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Airdrop of Supplies and Equipment: Rigging Containers

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Airdrop of Supplies and Equipment: Rigging Containers

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Preface

TM 4-48.03/MCRP 4-11.3C/TO 13C7-1-11 provides doctrinal guidance and direction for United States Army, United States Marine Corps, and United States Air Force units conducting aerial delivery operations. This manual provides information on how to prepare and rig airdrop containers. The three types of airdrop by which container loads can be delivered are low-velocity airdrop, high-velocity airdrop, and free drop.

The principal audience for TM 4-48.03/MCRP 4-11.3C/TO 13C7-1-11 is all members of the profession of arms. Commanders and staffs of Army, Marine Corps, Air Force headquarters serving as joint task force or multinational headquarters should also refer to applicable joint or multinational doctrine concerning the range of military operations and joint or multinational forces. Trainers and educators throughout the Army, Marine Corps, and Air Force will also use this publication.

Commanders, staffs, and subordinates ensure that their decisions and actions comply with applicable United States, international, and in some cases host-nation laws and regulations. Commanders at all levels ensure that their Soldiers, Marines, and Airmen operate in accordance with the law of war and the rules of engagement. (See FM 27-10).

TM 4-48.03/MCRP 4-11.3C/TO 13C7-1-11 does not implement any STANAGs.

TM 4-48.03/MCRP 4-11.3C/TO 13C7-1-11 uses joint terms where applicable. Selected joint and Army terms and definitions appear in both the glossary and the text. Terms for which TM 4-48.03/MCRP 4-11.3C/TO 13C7-1-11 is the proponent publication (the authority) are italicized in the text and marked with an asterisk (*) in the glossary. Terms and definitions for which TM 4-48.03/MCRP 4-11.3C/TO 13C7-1-11 is the proponent publication are boldfaced in the text. For other definitions shown in the text, the term is italicized and the number of the proponent publication follows the definition.

TM 4-48.03/MCRP 4-11.3C/TO 13C7-1-11 applies to the Active Army, Army National Guard/Army National Guard of the United States, United States Army Reserve, the total force Marine Corps, and United States Airforce units unless otherwise stated.

The proponent of TM 4-48.03/MCRP 4-11.3C/TO 13C7-1-11 is the United States Army Quartermaster School. The preparing agency is the G-3 Doctrine Division, USACASCOM. Send comments and recommendations on DA Form 2028 (Recommended Changes to Publications and Blank Forms) to Commander, United States Army Combined Arms Support Command and Fort Lee, ATTN: ATCL-TS, 2221 A Avenue, Fort Lee, Virginia 23801 or submit an electronic DA Form 2028 by e-mail to: usarmy.lee.tradoc.mbx.lee-cascom-doctrine@mail.mil. In addition to submission of DA Form 2028, provide same comments and recommendations in MilWiki for rapid dissemination to doctrine authors and for universal review at <https://www.milsuite.mil>.

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Introduction

Publication of TM 4-48.03/MCRP 4-11.3C/TO 13C7-1-11(FM 4-20.103/MCRP 4-11.3C/TO 13C7-1-11) *Airdrop of Supplies and Equipment: Rigging Containers* supersedes FM 4-20.103/MCRP 4-11.3C/TO 13C7-1-11, *Airdrop of Supplies and Equipment: Rigging Containers*, 2 September 2005.

This special revision to the technical manual (TM) publishing medium/nomenclature has been accomplished to comply with US Army TRADOC doctrine restructuring requirements. The title and content of the manual(s) is identical to that of the superseded manual(s) unless specifically noted changes are identified. This special revision does not integrate any changes in Army doctrine since 2 September 2005 and does alter the publication's original references. For the status of official Department of the Army (DA) publications, consult DA Pam 25-30, *Consolidated Index of Army Publications and Blank Forms*, at <http://armypubs.army.mil/2530.html>. DA Pam 25-30 is updated as new and revised publications, as well as changes to publications are published.

SCOPE

The purpose of this manual is to provide the latest approved procedures for rigging Aerial Delivery Containers. This manual is written for use by the parachute rigger, jumpmaster, and Low-Cost Low-Altitude, Aerial Delivery System certified personnel. It consists of eight parts.

- Part One contains general information for container loads and aircraft.
- Part Two contains procedures for rigging A-7A container loads.
- Part Three contains procedures for rigging A-21 container loads.
- Part Four contains procedures for rigging A-22 container loads.
- Part Five contains procedures for rigging Low-Cost Aerial Delivery Systems.
- Part Six contains procedures for rigging Low-Cost Low-Altitude Aerial Delivery Systems.
- Part Seven contains procedures for rigging Joint Precision Airdrop System loads.
- Part Eight contains procedures for rigging specialized loads and equipment.

NOTICE OF EXCEPTION

When an item of airdrop equipment is replaced or a rigging procedure is changed, it will be impossible to change all manuals in the field at one time. Therefore, General Subjects Technical Manual (TM) 4-48.03/Marine Corps Reference Publication (MCRP) 4-11.3C/Technical Order (TO) 13C7-1-11 will be changed, when necessary and will take precedence over the procedures in an individual rigging manual. There may be times, however, when the procedures in an individual rigging manual must be followed even though they are different from those in this manual. When this occurs, a notice of exception will be printed at the beginning of each paragraph where the exception is authorized. The notice of exception will look like the following:

NOTICE OF EXCEPTION

The procedures in this paragraph are different from those in TM 4-48.03/MCRP 4-11.3C/TO 13C7-1-11. An exception to TM 4-48.03/MCRP 4-11.3C/TO 13C7-1-11 is granted. The procedures in this paragraph must be followed.

REFERENCE INFORMATION

To avoid repeating certain information and procedures, it is often necessary to reference other TMs and technical manuals (TM). For example, this manual often references TM 4-48.02/Marine Corp Reference

Publication (MCRP) 4-11.3J/Naval Sea Command (NAVSEA) SS400-AB-MMO-010/TO 13C7-1-5. This may seem to be contradictory in that this manual, TM 4-48.03/MCRP 4-11.3C/TO 13C7-1-11, deals with rigging container loads and TM 4-48.02/MCRP 4-11.3J/NAVSEA SS400-AB-MMO-010 REV 1/TO 13C7-1-5 deals with rigging platform loads. However, TM 4-48.02/MCRP 4-11.3J/NAVSEA SS400-AB-MMO-010 REV 1/TO 13C7-1-5 also provides general information and general procedures. Where information is the same or only minor differences exist, it is permissible to state that the information is provided in TM 4-48.02/MCRP 4-11.3J/NAVSEA SS400-AB-MMO-010 REV 1/TO 13C7-1-5. Where procedures are the same or only minor differences exist it is permissible to state that the procedure is done according to or by adapting the procedures in TM 4-48.02/MCRP 4-11.3J/NAVSEA SS400-AB-MMO-010 REV 1/TO 13C7-1-5.

PART ONE

General Information

Chapter 1

General Rigging Information for Container Loads

DESCRIPTION OF CONTAINER LOADS

1-1. Container loads are loads that are rigged for airdrop in airdrop containers such as the A-7A airdrop cargo sling assembly, the A-21 cargo bag assembly, and the A-22 cargo bag assembly. These containers are packed with supplies, disassembled equipment, or small items of ready-to-use equipment prepared for airdrop. Loads may be required to be cushioned with energy dissipating material (honeycomb), felt, or cellulose wadding depending on the load requirements and the type of airdrop. The number and types of parachutes required to stabilize the load and slow its descent depend on the type of container used, the weight of the load, and the type of airdrop.

- **A-7A Airdrop Cargo Sling Assembly.** The A-7A airdrop cargo sling assembly consists of four identical sling straps. The length of each strap is 188 inches. Each sling strap is fitted with a friction adapter and a floating D-ring. Loads weighing up to 500 pounds may be airdropped with an A-7A airdrop cargo sling assembly. Each A-7A cargo sling strap weighs 1 ½ pounds. This manual covers rigging the A-7A airdrop cargo sling assembly.
- **A-21 Cargo Bag Assembly.** The A-21 cargo bag assembly is an adjustable container. It consists of a sling assembly with scuff pad, fixed quick-release strap and assembly, two O-ring straps, three quick-release straps, and a 97- by 115-inch canvas cover. The A-21 cargo bag assembly has a 500-pound load capacity. This manual covers rigging the A-21 cargo bag assembly.
- **A-22 Cargo Bag Assembly.** The A-22 cargo bag assembly is an adjustable cotton duck cloth/nylon and nylon webbing container. It consists of a sling assembly, a cover, and four suspension webs. The container weight is about 41 pounds. The load may be rigged with or without a cover. The weight capacity for the container is 501 to 2,200 pounds without the weight of the parachute. The height will vary, but will not exceed 83 inches with the parachute unless a specific rigging procedure authorizes it. Containers rigged for C-17 airdrop are restricted to 101 inches. This manual covers rigging the A-22 container for airdrop.
- **Stretch A-22 Cargo Bag.** The stretch A-22 cargo bag consists of two A-22 cargo bag assemblies. The covers may or may not be used. Only six of the suspension webs are used. Nylon and cotton sling assemblies must not be mixed. The weight capacity of the load is 675 to 2,200 pounds without the weight of the parachute. This manual covers rigging the stretch A-22 container for airdrop.
- **Double A-22 Cargo Bag.** The double A-22 cargo bag consists of two A-22 cargo bag assemblies. The covers may or may not be used. Only six of the suspension webs are used. Nylon and cotton sling assemblies must not be mixed. The weight capacity of the load is 900 to 2,200 pounds without the weight of the parachute. This manual covers rigging the double A-22 container for airdrop.

- **Low-Cost Aerial Delivery System (LCADS) Low Cost Container (LCC).** LCADS LCC is a lightweight A-22 type container with no scuff pad, cover, or friction adapters on the lateral bands. It is rigged like the A-22 container, but is used for low and high-velocity delivery of items where airdrop equipment is not recoverable. The weight capacity of the load is 501 to 2,200 pounds without the weight of the parachute. This manual covers rigging the LCADS LCC for airdrop.
- **Low-Cost Low Altitude (LCLA) Resupply Load.** The LCLA resupply load is a modified, lightweight system that consists of four or more 188 inch LCLA straps with friction adapters, plastic shrink wrap, or load cover. It is rigged like a door bundle, but is used for delivery of items where airdrop equipment is not recoverable. The suspended weight of the load is 80 to 1,000 pounds and varies depending on the parachute used. This manual covers rigging of the LCLA resupply load.
- **Joint Precision Airdrop System (JPADS).** A typical A-22 container load is rigged for Low-Velocity Airdrop using an A-22 cargo bag and the Joint Precision Airdrop Systems 2,200 pounds (JPADS 2K). Typical loads include rations, repair parts, water cans and other small items. Items to be dropped may be rigged in their original shipping container or may be repacked for airdrop. The minimum rigged weight for the load when using JPADS 2K is 880 pounds to include the Autonomous Guidance Unit (AGU) and the parachute. Maximum weight is 2,281 pounds.
- **Fabricating Air Force Airdrop Equipment.** Part Eight of this manual covers rigging of the Standard Airdrop Training Bundle (SATB), fabrication of C-130 Container Delivery System (CDS) Pulley Strap, and CDS Kit.

TYPES OF AIRDROP

1-2. The three types of airdrop by which container loads can be delivered are low-velocity airdrop, high-velocity airdrop, and free drop. These are described below.

- **Low-Velocity Airdrop.** Low-velocity airdrop is the delivery of supplies and equipment from an aircraft in flight using cargo parachutes. The items are usually rigged with honeycomb under them. The cargo parachutes are attached to the top of the load. The parachutes slow the descent of the load and ensure minimum shock when the load hits the ground.
- **High-Velocity Airdrop.** High-velocity airdrop is the delivery of supplies and equipment from an aircraft in flight using a stabilizing parachute. The items are rigged with honeycomb and the stabilizing parachute is attached to the top of the load to maintain an upright position.
- **Free Drop.** Free drop is the delivery of certain non-fragile items of supplies from an aircraft in flight without the use of a parachute. No specific instructions are given in this manual for this type of airdrop.

COMMONLY USED ITEMS

1-3. Items commonly used for rigging container loads are described below. An equipment required table is included for each load in this manual as a part of the section describing that load. This table lists the items and quantity of each item needed to prepare and rig the load covered in that section. Standard airdrop hardware straps and canvas items are described in TM 4-48.02/MCRP 4-11.3C/NAVSEA SS400-AB-MMO-010 REV 1/TO 13C7-1-5. Canvas, metal, webbing, and wood items in this section and for other airdrop items are listed in TM 4-48.02/MCRP 4-11.3J/NAVSEA SS400-AB-MMO-010 REV 1/TO 13C7-1-5. Some textile, wood, and miscellaneous items are described below. The proper use of these items will be covered in this manual or in other manuals of the TM 4-48.02/MCRP 4-11.3J/NAVSEA SS400-AB-MMO-010 REV 1/TO 13C7-1-5 series.

- **Textile Items.** Textile items which may be used when a container load is being rigged are described below.

Note. Lengths will vary. Lengths specified are only typical and may be changed.

- Type III nylon cord is used to make safety ties and to hold items in place. It has a tensile strength of 550 pounds.

Note. When 1/2-inch, 9/16-inch, or 5/8-inch tubular nylon webbing is not available for the skid board tie, type IV (coreless) braided nylon cord can be used. When the type IV (coreless) braided nylon cord is not available, a double length of type III nylon cord can be used.

- 1/2-inch, 9/16-inch, or 5/8-inch tubular nylon webbing is used as a primary skid board tie. It is also used to secure items during a drop. It has a tensile strength of 1,000 pounds, 1,500 pounds, and 2,250 pounds respectively.
- 1-inch tubular nylon webbing is used to form parachute attaching points on low cost low altitude loads. It has a tensile strength of 4,000 pounds
- Type I, 1/4-inch cotton webbing is used to make many of the needed safety ties. It has a tensile strength of 80 pounds.
- Ticket numbers 8/4 and 8/7 cotton threads are used to make various ties. These threads have a tensile strength of 13 and 24.5 pounds respectively.
- **Wood Items.** Wood items used on container loads, with the exception of the A-22 skid board, are made locally using details found in the rigging manual for the particular load. The 48- by 48-inch skid board for the A-22 cargo bag may be ordered pre-cut or prepared locally. When the skid board is prepared locally, AC grade plywood must be used.
- **Miscellaneous Items.** Miscellaneous items which may be used when a container load is being rigged are described below.
 - Two-inch cloth-backed tape is used to prevent honeycomb from being cut by the type III nylon cord and to hold padding in place.
 - Cellulose wadding and felt sheets may be used to pad fragile items to prevent sharp edges from cutting and to protect slings during deployment.
 - Pad energy dissipating (Honeycomb) is used to absorb the landing shock. Honeycomb is also used to fill empty spaces and to level and pad the load. The number of layers used depends on the item being airdropped and the method of airdrop. Honeycomb is issued in 3- by 36- by 96-inch sheets.
 - Steel strapping may be used for rigging airdrop items. The standard strapping used is 1/50-inch thick and 5/8-inch wide with a breaking strength of 1,000 pounds. It can be used to bind items together or form containers on A-7A and A-21 loads. When strapping is used to form containers, it will be doubled and the maximum weight of the load will not exceed 250 pounds without parachute weight. When strapping is used on A-22 loads, it will not be bound around the skid board unless specific rigging procedures authorize it.

PARACHUTE REQUIREMENTS

- 1-4. The parachute requirements for low-velocity and high-velocity airdrop are as described below.

Low-Velocity Airdrop. The 68-inch pilot, T-10 modified cargo, and G-14 cargo parachutes are used singularly with A-7A cargo sling loads and A-21 cargo bag loads rigged for low-velocity airdrop. Three 68-inch pilot parachutes may be used only on A-7A sling loads. The G-14 in clusters of two or three parachutes, the LCADS low velocity cargo parachute, or a G-12 cargo parachute is used on either the A-22 cargo bag or the LCADS LCC loads. The JPADS is used on the A-22 cargo bag loads and on the Double A-22 cargo bag loads. The minimum required weight and the maximum allowable weight for cargo parachutes used on loads rigged for low-velocity airdrop are listed in Table 1-1. These parachutes can only be used with LCLA Resupply Loads, Cross, Double Cross, Triple Cross, LCLA

35-foot diameter cargo parachute, Double LCLA 35-foot diameter cargo parachute, LCLA 24-foot diameter cargo parachute and Double LCLA 24-foot diameter cargo parachute.

- **High-Velocity Airdrop.** A 68-inch pilot parachute is the primary parachute used for a 75- to 150-pound load, suspended weight, being prepared for high-velocity airdrop. For loads between 151- and 500-pounds, use three 68-inch pilot parachutes or a 12-foot high-velocity parachute. When the 12-foot high-velocity parachute is not available, a 15-foot cargo extraction parachute packed specifically for use as a high-velocity parachute may be used. For loads over 500-pounds, the 26-foot high-velocity cargo parachute is the primary parachute and should be used whenever possible. The LCADS high velocity cargo parachute may also be used on the A-22 cargo bag. See Table 1-1 for weight ranges. If the 26-foot high-velocity parachute is not available, a 22-foot cargo extraction parachute packed specifically for use as a high-velocity parachute may be used. Special procedures for the 15- and 22-foot extraction parachute consist of attaching the static lines and replacing the extraction line with a 20-foot cargo sling (see TM 10-1670-278-23&P/TO 13C5-26-2/NAVAIR 13-1-27 for the 15-foot extraction parachute and TM 10-1670-279-23&P/TO 13C5-27-2/NAVAIR 13-1-28 for the 22-foot extraction parachute).

DATA TAG FOR RIGGED LOADS

1-5. A data tag is prepared and secured to each container load so that it can be easily seen. Entries on the tag are used for inspection purposes and to help the loadmaster determine where to place the loads in the aircraft. Use a ballpoint pen or waterproof marker to record the following information on the tag:

- Total rigged weight.
- Height, including parachute.
- Width.
- Overall length.
- Type of parachute/breakaway or non-breakaway.
- Center of Balance (For double A-22 when utilizing the MV/CV-22 aircraft).

Table 1-1. Parachute requirements

Parachute	Suspended weight (pounds)	
	Minimum	Maximum
Low-Velocity		
One 68-inch pilot	30	50
Three 68-inch pilot	51	200
One T-10 cargo modified	90	500
One G-14 cargo	200	500
* Two G-14 cargo	501	1,000
* Three G-14 cargo	1,001	1,500
One G-12E cargo	501	2,200
LCADS low-velocity	501	2,200
JPADS	700	2,130
LCLA Only		
Cross	80	200
Double Cross	201	400
Triple Cross	401	600
LCLA 35-foot diameter cargo parachute	100	500
Double LCLA 35-foot diameter cargo parachute	501	1,000
LCLA 24-foot diameter cargo parachute	80	300
Double LCLA 24-foot diameter cargo parachute	301	600
High-Velocity		
One 68-inch pilot	75	150
Three 68-inch pilot	151	500
** One 12-foot high-velocity cargo	151	500
One 15-foot cargo extraction	151	500
** One 26-foot high-velocity cargo	501	2,200
One 22-foot cargo extraction	501	2,200
LCADS high-velocity	501	2,200
* On an A-22 load, G-14 cargo parachutes should be used only when a G-12 cargo parachute is not available.		
** Primary parachute.		
Note. Loads with three G-14 cargo parachutes must be dropped one at a time.		

COMPUTATION OF MINIMUM WEIGHT FOR CONTAINER LOADS

1-6. The following information can be used to determine the minimum weight required for a container load.

- Container loads may be dropped from the paratroop doors or the ramp.
- Paratroop Door Loads. Containers dropped from the paratroop doors require a minimum weight of 11 pounds per square foot.
- Ramp Loads. Containers dropped from the ramp require a minimum weight of 28 pounds per square foot.
- To compute the minimum weight required for a container load, measure the length, width, and height (without parachute) of each container. Multiply the two largest dimensions (in inches).

Divide the answer by 144. Multiply that answer by 28 (or 11 for paratroop door loads). The answer is the minimum allowable weight for that load. See the example in Table 1-2.

Table 1-2. Example of how to determine minimum allowable weight

Example:

Height (without parachute)	27 inches
Length	44 inches
Width	21 inches

44 inches x 27 inches = 1,188 square inches

$1,188 \div 144 = 8.25$ square feet

RAMP

$8.25 \times 28 = 231$ pounds

The minimum allowable weight for this container is 231 pounds, without parachute, for ramp operations.

DOOR

$8.25 \times 11 = 90.75$ pounds

The minimum allowable weight for this container is 90.75 pounds, without parachute, for door operations.

SPECIAL CONSIDERATIONS

1-7. Special considerations for this manual are described below.

CAUTION

Only ammunition listed in TM 4-48.16/MCRP 4-11.3B/TO 13C7-18-41 may be airdropped.

- The loads covered in this manual may include hazardous materials as defined in AFMAN 24-204; NAVSUP PUB 505; MCO P4030.19I; DLA I 4145.3 DCMAD1, CH3.4 (HM24), *Preparing Hazardous Materials for Military Air Shipments*. If included, the hazardous material must be packaged, marked, and labeled as required by AFMAN 24-204; NAVSUP PUB 505; MCO P4030.19I; DLA I 4145.3 DCMAD1, CH3.4 (HM24).
- A copy of TM 4-48.03/MCRP 4-11.3C/TO 13C7-1-11 must be available to the joint airdrop inspectors during the before- and after-loading inspections.

SAFETY PRECAUTIONS

CAUTION

Package, mark, and label hazardous materials according to Air Force Manual (AFMAN) 24-204(I)/TM 38-250/NAVSUP PUB 505/MCO P4030.19H/DLA I 4245.3.

1-8. Safety precautions **MUST** be closely followed when airdrop container loads are rigged. Failure to follow the precautions could result in serious injury to personnel or damage to the drop item or aircraft. The following safety precautions shall be taken by the rigger:

- Make sure that when lifting heavy items, the lifting device has a rated lifting capacity that exceeds the weight of the item to be lifted.
- Make sure that items being lifted are secured to the lifting device.
- Avoid working under equipment suspended above an airdrop container unless absolutely necessary.
- Cover all wet cell batteries in service with plastic or nonflammable material.
- Check fuel tanks of small engines to make sure they are drained. Check fuel cans to make sure they are performance-oriented packaging approved. When stowing fuel cans, use cellulose wadding or other suitable material to prevent metal-to-metal contact.

RIGGING PRECAUTIONS

1-9. The following precautions must be taken when a container load is being rigged.

- **Assemblies.** When components of assemblies are being rigged, make sure that all items needed to operate the assembly are packed in the same airdrop container whenever possible. For example, a radio and its battery should be packed in the same container.
- **Items.** When items such as radio equipment are rigged, they should be individually wrapped. Padding or honeycomb should be placed under each item being prepared and inserted between items of the load to prevent contact. Cellulose wadding, felt, or other suitable material must be used to avoid metal-to-metal or metal-to-wood contact.
- **Webbing.** All excess lengths of webbing must be folded and tied with type I, ¼-inch cotton webbing. This reduces the danger of containers becoming snagged as they are ejected or released from the aircraft.
- **Hazardous Materials.** Hazardous materials must be packed and the rigged load labeled or marked according to Air Force Manual AFMAN 24-204(I) /TM 38-250/NAVSUP PUB 505/MCO P4030.19H /DLAI 4245.3. Gasoline cans and drums must be padded and rigged to prevent metal-to-metal contact.

LOADS DROPPED IN FRIGID CLIMATES

1-10. When loads are dropped in frigid climates, special procedures or precautions may be needed to follow.

- Some drop items may have been modified for use in frigid climates by the installation of extra equipment such as heaters. Special rigging procedures may be needed when a drop item has been modified.
- All excess webbing of suspension slings and tie-down straps must be folded and tied with type I, ¼-inch cotton webbing.

CAUTION

Masking tape must not be used in frigid climate to secure loose webbing. Type 1 ¼ inch cotton webbing is an authorized substitute.

FINAL INSPECTION

1-11. After the data tag has been attached, the rigged load must be given a complete and final inspection by a qualified person. A-7A and A-21 loads **MUST** be inspected by either a parachute rigger or jumpmaster. All A-22 loads will be inspected by a Joint Airdrop Inspector qualified rigger. LCLA loads weighing 500 pounds or less will be inspected by a parachute rigger, jumpmaster, or an LCLA certified soldier. All

LCLA loads that are intended to be dropped from a C-130 aircraft will receive a Joint Airdrop Inspection by certified Joint Airdrop Inspectors (For LCLA dropped from a C-130 aircraft the number of joint airdrop inspection forms will be determined by the number of release gates used). The load inspection at a minimum must include the following:

- Check for serviceability of webbing, straps, and covers.
- Make sure load is rigged according to procedures outlined in this manual.
- Make sure the loads containing hazardous materials comply with AFMAN 24-204; NAVSUP PUB 505; MCO P4030.19I; DLAI 4145.3 DCMAD1, CH3.4 (HM24) and are labeled accordingly.
- Make sure the proper size parachute has been used and check its condition.
- Inspect the log record book (if applicable).
- Make sure that the parachute is correctly connected and secured to the load.

RELEASE GATE

1-12. A release gate is installed in the aircraft to restrain the load during flight. It is also used to prevent premature exit of container loads from the aircraft. The gate is installed according to procedures in the technical order for the particular aircraft used. The components of the release gate, with the exception of the webbing to be severed, are furnished by the U.S. Air Force. The type VIII, type XXVI nylon webbing, ½-inch, or 1-inch tubular nylon webbing is furnished by the user. For MV/CV-22 aircraft, the user will provide type XXVI nylon webbing and (2) D-rings, per airdrop stick. See Table 1-3 and Table 1-4 for release gate requirements.

Table 1-3. Release gate requirements

<i>Aircraft</i>	<i>Aircraft Rail System</i>	<i>Rigged Weight (Pounds)</i>	<i>Length of Type XXVI Nylon Webbing Required</i>	<i>Length of Type VIII Nylon Webbing Required</i>
MV/CV-22	Non-CVRS	501 – 4,700	30-foot single stick	
C-130 (all models)	Non-CVRS*	501 – 4,000		One 20-foot
C-130 (all models)	Non-CVRS*	501 – 13,000 13,001 – 25,000 25,001 – 40,000	One 20-foot Two 20-foot Three 20-foot	
C-130 (all models)	CVRS*	501 – 4,000		One 15-foot per stick
C-130 (all models)	CVRS*	501 – 13,000 13,001 – 25,000	One 15-foot per stick One 15-foot per stick Two 15-foot per stick	
C-17	Inboard Logistic Rails	501 – 18,800 18,001 – 37, 600	20-foot single stick 40-foot double stick	
Note. For multiple deliveries, provide a release gate based on the weight of each group of containers to be airdropped at one time.				
* CVRS (Centerline Vertical Restraint System)				

Table 1-4. Intermediate release gate requirements for JPADS

<i>Aircraft</i>	<i>Aircraft Rail System</i>	<i>Length of ½-inch Tubular Nylon Webbing Required</i>	<i>Length of 1-inch Tubular Nylon Webbing Required</i>
C-130 (all models)	Non-CVRS*	One 20-foot per container	
C-130 (all models)	CVRS*	One 15-foot per container	
C-17	Inboard Logistic Rails		One 20-foot per container

1-13. LCLA requires a suitable length of type VIII nylon webbing for a release strap. The length of the webbing is determined by the number of bundles to be dropped on each drop zone and the type of aircraft being used.

RELEASE GATE LOAD SPREADER

1-14. Any time a container is rigged for container delivery system (CDS) and offered as the aft-most container, for each release gate, but cannot firmly support the release gate to prevent load shift, it must have a release gate load spreader.

Note. When the total weight of the containers to be dropped from the C-17 aircraft exceeds 38,000 pounds, a release gate load spreader is needed for each aft-most container. Construct and secure it as given below.

- Total container weights up to 25,000 pounds per stick, using the same gate, use the procedures below to build the release gate load spreader:
 - The minimum size for the plywood is ¾-by 24- by 30-inches and the maximum size is ¾-by 24- by 48-inches. The release gate load spreader should be cut to the width of the load. Variations in size are authorized.

- Nail two identical size pieces of plywood together, with the grain of the plywood running vertical, using eight penny nails. The required minimum thickness of the release gate load spreader is 1 ½-inches.
- Drill a ½-inch hole 2 inches from each corner.
- Place the spreader between the sling assembly and cover or load so the long side is parallel to the top and bottom of the container. Center the spreader on the release gate.
- Secure the corners of the spreader to the load with type III nylon cord routed through the 1/2–inch holes.
- During combat operations and humanitarian relief efforts a 1-inch release gate load spreader may be used when ¾ -inch plywood is not available. Total container weights up to 16,667 pounds per stick, using the same gate, use the procedures below to build the release gate load spreader:
 - The minimum size for the plywood is 1-by 24- by 30-inches and the maximum size is 1- by 24- by 48-inches. The release gate load spreader should be cut to the width of the load. Variations in size are authorized.
 - Drill a ½-inch hole 2 inches from each corner.
 - Place the spreader between the sling assembly and cover or load so the long side is parallel to the top and bottom of the container. Center the spreader on the release gate.
 - Secure the corners of the spreader to the load with type III nylon cord routed through the 1/2–inch holes.

Note. The user is responsible for providing a release gate load spreader to prevent excessive load shift. The number of joint airdrop inspection forms will be determined by the number of release gates used.

KNOTS USED

1-15. Some knots used in rigging container loads are shown in Figure 1-1.

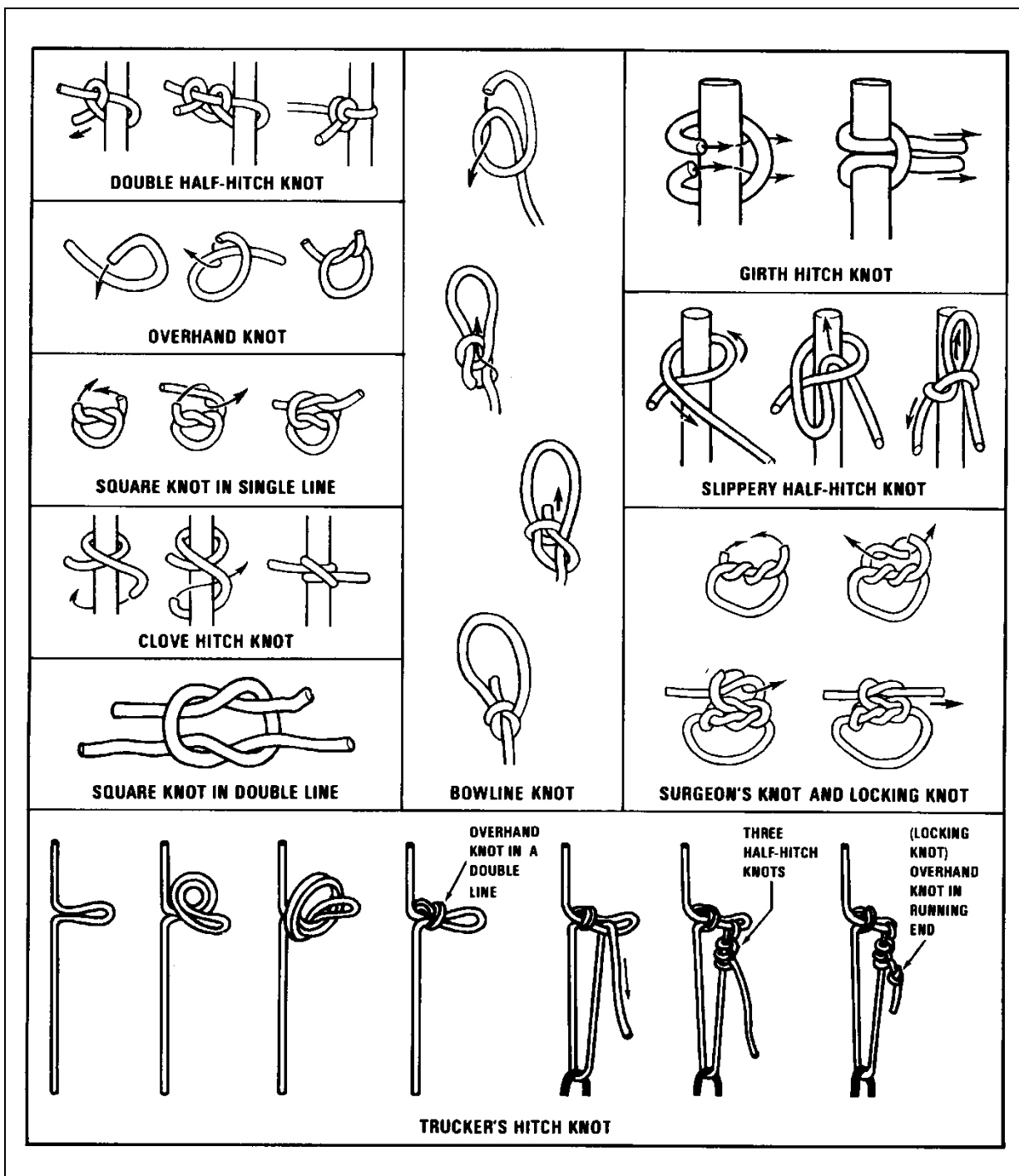
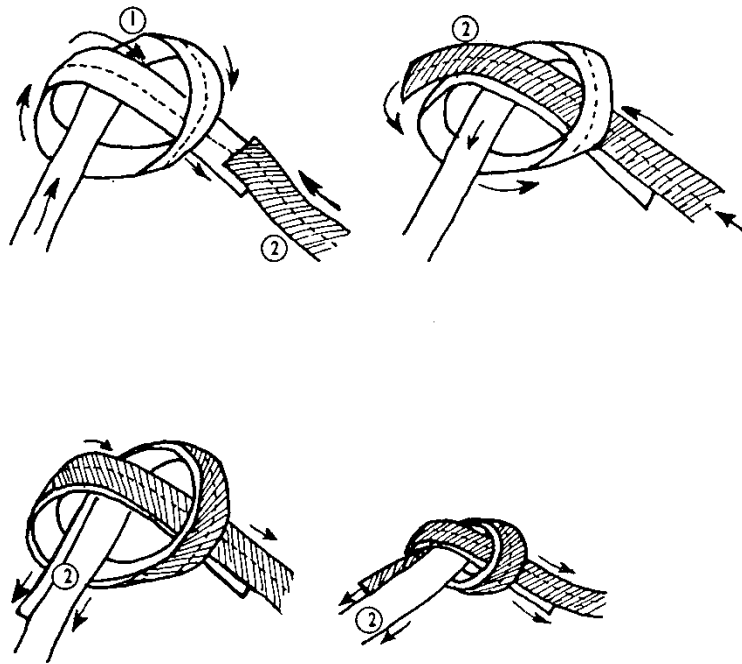


Figure 1-1. Knots used



① Make an overhand knot in one end.

② Follow the curve back in the reverse direction with the other end.

Notes.

There is no need to safety tie the ends when webbing is used.
Be sure the knot is neat, so as to tell if it is tied correctly.
This knot will jam after heavy loading.

RING BEND KNOT USED ON THE DRIVE-OFF AID

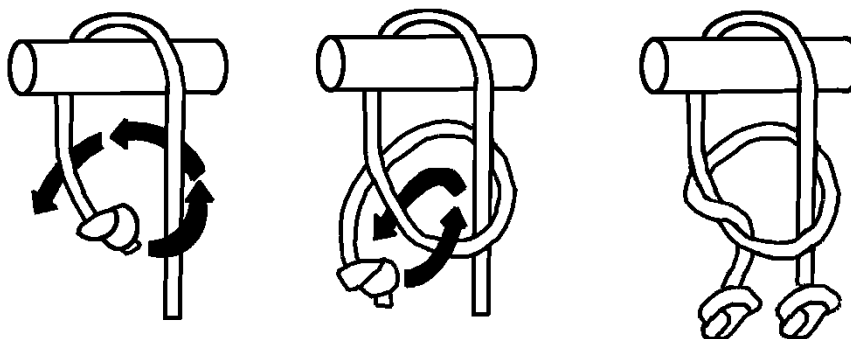


Figure 1-1. Knots used (continued)

SECURING STRAPS AND WEBBING

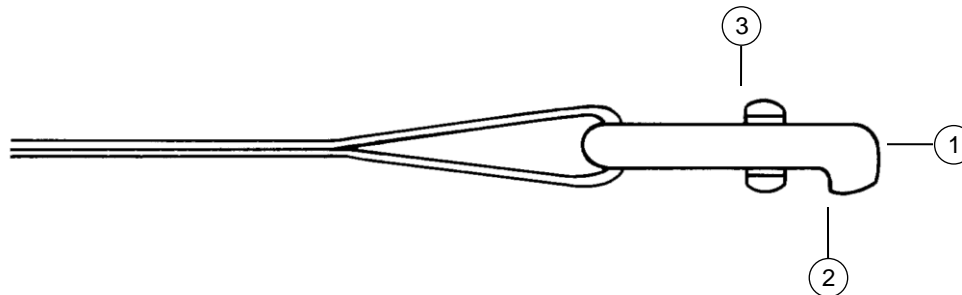
1-16. The straps and webbing used to rig loads must be properly fastened and secured.

CAUTION

Instructions given in this paragraph must be followed exactly to ensure straps and friction adapters stay tight and secured.

- **Fastening Strap with Friction Adapter.** Most containers in this manual have friction adapters attached somewhere on the container. It is critical that the running ends of the straps are routed properly. Figure 1-2 identifies the parts of the friction adapter. Figure 1-3 shows how to route the running end of the strap through the friction adapter.
- **Securing Excess Strap.** Excess strap is folded and tied with type I, ¼-inch cotton webbing. Figure 1-3 shows how to secure the excess strap.

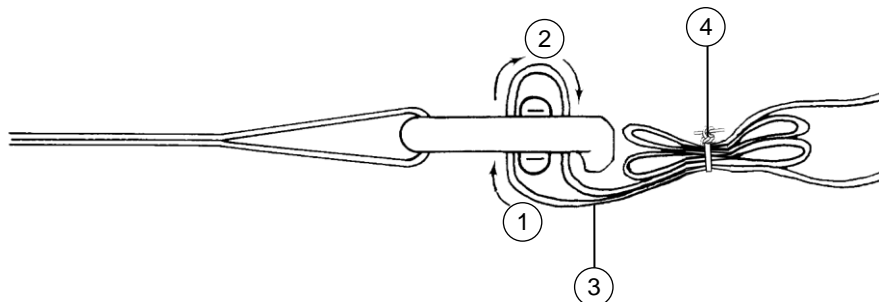
Note. This drawing is not shown to scale.



- ① Metal frame.
- ② Oversized portion.
- ③ Friction bar.

Figure 1-2. Friction adapter

Note. This drawing is not drawn to scale.



- ① Using the running end of the webbing. Route it up from the bottom between the friction bar and the stitch formation side of the metal frame.
- ② Route the running end down between the friction bar and the oversized portion of the metal frame.
- ③ Pull tension. The oversized portion of the metal frame should be pressing against the layer of webbing.
- ④ S-fold or roll the excess webbing. Secure it with one turn single, type I, 1/4-inch cotton webbing using a surgeon's knot and locking knot.

Figure 1-3. Webbing routed and excess secured

AIR FORCE UNILATERAL LOADS

1-17. Air Force unilateral loads are used to support aircrew airdrop proficiency requirements. The loads are designed as an alternative to actual rigged loads, using the procedures for rigging supplies in an A-22 container. Ballast for the unilateral CDS loads normally consists of a welded metal cage, lumber, water barrels, or ammo boxes filled with dirt or rocks; however, any material may be used as long as it is sufficiently restrained. The following exceptions to this manual are authorized for Air Force unilateral loads only.

CAUTION

The load weight may vary from the loads shown. Be sure that each load weight, parachute requirements, CB, and dimensions are computed according to this manual.

- A minimum of two layers of Energy Dissipating Material (honeycomb) will be used on all high velocity loads and a minimum of one layer for all low velocity loads. Each piece of honeycomb will be a minimum of 36 x 44 inches.

- High velocity and low velocity CDS loads weighing 1,600 lbs. or less can be rigged using 3/4-inch skid boards.
- The G-12E or 26-foot ring slot parachute may be attached directly to the D-rings on the A-22 container without using suspension webs. If connected directly to the A-22 container, the bundle height must not exceed 50 inches excluding the height of the parachute.

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Chapter 2

Aircraft Information

ARMY AIRCRAFT

2-1. The following Army aircraft are used to airdrop loads.

- **UH-60 (Blackhawk) Helicopter.** The UH-60 helicopter can carry supplies both internally (door loads) and externally (cargo hook loads). The allowable weight of the total cargo load is determined by responsible aviation personnel. The weight and dimensional limits for door loads are listed in Table 2-1. LCLA loads may be dropped from this aircraft.

CAUTION

UH-60 can only be used for door loads with chaff bucket /dispenser/bracket removed.

- **CH-47 (Chinook) Helicopter.** The CH-47 helicopter can deliver airdrop supplies over the ramp. The weight allowance of the total cargo load is determined by responsible aviation personnel. Any standard A-7A cargo sling, A-21 cargo bag, or A-22 cargo bag load may be dropped from the cargo ramp. LCLA loads may be dropped from the cargo ramp.
- **C-23 (Sherpa) Fixed Wing.** The C23 Sherpa can deliver airdrop supplies over the ramp only. The weight allowance of the total cargo load is determined by responsible aviation personnel. The height of the bundle is restricted to 55 inches including the parachute. Any A-7A cargo sling, A-21 cargo bag, A-22 cargo bag, or LCLA resupply load may be dropped from the cargo ramp.
- **CasA-212 Fixed Wing.** The CasA-212 can deliver airdrop supplies over the ramp only. The weight allowance of the total cargo load is determined by responsible aviation personnel. The height of the bundle is restricted to 65 inches including the parachute. Any A-7A cargo sling, A-21 cargo bag, A-22 cargo bag, or LCLA load may be dropped from the cargo ramp.

Table 2-1. Load limitation for uh-60 helicopter

Door Load Data	UH-60 A/L	
	A-7A/A-21	LCLA
Weight (without parachutes)		
Maximum for A-7A or A-21	500 lb.	
Maximum for LCLA resupply load		450 lb.
Minimum for each container	*	*
Dimensions (including parachute)		
Length	48 in	48 in
Width	30 in	30 in
Height	42 in	42 in
* See Table 1-1 for the minimum weight requirements which are based on type of parachute.		

AIR FORCE AIRCRAFT

2-2. The C-130 and C-17 aircraft can deliver container loads from the paratroop door or from the cargo ramp.

- **Paratroop Door Loads.** The maximum weight limit for the paratroop door load is 500 pounds excluding the weight of the parachute. However, if the load weighs more than 350 pounds, three trained designated pushers must assist the jumpmaster in pushing the load from the aircraft. The dimensions including the parachute must not exceed 48- by 30- by 66-inches. Loads are dropped before parachutists. Loads followed immediately by parachutists are rigged with parachutes having non-breakaway static lines. When the load is dropped from the paratroop door, the largest dimension will be placed in the upright position. The parachute must be placed on top of the load, or toward the inside of the aircraft.
- **Ramp Loads.** A-7A, A-21, and LCLA containers may be dropped off the cargo ramp of a C-130 aircraft. When using the ramp, the skid board must be at least 42 inches in width. A-22 containers may also be dropped from the cargo ramp of a C-17 or a C-130 aircraft in a single or double stick, but the skid board must be 48 inches in width. The number of containers dropped will vary depending on the type of aircraft and the skid board size (see Table 2-2 or 2-4). The maximum height of a container must not exceed 83 inches for C-130 and 101 inches for C-17. The width of the container must not exceed 48 inches.

2-3. The M28 Skytruck can deliver LCLA loads over the ramp only. The weight allowance of the total cargo load is determined by responsible aviation personnel. The maximum height of the load including the parachute is 44 inches. The maximum length of the load is 48 inches and the maximum width is 36 inches. The maximum rigged weight of the load is 518 pounds. The maximum skid board size is 36 inches wide by 48 inches long. The load must meet the 28 pounds per square foot requirement for over the ramp loads. The M28 Skytruck can only drop LCLA loads using the Cross parachute, Double Cross parachutes, 35-Foot Diameter LCLA Cargo parachute, and the 24-Foot Diameter LCLA Cargo parachute.

MARINE CORPS AIRCRAFT

2-4. The C-130 aircraft can deliver container loads from the paratroop door or from the cargo ramp.

- **C-130 Aircraft.** The Marine Corps C-130 uses the same procedures and has the same capability as the Air Force C-130.
- **CH-46 (Sea Knight) Helicopter.** The Marine Corps CH-46 has the same bundle size configuration as the CH-53. LCADS LCC may be dropped from this aircraft with the LCADS high velocity parachute only. LCLA loads maybe dropped from this aircraft with the Cross parachutes only.
- **CH-53 (Sea Stallion) Helicopter.** The CH-53E assault support helicopter is equipped with a seven-blade main rotor and a four-blade canted tail rotor. It is designed for land- and ship-based operations, with an emergency water operating capability. The helicopter is equipped with a rear ramp loading system, cargo winch, roller conveyors, and cargo tie-down facilities. External cargo may be suspended from hooks using either single- or two-point suspension systems. Maximum weight on wheels is 69,750 pounds. Maximum allowable gross weight is 73,500 pounds. Refer to NAVAIR A1-H53BE-NFM-000 Part XI Performance Data for specific capabilities. Inboard cabin compartment floor is limited to static loads of 300 pounds per square foot. Outboard sections of the floor are stressed to greater loads at various positions for vehicle loading capability (NAVAIR A1-H53BE-CLG-000 Figure 3). Roller conveyors are limited to 2,200 pounds on a 48-inch skid board. The maximum usable cabin height is 73 inches. The maximum usable cabin length is 336 inches. The maximum usable cabin width is 76 inches. The maximum airdrop load is 2,200 pounds per container. The tie-down fittings vary in capacity between 5,000 pounds and 20,000 pounds. Specifics can be found in the Cargo Loading Manual NAVAIR A1-H53BE-CLG-000.

- **MV/CV-22 (Osprey) Aircraft.** The MV/CV-22 aircraft is a vertical lift assault support aircraft with (2) three-blade rotors. It is designed for land and ship-based operations. The MV/CV-22 is equipped with a rear ramp loading system with the roller conveyors. The maximum airdrop weight is limited to 4,950 pounds per pass, due to the Cargo Release System. Airdrop loads are limited to a maximum height of 60 inches per single A-22 and 50 inches per double A-22. **All CDS skid boards must be 1 inch AC grade plywood.** Specifics can be found in the cargo loading manual (NAVAIR A1-V22AB-CLG-000). Also look at Table 2-3 on page 2-4.

-
- Notes.** 1. CDS loads to be followed immediately by parachutists must be rigged, unless specified, with parachutes having breakaway static lines.
2. High-velocity CDS dropped over 10,000 feet mean sea level will be rigged with a breakaway static line. (Exception for LCADS parachutes which are break-away static lines at all altitudes)
3. High-velocity CDS dropped under 10,000 feet mean sea level will be rigged with a non-breakaway static line. (Exception for LCADS parachutes which are break-away static lines at all altitudes)
-

Table 2-2. C-130 aircraft CDS capabilities

CDS Skid Dimension	Non-CVRS	CVRS
48- by 48-inch (Standard) can be 48- by 53 ½- inch	Only single stick, 1-8 containers	Single or double stick, 1-16 containers. Must be dropped in even numbers when dropping double stick.
48- by 72-inch stretch container	Only single stick, 1-6 stretch containers	Single or double stick, 1-12 stretch containers. Must be dropped in even numbers when dropping double stick.
48- by 96-inch double A-22 container	Only single stick, 1-4 double containers	Single or double stick, 1-8 double containers. Must be dropped in even numbers when dropping double stick.

-
- Notes.** 1. If the loads have a front or rear overhang, the number of containers will be reduced.
2. When steel strapping is bound around the skid board due to a specific rigging procedure, non-CVRS must be used.
-

CENTERLINE VERTICAL RESTRAINT SYSTEM

- 2-5. The CVRS was designed to provide vertical restraint for container loads in C-130 aircraft.

- **Description.** The CVRS adds a rail in the center of the cargo area. The rail runs from the front of the cargo area of the aircraft to the rear and is bolted in place. Aircraft without the CVRS in place may be loaded with containers positioned in a right stick formation, left stick formation, however, container skid boards must be 48-inches in width and must be 1-inch thick if the rigged weight is 1,600 pounds or greater. Loads weighing 1,599 pounds or less may use ¾-inch skid boards. On aircraft with the CVRS in place, when an A-22 container is being positioned in the right stick, the right edge of the skid is positioned in the right rail of the aircraft dual rail system and the left edge of the skid is positioned in the center rail. The left stick is loaded in a similar manner. On aircraft with the CVRS in place, each stick of containers is independent of the other.

Note. Any overhang must be placed lengthwise in the aircraft. If the container load has an overhang on three or four sides, the load must be dropped in a centerline configuration (non-CVRS).

- **Capabilities.** C-130 aircraft equipped with the CVRS can drop single, stretch, or double A-22 container loads in a single or double stick formation. Both sticks may be released simultaneously, or each stick can be dropped separately. All containers in a stick may be dropped on the same drop zone, or any combination of containers may be dropped on different drop zones. A separate release gate is required for each container or group of containers in each stick to be dropped on a separate drop zone. See Table 1-3, page 1-8, for release gate requirements.

NON-CVRS LOADS

2-6. The CVRS was designed to restrain the load vertically during the aircraft flight. When the load is not restrained to CVRS standards, it must be vertically restrained for flight. These restraints will be removed up to 30 minutes before airdrop. After the restraints are removed, the aircraft will have reduced maneuverability for threat avoidance.

Table 2-3. MV/CV-22 aircraft CDS capabilities

<i>CDS Skid Dimension</i>	<i>Non-CVRS</i>	<i>Note</i>
48- by 48-inch (Standard) can be 48- by 53 ½- inch	Only single stick, 1-2 containers	Maximum of (4) containers for (2) sticks
48- by 72-inch stretch container	Only single stick, 1 container	Maximum of (2) containers for (2) sticks
48- by 96-inch double A-22 container	Only single stick, 1 container	Maximum of (2) containers for (2) sticks
Notes. 1. Maximum width of airdrop loads will not exceed 52 inches. 2. Only 1-inch A/C grade plywood will be used for containers.		

INBOARD LOGISTICS RAIL

2-7. The inboard logistics rail was designed to restrain container loads vertically in the C-17 aircraft.

- **Description.** The inboard logistics rail is a permanent rail in the center of the C-17 aircraft cargo area. It runs from the front of the cargo area to the rear and folds down when not in use. The aircraft may be loaded with A-22 containers positioned in the right stick formation, left stick formation, or both; however, container skid boards must be 48-inches in width and must be 1-inch thick if the rigged weight is 1,600 pounds or greater. Loads weighing 1,599 pounds or less may use ¾-inch skid boards. When A-22 containers are being positioned in the right stick, the right edge of the skid is positioned in the right rail of the aircraft aerial delivery system rail and the left edge of the skid is positioned in the inboard logistics rail. The left stick is loaded in a similar manner. Each stick of containers is independent of each other.

Note. The width of the container load **MUST NOT** exceed 48 inches.

- **Capabilities.** The C-17 aircraft can drop single or double A-22 container loads in either a single or double stick configuration, but double sticks must have an even number of containers. Both sticks may be released simultaneously, or each stick can be dropped separately. All containers in a

stick may be dropped on the same drop zone, or any combination of containers may be dropped on different drop zones. A separate release gate is required for each container or group of containers in each stick to be dropped on a separate drop zone. See Table 1-3, page 1-8, for release gate requirements.

Table 2-4. C-17 aircraft CDS capabilities

<i>CDS Skid Dimension</i>	<i>Inboard Logistics Rail</i>
48- by 48-inch can be 48- by 53 ½- inch	Single or double stick, 1-40 containers. Must be dropped in even numbers when dropping double stick.
48- by 72-inch stretch container	Single or double stick, 1-20 stretch containers. Must be dropped in even numbers when dropping double stick.
48- by 96-inch double A-22 container	Single or double stick, 1-20 double containers. Must be dropped in even numbers when dropping double stick.

Note. If the loads have a front or rear overhang, the number of containers will be reduced.

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PART TWO

Rigging A-7A Container Loads

Chapter 3

General Information and Procedures for A-7A

A-7A AIRDROP CARGO SLING ASSEMBLY

3-1. The A-7A airdrop cargo sling assembly consists of four D-rings and four identical sling straps. Each strap is 188 inches long and has a friction adapter attached at one end. To rig an A-7A container, two or more straps are required. Figure 3-1 shows an A-7A airdrop cargo sling assembly.

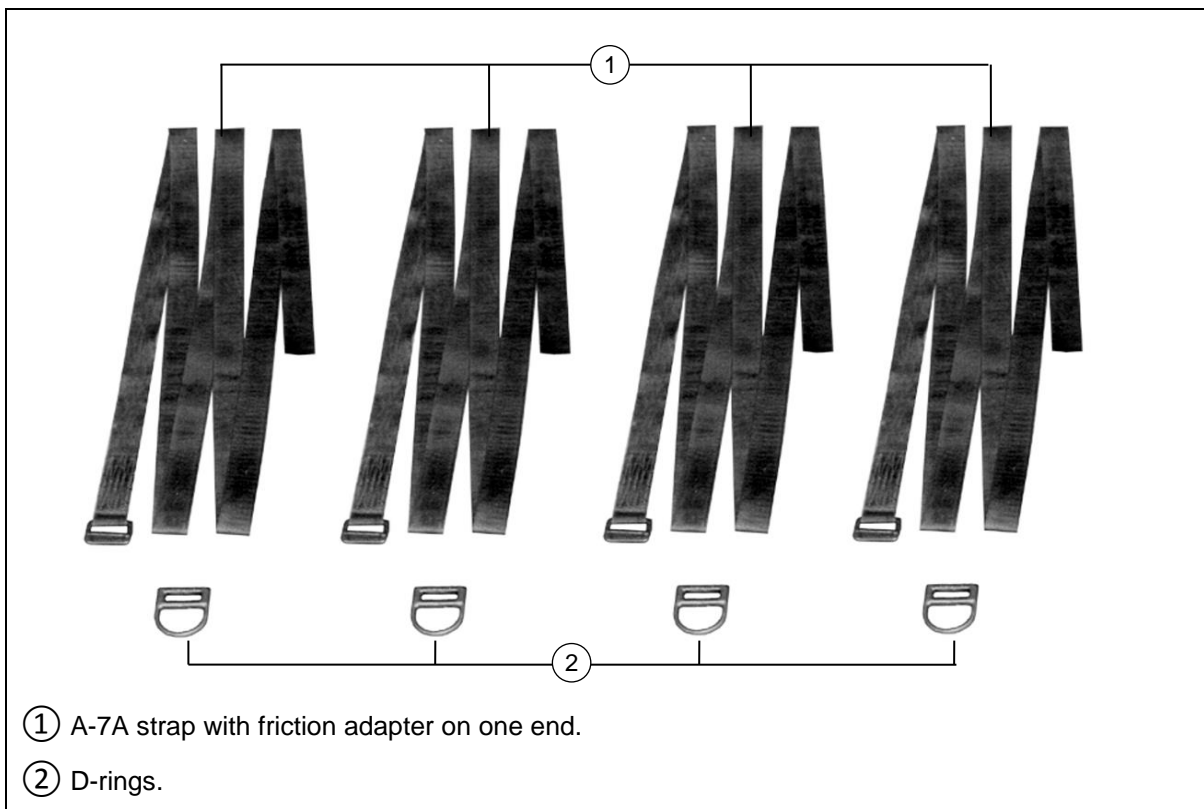


Figure 3-1. A-7A airdrop cargo sling assembly

WEIGHT LIMITS

3-2. The maximum weight of this container will vary according to the number of straps, but must not exceed 500 pounds. When two straps are used, 300 pounds is the maximum weight. When three straps are used, 400 pounds is the maximum weight. When four or more straps are used, the maximum weight must not exceed 500 pounds. The minimum weight will vary according to the parachute used. When dropped from the paratroop doors, the load must weigh a minimum of 11 pounds per square foot and 28 pounds per square foot from the ramp. Table 3-1 lists parachutes used with this container and the weight restrictions.

Table 3-1. Parachute requirements for A-7A container loads

Parachute	Suspended Weight (Pounds)	
	Minimum	Maximum
Low-Velocity		
One 68-inch pilot	30	50
Three 68-inch pilot	51	200
One T-10 modified cargo	90	500
One G-14 cargo	200	500
High-Velocity		
One 68-inch pilot	75	150
Three 68-inch pilot	151	500
* One 12-foot high-velocity	151	500
One 15-foot cargo extraction	151	500
* Primary Parachute		

A-7A CONTAINER LOADS

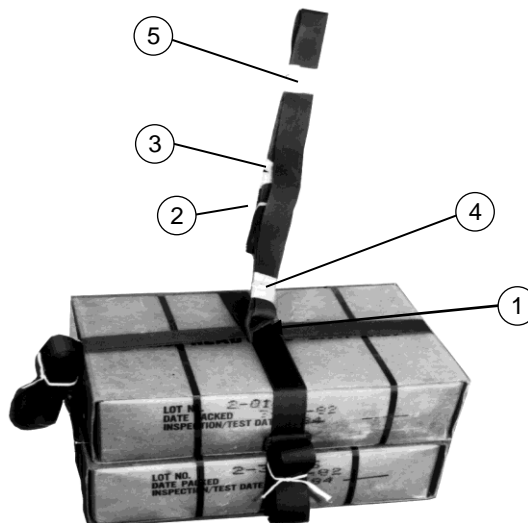
3-3. The A-7A loads can be rigged for low-velocity or high-velocity airdrop. The container can exit the aircraft either through the paratroop doors or off the ramp. The equipment should be padded with felt, cellulose wadding, or honeycomb. This container is usually used to supply small items, ready-to-use or disassembled equipment, or other non-fragile supplies. The load can be rigged by the using unit. The parachute must be packed by a parachute rigger. It is only required to be inspected by a jumpmaster or parachute rigger.

PARACHUTES FOR A-7A LOADS

3-4. To select a parachute for an A-7A load, consider the type of airdrop (low-velocity or high-velocity) and the weight of the rigged container, shown in Table 3-1. Pack and install the parachute as described below.

- **Low-Velocity Loads.** The parachutes that can be used to rig an A-7A load for low-velocity airdrop are described below.
 - One 68-inch pilot parachute. Pack one 68-inch pilot parachute in accordance with TM 10-1670-281-23&P/TO 13C5-32-2/NAVAIR 13-1-32. Install the parachute as shown in Figure 3-2.
 - Three 68-inch pilot parachutes. Pack three 68-inch pilot parachutes in accordance with TM 10-1670-281-23&P/TO 13C5-32-2/NAVAIR 13-1-32. Install the parachute as shown in Figure 3-3.

Note. Use masking tape only.



- ① Pass the free end of an A-7A strap through the D-ring on top of the load. Pass the free end of the strap through the friction adapter. Tighten the strap until a 24-inch loop is formed.

Note. Route the strap so that the oversized portion of the metal frame is down. Make sure the friction adapter is about halfway down the strap.

- ② Fold the excess strap. Secure the excess strap according to Chapter 1.
- ③ Tape the friction adapter.
- ④ Tape the strap together 2 inches above the D-ring with masking tape.
- ⑤ Tape the other end of the strap together so that a 3-inch loop is formed.

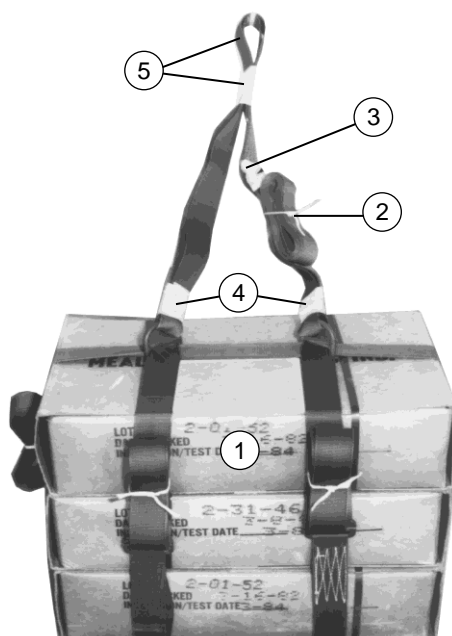
Figure 3-2. One 68-inch pilot parachute installed



- ⑥ Place the 3-inch loop on the parachute L-bar connector link. Fasten the L-bar connector link.
- ⑦ Place the 68-inch pilot parachute on top of the load. Tie each side of the parachute to one A-7A strap with a length of ticket number 8/7 cotton thread.
- ⑧ Fold the static line and secure it to top of the load with retainer bands.

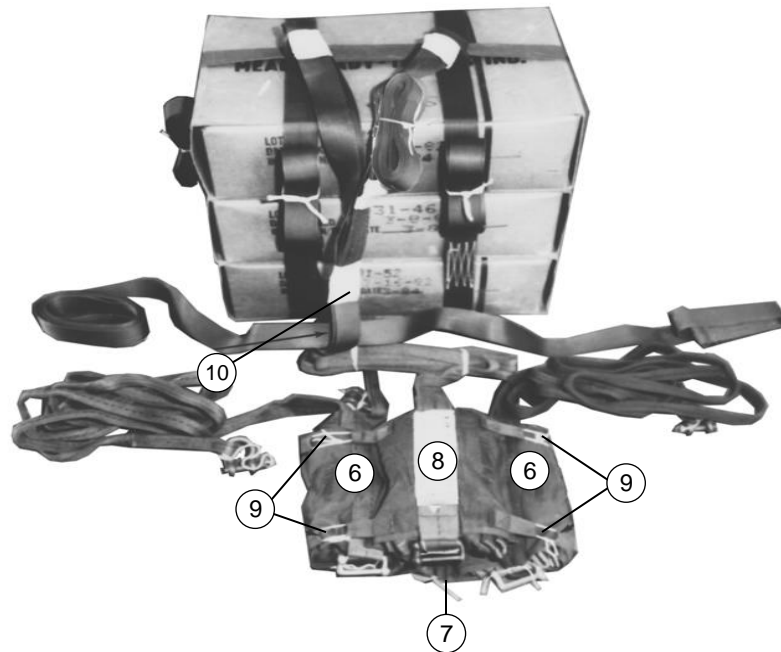
Figure 3-2. One 68-inch pilot parachute installed (continued)

Note. Use masking tape only.



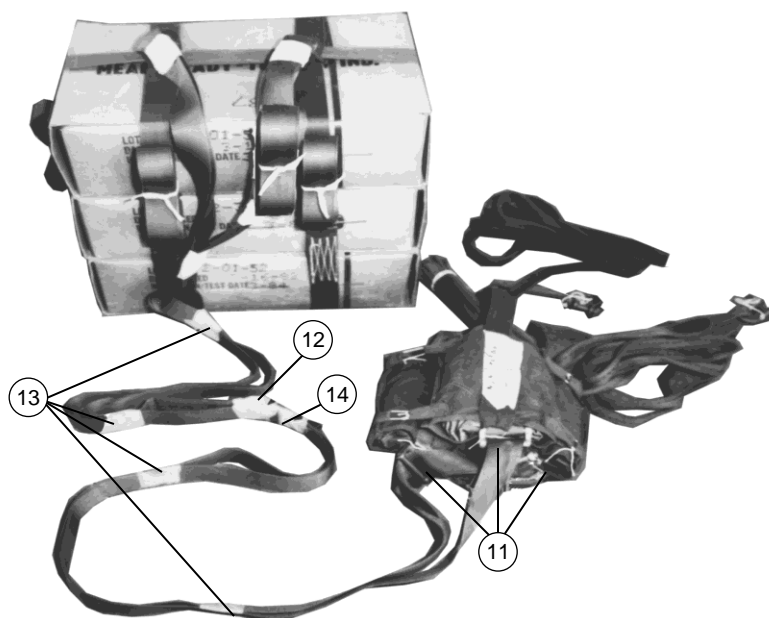
- ① Pass the free end of an A-7A strap through the two D-rings on top of the load. Pass the free end of the strap through the friction adapter. Pull both plies of the strap upward between the D-rings. Tighten the strap until the two plies of the strap are 24-inches above the load.
- ② Fold the excess strap. Secure the excess strap according to Chapter 1.
- ③ Tape the friction adapter with masking tape.
- ④ Tape the A-7A strap together 2 inches above each D-ring.
- ⑤ Form a 3-inch loop in the center of the A-7A strap. Tape the plies of the strap together below the loop.

Figure 3-3. Three 68-inch pilot parachutes installed



- ⑥ Place two 68-inch parachutes on a flat, dry surface.
- ⑦ Tie the parachutes together using the closest bag attaching loops with one length of ticket number 8/7 cotton thread at the top of the bag and one length at the bottom of the bag.
- ⑧ Place a third 68-inch parachute on top of the two parachutes in step 6.
- ⑨ Tie the top (third) parachute bag attaching loops to the outside bag attaching loops on the bottom parachutes with four lengths of ticket number 8/7 cotton thread.
- ⑩ Pass the free end of another A-7A strap through the 3-inch loop (step 5) in the other A-7A strap.

Figure 3-3. Three 68-inch pilot parachutes installed (continued)



- ⑪ Pass the free end of the A-7A strap through the L-bar connector links of each 68-inch parachute.
- ⑫ Pass the free end of the A-7A strap through the friction adapter, and tighten it to a length of 7 feet. Tape the friction adapter.
- ⑬ Tape the plies of the A-7A strap together.
- ⑭ Fold and tape the excess strap.

Figure 3-3. Three 68-inch pilot parachutes installed (continued)

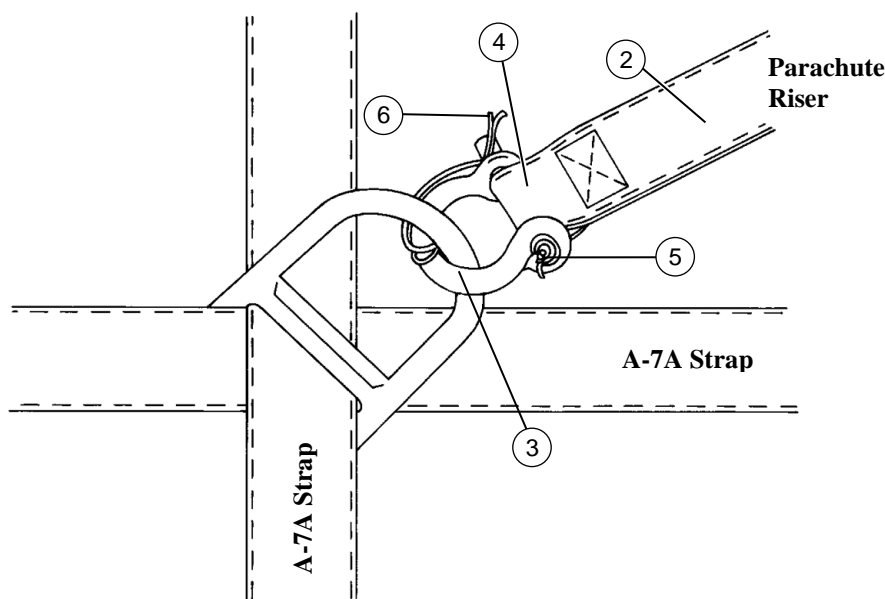


- ⑮ Fold the A-7A straps and lay them on top of the load. Tie the folds to the top of the load with two lengths of ticket number 8/7 cotton thread.
- ⑯ Place the parachutes on top of the load. Tie the parachute bag attaching loops to the A-7A straps with four lengths of ticket number 8/7 cotton thread.
- ⑰ Tape the parachute static lines together. Tie the static lines to the top of the load with ticket number 8/7 cotton thread.

