

a. Storage Criteria.

Administrative storage of airdrop equipment will be accomplished in accordance with TM 740-90-1, AR 750-1, and the instructions furnished below.

b. General Storage Requirements.

To insure that serviceability standards of stored airdrop 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 airdrop items.
- (2) Airdrop equipment will be stored in a dry, well-ventilated location and protected from pilferage, dampness, fire, dirt, insects, rodents, and direct sunlight.
- (3) Airdrop 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) Airdrop items will not be stored in a damaged, dirty, or damp condition.
- (5) All stored airdrop items will be marked, segregated, and located for accessibility and easy identification.
- (6) Airdrop 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 airdrop items.
- (8) Periodic rotation of stock, conversion of available space, proper housekeeping policies, and strict adherence to all safety regulations will be practiced at all times.

c. Storage Specifics for Parachutes.

In addition to the storage requirements stipulated in subparagraph b above, the following is a list of specifics which must be enforced when storing parachutes:

- (1) Except for those assemblies required for contingency operation, parachutes will not be stored in a packed configuration.
- (2) Stored parachute assemblies will be secured from access by unauthorized personnel.
- (3) A parachute which is in storage, and is administered a cyclic repack and inspection, will not be exposed in incandescent light or indirect sunlight for a period of more than 36 hours. In addition, exposure to direct sunlight should be avoided entirely.

4-23. Shipment.

a. Initial Shipment.

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

b. Shipping Between Maintenance Activities.

The shipping of airdrop equipment between organizational and direct support maintenance activities will be accomplished on a signature verification basis using whatever means of available transportation. Used parachutes and other fabric items 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. Used wood and metal airdrop items will be tagged as prescribed in TB 750-126 and placed into a suitable type container, if necessary. Unused airdrop equipment will be transported in original shipping containers. During shipment, every effort will be made to protect airdrop items from weather elements, dust, dirt, oil, grease, and acids. Vehicles used to transport parachutes will be inspected to insure the items are protected from the previously cited material damaging conditions.

c. Other Shipping Instructions.

Airdrop equipment destined for domestic or overseas shipment will be packaged and marked in accordance with AR 700-15, TM 38-230-1, and TM 38-230-2. Shipment of airdrop items will be accomplished in accordance with AR 55-45.

APPENDIX A REFERENCES

A-1. 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 materiel covered in this manual:

DA Pam 310-1	Index of Administrative Publications
DA Pam 310-2	Index of Blank Forms
DA Pam 310-3	Index of Doctrinal, Training and Organizational Publications
DA Pam 310-4	Index of Technical Manuals, Technical Bulletins, Supply Manuals (types 7, 8, and 9) Supply- Bulletins, and Lubrication Orders
DA Pam 310-6	Index of Supply Catalogs and Supply Manuals (excluding types 7, 8, and 9)
DA Pam 310-7	US Army Equipment Index of Modification Work Orders

A-2. Technical Manuals

TM 9-1370-203-20&P	Military Pyrotechnics
TM 10-1670-201-23	General Maintenance of Parachutes and Other Airdrop Equipment
T.O. 13C-1-41	
TM 10-1670-215-23	12-Foot-Diameter High-Velocity, G-13 24-Foot-Diameter, 26-Foot-Diameter High-Velocity, G-14 34-Foot-Diameter, 38-Foot-Diameter RCAT, G-12C and G-12D 64-Foot-Diameter, G-11A 100-Foot-Diameter, 15-Foot-Diameter Extraction, 22-Foot-Diameter Extraction, 21-Foot-Diameter Extraction, 3-Foot-Square Pilot
T.O. 13C5-1-102	
TM 10-1670-240-20/	Miscellaneous Airdrop Canvas, Webbing, Metal, and Wood Items
T.O. 13C7-49-11	
TM 10-1670-266-13&P	Altitude Sensor Parachute Staging Unit Test Set*
TM 38-230-1 and	Preservation, Packaging, Packing of Military Supplies and Equipment (vols 1 and 2)
TM 38-230-2	
TM 38-750	The Army Maintenance Management System (TAMMS)
TM 740-90-1	Administrative Storage of Equipment
TM 750-244-1-1/	Procedures for the Destruction of Air Delivery Equipment to Prevent Enemy Use
T.O. 13C3-1-10	
TM 750-244-5-1	Destruction of Conventional Ammunition and Improved Conventional Munitions to Prevent Enemy Use

A-3. Field Manuals

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

*To be published

A-4. Army Regulations

AR 310-25	Dictionary of United States Army Terms
AR 310-50	Authorized Abbreviation and Brevity Codes
AR 55-45	Military Standard Transportation and Movement Procedures (MILSTAMP)
AR 735-11	Accounting for Lost, Damaged, and Destroyed Property
AR 700-15	Preservation, Packaging, Packing, and Markings of Items of Supply
AR 750-1	Army Material Maintenance Concepts and Policies

A-5. Technical Bulletins

TB 750-99-16	Maintenance Expenditure Limits for FSC Group 16
TB 750-126	Use of Material Condition Tags and Labels on Army Aeronautical and Air Delivery Equipment

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 categories.