Figure 3-3. Three 68-inch pilot parachutes installed (continued)

- One G-14 Cargo Parachute. Install the parachute as shown in Figure 3-4.

Note. This drawing is not drawn to scale.



- ① Place the parachute on top of the load between the D-rings (not shown).
- ② Pull each riser to the closest D-ring.
- ③ Place the bell portion of the clevis on one D-ring.
- ④ Place the loop on the end of the riser between the clevis arms.
- ⑤ Insert the clevis pin through the hole in the clevis arm, through the loop on the riser, and through the hole in the other clevis arm.
- ⑥ Insert the cotter pin in the hole of the clevis pin. Spread the ends of the cotter pin enough to prevent the cotter pin from sliding out of the clevis pin.
- ⑦ Attach the other riser to the other D-ring as described in steps 3 through 6 (not shown).

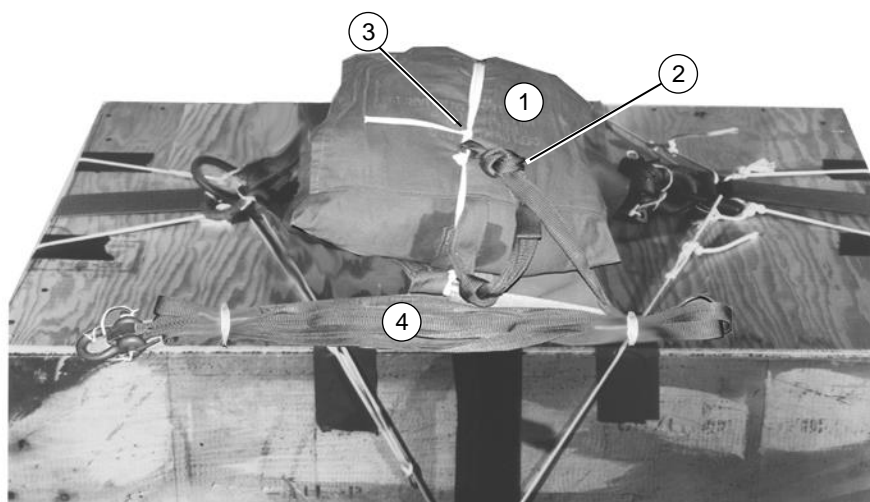
Figure 3-4. G-14 cargo parachute installed



- ⑧ Tie the parachute tie tapes to convenient points on the load with bow knots.

Figure 3-4. G-14 cargo parachute installed (continued)

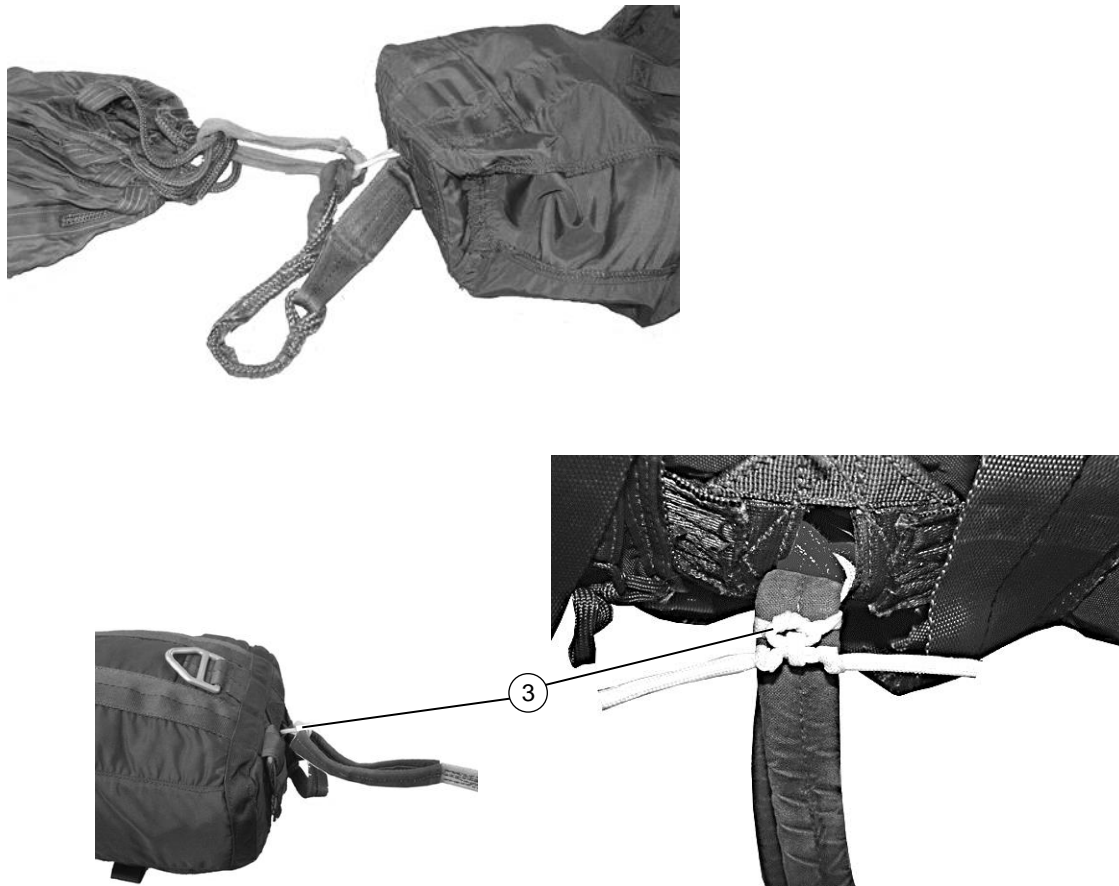
- **High-Velocity Loads.** The parachutes that can be used to rig an A-7A load for high-velocity airdrop are described below.
 - One 68-inch Pilot Parachute. Install one 68-inch pilot parachute as described in paragraph 3-4.
 - Three 68-inch Pilot Parachute. Install three 68-inch pilot parachutes as described in paragraph 3-4.
 - One 12-foot, High-Velocity Cargo Parachute. Install a 12-foot parachute as shown in Figure 3-5.
 - One 15-foot Cargo Extraction Parachute. When the 15-foot cargo extraction parachute is used, modify the parachute as shown in Figure 3-6. Install parachute as shown in Figure 3-7.



- ① Center the parachute and attach risers to D-rings as described in Figure 3-4, steps 1 through 7.
- ② Form a 3-inch diameter loop in the static line by tying an overhand knot approximately 8 inches up from the deployment bag main strap attaching loop.
- ③ Tie one end of a length of type I, 1/4-inch cotton webbing to a convenient point on the load on top of the load. Route the free end of the cotton webbing through the retaining loop, through the loop in the static line, and around a convenient point on the load. Form a trucker's hitch knot to secure the parachute.
- ④ S-fold the static line on top of the load. Secure the folds to the load with a retainer band.

Figure 3-5. 12-foot high-velocity cargo parachute

Note. For a breakaway static line girth hitch the static line through the deployment bag retaining loop and tie a 3-inch loop of gutted type III nylon cord through the static line loop and through the small clevis.



- ① Invert the 15-foot cargo extraction parachute deployment bag.
- ② Route one end of the gutted type III nylon cord through the hole in the top of the deployment bag and through the bridle loop then back out through the hole in the top of the deployment bag.
- ③ Route the ends of the type III nylon cord through the static line buffer loop in opposite directions and draw the ends tight. Tie the ends of the type III nylon cord together with a surgeon's knot and locking knot. Tie an overhand knot in each end.
- ④ Pack the 15-foot cargo extraction parachute according to TM 10-1670-278-23&P/TO 13C5-26-2/TM 01109C-23&P/ NAVAIR 13-1-27 (not shown).

Figure 3-6. 15-foot cargo extraction parachute modified

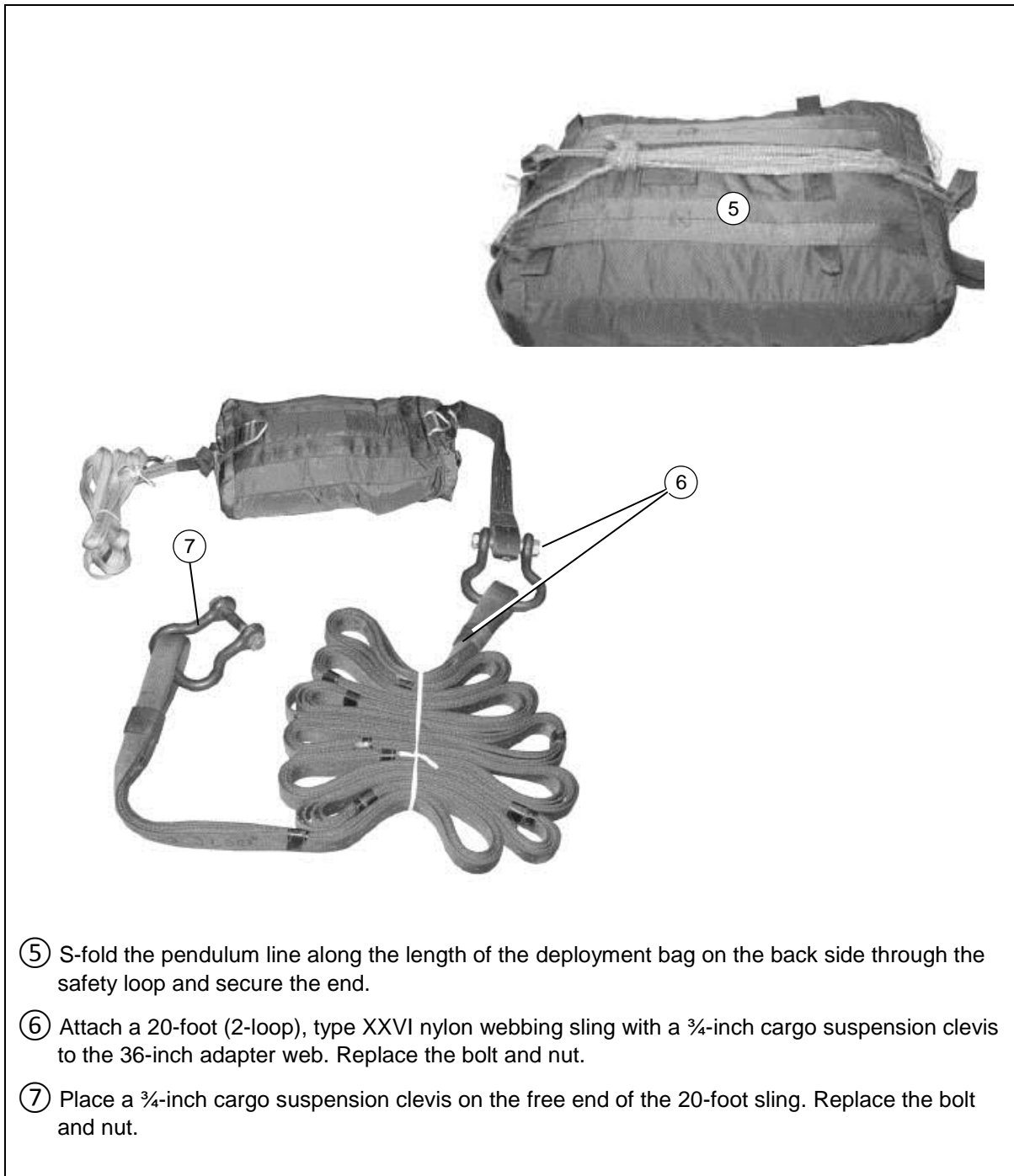
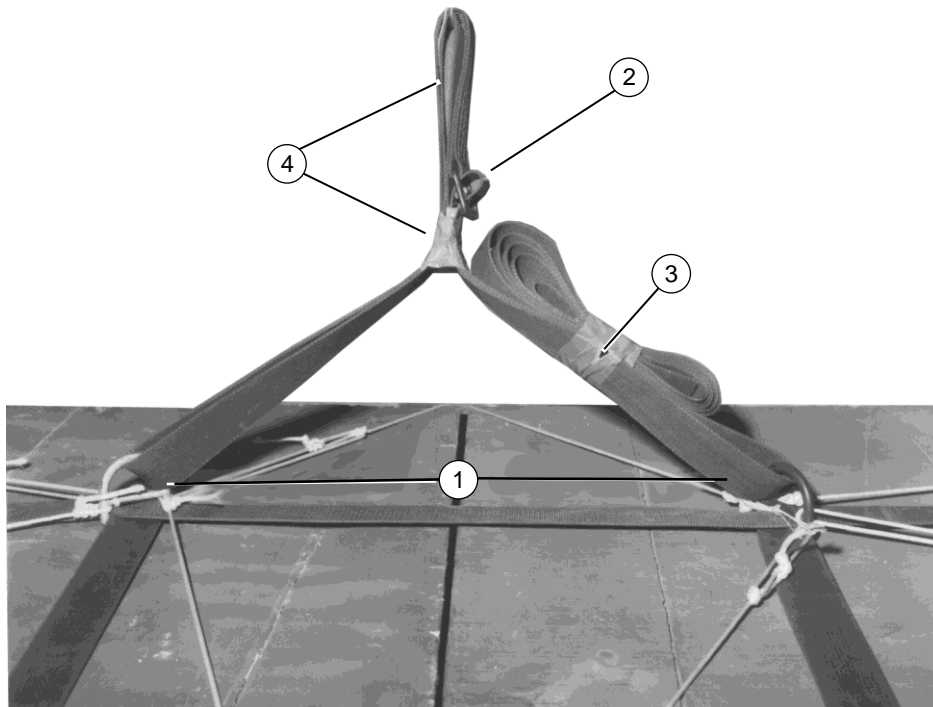


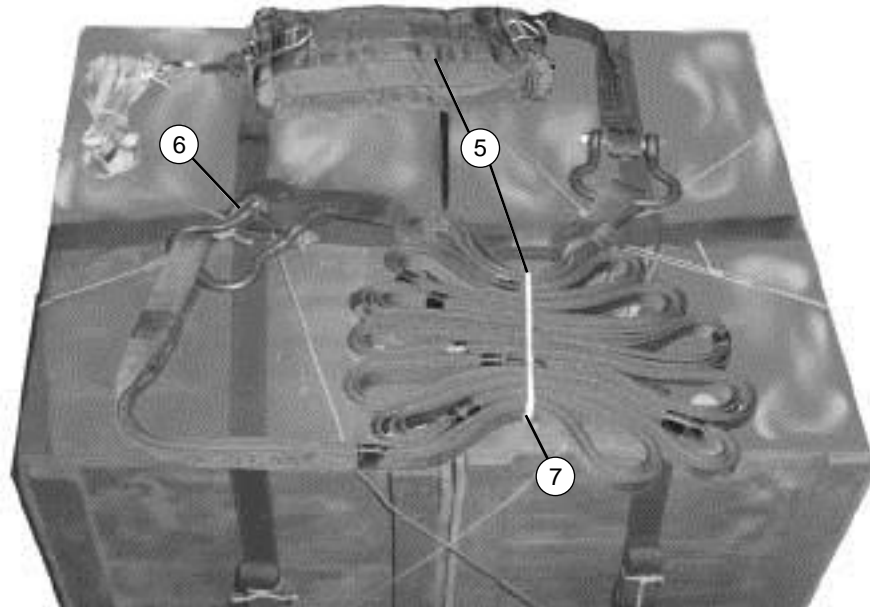
Figure 3-6. 15-foot cargo extraction parachute modified (continued)

Note. Use masking tape only.



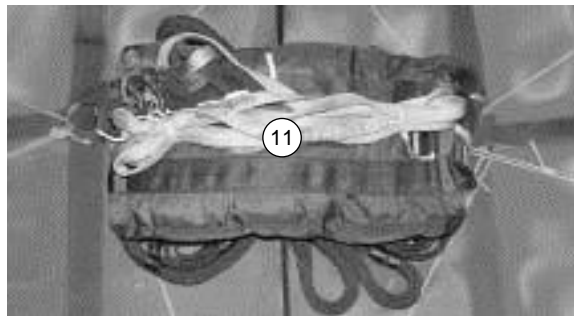
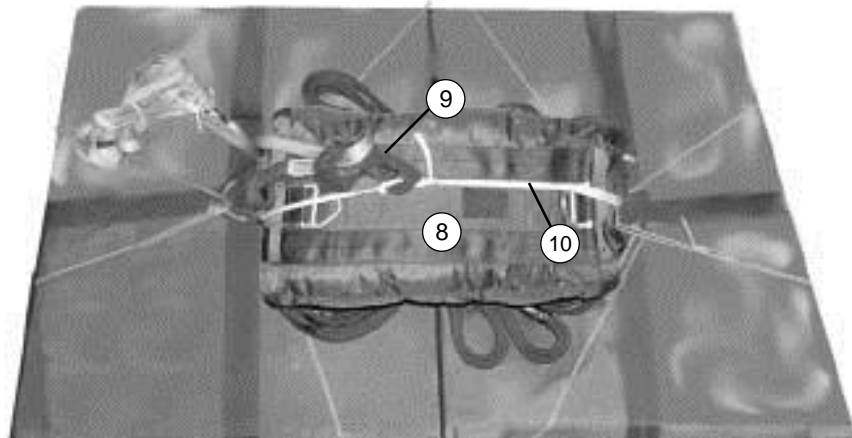
- ① Pass the free end of an A-7A strap through the two D-rings on top of the load.
- ② Fasten the strap with the friction adapter. Pull the end of the strap through the friction adapter until the double length of the strap is 24 inches long.
- ③ Fold the excess strap. Secure the folds to the strap with tape or type I, ¼-inch cotton webbing.
- ④ Pull the two plies of the strap upward. Form a 6-inch loop in the center of the strap and tape the plies of the strap together below the loop.

Figure 3-7. One 15-foot cargo extraction parachute installed



- ⑤ Place the modified 15-foot cargo parachute and the 20-foot sling on top of the load.
- ⑥ Place the loop formed in step 4 on the bolt of the cargo suspension clevis on the end of the 20-foot sling. Replace the nut.
- ⑦ Fold the 20-foot sling and tie the fold in place with suitable lengths of type I, ¼-inch cotton webbing.

Figure 3-7. One 15-foot cargo extraction parachute installed (continued)



- ⑧ Center the sling and the parachute on the load.
- ⑨ Form a 3-inch diameter loop in the static line by tying an overhand knot approximately 12-inches up from the deployment bag main strap attaching loop.
- ⑩ Tie one end of a length of type I, ¼-inch cotton webbing to a convenient point on the top of the load. Route the free end of the cotton webbing through the retaining loop, through the loop in the static line, and around a convenient point on the load. Form a trucker's hitch knot to secure the parachute.
- ⑪ Attach a retainer band to each V-ring and S-fold the static line to the V-rings.

Figure 3-7. One 15-foot cargo extraction parachute installed (continued)

MODIFYING THE T-10 PARACHUTE

3-5. The T-10 personnel parachute may be used as the recovery parachute on container loads weighing at least 90 pounds but not more than 500 pounds. However, the T-10 parachute must be modified to be used on container loads. Prepare the T-10 parachute as shown in TM 10-1670-331-23&P: Install the T-10 modified parachute as shown in Figure 3-4. Then use procedures in Figure 3-7, steps 9 and 10 for securing the parachute.

Chapter 4

Rigging Typical A-7A Containers

SECTION I – LOW-VELOCITY AIRDROP FROM PARATROOP DOOR

DESCRIPTION OF LOAD

4-1. Typical loads are rigged for low-velocity airdrop from a paratroop door of an aircraft. Typical loads may include rations, small equipment, water cans, or other supplies. Items should be padded and/or placed in boxes to prevent damage during airdrop. This load must not exceed 500 pounds, excluding the weight of the parachute. The minimum weight will vary according to the parachute. The maximum dimensions for this load is 48- by 30- by 66-inches including parachute. When the load is dropped, the largest dimension will be placed in an upright position in the door. The parachute will be on top or on the side located inside the aircraft. When the weight of the load exceeds 350 pounds, three trained designated pushers will assist the jumpmaster in pushing the load out. When dropped from the paratroop doors, the load must weigh a minimum of 11 pounds per square foot and 28 pounds per square foot from the ramp.

POSITIONING STRAPS

4-2. Position straps as shown in Figure 4-1.

-
- Notes.** 1. When two straps are used, a piece of type III nylon cord needs to be placed parallel to the bottom strap.
2. When positioning straps, make sure the oversized portion of the metal frame on the friction adapter is up.
-

Note. These drawings are not drawn to scale.

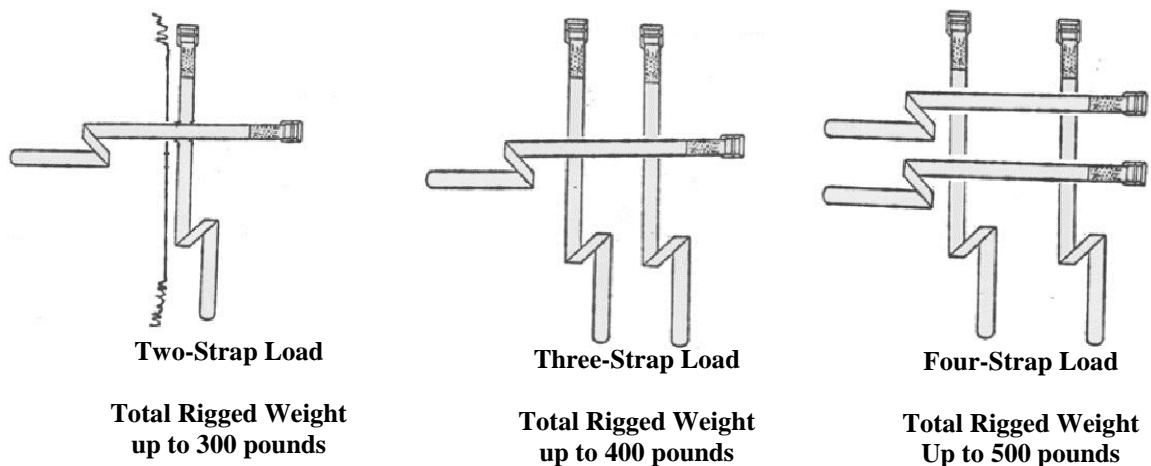
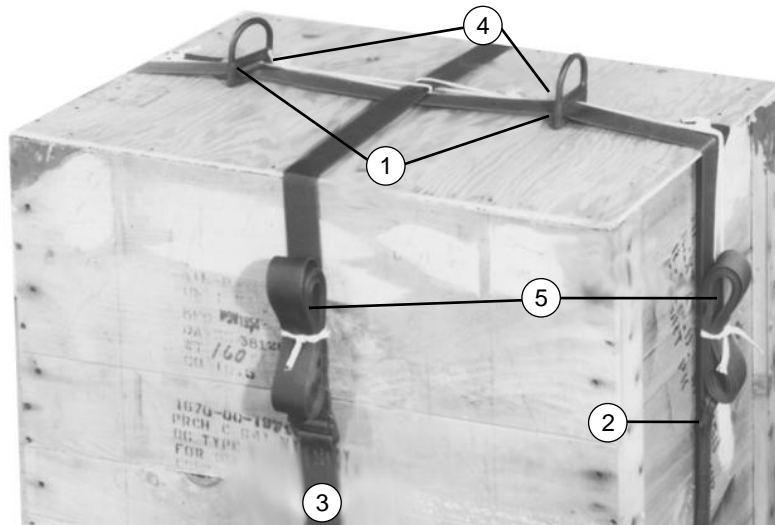


Figure 4-1. A-7A straps positioned

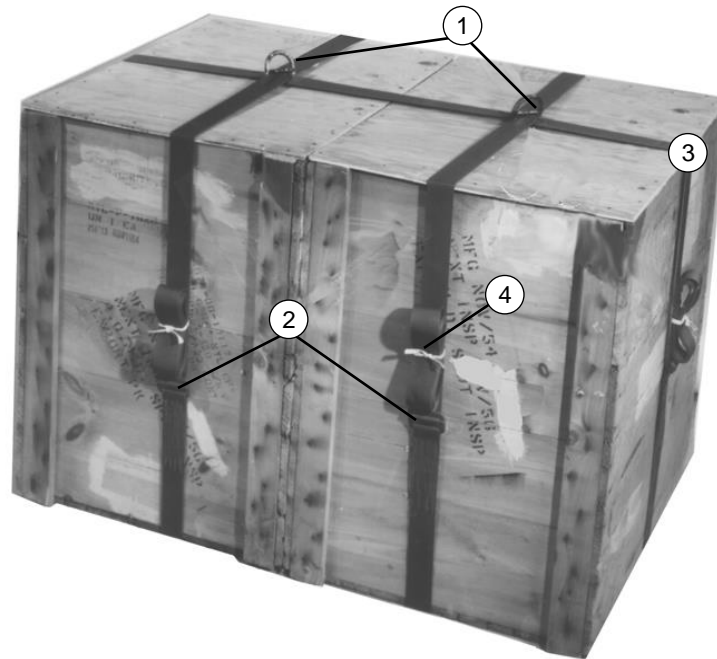
POSITIONING LOAD AND SECURING STRAPS

4-3. Center the equipment on the straps. If needed, honeycomb can be placed under the equipment. Secure the straps as shown in Figure 4-2 for a two-strap load, Figure 4-3 for a three-strap load, and Figure 4-4 for a four-strap load.



- ① Using the strap with the type III nylon cord beside it, route the strap through the rectangular portion of the two D-rings.
- ② Route the strap with D-rings on it over the load and route it through the friction adapter. Center the D-rings on top of the load 12 inches apart and apply tension to the strap.
- ③ Route the other strap over the load and route it through the friction adapter. Apply tension to the strap.
- ④ Route one end of the type III nylon cord over the top of the load. Tie a knot around the first D-ring and tie the running end of the type III nylon cord to the other D-ring. Repeat step for the other side. Tie knots in the running ends and trim the excess to 2 inches.
- ⑤ S-fold or roll the excess webbing. Secure it with one turn single, type I, ¼-inch cotton webbing using a surgeon's knot and locking knot.

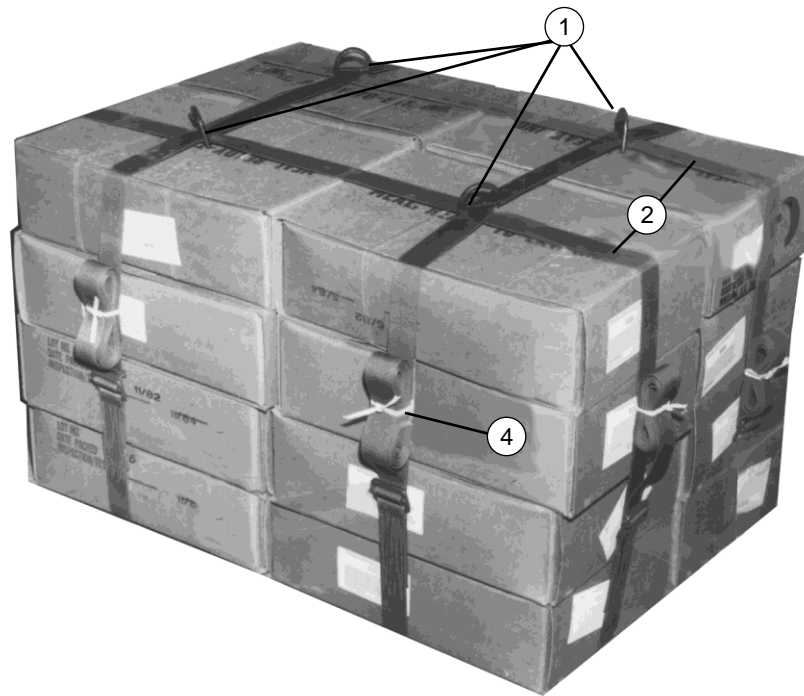
Figure 4-2. Two-strap load positioned and secured



- ① Route each parallel strap through the rectangular portion of a D-ring.
- ② Route the two straps with D-rings over the load and through the friction adapters. Center the D-ring on top of the load and apply tension.
- ③ Route the third strap through the rectangular portion of each D-ring, through the friction adapter, and apply tension.
- ④ S-fold or roll the excess webbing. Secure it with one turn single, type I, ¼-inch cotton webbing using a surgeon's knot and locking knot.

Figure 4-3. Three-strap load positioned and secured

Note. Loads may need to be supported with either a piece of honeycomb or plywood to prevent boxes from collapsing.



- ① Using two straps and four D-rings, route each strap through the rectangular portion of two D-rings and route the straps over the load and through the friction adapters. Ensure the D-rings are on top of the load.
- ② Using two additional straps for the sides, route one strap through the rectangular portion of the rear set of D-rings and through the friction adapters. Repeat with other strap through front set of D-rings.
- ③ Apply tension to all straps ensuring the D-rings stay in place.
- ④ S-fold or roll the excess webbing. Secure it with one turn single, type I, ¼-inch cotton webbing using a surgeon's knot and locking knot.

Figure 4-4. Four-strap load positioned and secured

INSTALLING PARACHUTE

4-4. Install a 68-inch parachute, T-10 modified cargo, or a G-14 cargo parachute on the load according to Chapter 3.

MARKING RIGGED LOAD

4-5. Mark the rigged load according to Chapter 1, paragraph 1-5. Compute the rigged load data for the two-, three-, and four-strap loads as shown in Figure 4-5. An AMC IMT 1033, 20050204, V1. (Shipper's Declaration for Dangerous Goods) may be required.



RIGGED LOAD DATA WITHOUT PARACHUTE

Two-strap with one 68-inch parachute	30 - 50 pounds
with three 68-inch parachutes	51 - 200 pounds
with one T-10 modified parachute.....	90 - 300 pounds
with one G-14 cargo parachute.....	200 - 300 pounds
Three-strap with one 68-inch parachute	30 - 50 pounds
with three 68-inch parachutes	51 - 200 pounds
with one T-10 modified parachute.....	90 - 400 pounds
with one G-14 cargo parachute.....	200 - 400 pounds
Four-strap with one 68-inch parachute	30 - 50 pounds
with three 68-inch parachutes	51 - 200 pounds
with one T-10 modified parachute.....	90 - 500 pounds
with one G-14 cargo parachute (shown).....	200 - 500 pounds

Figure 4-5. Typical four-strap load rigged for low-velocity paratroop door airdrop

EQUIPMENT REQUIRED

4-6. Use the equipment listed in Table 4-1 to rig a four-strap load for low-velocity airdrop as shown in Figure 4-5.

Table 4-1. Equipment required for rigging the four-strap A-7A load for low-velocity paratroop door airdrop

<i>National Stock Number</i>	<i>Item</i>	<i>Quantity</i>
4020-00-240-2146	Cord, nylon, type III	As required
8135-00-664-6958	Cushioning material, cellulose wadding	As required
1670-00-753-3928	Pad, energy dissipating, honeycomb	As required
1670-00-999-2658	Parachute, cargo, G-14	1
	OR	
N/A	Parachute, cargo, modified, T-10	1
	OR	
1670-00-216-7297	Pilot parachute, cargo, 68-inch	1 or 3
1670-00-251-1153	Sling assembly, cargo airdrop, A-7A	1
7510-00-266-6710	Tape, masking, 2-inch	As required
	Webbing:	
8305-00-268-2411	Cotton, ¼-inch, type I	As required
	Nylon:	
8305-00-082-5752	Tubular, ½-inch	As required

SECTION II – LOW-VELOCITY AIRDROP FROM RAMP

DESCRIPTION OF LOAD

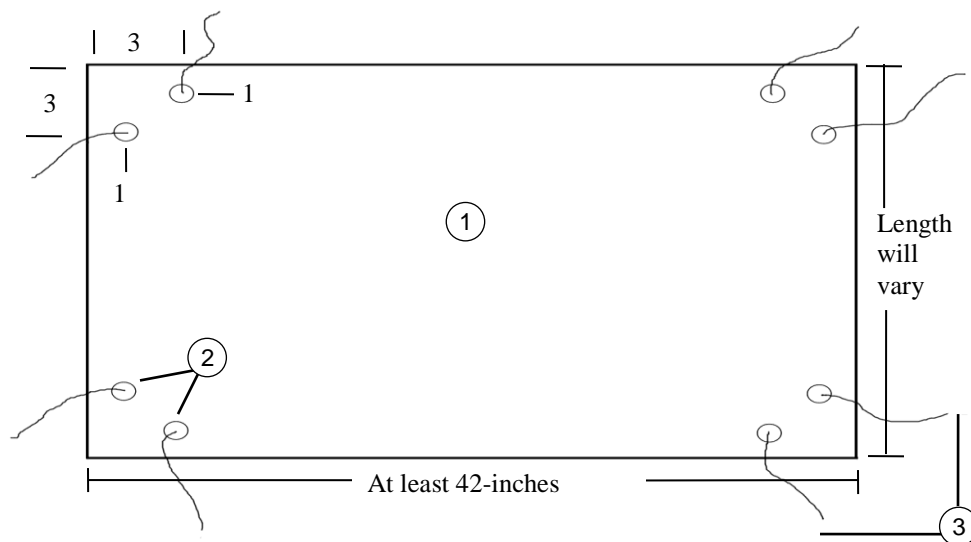
4-7. A-7A containers can be rigged to be dropped off the ramp of an aircraft. The load is rigged the same as paratroop door drops but it must have a skid board attached. The skid board must project 2 inches beyond the C-130 aircraft's inboard roller channel. The minimum width of the skid board for C-130 aircraft must be at least 42-inches. However, the skid board must be 48-inches wide for the C-17 and 48-inches wide for the C-130 when the CVRS is used. The weight range for ramp drops is 200 to 500 pounds without the weight of the parachute. The T-10 modified cargo or G-14 cargo parachute is the only parachute used on low-velocity ramp drops. Table 3-1 gives the weight ranges.

Note. Containers dropped from the ramp require a minimum weight of 28 pounds per square foot.

PREPARING SKID BOARD

4-8. Prepare the skid board as shown in Figure 4-6.

Notes. 1. This drawing is not drawn to scale.
2. All dimensions are given in inches.



- ① Place a ½- or ¾-inch piece of plywood on a flat surface. Size will vary depending on load.
- ② Drill eight ½-inch holes as shown above.
- ③ Pass a length of type III nylon cord through each set of holes. The length of the cord will vary according to the height of the load. If the type III nylon cord is not available, use ½-inch tubular nylon webbing.

Figure 4-6. Skid board prepared

PLACING HONEYCOMB AND POSITIONING STRAPS

4-9. Place the honeycomb on the skid board as shown in Figure 4-7. Position the straps as shown in Section I of this chapter.

POSITIONING LOAD AND SECURING STRAPS

4-10. Position the load and secure the straps as shown in Section I of this chapter.

SECURING SKID BOARD

4-11. Secure the skid board to the three-strap load as shown in Figure 4-8. Adapt the procedures in Figure 4-8 for a two-strap load. Secure the skid board to a four-strap load as shown in Figure 4-9.

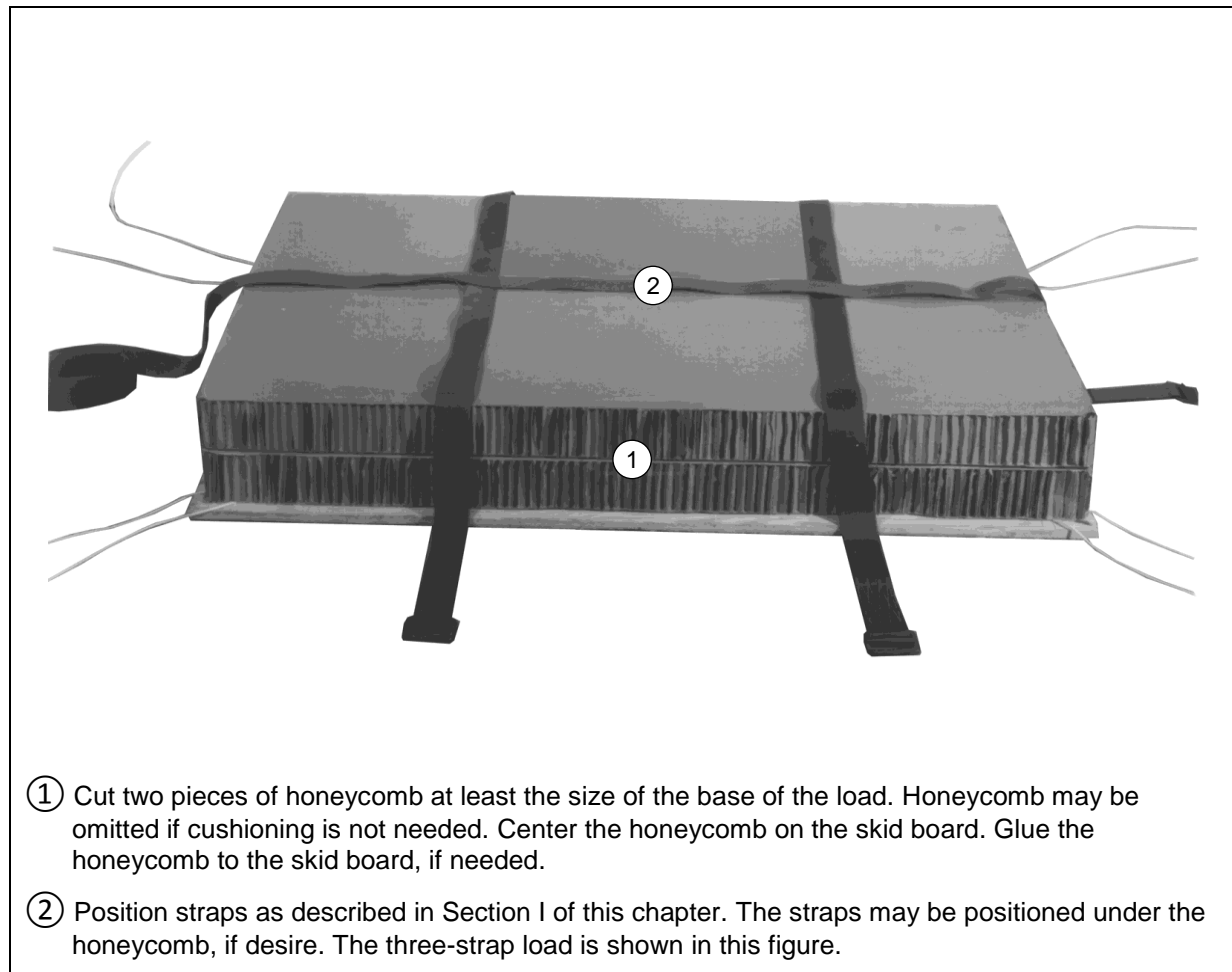
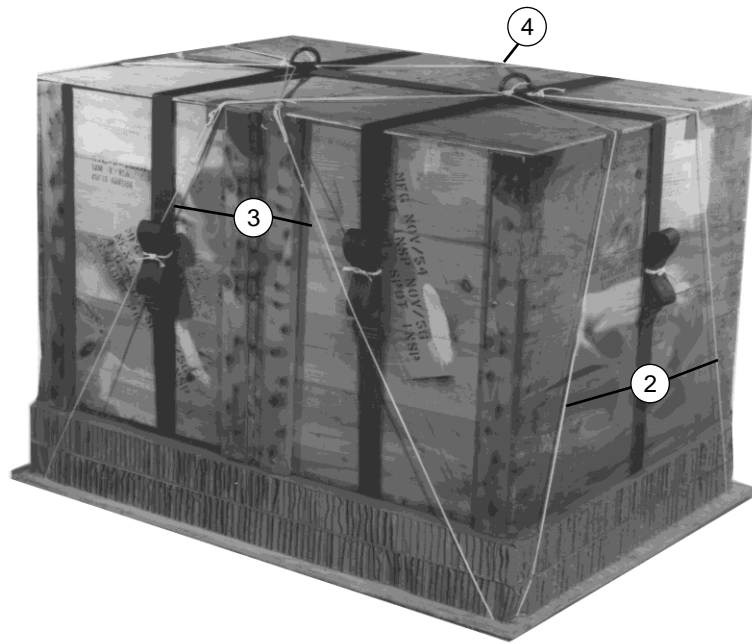
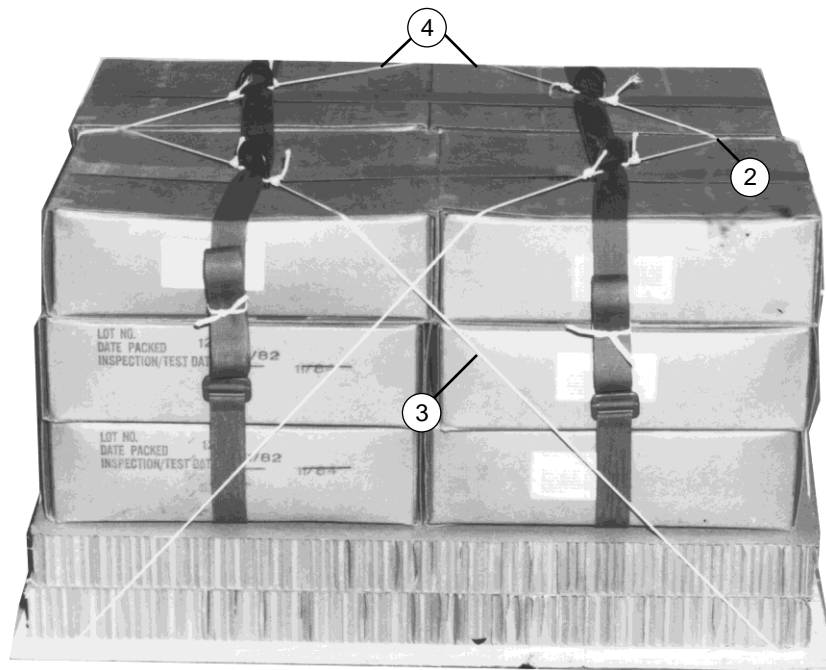


Figure 4-7. Honeycomb placed and straps positioned



- ① Secure the load as shown in Figure 4-3.
- ② Tie the two lengths of type III nylon cord on the right side of the skid board to the D-ring on top right side of the load. Repeat for the left side.
- ③ Tie the front right length of type III nylon cord to the D-ring on the top left side of the load using a trucker's hitch knot and an overhand knot in the running end. Repeat for the front left length of cord.
- ④ Repeat step 3 for the rear side of the load.

Figure 4-8. Skid board secured to three-strap load



- ① Secure the load as shown in Figure 4-4.
- ② Tie the front right length of type III nylon cord to rear right D-ring. Tie the rear right length of cord to the front right D-ring. Repeat for the left side.
- ③ On the front of the skid board, cross the right length of cord over to the front left D-ring. Tie it with a trucker's hitch knot with a knot in the running end. Repeat for the left side length of cord using the right front D-ring.
- ④ Repeat for the rear lengths of cord.

Figure 4-9. Skid board secured to four-strap load

INSTALLING PARACHUTE

4-12. Install a T-10 modified cargo or a G-14 cargo parachute on the load according to Chapter 3.

MARKING RIGGED LOAD

4-13. Mark the rigged load according to Chapter 1, paragraph 1-5. Compute the rigged load data for the two-, three-, and four-strap loads as shown in Figure 4-5. An AMC IMT 1033, 20050204, V1. (Shipper’s Declaration for Dangerous Goods) may be required.



RIGGED LOAD DATA (WITHOUT PARACHUTE)

Weight (without parachute)	200 - 500 pounds
Parachute (shown)	G-14 cargo
Weight (without parachute)	90 - 500 pounds
Parachute.....	T-10 cargo modified

Figure 4-10. Four-strap A-7A load rigged for low-velocity ramp airdrop

EQUIPMENT REQUIRED

4-14. Use the equipment listed in Table 4-2 to rig a four-strap load for low-velocity ramp airdrop as shown in Figure 4-10.

Table 4-2. Equipment required for rigging the four-strap A-7A load for low-velocity ramp airdrop

<i>National Stock Number</i>	<i>Item</i>	<i>Quantity</i>
4020-00-240-2146	Cord, nylon, type III	As required
8135-00-664-6958	Cushioning material, packaging, cellulose wadding	As required
1670-00-753-3928	Pad, energy-dissipation material, honeycomb	As required
1670-00-999-2658	Parachute, G-14	1
	OR	
N/A	Parachute, cargo, modified, T-10	1
	Plywood:	
5530-00-129-7777	½- by 48- by 96-inch	1 sheet
	or	
5530-00-128-4981	¾- by 48- by 96-inch	1 sheet
1670-00-251-1153	Sling assembly, cargo airdrop, A-7A	1
	Webbing:	
8305-00-268-2411	Cotton, ¼-inch, type I	As required
	Nylon:	
8305-00-082-5752	Tubular, ½-inch	As required

SECTION III – HIGH-VELOCITY AIRDROP

DESCRIPTION OF LOAD

4-15. An A-7A load rigged for high-velocity airdrop is rigged in a similar manner to low-velocity. Three layers of honeycomb and a skid board are required for paratroop door or ramp drop. This load must not exceed 500 pounds, excluding the weight of the parachute.

PREPARING DROP ITEMS

4-16. Place items in a container so that the A-7A straps can hold the items safely together during exit and descent. Items dropped at high-velocity will impact at a high rate of speed; therefore, sensitive items cannot be dropped using this method.

PREPARING SKID BOARD

4-17. Prepare the skid board in the same manner as in Section II of this chapter. The skid board will be at least the size of the base of the load for airdrop from the paratroop doors. When the load is being airdropped from the C-130 aircraft's cargo ramp, the skid board will be at least 42 inches wide, but must be 48 inches wide when using the C-17 or C-130 aircraft's CVRS. Route the skid board ties in the same manner as in Section II of this chapter.

PLACING HONEYCOMB

4-18. Place honeycomb as shown in Figure 4-11.

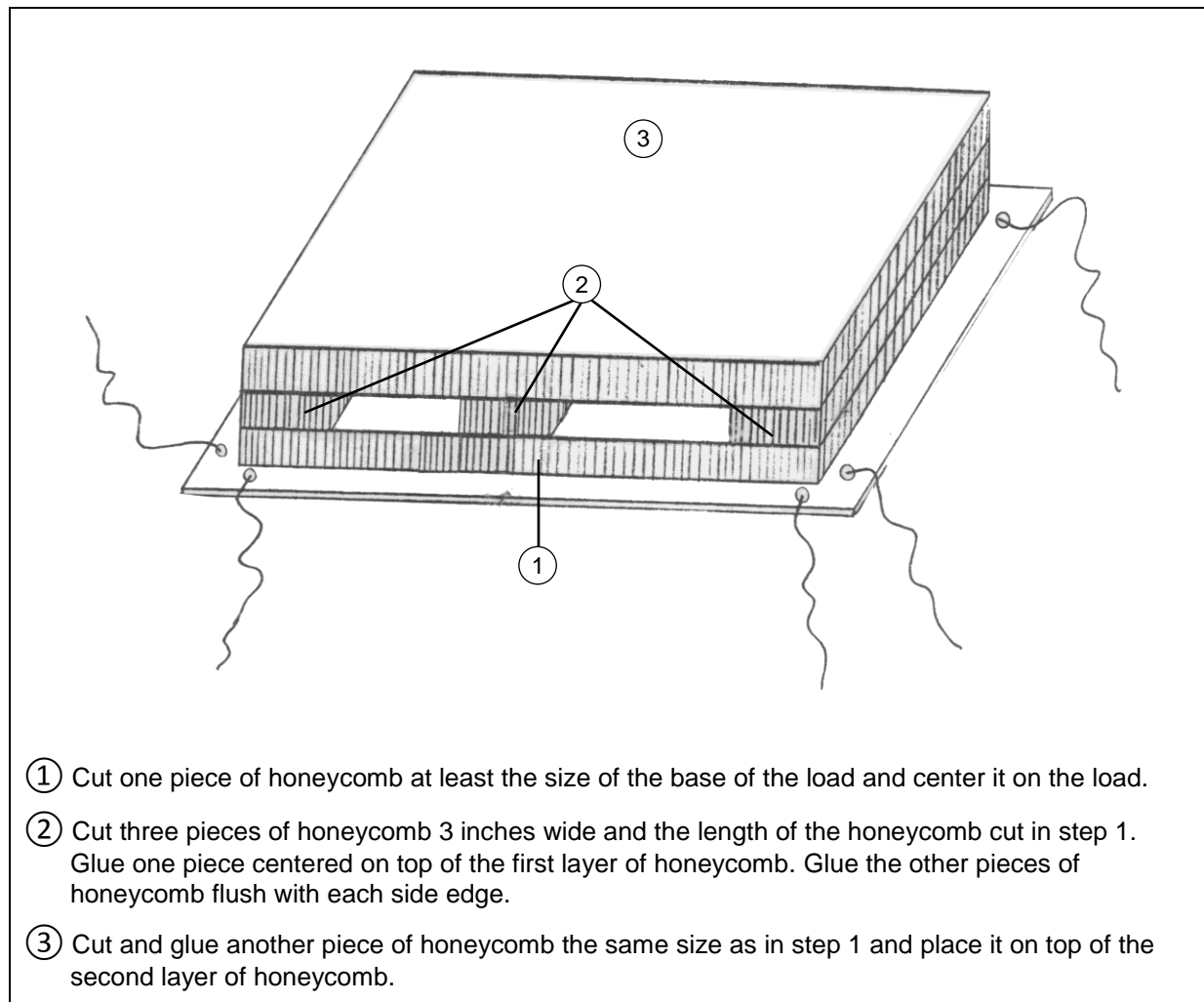


Figure 4-11. Honeycomb placed

SECURING STRAPS

4-19. Secure the straps according to Section I of this chapter.

SECURING SKID BOARD

4-20. Secure the skid board to the load as shown in Section II of this chapter.

INSTALLING PARACHUTE

4-21. Install the parachute on the load according to Chapter 3.

MARKING RIGGED LOAD

4-22. Mark the rigged load according to Chapter 1, paragraph 1-5. Compute the rigged load data for the two-, three-, and four-strap loads as shown in Figure 4-5. An AMC IMT 1033, 20050204, V1. (Shipper’s Declaration for Dangerous Goods) may be required.



RIGGED LOAD DATA (WITHOUT PARACHUTE)

One 68-inch parachute.....	75 - 150 pounds
Three 68-inch parachutes	151 – 500 pounds
* One 12-foot, high-velocity cargo parachute (shown).....	151 – 500 pounds
One 15-foot (modified for high-velocity).....	151 – 500 pounds

* Primary parachute

Figure 4-12. Four-strap A-7A load rigged for high-velocity airdrop

EQUIPMENT REQUIRED

4-23. Use the equipment listed in Table 4-3 to rig a four-strap load for high-velocity airdrop as shown in Figure 4-12.

Table 4-3. Equipment required for rigging the four-strap A-7A load for high-velocity ramp airdrop

<i>National Stock Number</i>	<i>Item</i>	<i>Quantity</i>
8040-00-273-8713	Adhesive, pate, 1-gallon	As required
4020-00-240-2146	Cord, nylon, type III	As required
8135-00-664-6958	Cushioning material, packaging, cellulose wadding	As required
1670-00-753-3928	Pad, energy-dissipation material, honeycomb	As required
1670-00-788-8666	Parachute, cargo, high-velocity, 12-foot	1
	OR	
1670-00-216-7297	Pilot parachute, cargo, 68-inch	1 or 3
	OR	
N/A	Parachute, cargo, extraction, 15-foot modified	1
	Plywood:	
5530-00-129-7777	½-by 48- by 96-inch	1 sheet
	or	
5530-00-128-4981	¾- by 48- by 96-inch	1 sheet
1670-00-251-1153	Sling assembly, cargo airdrop, A-7A	1
	Webbing:	
8305-00-268-2411	Cotton, ¼-inch, type I	As required
	Nylon:	
8305-00-082-5752	Tubular, ½-inch	As required

PART THREE

Rigging A-21 Container Loads

Chapter 5

General Information and Procedures for A-21

A-21 CARGO BAG ASSEMBLY

5-1. The A-21 cargo bag assembly is an adjustable airdrop container. It consists of a sling assembly and a 97- by 115-inch canvas cover. The sling assembly consists of the sling portion with a scuff pad attached, two O-ring straps, three quick-release straps, and one quick-release strap with a quick-release assembly attached. Figure 5-1 shows an A-21 cargo bag assembly.

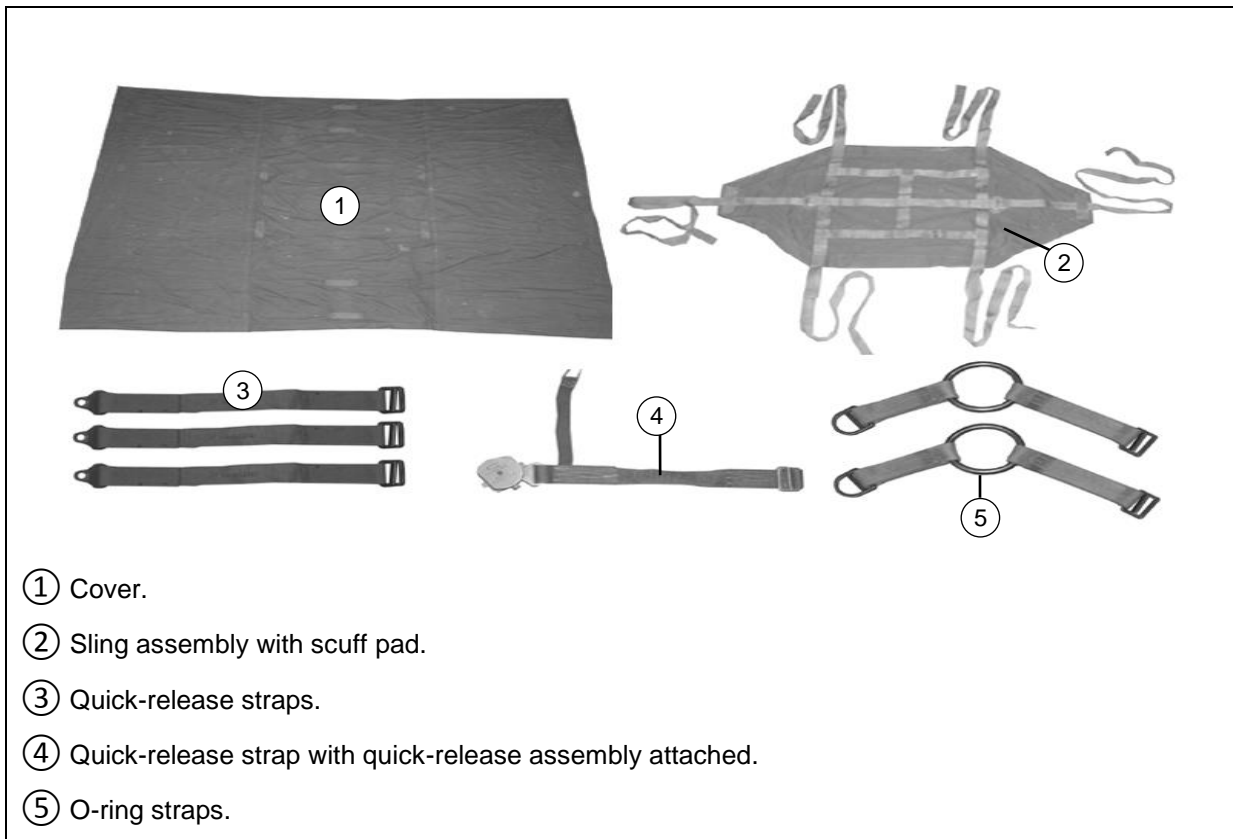


Figure 5-1. A-21 cargo bag assembly

CAPABILITIES OF A-21 CARGO BAG

5-2. The A-21 cargo bag can exit either through paratroop doors or off the ramp. The container can be rigged for low-velocity or high-velocity airdrop. The container is capable of dropping loads up to 500 pounds of rigged weight excluding the weight of the parachute. When dropped from the paratroop doors, the load must weigh a minimum of 11 pounds per square foot. When dropped from the ramp, the load must weigh a minimum of 28 pounds per square foot. Table 5-1 lists parachutes used with this container and the weight restrictions.

PARACHUTES USED FOR A-21 CARGO BAG

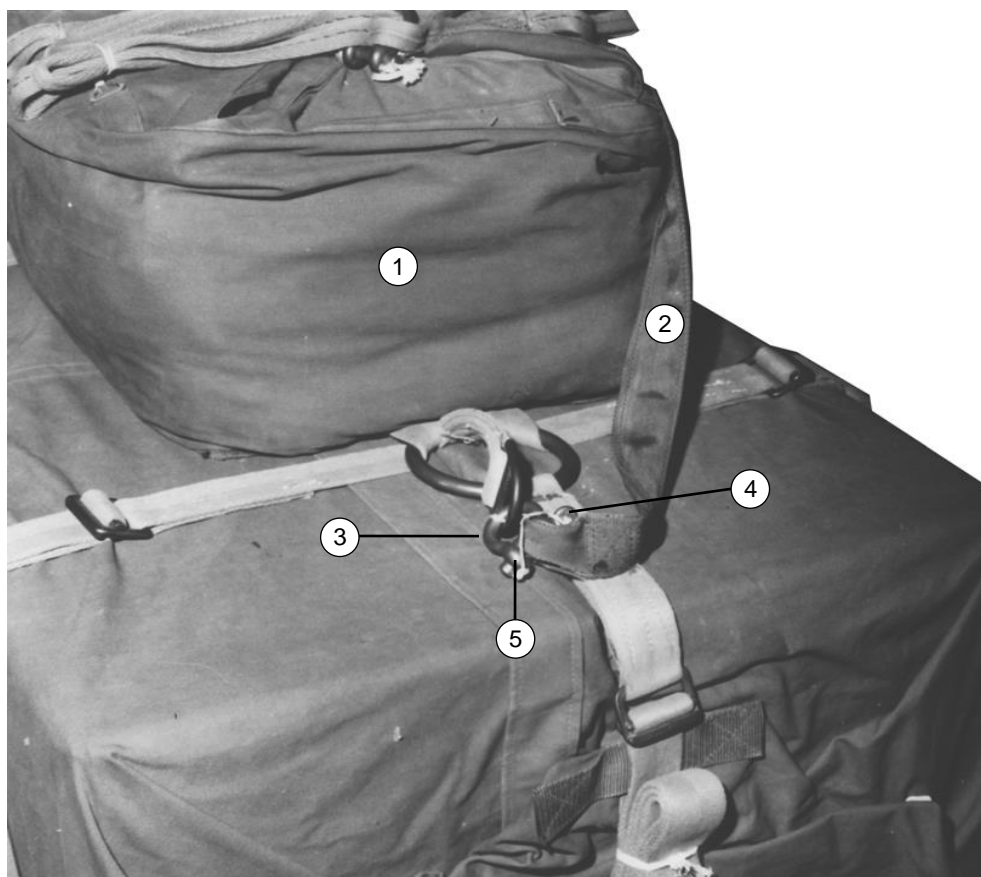
5-3. The T-10 modified cargo or G-14 cargo parachute is the parachute used on this container for low-velocity drops. For high-velocity drops, the primary parachute is a 12-foot high-velocity cargo parachute. If a 12-foot, high-velocity cargo parachute is not available, a 15-foot cargo extraction parachute or three 68-inch pilot parachutes may be used. Table 5-1 gives the weight ranges.

Table 5-1. Parachute requirements for A-21 cargo bag

<i>Parachutes</i>	<i>Suspended Weight (Pounds)</i>	
	<i>Minimum</i>	<i>Maximum</i>
Low-Velocity		
One T-10 modified cargo	90	500
One G-14 cargo	200	500
High-Velocity		
Three 68-inch pilot	151	500
* One 12-foot high-velocity	151	500
One 15-foot cargo extraction	151	500

INSTALLING PARACHUTE ON A-21 CARGO BAGS

5-4. The parachutes used on A-21 loads are installed to the two D-rings located on the O-ring straps. Figure 5-2 shows how to install the G-14 cargo parachute. Steps similar to the G-14 cargo parachute installation are used when installing the T-10 modified cargo parachute. Figure 5-3 shows how to install the 12-foot, high-velocity cargo parachute. When using the 68-inch pilot parachute or 15-foot cargo extraction parachute, refer to Chapter 3 and modify the procedures to the two D-rings on the O-ring straps.



- ① Center the parachute on the load between the O-rings.
- ② Position each riser to the closest D-ring on the end of the O-ring straps.
- ③ Place the bell portion of the clevis on the D-ring.
- ④ Route the clevis pin through one side of the clevis, through the loop at the end of the riser, and through the other hole on the other side of the clevis.
- ⑤ Insert the cotter pin through the clevis pin and spread the ends of the cotter pin enough to prevent the cotter pin from sliding out.

Figure 5-2. G-14 cargo parachute installed

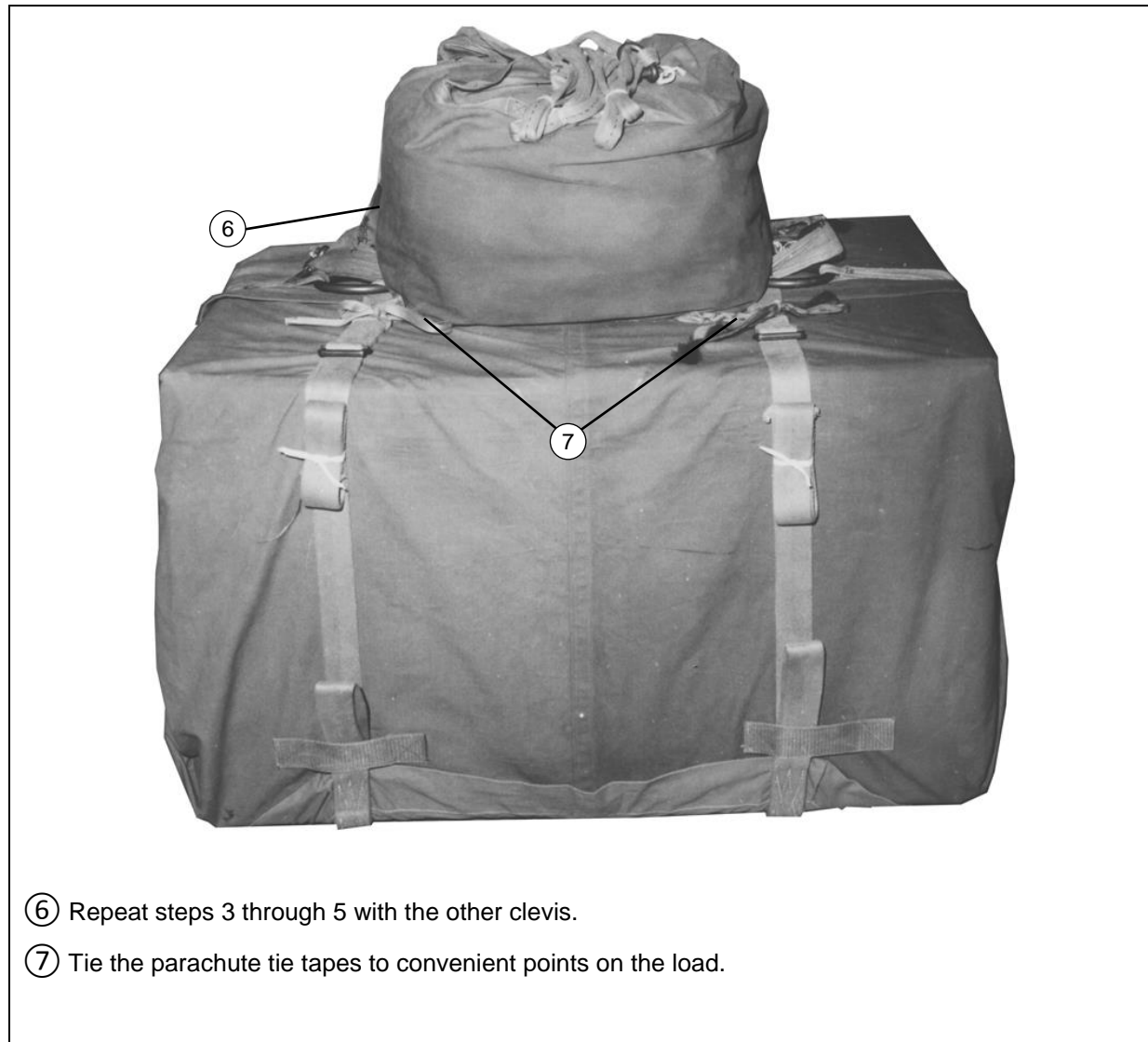
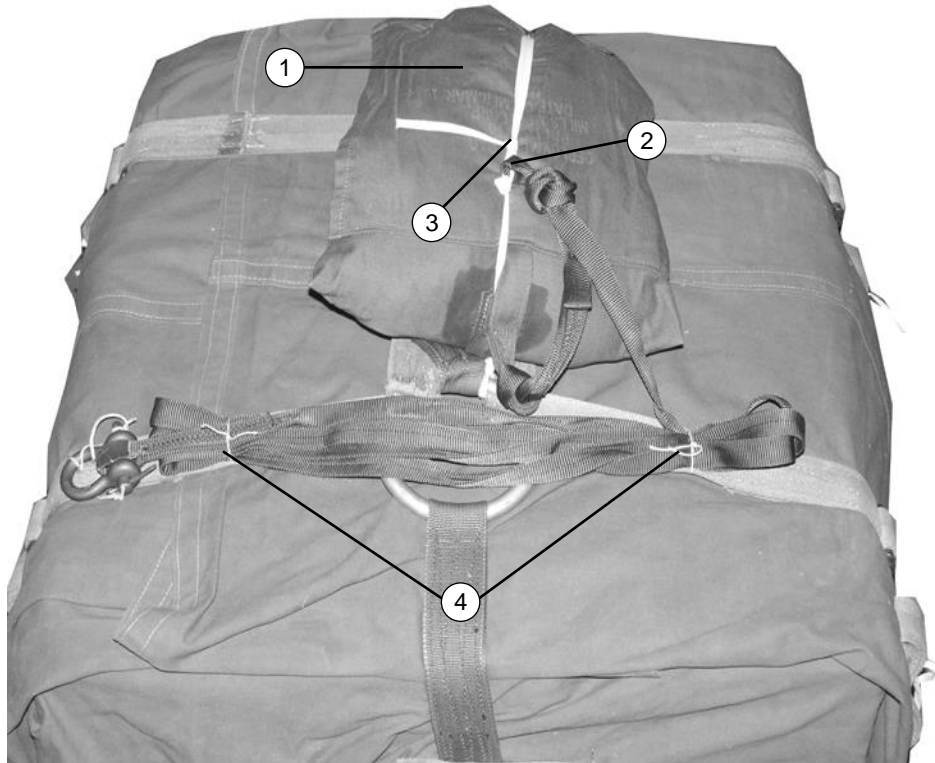


Figure 5-2. G-14 cargo parachute installed (continued)



- ① Install the parachute on the load using steps 1 through 6 of Figure 5-2.
- ② Form a 3-inch diameter loop in the static line by tying an overhand knot approximately 8 inches up from the deployment bag main strap attaching loop.
- ③ Tie one end of a length of type I, ¼-inch cotton webbing to a convenient point on top of the load. Route the free end of the cotton webbing through the retaining loop, through the loop in static line and around a convenient point on the load. Form a trucker's hitch knot to secure the parachute.
- ④ S-fold the static line on top of the load. Secure the folds to the top of the load with a length of ticket number 8/7 cotton thread.

Figure 5-3. 12-foot, high-velocity cargo parachute installed

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Chapter 6

Rigging Typical A-21 Loads

SECTION I – LOW-VELOCITY AIRDROP FROM PARATROOP DOOR

DESCRIPTION OF LOAD

6-1. Typical A-21 loads are rigged for airdrop from a paratroop door of an aircraft. Typical loads include rations, repair parts, water cans, and other small non-fragile items. Items to be dropped may be rigged in their original container or may be repacked and padded further to prevent damage. When completely rigged, the load must not exceed 500 pounds, excluding the weight of the parachute. The maximum dimensions for this load are 48- by 30- by 66-inches. Refer to Part Two for general rigging information and aircraft considerations and restrictions.