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 categories.

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

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

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

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

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

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

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

e. Aline. To adjust specified variable elements of an item to bring about optimum or desired performance.

f. Calibrate. To determine and cause corrections to be made or to be adjusted on instruments or test, measuring, and diagnostic equipments used in precision measurement. Consists of comparisons of two instruments, one of which is a certified standard of known accuracy, to detect and adjust any discrepancy in the accuracy of the instrument being compared.

g. Remove/Install. To remove and install the same item when required to perform service or other maintenance functions. Install may be the act of emplacing, seating, or fixing into position a spare, repair part, or module (component or assembly) in a manner to allow the proper functioning of an equipment or system.

h. Replace. To remove an unserviceable item and install a serviceable counterpart in its place. "Replace" is authorized by the MAC and is shown as the 3d position code of the SMR code.

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.

B-2. Maintenance functions (cont.)

j. Overhaul. That maintenance effort (service/action) prescribed to restore an item to a completely serviceable/operational condition as required by maintenance standards in appropriate technical publications (i.e., DMWR). Overhaul is normally the highest degree of maintenance performed by the Army. Overhaul does not normally return an item to like new condition.

k. Rebuild. Consists of those services/actions necessary for the restoration of unserviceable equipment to a like new condition in accordance with original manufacturing standards. Rebuild is the highest degree of materiel maintenance applied to Army equipment. The rebuild operation includes the act of returning to zero those age measurements (hours/miles, etc.) considered in classifying Army equipment/components.

B-3. Explanation of Columns in the MAC, Section II.

a. Column 1, Group Number. Column 1 lists functional group code numbers, the purpose of which is to identify maintenance significant components, assemblies, subassemblies, and modules with the next higher assembly. End item group number shall be "00".

b. Column 2, Component/Assembly. Column 2 contains the names of components, assemblies, subassemblies, and modules for which maintenance is authorized.

c. Column 3, Maintenance Function. Column 3 lists the functions to be performed on the item listed in Column 2. (For detailed explanation of these functions, see paragraph B-2.)

d. Column 4, Maintenance Category. Column 4 specifies, by the listing of a work time figure in the appropriate subcolumn(s), the category 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 category of maintenance. If the number or complexity of the tasks within the listed maintenance function vary at different maintenance categories, appropriate work time figures will be shown for each category. 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 categories are as follows:

C	Operator or crew
O	Organizational Maintenance
F	Direct Support Maintenance
H	General Support Maintenance
D	Depot Maintenance

e. Column 5, Tools and Equipment. Column 5 specifies, by code, those common tool sets (not individual tools) and special tools, TMDE, and support equipment required to perform the designated function.

f. Column 6, Remarks. This column shall, when applicable, contain a letter code, in alphabetic order, which shall be keyed to the remarks contained in Section IV.

B-4. Explanation of Columns in Tool and Test Equipment Requirements, Section III.

a. Column 1, Reference Code. The tool and test equipment reference code correlates with a code used in the MAC, Section II, Column 5.

b. Column 2, Maintenance Category. The lowest category of maintenance authorized to use the tool or test equipment.

B-4. Explanation of Columns in Tool and Test Equipment Requirements, Section III (cont.).

- c. Column 3, Nomenclature. Name or identification of the tool or test equipment.
- d. Column 4, National Stock Number. The National stock number of the tool or test equipment.
- e. Column 5, Tool Number. The manufacturer's part number.

B-5. Explanation of Columns in Remarks, Section IV.

- a. Column 1, Reference Code. The code recorded in column 6, Section II.
- b. Column 2, Remarks. This column lists information pertinent to the maintenance function being performed as indicated in the MAC, Section II.