Note. Containers dropped from doors require a minimum weight of 11 pounds per square foot.

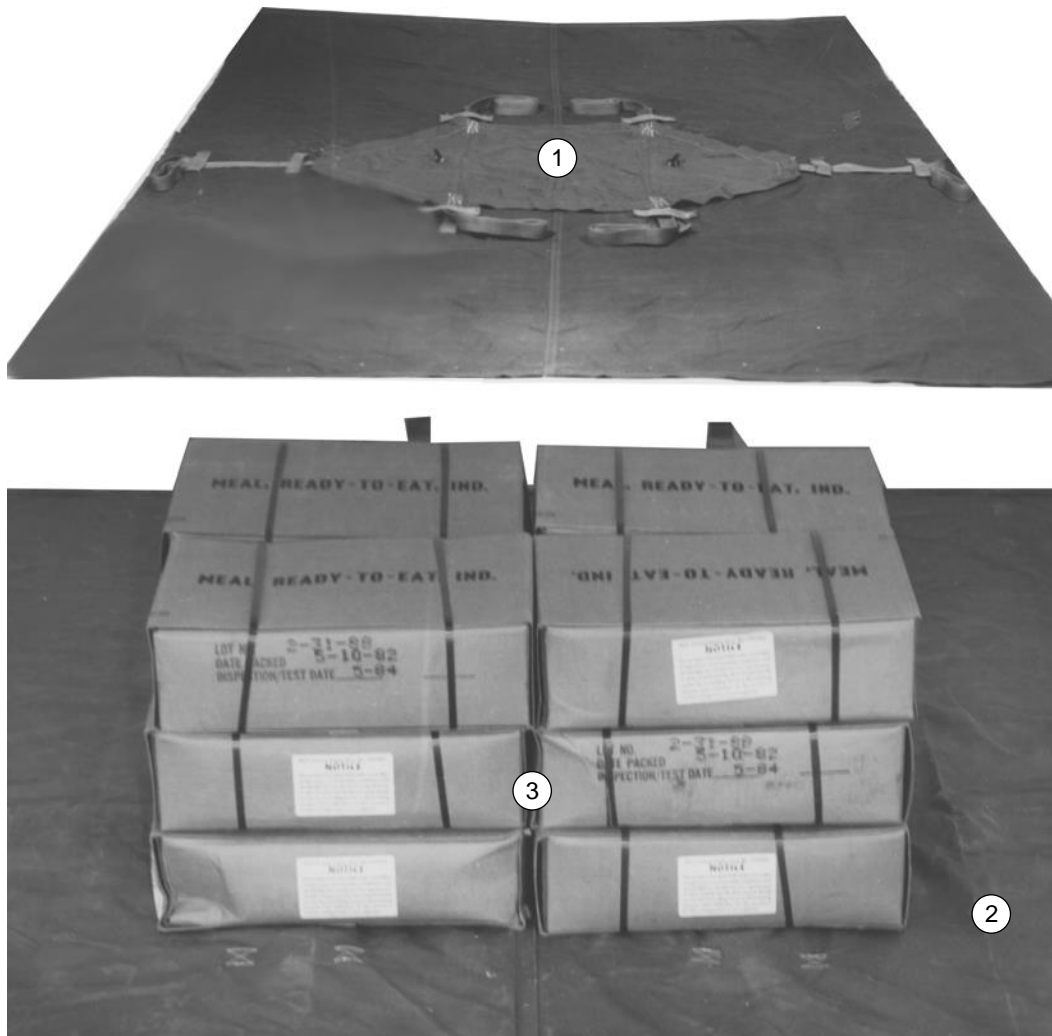
PREPARING DROP ITEMS

6-2. Prepare the drop items according to the load's sensitivity. Some items will require no padding while others will need padding with cellulose wadding, felt, and honeycomb. All items should be padded well to prevent damage during airdrop. In addition, items must be in containers large enough so they will not fall out of the load during airdrop.

POSITIONING CONTAINER AND LOAD

6-3. Position the container and load as shown in Figure 6-1.

Note. One or two layers of honeycomb may be placed under the load, if needed.



- ① Lay the A-21 bag cover on a flat, dry surface with the strap keepers up. Center the sling assembly on the cover with the sewn webbing facing the cover. Route the straps through the strap keepers.
- ② Flip the cover and sling assembly over. The scuff pad should be on the bottom.
- ③ Center the load on the cover and the sling assembly.

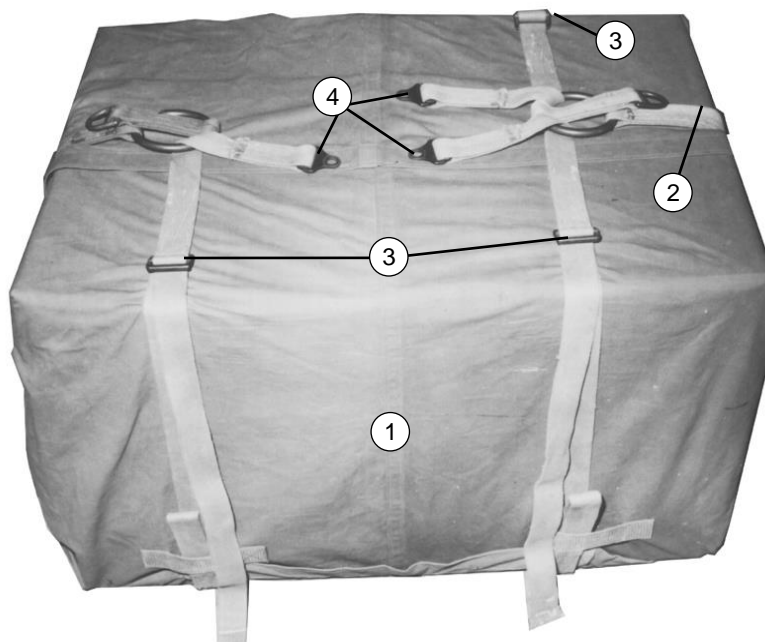
Figure 6-1. Container and load positioned

RIGGING CONTAINER

6-4. Rig the container as shown in Figure 6-2.

CAUTION

Make sure friction adapters are fastened properly according to Figure 1-3.



- ① Fold the cover over the load. Fold the excess cover under itself.
- ② Loosely fit an O-ring strap on the right side long strap. Repeat for the left side.
- ③ Fit a quick-release strap on the two front straps and the rear right strap.
- ④ Pass the free end of the quick-release strap under the O-ring and up through the center of the O-ring. Lay the running end toward the center of the load. Repeat step for the other two quick-release straps. There should be a half twist inward when the straps are routed properly.

Figure 6-2. Container rigged



- ⑤ Center the strap with quick-release assembly on the load. Route the strap over the left O-ring and down through the center. Fasten the friction adapter to the rear left strap. Make sure the friction adapter is fastened properly according to Figure 1-3.
- ⑥ Make sure the quick-release assembly plungers are up. Insert the three quick-release strap lugs into the quick-release assembly. Pull slightly on each to make sure the plungers lock the straps in place.
- ⑦ Insert the safety clip.
- ⑧ Tighten all straps. Make sure the quick-release assembly is centered on the load. Fold the excess strap, and tie or tape in place according to Figure 1-3.

Figure 6-2. Container rigged (continued)

INSTALLING PARACHUTE

6-5. Install the T-10 modified cargo or the G-14 cargo parachute according to Paragraph 5-4.

MARKING RIGGED LOAD

6-6. Mark the rigged load according to Chapter 1, paragraph 1-5. Compute the rigged load data for the A-21 container loads. An AMC IMT 1033, 20050204, V1. (Shipper's Declaration for Dangerous Goods) may be required.



RIGGING LOAD DATA (WITHOUT PARACHUTE)

G-14 cargo parachute	200 - 500 pounds
T-10 modified cargo parachute	200 - 500 pounds

Figure 6-3. A-21 container load rigged for low-velocity paratroop door airdrop

EQUIPMENT REQUIRED

6-7. Use the equipment listed in Table 6-1 to rig the load as shown in Figure 6-3.

Table 6-1. Equipment required for rigging the A-21 container load for low-velocity paratroop door airdrop

<i>National Stock Number</i>	<i>Item</i>	<i>Quantity</i>
1670-00-242-9173	Bag, cargo, A-21	1
8135-00-664-6958	Cushioning material, packaging, cellulose wadding	As required
1670-00-753-3928	Pad, energy-dissipation material, honeycomb	As required
1670-00-999-2658	Parachute, cargo, high-velocity, G-14	1
	OR	
N/A	Parachute, cargo, modified, T-10	1
	Webbing:	
8305-00-268-2411	Cotton, ¼-inch, type I	As required

SECTION II – LOW-VELOCITY AIRDROP FROM RAMP

DESCRIPTION OF LOAD

6-8. Typical A-21 loads are rigged to be dropped off the ramp of an aircraft. Typical loads include rations, water cans, small parts, and other non-fragile supplies. The load must be rigged with a skid board. The weight range for an A-21 load is 200 to 500 pounds, excluding the weight of the parachute.

Note. Containers dropped from the ramp require a minimum weight of 28 pounds per square foot.

PREPARING DROP ITEMS

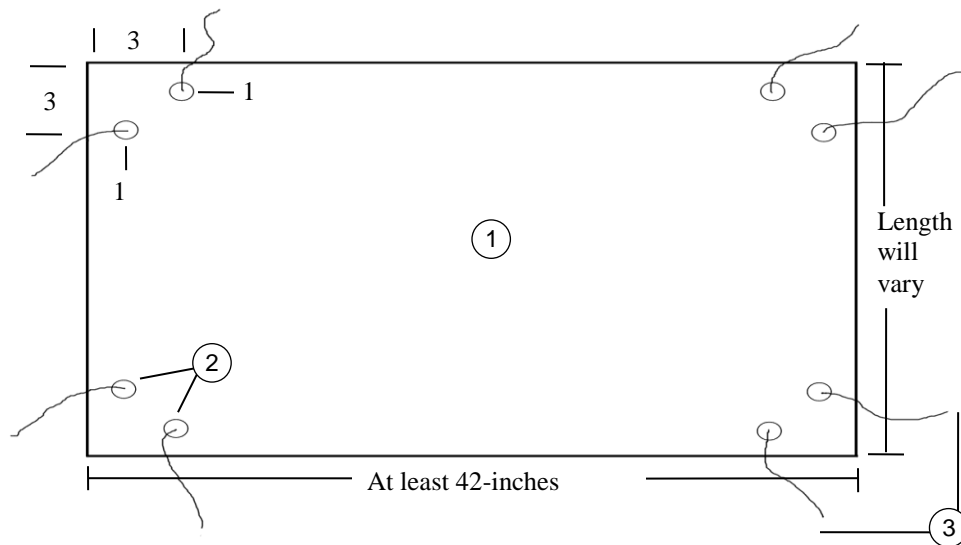
6-9. Prepare the drop items according to the load's sensitivity. Some items will require no padding while others will require cellulose wadding, felt, and honeycomb. All items should be padded well to prevent damage during airdrop.

PREPARING SKID BOARD

6-10. Prepare a skid board as shown in Figure 6-4.

Notes.

1. This drawing is not drawn to scale.
2. All dimensions are given in inches.



- ① Place a $\frac{1}{2}$ - or $\frac{3}{4}$ -inch piece of plywood on a flat surface. Size will vary depending on load.
- ② Drill eight $\frac{1}{2}$ -inch holes as shown above.
- ③ Pass a length of type III nylon cord through each set of holes. The length of the cord will vary according to the height of the load. If the type III nylon cord is not available, use $\frac{1}{2}$ -inch tubular nylon webbing.
- ④ If required, place two layers of honeycomb the size of the base of the load on the skid board. (not shown)

Figure 6-4. Skid board prepared

POSITIONING CONTAINER AND LOAD

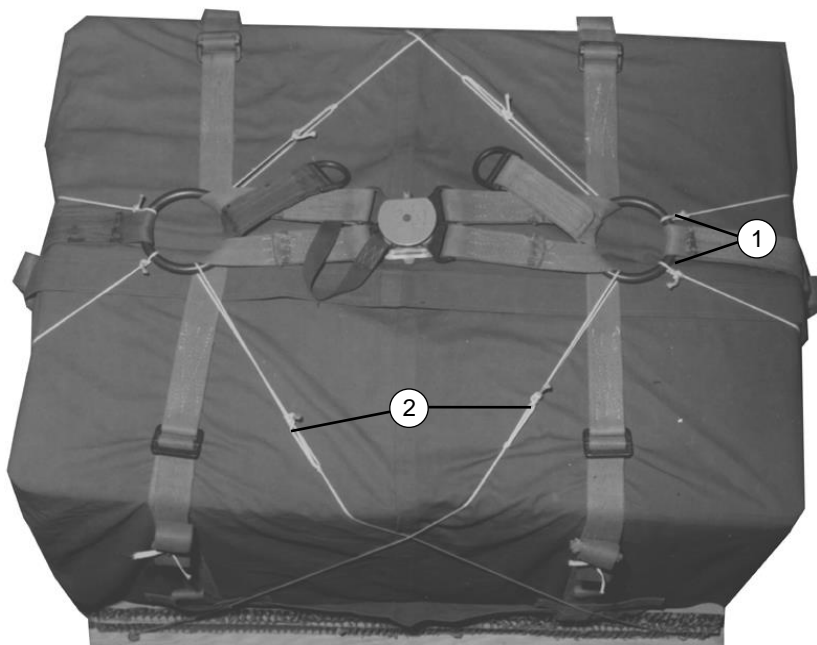
6-11. Position the container and load according to Paragraph 6-3.

RIGGING CONTAINER

6-12. Rig the container according to Paragraph 6-4.

SECURING SKID BOARD

6-13. Secure the skid board to the load as shown in Figure 6-5.



- ① Tie the two lengths of type III nylon cord on the right side of the load to the top right O-ring with three half-hitch knots and a knot in the running end. Repeat for the left side.
- ② Using the front right length of cord, cross it over the load and tie it to the left O-ring with a trucker's hitch knot and an overhand knot in the running end. Repeat with the left front length of cord to the right O-ring. Ties should form an "X". Repeat for the back side.

Figure 6-5. Skid board secured

INSTALLING PARACHUTE

6-14. Install the T-10 modified cargo or the G-14 cargo parachute to the load according to Paragraph 5-4.

MARKING RIGGED LOAD

6-15. Mark the rigged load according to Chapter 1, paragraph 1-5. Compute the rigged load data for the A-21 container loads. An AMC IMT 1033, 20050204, V1. (Shipper's Declaration for Dangerous Goods) may be required.



RIGGING LOAD DATA (WITHOUT PARACHUTE)

G-14 cargo parachute.....	200 - 500 pounds
T-10 modified cargo parachute.....	200 - 500 pounds

Figure 6-6. A-21 container load rigged for low-velocity ramp airdrop

EQUIPMENT REQUIRED

6-16. Use the equipment listed in Table 6-2 to rig the load shown in Figure 6-6.

Table 6-2. Equipment required for rigging the A-21 container load for low-velocity ramp airdrop

<i>National Stock Number</i>	<i>Item</i>	<i>Quantity</i>
1670-00-242-9173	Bag, cargo, A-21	1
4020-00-240-2146	Cord, nylon, type III	As required
8135-00-664-6958	Cushioning material, packaging, cellulose wadding	As required
1670-00-753-3928	Pad, energy-dissipation material, honeycomb	As required
1670-00-999-2658	Parachute, cargo, G-14	1
	OR	
N/A	Parachute, cargo, modified, T-10	1
5530-00-129-7777	Plywood:	
	1/2- by 48- by 96-inch	1 sheet
5530-00-128-4981	Or	
	3/4- by 48- by 96-inch	1 sheet
8305-00-268-2411	Webbing:	
	Cotton, 1/4-inch, type I	As required

SECTION III – HIGH-VELOCITY AIRDROP

DESCRIPTION OF LOAD

6-17. Typical A-21 loads are rigged for high-velocity airdrop from either the paratroop door or ramp of an aircraft. Typical loads include rations, water cans, small repair parts, and other small non-fragile items. The load shown in this section consists of rations and boxes filled with sand to increase weight. The load cannot exceed 500 pounds, excluding the weight of the parachute. The minimum weight will vary according to the parachute used. The load shown in this section is rigged with one 12-foot, high-velocity cargo parachute.

Note. Containers dropped from the door require a minimum weight of 11 pounds per square foot. Containers dropped from the ramp require a minimum weight of 28 pounds per square foot.

PREPARING DROP ITEMS

6-18. Prepare the drop items according to the load's sensitivity. Items should be well padded so items will not be damaged during airdrop. Items can be dropped in original container or repacked if necessary.

PREPARING SKID BOARD

6-19. Prepare a skid board for ramp drop as shown in Figure 6-4. For paratroop door drops, the skid board is optional. When the load is being airdropped from the C-130 aircraft's cargo ramp, the skid board will be at least 42 inches wide, but must be 48 inches wide when using the C-17 or C-130 aircraft's CVRS.

POSITIONING HONEYCOMB

6-20. Use honeycomb on paratroop door or ramp drops. When the skid board is not used, place the honeycomb inside the container when rigging the load. When the skid board is used, place the honeycomb inside or outside the container. Prepare and position the honeycomb as shown in Figure 6-7.

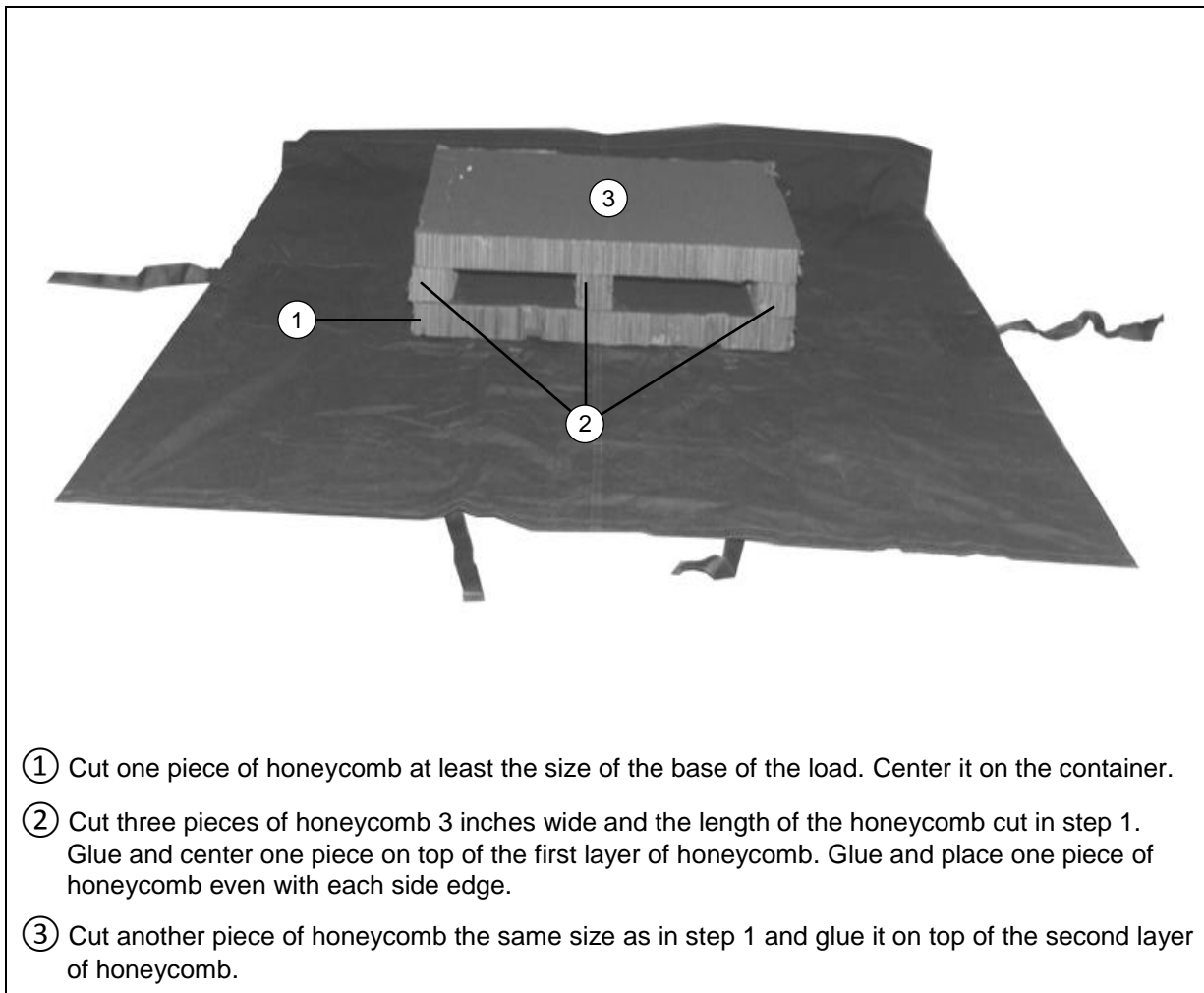


Figure 6-7. A-21 honeycomb prepared and positioned

POSITIONING CONTAINER AND LOAD

6-21. Position the container and load according to Paragraph 6-3.

RIGGING CONTAINER

6-22. Rig the container according to Paragraph 6-4.

SECURING SKID BOARD

6-23. Secure the skid board according to Paragraph 6-13.

INSTALLING PARACHUTE

6-24. Install the parachute according to Chapters 3 and 5.

MARKING RIGGED LOAD

6-25. Mark the rigged load according to Chapter 1, paragraph 1-5. Compute the rigged load data for the A-21 container loads. An AMC IMT 1033, 20050204, V1. (Shipper's Declaration for Dangerous Goods) may be required.



RIGGING LOAD DATA (WITHOUT PARACHUTE)

Three 68-inch parachutes	151 - 500 pounds
*12-foot, high-velocity cargo parachute (shown)	151 - 500 pounds
15-foot modified parachute for high-velocity	151 - 500 pounds
*Primary parachute	

Figure 6-8. A-21 container load rigged for high-velocity airdrop

EQUIPMENT REQUIRED

6-26. Use the equipment listed in Table 6-3 to rig the load shown in Figure 6-8.

Table 6-3. Equipment required for rigging the A-21 container load for high-velocity airdrop

<i>National Stock Number</i>	<i>Item</i>	<i>Quantity</i>
8040-00-273-8713	Adhesive, paste, 1-gallon	As required
1670-00-242-9173	Bag, cargo, A-21	1
4020-00-240-2146	Cord, nylon, type III	As required
8135-00-664-6958	Cushioning material, packaging, cellulose wadding	As required
1670-00-753-3928	Pad, energy-dissipation material, honeycomb	As required
1670-00-788-8666	Parachute, cargo, high-velocity, 12-foot	1
	OR	
1670-00-216-7297	Pilot parachute, cargo, 68-inch	
	OR	
N/A	Parachute, cargo, extraction, 15-foot modified	
	Plywood:	
5530-00-129-7777	1/2- by 48- by 96-inch	1 sheet
	Or	
5530-00-128-4981	3/4- by 48- by 96-inch	1 sheet
7510-00-266-6710	Tape, masking, 2-inch	As required
	Webbing:	
8305-00-268-2411	Cotton, 1/4-inch, type I	As required
	Nylon:	
8305-00-082-5752	Tubular, 1/2-inch	As required

PART FOUR

Rigging A-22 Container Loads

Chapter 7

General Information and Procedures for A-22

A-22 CARGO BAG ASSEMBLY

7-1. The A-22 cargo bag assembly is an adjustable cotton duck cloth and nylon webbing container. It consists of a sling assembly, a cover, and four suspension webs as shown in Figure 7-1. The load may be rigged with or without the cover.

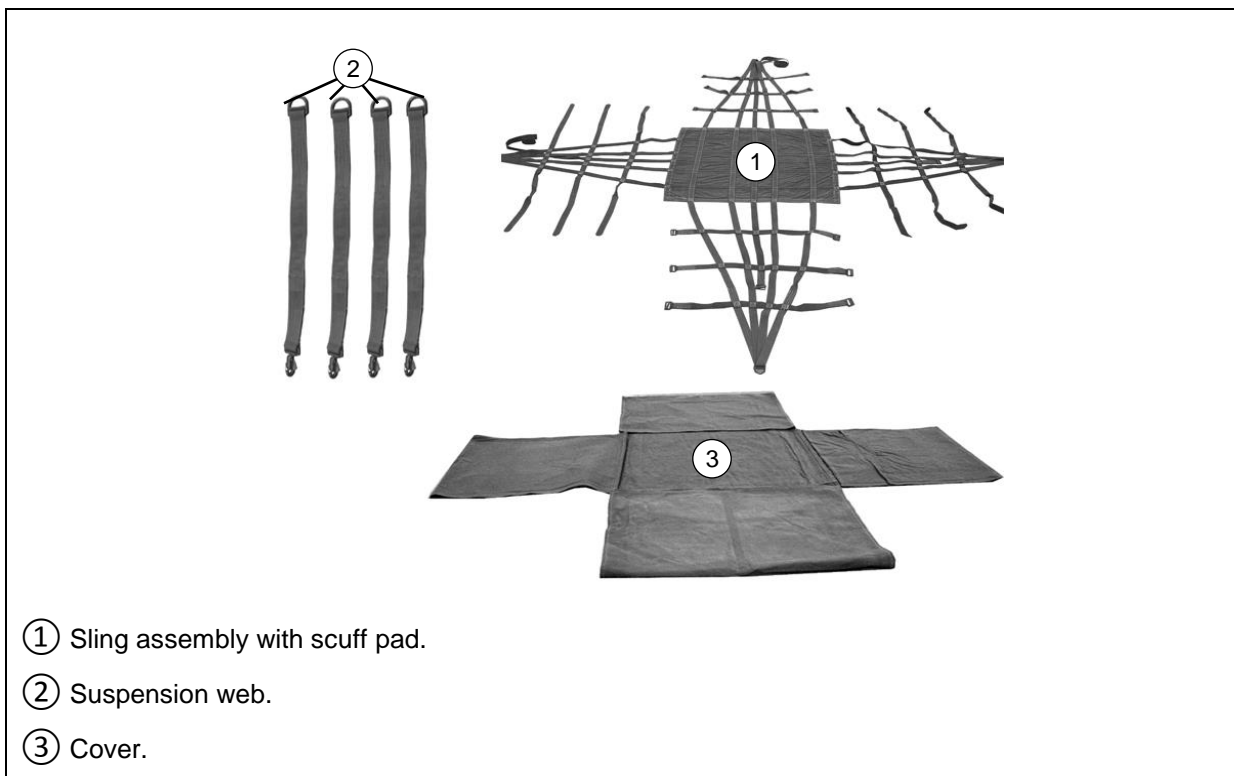


Figure 7-1. A-22 cargo bag

A-22 SKID BOARD

CAUTION

When the skid board is locally fabricated, AC grade plywood must be used. Make sure the smooth side is facing down on the rollers.

7-2. The skid board is 1- by 48- by 48-inches for both low- and high-velocity drops. When dropping low-velocity loads weighing 501 to 1,600 pounds, a 3/4-inch thick skid board may be used. The skid board has sixteen 1/2-inch holes (four in each side), which are used to secure the skid board to the load. The skid board ties are made with 1/2-inch (⁹/₁₆-inch or ⁵/₈-inch) tubular nylon webbing. The length will vary according to the layers of honeycomb. Steel strapping will not be used to secure the skid board to the load unless specific rigging procedures authorize it.

Note. The steel strapping must not touch the aircraft's rollers.

A-22 CONTAINER LIMITATIONS

7-3. The A-22 load has a weight range of 501 to 2,200 pounds, excluding the weight of the parachute. Ensure the load weighs the minimum of 28-pounds per square foot. The height of the load with parachute will not exceed 83 inches for C-130 aircraft or 101 inches for C-17 aircraft unless specific rigging procedures authorize it. The width of the load must not exceed 48 inches. When utilizing the MV/CV-22 aircraft, the height of the load will not exceed 60 inches. The airdrop load dimensions will not exceed 52- by 52-inches. The use of 1-inch A/C grade plywood is the only authorized skid board material from the MC/CV-22 aircraft.

Notes.

1. If the load is smaller than the length of the skid board, place honeycomb filler sheets vertically inside the A-22 container. The length of the A-22 container should equal the length of the skid board. This prevents the A-22 containers from shifting when the loads are restrained in the aircraft.
 2. Any overhang must be placed to the front or rear of the container; overhang to the left or right will not fit in the CVRS or logistic rails.
-

DOUBLE A-22 CARGO BAG

7-4. The double A-22 cargo bag is made using two A-22 cargo bags. The weight range is 900 to 2,200 pounds. The skid board is constructed of a 1- by 48- by 96-inch piece of plywood. When dropping loads weighing 900 to 1,600 pounds, a 3/4-thick skid board may be used. The skid board has twenty-four 1/2-inch holes used for skid board ties. Ensure the load weighs the minimum of 28-pounds per square foot. This load will also be rigged with double "X" skid board ties. When utilizing the MV/CV-22 aircraft, the height of the load will not exceed 50 inches. The width of the airdrop load will not exceed 52 inches. The use of 1-inch A/C grade plywood is the only authorized skid board material from the MC/CV-22 aircraft.

CAUTION

When rigging double A-22 loads, make sure cotton and nylon sling assemblies are not mixed.

STRETCH A-22 CARGO BAG

7-5. The stretch A-22 cargo bag is made using two A-22 cargo bags. The weight range is 675 to 2,200 pounds. The skid board is constructed of a 1- by 48- by 72-inch piece of plywood. When dropping loads weighing 675 to 1,600 pounds, a ¾-inch thick skid board may be used. The skid board has twenty-four ½-inch holes used for skid board ties. Ensure the load weighs the minimum of 28-pounds per square foot. This load will also be rigged with the double “X” skid board ties. When utilizing the MV/CV-22 aircraft, the height of the load will not exceed 50 inches. The width of the airdrop load will not exceed 52 inches. The use of 1-inch A/C grade plywood is the only authorized skid board material from the MC/CV-22 aircraft.

ASSEMBLY LINE RIGGING

7-6. When assembly line rigging is used for A-22 loads, only five stations are needed. The five stations are laying out containers and preparing base, positioning load, rigging load, installing parachute, and inspecting the rigged load.

INSPECTING LOAD

7-7. A qualified rigger must inspect the A-22 load. While being rigged, this load should be supervised or rigged by a parachute rigger. DD Form 1748-1, *Joint Airdrop Inspection Record (Container)*, must be completed before airdrop.

PARACHUTES USED

7-8. There are two types of parachutes used for A-22 loads, depending on whether the load is being dropped for low- or high-velocity. Each category has a primary and alternate parachute. The alternate should be used only when the primary parachute is not available.

- **LOW-VELOCITY DROPS.**
 - **Primary Parachute.** The G-12E cargo parachute is the primary parachute used for A-22 loads for low-velocity airdrop. It is rated for 501 to 2,200 pounds of suspended weight. A 68-inch pilot parachute is installed on the G-12E cargo parachute to deploy it. Other parachutes may be used to deploy the G-12E cargo parachute; however, the specific manual must give the procedures. TM 10-1670-281-23&P/TO 13C5-32-2 covers the inspection and packing of the G-12E cargo parachute and the 68-inch pilot parachute.

Note: Suspended weight is the total weight of the load without the parachute attached.

- **Alternate Parachutes.** The G-14 cargo parachute is the alternate parachute used for A-22 loads for low-velocity airdrop. It is used in a cluster of two or three parachutes. The two clustered parachutes are used for loads containing 501 to 1,000 pounds of suspended weight and the three clustered parachutes are used for loads containing 1,001 to 1,500 pounds of suspended weight. TM 10-1670-282-23&P/TO 13C5-30-2 covers the inspection and packing of the G-14 cargo parachute.

Note. Loads with three G-14 cargo parachutes must be dropped one at a time.

- The Low Cost Aerial Delivery System (LCADS) Low Velocity Cargo Parachute (LVCP) is an alternate parachute for the G-12 E cargo parachute. The LVCP is used for loads containing 501 to 2,200 pounds of suspended weight and has a minimum drop altitude of 1000 feet above ground level (AGL). Drops above 10,000 feet mean sea level are restricted to 1,700 pounds of suspended weight. The LVCP comes pre-packed by the manufacturer and is a one-time-use item.
- The Joint Precision Airdrop System is an alternate low-velocity delivery system used under certain conditions. The minimum rigged weight for the JPADS 2K is 880 pounds. The maximum rigged weight is 2,261 pounds. These weights include the AGU and the parachute.
- **HIGH-VELOCITY DROPS.**
 - **Primary Parachute.** The 26-foot, high-velocity cargo parachute is the primary parachute used for high-velocity A-22 airdrops. The parachute is rated from 501 to 2,200 pounds. TM 10-1670-276-23&P/TO 13C5-29-2/NAVAIR 13-1-29 covers the inspection and packing of the parachute.
 - **Alternate Parachutes.** The 22-foot cargo extraction parachute is the alternate parachute used for A-22 high-velocity airdrops. It is rated for 501 to 2,200 pounds of suspended weight. TM 10-1670-279-23&P/TO 13C5-27-2/NAVAIR 13-1-28 covers the inspection and packing of the parachute.
 - **The Low Cost Aerial Delivery System (LCADS) High Velocity Cargo Parachute (HVCP)** is an alternate parachute for the 26-foot high velocity cargo parachute. The LCADS HVCP is used for loads containing 501 to 2,200 pounds of suspended weight and has a minimum drop altitude of 3000 feet above ground level (AGL). The HVCP comes pre-packed by the manufacturer and is a one-time-use item.

INSTALLING PARACHUTES

7-9. Parachutes should be installed as follows:

- Install the G-12E cargo parachute as shown in Figure 7-2.
- Install two G-14 cargo parachutes as shown in Figure 7-3.
- Install three G-14 cargo parachutes as shown in Figure 7-4.
- Install the LCADS LVCP as shown in Figure 7-5.
- Install the 26-foot, high-velocity cargo parachute as shown in Figure 7-6.
- Install the 22-foot, cargo extraction parachute as shown in Figure 7-7.
- Install the LCADS HVCP as shown in Figure 13-8.
- Install the JPADS as shown in Chapter 16.

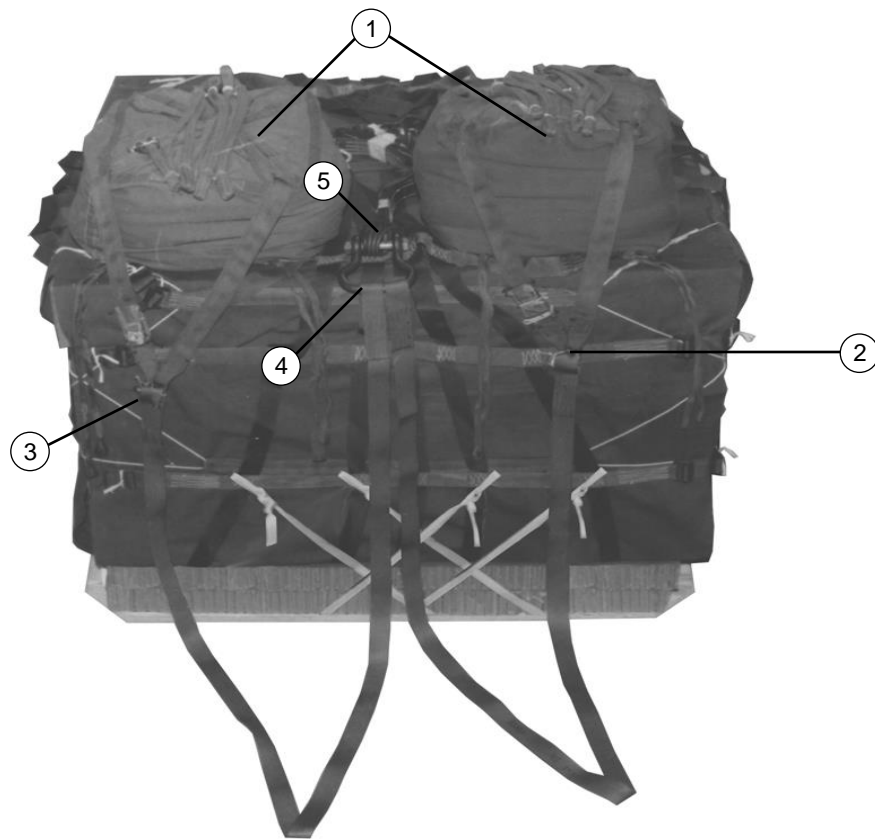


Note. Any overhang must be placed to the front or rear of the container; overhang to the left or right will not fit in the CVRS or logistic rails.

- ① Place the G-12E cargo parachute on the load. When the front and rear have been designated, the parachute sides should run parallel to the front and rear.
- ② Place the four D-rings of the suspension webs on the clevis bolt. Replace the nut.
- ③ Secure the parachute to the load on each front and rear corner of the parachute using one turn single of type I, ¼-inch cotton webbing.

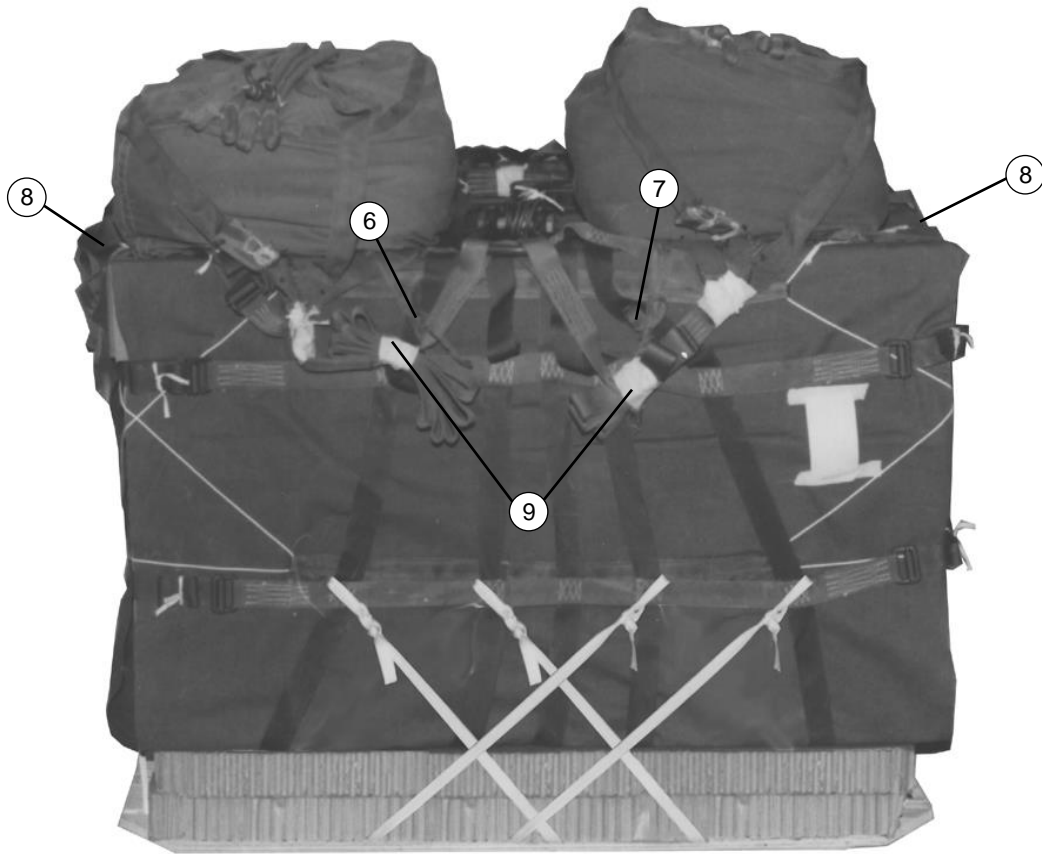
Note. Ensure the 68-inch pilot parachute is attached and secured to the G-12E cargo parachute according to TM 10-1670-281-23&P/TO 13C5-32-2/NAVAIR 13-1-32.

Figure 7-2. G-12e cargo parachute installed



- ① Place two G-14 cargo parachutes on the front of the load with the parachutes side by side.
- ② Remove the pin from the $\frac{3}{8}$ -inch shackle assembly on the risers. Place the risers of one parachute on the bell portion of a single clevis. Place the end of a 120-inch connector strap on the clevis. Replace the clevis pin and the cotter pin, bend the cotter pin. Repeat for the other parachute.
- ③ Place the risers of the second parachute and the end of another 120-inch connector strap on a second $\frac{3}{8}$ -inch shackle as described in step 2.
- ④ Place the free end of the 120-inch connector straps on the bell portion of a $\frac{3}{4}$ -inch cargo suspension clevis.
- ⑤ Place the four suspension web D-rings on the bolt of the clevis. Replace nut.

Figure 7-3. Two g-14 cargo parachutes installed



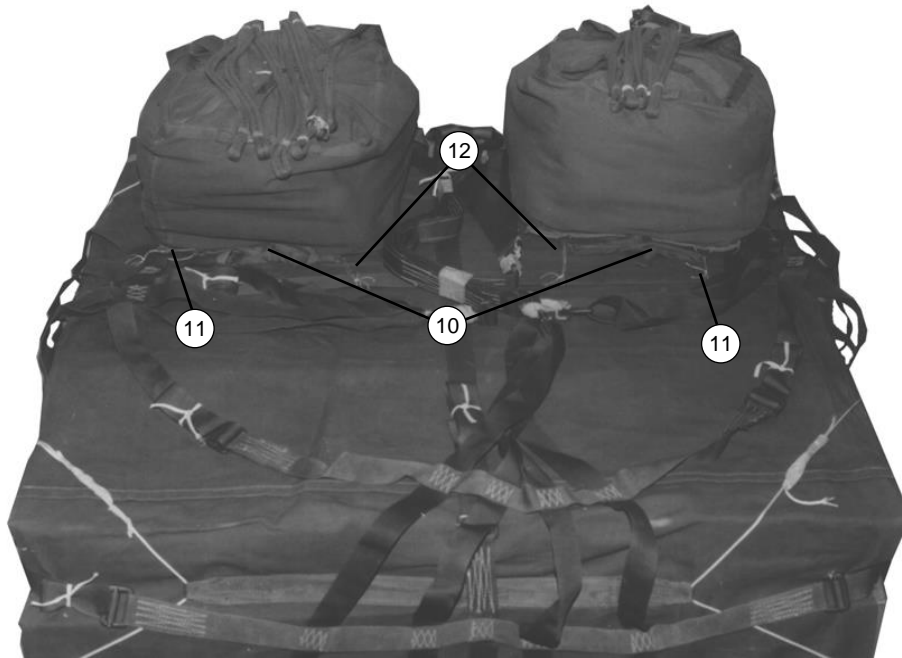
- ⑥ Tie the front center tie tapes of one parachute to a convenient point on the front of the load.
- ⑦ Tie the front center tie tapes of the other parachute to a convenient point on the front of the load.
- ⑧ Tie the front outside tie tapes of each parachute to a convenient point on the load.
- ⑨ Fold the excess connector strap and secure the folds with masking tape. Tie the folds to the front of the load with a double length of type I, 1/4-inch cotton webbing.

Figure 7-3. Two g-14 cargo parachutes installed (continued)

Notes.

Two, 9-foot, (2-loop) slings may be used in place of the two 120-inch connector straps. However, one sling and one strap may not be used.

Tape the clevis pin and other sharp edges with cloth-backed tape.

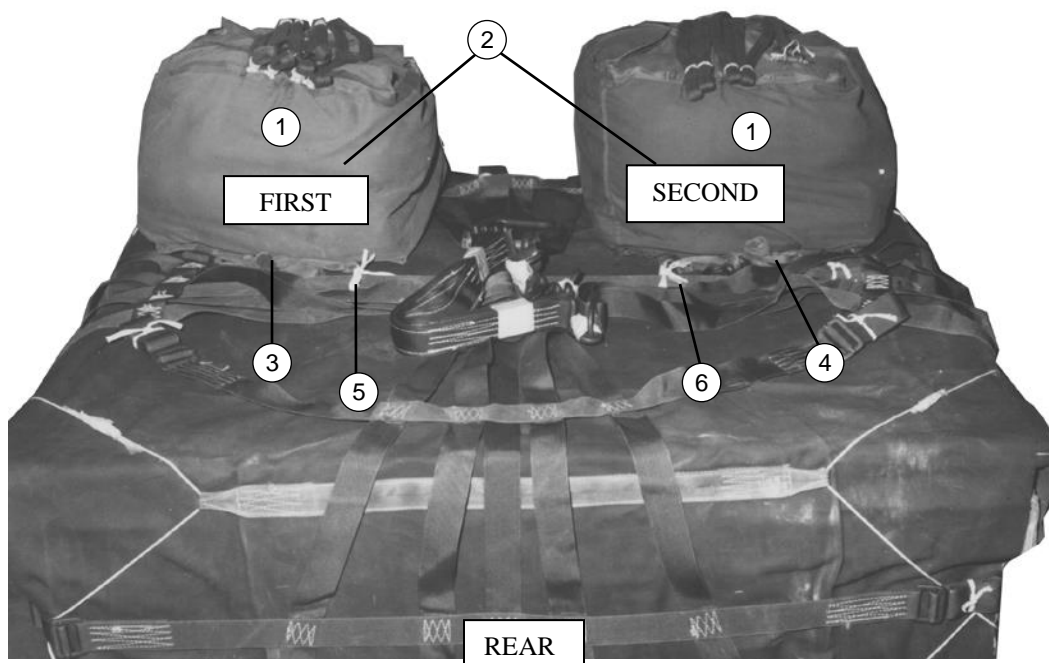


- ⑩ Tie the rear tapes of each parachute together.
- ⑪ Pass a length of ticket number 8/7 cotton thread through the outside tie loop of each parachute. Tie the ticket number 8/7 cotton thread to a convenient point on the load.
- ⑫ Pass a length of ticket number 8/7 cotton thread through the inside tie loop of each parachute. Tie the ticket number 8/7 cotton thread to a convenient point on the load.

Figure 7-3. Two g-14 cargo parachutes installed (continued)

CAUTION

The cluster of three G-14 cargo parachutes will be used with single airdrop loads only and not with multiple loads.



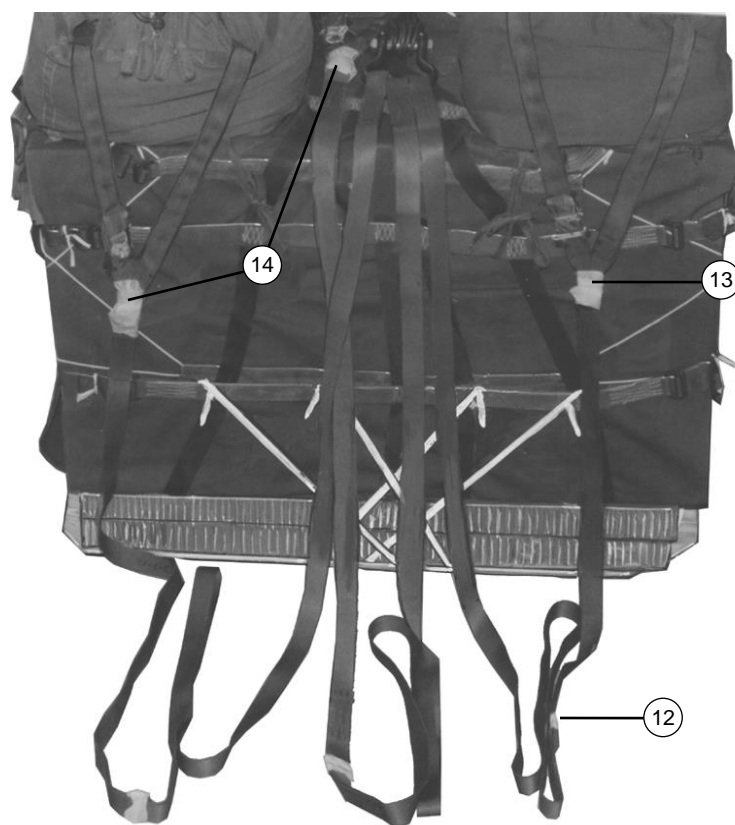
- ① Place two G-14 cargo parachutes equipped with non-breakaway static lines on top of the load even with the front of the A-22 cargo bag.
- ② Designate the parachutes as first and second.
- ③ Tie the left rear tie tapes of the first parachute to the right tie loop.
- ④ Tie the right rear tie tape of the second parachute to the left tie loop.
- ⑤ Tie the left rear corner of the first parachute to the A-22 sling assembly with a double length of type I, ¼-inch cotton webbing.
- ⑥ Tie the right rear corner of the second parachute to the A-22 sling assembly with a double length of type I, ¼-inch cotton webbing.

Figure 7-4. Three g-14 cargo parachutes installed



- ⑦ Center a third G-14 cargo parachute with a non-breakaway static line behind the first and second parachutes.
- ⑧ Tie the three outside tie tapes of the first and second parachutes and the two outside tie tapes of the third parachute to convenient points on the load.
- ⑨ Tie the front deployment bag tie tapes of the third parachute together.
- ⑩ Pass one end of a double length of type I, $\frac{1}{4}$ -inch cotton webbing around the tie tapes and the upper lateral strap of the A-22 sling assembly. Tie the ends of the type I, $\frac{1}{4}$ -inch cotton webbing together with a surgeon's knot and locking knot.
- ⑪ Tie the opposite side of the deployment bag of the third parachute as described in step 10.

Figure 7-4. Three g-14 cargo parachutes installed (continued)

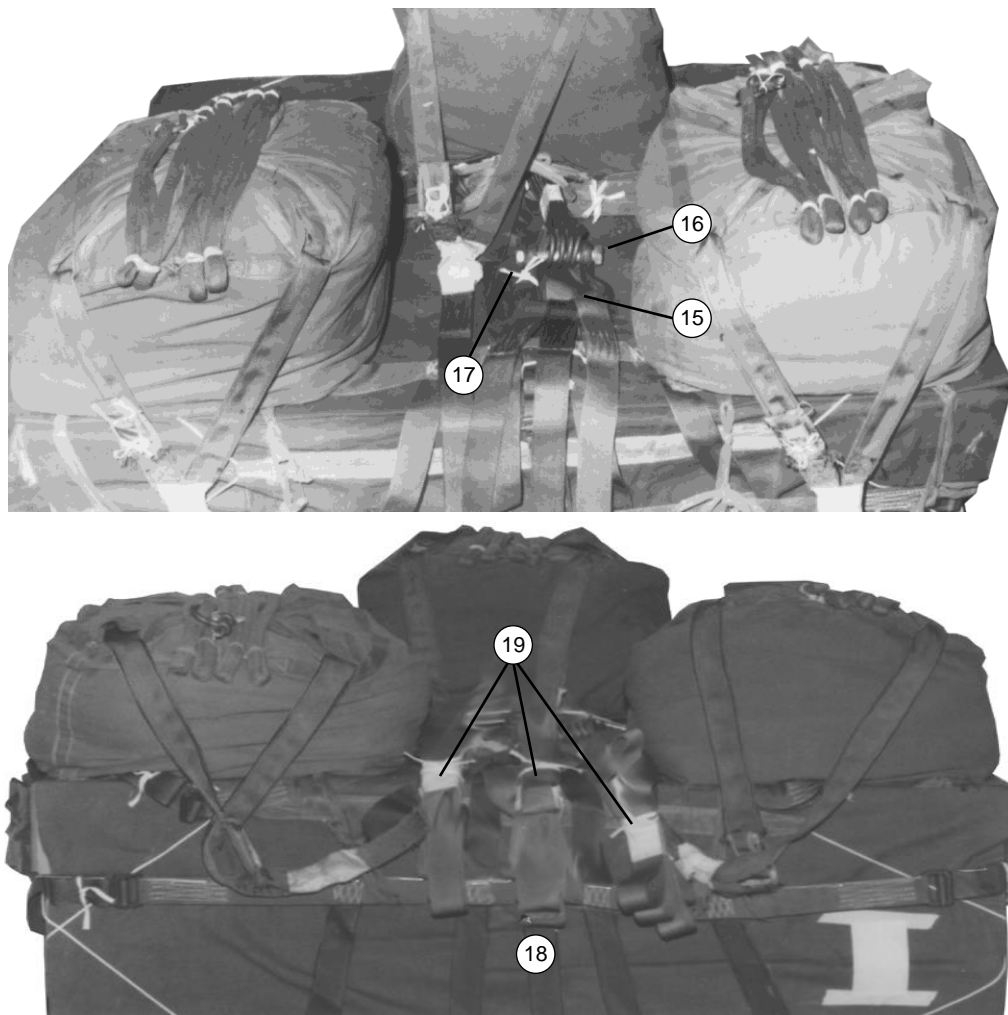


- ⑫ Form a 180-inch riser extension by connecting a 60-inch connector strap and a 120-inch connector strap with an L-bar connector link. Cover the L-bar connector link with tape.

Note. A 16-foot (2-loop), type XXVI nylon webbing sling is an authorized substitute. A medium clevis must be used to connect the sling to the G-14 risers.

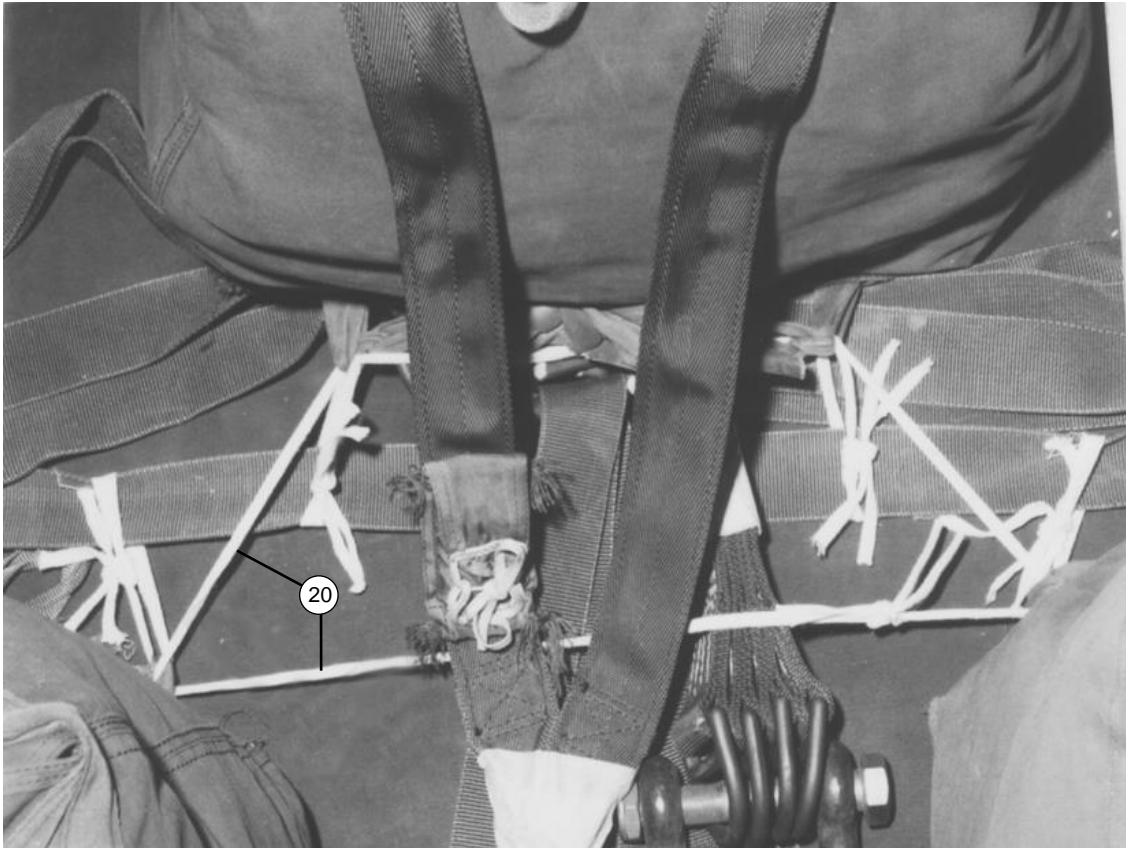
- ⑬ Connect the risers of the first parachute to one end of the 180-inch riser extension with a $\frac{3}{8}$ -inch shackle assembly. Cover the $\frac{3}{8}$ -inch shackle assembly with cloth-backed tape.
- ⑭ Repeat steps 12 and 13 for the second and third parachutes.

Figure 7-4. Three g-14 cargo parachutes installed (continued)



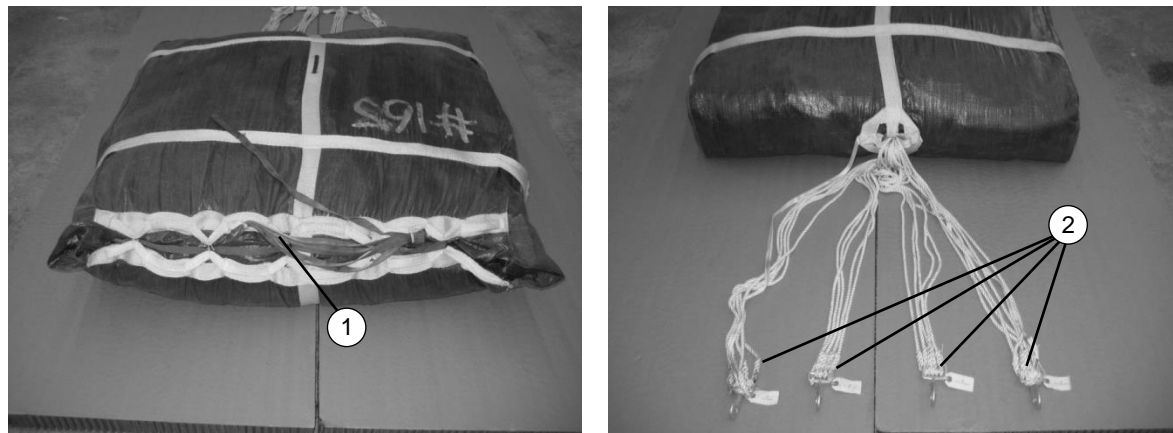
- ⑮ Place the bell portion of a cargo suspension clevis on the free ends of the riser extensions.
- ⑯ Place the A-22 sling assembly D-rings on the bolt of the cargo suspension clevis. Replace the nut.
- ⑰ Tie the cargo suspension clevis to the A-22 sling assembly with a double length of type I, ¼-inch cotton webbing.
- ⑱ Fold each riser extension and tape the folds together with masking tape.
- ⑲ Tie the folds to the A-22 sling assembly with type I, ¼-inch cotton webbing using a surgeon's knot and locking knot.

Figure 7-4. Three g-14 cargo parachutes installed (continued)



- ②① Safety the three cargo parachutes together with one length of type I, ¼-inch cotton webbing. Pass the webbing through the inside bag closing tie loops of the deployment bags. Tie the ends of the webbing together with a surgeon's knot and locking knot.

Figure 7-4. Three g-14 cargo parachutes installed (continued)



① Place the parachute on the load with the static line facing the front of the load.

② The suspension lines are separated into numbered groups.

Lines 1 through 5 – Group #1.

Lines 6 through 10 – Group #2.

Lines 11 through 15 – Group #3.

Lines 16 through 20 – Group #4.

Figure 7-5. LCADS low-velocity cargo parachute installed

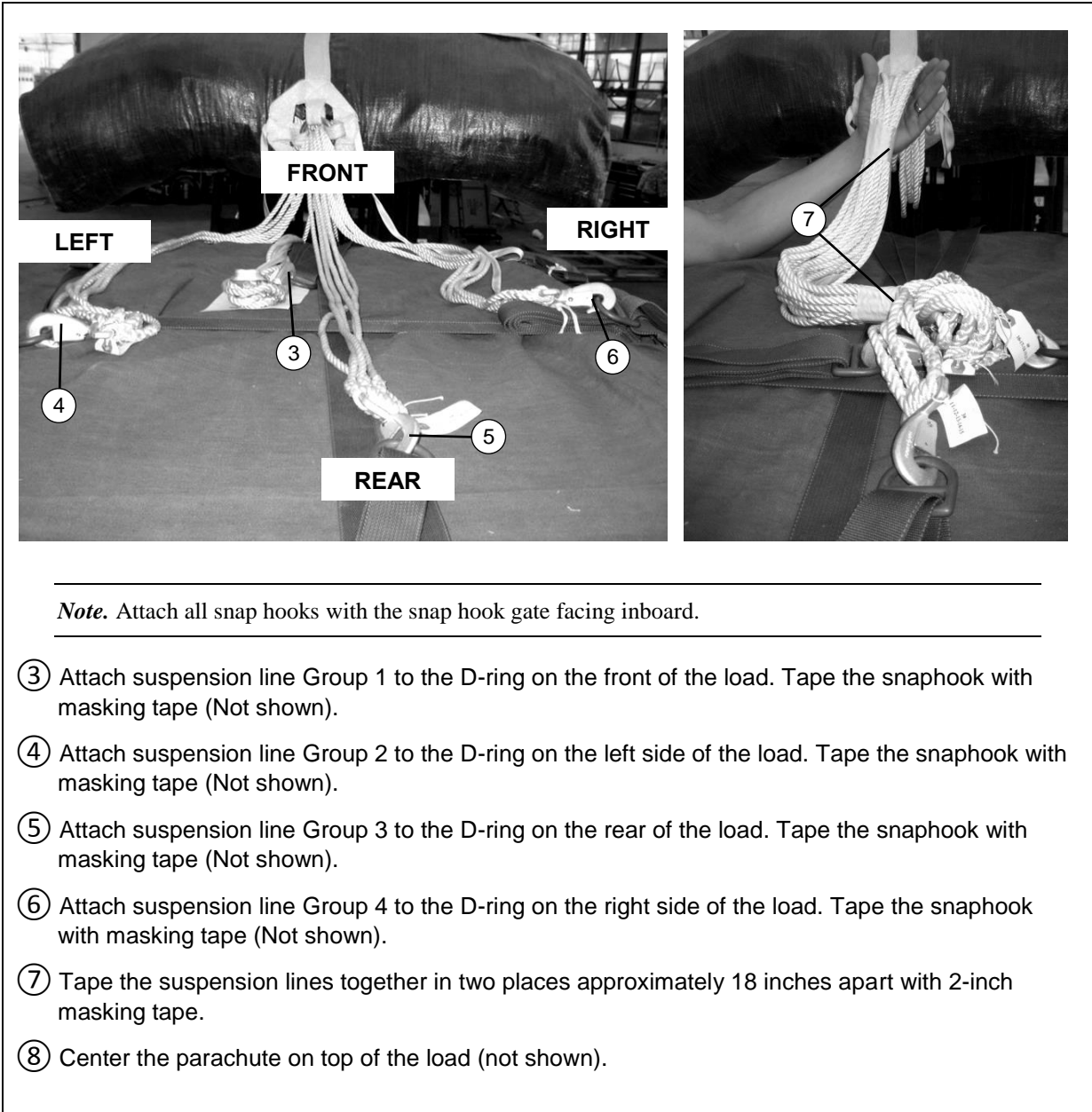
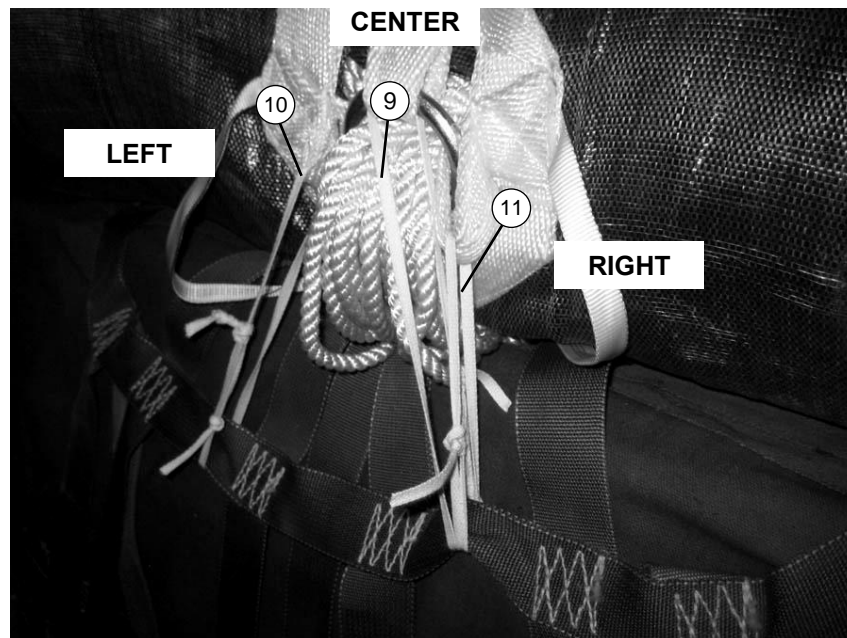
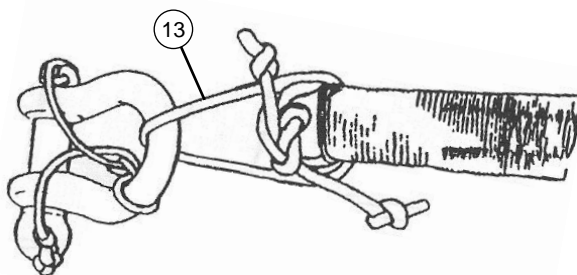


Figure 7-5. LCADS low-velocity cargo parachute installed (continued)



- ⑨ Tie a one turn single, type I ¼- inch cotton webbing tie from the center loop of the deployment bag, where the suspension lines extend, to the container lateral strap. Secure the tie with a trucker's hitch.
- ⑩ Tie a one turn single, type I ¼- inch cotton webbing tie from the left loop of the deployment bag where the suspension lines extend, to the container lateral strap. Secure the tie with a trucker's hitch.
- ⑪ Tie a one turn single, type I ¼- inch cotton webbing tie from the right loop of the deployment bag where the suspension lines extend, to the container lateral strap. Secure the tie with a trucker's hitch.