**SECTION II. MAINTENANCE ALLOCATION CHART FOR
HIGH ALTITUDE AIRDROP RESUPPLY SYSTEM (HAARS)**

(1) Number	(2) Component/ Assembly	(3) Maintenance Function	(4) Maintenance Category					(5) Tools & Equipment	(6) Remarks
			C	O	F	H	D		
00	Components of HAARS								
01	57-Foot-Long Center Line	INSPECT SERVICE REPAIR REPLACE	0.1	0.1 0.1 0.2 0.1					
02	Altitude Sensor Parachute Staging Unit	INSPECT TEST ALINE SERVICE REPLACE	0.1	0.1 0.4 0.2 0.1 0.1					
03	G-12E 64-Foot-Diameter Cargo Parachute	SERVICE	1.2						A/B

**SECTION III. TOOLS AND TEST EQUIPMENT REQUIREMENTS FOR
HIGH ALTITUDE AIRDROP RESUPPLY SYSTEM (HAARS)
(Not Required)**

SECTION IV. REMARKS

Reference Code	Remarks
A	Maintenance functions such as Inspect, Repair, and Replace; and the Repair Parts and Special Tools List (RPSTL) for the G-12E are provided in TM 10-1670-215-23/T.O.13C5-1-102.
B	The work time of 1.2 includes installing the center line.

APPENDIX C
REPAIR PARTS AND SPECIAL TOOLS LIST
(Current as of 26 August 1981)

Section I. INTRODUCTION

C-1. Scope. This appendix lists spares and repair parts; special tools; test, measurement and diagnostic equipment (TMDE); and other special support equipment required for performance of Organizational Maintenance of the High Altitude Airdrop Resupply System (HAARS). It authorizes the requisitioning and issue of spares and repair parts as indicated by the source and maintenance 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 for use in the performance of maintenance. Parts list are composed of functional groups in numeric sequence, with the parts in each group listed in figure and item number sequence. Bulk materials are listed in NSN sequence.

b. Section III Special Tools List. A list of special tools, special TMDE, and other special support equipment authorized for the performance of maintenance.

c. Section IV. National Stock Number and Part Number Index. A list, in National Item Identification Number (NIIN) sequence of all National Stock Numbers (NSN) appearing in the listings, followed by a list, in alphameric 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.

a. Illustration. This column is divided as follows:

(1) Figure Number. Indicates the figure number of the illustration on which the item is shown.

(2) Item Number. The number used to identify each item called out in the illustration.

b. Source, Maintenance and Recoverability (SMR) Codes.

(1) Source Code. Source codes indicate the manner of acquiring support items for maintenance, repair or overhaul of end items. Source codes are entered in the first and second positions of the Uniform SMR Code format as follows:

Code	Definition
PA	Item procured and stocked for anticipated or known useage.
AO	Item to be assembled at organizational level.

NOTE

Cannibalization or salvage may be used as a source of supply for any items source coded above.

(2) Maintenance Code. Maintenance codes are assigned to indicate the levels of maintenance authorized to USE and REPAIR support items. The maintenance codes are entered in the third and fourth positions of the Uniform SMR Code format as follows:

(a) The maintenance code entered in the third position will indicate the lowest maintenance level authorized to remove, replace and use the support item. The maintenance code entered in the third position will indicate the following level of maintenance:

Code	Application/Explanation
O	Support item is removed, replaced, used at the organizational level.

(b) The maintenance code entered in the fourth position indicates whether the item is to be repaired and identifies the lowest maintenance level with the capability to perform complete repair (i.e., all authorized maintenance functions). This position will contain one of the following maintenance codes:

Code	Application/Explanation
O	The lowest maintenance level capable of complete repair of the support item is the organizational level.
F	The lowest maintenance level capable of complete repair of the support item is the Direct Support level.
L	Repair restricted to the US Army Metrology and Calibration Center (USAMCC), Specialized Repair Activity.
Z	Nonreparable. No repair is authorized.

(3) **Recoverability Code.** Recoverability codes are assigned to support items to indicate the disposition action on unserviceable items. The recoverability code is entered in the fifth position of the Uniform SMR Code format as follows:

Code	Definition
Z	Nonreparable item. When unserviceable, condemn and dispose at the level indicated in position 3.
F	Reparable item. When uneconomically repairable, condemn and dispose at the Direct Support level.
L	Reparable item. Repair, condemnation, and disposal not authorized below depot/specialized repair activity level.

c. **National Stock Number.** Indicates the National stock number assigned to the item and which will be used for requisitioning.

d. **Part Number.** 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 a stock numbered item is requisitioned, the item received may have a different part number than the part being replaced.

e. **Federal Supply Code for Manufacturer (FSCM).** The FSCM is a 5-digit numeric code listed in SB 708-42 which is used to identify the manufacturer, distributor, or Government agency, etc.

f. **Description.** Indicates the Federal item name and, if required, a minimum description to identify the item.

g. **Unit of Measure (U/M).** Indicates the standard of the basic quantity of the listed item as used in performing the actual maintenance function. This measure is expressed by a two-character alphabetical abbreviation (e.g., ea, in., pr, etc.). When the unit of measure differs from the unit of issue, the lowest unit of issue that will satisfy the required units of measure will be requisitioned.

h. **Quantity Incorporated in Unit.** 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 this column in lieu of a quantity indicates that no specific quantity is applicable (e.g., shims, spacers, etc.).

C-4. Special Information. In the 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. How to Locate Repair Parts.

a. When National Stock Number or Part Number is Unknown:

(1) **First.** Find the illustration covering the functional group to which the item belongs.

(2) **Second.** Identify the item on the illustration and note the illustration figure and item number of the item.

(3) **Third.** Using the Repair Parts Listing, find the figure and item number noted on the illustration.

b. When National Stock Number or Part Number is A Known.

(1) **First.** Using the Index of National Stock Numbers and Part Numbers, find the pertinent National stock number or part number. This index is in ascending NIIN sequence followed by a list of part numbers in alphanumeric sequence, cross-referenced to the illustration figure number and item number.

(2) **Second.** After finding the figure and item number, locate the figure and item number in the repair parts list.

C-6. Abbreviations. Not Applicable.

SECTION II. REPAIR PARTS LIST

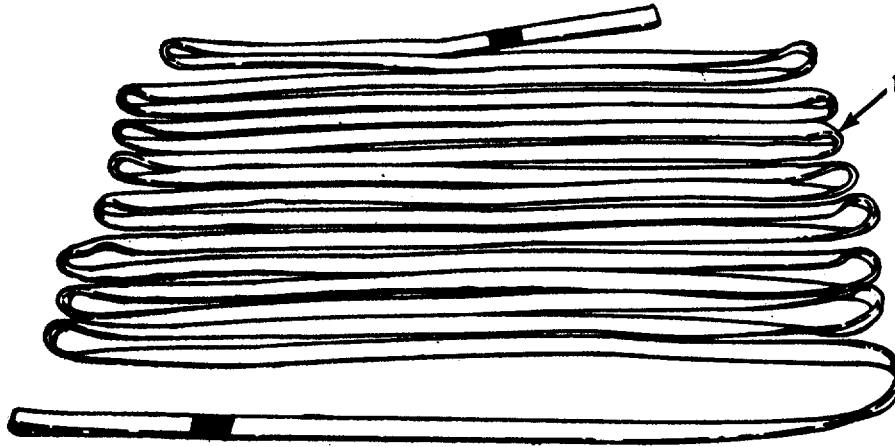


Figure C-1. 57-foot-long center line.

(1) ILLUSTRATION		(2)	(3)	(4)	(5)	(6)	(7)	(8)
(a) FIG. NO.	(b) ITEM NO.	SMR CODE	FEDERAL STOCK NUMBER	PART NUMBER	FSCM	DESCRIPTION <i>USABLE ON CODE</i>	U.M.	QTY INC IN UNIT
C-1	1	PAOZZ	1670064-4928	11-1-568	81337	GROUP 01 - 57-FOOT-LONG CENTER LINE VENT PULL DOWN CENTER LINE ..	EA	1