Figure 7-5. LCADS low-velocity cargo parachute installed (continued)

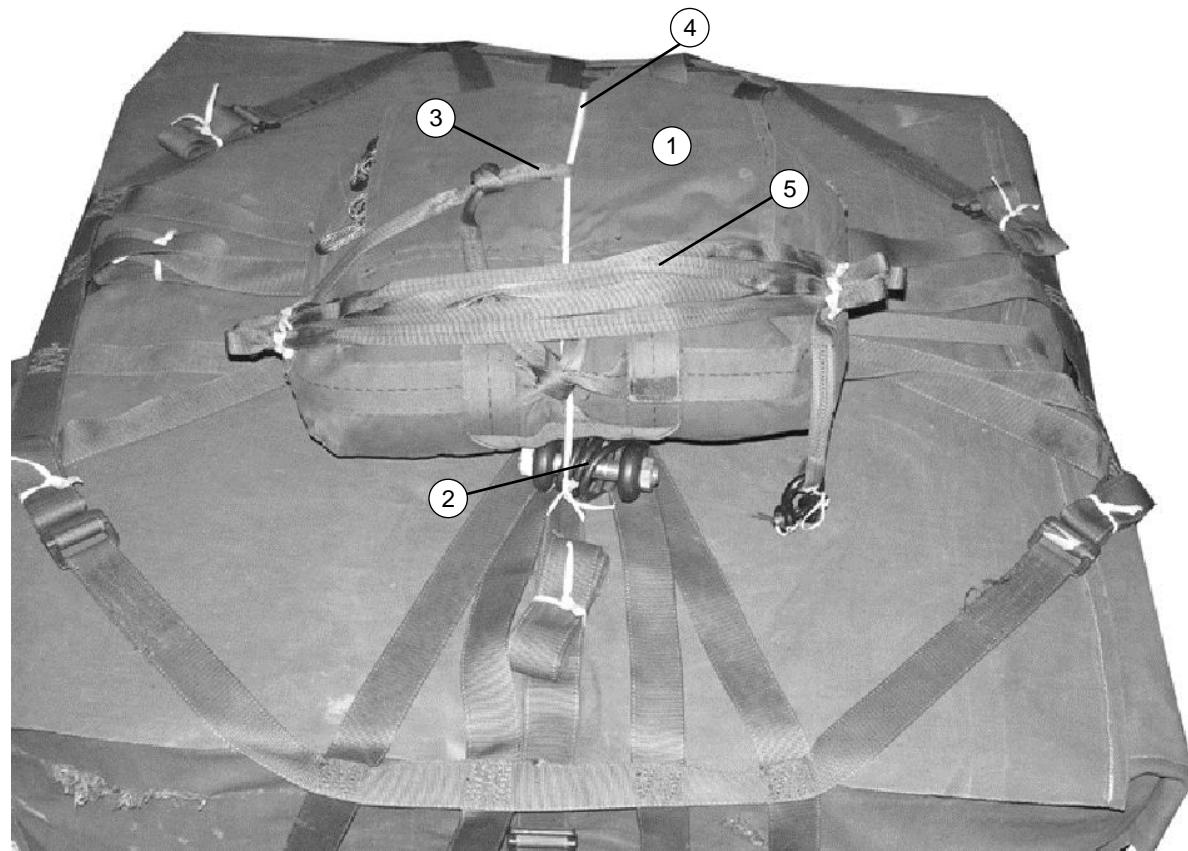


- ⑫ Secure the parachute to the load with one turn doubled Type I, ¼-inch cotton webbing. Secure the tie to the container lateral strap on one side with 3 alternating half hitches. Route the tie up through the front carrying handle of the parachute, over the top of the parachute and down through the other front carrying handle. Secure the tie with a trucker's hitch to the container lateral strap.
- ⑬ Attach a ⅜-inch shackle to the static line in the breakaway configuration using Type III nylon cord.

CAUTION

The breakaway tie between the static line and the ⅜-inch shackle is made with full strength Type III nylon cord. **DO NOT** remove the filler cords from the Type III nylon cord.

Figure 7-5. LCADS low-velocity cargo parachute installed (continued)



- ① Place a 26-foot, high-velocity cargo parachute on top of the load.
- ② Place the suspension web D-rings on the bolt of the cargo suspension clevis.
- ③ Form a 3-inch diameter loop in the static line by tying an overhand knot approximately 12 inches up from the deployment bag main strap attaching loop.
- ④ Tie one end of a length of Type I, ¼-inch cotton webbing to a convenient point on the A-22 container. Pass the free end of the cotton webbing through the deployment bag main strap attaching loop, through the loop in the static line around a convenient point on the load and secure using a trucker's hitch knot.
- ⑤ Stow the static line according to TM 10-1670-276-23&P/TO 13C5-29-2/NAVAIR 13-1-29.

Figure 7-6. One 26-foot high-velocity cargo parachute installed



- ① Modify the 22-foot cargo extraction parachute by adapting the procedures in Figure 3-6, steps 1 through 3 for modifying the 15-foot extraction parachute.
- ② Pack the 22-foot extraction parachute in accordance with TM 10-1670-279-23&P/TO 13C5-27-2.
- ③ S-fold pendulum line and attach a 20-foot Type XXVI sling following Figure 3-6, steps 5 through 7.
- ④ Secure parachute to the top of the load using the procedures outlined in Figure 3-7, steps 5 through 11.

Figure 7-7. One 22-foot cargo extraction parachute installed

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Chapter 8

Rigging Typical A-22 Loads

SECTION I – RIGGING A-22 LOADS FOR LOW-VELOCITY AIRDROP

DESCRIPTION OF LOAD

8-1. A typical load is rigged for low-velocity airdrop using an A-22 cargo bag. Typical loads include rations, repair parts, water cans, and other small items. Items to be dropped may be rigged in their original shipping container or may be repacked for airdrop. A-22 container loads must weigh between 501 and 2,200 pounds, excluding the weight of the parachute. The load is rigged with one G-12E cargo parachute with a 68-inch diameter pilot parachute. See Chapter 2 for aircraft capabilities and limitations.

PREPARING DROP ITEMS

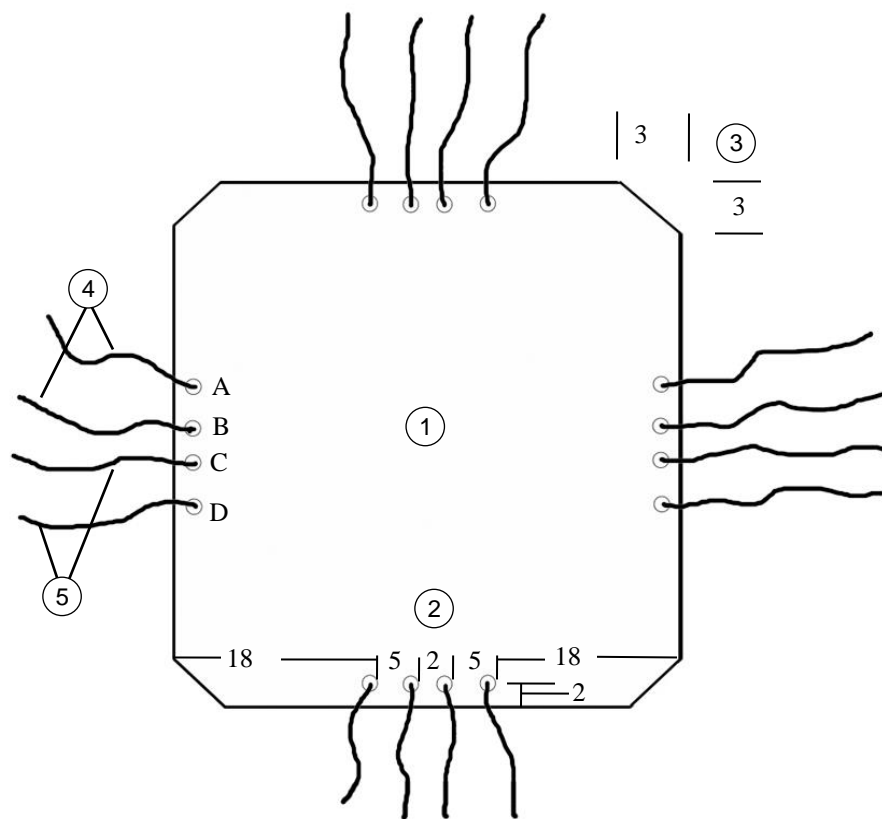
8-2. Prepare the drop items according to the load's sensitivity. Items must be well padded to prevent damage during airdrop. Items must also be padded or containerized to prevent them from falling out of the container during airdrop.

PREPARING SKID BOARD

8-3. Prepare a locally fabricated skid board as shown in Figure 8-1.

Notes.

This drawing is not drawn to scale.
All dimensions are given in inches.
Use only AC grade plywood for skid boards.



- ① Place a $\frac{3}{4}$ - or 1- by 48- by 48-inch piece of plywood on a flat surface.
- ② Drill four $\frac{1}{2}$ -inch holes on each side as shown above.
- ③ Measure 3 inches in from each corner of the skid board and make a diagonal cut.
- ④ Cut eight 8-foot lengths of $\frac{1}{2}$ -inch tubular nylon webbing. Route one length through hole A from the bottom and the other end through hole B from the bottom. Even the ends.
- ⑤ Repeat step 3 for holes C and D and remaining sides.

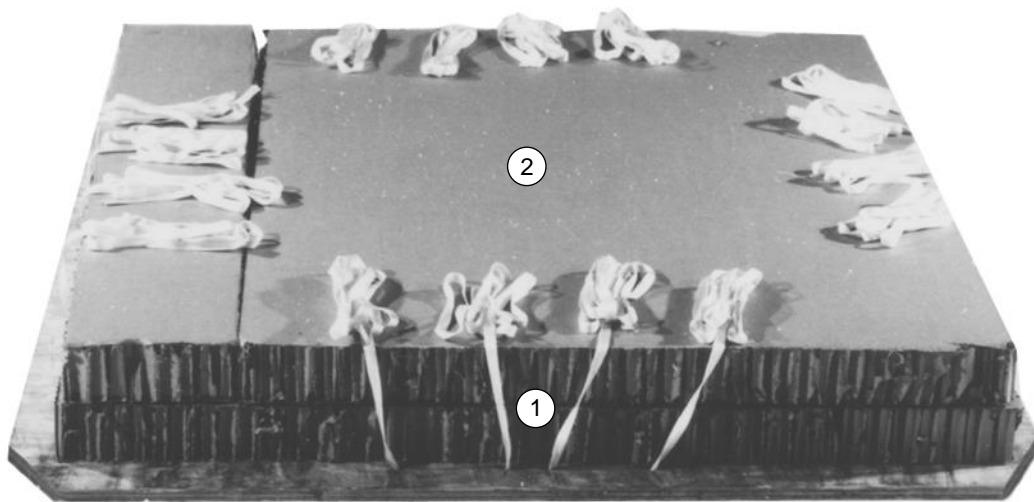
Figure 8-1. Locally fabricated skid board prepared for single A-22 load

POSITIONING HONEYCOMB

8-4. Position honeycomb as shown in Figure 8-2. Glue the pieces of honeycomb together; however, the stack does not have to be glued to the skid board.

CAUTION

The bottom layer of honeycomb must be 2 inches from all sides to allow proper operation of the CVRS.



- ① Center a 36- by 44-inch and an 8- by 44-inch piece of honeycomb side by side on the skid board.
- ② Repeat step 1 for a second layer of honeycomb; however, alternate the pieces of honeycomb.

Figure 8-2. Honeycomb positioned on skid board

POSITIONING A-22 CARGO BAG SLING, COVER, AND LOAD

8-5. Position the A-22 cargo bag sling, cover, and load as shown in Figure 8-3.

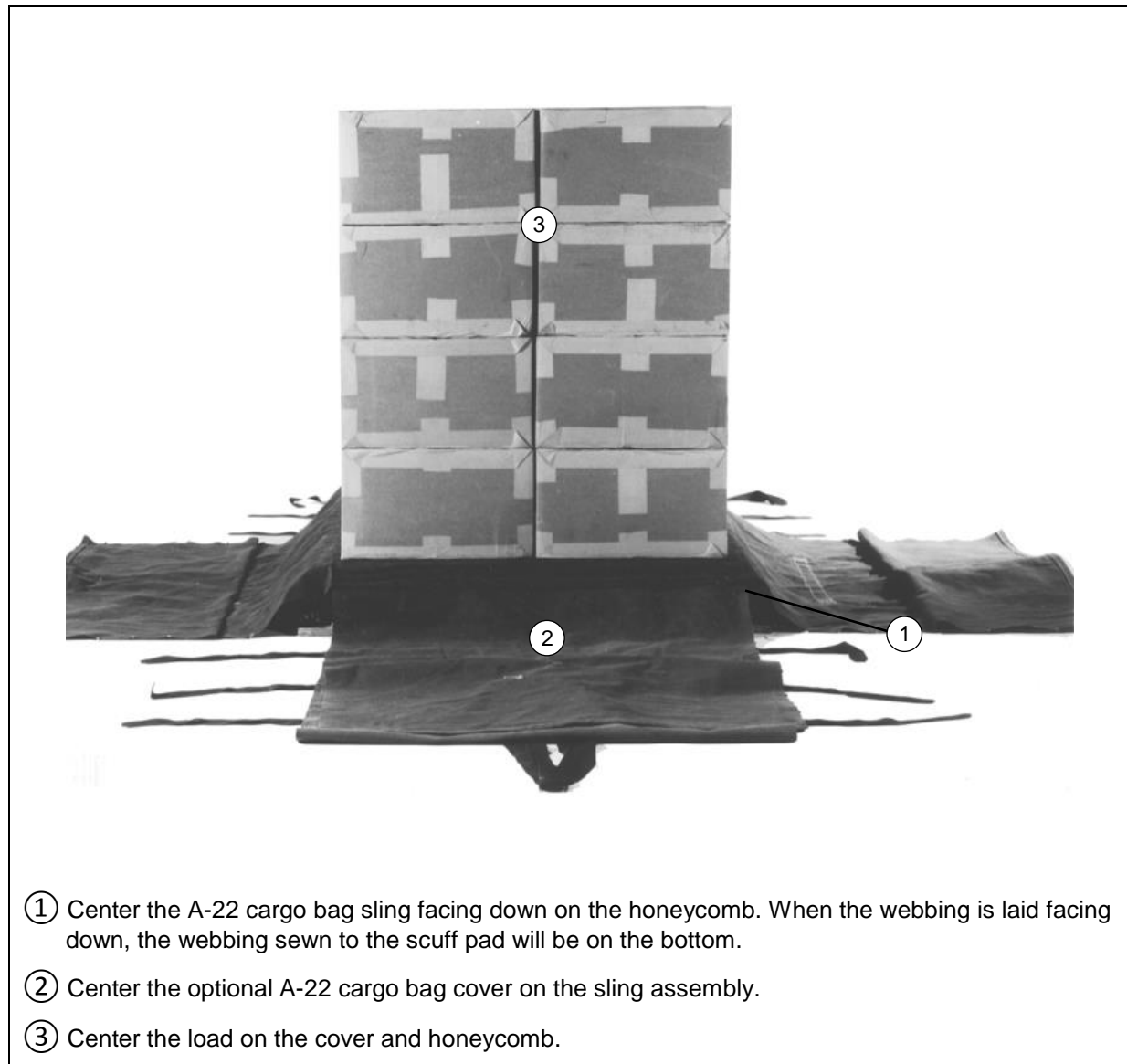
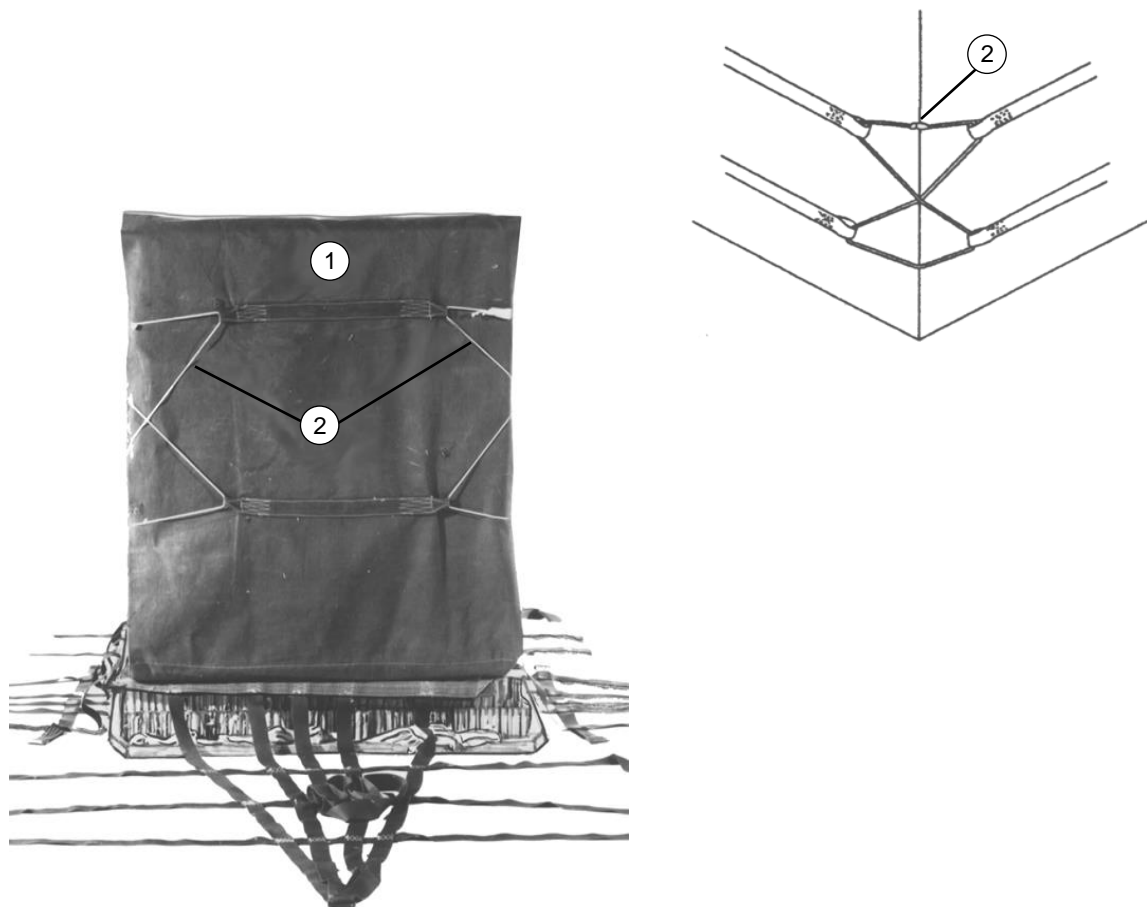


Figure 8-3. A-22 cargo bag sling, cover, and load positioned

SECURING A-22 CARGO BAG COVER

8-6. Secure the A-22 cargo bag cover over the load as shown in Figure 8-4.

Note. This drawing is not drawn to scale.



- ① Bring up sides to cover the load. Fold under any side that will obstruct the bag cover securing ties.
- ② Using a length of type III, nylon cord. Route the cord as shown. Pull it tight and make a surgeon's knot and bow knot. Secure the knot and the excess with masking tape. Make sure one running end is exposed.

Figure 8-4. A-22 cargo bag cover secured

SECURING A-22 CARGO BAG SLING

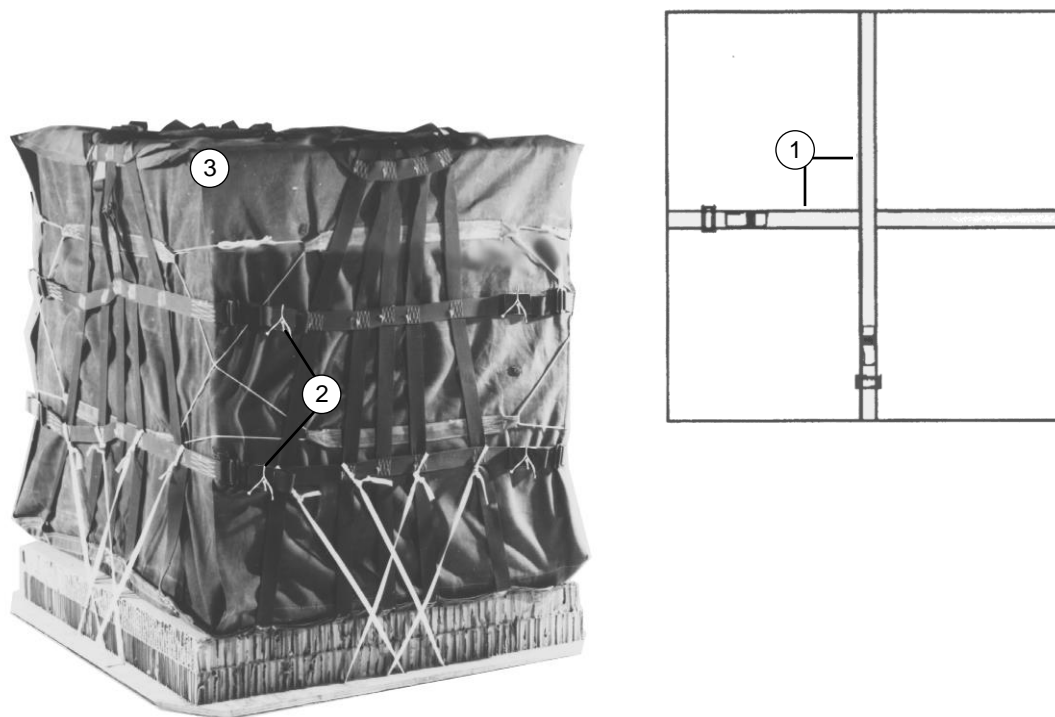
8-7. Secure the sling assembly according to Figure 8-5.

Notes.

This drawing is not drawn to scale.

Friction adapters cannot be on corners.

The middle support web should remain vertical.

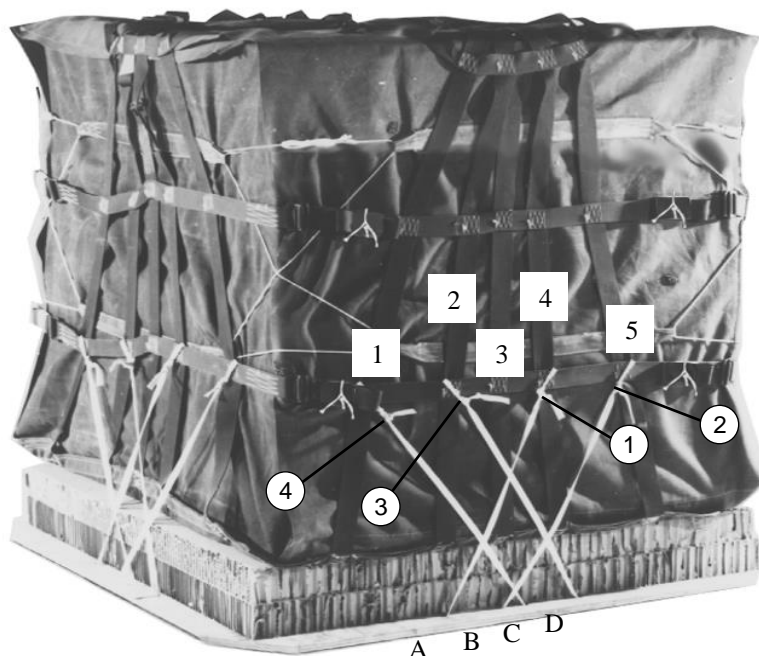


- ① Bring the short tie-down strap over the load and route it through the friction adapter. Route the long tie-down strap the same way. Apply tension to the friction adapter and secure the excess as shown in Figure 1-3.
- ② Route the two lower lateral straps through the friction adapter. Apply uniform tension and secure the excess as shown in Figure 1-3.
- ③ If the top lateral strap is higher than the load, tighten the strap loosely on top of the load as shown above. If the load is higher than the lateral strap, place the strap over the corner and tighten it.
- ④ If the strap cannot be placed over the corner, fasten the strap around the load sides. Pass a length of type I, ¼-inch cotton webbing through each rectangle portion of the sling assembly D-rings and tie the ends together with a surgeon's knot and locking knot. Ensure the type I, ¼-inch cotton webbing stays on top of the corners of the load.

Figure 8-5. A-22 cargo bag sling secured

SECURING SKID BOARD TO A-22 CARGO BAG

8-8. Secure the skid board to the A-22 cargo bag as shown in Figure 8-6. When tightening straps, make sure excess tension is not applied causing the sewn portion at the intersection of lateral straps and support web to separate.



- ① Starting at the left side, take tie-down A and diagonally tie it around the intersection of the lower lateral strap and fourth support web. Use three half-hitch knots and an overhand knot in the running end.
- ② Route tie-down B around the fifth support web and lower lateral strap intersection diagonally. Pull the excess slack out and tie it with a trucker's hitch knot and an overhand knot in the running end. Cut excess webbing, leaving end approximately 6 inches long.
- ③ Repeat step 1 for tie-down D and secure it to the second intersection on the lower lateral strap.
- ④ Repeat step 2 for tie-down C and secure it to the first intersection on the lower lateral strap.
- ⑤ Repeat steps 1 through 4 for the other tie-down straps (not shown).

Figure 8-6. Skid board secured to A-22 bag

ATTACHING SUSPENSION WEBS

8-9. Attach four suspension webs as shown in Figure 8-7.

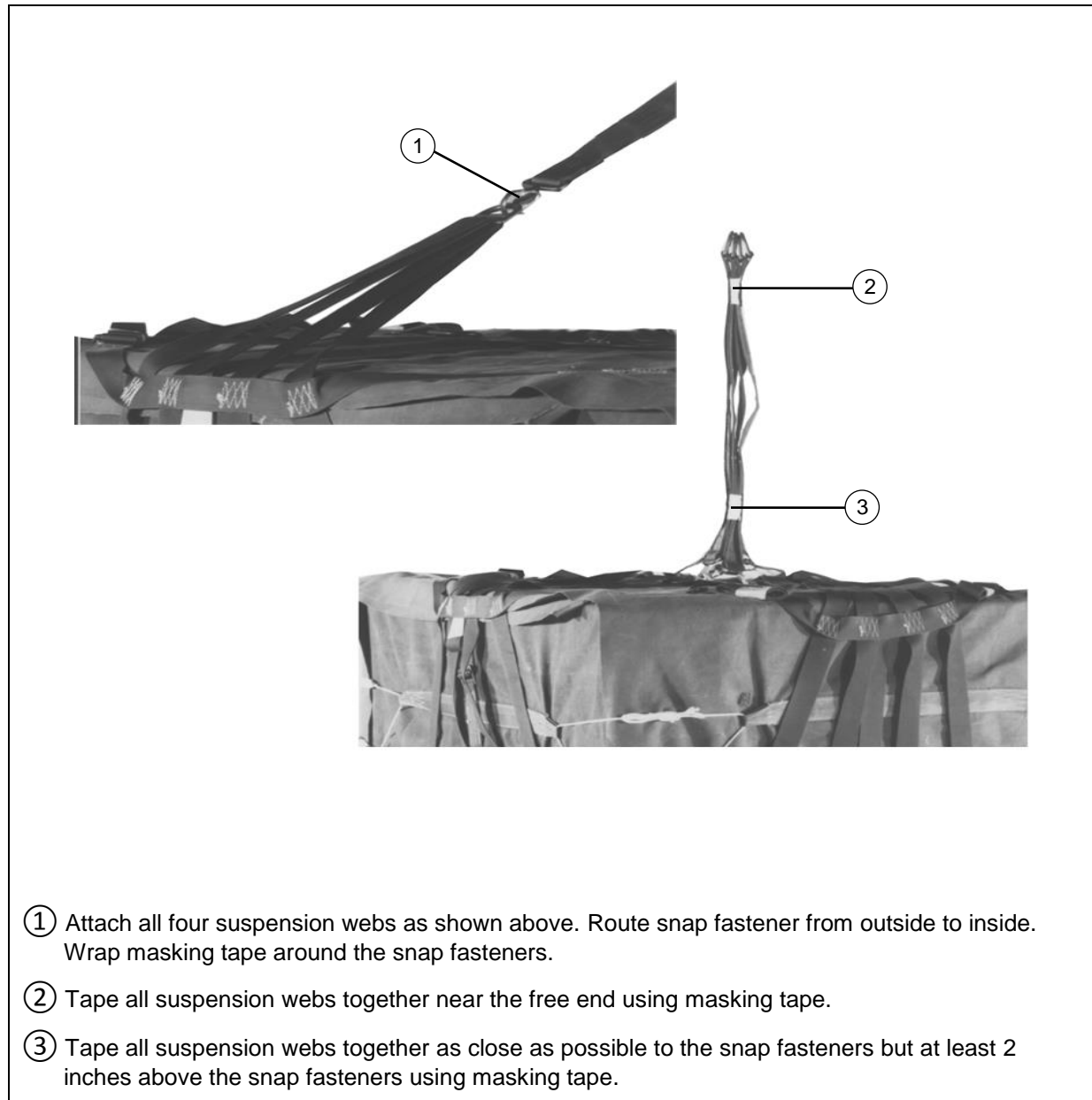


Figure 8-7. Suspension webs attached

INSTALLING PARACHUTE

8-10. Install the cargo parachute according to Chapter 7.

MARKING RIGGED LOAD

8-11. Mark the rigged load according to Paragraph 1-5. Compute the rigged load data. An AMC IMT 1033, 20050204, V1. (Shipper's Declaration for Dangerous Goods) may be required.

CAUTION

Make the final rigger inspection required by TM 4-48.02/MCRP 4-11.3J/NAVSEA SS40-AB-MMO-010/TO 13C7-1-5 and AR 59-4/OPNNAVINST 4630.24C/AFJ 13-210(I)/MCO 13480.1B before the load leaves the rigging site.



RIGGING LOAD DATA (WITHOUT PARACHUTE)

G-12E cargo parachute.....	501 – 2,200 pounds
LCADS LCLV cargo parachute.....	501 – 2,200 pounds
Two G-14 cargo parachutes.....	501 – 1,000 pounds
Three G-14 cargo parachutes.....	1,001 – 1,500 pounds

Figure 8-8. A-22 container load rigged for low-velocity airdrop

EQUIPMENT REQUIRED

8-12. Use the equipment listed in Table 8-1 to rig the load shown in Figure 8-8.

Table 8-1. Equipment required for rigging an A-22 container load for low-velocity airdrop

<i>National Stock Number</i>	<i>Item</i>	<i>Quantity</i>
8040-00-273-8713	Adhesive, paste, 1-gallon	As required
1670-00-587-3421	Bag, cargo, A-22	1
4030-00-678-8562	Clevis, suspension, ¾-inch (medium)	1
4020-00-240-2146	Cord, nylon, type III	As required
1670-00-753-3928	Pad, energy-dissipation material, honeycomb	2 sheets
1670-00-999-2658	Parachute, cargo, G-12E	1
	OR	
1670-01-547-0401	Parachute, cargo, Low Cost Low Velocity	1
	OR	
1670-00-999-2658	Parachute, cargo, G-14	2 or 3
	Plywood:	
5530-00-128-4981	¾- by 48- by 96-inch (locally fabricated skid board)	1 sheet
	or	
5530-00-914-5118	1- by 48- by 96-inch	1 sheet
7510-00-266-6710	Tape, masking, 2-inch	As required
8310-01-102-4478	Thread, cotton, ticket number 8/7	As required
	Webbing:	
8305-00-268-2411	Cotton, ¼-inch, type I	As required
	Nylon:	
8305-00-082-5752	Tubular, ½-inch	As required

SECTION II – RIGGING A-22 LOADS FOR HIGH-VELOCITY AIRDROP**DESCRIPTION OF LOAD**

8-13. A typical load is rigged for high-velocity airdrop using the A-22 cargo bag. Typical loads include rations, repair parts, water cans, and other small items. Items may be dropped in their original package or repacked for greater protection. See Chapter 2 for aircraft capabilities and limitations.

PREPARING ITEMS AND SKID BOARD

8-14. Refer to Paragraph 8-2 to prepare the items. Use 1-inch thick plywood to prepare a skid board according to Paragraph 8-3.

POSITIONING HONEYCOMB

8-15. Use Table 8-2 to determine the number and size of honeycomb layers. Honeycomb layers should be glued together; however, the stack does not have to be glued to the skid board. See Figure 8-9 for loads weighing less than 1,100 pounds. See Figure 8-10 for loads weighing more than 1,100 pounds.

Note. The maximum width of the top three layers of honeycomb is 48 inches.

Table 8-2. Honeycomb sizes for high-velocity A-22 loads

<i>Weight of Load (Pounds)</i>	<i>Layer Number</i>	<i>Pieces</i>	<i>Length (Inches)</i>	<i>Width (Inches)</i>
501 – 1,100	1	1	44	36
		1	44	8
	2	3	44	8
	3	1	48	36
		1	48	12
	4	3	48	12
	5	1	48	36
		1	48	12
1,100 – 2,200	1	1	44	36
		1	44	8
	2	1	44	36
		1	44	7
	3	1	48	36
		1	48	12
	4	1	48	36
		1	48	12
	5	1	48	36
		1	48	12

Note. On loads weighing 1,000 to 1,100 pounds, either stack formation may be used.

CAUTION

Loads over 1,300 pounds will not have full energy absorption on impact.

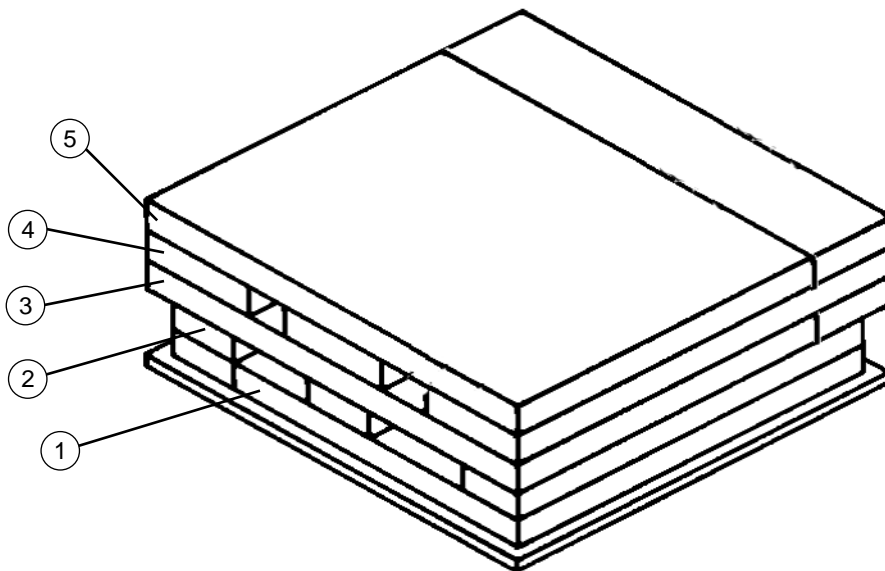
RIGGING CONTAINER

8-16. Rig the container according to Paragraphs 8-5 through 8-9.

INSTALLING PARACHUTE

8-17. Install the high-velocity parachute according to Chapter 7.

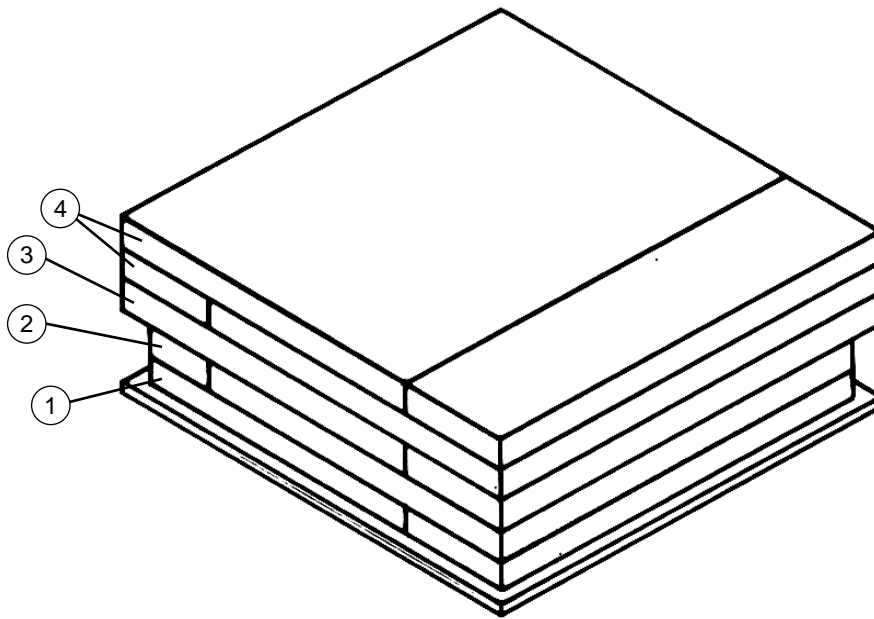
Note. This drawing is not drawn to scale.



- ① Center a 36- by 44-inch and an 8- by 44-inch piece of honeycomb side by side on the skid board. Make sure the layer is 2 inches in from all sides.
- ② Cut three 8- by 44-inch pieces of honeycomb. Center one piece on top of the first layer of honeycomb. Place one piece of honeycomb even with each side edge.
- ③ Center a 36- by 48-inch and a 12- by 48-inch piece of honeycomb side by side on top of the second layer of honeycomb.
- ④ Cut three 12- by 48-inch pieces of honeycomb. Center one piece on top of the third layer of honeycomb. Place one piece of honeycomb even with each side edge.
- ⑤ Repeat step 3 for the fifth layer of honeycomb.

Figure 8-9. Honeycomb positioned for load weighing less than 1,100 pounds

Note. This drawing is not drawn to scale.



- ① Center a 36- by 44-inch and an 8- by 44-inch piece of honeycomb side by side on the skid board. Make sure the layer is 2 inches from all sides.
- ② Repeat step 1 and alternate the pieces of honeycomb from the second layer of honeycomb.
- ③ Center a 36- by 48-inch and a 12- by 48-inch piece of honeycomb side by side on top of the second layer of honeycomb.
- ④ Repeat step 3 and alternate the pieces of honeycomb for the fourth and fifth layers of honeycomb.

Figure 8-10. Honeycomb positioned for load weighing more than 1,100 pounds

MARKING RIGGED LOAD

8-18. Mark the rigged load according to Paragraph 1-5. Compute the rigged load data. An AMC IMT 1033, 20050204, V1. (Shipper's Declaration for Dangerous Goods) may be required.

CAUTION

Make the final rigger inspection required by TM 4-48.02/MCRP 4-11.3J/NAVSEA SS400-AB-MMO-010 REV 1/TO 13C7-1-5 and AR 59-4/Operational Naval Instruction (OPNAVINST) 4630.24C/AFJ 13-210(I)/MCO 13480.1B before the load leaves the rigging site.



RIGGING LOAD DATA (WITHOUT PARACHUTE)

26-foot, high-velocity parachute	501 – 1,100 pounds
LCADS LCHV cargo parachute.....	501 – 1,100 pounds
22-foot extraction cargo parachute modified.....	501 – 1,100 pounds

Note. This container may weigh up to 2,200 pounds using the honeycomb stack formation given in Figure 8-10.

Figure 8-11. A-22 container load weighing less than 1,100 pounds rigged for high-velocity airdrop

EQUIPMENT REQUIRED

8-19. Use the equipment listed in Table 8-3 to rig the load shown in Figure 8-11.

Table 8-3. Equipment required for rigging an A-22 container load weighing less than 1,100 pounds for high-velocity airdrop

<i>National Stock Number</i>	<i>Item</i>	<i>Quantity</i>
8040-00-273-8713	Adhesive, paste, 1-gallon	As required
1670-00-587-3421	Bag, cargo, A-22	1
4030-00-678-8562	Clevis, suspension, ¾-inch (medium)	1
4020-00-240-2146	Cord, nylon, type III	As required
1670-00-753-3928	Pad, energy-dissipation material, honeycomb	2 sheets
1670-00-872-6109	Parachute, cargo, 26-foot	1
	OR	
1670-01-529-1202	Parachute, cargo, LCADS LCHV	1
	OR	
N/A	Parachute, cargo, extraction, 22-foot, modified	1
5530-00-128-4981	Plywood: ¾- by 48- by 96-inch (locally fabricated skid board)	1 sheet
5530-00-914-5118	or	
7510-00-266-6710	1- by 48- by 96-inch	1 sheet
8310-01-102-4478	Tape, masking, 2-inch	As required
	Thread, cotton, ticket number 8/7	As required
8305-00-268-2411	Webbing: Cotton, ¼-inch, type I	As required
8305-00-082-5752	Nylon: Tubular, ½-inch	As required

SECTION III – RIGGING DOUBLE A-22 CARGO BAG LOADS FOR LOW-VELOCITY

DESCRIPTION OF LOAD

8-20. A typical load is rigged for low-velocity airdrop using a double A-22 container. The double container is made by using two A-22 cargo bags. The cover is optional. The weight limitation of the load is 900 to 2,200 pounds, excluding the weight of the parachute. The load is rigged with one G-12E cargo parachute with a 68-inch diameter pilot parachute. See Chapter 2 for aircraft capabilities and limitations.

PREPARING SKID BOARD

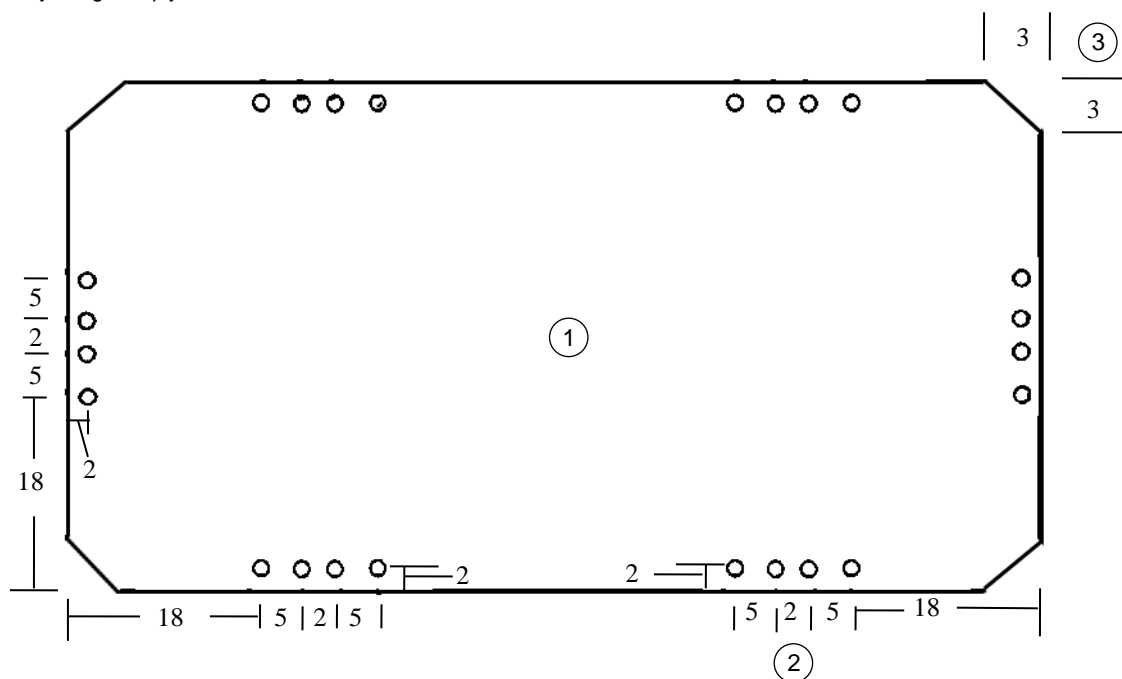
8-21. Prepare the skid board as shown in Figure 8-12.

Notes.

This drawing is not drawn to scale.

All dimensions are given in inches.

Use only AC grade plywood for skid boards.



- ① Place a $\frac{3}{4}$ - or 1- by 48- by 96-inch sheet of plywood on a flat surface.
- ② Drill twenty-four $\frac{1}{2}$ -inch holes as shown.
- ③ Measure 3 inches in from each corner of the skid board and make a diagonal cut.

Figure 8-12. Skid board prepared for a double A-22 load

PREPARING SKID BOARD TIES AND POSITIONING HONEYCOMB

8-22. Prepare the skid board ties and position the honeycomb on the skid board as shown in Figure 8-13.

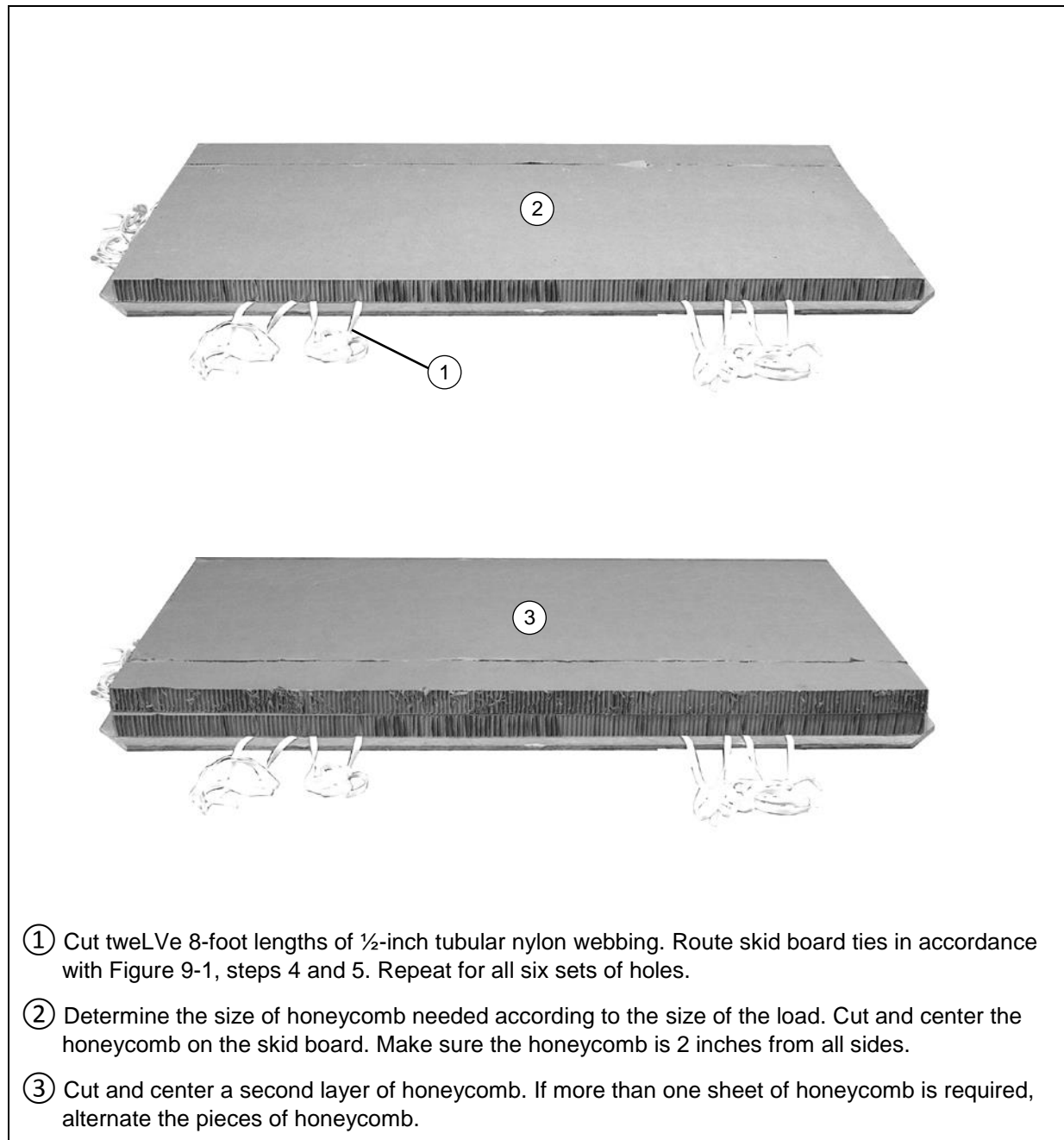
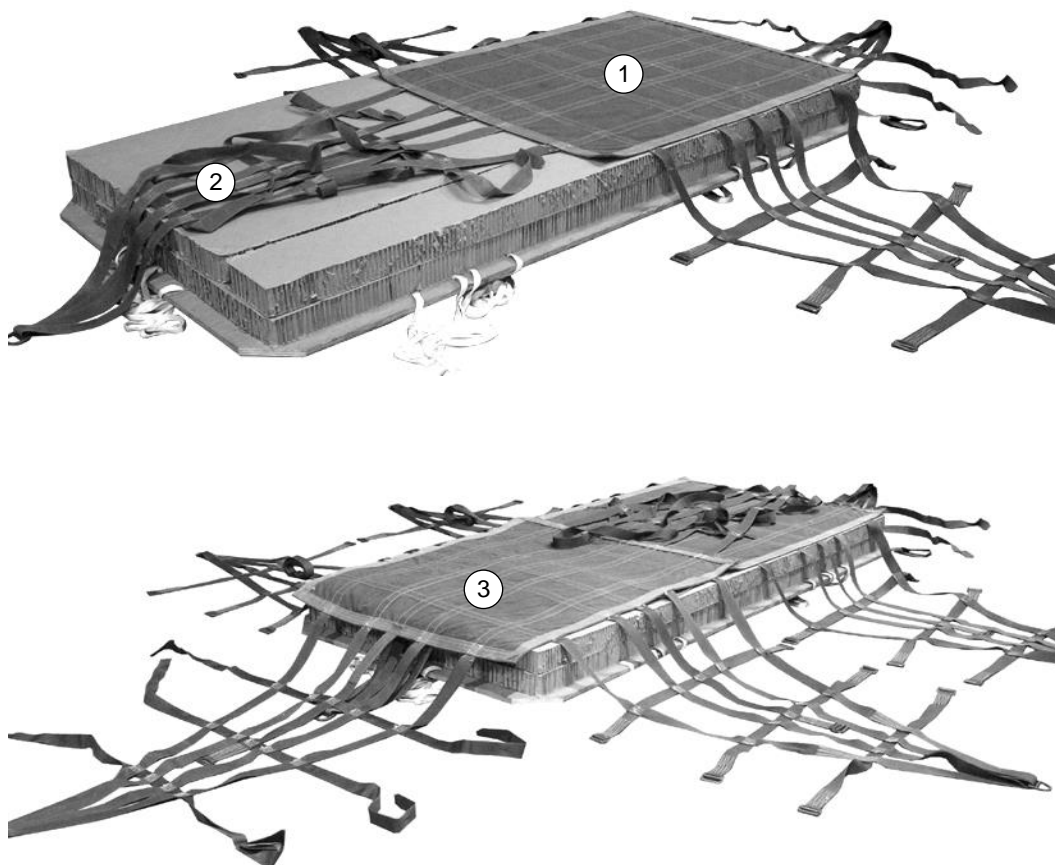


Figure 8-13. Skid board ties prepared and honeycomb positioned

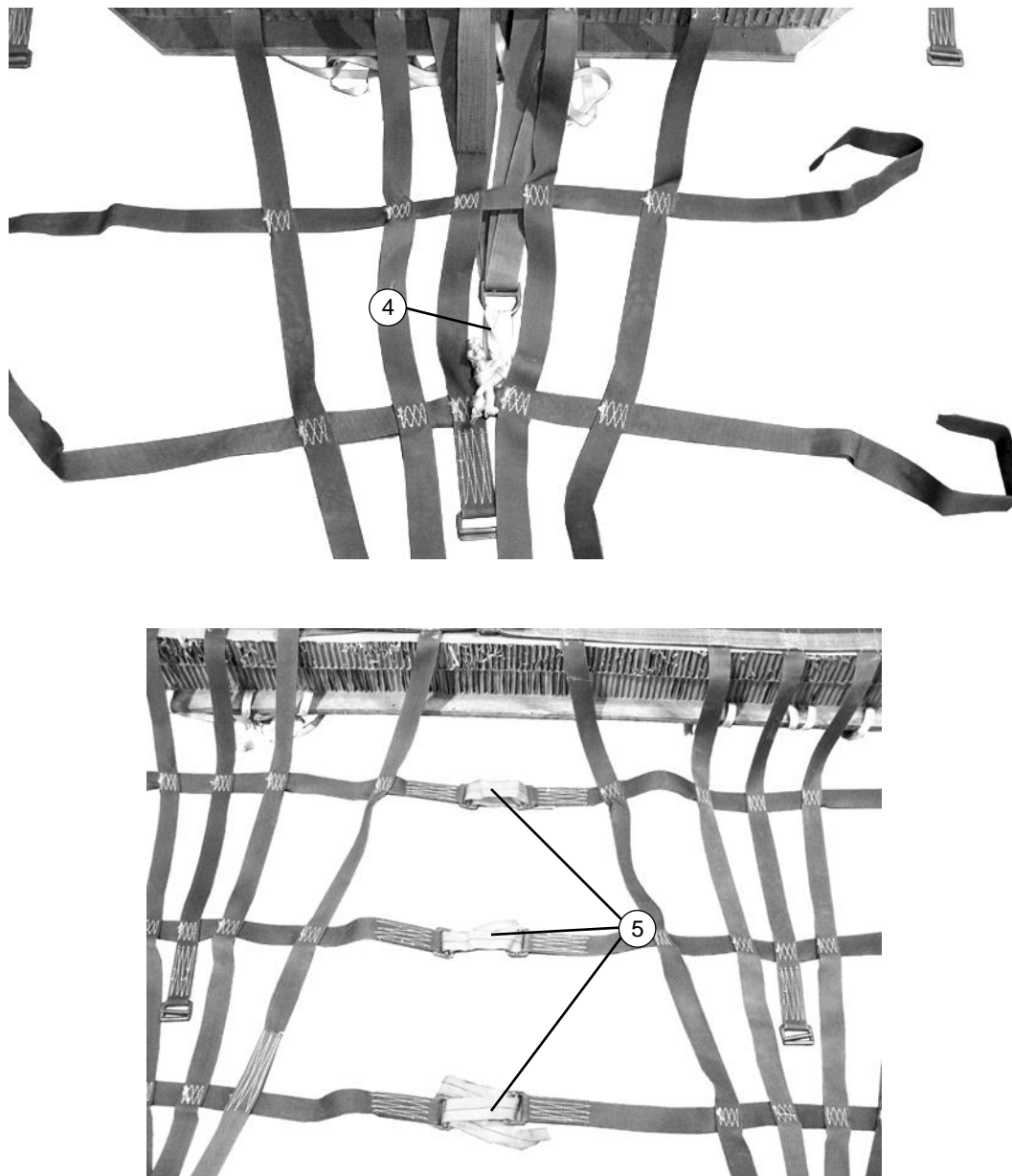
POSITIONING A-22 SLING ASSEMBLIES

8-23. Position two A-22 sling assemblies on the double A-22 load as shown in Figure 8-14.



- ① Place one A-22 sling assembly toward the front of the layer of honeycomb. Extend all lateral straps and support webbing. Make sure the support web D-ring at the rear extends off the load and that the friction adapter on the front support web extends to the front of the load.
- ② Fold and place all lateral straps on top of the rear support web.
- ③ Place the second A-22 sling assembly to the rear. Position it in the same manner as the front assembly. Make sure the D-ring on the front support web extends off the load and the friction adapter on the rear support web extends to the rear of the load.

Figure 8-14. Sling assemblies positioned



- ④ Use a length of type VIII nylon webbing to tie the support web D-ring exposed at the front and rear of the load to the other A-22 sling assembly as shown.
- ⑤ Cut six lengths of type VIII nylon webbing. Route one length through each set of friction adapters at the midsection of the load as shown. Do not apply tension at this time.

Figure 8-14. Sling assemblies positioned (continued)

POSITIONING COVERS

8-24. Use two optional A-22 cargo bag covers when rigging this load, if needed. Position the covers as shown in Figure 8-15.

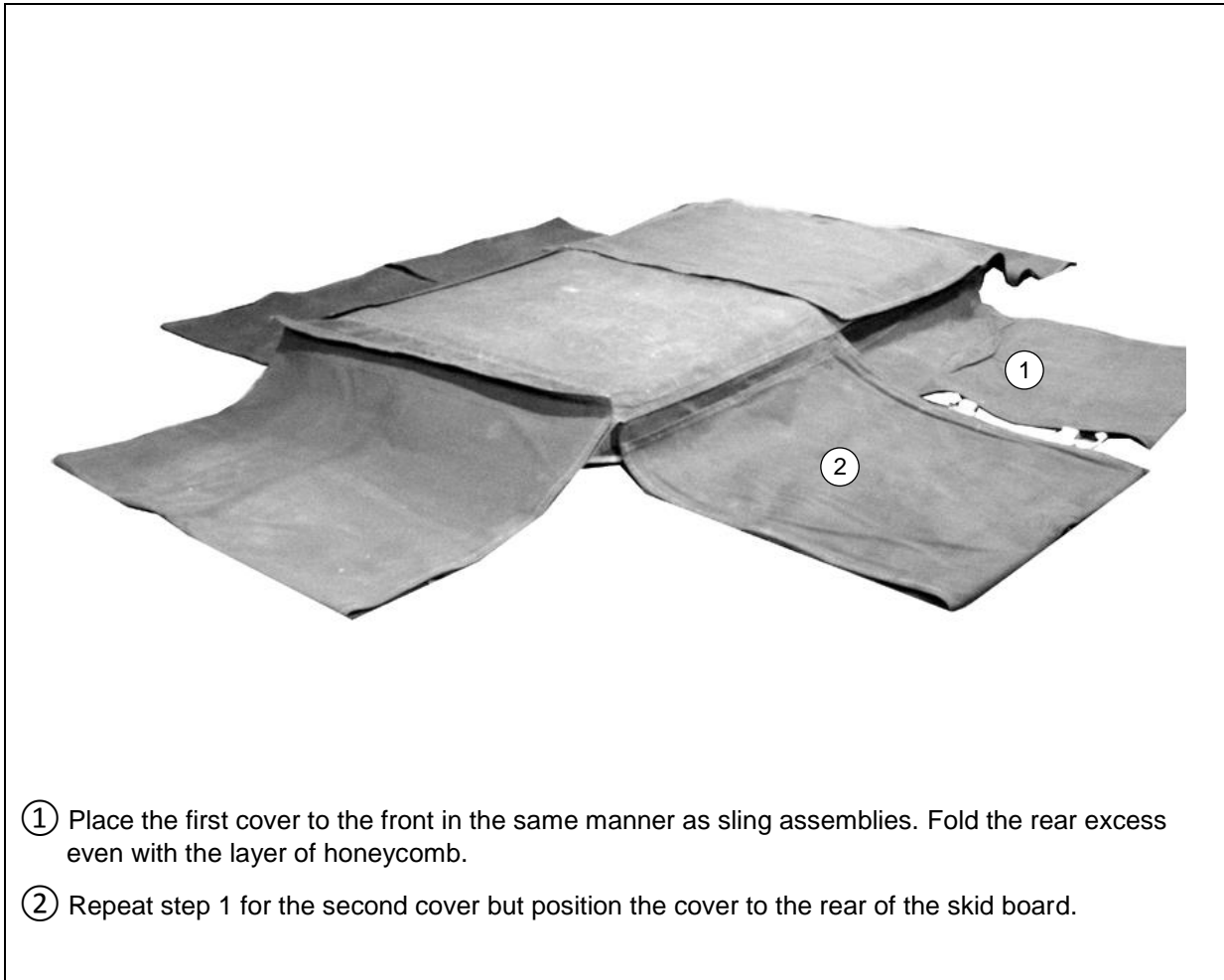
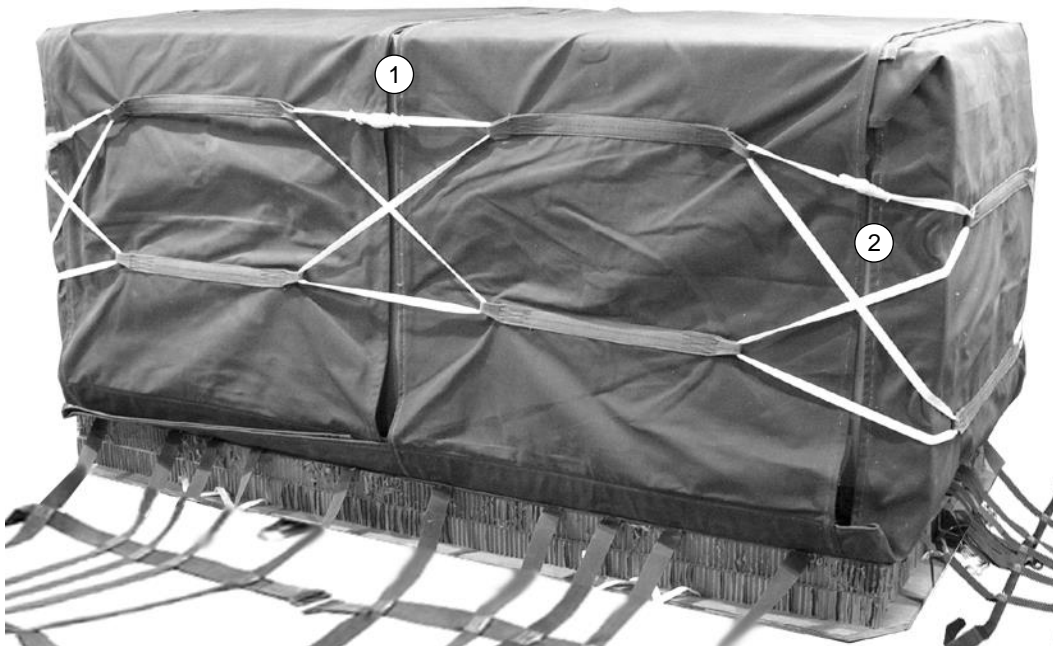


Figure 8-15. Covers positioned

POSITIONING LOAD AND CLOSING BAG COVERS

8-25. Center the load so that the weight of the load is evenly distributed. Use honeycomb and cellulose wadding to protect the items. Use cord, tape, or steel strapping to keep the load from shifting. Close the cover as shown in Figure 8-16.

Note. When using the MV/CV-22 aircraft, ensure the CB does not exceed 45 inches from the forward edge of the airdrop load.



- ① Fold the bag covers over the front and rear first, then the sides over the top. Fold under the excess side covers.
- ② Use six lengths of ½-inch tubular nylon webbing to lace the bag closed. Pull the webbing tight and tie the running ends in a surgeon's knot and bow knot. Tape the excess and knot. Leave one running end slightly exposed to allow rapid de-rigging.

Figure 8-16. A-22 cargo bag covers closed

SECURING TIE-DOWN STRAPS

8-26. Secure the tie-down straps as shown in Figure 8-17.

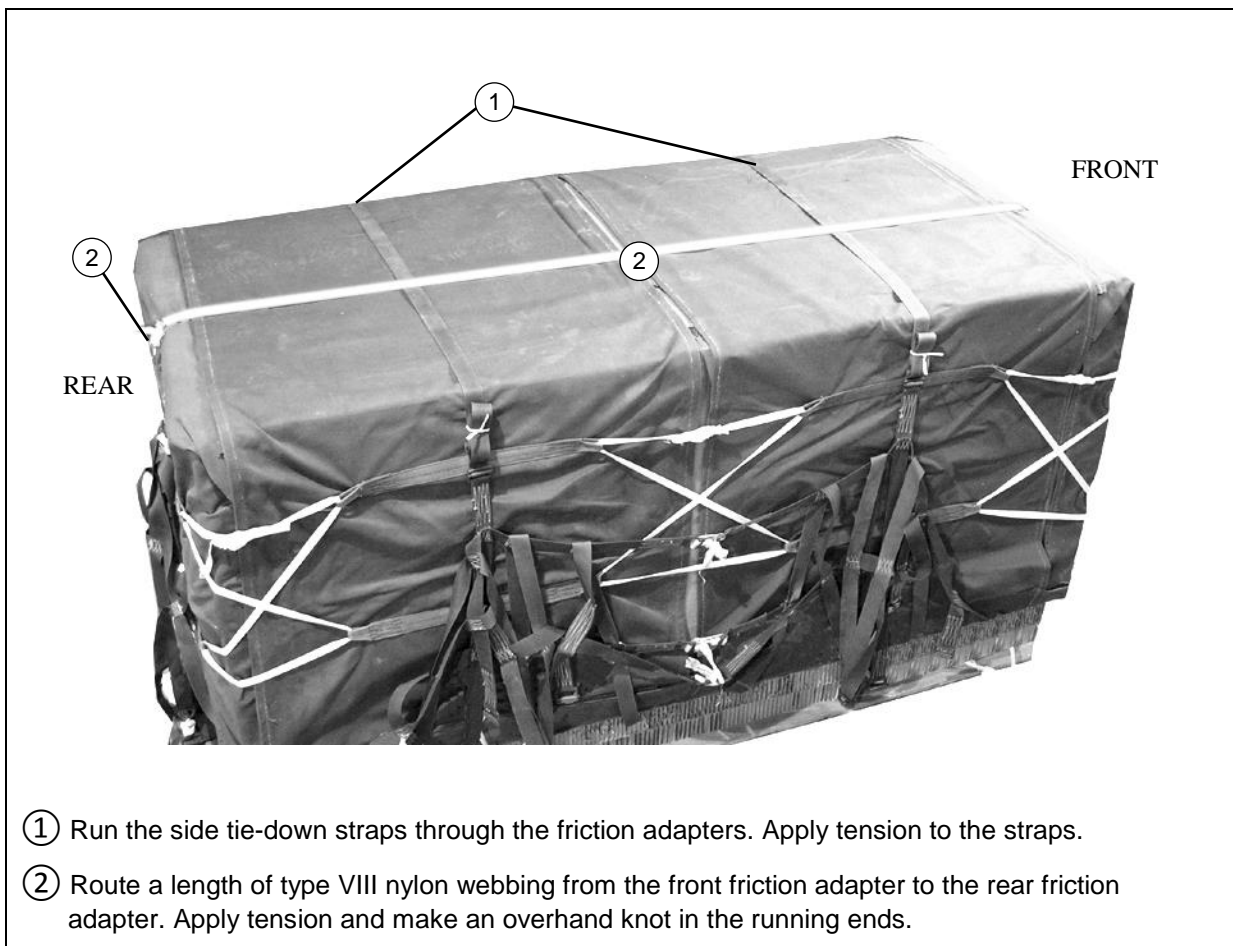


Figure 8-17. Tie-down straps secured

SECURING LATERAL STRAPS

8-27. Secure the lateral straps as shown in Figure 8-18.

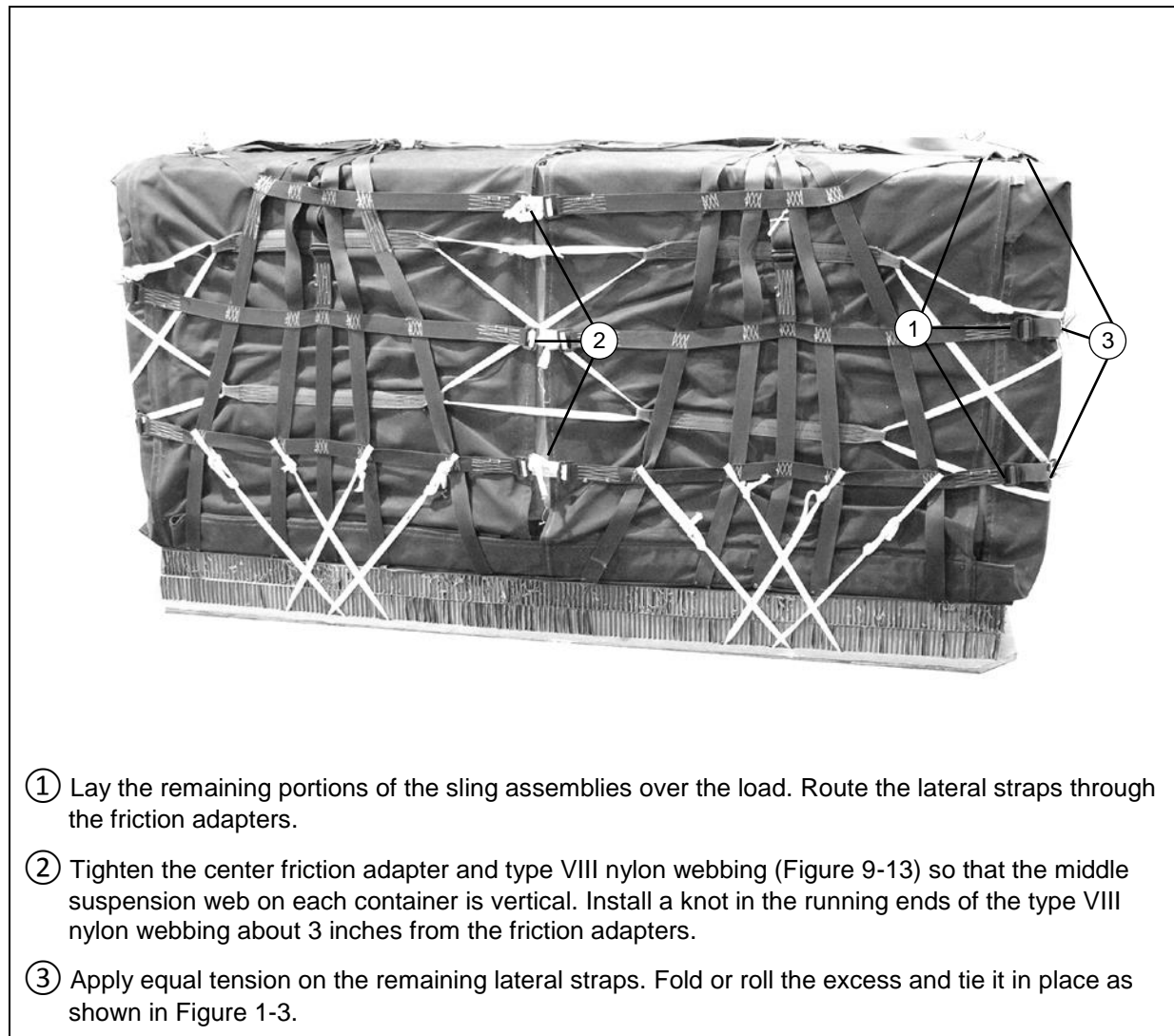


Figure 8-18. Lateral straps secured

SECURING SKID BOARD TIES

8-28. Secure the skid board ties as shown in Figure 8-19.

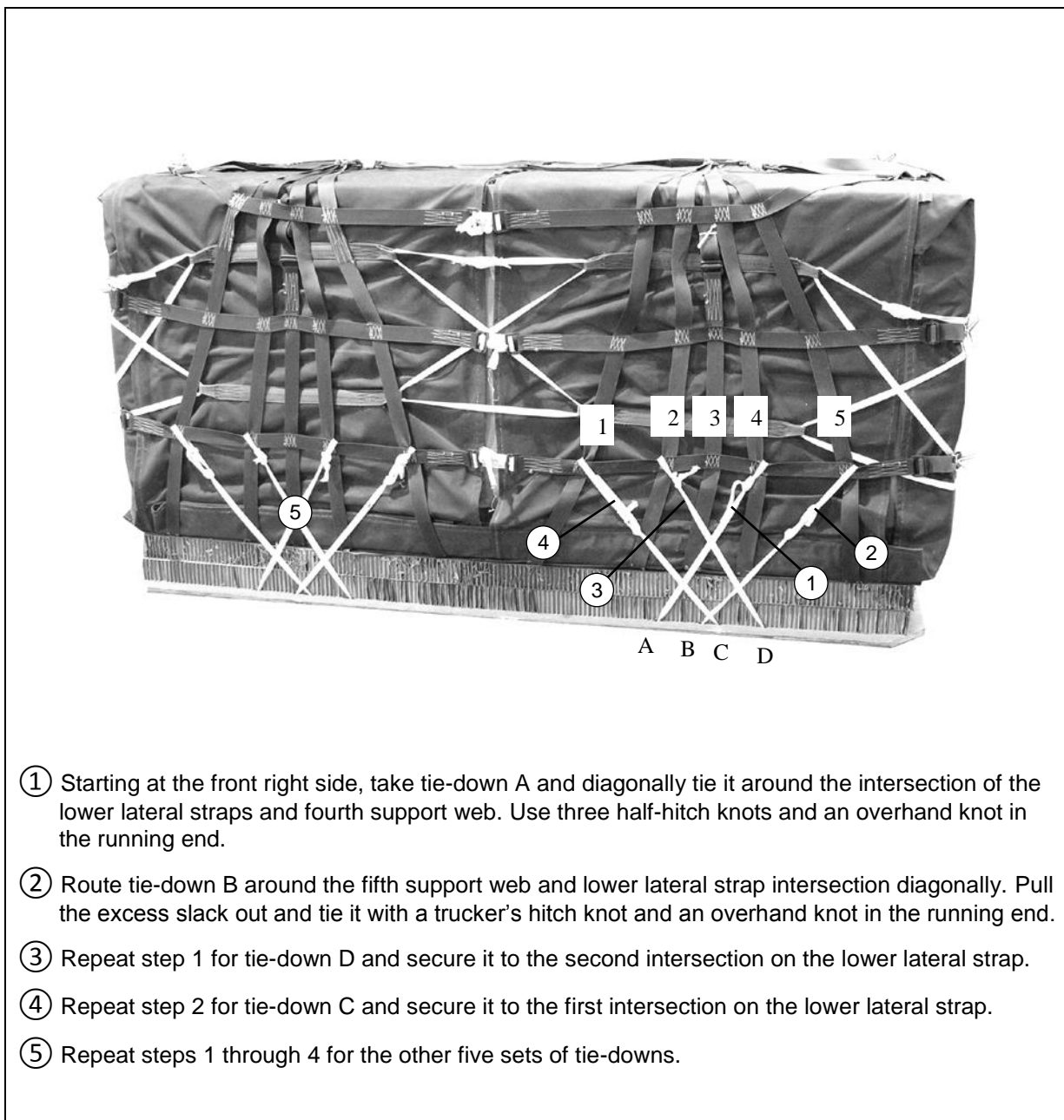


Figure 8-19. Skid board ties secured

- ① Starting at the front right side, take tie-down A and diagonally tie it around the intersection of the lower lateral straps and fourth support web. Use three half-hitch knots and an overhand knot in the running end.
- ② Route tie-down B around the fifth support web and lower lateral strap intersection diagonally. Pull the excess slack out and tie it with a trucker's hitch knot and an overhand knot in the running end.
- ③ Repeat step 1 for tie-down D and secure it to the second intersection on the lower lateral strap.
- ④ Repeat step 2 for tie-down C and secure it to the first intersection on the lower lateral strap.
- ⑤ Repeat steps 1 through 4 for the other five sets of tie-downs.

INSTALLING SUSPENSION SLINGS

8-29. Install suspension slings using six suspension webs, two $\frac{3}{4}$ -inch cargo suspension clevises, and two 3-foot (2-loop), type XXVI nylon webbing slings as shown in Figure 8-20.

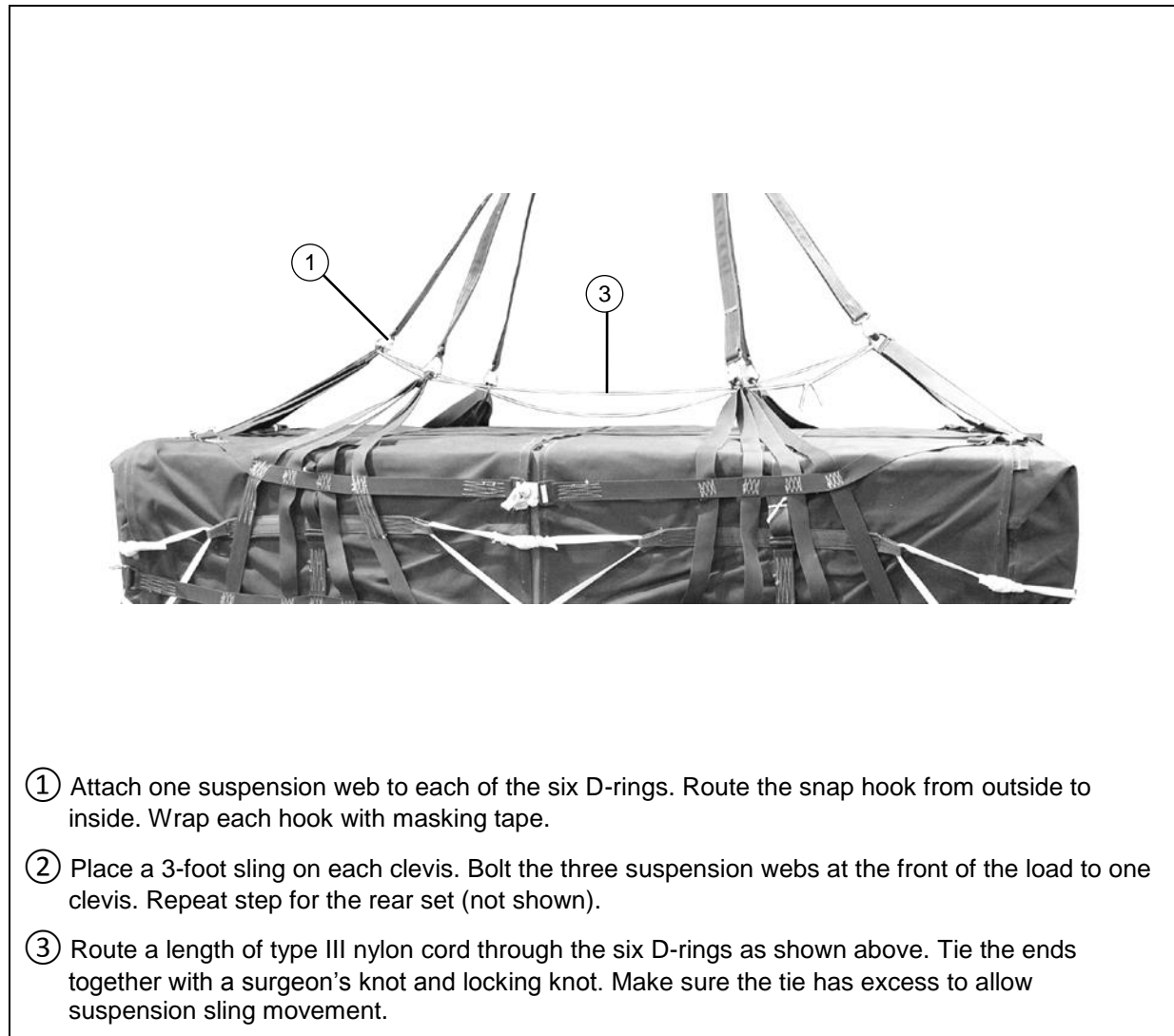
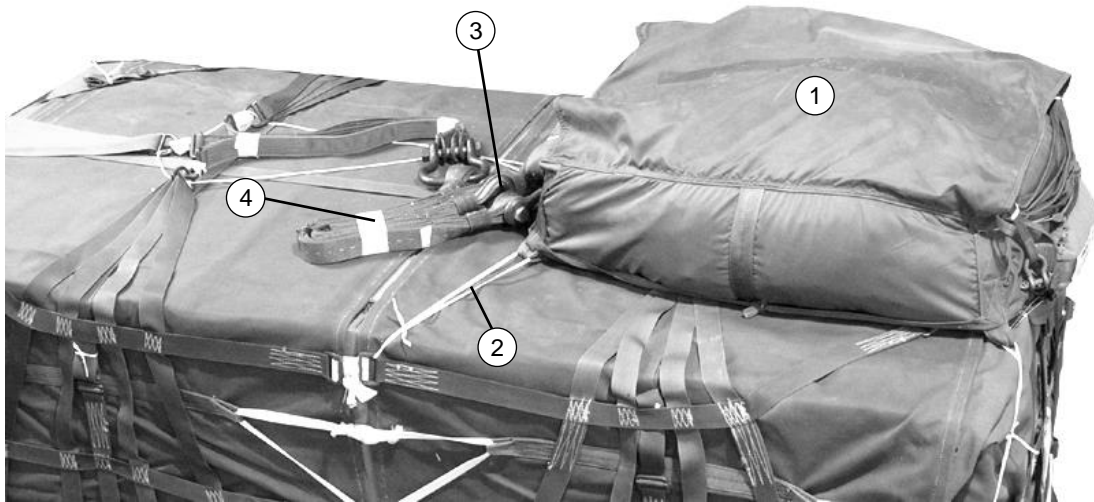


Figure 8-20. Suspension slings installed

INSTALLING PARACHUTE

8-30. Install a G-12E cargo parachute as shown in Figure 8-21.



- ① Place a G-12E cargo parachute on the load with the riser compartment up and the bridle toward the front of the load. Position the parachute on the front of the load.
- ② Tie each corner of the parachute to the sling assembly using type I, ¼-inch cotton webbing.
- ③ Bolt the two 3-foot slings to the parachute's cargo suspension clevis. Ensure the risers from the parachute are not removed from the clevis.
- ④ Fold and tape the excess sling with masking tape.

Figure 8-21. G-12e cargo parachute installed

MARKING RIGGED LOAD

8-31. Mark the rigged load according to Paragraph 1-5. Compute the rigged load data. An AMC IMT 1033, 20050204, V1. (Shipper's Declaration for Dangerous Goods) may be required.

CAUTION

Make the final rigger inspection required by TM 4-48.02/MCRP 4-11.3J/NAVSEA SS400-AB-MMO-010 REV 1/TO 13C7-1-5 and AR 59-4/OPNAVINST 4630.24C/AFJ 13-210(I)/MCO 13480.1B before the load leaves the rigging site.



RIGGING LOAD DATA (WITHOUT PARACHUTE)

G-12E cargo parachute 900 – 2,200 pounds

Note. When using the MV/CV-22 aircraft, ensure the CB is annotated on the load data tag and does not exceed 45 inches from the forward edge of the airdrop load.

Figure 8-22. Double A-22 cargo bag rigged for low-velocity airdrop

EQUIPMENT REQUIRED

8-32. Use the equipment listed in Table 8-4 to rig the load shown in Figure 8-22.

Table 8-4. Equipment required for rigging double A-22 cargo bag for low-velocity airdrop

<i>National Stock Number</i>	<i>Item</i>	<i>Quantity</i>
1670-00-587-3421	Bag, cargo, A-22	2
4030-00-678-8562	Clevis, suspension, 3/4-inch (medium)	2
4020-00-240-2146	Cord, nylon, type III	As required
1670-00-753-3928	Pad, energy-dissipation material, honeycomb	3 sheets
	Parachute:	
1670-01-065-3755	Cargo, G-12E	1
1670-00-216-7297	Pilot, 68-inch diameter	1
	Plywood:	
5530-00-128-4981	3/4- by 48- by 96-inch (locally fabricated skid board) or	1 sheet
5530-00-914-5118	1- by 48- by 96-inch	1 sheet
1670-01-062-6301	Sling, cargo, airdrop, 3-foot (2-loop), type XXVI nylon webbing	2
7510-00-266-6710	Tape, masking, 2-inch	As required
8310-01-102-4478	Thread, cotton, ticket number 8/7	As required
	Webbing:	
8305-00-268-2411	Cotton, 1/4-inch, type I	As required
	Nylon:	
8305-00-082-5752	Tubular, 1/2-inch	As required
8305-00-263-3591	Type VIII, NT	As required

SECTION IV – RIGGING DOUBLE A-22 CARGO BAG LOADS FOR HIGH-VELOCITY AIRDROP

DESCRIPTION OF LOAD

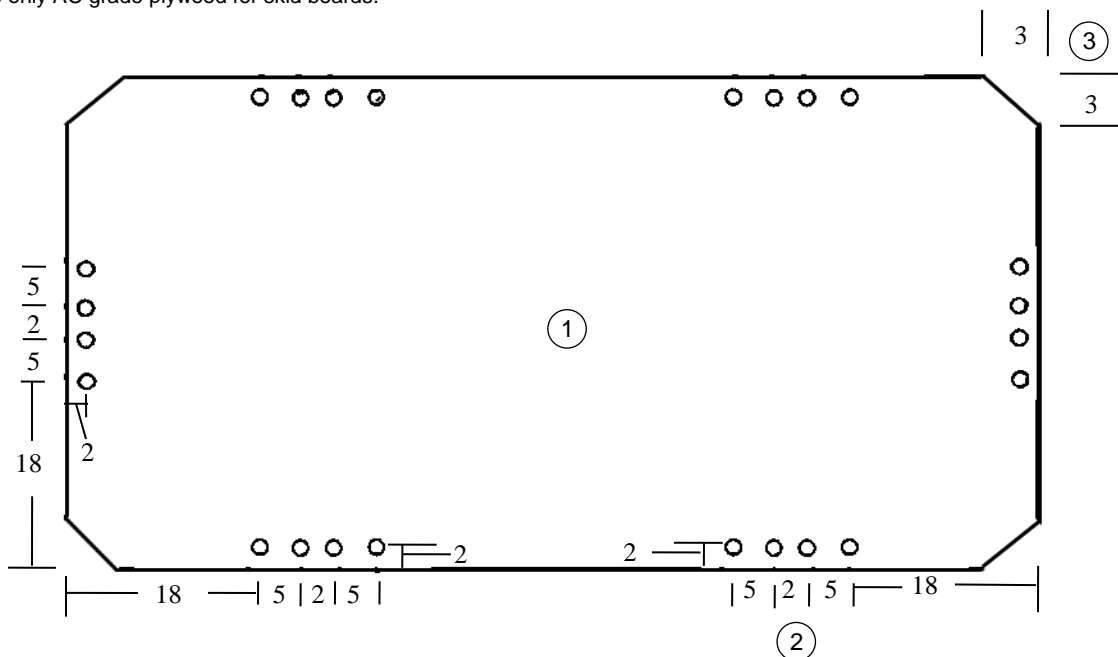
8-33. A typical load is rigged for high-velocity airdrop using a double A-22 container. The double container is made by using two A-22 cargo bags. The cover is optional. The weight limitation of the load is 900 to 2,200 pounds, excluding the weight of the parachute. The load is rigged with one 26-foot high-velocity parachute. See Chapter 2 for aircraft capabilities and limitations.

PREPARING SKID BOARD AND SKID BOARD TIES

8-34. Prepare the skid board as shown in Figure 8-23.

Notes.

This drawing is not drawn to scale.
All dimensions are given in inches.
Use only AC grade plywood for skid boards.



- ① Place a $\frac{3}{4}$ - or 1- by 48- by 96-inch sheet of plywood on a flat surface.
- ② Drill twenty-four $\frac{1}{2}$ -inch holes as shown.
- ③ Measure 3 inches in from each corner of the skid board and make a diagonal cut.
- ④ Cut twelve 10-foot lengths of $\frac{1}{2}$ -inch tubular nylon webbing. Route skid board ties in accordance with Figure 9-1, steps 4 and 5. Repeat for all six sets of holes (not shown).

Figure 8-23. Skid board prepared for a double A-22 load

POSITIONING HONEYCOMB

8-35. Use Table 8-5 to determine the number and size of honeycomb layers. Honeycomb layers will be glued together; however, the stack does not have to be glued to the skid board. See Figure 8-24 for loads weighing less than 1,600 pounds. See Figure 8-25 for loads weighing more than 1,600 pounds.

CAUTION

Loads over 1,950 pounds will not have full energy absorption.

Table 8-5. Honeycomb sizes for high-velocity A-22 loads

<i>Weight of Load (Pounds)</i>	<i>Layer Number</i>	<i>Pieces</i>	<i>Length (Inches)</i>	<i>Width (Inches)</i>
900 – 1,600	1	1	92	36
		1	92	8
	2	6	5	48
		1	96	36
	3	1	96	12
		6	5	48
	4	1	96	36
		1	96	12
	5	6	5	48
		1	96	36
	6	1	96	12
		6	5	48
	7	1	96	36
		1	96	12
1,601 – 2,200	1	1	92	36
		1	92	8
	2	1	96	36
		1	96	12
	3	1	96	36
		1	96	12
	4	1	96	36
		1	96	12
	5	1	96	36
		1	96	12
	6	1	96	36
		1	96	12
	7	1	96	36
		1	96	12

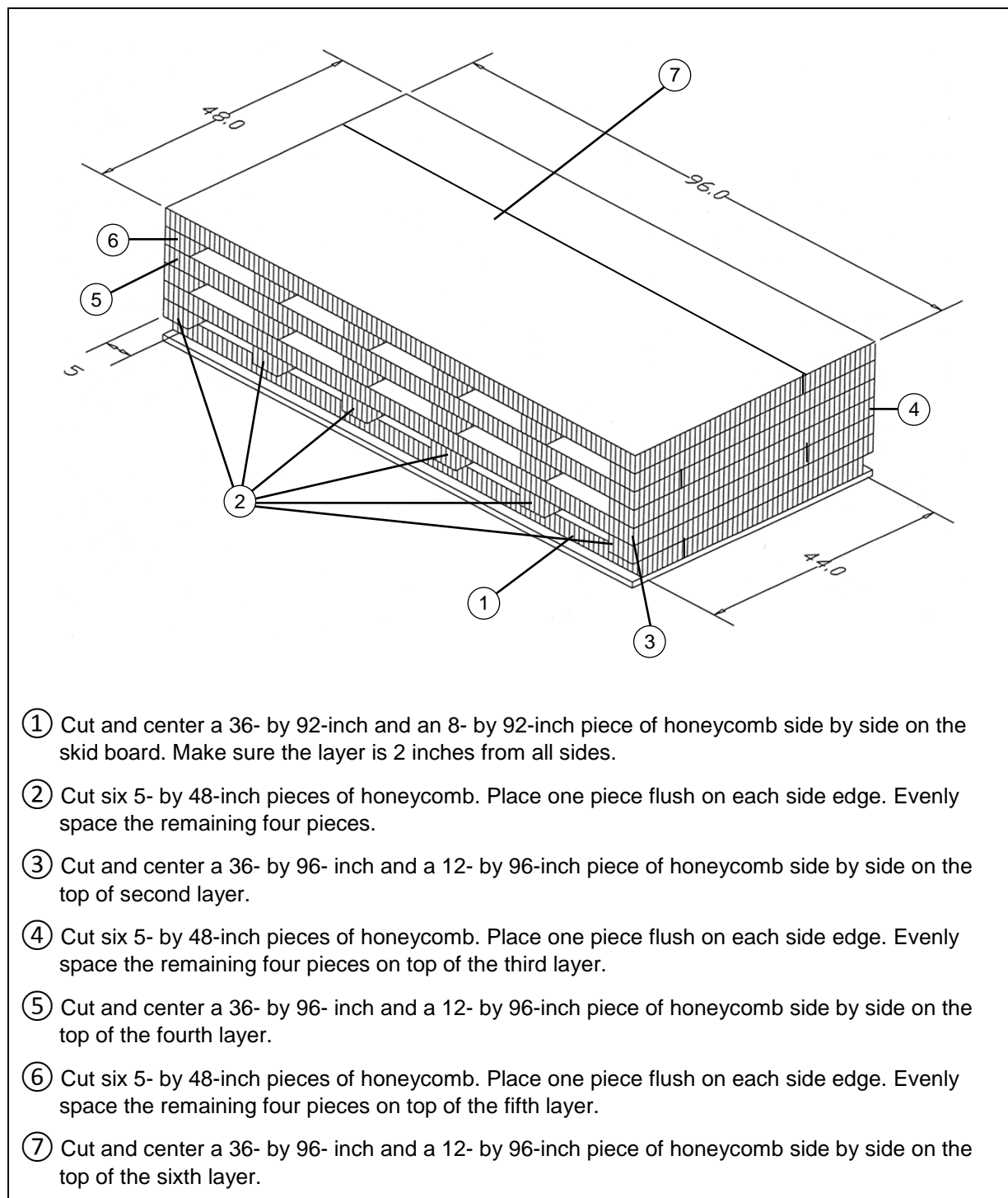


Figure 8-24. Honeycomb positioned for load weighing 900 to 1,600 pounds

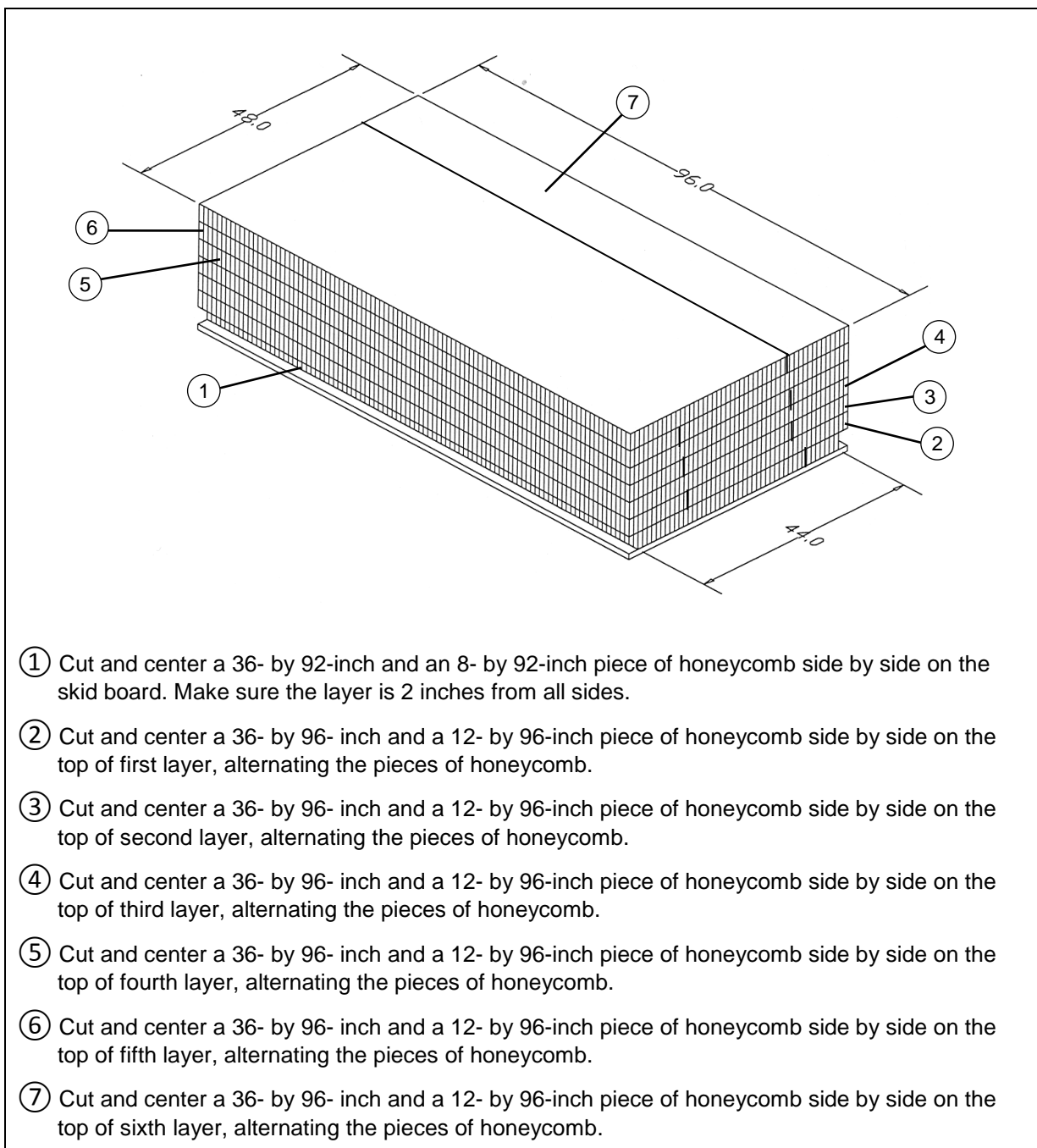


Figure 8-25. Honeycomb positioned for load weighing more than 1,600 pounds

POSITIONING A-22 SLING ASSEMBLIES

8-36. Position A-22 sling assemblies as shown in Section III, Figure 8-14.

POSITIONING COVERS

8-37. Position the optional covers as shown in Section III, Figure 8-15.

POSITIONING LOAD AND CLOSING BAG COVERS

8-38. Position load and closing bag covers as shown in Section III, Figure 8-16.

SECURING TIE-DOWN STRAPS

8-39. Secure the tie-down straps as shown in Section III, Figure 8-17.

SECURING LATERAL STRAPS

8-40. Secure the lateral straps as shown in Section III, Figure 8-18.

SECURING SKID BOARD TIES

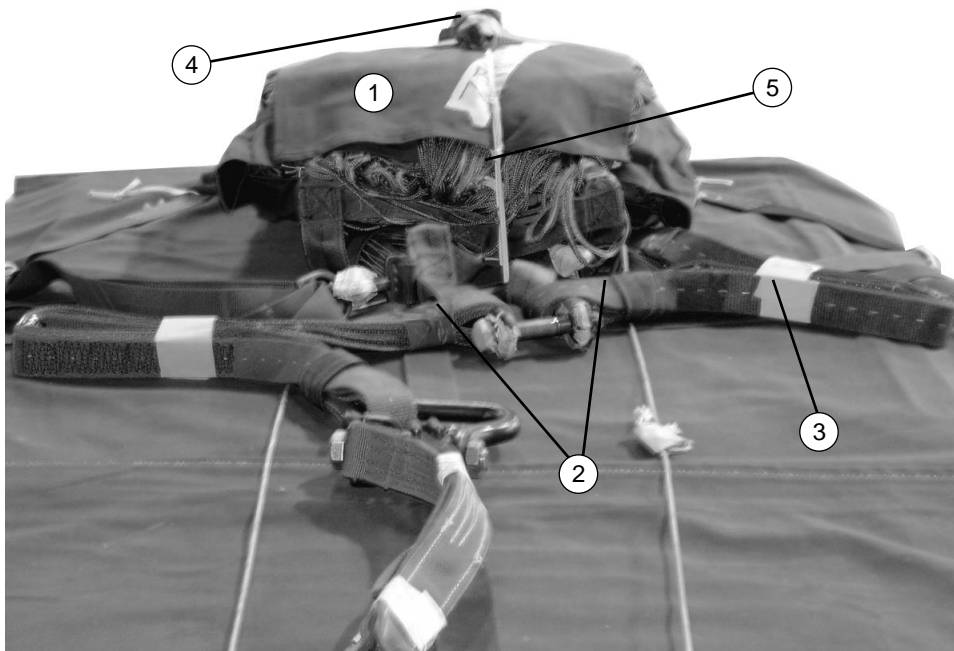
8-41. Secure the skid board ties as shown in Section III, Figure 8-19.

INSTALLING SUSPENSION SLINGS

8-42. Install suspension slings using six suspension webs, two ¾-inch cargo suspension clevises, and two 3-foot (2-loop), type XXVI nylon webbing slings as shown in Section III, Figure 8-20.

INSTALLING PARACHUTE

8-43. Install a 26-foot high-velocity parachute as shown in Figure 8-26.



- ① Place a 26-foot high-velocity parachute on top of the load.
- ② Bolt the two 3-foot slings to the parachute's cargo suspension clevis legs. Ensure the risers from the parachute are not removed from the clevis.
- ③ Fold and tape the excess sling with masking tape.
- ④ Form a 3-inch diameter loop in the static line by tying an overhand knot approximately 12 inches up from the deployment bag main strap attaching loop.
- ⑤ Tie one end of a length of type I, ¼-inch cotton webbing to a convenient point on the A-22 container. Pass the free end of the cotton webbing through the deployment bag main strap attaching loop, through the loop in the static line around a convenient point on the load and secure using a trucker's hitch knot.
- ⑥ Stow the static line according to TM 10-1670-276-23&P/TO 13C5-29-2/NAVAIR 13-1-29. (not shown).

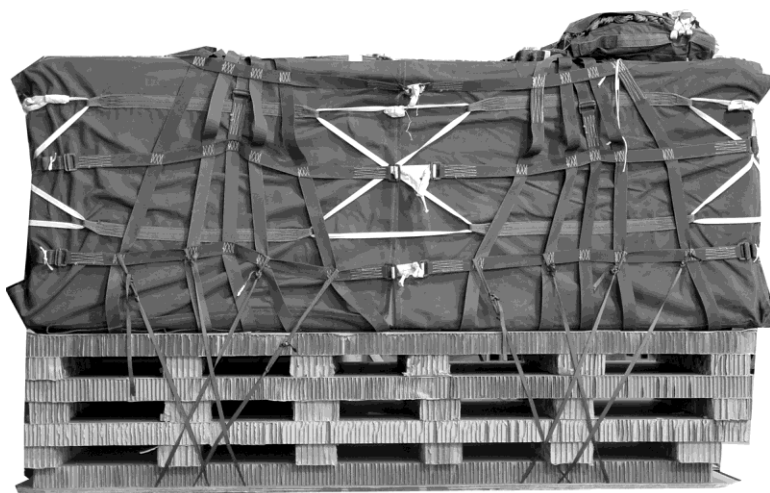
Figure 8-26. 26-foot high-velocity parachute installed

MARKING RIGGED LOAD

8-44. Mark the rigged load according to paragraph 1-5. Compute the rigged load data. An AMC IMT 1033, 20050204, V1. (Shipper's Declaration for Dangerous Goods) may be required.

CAUTION

Make the final rigger inspection required by TM 4-48.02/MCRP 4-11.3J/NAVSEA SS400-AB-MMO-010 REV 1/TO 13C7-1-5 and AR 59-4/OPNAVINST 4630.24C/AFJ 13-210(I)/MCO 13480.1B before the load leaves the rigging site.



RIGGING LOAD DATA

26-foot high-velocity parachute	900 - 1,600 pounds
22-foot cargo extraction parachute, modified.....	900 – 1,600 pounds

Figure 8-27. Double A-22 container load weighing less than 1,600 pounds rigged for high-velocity airdrop

CAUTION

Make the final rigger inspection required by TM 4-48.02 /MCRP 4-11.3J/NAVSEA SS400-AB-MMO-010 REV 1/TO 13C7-1-5 and AR 59-4/OPNAVINST 4630.24C/AFJ 13-210(I)/MCO 13480.1B before the load leaves the rigging site.



RIGGING LOAD DATA

26-foot, high-velocity parachute.....	1,601 – 2,200 pounds
22-foot cargo extraction parachute, modified.....	1,601 – 2,200 pounds

Figure 8-28. Double A-22 container load weighing more than 1,600 pounds rigged for high-velocity airdrop

EQUIPMENT REQUIRED

8-45. Use the equipment listed in Table 8-6 and Table 8-7 to rig the load shown in Figures 8-27 and 8-28.

Table 8-6. Equipment required for rigging double A-22 container load weighing less than 1,600 pounds for high-velocity airdrop

<i>National Stock Number</i>	<i>Item</i>	<i>Quantity</i>
1670-00-587-3421	Bag, cargo, A-22	2
4030-00-678-8562	Clevis, suspension, ¾-inch (medium)	3
4020-00-240-2146	Cord, nylon, type III	As required
1670-00-753-3928	Pad, energy-dissipation material, honeycomb	8 sheets
1670-00-872-6109	Parachute, high-velocity, 26-foot	1
	OR	
N/A	Parachute, cargo extraction, 22-foot, modified	1
	Plywood:	
5530-00-128-4981	¾- by 48- by 96-inch (locally fabricated skid board)	1 sheet
	or	
5530-00-914-5118	1- by 48- by 96-inch	1 sheet
1670-01-062-6301	Sling, cargo, airdrop, 3-foot (2-loop), type XXVI nylon webbing	2
7510-00-266-6710	Tape, masking, 2-inch	As required
8310-01-102-4478	Thread, cotton, ticket number 8/7	As required
	Webbing:	
8305-00-268-2411	Cotton, ¼-inch, type I	As required
	Nylon:	
8305-00-082-5752	Tubular, ½-inch	As required
8305-00-263-3591	Type VIII, NT	As required

Table 8-7. Equipment required for rigging double A-22 container load weighing more than 1,600 pounds for high-velocity airdrop

<i>National Stock Number</i>	<i>Item</i>	<i>Quantity</i>
1670-00-587-3421	Bag, cargo, A-22	2
4030-00-678-8562	Clevis, suspension, ¾-inch (medium)	3
4020-00-240-2146	Cord, nylon, type III	As required
1670-00-753-3928	Pad, energy-dissipation material, honeycomb	10 sheets
1670-00-872-6109	Parachute, high-velocity, 26-foot	1
	OR	
N/A	Parachute, cargo extraction, 22-foot, modified	1
		1 sheet
	Plywood:	
5530-00-128-4981	¾- by 48- by 96-inch (locally fabricated skid board)	1 sheet
	or	2
5530-00-914-5118	1- by 48- by 96-inch	
1670-01-062-6301	Sling, cargo, airdrop, 3-foot (2-loop), type XXVI nylon webbing	As required
		As required
7510-00-266-6710	Tape, masking, 2-inch	
8310-01-102-4478	Thread, cotton, ticket number 8/7	As required
	Webbing:	
8305-00-268-2411	Cotton, ¼-inch, type I	As required
	Nylon:	As required
8305-00-082-5752	Tubular, ½-inch	
8305-00-263-3591	Type VIII, NT	

SECTION V – RIGGING STRETCH A-22 CARGO BAG LOADS FOR LOW-VELOCITY AIRDROP

DESCRIPTION OF LOAD

8-46. A typical load is rigged for low-velocity airdrop using a stretch A-22 container. The stretch container is made by using two A-22 cargo bags. The cover is optional. The weight limitation of the load is 675 to 2,200 pounds, excluding the weight of the parachute. The load is rigged with one G-12E cargo parachute with a 68-inch diameter pilot parachute. See Chapter 2 for aircraft capabilities and limitations.

PREPARING SKID BOARD

8-47. Prepare a skid board as shown in Figure 8-29.

PREPARING SKID BOARD TIES AND POSITIONING HONEYCOMB

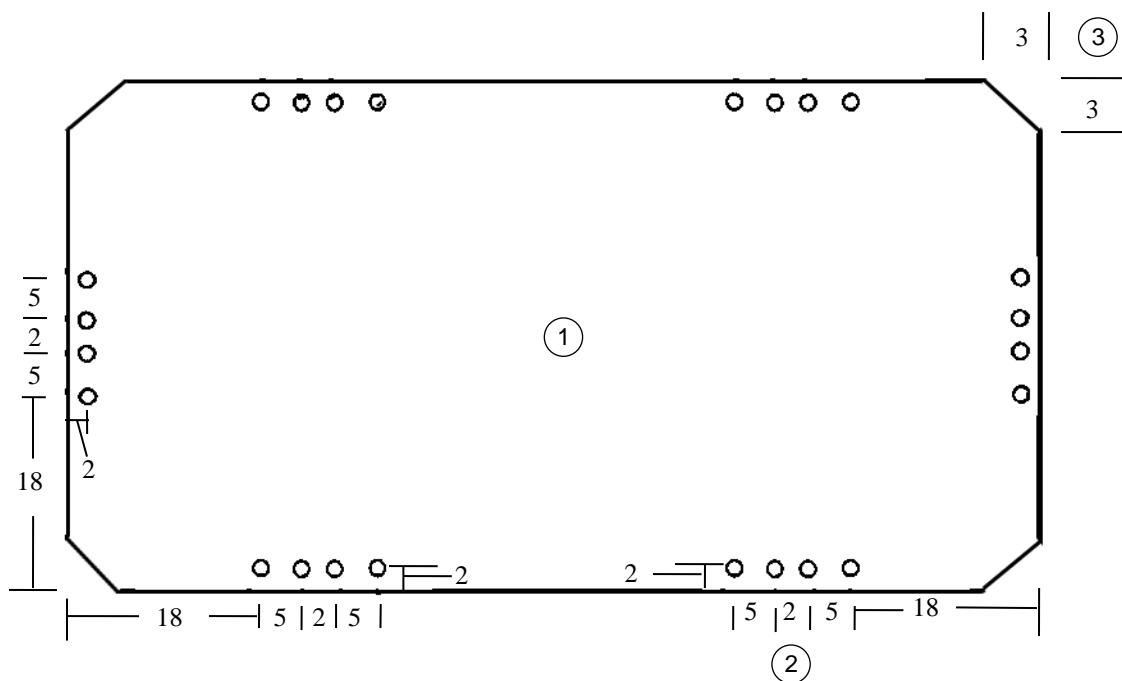
8-48. Prepare skid board ties and position the honeycomb on the skid board as shown in Figure 8-29.

Notes.

This drawing is not drawn to scale.

All dimensions are given in inches.

Use only AC grade plywood for skid boards.



- ① Place a $\frac{3}{4}$ - or 1- by 48- by 72-inch sheet of plywood on a flat surface.
- ② Drill twenty-four $\frac{1}{2}$ -inch holes as shown.
- ③ Measure 3 inches in from each corner of the skid board and make a diagonal cut.
- ④ Cut twelve 8-foot lengths of $\frac{1}{2}$ -inch tubular nylon webbing. Route skid board ties in accordance with Figure 8-1, steps 4 and 5. Repeat for all six sets of holes (not shown).
- ⑤ Determine the size of honeycomb needed according to the size of the load. Cut and center the honeycomb on the skid board. Make sure the honeycomb is 2 inches from all sides (not shown).
- ⑥ Cut and center a second layer of honeycomb. If more than one sheet of honeycomb is required, alternate the pieces of honeycomb (not shown).

Figure 8-29. Skid board prepared for a stretch A-22 load

POSITIONING A-22 SLING ASSEMBLIES

8-49. Position two A-22 sling assemblies on the stretch A-22 load as shown in Figure 8-30.

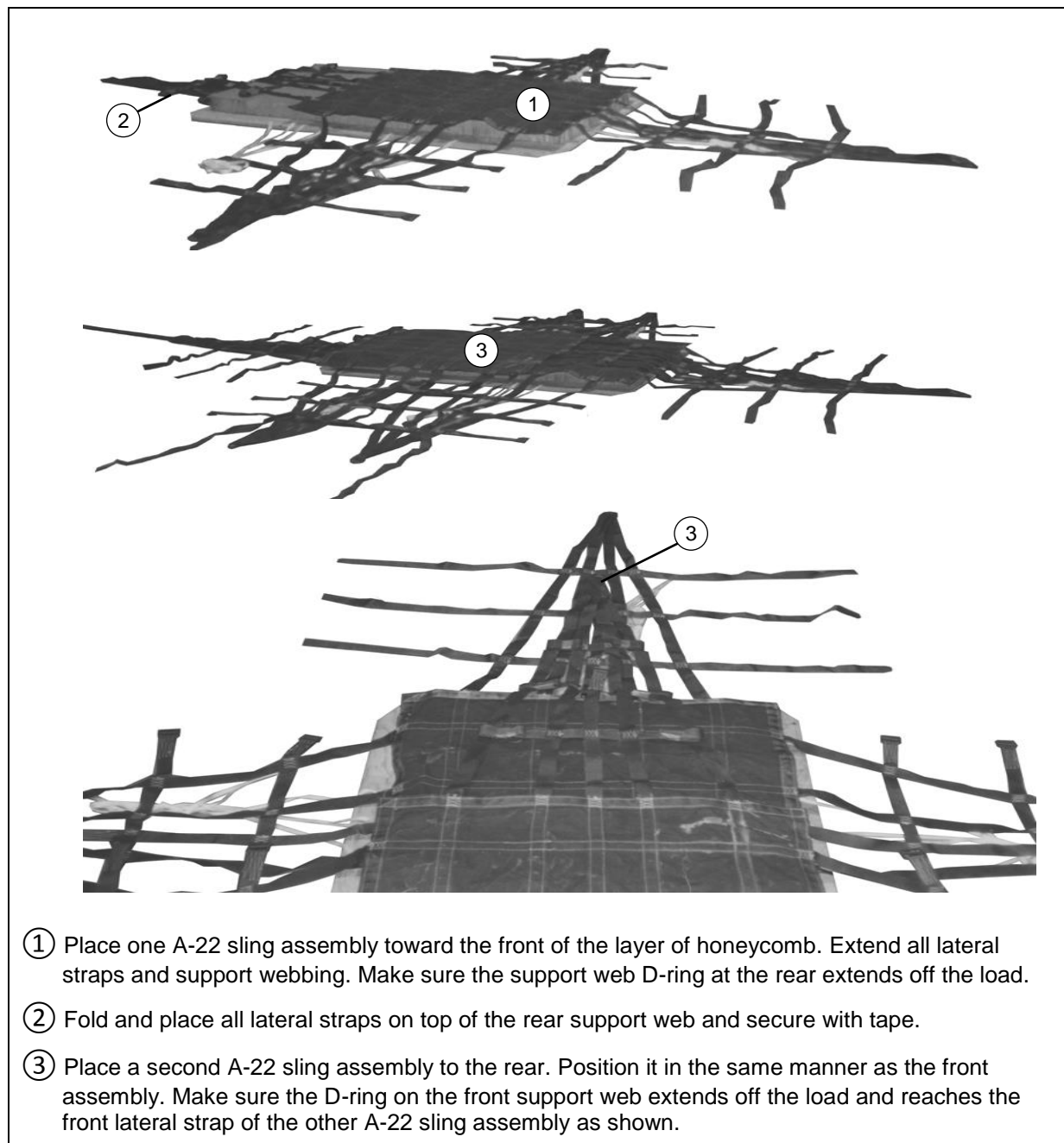
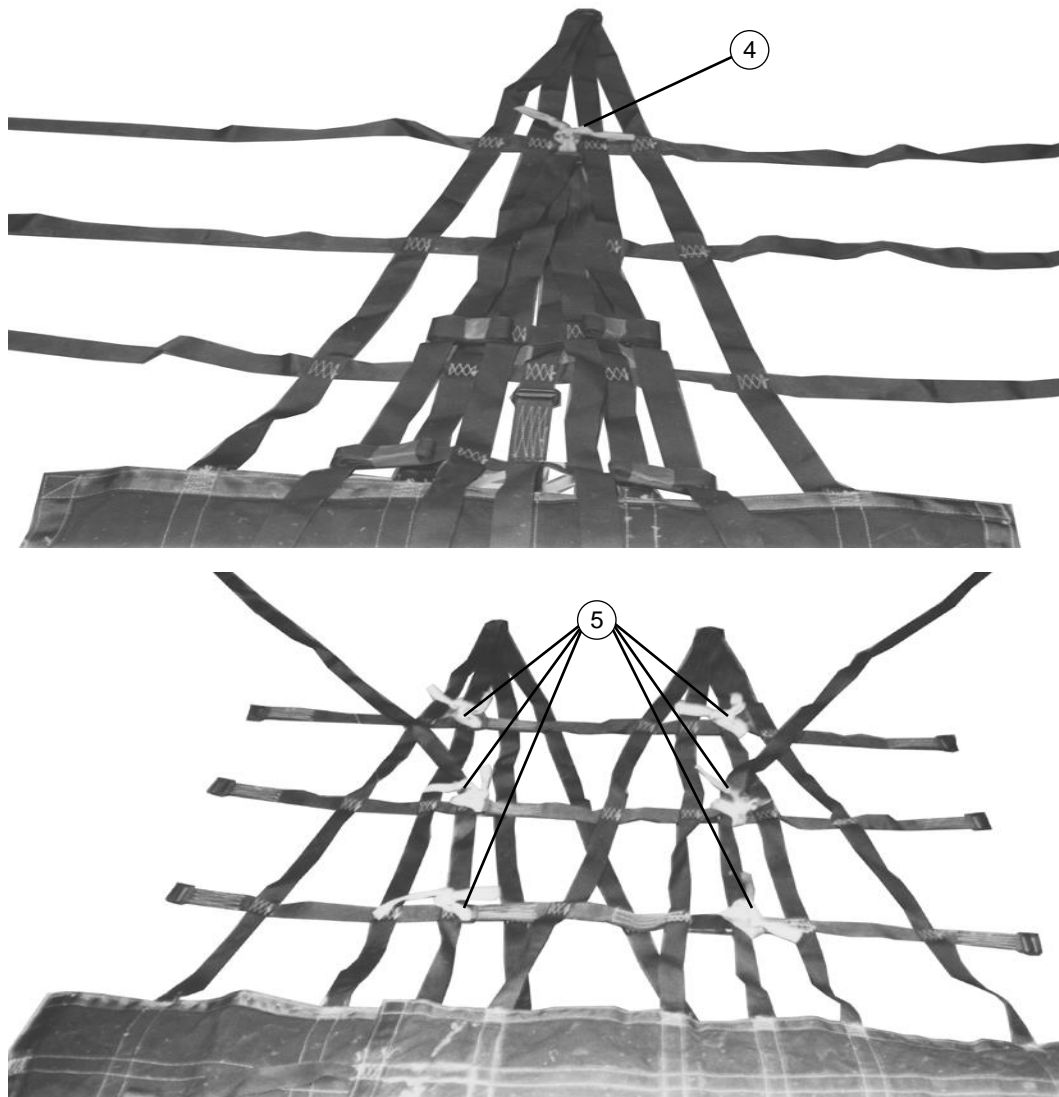


Figure 8-30. A-22 sling assemblies positioned



- ④ Use a length of type VIII nylon webbing or two turns of 1-inch tubular nylon webbing to tie the support web D-rings exposed at the front and rear of the load to the top lateral strap of the other A-22 sling assembly as shown.
- ⑤ Use a length of type VIII nylon webbing or two turns of 1-inch tubular nylon webbing to tie the friction adapters diagonally around the intersection of the short tie-down strap and the corresponding lateral strap of the other sling assembly as shown.

Figure 8-30. A-22 sling assemblies positioned (continued)

POSITIONING COVERS

8-50. Use two optional A-22 cargo bag covers when rigging this load, if needed. Position the covers as shown in Figure 8-31.

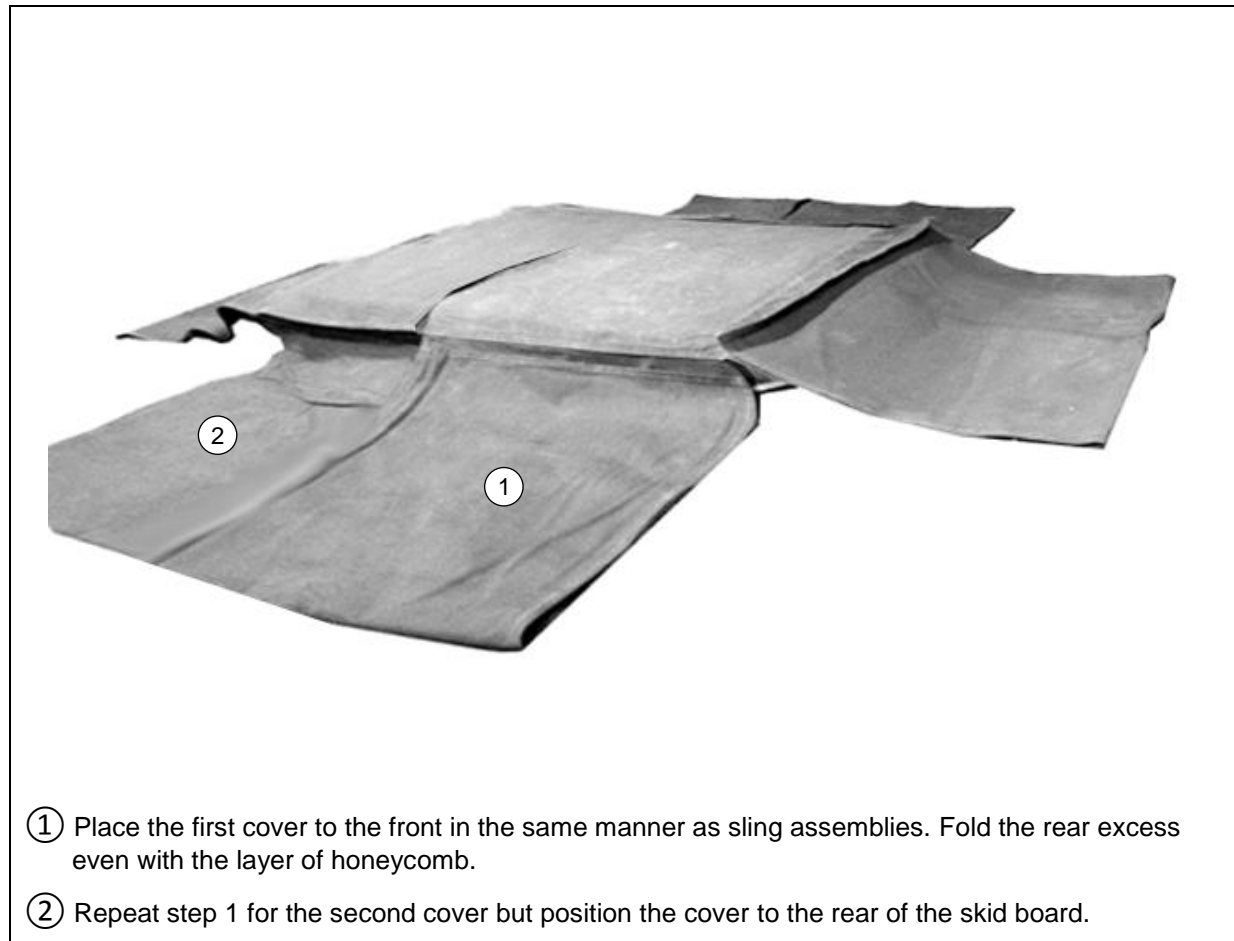
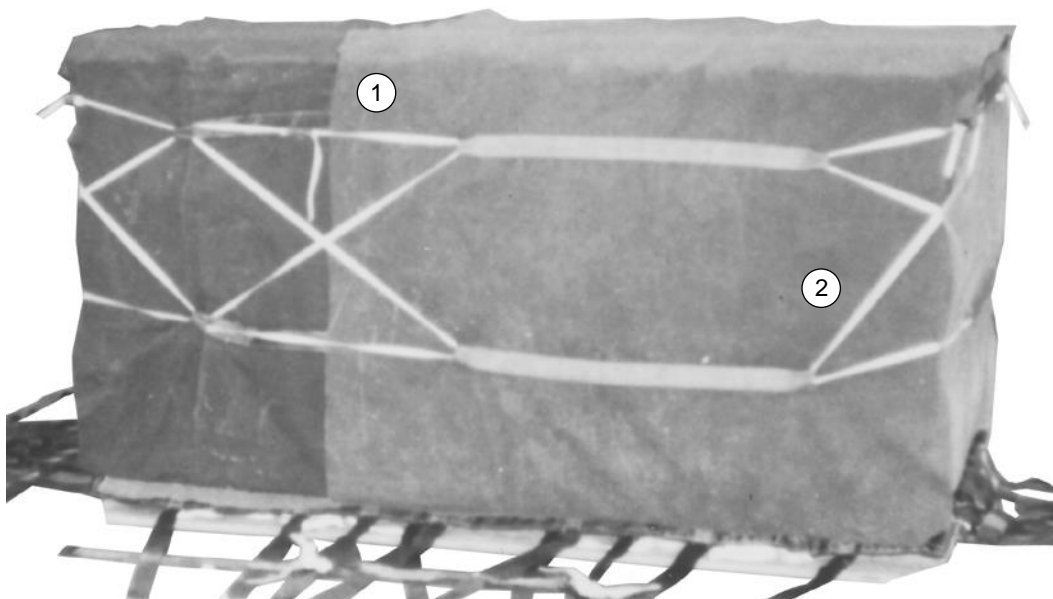


Figure 8-31. Covers positioned

POSITIONING LOAD AND CLOSING BAG COVERS

8-51. Center the load so that the weight of the load is evenly distributed. Use honeycomb and cellulose wadding to protect the items. Use cord, rope, or steel strapping to keep the load from shifting. Close the cover as shown in Figure 8-32.



- ① Fold the bag covers over the front and rear first, then the sides over the top. Fold under the excess side covers.
- ② Use six lengths of $\frac{1}{2}$ -inch tubular nylon webbing to lace the bag closed. Pull the webbing tight and tie the running ends in a surgeon's knot and bow knot. Tape the excess and knot. Leave one running end slightly exposed to allow rapid de-rigging.

Figure 9-32. A-22 cargo bag covers closed

SECURING TIE-DOWN STRAPS

8-52. Secure the tie-down straps as shown in Figure 8-33.

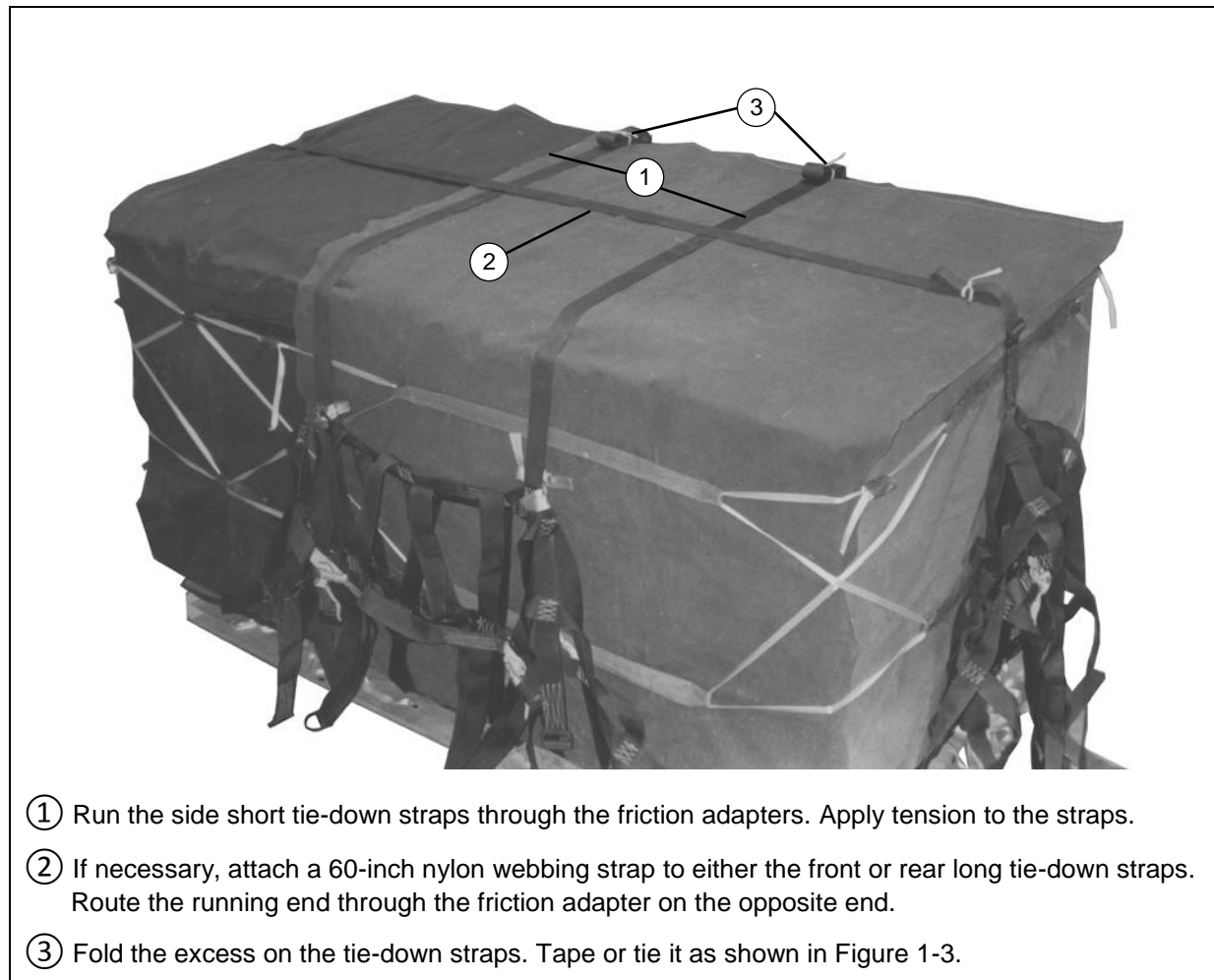
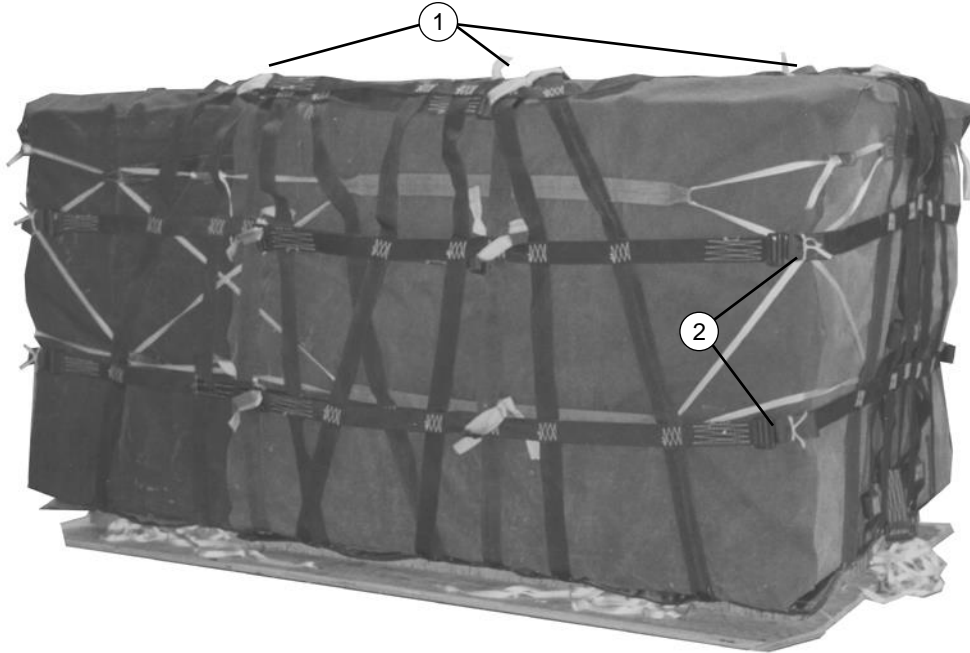


Figure 8-33. Tie-down straps secured

SECURING LATERAL STRAPS

8-53. Secure the lateral straps as shown in Figure 8-34.



- ① Lay the remaining portion of the sling assemblies over the load.
- ② Route the lateral straps through the friction adapters and apply equal tension. Fold the excess and tie it in place as shown in Figure 1-3.

Figure 8-34. Lateral straps secured

SECURING SKID BOARD TIES

8-54. Secure the skid board ties as shown in Figure 8-35.

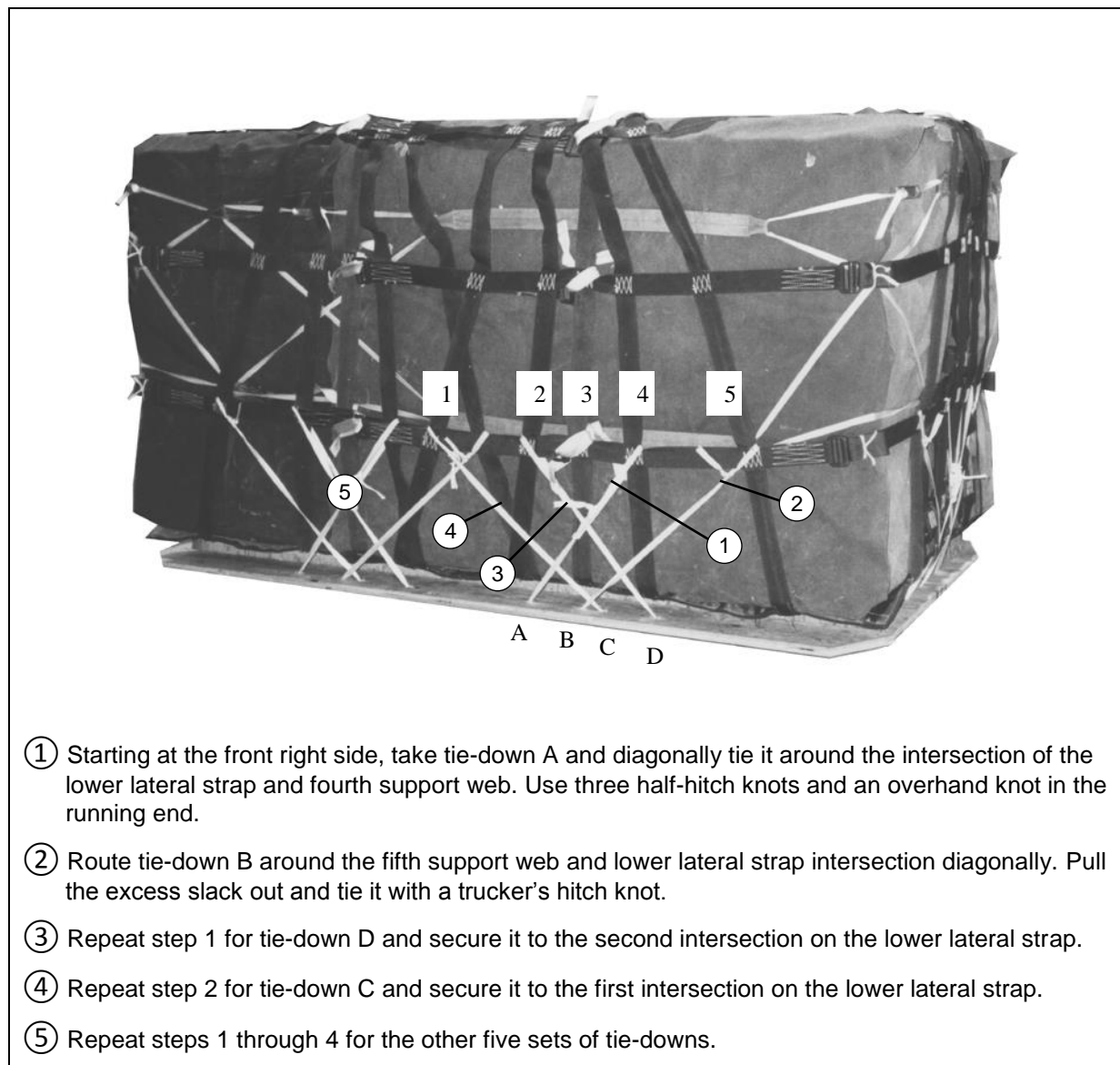
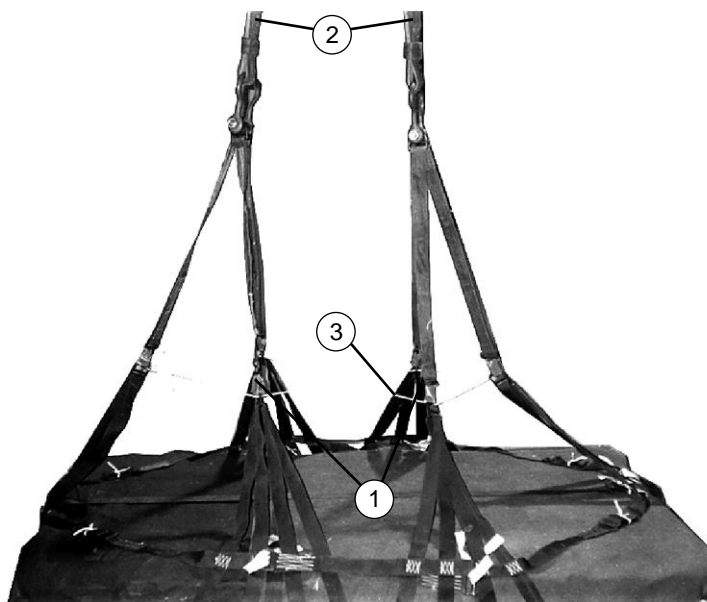


Figure 8-35. Skid board ties secured

INSTALLING SUSPENSION SLINGS

8-55. Install suspension slings using six suspension webs, two 3/4-inch cargo suspension clevises, and two 3-foot (2-loop), type XXVI nylon webbing slings as shown in Figure 8-36.



- ① Attach one suspension web to each of the six D-rings. Route the snap hook from outside to inside. Wrap each hook with masking tape.
- ② Place a 3-foot sling on each clevis. Bolt the three suspension webs at the front of the load to one clevis. Repeat step for the rear set.
- ③ Route a length of type III nylon cord through the six D-rings as shown above. Tie the ends together. Make sure the tie has excess to allow suspension sling movement.

Note. After positioning the type III nylon cord, fold and tape the excess with masking tape (not shown).

Figure 8-36. Suspension slings installed

INSTALLING PARACHUTE

8-56. Install a G-12E cargo parachute as shown in Figure 8-37.