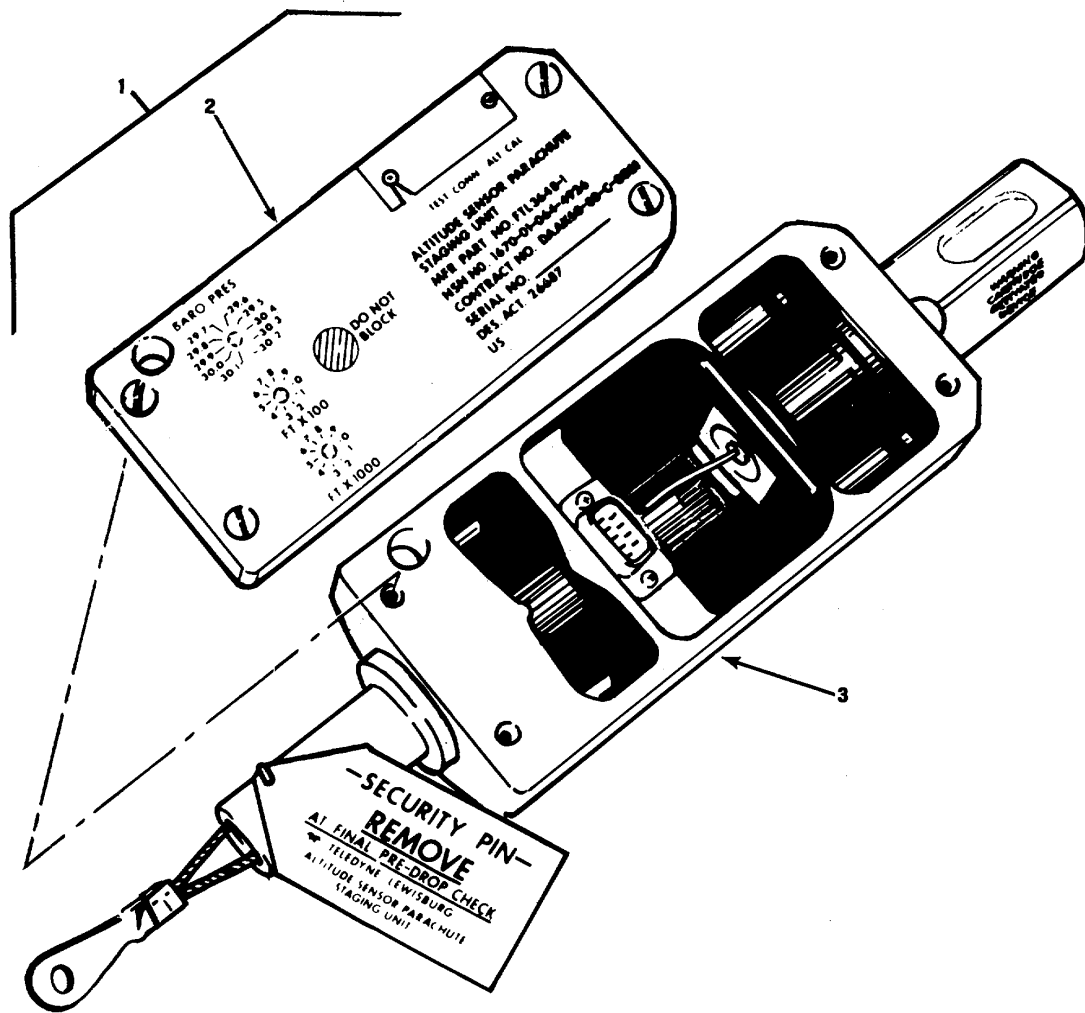


Figure C-2. Altitude sensor parachute staging unit.

(1) ILLUSTRATION		(2)	(3)	(4)	(5)	(6) DESCRIPTION	(7)	(8)
(a) FIG. NO.	(b) ITEM NO.	SMR CODE	FEDERAL STOCK NUMBER	PART NUMBER	FSCM	USABLE ON CODE	U.M.	QTY INC IN UNIT
						GROUP 02 - ALTITUDE SENSOR PARACHUTE STAGING UNIT		
C-2	1	AOOZZ	1670401471-5022	FLT3648	26687	ALTITUDE SENDOR PARACHUTE STAGING UNIT	EA	1
C-2	2	PAOZZ	1670-01-064-4926	FLT3648-1	26687	* SENSOR MODULE	EA	1
C-2	3	PAOZZ	1377401-064-4927	FLT3648-2	26687	* CUTTER MODULE	EA	1

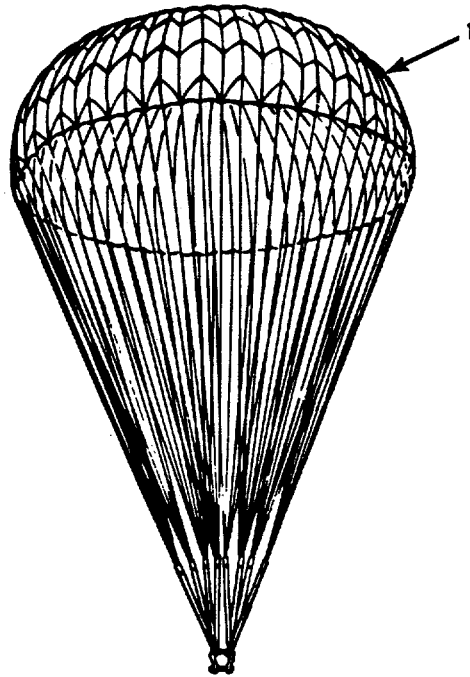


Figure C-3. G-12E 64-foot-diameter cargo parachute.