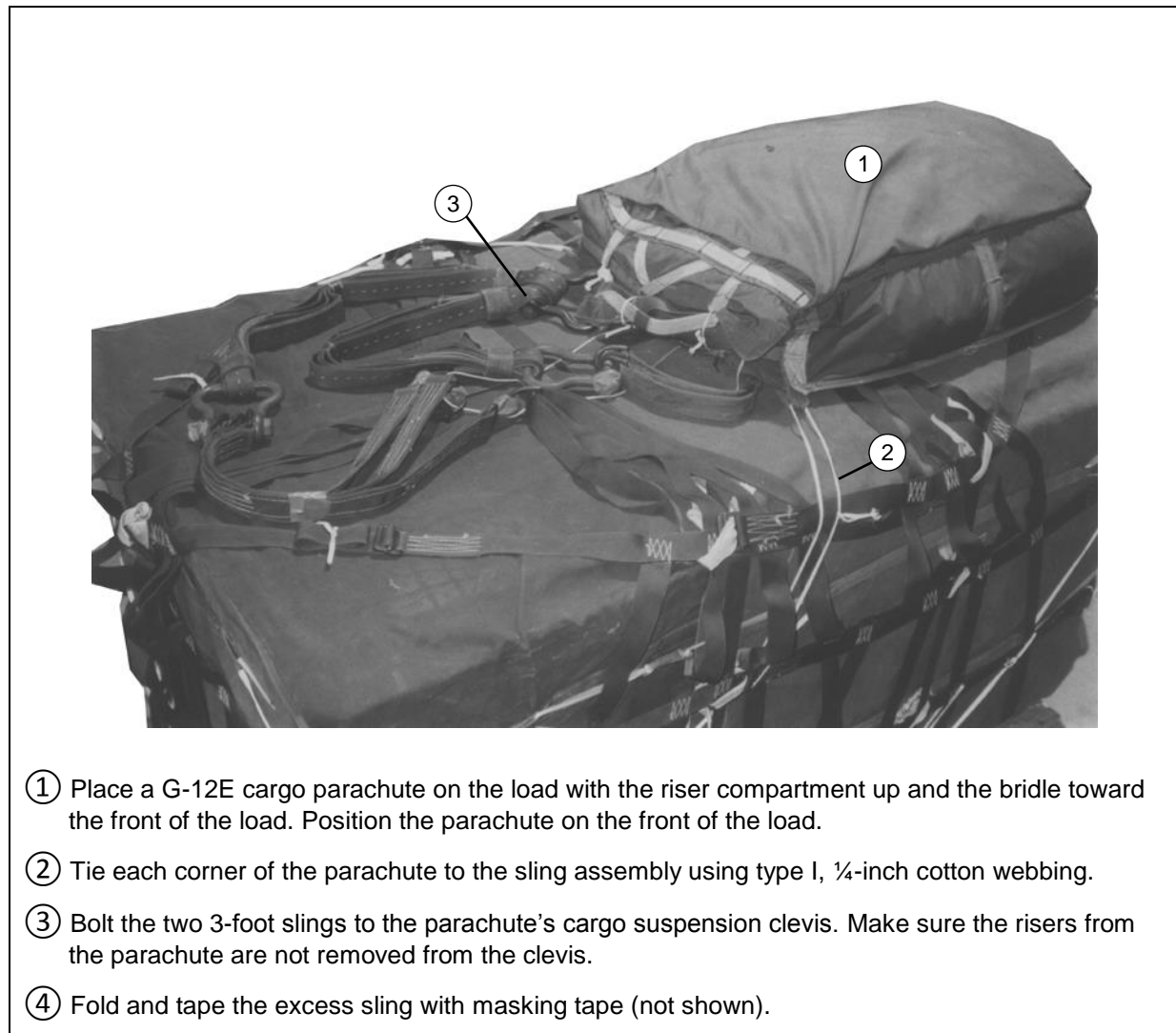


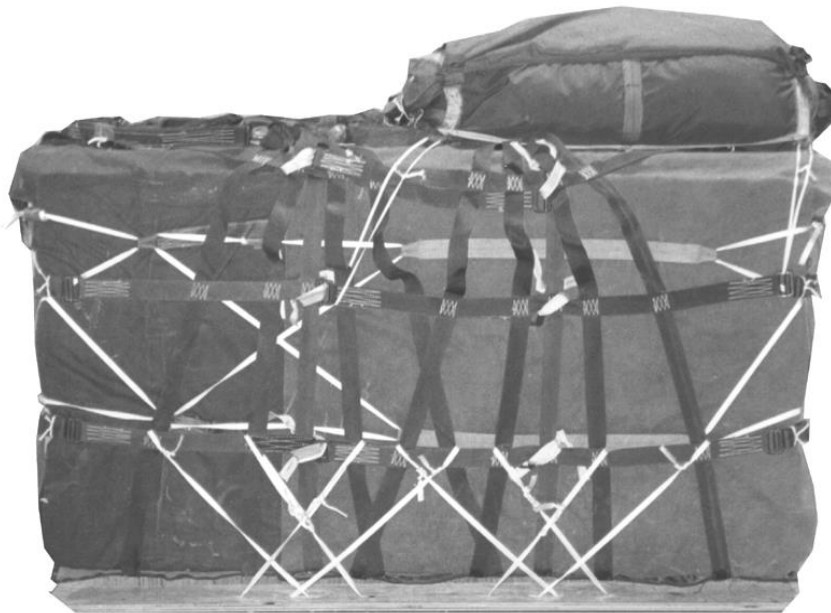
Figure 8-37. G-12e cargo parachute installed

MARKING RIGGED LOAD

8-57. Mark the rigged load according to Paragraph 1-5. Compute the rigged load data. An AMC IMT 1033, 20050204, V1. (Shipper's Declaration for Dangerous Goods) may be required.

CAUTION

Make the final rigger inspection required by TM 4-48.02/MCRP 4-11.3J/NAVSEA SS400-AB-MMO-010 REV 1/TO 13C7-1-5 and AR 59-4/OPNAVINST 4630.24C/AFJ 13-210(I)/MCO 13480.1B before the load leaves the rigging site.



RIGGING LOAD DATA

G-12E cargo parachute.....675 – 2,328 pounds

Figure 8-38. Stretch A-22 cargo bag rigged for low-velocity airdrop

EQUIPMENT REQUIRED

8-58. Use the equipment listed in Table 8-8 to rig the load shown in Figure 8-38.

Table 8-8. Equipment required for rigging stretch A-22 cargo bag for low-velocity airdrop

<i>National Stock Number</i>	<i>Item</i>	<i>Quantity</i>
1670-00-587-3421	Bag, cargo, A-22	2
4030-00-678-8562	Clevis, suspension, 3/4-inch (medium)	2
4020-00-240-2146	Cord, nylon, type III	As required
1670-00-753-3928	Pad, energy-dissipation material, honeycomb	As required
	Parachute:	
1670-01-065-3755	Cargo, G-12E	1
1670-00-216-7297	Pilot, 68-inch diameter	1
	Plywood:	
5530-00-128-4981	3/4-by 48- by 96-inch (locally fabricated skid board) or	1 sheet
5530-00-914-5118	1- by 48- by 96-inch	1 sheet
1670-01-062-6301	Sling, cargo, airdrop, 3-foot (2-loop), type XXVI nylon webbing	2
1670-00-368-7486	Strap, webbing, restraint (shear strap), 60-inch	1
7510-00-266-6710	Tape, masking, 2-inch	As required
8310-01-102-4478	Thread, cotton, ticket number 8/7	As required
	Webbing:	
8305-00-268-2411	Cotton, 1/4-inch, type I	As required
	Nylon:	
8305-00-082-5752	Tubular, 1/2-inch	As required
8305-00-263-3591	Type VIII, NT	As required
	Or	
8305-00-268-2455	Tubular, 1-inch, OD	As required

SECTION VI – RIGGING STRETCH A-22 CARGO BAG LOADS FOR HIGH-VELOCITY AIRDROP

DESCRIPTION OF LOAD

8-59. A typical load is rigged for low-velocity airdrop using a stretch A-22 container. The stretch container is made by using two A-22 cargo bags. The cover is optional. The weight limitation of the load is 675 to 2,200 pounds, excluding the weight of the parachute. The load is rigged with a high-velocity parachute. See Chapter 2 for aircraft capabilities and limitations.

PREPARING SKID BOARD AND SKID BOARD TIES

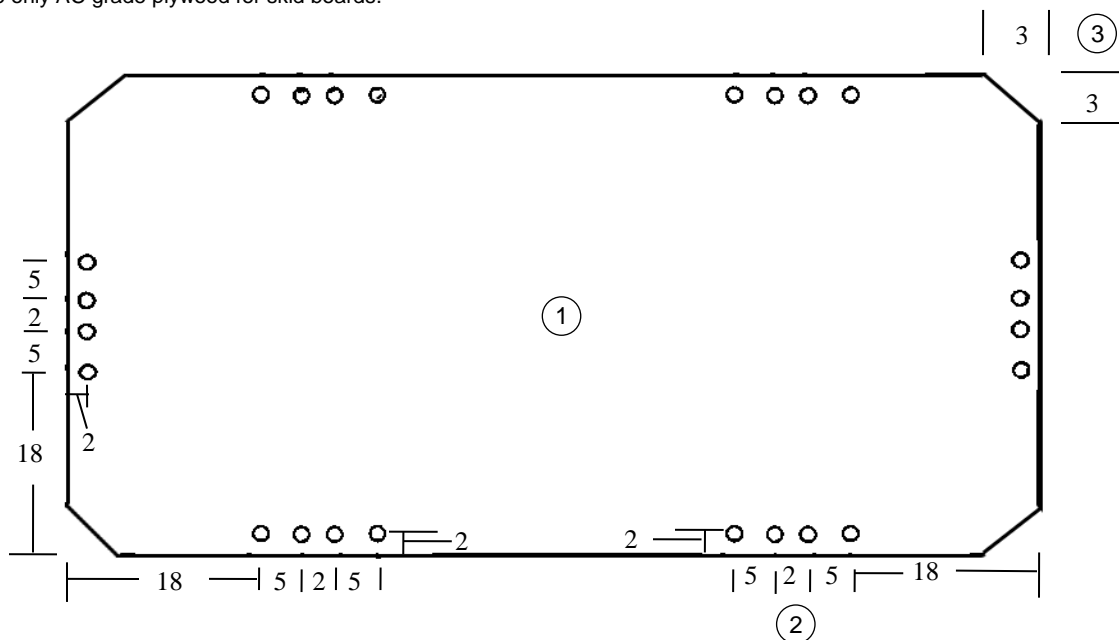
8-60. Prepare a skid board as shown in Figure 8-39.

Notes.

This drawing is not drawn to scale.

All dimensions are given in inches.

Use only AC grade plywood for skid boards.



- ① Place a $\frac{3}{4}$ - or 1- by 48- by 72-inch sheet of plywood on a flat surface.
- ② Drill twenty-four $\frac{1}{2}$ -inch holes on as shown.
- ③ Measure 3 inches in from each corner of the skid board and make a diagonal cut.
- ④ Cut twelve 10-foot lengths of $\frac{1}{2}$ -inch tubular nylon webbing. Route skid board ties in accordance with Figure 8-1, steps 4 and 5. Repeat for all six sets of holes (not shown).

Figure 8-39. Skid board prepared for a stretch A-22 load

POSITIONING HONEYCOMB

8-61. Use Table 8-9 to determine the number and size of honeycomb layers. Honeycomb layers will be glued together; however, the stack does not have to be glued to the skid board. See Figure 8-40 for loads weighing less than 1,450 pounds. See Figure 8-41 for loads weighing more than 1,451 pounds.

CAUTION

Loads over 1,700 pounds will not have full energy absorption.

Table 8-9. Honeycomb sizes for high-velocity A-22 loads

<i>Weight of Load (Pounds)</i>	<i>Layer Number</i>	<i>Pieces</i>	<i>Length (Inches)</i>	<i>Width (Inches)</i>
675 – 1,450	1	1	68	36
		1	68	8
	2	6	5	48
	3	1	72	36
		1	72	12
	4	6	5	48
	5	1	72	36
		1	72	12
	6	6	5	48
	7	1	72	36
		1	72	12
1,451 – 2,200	1	1	68	36
		1	68	8
	2	1	72	36
		1	72	12
	3	1	72	36
		1	72	12
	4	1	72	36
		1	72	12
	5	1	72	36
		1	72	12
	6	1	72	36
		1	72	12
	7	1	72	36
		1	72	12

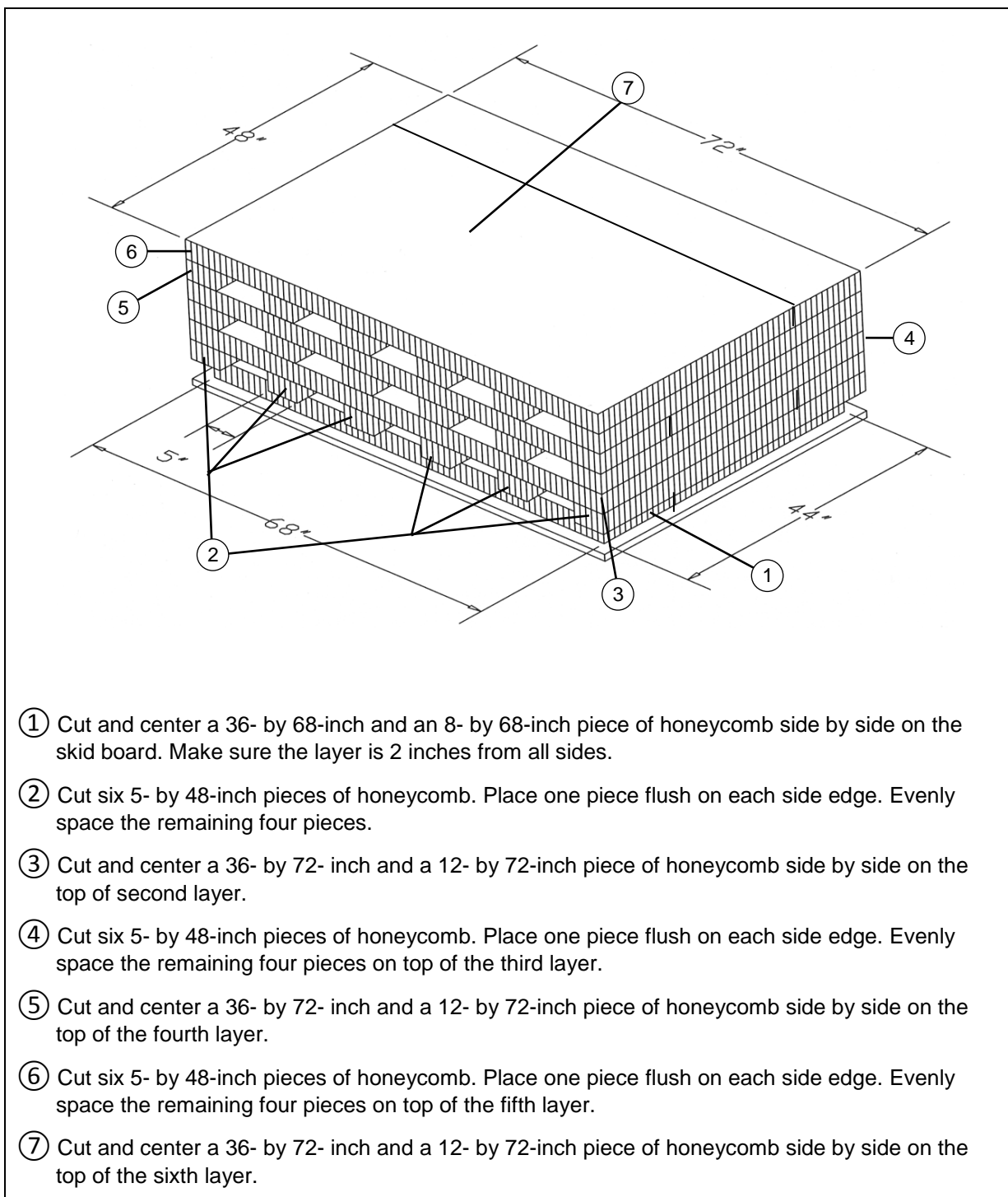


Figure 8-40. Honeycomb positioned for load weighing 675 to 1,450 pounds

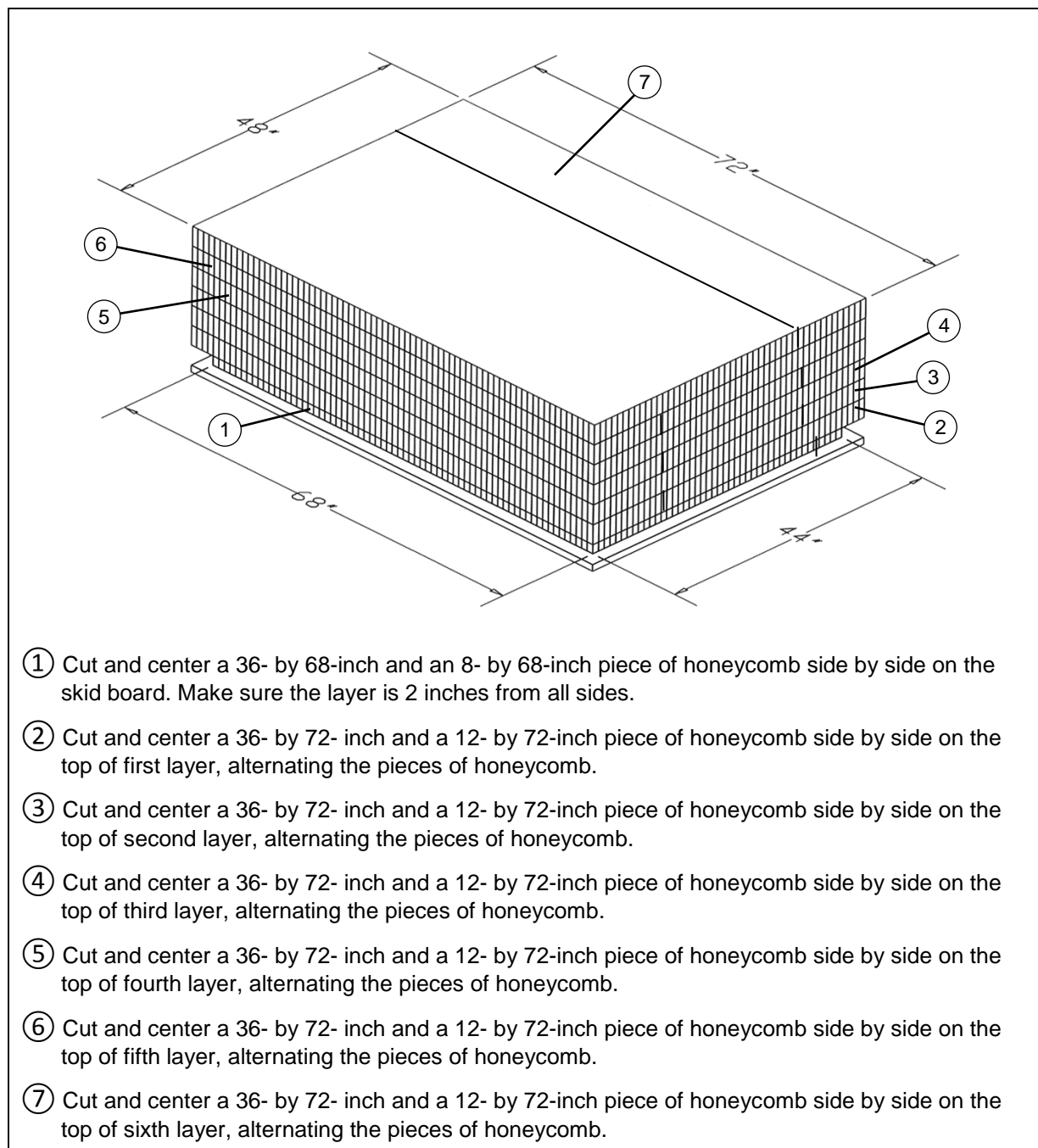


Figure 8-41. Honeycomb positioned for load weighing 1,451 to 2,200 pounds

POSITIONING A-22 SLING ASSEMBLIES

8-62. Position A-22 sling assemblies as shown in Section V, Figure 8-30.

POSITIONING COVERS

8-63. Position the optional covers as shown in Section V, Figure 8-31.

POSITIONING LOAD AND CLOSING BAG COVERS

8-64. Position load and closing bag covers as shown in Section V, Figure 8-32.

SECURING TIE-DOWN STRAPS

8-65. Secure the tie-down straps as shown in Section V, Figure 8-33.

SECURING LATERAL STRAPS

8-66. Secure the lateral straps as shown in Section V, Figure 8-34.

SECURING SKID BOARD TIES

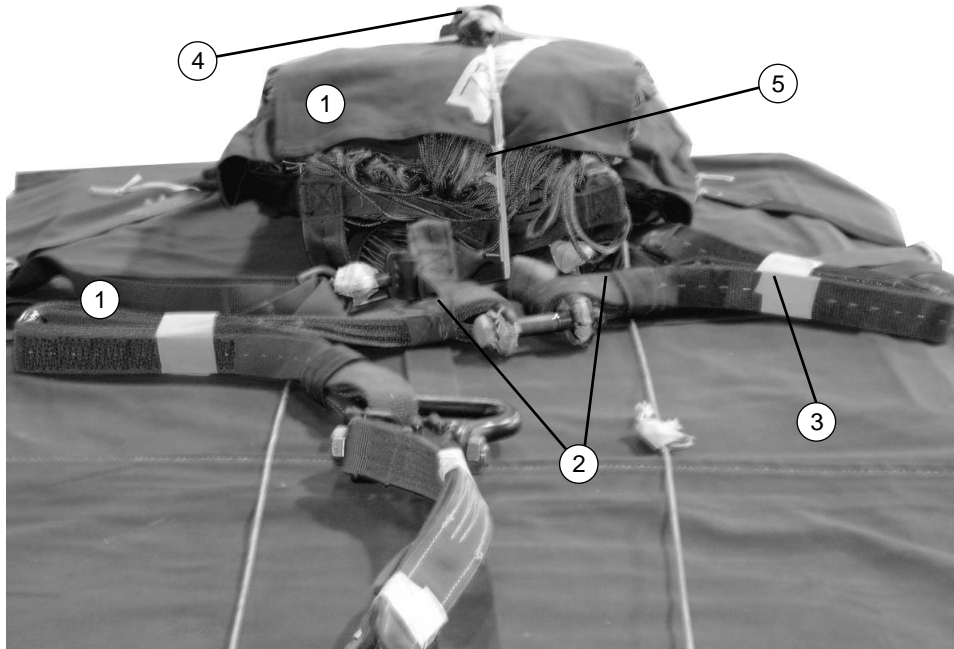
8-67. Secure the skid board ties as shown in Section V, Figure 8-35.

INSTALLING SUSPENSION SLINGS

8-68. Install suspension slings using six suspension webs, two $\frac{3}{4}$ -inch cargo suspension clevises, and two 3-foot (2-loop), type XXVI nylon webbing slings as shown in Section V, Figure 8-36.

INSTALLING PARACHUTE

8-69. Install a high-velocity parachute as shown in Figure 8-42.



- ① Place a high-velocity parachute on top of the load.
- ② Bolt the two 3-foot slings to the parachute's cargo suspension clevis. Make sure the risers from the parachute are not removed from the clevis.
- ③ Fold and tape the excess sling with masking tape.
- ④ Form a 3-inch diameter loop in the static line by tying an overhand knot approximately 12 inches up from the deployment bag main strap attaching loop.
- ⑤ Tie one end of a length of type I, 1/4-inch cotton webbing to a convenient point on the A-22 container. Pass the free end of the cotton webbing through the deployment bag main strap attaching loop, through the loop in the static line around a convenient point on the load and secure using a trucker's hitch knot.
- ⑥ Stow the static line according to TM 10-1670-276-23&P/TO 13C5-29-2/NAVAIR 13-1-29 (not shown).

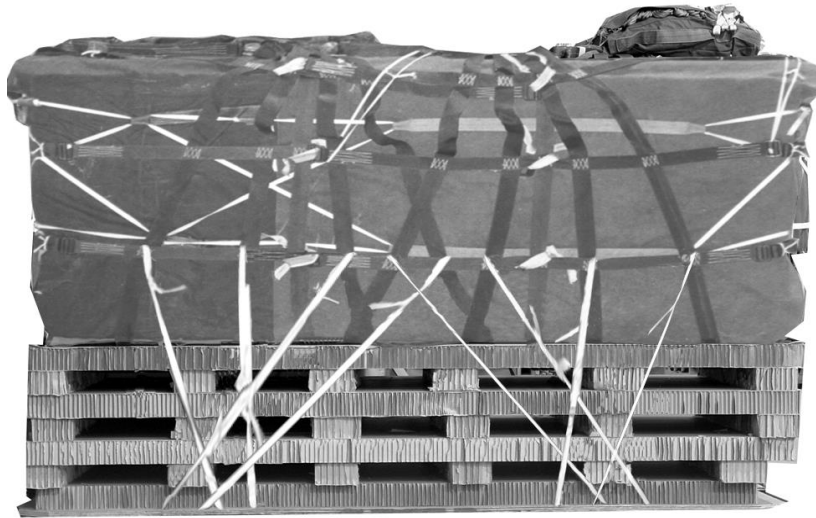
Figure 8-42. 26-foot high-velocity parachute installed

MARKING RIGGED LOAD

8-70. Mark the rigged load according to Paragraph 1-5. Compute the rigged load data. An AMC IMT 1033, 20050204, V1. (Shipper's Declaration for Dangerous Goods) may be required.

CAUTION

Make the final rigger inspection required by TM 4-48.02/MCRP 4-11.3J/NAVSEA SS400-AB-MMO-010 REV 1/TO 13C7-1-5 and AR 59-4/OPNAVINST 4630.24C/AFJ 13-210(I)/MCO 13480.1B before the load leaves the rigging site.



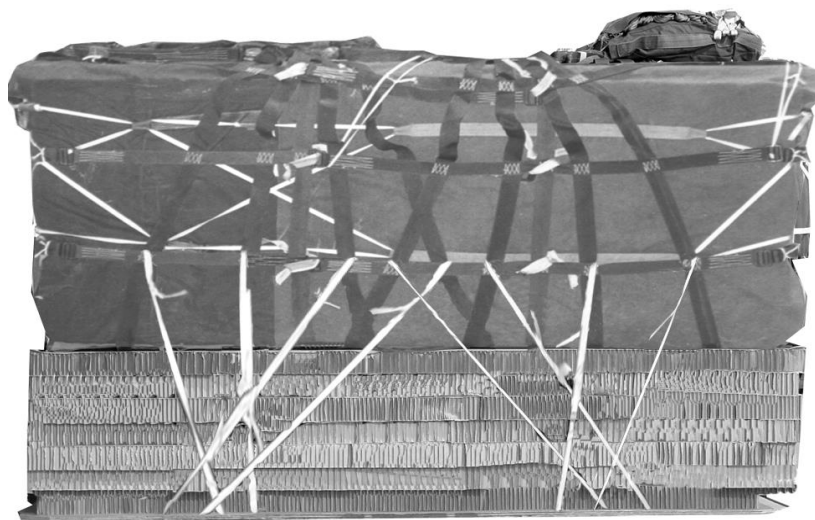
RIGGING LOAD DATA

26-foot, high-velocity parachute	675 – 1,450 pounds
22-foot cargo extraction parachute, modified.....	675 – 1,450 pounds

Figure 8-43. Stretch A-22 container load weighing less than 1,450 pounds rigged for high-velocity airdrop

CAUTION

Make the final rigger inspection required by TM 4-48.02/MCRP 4-11.3J/NAVSEA SS400-AB-MMO-010 REV 1/TO 13C7-1-5 and AR 59-4/OPNAVINST 4630.24C/AFJ 13-210(I)/MCO 13480.1B before the load leaves the rigging site.



RIGGING LOAD DATA (WITHOUT PARACHUTE)

26-foot, high-velocity parachute	1,451 – 2,200 pounds
22-foot cargo extraction parachute, modified.....	1,451 – 2,200 pounds

Figure 8-44. Stretch A-22 container load weighing more than 1,450 pounds rigged for high-velocity airdrop

EQUIPMENT REQUIRED

8-71. Use the equipment listed in Table 8-10 and Table 8-11 to rig the load shown in Figures 8-43 and 8-44.

Table 8-10. Equipment required for rigging stretch A-22 container load weighing less than 1,450 pounds for high-velocity airdrop

<i>National Stock Number</i>	<i>Item</i>	<i>Quantity</i>
1670-00-587-3421	Bag, cargo, A-22	2
4030-00-678-8562	Clevis, suspension, ¾-inch (medium)	3
4020-00-240-2146	Cord, nylon, type III	As required
1670-00-753-3928	Pad, energy-dissipation material, honeycomb	8 sheets
1670-00-872-6109	Parachute, high-velocity, 26-foot	1
	OR	
N/A	Parachute, cargo extraction, 22-foot, modified	1
	Plywood:	
5530-00-128-4981	¾- by 48- by 96-inch (locally fabricated skid board)	1 sheet
	or	
5530-00-914-5118	1- by 48- by 96-inch	1 sheet
1670-01-062-6301	Sling, cargo, airdrop, 3-foot (2-loop), type XXVI nylon webbing	2
7510-00-266-6710	Tape, masking, 2-inch	As required
8310-01-102-4478	Thread, cotton, ticket number 8/7	As required
	Webbing:	
8305-00-268-2411	Cotton, ¼-inch, type I	As required
	Nylon:	
8305-00-082-5752	Tubular, ½-inch	As required
8305-00-263-3591	Type VIII, NT	As required

Table 8-11. Equipment required for rigging stretch A-22 container load weighing more than 1,450 pounds for high-velocity airdrop

<i>National Stock Number</i>	<i>Item</i>	<i>Quantity</i>
1670-00-587-3421	Bag, cargo, A-22	2
4030-00-678-8562	Clevis, suspension, ¾-inch (medium)	3
4020-00-240-2146	Cord, nylon, type III	As required
1670-00-753-3928	Pad, energy-dissipation material, honeycomb	10 sheets
1670-00-872-6109	Parachute, high-velocity, 26-foot	1
	OR	
N/A	Parachute, cargo extraction, 22-foot, modified	1
	Plywood:	
5530-00-128-4981	¾- by 48- by 96-inch (locally fabricated skid board)	1 sheet
	or	
5530-00-914-5118	1- by 48- by 96-inch	1 sheet
1670-01-062-6301	Sling, cargo, airdrop, 3-foot (2-loop), type XXVI nylon webbing	2
7510-00-266-6710	Tape, masking, 2-inch	As required
8310-01-102-4478	Thread, cotton, ticket number 8/7	As required
	Webbing:	
8305-00-268-2411	Cotton, ¼-inch, type I	As required
	Nylon:	
8305-00-082-5752	Tubular, ½-inch	As required
8305-00-263-3591	Type VIII, NT	As required

SECTION VII – RIGGING DOUBLE A-22 CARGO BAG LOADS WITH LOW-COST AERIAL DELIVERY SYSTEM (LCADS) LOW-VELOCITY CARGO PARACHUTE

DESCRIPTION OF LOAD

8-72. A typical load is rigged for low-velocity airdrop using a double A-22 container. The double container is made by using two A-22 cargo bags. Shrink wrap or plastic sheeting may be used as a substitute for the A-22 cargo bag cover. The weight limitation of the load is 900 to 2,200 pounds, excluding the weight of the parachute. The minimum drop altitude is 1,000 feet above ground level. Drops above 10,000 feet mean sea level are restricted to 1,700 pounds of suspended weight. The load is rigged with one LCADS LVCP.

CAUTION

Ensure the tie between the static line and the $\frac{3}{8}$ -inch shackle (G-14 clevis) is rigged for break-away static line only. Do not remove the Type III nylon cord filler cords (NON-GUTTED).

PREPARING SKID BOARD

8-73. Prepare the skid board as shown in Figure 8-12.

PREPARING SKID BOARD TIES AND POSITIONING HONEYCOMB

8-74. Prepare the skid board ties and position the honeycomb on the skid board as shown in Figure 8-13.

POSITIONING A-22 SLING ASSEMBLIES

8-75. Position two A-22 sling assemblies on the double A-22 load as shown in Figure 8-14.

POSITIONING COVERS

8-76. Use two optional A-22 cargo bag covers when rigging this load, if needed. Position the covers as shown in Figure 8-15.

POSITIONING LOAD AND CLOSING BAG COVERS

8-77. Center the load so that the weight of the load is evenly distributed. Use honeycomb and cellulose wadding to protect the items. Use cord, tape, or steel strapping to keep the load from shifting. Close the cover as shown in Figure 8-16.

SECURING TIE-DOWN STRAPS

8-78. Secure the tie-down straps as shown in Figure 8-17.

8-79. Secure the front and rear sling assembly D-rings as shown below in Figure 8-45.



- ① Cut a length of Type VIII nylon webbing. Route the Type VIII nylon webbing from the front support web D-ring to the rear support web D-ring. Secure the Type VIII nylon webbing using three alternating half hitches and an overhand knot in the running end to the front D-ring. Apply tension and secure the free running end of the Type VIII nylon webbing to the rear D-ring using a Trucker's Hitch and three alternating half hitches and make an overhand knot in the running end.

Figure 8-45. Tie-down straps secured

SECURING LATERAL STRAPS

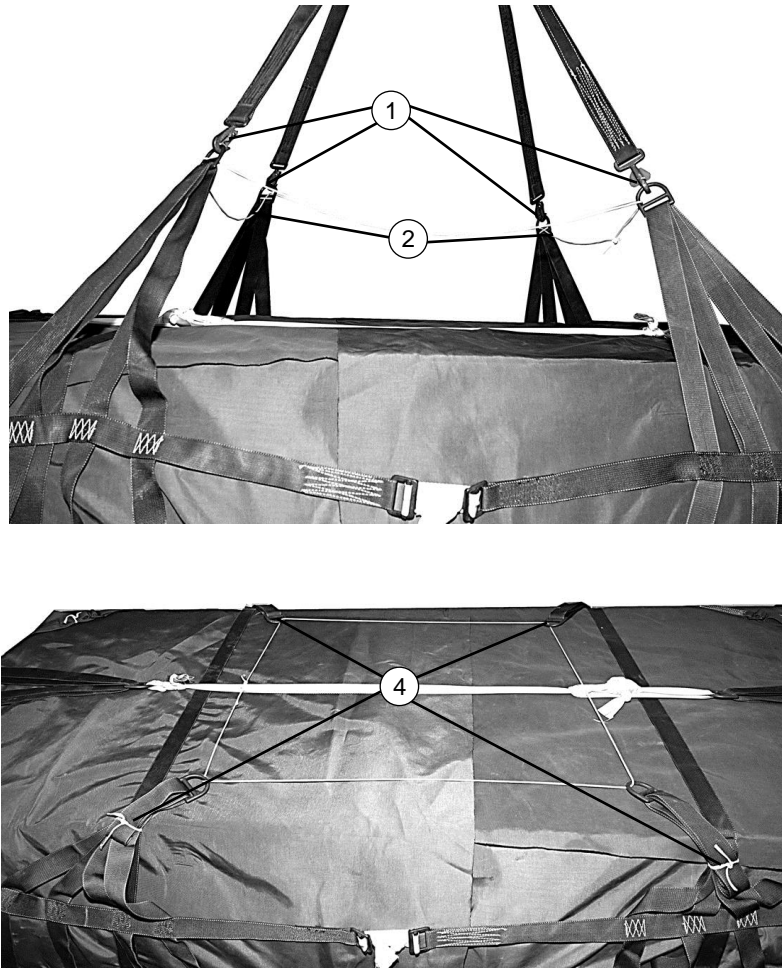
8-80. Secure the lateral straps as shown in step 2, Figure 8-18.

SECURING SKID BOARD TIES

8-81. Secure the skid board ties as shown in Figure 8-19.

INSTALLING SUSPENSION SLINGS

8-82. Install suspension slings using four suspension webs as shown in Figure 8-46.

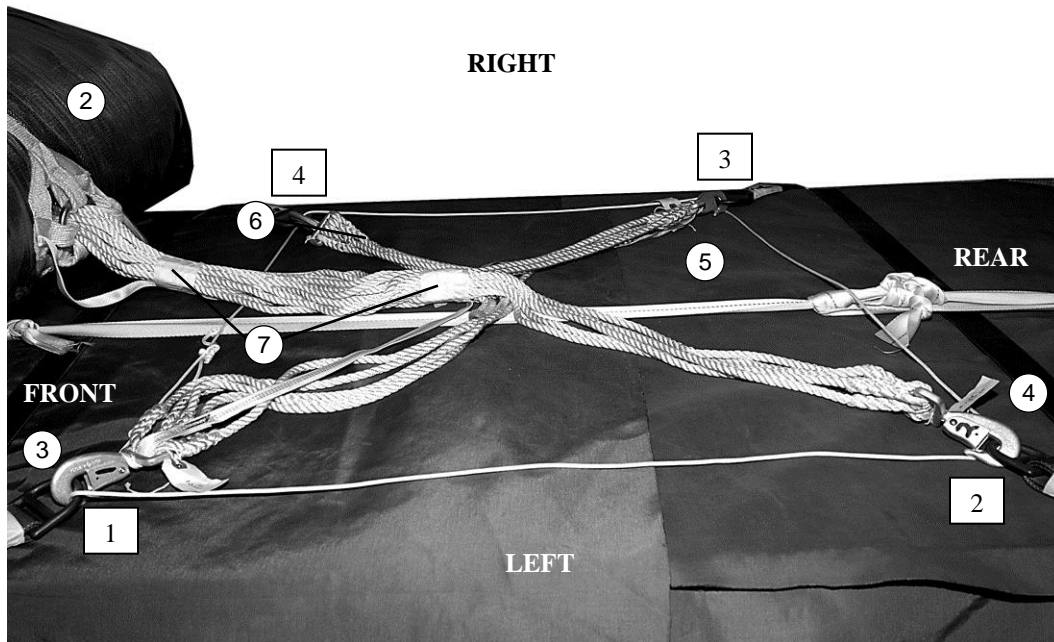


- ① Attach one suspension web to each of the four D-rings. Raise the suspension webs until fully elongated.
- ② Route a length of Type III nylon cord through the four D-rings as shown above. Tie the ends together with a surgeon's knot and locking knot. Ensure the tie has excess to allow suspension sling movement.
- ③ Remove the suspension web from all four D-rings (not shown).
- ④ Spread the four support web D-rings evenly on top of the load. Fold the excess support web and secure it to the side tiedown straps with Type I, 1/4-inch cotton webbing.

Figure 8-46. Suspension slings installed

INSTALLING PARACHUTE

8-83. Install an LCADS LV cargo parachute as shown in Figure 8-47.



- ① Number the support web D-rings as follows: 1 – left front D-ring, 2 – left rear D-ring, 3 – right rear D-ring, 4 – right front D-ring.
- ② Place an LCADS LV cargo parachute on the front of the load with the static line toward the front of the load.
- ③ Attach suspension line group 1 to support web 1. Tape the snap hook (not shown).
- ④ Attach suspension line group 2 to support web 2. Tape the snap hook (not shown).
- ⑤ Attach suspension line group 3 to support web 3. Tape the snap hook (not shown).
- ⑥ Attach suspension line group 4 to support web 4. Tape the snap hook (not shown).
- ⑦ Tape the suspension lines together approximately 6- and 18-inches from the “O” ring on the deployment bag with 2-inch masking tape.

Figure 8-47. LCADS LV cargo parachute installed



- ⑧ Secure the parachute to the load with one turn doubled Type I, ¼-inch cotton webbing. Secure the tie to the center lateral strap on one side with 3 alternating half hitches. Route the tie up through the front carrying handle of the parachute, over the top of the parachute and down through the other front carrying handle. Secure the tie with a trucker's hitch to the center lateral strap on the opposite side.
- ⑨ Tie a one turn single, type I ¼- inch cotton webbing tie from the center loop of the deployment bag, where the suspension lines extend, to the rear support web D-ring. Secure the tie with a trucker's hitch.
- ⑩ Tie a one turn single, type I ¼- inch cotton webbing tie from the left loop of the deployment bag where the suspension lines extend, to the left rear support web D-ring. Secure the tie with a trucker's hitch.
- ⑪ Tie a one turn single, type I ¼- inch cotton webbing tie from the right loop of the deployment bag where the suspension lines extend, to the right rear support web D-ring. Secure the tie with a trucker's hitch.

Figure 8-47. LCADS LV cargo parachute installed (continued)

MARKING RIGGED LOAD

8-84. Mark the rigged load according to Paragraph 1-5 and as shown in Figure 8-48. Compute the rigged load data. An AMC IMT 1033, 20050204, V1. (Shipper's Declaration for Dangerous Goods) may be required.

CAUTION

Make the final rigger inspection required by TM 4-48.02/MCRP 4-11.3J/NAVSEA SS400-AB-MMO-010 REV 1/TO 13C7-1-5 and AR 59-4/OPNAVINST 4630.24C/AFJ 13-210(I)/MCO 13480.1B before the load leaves the rigging site.



RIGGED LOAD DATA (WITHOUT PARACHUTE)

LCADS LV cargo parachute 900 – 2,200 pounds

Figure 8-48. Double A-22 cargo bag rigged for low-velocity airdrop with LCADS LVCP

Table 8-12. Equipment required for rigging double A-22 container load with LCADS LVCP for low-velocity airdrop

<i>National Stock Number</i>	<i>Item</i>	<i>Quantity</i>
1670-00-587-3421	Bag, cargo, A-22	2
4020-00-240-2146	Cord, nylon, type III	As required
1670-00-753-3928	Pad, energy-dissipation material, honeycomb	As required
1670-01-547-0401	Parachute, LCADS LV	1
	Plywood:	
5530-00-128-4981	¾- by 48- by 96-inch (locally fabricated skid board)	1 sheet
	or	
5530-00-914-5118	1- by 48- by 96-inch	1 sheet
7510-00-266-6710	Tape, masking, 2-inch	As required
	Webbing:	
8305-00-268-2411	Cotton, ¼-inch, type I	As required
	Nylon:	
8305-00-082-5752	Tubular, ½-inch	As required
8305-00-263-3591	Type VIII, NT	As required

SECTION VIII – RIGGING DOUBLE A-22 CARGO BAG LOADS FOR HIGH-VELOCITY AIRDROP WITH LOW-COST AERIAL DELIVERY SYSTEM (LCADS) HIGH VELOCITY CARGO PARACHUTE (HVCP)

DESCRIPTION OF LOAD

8-85. A typical load is rigged for high-velocity airdrop using a double A-22 container. The double container is made by using two A-22 cargo bags. Shrink wrap or plastic sheeting may be used as a substitute for the A-22 cargo bag cover. The weight limitation of the load is 900 to 2,200 pounds, excluding the weight of the parachute. The minimum drop altitude is 3,000 feet above ground level. The load is rigged with one LCADS HVCP.

CAUTION

Ensure the tie between the static line and the $\frac{3}{8}$ -inch shackle (G-14 clevis) is rigged for break-away static line only. Remove the Type III nylon cord filler cords (guttled).

PREPARING SKID BOARD

8-86. Prepare the skid board as shown in Figure 8-12.

PREPARING SKID BOARD TIES AND POSITIONING HONEYCOMB

8-87. Prepare the skid board ties and position the honeycomb on the skid board as shown in Figure 8-13.

POSITIONING A-22 SLING ASSEMBLIES

8-88. Position two A-22 sling assemblies on the double A-22 load as shown in Figure 8-14.

POSITIONING COVERS

8-89. Use two optional A-22 cargo bag covers when rigging this load, if needed. Position the covers as shown in Figure 8-15. Placing an additional layer of honeycomb on top of the cover is recommended but not required.

POSITIONING LOAD AND CLOSING BAG COVERS

8-90. Center the load so that the weight of the load is evenly distributed. Use honeycomb and cellulose wadding to protect the items. Use cord, tape, or steel strapping to keep the load from shifting. Close the cover as shown in Figure 8-16.

SECURING TIE-DOWN STRAPS

8-91. Secure the tie-down straps as shown in Figure 8-17.

8-92. Secure the front and rear sling assembly D-rings as shown in Figure 8-45.

SECURING LATERAL STRAPS

8-93. Secure the lateral straps as shown in Figure 8-18.

SECURING SKID BOARD TIES

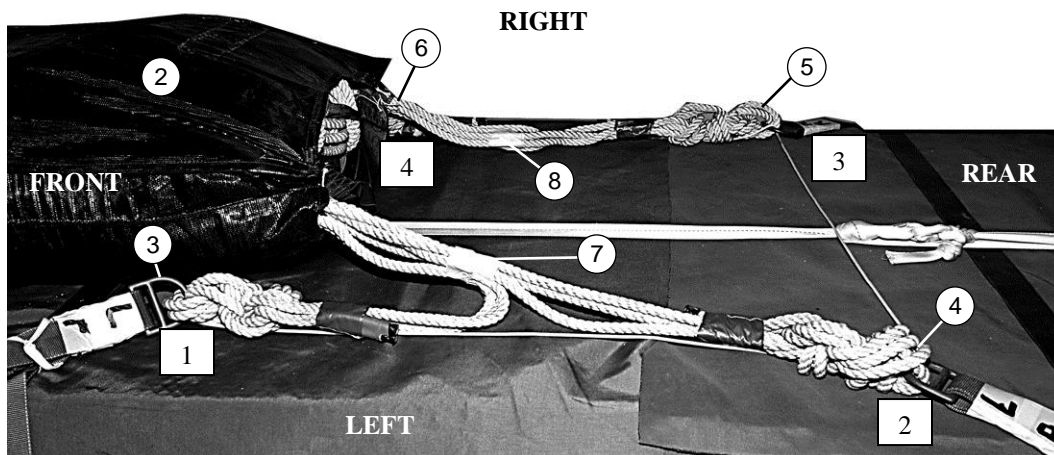
8-94. Secure the skid board ties as shown in Figure 8-19.

INSTALLING SUSPENSION SLINGS

8-95. Install suspension slings using four suspension webs as shown in Figure 8-46.

INSTALLING PARACHUTE

8-96. Install an LCADS HV cargo parachute as shown in Figure 8-49.



- ① Number the support web D-rings as follows: 1 – left front D-ring, 2 – left rear D-ring, 3 – right rear D-ring, 4 – right front D-ring.
- ② Place an LCADS HV cargo parachute 12 inches from the front edge of the load with the static line toward the front of the load.
- ③ Route suspension lines 4 through 6 (bottom left group coming out of the deployment bag), 30 inches through D-ring 1. Secure suspension line group with three alternating half-hitches. Tape the suspension lines with 2-inch cloth-backed tape.
- ④ Route suspension lines 1 through 3 (top left group coming out of the deployment bag), 30 inches through D-ring 2. Secure suspension line group with three alternating half-hitches. Tape the suspension lines with 2-inch cloth-backed tape.
- ⑤ Route suspension lines 10 through 12 (top right group coming out of the deployment bag), 30 inches through D-ring 3. Secure suspension line group with three alternating half-hitches. Tape the suspension lines with 2-inch cloth-backed tape.
- ⑥ Route suspension lines 7 through 9 (bottom right group coming out of the deployment bag), 30 inches through D-ring 4. Secure suspension line group with three alternating half-hitches. Tape the suspension lines with 2-inch cloth-backed tape.
- ⑦ Tape suspension lines 1 through 3 and 4 through 6 together with 2-inch masking tape.
- ⑧ Tape suspension lines 10 through 12 and 7 through 9 together with 2-inch masking tape.

CAUTION

Failure to properly connect the suspension line groups will cause the suspension lines to cross.

Figure 8-49. LCADS HV cargo parachute installed

SECURE THE PARACHUTE TO THE LOAD

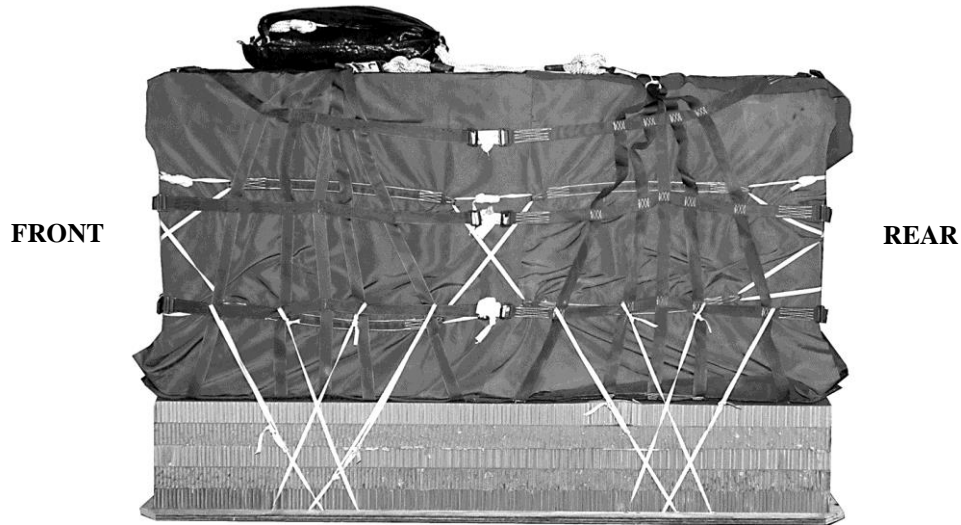
8-97. Secure the parachute as shown in Figure 8-47.

MARKING RIGGED LOAD

8-98. Mark the rigged load according to Paragraph 1-5 and as shown in Figure 8-50. Compute the rigged load data. An AMC IMT 1033, 20050204, V1. (Shipper's Declaration for Dangerous Goods) may be required.

CAUTION

Make the final rigger inspection required by TM 4-48.02/MCRP 4-11.3J/NAVSEA SS400-AB-MMO-010 REV 1/TO 13C7-1-5 and AR 59-4/OPNAVINST 4630.24C/AFJ 13-210(I)/MCO 13480.1B before the load leaves the rigging site.



RIGGING LOAD DATA (WITHOUT PARACHUTE)

LCADS HV cargo parachute.....	900 – 2,200 pounds
Height:.....	83 inches
Width:.....	48 inches
Length:.....	96 inches

Figure 8-50. Double A-22 cargo bag rigged for high-velocity airdrop with LCADS HVCP

Table 8-13. Equipment required for rigging double A-22 container load with LCADS HVCP for high-velocity airdrop

<i>National Stock Number</i>	<i>Item</i>	<i>Quantity</i>
1670-00-587-3421	Bag, cargo, A-22	2
4020-00-240-2146	Cord, nylon, type III	As required
1670-00-753-3928	Pad, energy-dissipation material, honeycomb	As required
1670-01-529-1202	Parachute, LCADS HVCP	1
	Plywood:	
5530-00-128-4981	¾- by 48- by 96-inch (locally fabricated skid board)	1 sheet
	or	
5530-00-914-5118	1- by 48- by 96-inch	1 sheet
7510-00-266-6710	Tape, pressure sensitive, (masking), 2-inch	As required
	Webbing:	
8305-00-268-2411	Cotton, ¼-inch, type I	As required
	Nylon:	
8305-00-082-5752	Tubular, ½-inch	As required
8305-00-263-3591	Type VIII, NT	As required

Chapter 9

Rigging Petroleum Products

CAUTION

Make sure all petroleum products are packaged in performance oriented packaging standard drums and cans. Gasoline cans and drums must be padded and rigged to prevent metal-to-metal contact.

DESCRIPTION OF LOAD

9-1. This chapter shows how to rig sample loads of petroleum products for low-velocity and high-velocity airdrop. They will be rigged in an A-22 cargo bag or Low Cost Aerial Delivery System (LCADS) Low Cost Container (LCC). This chapter will show how to position the load only. The container is rigged as a typical load and the parachute is installed using normal procedures.

PREPARING SKID BOARD AND POSITIONING HONEYCOMB

9-2. Prepare the skid board according to Figure 8-1 and position the honeycomb according to Chapter 8.

POSITIONING CONTAINER

9-3. Center the sling assembly on the honeycomb stack. If desired, an optional cover may be used.

POSITIONING LOAD

9-4. Position the load as follows:

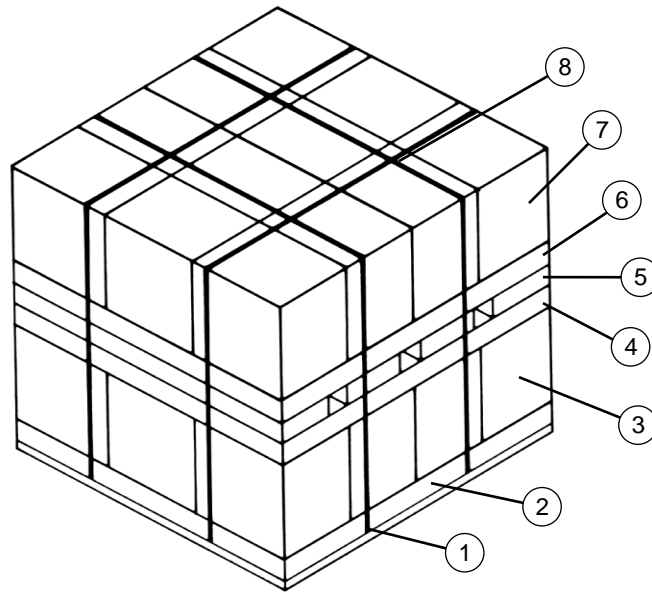
- Use Figure 9-1 to position cases of oil.
- Use Figure 9-2 to position 5-gallon drums.
- Use Figure 9-3 to position 5-gallon fuel cans.
- Use Figure 9-4 to position 30-gallon grease drums and cases of oil.
- Use Figure 9-5 to position 55-gallon drums in an A-22 cargo bag.

Note. These procedures can be used to rig similar loads. The load may consist of drums of oil, grease, fuel, or a combination.

SECURING CONTAINER AND INSTALLING PARACHUTE

9-5. Secure the container according to Figures 8-4 through 8-7. Install a cargo parachute according to Chapter 7.

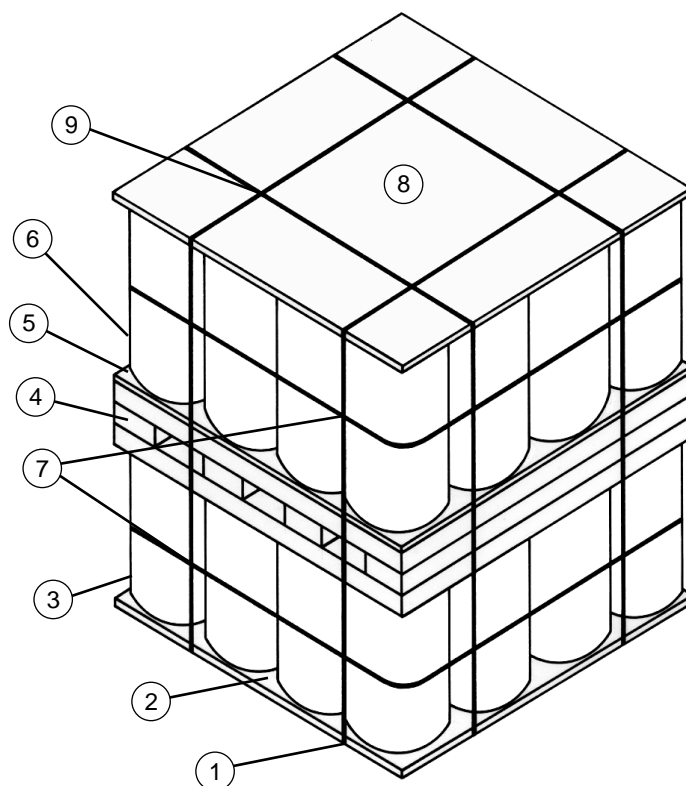
Note. This drawing is not drawn to scale.



- ① Use four 20-foot lengths of steel strapping. Lay two lengths side to side on top of the plywood. Lay the other two lengths front to rear on top of the plywood. Adjust each length so that it is 8 inches from the edge.
- ② Center a 36- by 48-inch and a 12- by 48-inch piece of honeycomb side by side on top of the plywood.
- ③ Place 12 cases of oil on top of the honeycomb.
- ④ Form the second layer of honeycomb as described in step 2 except alternate the pieces of honeycomb.
- ⑤ Evenly space four 8- by 48-inch pieces of honeycomb on top of the second layer of honeycomb.
- ⑥ Form the fourth layer of honeycomb as described in step 2 except alternate the pieces of honeycomb.
- ⑦ Position 12 cases of oil on top of the honeycomb.
- ⑧ Bind the steel strapping over the top of the load. Use four seals to secure each piece of steel strapping. Cut off excess if necessary.

Figure 9-1. Cases of oil rigged

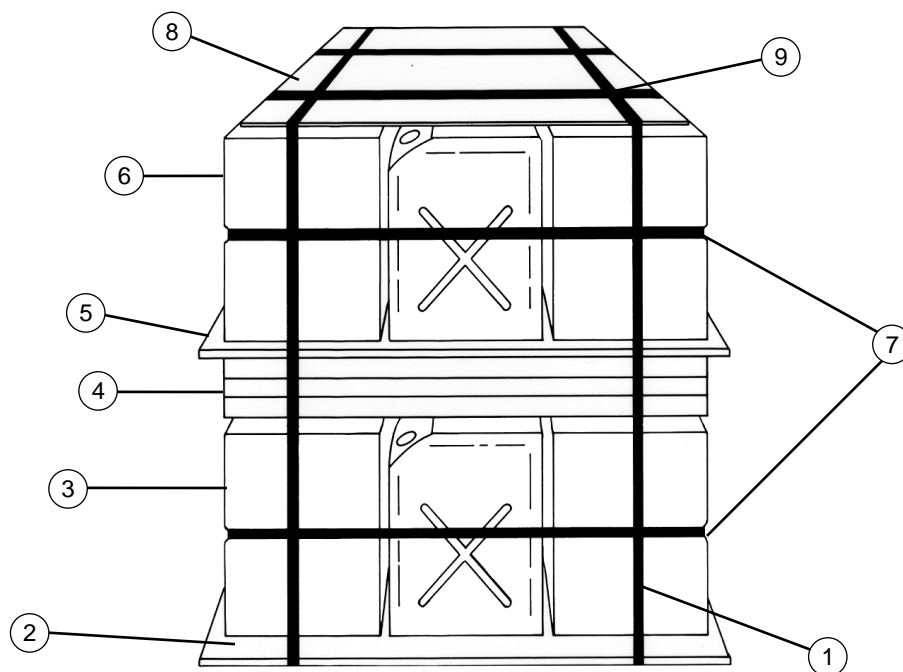
Note. This drawing is not drawn to scale.



- ① Repeat step 1 of Figure 9-1.
- ② Center a 48- by 48-inch piece of $\frac{3}{4}$ -inch plywood on top of the container.
- ③ Place sixteen 5-gallon drums on top of the strapping.
- ④ Repeat steps 4 through 6 of Figure 9-1 to form three layers of honeycomb.
- ⑤ Place a 48- by 48- inch piece of $\frac{3}{4}$ -inch plywood on top of the honeycomb.
- ⑥ Position sixteen 5-gallon drums on top of the plywood.
- ⑦ Wrap a length of steel strapping around each layer of drums. Bind the strapping in place.
- ⑧ Place a 45- by 45-inch piece of $\frac{3}{4}$ -inch plywood on top of the load.
- ⑨ Bind the steel strapping over the top of the load. Use four seals to secure each piece of steel strapping. Cut off excess if necessary. Pad the 5-gallon drums as necessary.

Figure 9-2. Five-gallon drums rigged

Note. This drawing is not drawn to scale.



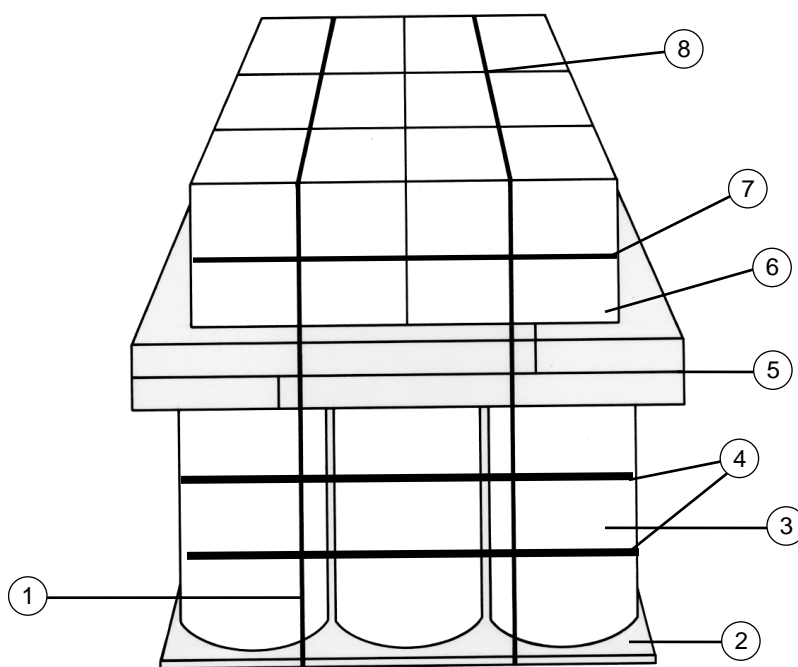
- ① Repeat step 1 of Figure 9-1.
- ② Center a 48- by 48-inch piece of $\frac{3}{4}$ -inch plywood on top of the strapping.
- ③ Position 21 cans on top of the plywood (three rows wide and seven in each row). Wrap every other can with cellulose wadding or cardboard sheets.

Note. Make sure the 5-gallon cans are filled not more than 1-inch below filler threads.

- ④ Position three layers of honeycomb. Use a 36- by 48-inch and a 12- by 48-inch piece of honeycomb in each layer. Alternate the pieces of honeycomb in each layer.
- ⑤ Lay a 48- by 48- inch piece of $\frac{3}{4}$ -inch plywood on top of the steel strapping.
- ⑥ Repeat step 3.
- ⑦ Wrap a length of steel strapping around each layer of cans. Bind the strapping in place.
- ⑧ Place a 44- by 44-inch piece of $\frac{3}{4}$ -inch plywood on top of the load.
- ⑨ Bind the steel strapping over the top of the load. Use four seals to secure each piece of steel strapping. Cut off excess if necessary. Pad the 5-gallon cans as necessary.

Figure 9-3. Five-gallon fuel cans rigged

Note. This drawing is not drawn to scale.



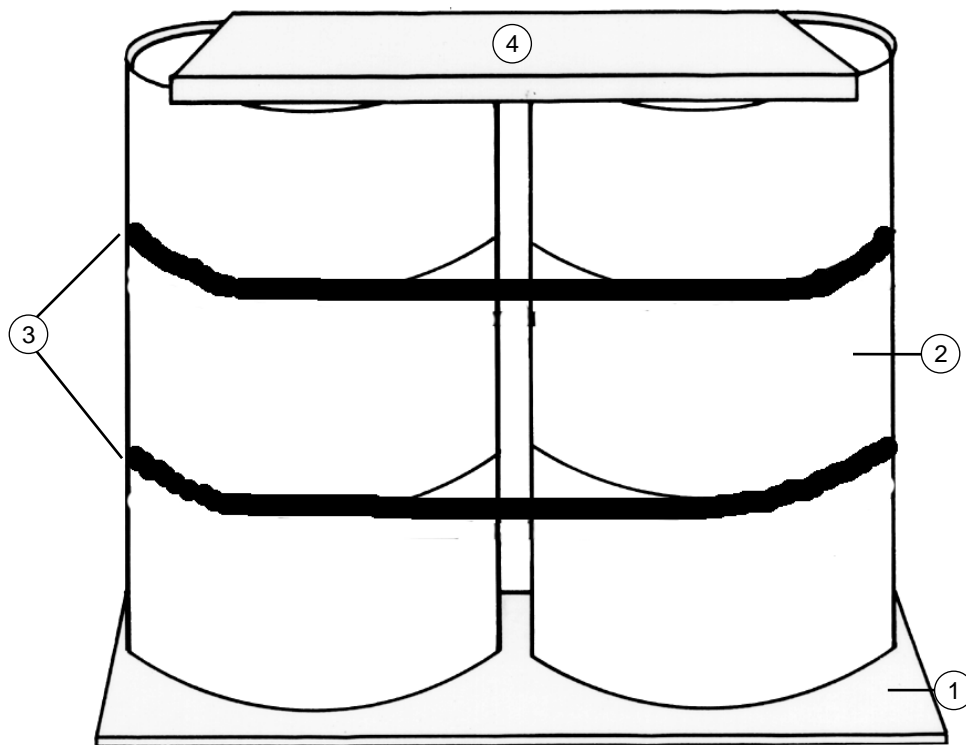
- ① Repeat step 1 of Figure 9-1.
- ② Center a 48- by 48-inch piece of $\frac{3}{4}$ -inch plywood on top of the steel strapping.
- ③ Place nine 30-gallon drums on top of the plywood. Pad the 30-gallon drums as necessary.
- ④ Evenly space two 18-foot lengths of steel strapping around the drums. Bind the strapping in place.
- ⑤ Position two layers of honeycomb. Use a 36- by 48-inch and a 12- by 48-inch piece of honeycomb in each layer. Alternate the pieces of honeycomb in each layer.
- ⑥ Place six cases of oil on top of honeycomb.
- ⑦ Wrap a length of steel strapping around the cases. Bind the strapping in place.
- ⑧ Bind the steel strapping over the top of the load. Use four seals to secure each piece of steel strapping. Cut off excess if necessary.

Figure 9-4. Thirty-gallon grease drums and cases of oil rigged

Note. This drawing is not drawn to scale.

CAUTION

When dropping 55-gallon drums in the Low Cost Aerial Delivery System Low Cost Container follow the procedures in Paragraphs 12-19 through 12-27.



- ① Center a 48- by 48-inch piece of $\frac{3}{4}$ -inch plywood on top of the container.
- ② Place four 55-gallon drums on top of the plywood.
- ③ Wrap two 16-foot lengths of $\frac{1}{2}$ -inch tubular nylon webbing around the drums. Make sure each length is just above the grooves on the drums. Secure each length of webbing together using a trucker's hitch knot.
- ④ Center a 36- by 36-inch piece of $\frac{3}{4}$ -inch piece of plywood on top of the load.

Figure 9-5. Fifty-five gallon drums rigged

MARKING RIGGED LOAD

9-6. Mark the rigged load according to Paragraph 1-5. Compute the rigged load data. An AMC IMT 1033, 20050204, V1. (Shipper's Declaration for Dangerous Goods) may be required.

EQUIPMENT REQUIRED

9-7. Use the equipment listed in Table 9-1 to rig the petroleum products. However, the equipment will vary from load to load.

Table 9-1. Equipment required for rigging petroleum products in an A-22 cargo bag

<i>National Stock Number</i>	<i>Item</i>	<i>Quantity</i>
8040-00-273-8713	Adhesive, paste, 1-gallon	As required
1670-00-587-3421	Bag, cargo, A-22	1
4020-00-240-2146	Cord, nylon, type III	As required
8135-00-664-6958	Cushioning material, packaging, cellulose wadding	As required
1670-00-753-3928	Pad, energy-dissipation material, honeycomb	As required
	Parachute:	
1670-01-065-3755	Cargo, G-12E	1
	OR	
1670-01-547-0401	Parachute, cargo, Low Cost Low Velocity	1
1670-00-872-6109	High-Velocity, 26-foot	1
	OR	
1670-01-529-1202	Parachute, cargo, LCADS LCHV	1
	Plywood:	
5530-00-128-4981	$\frac{3}{4}$ - by 48- by 96-inch (locally fabricated skid board)	As required
	or	
5530-00-129-7777	$\frac{1}{2}$ - by 48- by 96-inch	As required
1670-00-883-1654	Skid, cargo bag, platform, plywood	1
8135-00-283-0067	Strapping, steel, 5/8-inch	As required
7510-00-266-6710	Tape, masking, 2-inch	As required
8310-01-102-4478	Thread, cotton, ticket number 8/7	As required
	Webbing:	
8305-00-268-2411	Cotton, $\frac{1}{4}$ -inch, type I	As required
8305-00-082-5752	Nylon, tubular, $\frac{1}{2}$ -inch	As required

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Chapter 10

Rigging Ahkio Sleds

DESCRIPTION OF LOAD

10-1. Four Ahkio sleds are rigged in a double A-22 cargo bag. The sleds are filled with at least 200 pounds of equipment in each sled. The load uses a G-12E cargo parachute. Each sled is 24 inches wide, 88 inches long and 8 inches high. It weighs 38 pounds and can carry up to 500 pounds of equipment.