(1) ILLUSTRATION		(2)	(3)	(4)	(5)	(6)	(7)	(8)
(a) FIG. NO.	(b) ITEM NO.	SMR CODE	FEDERAL STOCK NUMBER	PART NUMBER	FSCM	DESCRIPTION <i>USABLE ON CODE</i>	U.M.	QTY INC IN UNIT
C3	1	PAOFF	1670-01-065-3755	11-1-2620	81337	GROUP 03 - G-12E 64-FOOT-DIAMETER CARGO PARACHUTE G-12E64-FOOT-DIAMETERCARGOPARACHUTE	EA	1

SECTION III. SPECIAL TOOLS LIST

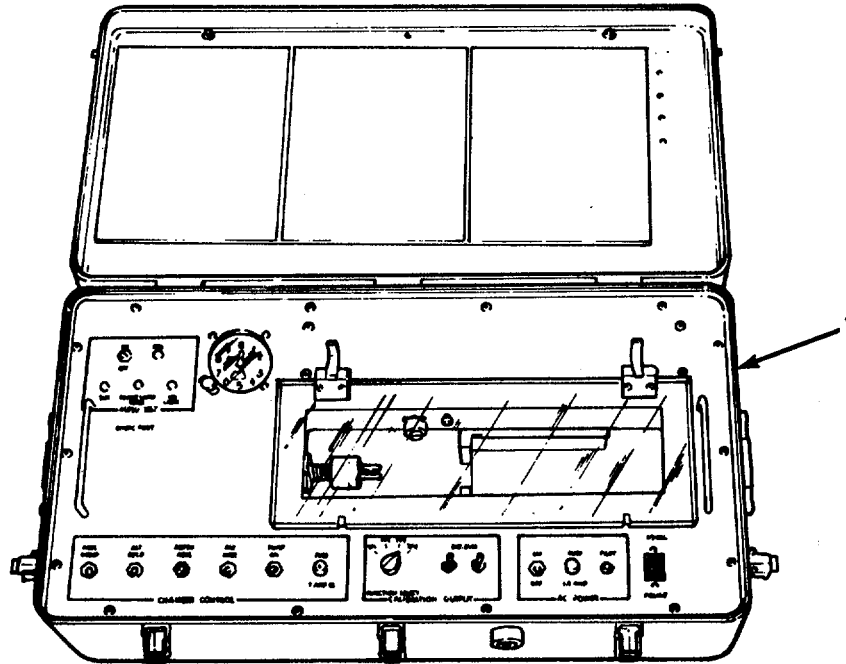


Figure C-4. Altitude sensor parachute staging unit test set.

(1) ILLUSTRATION		(2)	(3)	(4)	(5)	(6)	(7)	(8)
(a) FIG. NO.	(b) ITEM NO.	SMR CODE	FEDERAL STOCK NUMBER	PART NUMBER	FSCM	DESCRIPTION <i>USABLE ON CODE</i>	U.M.	QTY INC IN UNIT
C-4	1	PAOLL	11670-1464-4925	FLT4240-1	26687	GROUP 04 - TEST SET ASSEMBLY, ALTITUDE SENSOR PARACHUTE STAGING UNIT TESTSETASSEMBLY	EA	1

SECTION IV. NATIONAL STOCK NUMBER AND PART NUMBER INDEX

STOCK NUMBER	FIG. NO.	ITEM NO.	PART NUMBER	FSCM	FIG. NO.	ITEM NO.
1377-01-064-4927	C-2	3	FLT3648	26687	C-2	1
167001-064-4925	C-4	1	FLT3648-1	26687	C-2	2
1670-01-064-4926	C-2	2	FLT3648-2	26687	C-2	3
1670-01-064-4928	C-1	1	FLT4240-1	26687	C-4	1
1670-01-065-3755	C-3	1	11-1-2620	81337	C-3	1
1670-01-071-5022	C-2	1	11-1-568	81337	C-1	1

**APPENDIX D
EXPENDABLE SUPPLIES AND MATERIALS LIST**

SECTION I. INTRODUCTION

D-1. SCOPE. This appendix lists expendable supplies and materials you will need to operate and maintain the HAARS. 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 cleaning compound, item 5, 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

F - Direct Support Maintenance

H - General Support 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. The last line for each item indicates the Federal Supply Code for Manufacturer (FSCM) in parentheses followed by the part number.