PREPARING SKID BOARD AND POSITIONING HONEYCOMB AND CONTAINER

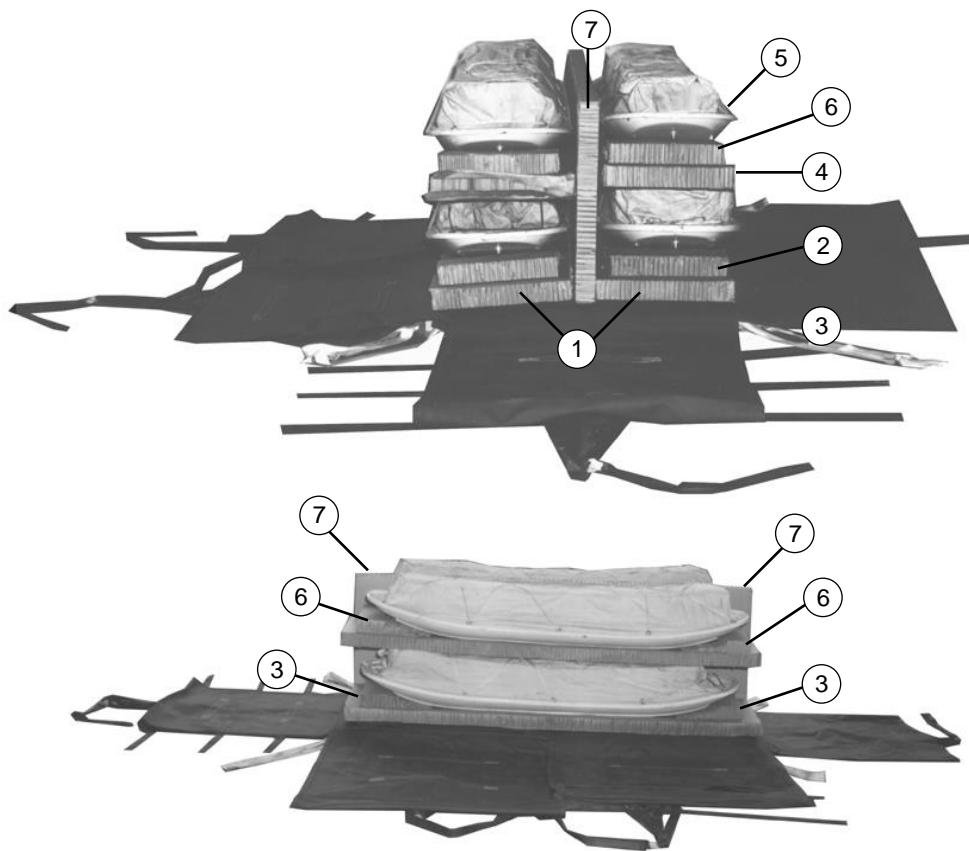
10-2. Prepare a typical double A-22 skid board as shown in Figure 8-12. Position two layers of honeycomb on the skid board as shown in Figure 8-13. Position the A-22 sling assembly according to Paragraph 8-23. Position the A-22 covers according to 8-24.

POSITIONING LOAD

10-3. Position the load according to Figure 10-1. Make sure the sleds have rations, equipment, or other items positioned inside so that the load will weigh at least 900 pounds without the weight of the parachute.

COMPLETING RIGGED LOAD

10-4. Complete the rigging of the load according to Paragraphs 8-25 through 8-30.



- ① Place two 21- by 94-inch piece of honeycomb side by side on the cargo covers. Leave a 3-inch space between the honeycomb pieces.
- ② Place one sled on each 21- by 94-inch piece of honeycomb.
- ③ Place an 18- by 21-inch piece of honeycomb under each end of the sleds. Crush the edges of the honeycomb so that the honeycomb will support the ends of the sleds.
- ④ Lay a 21- by 94-inch piece of honeycomb on top of each sled.
- ⑤ Place one sled on each 21- by 94-inch piece of honeycomb.
- ⑥ Place an 18- by 21-inch piece of honeycomb under each end of the sleds. Crush the edges of the honeycomb so that the honeycomb will support the ends of the sleds.
- ⑦ Place a 94-inch piece of honeycomb between the stacks of sleds. The height of the honeycomb may vary according to the height of the load. The honeycomb should be even with the top of the load.

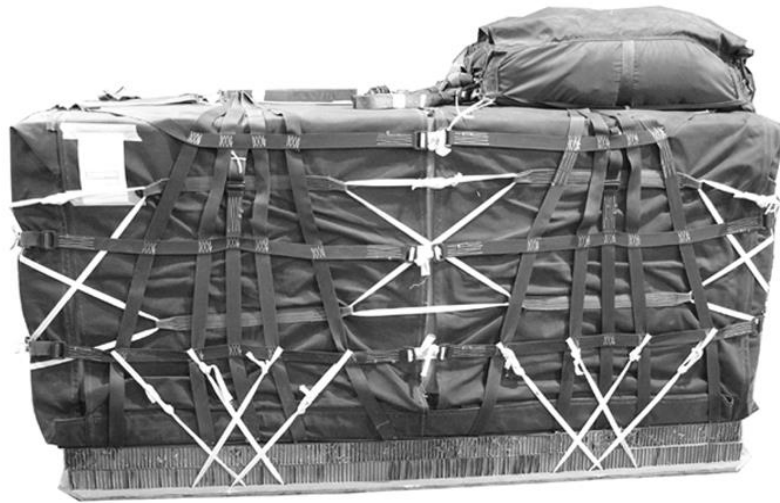
Figure 10-1. Load positioned

MARKING RIGGED LOAD

10-5. Mark the rigged load according to Paragraph 1-5 using the data given in Figure 10-2. If the load varies from the one shown in Figure 10-2; recompute the data. An AMC IMT 1033, 20050204, V1. (Shipper's Declaration for Dangerous Goods) may be required.

CAUTION

Make the final rigger inspection required by TM 4-48.02/MCRP 4-11.3J/NAVSEA SS400-AB-MMO-010 REV 1/TO 13C7-1-5 and AR 59-4/OPNAVINST 4630.24C/AFJ 13-210(I)/MCO 13480.1B before the load leaves the rigging site.



RIGGING LOAD DATA AHKIO SLEDS

Weight: minimum load allowed	900 pounds
Maximum load allowed.....	2,200 pounds
Height (with one G-12E cargo parachute)	up to 83 inches
Width	48 inches
Length	96 inches

Figure 10-2. Ahkio sleds rigged in a double A-22 cargo bag for low-velocity airdrop

EQUIPMENT REQUIRED

10-6. Use the equipment listed in Table 10-1 to rig the load shown in Figure 10-2.

Table 10-1. Equipment required for rigging Ahkio sleds in a double A-22 cargo bag for low-velocity airdrop

<i>National Stock Number</i>	<i>Item</i>	<i>Quantity</i>
8040-00-273-8713	Adhesive, paste, 1-gallon	As required
1670-00-587-3421	Bag, cargo, A-22	2
4030-00-678-8562	Clevis, suspension, 3/4-inch (medium)	2
4020-00-240-2146	Cord, nylon, type III	As required
8135-00-664-6958	Cushioning material, packaging, cellulose wadding	As required
1670-00-753-3928	Pad, energy-dissipation material, honeycomb	7 sheets
	Parachute:	
1670-01-065-3755	Cargo, G-12E	1
1670-00-216-7297	Pilot, 68-inch diameter	1
	Plywood:	
5530-00-128-4981	3/4- by 48- by 96-inch (locally fabricated skid board) or	1 sheet
5530-00-914-5118	1- by 48- by 96-inch	1 sheet
1670-01-062-6301	Sling, type XXVI nylon webbing 3-foot (2-loop)	3
7510-00-266-6710	Tape, masking, 2-inch	As required
8310-01-102-4478	Thread, cotton, ticket number 8/7	As required
	Webbing:	
8305-00-268-2411	Cotton, 1/4-inch, type I	As required
	Nylon,	As required
8305-00-082-5752	Tubular, 1/2-inch	
8305-00-263-3591	Type VIII	As required
8305-00-260-6890	Type X	As required

PART FIVE

Rigging Low-Cost Aerial Delivery System (LCADS), Low Cost Container (LCC)

Chapter 11

General Information and Procedures for LCADS, LCC

NOTICE OF EXCEPTION

The procedures in this Part are different from those in Chapter 2, paragraphs 2-2 and 2-3, page 2-2 and 2-3. An exception to TM 4-48.03/MCRP 4-11.3C/TO 13C7-1-11 is granted. The procedures in this Part must be followed.

LCADS LCC COMPONENTS

11-1. The LCADS LCC is a simplified, lightweight, alternative to the A-22 cargo bag assembly for low- and high-velocity airdrop. The only component is a sling assembly with no scuff pad, cover, suspension webs or friction adapters on the lateral bands. The LCC is used for high-volume delivery of supply items when recovery of airdrop equipment is impractical or disruptive to retrograde operations. The material used on the LCC sling assembly is an economical and readily available polypropylene material. The LCC is designated a one-time-use, expendable item.

LCADS LCC SKID BOARD

11-2. Like the standard A-22 container, the sling assembly is secured to a 3/4 or 1- by 48- by 48-inch piece of plywood (Grade AC) skid board with 1/2-inch tubular nylon webbing. Honeycomb is positioned between the container and the skid board for impact cushioning.

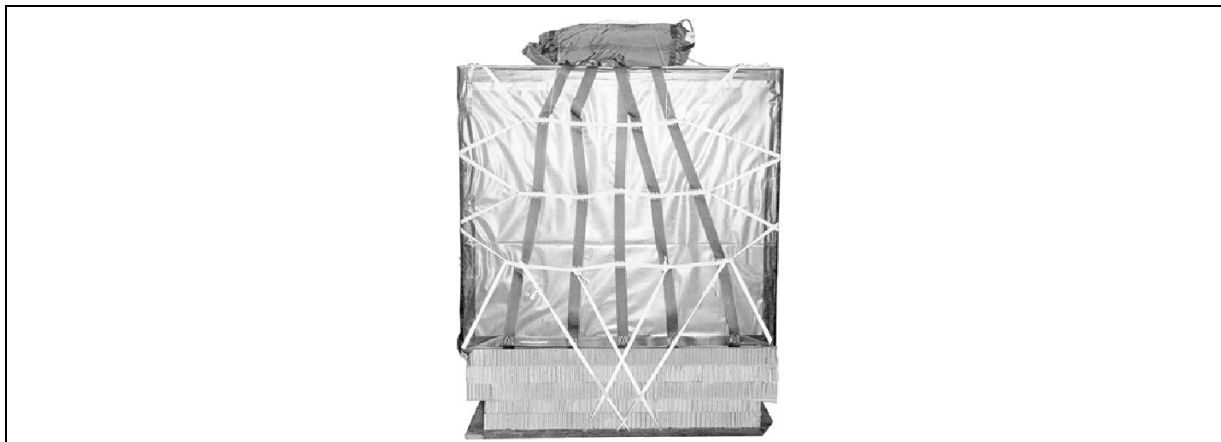


Figure 11-1. Fully rigged LCADS LCC for high-velocity airdrop

LCADS CONTAINER LIMITATIONS

11-3. The LCADS LCC has a weight restriction of 501 to 2,200 pounds.

INSPECTING THE LOAD

11-4. The LCADS LCC must be inspected by a qualified rigger. While being rigged, this load should be supervised or rigged by a parachute rigger. DD Form 1748-1 must be completed before airdrop.

PARACHUTES USED

11-5. There are four types of parachutes used for LCADS LCC loads, depending on availability and whether the load is being dropped for low-velocity or high-velocity.

- **LOW-VELOCITY AIRDROP.**
 - **Primary Parachute.** The Low Cost Aerial Delivery System (LCADS) Low Velocity Cargo Parachute (LVCP) is the primary parachute for the LCC. The LVCP comes pre-packed by the manufacturer and ready to attach to the LCC. It is designed to be dropped with a breakaway static line at all authorized altitudes and has a minimum drop altitude of 1,000 feet Above Ground Level (AGL). Riggers must ensure that the LVCP is rigged with a breakaway static line by installing a Type III nylon cord break-tie between the static line and $\frac{3}{8}$ -inch shackle (DO NOT remove the filler cords from the length of Type III nylon cord). The LVCP is rated for 501-2,200 pounds suspended weight. Drops above 10,000 feet mean sea level are restricted to 1,700 pounds suspended weight. The LVCP is designated a one-time-use item.
 - **Alternate Parachute.** The G-12E cargo parachute is the alternate parachute for LCC. It is rated for 501 to 2,200 pounds of suspended weight. A 68-inch pilot parachute is installed on the G-12E cargo parachute to deploy it.
- **HIGH-VELOCITY AIRDROP.**
 - **Primary Parachute.** The LCADS High Velocity Cargo Parachute (HVCP) is similar in performance to the 26 foot high velocity parachute. The HVCP comes pre-packed by the manufacturer and ready to attach to the LCC. It is designed to be dropped with a breakaway static line at all authorized altitudes and has a minimum drop altitude of 3,000 feet AGL. Riggers must ensure that the HVCP is rigged with a breakaway static line by installing a Type III nylon cord (Gutted) break-tie between the static line and $\frac{3}{8}$ -inch shackle. The HVCP is rated for 501-2,200 pounds and is designated a one-time-use item.
 - **Alternate Parachute.** The 26-foot high-velocity parachute cargo parachute is the alternate parachute for LCC loads rigged for high-velocity airdrop. It is rated for 501 to 2,200 pounds

of suspended weight. TM 10-1670-279-23&P covers the inspection and packing of the parachute. Ensure the parachute is rigged for Break-away Static Line Only regardless of drop altitude.

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Chapter 12

Rigging Typical Low-Cost Aerial Delivery Container Loads

SECTION I – RIGGING LCADS LCC FOR LOW-VELOCITY AIRDROP

SYSTEM DESCRIPTION

12-1. The LCADS LCC is rigged similarly to an A-22 low-velocity load. Typical loads include rations, repair parts, water, and/or other small items. Items may be dropped in their original packaging or repackaged for greater protection. The LCADS container loads must weigh at least 501 pounds but not exceed 2,200 pounds excluding the parachute. The load is rigged with an LCADS LVCP or a G-12E cargo parachute.

PREPARING ITEMS AND SKID BOARD

12-2. Prepare the skid board using Figure 8-1. Prepare the items to be dropped according to load's sensitivity. Items must be well padded to prevent damage during airdrop.

PREPARING AND PLACING HONEYCOMB

12-3. Prepare and place the honeycomb as shown in Figure 8-2.

POSITIONING SLING ASSEMBLY

12-4. Center the LCC sling assembly over the honeycomb and skid board as shown in Figure 12-1. The dimension of the webbing is 222- by 222-inches.

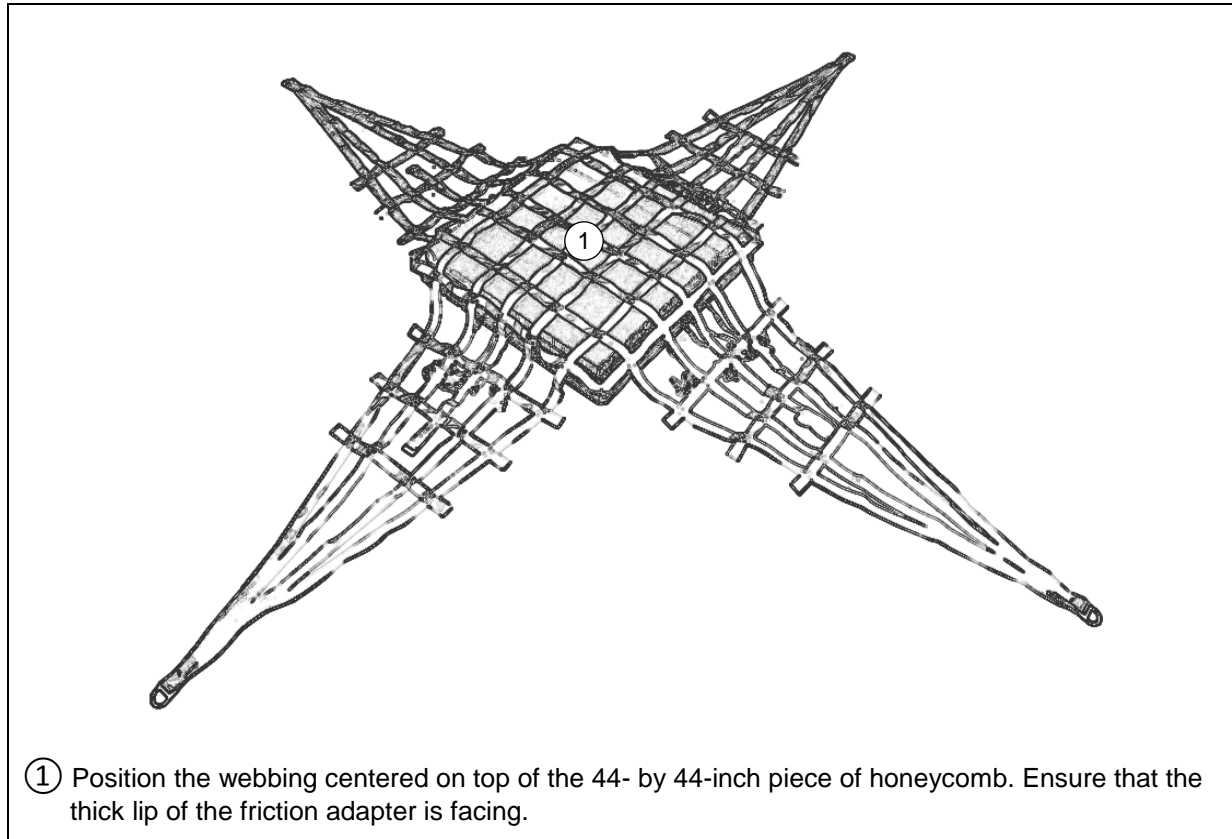
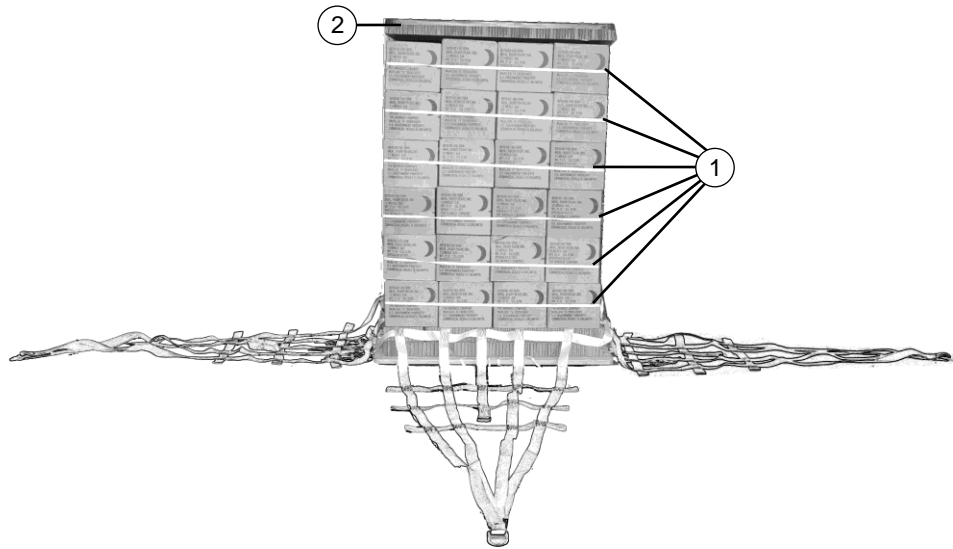


Figure 12-1. LCC sling assembly positioned

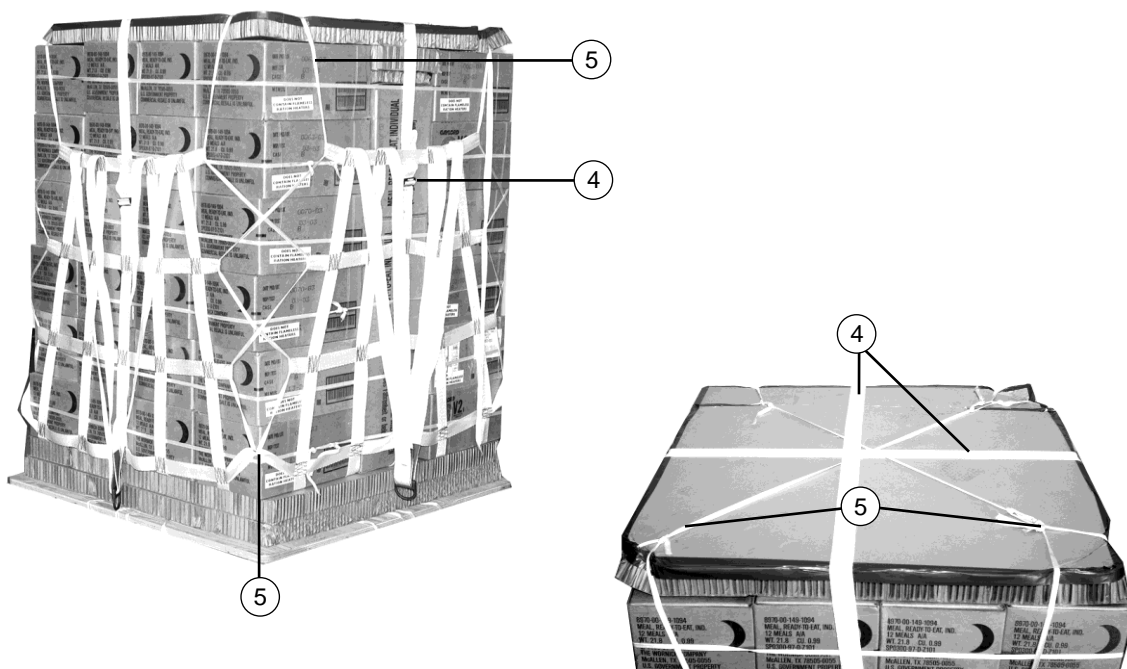
POSITIONING LOAD AND SECURING SLING ASSEMBLY

12-5. Center and secure the load on the sling assembly and honeycomb. If a cover is required, cover the load with a plastic bag, shrink wrap, or an A-22 cargo cover. Secure and tie the sling assembly as shown in Figure 12-2.



- ① Secure the load together with ½-inch tubular nylon webbing around each layer.
- ② Cut and position a 36- by 44- and 8- by 44- inch piece of honeycomb on top of the load. Tape the pieces together and around the outside edges. Position the honeycomb centered on top of the load.
- ③ Cover the load with shrink wrap, plastic, or an A-22 cover (not shown or required).

Figure 12-2. Load positioned and sling secured



- ④ Fasten the long and short tie-down straps over the load using the friction adapters provided.
- ⑤ Tie each corner of the sling assembly with $\frac{1}{2}$ -inch tubular nylon webbing. Girth hitch the webbing to the bottom strap, route the webbing up through the bottom webbing loop, cross the ties, up through the next loops, and repeat until the top loops are reached. Secure the ties together on the top corners with a surgeon's knot and locking knot. Tie the diagonal loops together with a length of $\frac{1}{2}$ -inch tubular nylon webbing with three alternating half hitches and a knot in the running end.

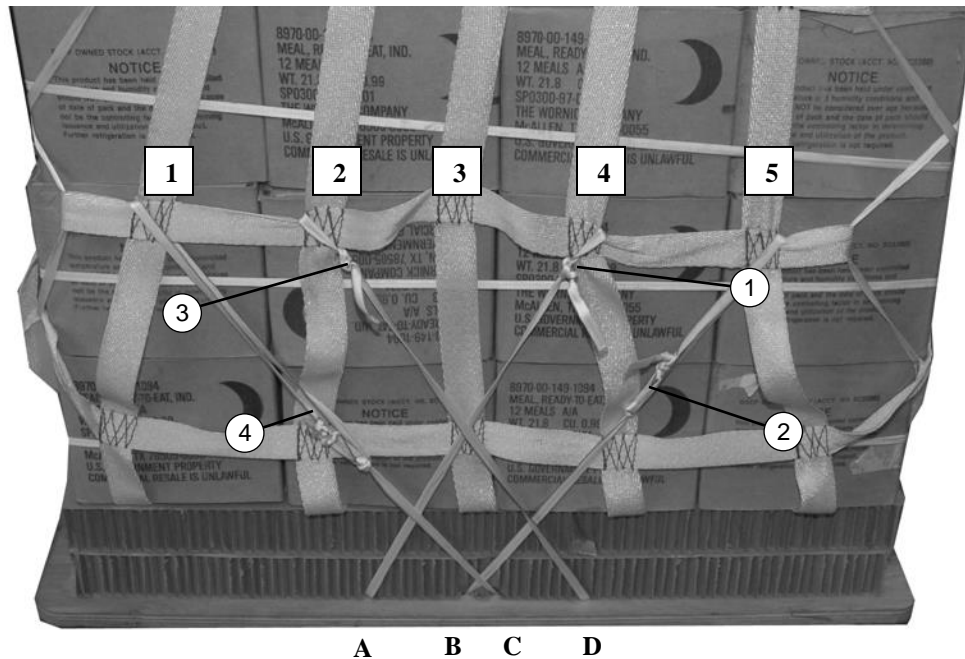
Note. On a load where the top lateral straps are above the top of the item, secure the loops together as closely as possible with the tie on top.

- ⑥ Bring the ends of the support web up, remove any twists, and tape them together 4 inches below the D-rings using 2-inch masking tape (not shown).

Figure 12-2. Load positioned and sling secured (continued)

SECURING SLING ASSEMBLY TO SKID BOARD

12-6. Tie the sling assembly to the skid board as shown in Figure 12-3.

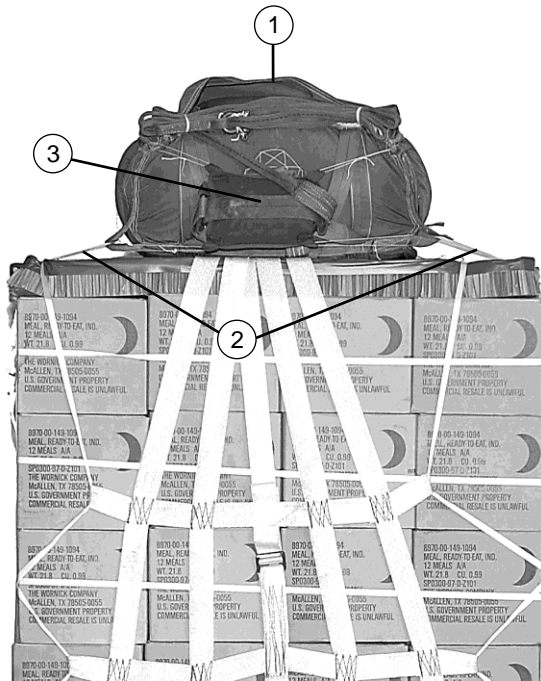


- ① Starting at the left side, take tie-down A and diagonally tie it around the intersection of the lower lateral strap and fourth support web. Use three half-hitch knots and overhand knots in the running end.
- ② Route tie-down B around the fifth support web and lower lateral strap intersection diagonally. Pull the excess slack out, and tie it with a trucker's hitch knot and an overhand knot in the running end. Cut excess webbing, leaving the end approximately 6 inches long.
- ③ Repeat step 1 for tie-down D, and secure it to the second intersection on the lower lateral strap.
- ④ Repeat step 2 for tie-down C, and secure it to the first intersection on the lower lateral strap.
- ⑤ Repeat steps 1 through 4 for the other tie-downs (not shown).

Figure 12-3. Skid board secured

INSTALLING PARACHUTE

12-7. Install the LCADS LVCP as shown in Figure 7-5. Install the G-12E cargo parachute as shown in Figure 12-4.



- ① Position a G-12E cargo parachute on top of the load and secure the parachute clevis to the support web D-rings.
- ② Tie the corners of the parachute with one turn single type I, 1/4-inch cotton webbing to the sling assembly.
- ③ Secure the 68-inch pilot parachute to the G-12 deployment bag as described in TM 10-1670-281-23&P/TO 13C5-32-2/NAVAIR 13-1-32.

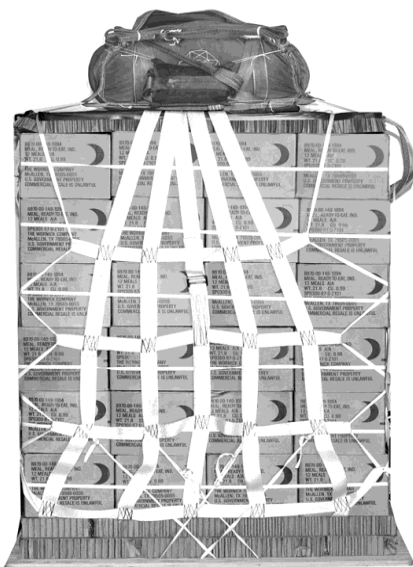
Figure 12-4. G-12e cargo parachute installed

MARKING RIGGED LOAD

12-8. Mark the rigged load according to Paragraph 1-5 using the data given in Figure 12-5. If the load varies from the one shown in Figure 12-5, recompute the data. An AMC IMT 1033, 20050204, V1. (Shipper's Declaration for Dangerous Goods) may be required.

CAUTION

Make the final rigger inspection required by TM 4-48.02/MCRP 4-11.3J/NAVSEA SS400-AB-MMO-010 REV 1/TO 13C7-1-5 and AR 59-4/OPNAVINST 4630.24C/AFJ 13-210(I)/MCO 13480.1B before the load leaves the rigging site.



RIGGING LOAD DATA

Weight: minimum load allowed	900 pounds
Maximum load allowed (without parachute)	2,200 pounds
Height:	83 inches
Width:	48 inches
Length:	48 inches

Figure 12-5. LCADS LCC rigged for low-velocity airdrop

EQUIPMENT REQUIRED

12-9. Use the equipment listed in Table 12-1 to rig the load shown in Figure 12-5.

Table 12-1. Equipment required for rigging LCADS for low-velocity airdrop

<i>National Stock Number</i>	<i>Item</i>	<i>Quantity</i>
8040-00-273-8713	Adhesive, paste, 1-gallon	As required
	Bag, cover, 4 mil polyethylene (54- by 52- by 60-inches)	As required
8135-00-476-5268	Shrink wrap	As required
1670-01-523-7246	Sling Assembly, LCADS	1
4030-00-678-8562	Clevis, suspension, 3/4-inch (medium)	1
4020-00-240-2146	Cord, nylon, type III	As required
1670-00-753-3928	Pad, energy-dissipation material, honeycomb	3 sheets
	Parachute:	
1670-01-547-0401	Cargo, LCADS LV	1
	OR	
1670-00-893-2371	Cargo, G-12E	1
1670-00-216-7297	Pilot, 68-inch diameter	1
5530-00-128-4981	Plywood, 3/4- by 48- by 96-inch	1 sheet
	or	
5530-00-914-5118	Plywood, 1- by 48- by 96-inch	1 sheet
	or	
1670-01-342-5913	Skid Board, 1- by 48- by 48-inch	1
	or	
1670-00-883-1654	Skid Board, 3/4- by 48- by 48-inch	1
7510-00-266-6710	Tape, masking, 2-inch	As required
8310-01-102-4478	Thread, cotton, ticket number 8/7	As required
	Webbing:	
8305-00-268-2411	Cotton, 1/4-inch, type I	As required
8305-00-082-5752	Nylon, tubular, 1/2-inch	As required

SECTION II – RIGGING LCADS LCC FOR HIGH-VELOCITY

SYSTEM DESCRIPTION

12-10. The LCADS LCC is rigged similarly to an A-22 high-velocity load. Typical loads include rations, water, and other small non-fragile items. LCADS container loads must weigh at least 501 pounds but not exceed 2,200 pounds, excluding the weight of the parachute. The load is rigged with a LCADS HVCP or a standard 26-foot high-velocity parachute.

PREPARING ITEMS AND SKID BOARD

12-11. Refer to Figure 8-1 for preparation of the skid board. Prepare the drop items according to the load's sensitivity. Items must be well padded to prevent damage during airdrop.

POSITIONING HONEYCOMB

12-12. Position honeycomb as shown in Figure 8-10.

POSITIONING SLING ASSEMBLY

12-13. Center the sling assembly over the honeycomb and skid board as shown in Figure 12-6.

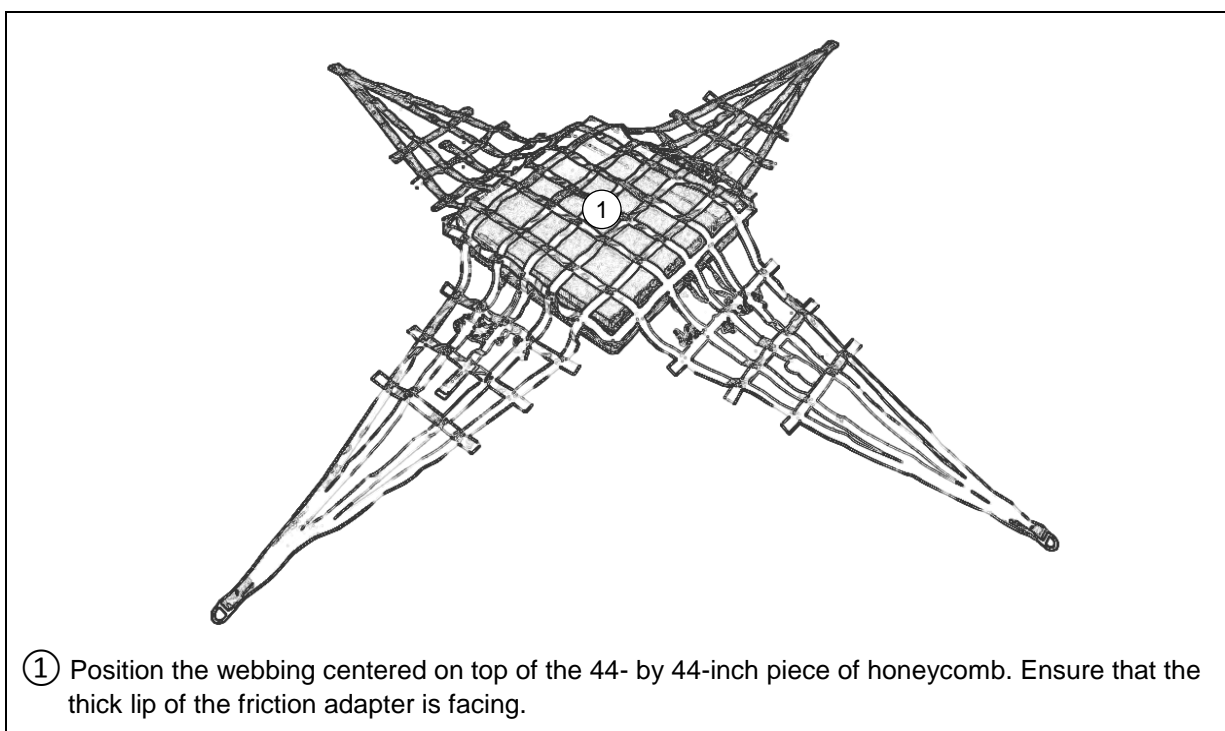


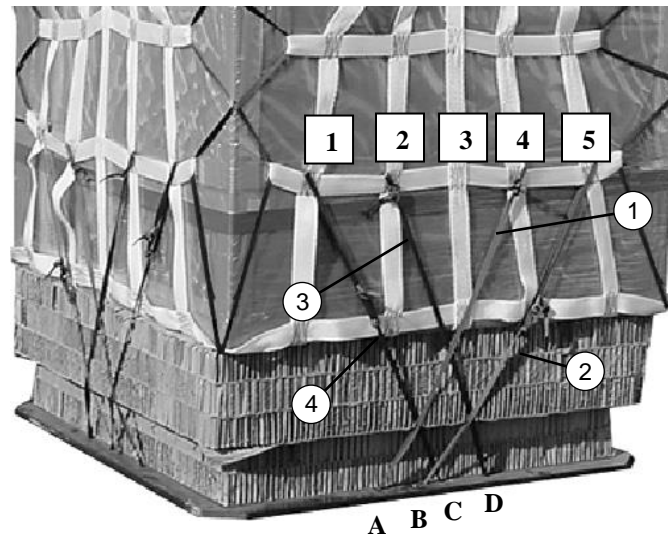
Figure 12-6. LCC sling assembly positioned

POSITIONING LOAD AND SECURING SLING ASSEMBLY

12-14. Position load and secure sling assembly according to Figure 12-2.

SECURING SLING ASSEMBLY TO SKID BOARD

12-15. Tie the sling assembly to the skid board as shown in Figure 12-7.



- ① Starting at the left side, take tie-down A and diagonally tie it around the intersection of the lower lateral strap and fourth support web. Use three half-hitch knots and overhand knots in the running end.
- ② Route tie-down B around the fifth support web and lower lateral strap intersection diagonally. Pull the excess slack out and tie it with a trucker's hitch knot and an overhand knot in the running end. Cut excess webbing, leaving the end approximately 6 inches long.
- ③ Repeat step 1 for tie-down D, and secure it to the second intersection on the lower lateral strap.
- ④ Repeat step 2 for tie-down C, and secure it to the first intersection on the lower lateral strap.
- ⑤ Repeat steps 1 through 4 for the other tie-downs. (Not shown)

Figure 12-7. Skid board secured to sling assembly

INSTALLING PARACHUTE

12-16. Install the LCADS high-velocity parachute as shown in Figure 12-8 or install the standard 26-foot high-velocity parachute according to Figure 7-5.

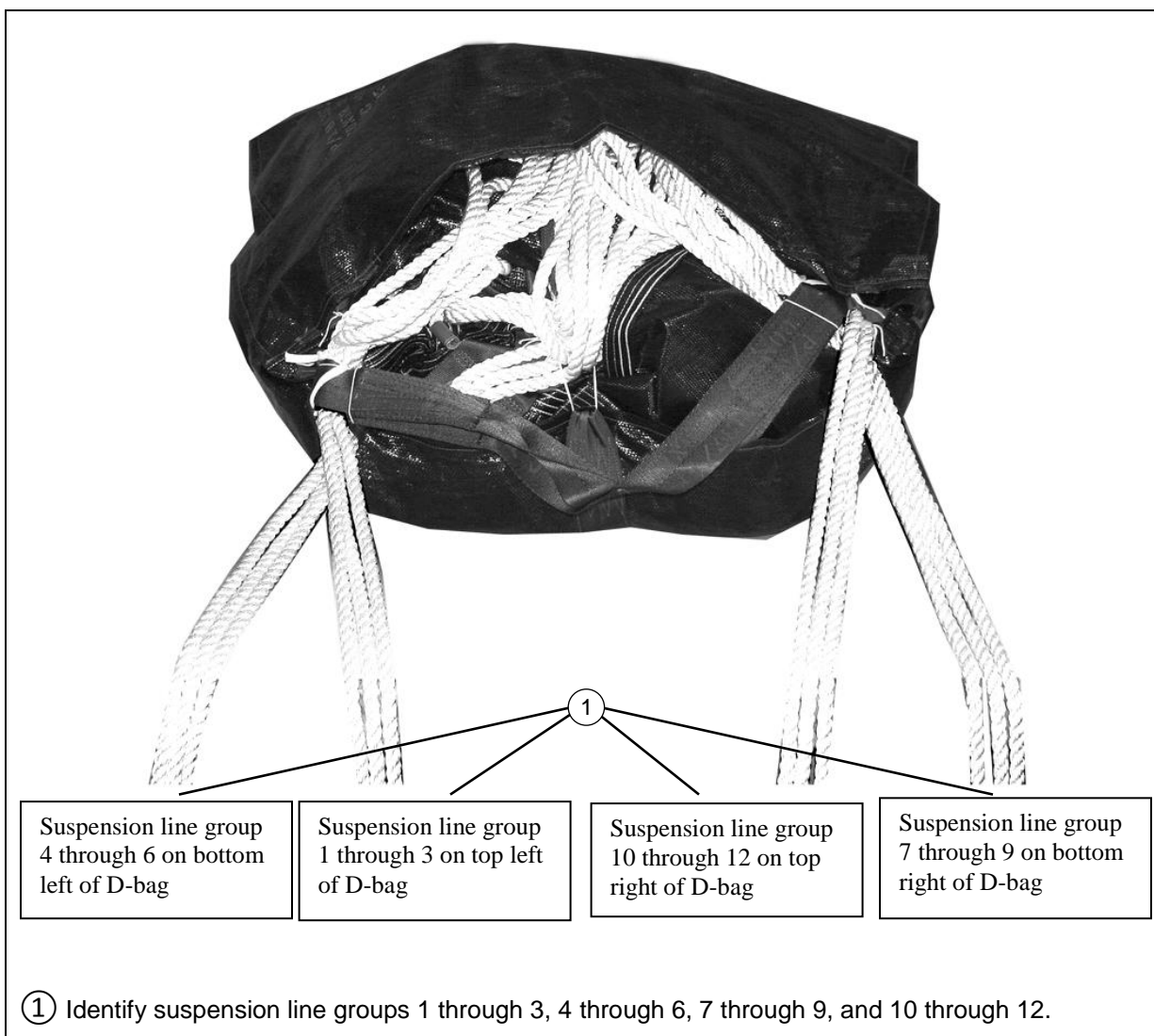
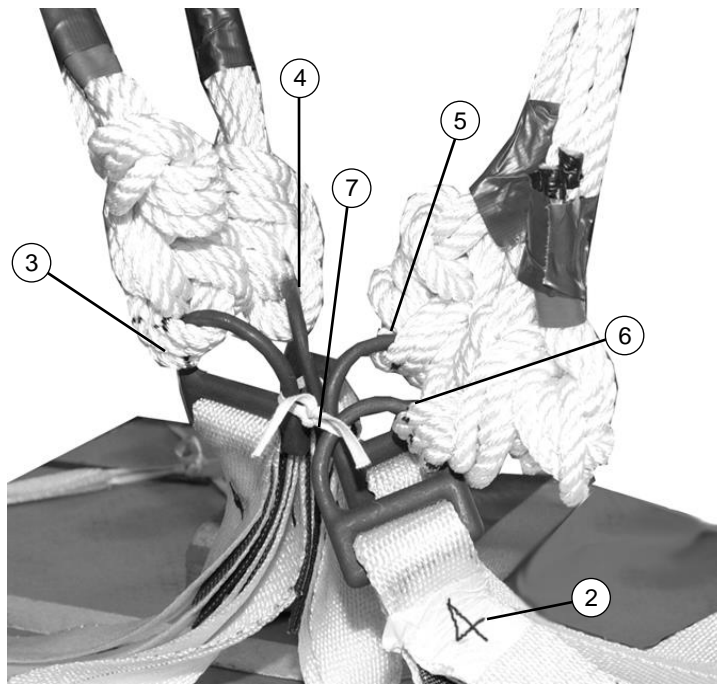


Figure 12-8. LCADS high-/velocity parachute installed

CAUTION

Failure to properly connect the suspension line groups could result in suspension lines or securing webs crossing.



- ② Identify four D-rings on LCADS securing web as follows. Facing the container, D-ring 1 is front side of container, D-ring 2 is on left side of container, D-ring 3 is rear side of container, D-ring 4 is to the right side of container.
- ③ Route suspension line group 1 through 3, 30 inches through D-ring 1. Secure suspension line group with three alternating half-hitches and tape the running ends with 2-inch cloth-backed tape.
- ④ Route suspension line group 4 through 6 through D-ring 2 and secure same as step 3.
- ⑤ Route suspension line group 7 through 9 through D-ring 3 and secure same as step 3.
- ⑥ Route suspension line group 10 through 12 through D-ring 2 and secure same as step 3.
- ⑦ Secure the four D-rings together with ¼-inch cotton webbing with surgeon's knot and locking knot.

Figure 12-8. LCADS high-velocity parachute installed (continued)

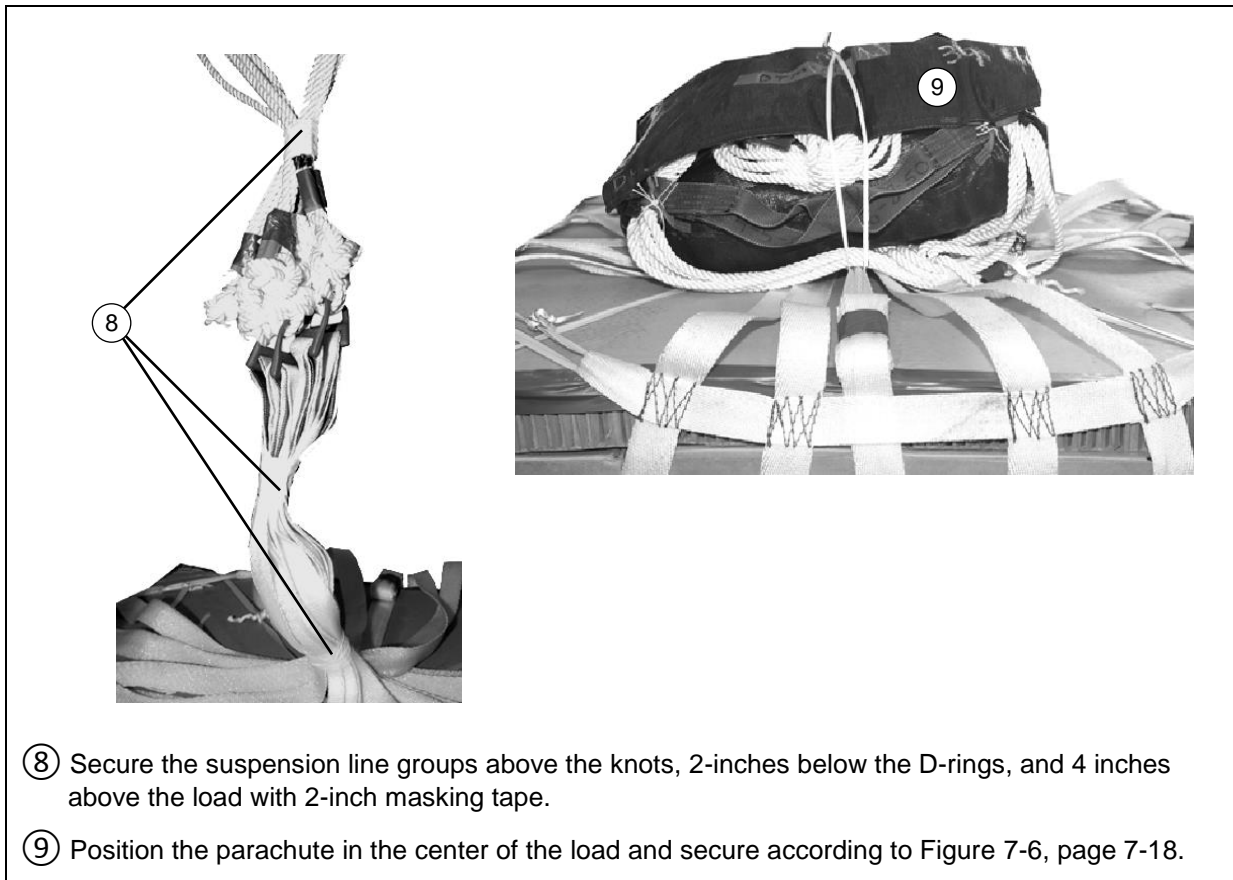


Figure 12-8. LCADS high-velocity parachute installed (continued)

MARKING RIGGED LOAD

12-17. Mark the rigged load according to Paragraph 1-5 using the data given in Figure 12-9. If the load varies from the one shown in Figure 12-9, recompute the data. An AMC IMT 1033, 20050204, V1. (Shipper's Declaration for Dangerous Goods) may be required.

CAUTION

Make the final rigger inspection required by TM 4-48.02/MCRP 4-11.3J/NAVSEA SS400-AB-MMO-010 REV 1/TO 13C7-1-5 and AR 59-4/OPNAVINST 4630.24C/AFJ 13-210(I)/MCO 13480.1B before the load leaves the rigging site.



RIGGING LOAD DATA

Weight: minimum load allowed.....	501 pounds
Maximum load allowed (without parachute)	2,200 pounds
Height:	83 inches
Width:	48 inches
Length:	48 inches

Figure 12-9. LCADS LCC rigged for high-velocity airdrop

EQUIPMENT REQUIRED

12-18. Use the equipment listed in Table 12-2 to rig the load shown in Figure 12-9.

Table 12-2. Equipment required for rigging LCADS LCC for high-velocity airdrop

<i>National Stock Number</i>	<i>Item</i>	<i>Quantity</i>
8040-00-273-8713	Adhesive, paste, 1-gallon	As required
	Bag, cover, 4 mil polyethylene (54- by 52- by 60-inches)	As required
8135-00-476-5268	Shrink wrap	As required
1670-01-523-7246	Sling Assembly, LCADS	1
4030-00-678-8562	Clevis, suspension, ¾-inch (medium)	1
4020-00-240-2146	Cord, nylon, type III	As required
1670-00-753-3928	Pad, energy-dissipation material, honeycomb	3 sheets
	Parachute:	
1670-01-529-1202	LCADS, high-velocity	1
	or	
1670-00-872-6109	Cargo, high-velocity, 26-foot	1
	Plywood:	
5530-00-128-4981	¾- by 48- by 96-inch (locally fabricated skid board)	1 sheet
	or	
5530-00-914-5118	1- by 48- by 96-inch	1 sheet
7510-00-266-6710	Tape, masking, 2-inch	As required
8310-01-102-4478	Thread, cotton, ticket number 8/7	As required
	Webbing:	
8305-00-268-2411	Cotton, ¼-inch, type I	As required
8305-00-082-5752	Nylon, tubular, ½-inch	As required

SECTION III – RIGGING 55-GALLON DRUMS IN LCADS LCC FOR LOW OR HIGH-VELOCITY AIRDROP

CAUTION

Make sure all petroleum products are packaged in performance oriented packaging standard drums and cans. Gasoline cans and drums must be padded and rigged to prevent metal-to-metal contact.

SYSTEM DESCRIPTION

12-19. The 55 gallon drums, with petroleum, are rigged in an LCADS LCC for low or high-velocity airdrop. The LCADS container loads must weigh at least 501 pounds but not exceed 2,200 pounds excluding the parachute. The load is rigged with a low- or high-velocity cargo parachute.

PREPARING ITEMS AND SKID BOARD

12-20. Refer to Figure 8-1 for preparation of the skid board. Prepare the drop items according to the load's sensitivity. Items must be well padded to prevent damage during airdrop.

POSITIONING HONEYCOMB

12-21. Prepare and place the honeycomb for low-velocity airdrop as shown in Paragraph 8-4 and as shown in Figure 8-2. Prepare and place the honeycomb for high-velocity airdrop as shown in Paragraph 8-15, Table 8-2, and as shown in Figure 8-9 and 8-10.

POSITIONING SLING ASSEMBLY

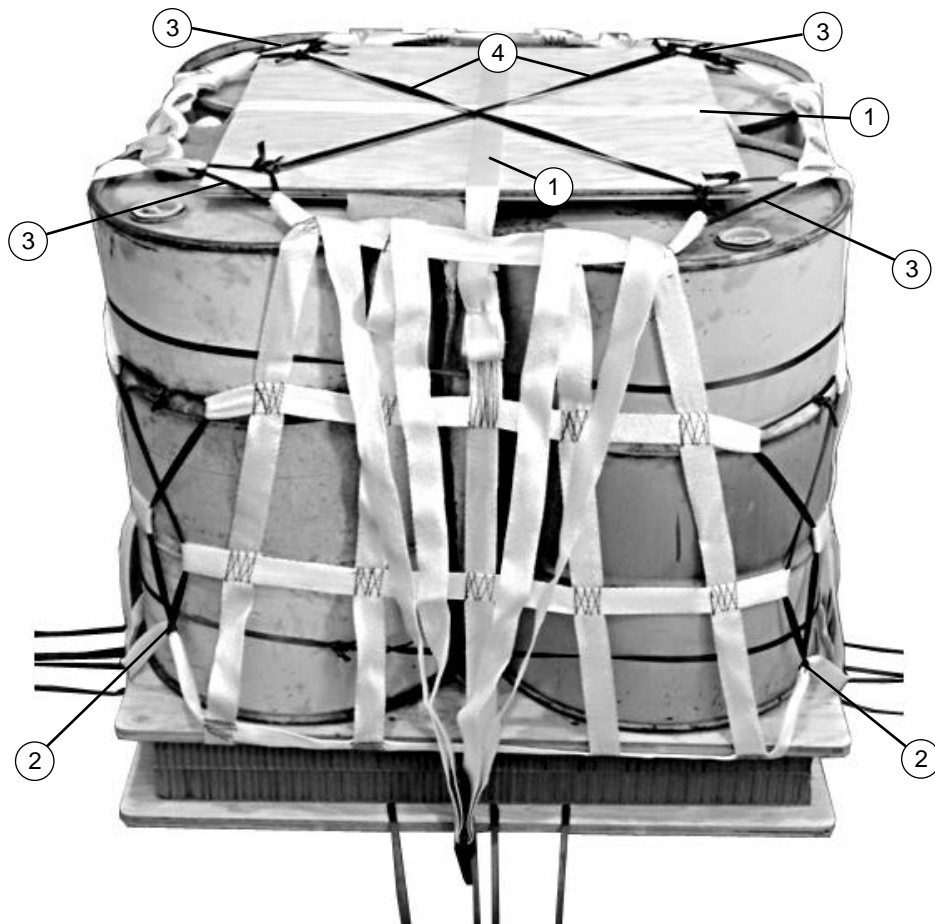
12-22. Center the sling assembly over the honeycomb and skid board as shown in Figure 12-1.

POSITIONING LOAD AND SECURING SLING ASSEMBLY

12-23. Center the load on the sling assembly and honeycomb as shown in Figure 8-5. Secure the sling assembly as shown in Figure 12-10.

Note. During combat operations and humanitarian relief efforts a 32- by 32-inch piece of honeycomb maybe placed on top of the 55-gallon drums when $\frac{3}{4}$ - or 1-inch plywood is not available. The top edges of the honeycomb should be taped with 2-inch cloth-backed adhesive tape.

- Notes.** 1. The top piece of plywood is ¾- or 1- by 32- by 32-inches.
2. Position the drums with the filler caps facing the outside corners.



- ① Fasten the long and short tie-down straps over the load using the friction adapters provided. Secure the excess as shown in Figure 1-3.
- ② Girth hitch ½-tubular nylon webbing to each corner of sling assembly. Route the webbing up through the bottom webbing loop, cross the ties, up through the center loops, and secure the ties together with surgeon's knot and locking knot or a slip knot.
- ③ Tie the top sling assembly webbing loop on each corner together with ½-inch tubular nylon webbing on top of the load and secure with a surgeon's knot and locking knot or a slip knot.
- ④ Tie the opposite corner ties of the top sling assembly webbing loop together with ½-inch tubular nylon webbing using three alternating half hitches with a knot in the running end.
- ⑤ Bring the ends of the support web up, remove any twists, and tape them together 4 inches below the D-rings using 2-inch masking tape (not shown).

Figure 12-10. 55-gallon drums positioned and sling secured

SECURING SLING ASSEMBLY TO SKID BOARD

12-24. Tie the sling assembly to the skid board as shown in Figure 12-3.

INSTALLING PARACHUTE

12-25. Install the cargo parachute as follows:

- Install the G-12E cargo parachute as shown in Figure 12-3.
- Install the LCADS low-velocity cargo parachute as shown in Figure 7-5.
- Install the 26-foot high-velocity cargo parachute as shown in Figure 7-6.
- Install the LCADS high-velocity cargo parachute as shown in Figure 12-8.

MARKING RIGGED LOAD

12-26. Mark the rigged load according to Paragraph 1-5. An AMC IMT 1033, 20050204, V1. (Shipper's Declaration for Dangerous Goods) may be required.

EQUIPMENT REQUIRED

12-27. Use the equipment listed in Table 12-3.

Table 12-3. Equipment required for rigging 55-gallon drums in an LCADS LCC

<i>National Stock Number</i>	<i>Item</i>	<i>Quantity</i>
8040-00-273-8713	Adhesive, paste, 1-gallon	As required
8135-00-476-5268	Shrink wrap	As required
1670-01-523-7246	Sling Assembly, LCADS	1
4030-00-678-8562	Clevis, suspension, 3/4-inch (medium)	1
4020-00-240-2146	Cord, nylon, type III	As required
1670-00-753-3928	Pad, energy-dissipation material, honeycomb	3 sheets
1670-01-529-1202	Parachute: LCADS, high-velocity or	1
1670-00-872-6109	Cargo, high-velocity, 26-foot	1
5530-00-128-4981	Plywood: 3/4- by 48- by 96-inch (locally fabricated skid board) or	1 sheet
5530-00-914-5118	1- by 48- by 96-inch	1 sheet
7510-00-266-6710	Tape, masking, 2-inch	As required
8310-01-102-4478	Thread, cotton, ticket number 8/7	As required
8305-00-268-2411	Webbing: Cotton, 1/4-inch, type I	As required
8305-00-082-5752	Nylon, tubular, 1/2-inch	As required

PART SIX

Rigging Low-Cost Low-Altitude (LCLA) Resupply Loads

Chapter 13

General Information and Procedures for LCLA

LCLA RESUPPLY LOAD COMPONENTS

13-1. LCLA straps are made of polypropylene webbing with a friction adapter. The LCLA container consists of four or more identical straps. The length of the strap is 188-inches. Heavy duty D-rings may be ordered under a separate National Stock Number and are fitted on each strap for parachute attachment. One inch tubular nylon webbing may be substituted for the heavy duty D-rings to form parachute attaching points.

The LCLA family of parachutes and straps are designed for a one time use to deliver all classes of supplies and equipment as long as the load meets the minimum and maximum weight capabilities of each parachute system used. It also needs to meet the height and width limitations of each aircraft, referenced in Chapter 2.

The LCLA straps are used with the Cross parachute, Double Cross parachute, and Triple Cross parachute, LCLA 35-foot diameter cargo parachute, Double LCLA 35-foot diameter cargo parachute, the LCLA 24-foot diameter cargo parachute and the Double LCLA 24-foot diameter cargo parachute. The LCLA 24- and 35-foot diameter cargo parachutes may be repacked for training as shown in TM 10-1670-331-23&P.

A minimum of three straps are used to rig a load. They are allowed to be cut to size.

The LCLA resupply loads are designed to resist impact, keeping contents intact, from altitudes of 150-feet to 500-feet AGL. The system is an expendable type, one time use item, which is user friendly (easy to rig, transport, and deliver).

LCLA LOAD COVERS

13-2. LCLA resupply load covers are used to prevent articles from falling out of the load during the drop. Covers should be large enough to completely cover the load. Some examples of load covers are polypropylene material, shrink wrap, blankets, pallet covers cut to size, and old Cross parachutes cut to size.

LCLA SKID BOARD AND HONEYCOMB

13-3. The LCLA skid board is a $\frac{3}{4}$ - or 1-inch piece of AC grade plywood. Cut the skid board to fit the base of the load and should not exceed 1 inch wider or longer than the load. Skid boards used on C-130 aircraft

must be a minimum of 42-inches wide. Tape the edges of the skid board where the LCLA straps contact the skid board. Honeycomb is positioned between the equipment and the skid board for impact cushioning.

LCLA CONTAINER LIMITATIONS

13-4. The LCLA resupply load has a weight restriction of 80 pounds minimum and 1,000 pounds maximum suspended weight.

INSPECTING LOAD

13-5. LCLA loads weighing 500 pounds or less will be inspected by a parachute rigger, jumpmaster, or an LCLA certified soldier. All LCLA loads that are intended to be dropped from a C-130 aircraft will receive a Joint Airdrop Inspection using DD Form 1748-1 by certified Joint Airdrop Inspectors. The following areas should be inspected on the LCLA resupply load:

- Parachute correctly attached to the load.
- LCLA container tight.
- Sharp edges taped (skid boards and load).
- No cuts or frays on the container straps.
- Skid boards $\frac{3}{4}$ " or 1" thick with smooth side down.
- Parachute static line serviceable (no cuts or frays).

PARACHUTES USED

13-6. LCLA Airdrop:

- The Cross parachute (packed by the manufacturer) is the primary parachute for LCLA airdrops. It is rated for 80 to 200 pounds of suspended weight. It weighs 13 pounds. It is 8 1/2 inches high, 18 inches wide and 21 inches long when pre-packed.
- The Double Cross parachute (packed by the manufacturer) is a cluster of two Cross parachutes to form this parachute configuration. It is rated for 201 to 400 pounds of suspended weight. It weighs 26 pounds. It is 17 inches high, 18 inches wide and 21 inches long when pre-packed.
- The Triple Cross parachute is a cluster of three Cross parachutes to form this parachute configuration. It is rated for 401 to 600 pounds of suspended weight. The cluster weighs 39 pounds. It is 25 inches high, 18 inches wide and 21 inches long when pre-packed.
- The LCLA 35-foot diameter cargo parachute is an alternate parachute for LCLA resupply load. It is rated for 100 to 500 pounds of suspended weight. It weighs 18.4 pounds. It is 8 inches high, 20 inches wide, and 22 inches long when pre-packed.
- The Double LCLA 35-foot diameter cargo parachute is a cluster of two LCLA 35-foot diameter cargo parachutes to form this parachute configuration. It is rated for 501 to 1,000 pounds of suspended weight. It weighs 36.8 pounds. It is 16 inches high, 20 inches wide, and 22 inches long when pre-packed.
- The LCLA 24-foot diameter cargo parachute is an alternate parachute for LCLA resupply loads. It is rated for 80 to 300 pounds of suspended weight. It weighs 9.8 pounds. It is 5 inches high, 16 inches wide, and 19 inches long when pre-packed.

- The Double LCLA 24-foot diameter cargo parachute is a cluster of two LCLA 24-foot diameter cargo parachutes to form this parachute configuration. It is rated for 301 to 600 pounds of suspended weight. It weighs 19.6 pounds. It is 10 inches high, 16 inches wide, and 19 inches long when pre-packed.

TYPICAL LOADS

13-7. Typical loads are rigged for LCLA airdrop from the ramp or door of an aircraft. Typical loads may include rations, small equipment, water bottles, or other supplies. Items should be padded and/or placed in boxes to prevent damage during airdrop. This load must not exceed 500 pounds, excluding the weight of the parachute, from all aircraft except the C-130. The C-130 may drop LCLA loads up to 1,000 pounds. The minimum and maximum weight will vary according to the parachute. The maximum dimensions for loads dropped from the door are 48- by 30- by 66-inches including parachute unless otherwise restricted by the aircraft (see Chapter 2). The maximum dimensions for loads dropped from the ramp are limited to the length of the LCLA strap and the load must meet the minimum requirement of 28 pounds per square foot including parachute. The parachute will be on top of the load. When the weight of the load exceeds 350 pounds, three trained designated pushers should assist the jumpmaster in pushing the load out, on C-130 Aircraft the aircraft loadmaster will push the load out. When dropped from the paratroop doors, the load must weigh a minimum of 11 pounds per square foot.

CAUTION

Only ammunition listed in TM 4-48.16/MCRP 4-11.3B/TO 13C7-18-41 may be airdropped.

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Chapter 14

Rigging Typical Low-Cost Low-Altitude (LCLA) Resupply Loads For Low-Velocity Airdrop

SECTION I - RIGGING LCLA RESUPPLY LOADS WITH A CROSS PARACHUTE FOR LOW-VELOCITY AIRDROP

DESCRIPTION OF LOAD

14-1. Two cases of Meals-Ready-To-Eat (MRE's) and two cases of 20-oz water bottles are rigged in an LCLA resupply load for low-velocity airdrop. The LCLA resupply load consists of the Cross parachute, three 188-inch LCLA straps, two D-rings, and a load cover (optional). The LCLA resupply load is capable of being rigged in three different configurations for low-velocity airdrop using a $\frac{3}{4}$ - or 1- by 24- by 18-inch A/C grade plywood skid board. The load has a suspended weight of 123 pounds. It has a total height of 37 inches, width of 24 inches, and a length of 18 inches. The load has a total rigged weight of 137 pounds.

Note. These procedures can be used to rig similar loads.



Figure 14-1. Load description

PREPARING SKID BOARD AND POSITIONING STRAPS

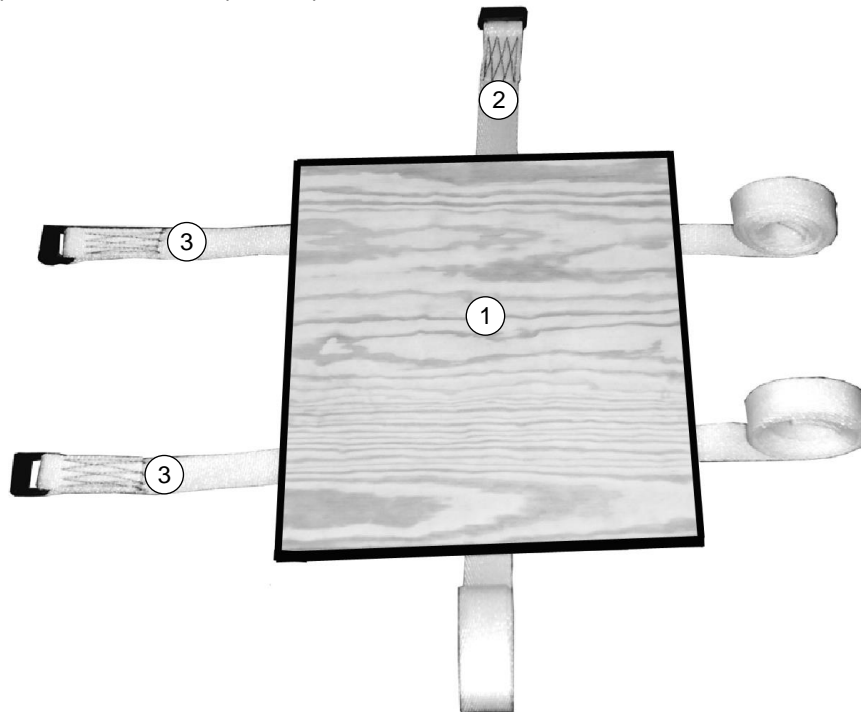
14-2. Prepare the skid board using Figure 14-2. Prepare the items to be dropped according to load's sensitivity. Items must be well padded to prevent damage during airdrop.

Note. The procedures described below will be utilized for all three configurations.

- This is for configurations 1, 2, and 3.

Note. 1. These instructions are load specific.

2. The sewn portion of the LCLA strap faces up.



- ① Cut a $\frac{3}{4}$ - by 24- by 18-inch piece of plywood. If $\frac{3}{4}$ -inch plywood is unavailable, use 1-inch plywood as a substitute. Make sure smooth side is down (A side).
- ② Position and center a LCLA resupply load strap lengthwise under the plywood.
- ③ Position the two remaining LCLA resupply load straps widthwise under the plywood, 4-inches from each edge.

Figure 14-2. Skid board prepared

PREPARING AND PLACING HONEYCOMB

14-3. Prepare and place the honeycomb as shown in Figure 14-3.

- This is for configurations 1, 2, and 3.