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 SUPPLIES AND MATERIALS LIST

ITEM NUMBER	LEVEL	NATIONAL STOCK NUMBER	DESCRIPTION	U/M
1	0	6810-00-270-9982	Tetrachloroethylene, Technical	dr
2	0	7930-00-281-4731	Dish Washing Compound, hand flake	50 lb sack
3	0	7920-00-205-3570	Rag, wiping	be
4	0	8310-00-248-9716	Thread, nylon, size no. 6	yd
5	0	8305-00-082-5753	Webbing, textile nylon, tubular 1" width	yd
6	0	7510-00-161-4291	Paper clip, type 2, medium	bx
7	0	8305-00-433-5986	Cloth, muslin-cotton, type III	ft
8	0	8310-00-917-3944	Thread, cotton-ticket no. 3	yd
9	0	8305-00-268-2411	Webbing, textile-cotton, type I, 1/4-inch wide	ft
10	0	1670-00-368-7486	Strap, webbing, 60-inch	ea
11	0	7510-00-663-0196	Tape, pressure sensitive, 2-inch wide, type 3, O.D.	ro
12	0	8305-00-268-2453	Webbing, textile-nylon, tubular, 1/2-inch wide	ft
13	0	7510-00-286-5362	Ink, marking, parachute-strata-blue	pt

INDEX

Subject	Paragraph	Subject	Paragraph
A			
Administrative storage	4-22	Checks and services, maintenance, preventive	
Alinement of ASPSU	4-18	Operator	2-2
Altitude sensor parachute staging unit (ASPSU):		Organizational	4-9
Description	1-8	Cleaning:	
Checks and services:		Center line	4-13
Operator	2-2	Altitude sensor parachute staging unit (ASPSU)	4-19
Organizational	4-9	Controls and indicators, operators	2-1
Maintenance	4-16		
Initial setup	4-15	D	
Testing	4-17	Deployment bag for G-12E:	
Alinement	4-18	Alteration	4-21, 10
Cleaning	4-19	Stencil	4-21, 10
Service	4-19	Description, functional	1-12
Replace	4-20	Destruction of materiel to prevent enemy use	1-4
Disassembly	4-20	Destructive test of cutter module	4-17, 3
Inspection	4-20	Disassembly of ASPSU	4-20
Reassembly	4-20		
Altitude setting for ASPSU	2-7	E	
Assembly and preparation for use	2-4	Enemy use, prevent	1-4
Auxiliary equipment, operation of	2-10	Equipment data	T1-1
		Equipment improvement recommendations, reporting	1-3
B		Expendable supplies and materials list	D-1
Barometric pressure setting	T2-3		
Barometric pressure setting for ASPSU	2-7	F	
		Forms, records, and reports	1-2
C		Frequency, radio, interference	TI-i
Cargo parachute, G-12E, 64-foot-diameter:		Functional description	1-12
Description	1-8	Functional description of ASPSU	4-17
Checks and services:			
Operator	2-2	G	
Organizational	4-9	G-12E	
Maintenance	4-21	Initial setup	4-21
Center line:		Service	4-21
Initial setup	4-12	Packing	4-21
Inspect	4-12		
Service	4-13	H	
Repair	4-14	HAARS placed in standby condition	2-8
Replace	4-15	HAARS placed in shutdown condition	2-9
Cleaning	4-13		
Removal	4-15	I	
Installation	4-15	Improvements to manual, recommending (See table of contents)	
Center line, 57-foot-long:		Initial setup	
Description	1-8	Center line	
Checks and services:		Inspection	4-12
Operator	2-2		
Organizational	4-9		
Maintenance	4-12		

INDEX CONT)

Subject	Paragraph	Subject	Paragraph
I		P	
Initial setup (cont)		Packing of G-12E	4-21
Cleaning	4-13	General information	4-21,1
Repair	4-14	Place G-12 in proper layout	4-21,2
Replace	4-15	Serving the canopy vent	4-21,3
Altitude sensor parachute staging unit (ASPSU)		Attaching center line to canopy vent lines	4-21,4
Inspection	4-16	Applying tension	4-21,5
Testing	4-17	Folding the gores	4-21,5
Alinement	4-18	Effecting canopy vent pull-down	4-21,7
Cleaning	4-19	Tying the canopy, suspension lines, and center line	4-21,8
Service	4-19	Tying the connector link assemblies	4-21,9
Replace	4-20	Deployment bag alteration	4-21,10
Disassembly	4-20	Stowing the canopy	4-21,11
G-12E		Stowing the suspension lines, center line, and risers	4-21,12
Packing	4-21	Closing the deployment bag	4-21,13
Inspect center line	4-12	Army parachute log record	4-21,14
Inspection of ASPSU	4-20	Packing 68-inch diameter pilot parachute	4-21,15
Inspection, pack-in-process	4-21	Parts list	C-1
Installation instructions of ASPSU	4-8	Pressure setting, barometric	T2-3
Installation of center line	4-15		
K		R	
Knots - used in packing the G-12E		Radio frequency interference	T1-1
Surgeon's	4-21,3	Reassembly of ASPSU	4-20
Locking	4-21,3	Receipt of HAARS, servicing	4-4
Girth hitch	4-21,4	Recommendations, equipment improvement, reporting	1-3
Overhand knot	4-21,12	Recommending improvements to manual (See table of contents)	
Half hitch	4-21,12	References (See Appendix A)	A-1
M		Removal of center line	4-1
Maintenance allocation chart (MAC)	B-1	Repair center line	4-14
Maintenance checks and services, preventive		Repair parts and special tools list	C-1
Operators	2-2	Replace	
Organizational	4-9	Center line	4-15
Maintenance factions/procedures	4-11	Altitude sensor parachute staging unit (ASPSU)	4-20
Maintenance procedures		Reporting equipment improvement recommendations	1-3
57-foot long center line	4-12	Reporting of errors found in manual (See table of contents)	
Altitude sensor parachute staging unit (ASPSU)	4-16	Reports, forms, and records	1-2
G-12E 64-foot diameter cargo parachute	4-21		
Materials and supplies list	D-1		
Movement of HAARS, preparation of	2-11		
O			
Operating life	T1-1		
Operation procedures	2-6		
Operation test of ASPSU	4-17,2		
Operational environment	T1-1		

INDEX (CONT)

Subject	Paragraph	Subject	Paragraph
S		T	
Safety, care, and handling	1-11	Tables, list of	
Services and checks, maintenance		Equipment data	P1-10
Operator	2-2	Altitude sensor parachute staging unit (ASPSU)	P2-1
Organizational	4-9	Operators preventive maintenance checks and services	P2-3
Service		Test - altitude sensor parachute staging unit	4-17
Center line	4-13	TMDE, special tools, and support equipment	4-2
Altitude sensor parachute staging unit (ASPSU)	4-19	Tools and equipment	4-1
G-12E	4-21	Troubleshooting	4-10
Service upon receipt	4-4		
Setting altitude for ASPSU	2-7	W	
Shipment	4-23	Warnings (See inside front cover)	
Shipment and storage, preparation	4-22		
Special tools, TMDE, and support equipment	4-2		
Storage or shipment, preparation	4-22		
Supplies and materials list	D-1		
Support equipment, . TMDE, and special tools	4-2		

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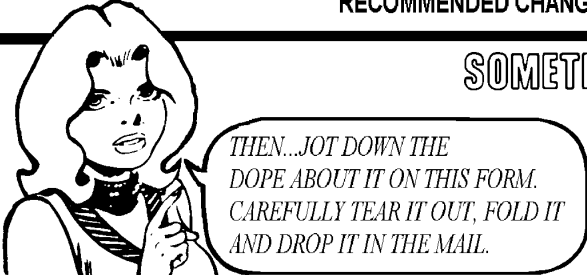
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The Metric System and Equivalents

Linear Measure

1 centimeter = 10 millimeters = .39 inch
 1 decimeter = 10 centimeters = 3.94 inches
 1 meter = 10 decimeters = 39.37 inches
 1 dekameter = 10 meters = 32.8 feet
 1 hectometer = 10 dekameters = 328.08 feet
 1 kilometer = 10 hectometers = 3,280.8 feet

Weights

1 centigram = 10 milligrams = .15 grain
 1 decigram = 10 centigrams = 1.54 grains
 1 gram = 10 decigrams = .035 ounce
 1 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 milliliters = .34 fl. ounce
 1 deciliter = 10 centiliters = 3.38 fl. ounces
 1 liter = 10 deciliters = 33.81 fl. ounces
 1 dekaliter = 10 liters = 2.64 gallons
 1 hectoliter = 10 dekaliters = 26.42 gallons
 1 kiloliter = 10 hectoliters = 264.18 gallons

Square Measure

1 sq. centimeter = 100 sq. millimeters = .155 sq. inch
 1 sq. decimeter = 100 sq. centimeters = 15.5 sq. inches
 1 sq. meter (centare) = 100 sq. decimeters = 10.76 sq. feet
 1 sq. dekameter (are) = 100 sq. meters = 1,076.4 sq. feet
 1 sq. hectometer (hectare) = 100 sq. dekameters = 2.47 acres
 1 sq. kilometer = 100 sq. hectometers = .386 sq. mile

Cubic Measure

1 cu. centimeter = 1000 cu. millimeters = .06 cu. inch
 1 cu. decimeter = 1000 cu. centimeters = 61.02 cu. inches
 1 cu. meter = 1000 cu. decimeters = 35.31 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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