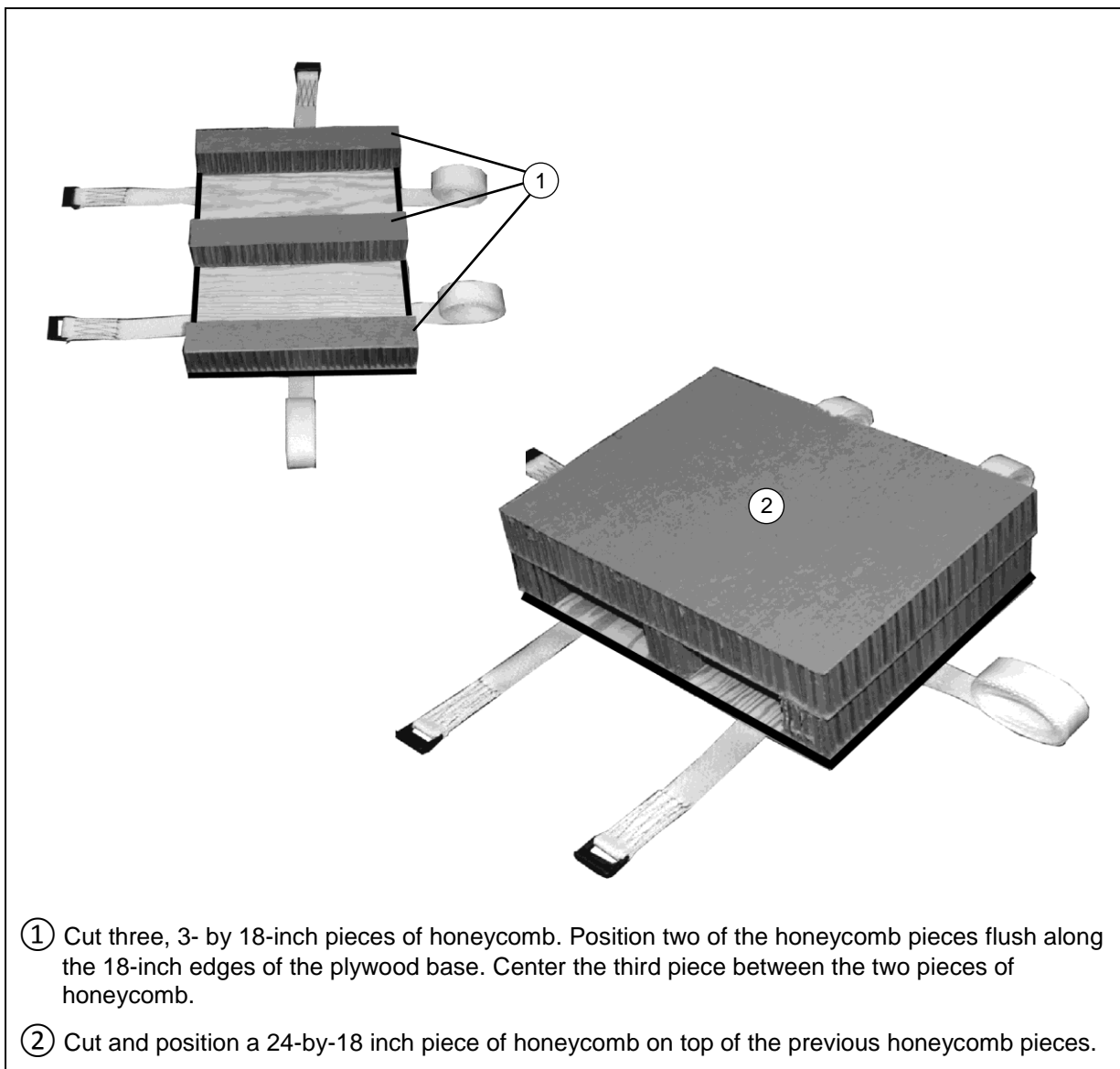


Figure 14-3. Honeycomb prepared and placed

POSITIONING AND SECURING LOAD

14-4. The load can be configured in three ways, without cover, wrapped in shrink wrap, or with a LCLA resupply load lightweight polypropylene material (to be used as a cover). Center the load on the honeycomb. Secure load as shown in Figures 14-4 through 14-7 for all three configurations.

- Configuration 1 without cover.

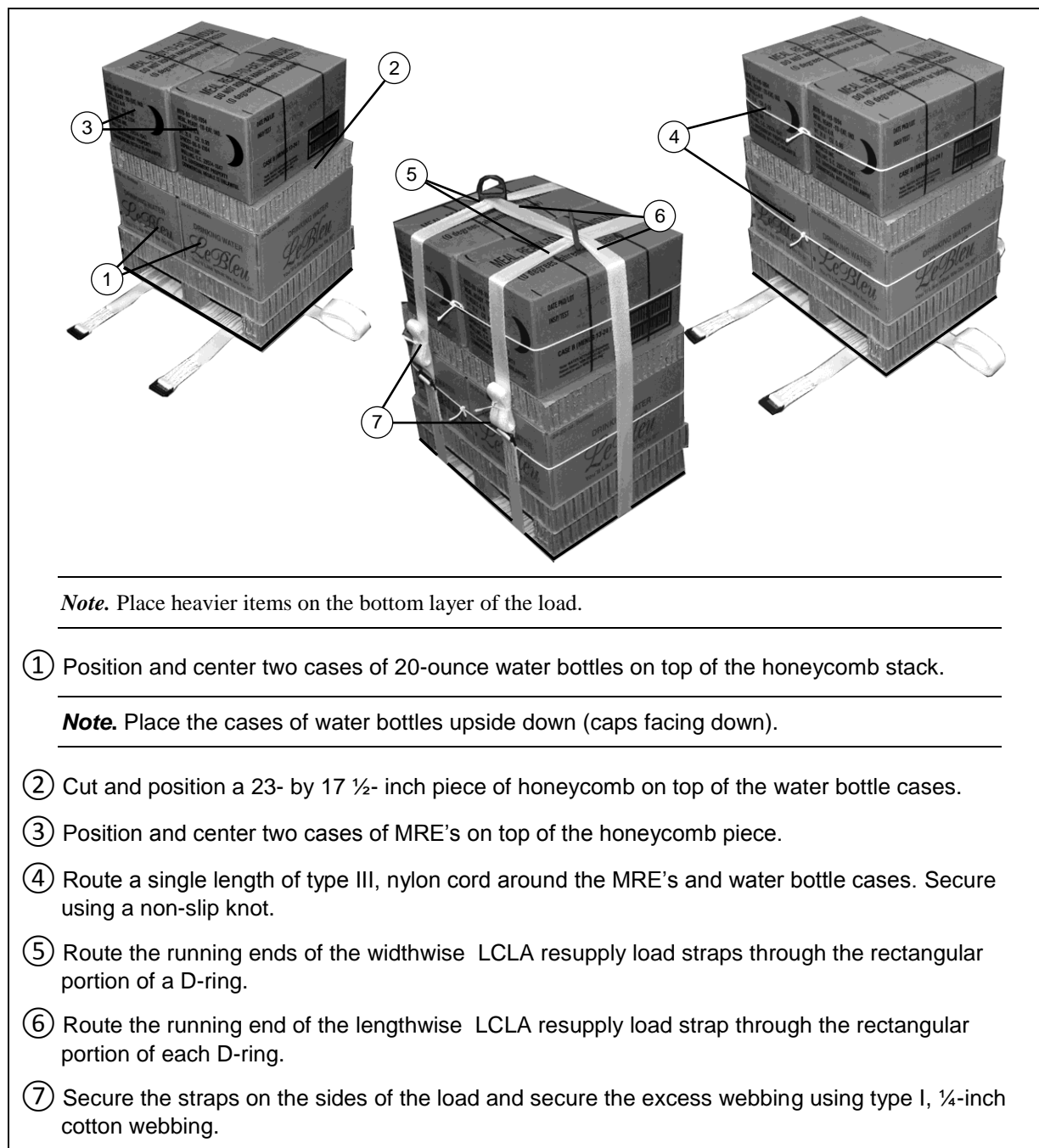
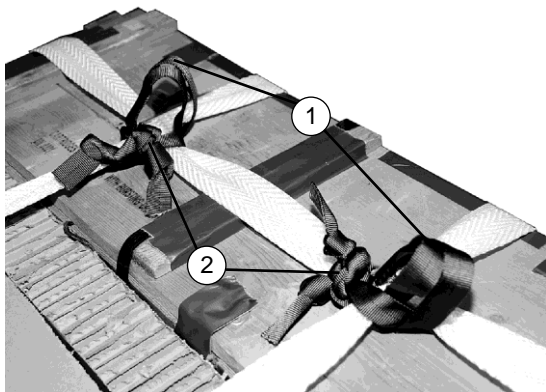


Figure 14-4. Load positioned and secured for configuration 1

Notes. 1. Use these procedures if you do not have the D-rings.
2. Use these procedures for all Double 35-foot diameter parachute loads.



- ① Route a length of 1-inch tubular nylon webbing, three turns single, between the top of the load and the LCLA resupply load straps. Run the 1-inch tubular nylon webbing crossways forming 3 complete loops.
- ② Secure the running ends on top of the straps with a surgeons knot and locking knot and an overhand knot in the running ends.
- ③ Wrap cloth-backed tape around the two loops of the 1-inch tubular nylon webbing.
- ④ Repeat steps 1 through 3 for each parachute attaching point on the load.

Figure 14-5. Alternate parachute suspension points

- Configuration 2 with shrink wrap.

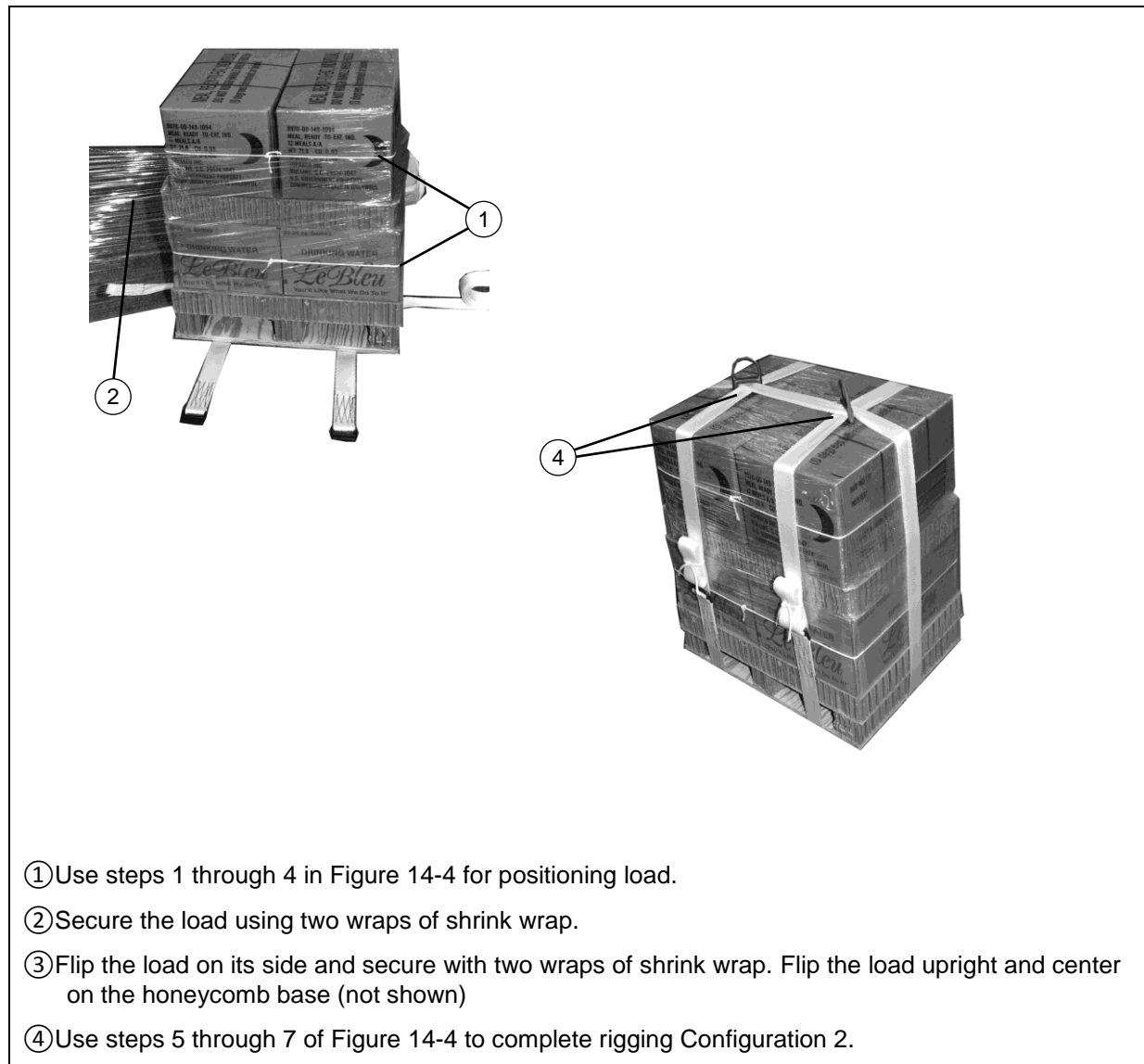


Figure 14-6. Load positioned and secured for configuration 2

- Configuration 3 with a LCLA resupply load lightweight polypropylene (or suitable substitute). material (to be used as a cover).

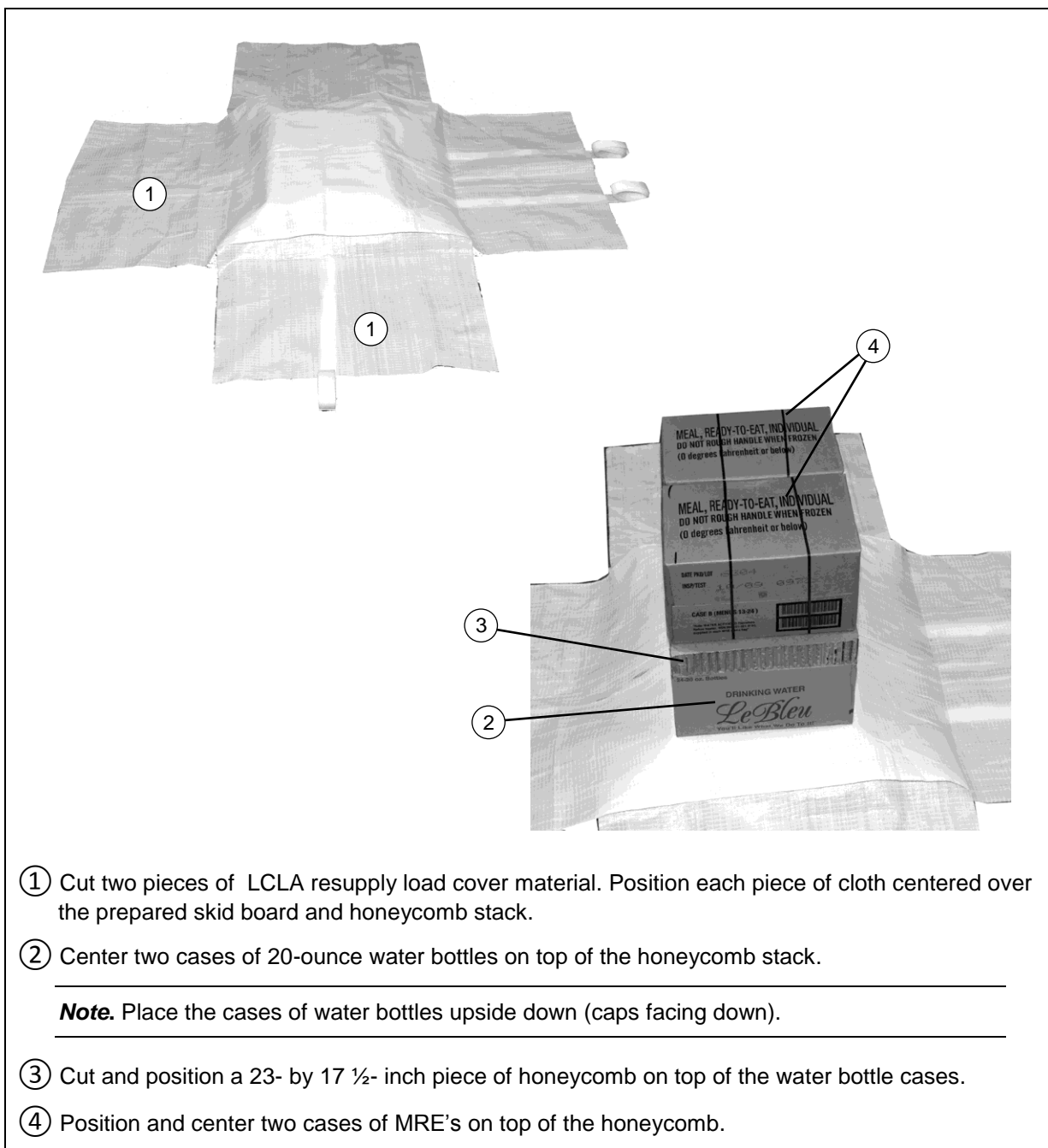
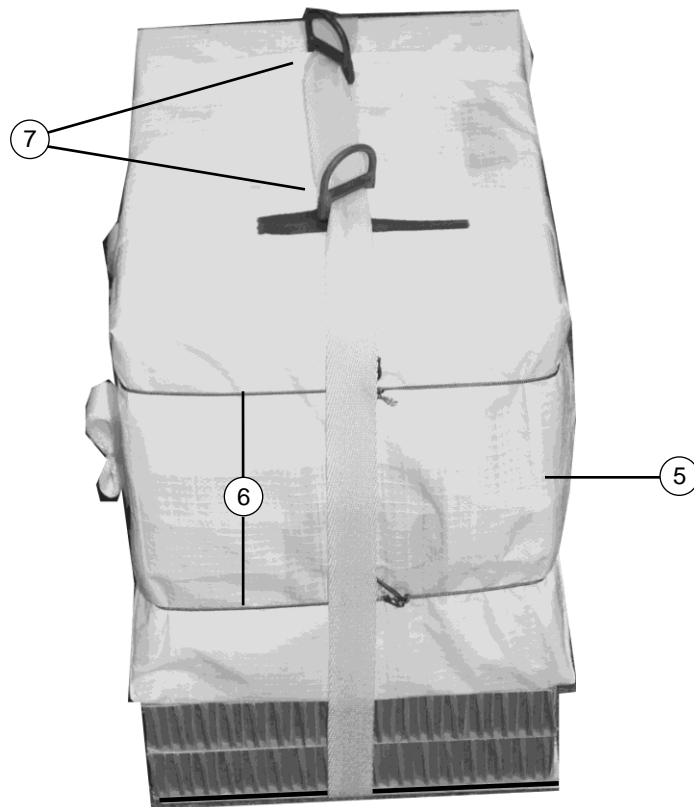


Figure 14-7. Load positioned and secured for configuration 3



- ⑤ Fold the load cover over the sides of the load. Tuck the sides in and secure the excess using 2-inch cloth-backed tape.
- ⑥ Route a single length of type III, nylon cord around the MRE's and water bottle cases. Secure using a non-slip knot.
- ⑦ Use steps 5 through 7 of Figure 15-4 to complete rigging Configuration 3.

Figure 14-7. Load positioned and secured for configuration 3 (continued)

INSTALLING PARACHUTE

14-5. Install the Cross parachute as shown in Figure 14-8 for all three configurations.

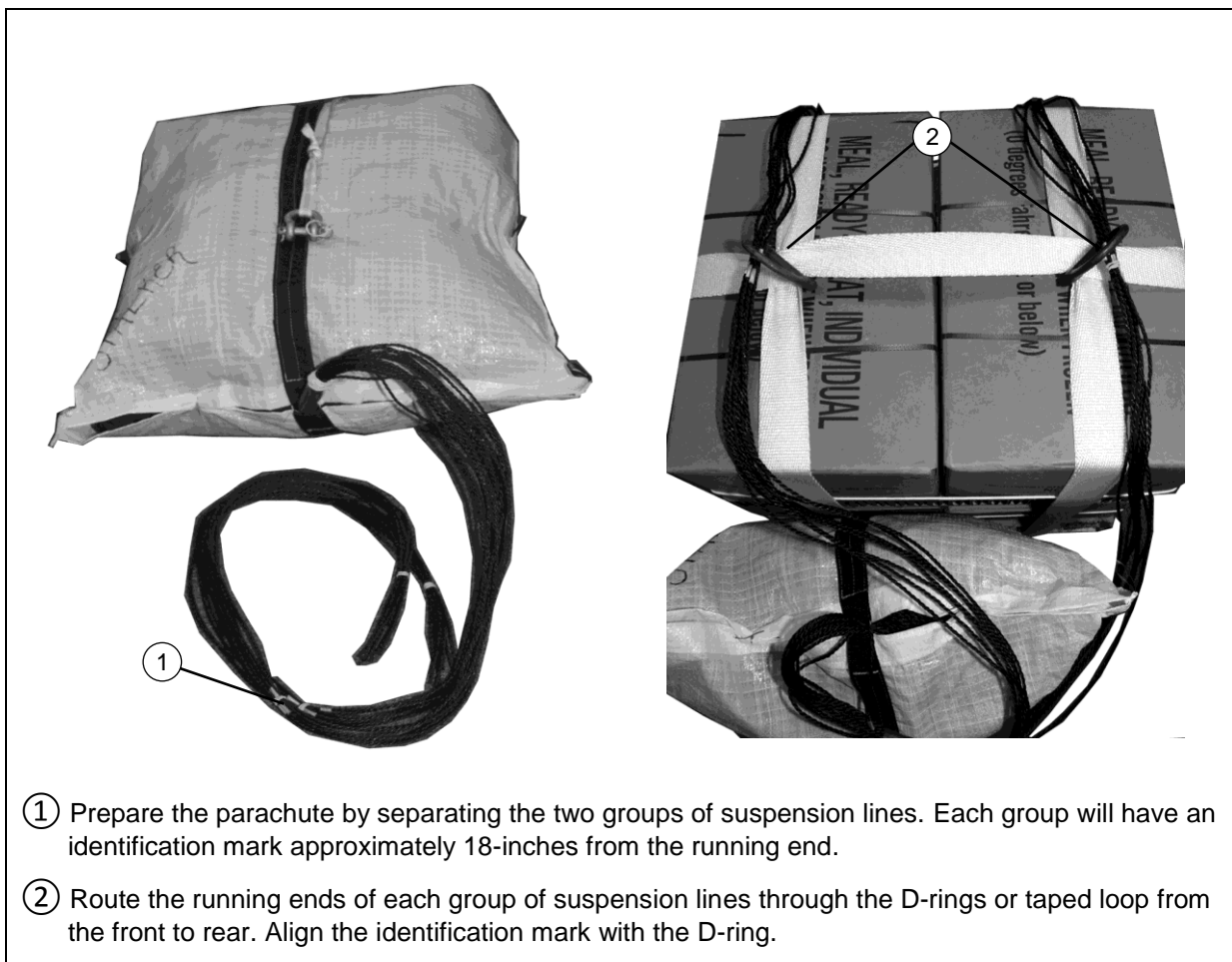
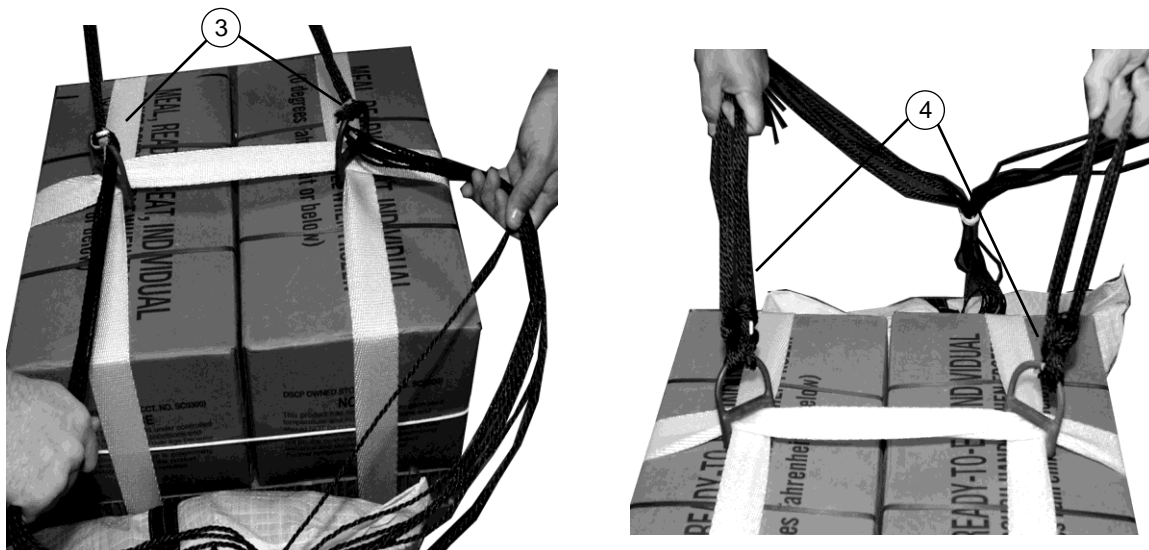


Figure 14-8. Cross parachute installed



- ③ Wrap each group of suspension lines around the D-rings or suspension loops once.
- ④ Secure the running ends in place by using two alternating half hitches.

Figure 14-8. Cross parachute installed (continued)

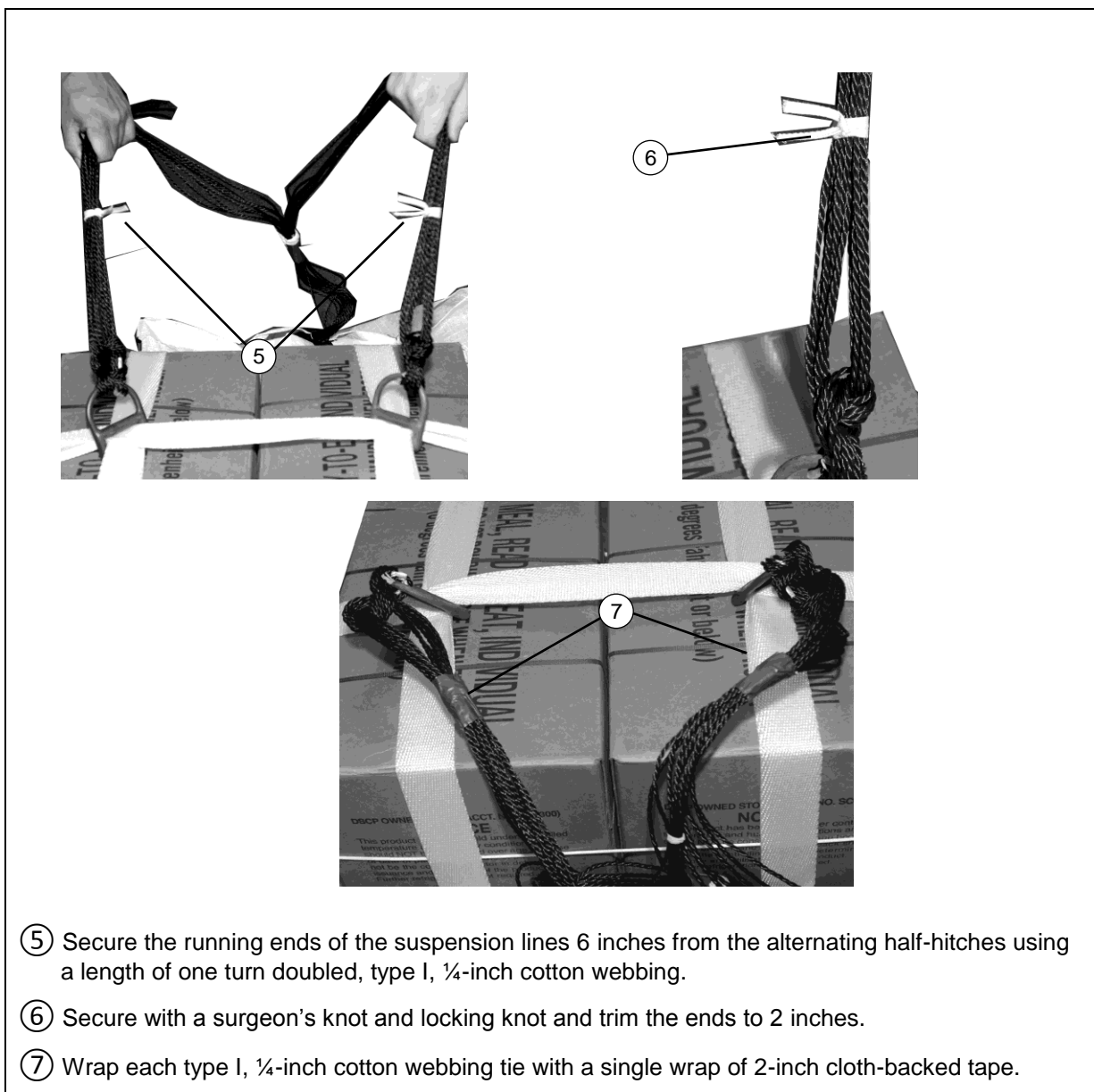


Figure 14-8. Cross parachute installed (continued)

SECURING PARACHUTE

14-6. Secure the Cross parachute as shown in Figure 14-9 for all three configurations.



- ① Position the remaining suspension lines on top of the load (not shown).
- ② Position the parachute on top of the suspension lines ensuring the static line faces toward either 18-inch edge of the load.

Figure 14-9. Cross parachute secured

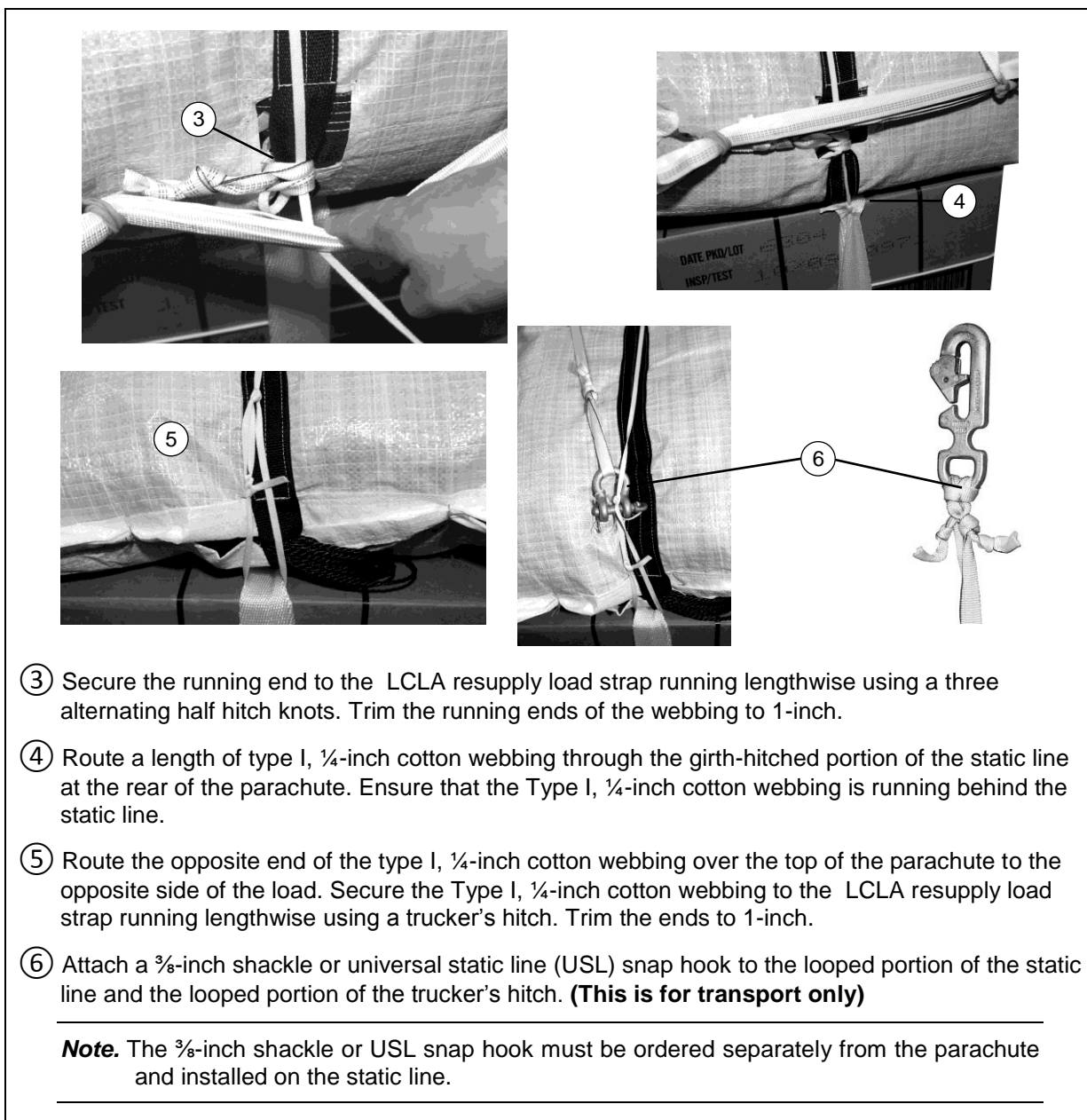


Figure 14-9. Cross parachute secured (continued)

MARKING RIGGED LOAD

14-7. Mark the rigged load according to Paragraph 1-5, page 1-4 using the data given in Figure 14-10. If the load varies from the one shown in Figure 14-10, recompute the data. An AMC IMT 1033, 20050204, V1. (Shipper's Declaration for Dangerous Goods) may be required.

CAUTION

Make the final inspection IAW TM 4-48.03/MCRP 4-11.3C/TO 13C7-1-11 and AR 59-4/OPNAVINST 4630.24C/AFJ 13-210(I)/MCO 13480.1B before loaded on the aircraft.



RIGGING LOAD DATA

Rigged weight (as shown)	137 pounds
Minimum (rigged weight) load allowed	93 pounds
Maximum load allowed	213 pounds
Height: (as shown)	37 inches
Width: (as shown)	24 inches
Length: (as shown)	18 inches

Figure 14-10. LCLA resupply load rigged for low-velocity airdrop with cross parachute

EQUIPMENT REQUIRED

14-8. Use the equipment listed in Table 14-1 to rig the load shown in Figure 14-10.

Table 14-1. Equipment required for rigging meals-ready-to-eat (MRE's) and 20-oz water bottles in a low-cost low-altitude resupply load for low-velocity airdrop with a cross parachute

<i>National Stock Number</i>	<i>Item</i>	<i>Quantity</i>
8040-00-273-8713	Adhesive, paste, 1 gallon	As required
4030-00-678-8560	Clevis, shackle, 3/8-inch diameter	1
	OR	
1670-01-476-3142	Snap hook, universal static line (USL)	1
4020-00-240-2146	Cord, nylon, type III	As required
5365-00-937-0147	D-ring, heavy-duty	2
1670-00-753-3928	Pad, energy-dissipation material, honeycomb	1 sheet
1670-01-551-5433	Parachute, 32-foot diameter, Cross	1
5530-00-128-4981	Plywood, 3/4- by 48- by 96-inch	1 sheet
	or	
5530-00-914-5118	Plywood, 1- by 48- by 96-inch	1 sheet
N/A	Polypropylene, lightweight material	As required
8135-00-476-5268	Shrink wrap	As required
1670-01-554-0755	Sling assembly, cargo airdrop LCLA resupply load	3
7510-00-074-5124	Tape, pressure sensitive, 2-inch (cloth-backed)	As required
7510-00-266-6712	Tape, pressure sensitive, masking	As required
8305-00-268-2411	Webbing, cotton, type I, 1/4-inch	As required
8305-00-268-2455	Webbing, nylon, tubular, 1-inch	As required

SECTION II - RIGGING LCLA RESUPPLY LOADS WITH DOUBLE CROSS PARACHUTES FOR LOW-VELOCITY AIRDROP

DESCRIPTION OF LOAD

14-9. Six PA-120 metal cases of 40-mm ammunition and four cases of 20-oz water bottles are rigged in a low cost low altitude aerial delivery system (LCLA ADS) for low-velocity airdrop. The LCLA ADS consists of two 32-foot diameter, Cross parachutes clustered in a Double Cross configuration, four or more 188-inch (LCLA ADS) straps and four D-rings. The use of 1-inch tubular nylon is authorized to replace heavy duty D-rings. The LCLA ADS is capable of being rigged for low-velocity airdrop using a ¾-inch (or 1-inch) - by 48-inch by 24-inch piece of A/C grade plywood for the skid board. The Cross Parachute is pre-packed into a polypropylene deployment bag and can sustain a weight range of 201 to 400 pounds suspended weight when clustered in the Double Cross configuration. This load has a suspended weight of 400 pounds and a total rigged weight of 428 pounds. It has a height of 33 ½- inches, but cannot exceed 48 inches and a width of 48-inches and a length of 24-inches.

Note. These procedures can be used to rig similar loads.

CAUTION

Only ammunition listed in TM 4-48.16/MCRP 4-11.3B/TO 13C7-18-41 may be airdropped.

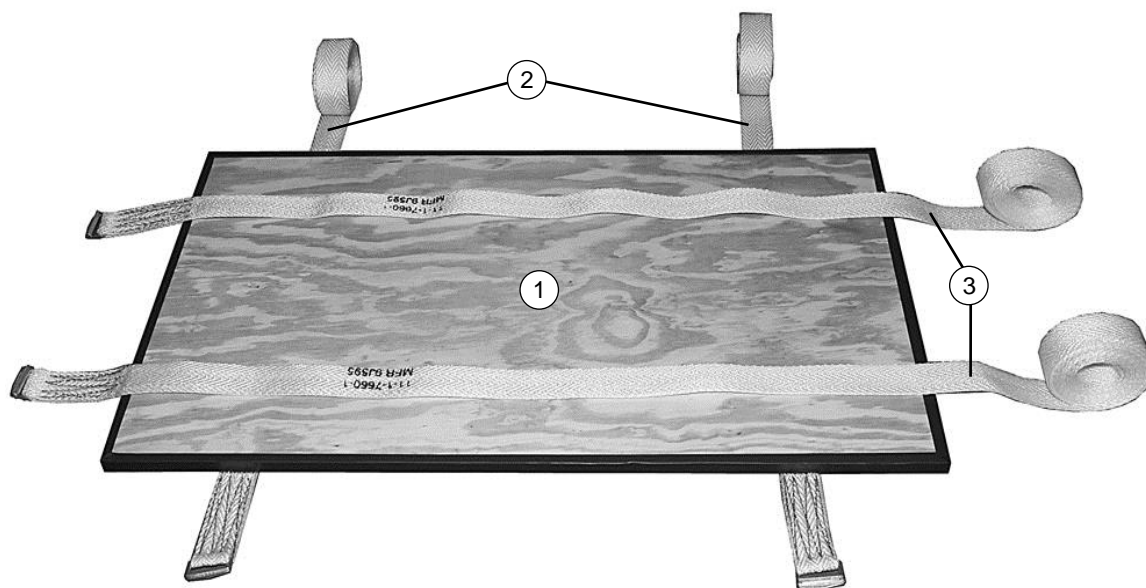


Figure 14-11. Double cross load description

PREPARING ITEMS, SKID BOARD, AND POSITIONING STRAPS

14-10. Prepare the skid board using Figure 14-12. Prepare the items to be dropped according to load's sensitivity. Items must be well padded to prevent damage during airdrop.

Note. These instructions are load specific.



- ① Cut a $\frac{3}{4}$ - by 42- by 24-inch piece of plywood. If $\frac{3}{4}$ -inch plywood is unavailable, use 1-inch plywood as a substitute. Make sure smooth side is down (A side) and tape the edges.
- ② Position two LCLA resupply load straps lengthwise under the plywood with the sewn portion facing up and against the edge of the plywood, six inches in from the edge.
- ③ Position two LCLA resupply load straps widthwise on top of the plywood with the sewn portion facing up, 4-inches from each edge.

Figure 14-12. Skid board and items prepared

PREPARING AND PLACING HONEYCOMB

14-11. Prepare and place the honeycomb as shown in Figure 14-13.

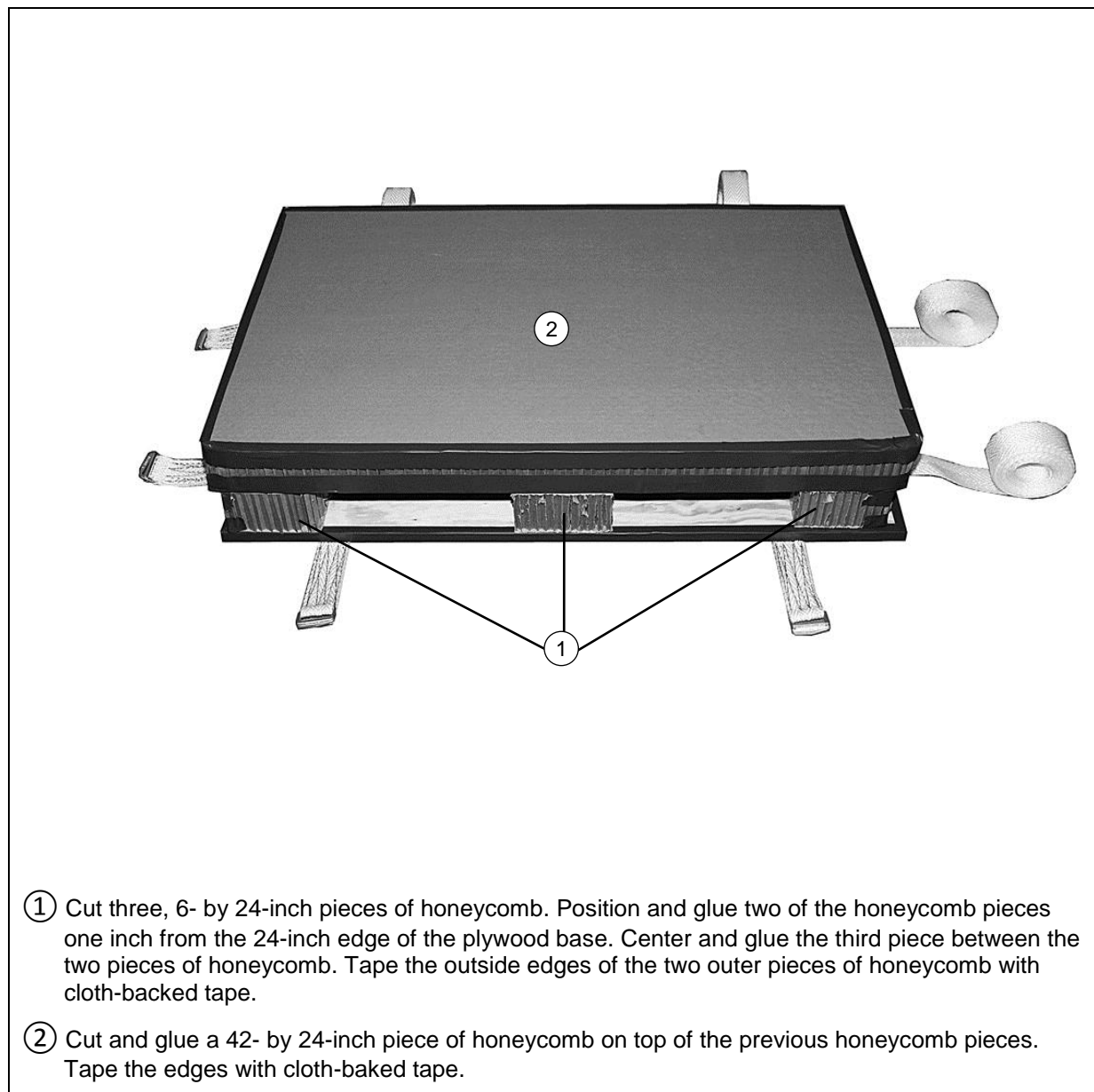
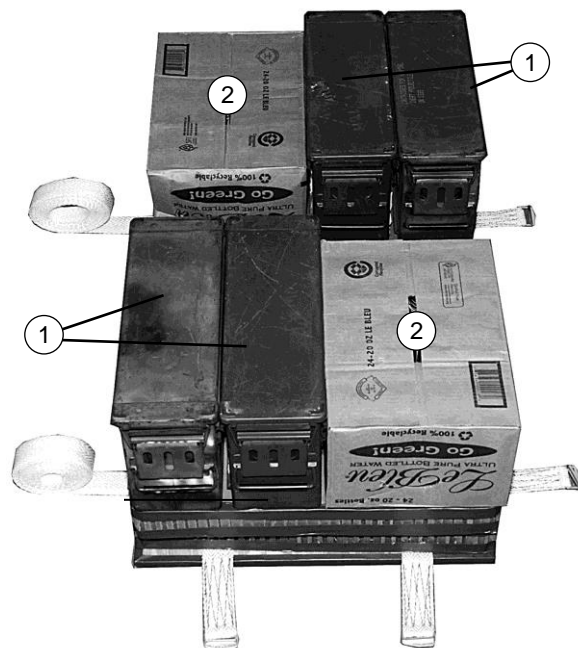


Figure 14-13. Honeycomb prepared and placed

POSITIONING AND SECURING LOAD

14-12. The load can be configured in three ways, without cover, wrapped in shrink wrap, or with a LCLA resupply load lightweight polypropylene material (to be used as a cover). Center the load on the honeycomb. Secure load as shown in Figures 14-14.

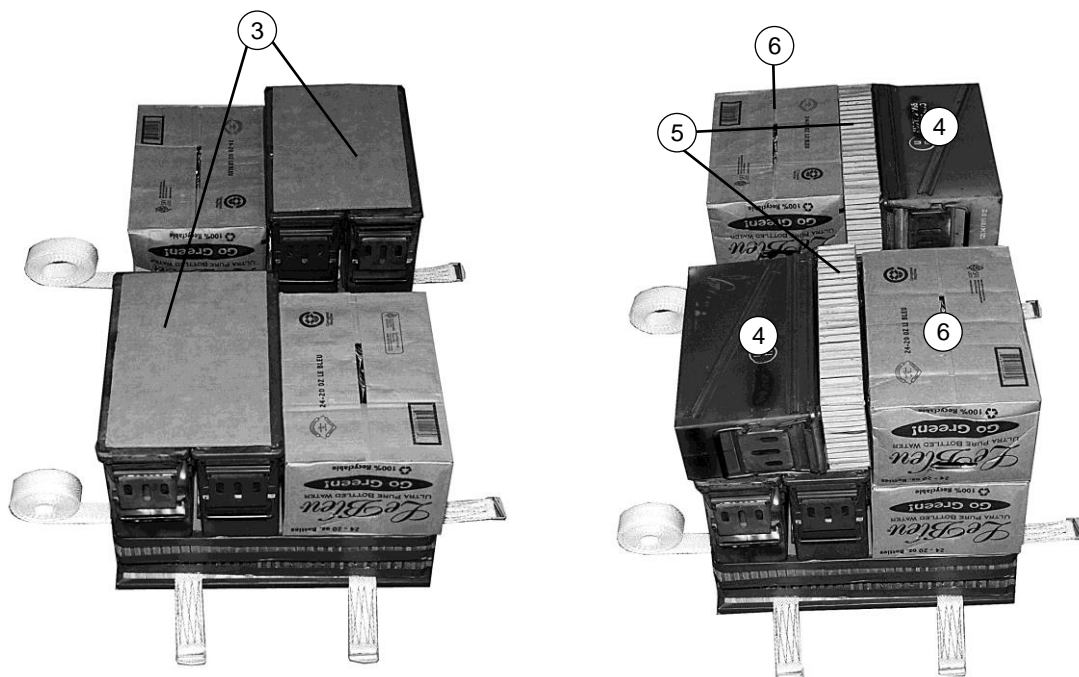


- ① Position two 40-mm ammunition boxes widthwise on the bottom corner of the honeycomb and flush on each side. Position two more 40-mm ammunition boxes widthwise on the opposite corner of the honeycomb.

Note. Place the cases of water bottles upside down (caps facing down).

- ② Position one case of 20-ounce water bottles next to the ammunition boxes. Repeat the same step on the opposite corner.

Figure 14-14. Load positioned and secured



- ③ Cut two 17-inch by 11-inch pieces of cardboard. Place one piece of cardboard on top of the previously positioned 40-MM ammunition boxes, one piece per corner.
- ④ Place one 40-MM ammunition box on top of each cardboard piece. Place the ammunition box on its side with the lid facing the inside of the load.
- ⑤ Cut two, 17-inch by 6 ½-inch pieces of honeycomb. Place one piece of honeycomb against the ammunition box lid on each side of the load.
- ⑥ Position one case of 20-ounce water bottles on top of each previously positioned case of water bottles.

Note. Place the bottle caps facing down.

Figure 14-14. Load positioned and secured (continued)

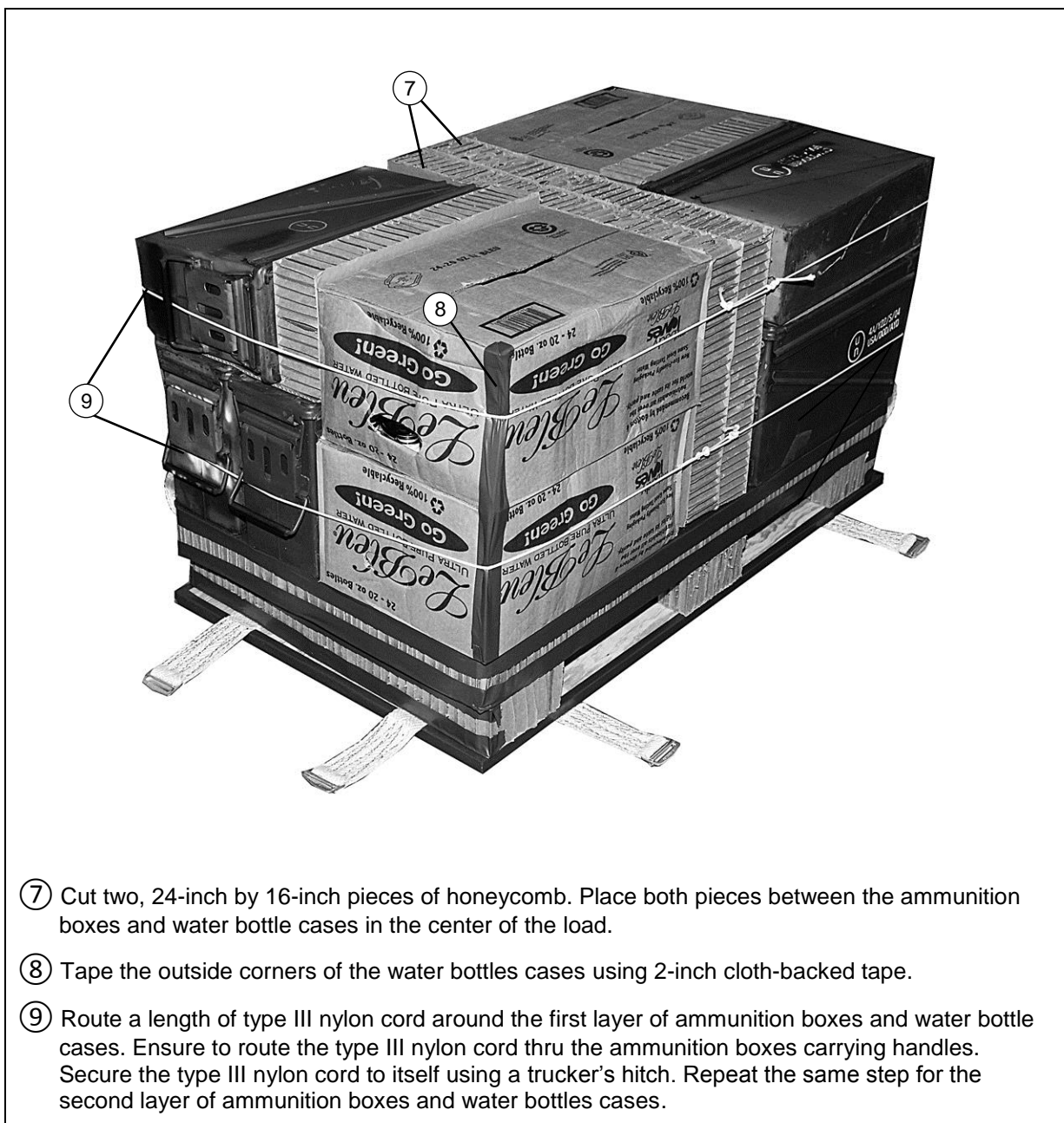


Figure 14-14. Load positioned and secured (continued)



- ⑩ Secure the load using four wraps of shrink wrap..
- ⑪ Cut and position a $\frac{3}{4}$ - by 42- by 24-inch piece of A/C grade plywood on top of the load. Tape the edges of the plywood using 2-inch cloth-backed adhesive tape.

Figure 14-14. Load positioned and secured (continued)



- ⑫ Route the running end of one LCLA strap that runs lengthwise up and over the top of the load, through the rectangular portion of the first D-ring, through the rectangular portion of the second D-ring and down to and through the friction adapter end of the LCLA strap. Fold and secure the excess using one turn single type I, ¼-inch cotton webbing. Repeat for the second LCLA strap that runs lengthwise.
- ⑬ Route the running end of one LCLA strap that runs widthwise up and over the top of the load, through the rectangular portion of the first D-ring, through the rectangular portion of the second D-ring and down to and through the friction adapter end of the LCLA strap. Fold and secure the excess using one turn single type I, ¼-inch cotton webbing. Repeat for the second LCLA strap that runs widthwise.

Note. 1-inch tubular nylon webbing, as shown in Figure 14-5, may be used instead of D-rings for suspension points.

Figure 14-14. Load positioned and secured (continued)

CLUSTERING AND INSTALLING TWO CROSS PARACHUTES

14-13. Install two Cross parachutes as shown in Figures 14-15 and 14-16.

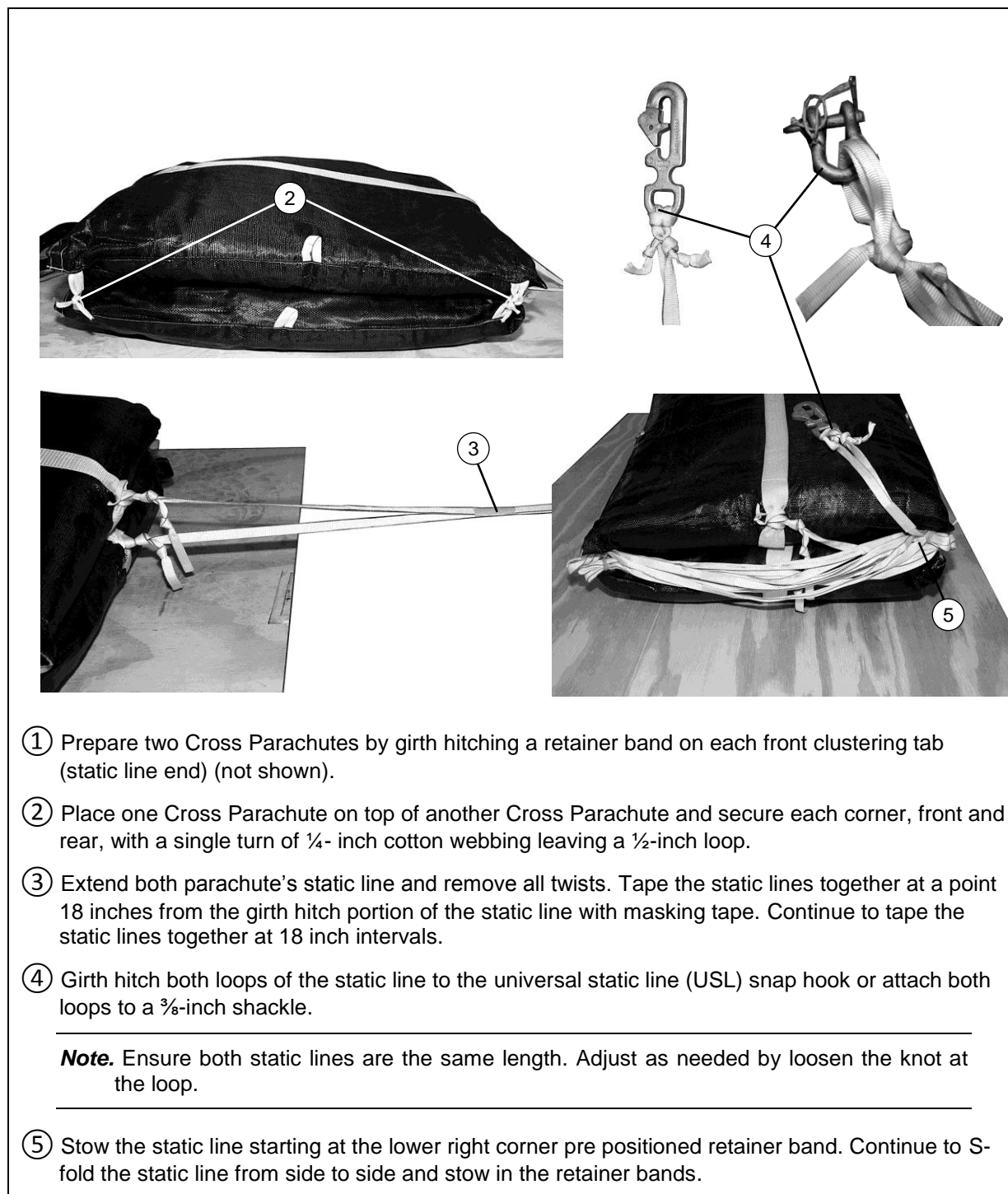
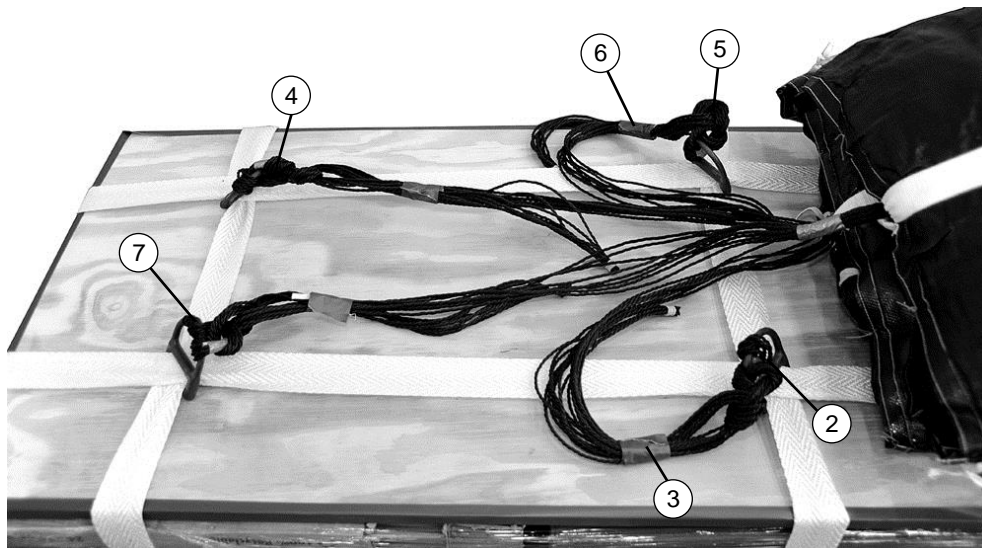


Figure 14-15 double cross parachutes clustered

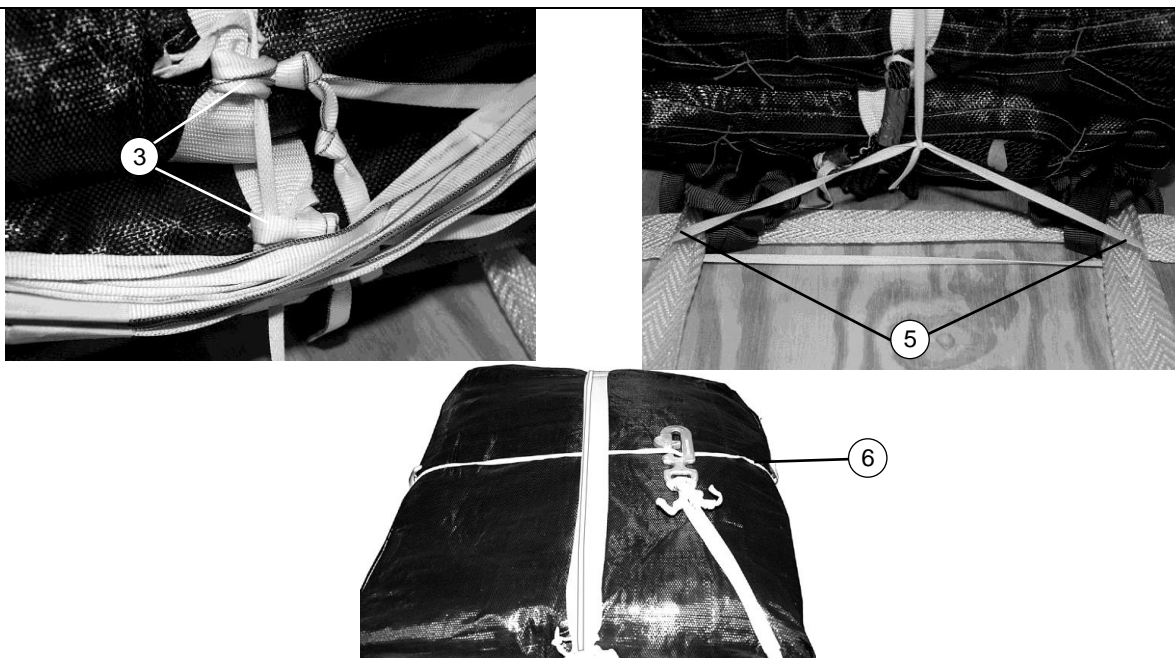


- ① Prepare the parachute by separating the two groups of suspension lines on each parachute. Each group will have an identification mark approximately 18-inches from the running end (not shown).
- ② Route one group of suspension lines from the bottom parachute through the closest right heavy duty D-ring, from outside to inside, to the identification mark. Wrap the group of suspension lines around the heavy duty D-ring once and secure the running end with two alternating half-hitches.
- ③ Secure the running ends of the suspension lines 6-inches from the alternating half-hitches with one turn double type I, ¼-inch cotton webbing. Tie a surgeon's knot and locking knot and trim the ends to 2-inches. Wrap each type I, ¼-inch cotton webbing tie with a single wrap of 2-inch cloth-backed tape.
- ④ Repeat steps 2 and 3 for the second group of suspension lines of the bottom parachute on the furthest left heavy duty D-ring.
- ⑤ Route one group of suspension lines from the top parachute through the closest left heavy duty D-ring from outside to inside of the load to the identification mark. Wrap the group of suspension lines around the heavy duty D-ring once and secure the running end in place using two alternating half-hitches.
- ⑥ Secure the running ends of the suspension lines 6-inches from the alternating half-hitches with one turn double type I, ¼-inch cotton webbing. Tie a surgeon's knot and locking knot and trim the ends to 2-inches. Wrap each type I, ¼-inch cotton webbing tie with a single wrap of 2-inch cloth-backed tape.
- ⑦ Repeat steps 5 and 6 for the second group of suspension lines of the top parachute on the furthest right heavy duty D-ring.

Figure 14-16. Double parachutes installed

SECURING PARACHUTE

14-14. Secure two Cross parachute as shown in Figure 14-17.



- ① Position the remaining suspension lines on top of the load (not shown).
- ② Position the parachute on top of the suspension lines ensuring the static line faces toward either 24-inch edge of the load (not shown).
- ③ Route the running end under both LCLA resupply load straps running width wise using three alternating half hitch knots. Trim the running ends of the webbing to 1-inch (not shown).
- ④ Route a length of type I, ¼-inch cotton webbing through the girth-hitched portion of the static lines at the rear of the top and bottom parachutes. Ensure that the Type I, ¼-inch cotton webbing is running behind the static line.
- ⑤ Route the opposite end of the type I, ¼-inch cotton webbing over the top of the parachutes to the opposite side of the load. Route the running end under both LCLA resupply load straps running width wise and secure using a trucker's hitch. Trim the ends to 1-inch.
- ⑥ Route a second length of type I, ¼-inch cotton webbing between the parachutes, up through both top parachute's center clustering tabs, and through the universal static line (USL) Snap hook or ⅜-inch shackle. Secure the tie to itself using a surgeon's knot and locking knot or bow knot.

CAUTION

The tie in step 6 is a transportation tie and must be removed before airdrop.

Figure 14-17. Double cross parachutes secured

MARKING RIGGED LOAD

14-15. Mark the rigged load according to Paragraph 1-5, page 1-4 using the data given in Figure 14-18. If the load varies from the one shown in Figure 14-18, recompute the data. An AMC IMT 1033, 20050204, V1. (Shipper's Declaration for Dangerous Goods) may be required.

CAUTION

Make the final inspection IAW TM 4-48.03/MCRP 4-11.3C/TO 13C7-1-11 and AR 59-4/OPNAVINST 4630.24C/AFJ 13-210(I)/MCO 13480.1B before loaded on the aircraft.



RIGGING LOAD DATA

Rigged weight (as shown).....	426 pounds
Minimum (rigged weight) load allowed.....	201 pounds
Maximum load allowed.....	426 pounds
Height: (as shown)	33 1/2 inches
Maximum Height	48 3/4-inches
Width: (as shown)	42 inches
Length: (as shown).....	24 inches

Figure 14-18. LCLA resupply load rigged for low-velocity airdrop with double cross parachutes

EQUIPMENT REQUIRED

14-16. Use the equipment listed in Table 14-2 to rig the load shown in Figure 14-18.

Table 14-2. Equipment required for rigging 40-mm ammunition and 20-oz water bottles in a low-cost low-altitude resupply load for low-velocity airdrop with double cross parachutes

<i>National Stock Number</i>	<i>Item</i>	<i>Quantity</i>
8040-00-273-8713	Adhesive, paste, 1 gallon	As required
4030-00-678-8560	Clevis, shackle, 3/8-inch diameter OR	2
1670-01-476-3142	Snap Hook, universal static line (USL)	1
4020-00-240-2146		
5365-00-937-0147	Cord, nylon, type III	As required
1670-00-753-3928	D-ring, heavy-duty	4
1670-01-551-5433	Pad, energy-dissipation material, honeycomb	1 sheet
5530-00-128-4981	Parachute, 32-foot diameter, Cross	2
5530-00-914-5118	Plywood, 3/4- by 48- by 96-inch OR	1 sheet
8135-00-476-5268	Plywood, 1- by 48- by 96-inch	1 sheet
1670-01-554-0755	Polypropylene, lightweight material	As required
	Shrink wrap	As required
7510-00-074-5124	Sling assembly, cargo airdrop LCLA resupply load	4
7510-00-266-6712	Tape, pressure sensitive, 2-inch (cloth-backed)	As required
8305-00-268-2411	Tape, pressure sensitive, masking	As required
8305-00-268-2455	Webbing, cotton, type I, 1/4-inch	As required
	Webbing, nylon, tubular, 1-inch	As required

SECTION III – RIGGING AN LCLA RESUPPLY LOAD WITH TRIPLE CROSS PARACHUTES FOR LOW-VELOCITY AIRDROP

DESCRIPTION OF LOAD

14-17. Four boxes of simulated 105-mm ammunition and four cases of Meals Ready to Eat are rigged in a low cost low altitude aerial delivery system (LCLA ADS) for low-velocity airdrop. The LCLA ADS consists of the three Cross Parachutes clustered in a Triple Cross configuration, five 188-inch LCLA Straps and four D-rings. The use of 1-inch tubular nylon is authorized to replace heavy duty D-rings. The LCLA ADS, is capable of being rigged for low-velocity airdrop using a ¾-inch (or 1-inch) - by 48-inch by 36-inch piece of A/C grade plywood skid board. The Triple Cross parachutes are pre-packed into a polypropylene D-bags and can sustain a total suspended weight range of 401 to 600 pounds. This load has a suspended weight of 600 pounds and a total rigged weight of 639 pounds. It has a height of 40- inches, but can not to exceed 48 inches, a width of 48-inches and a length of 36-inches.

Note. These procedures can be used to rig similar loads.

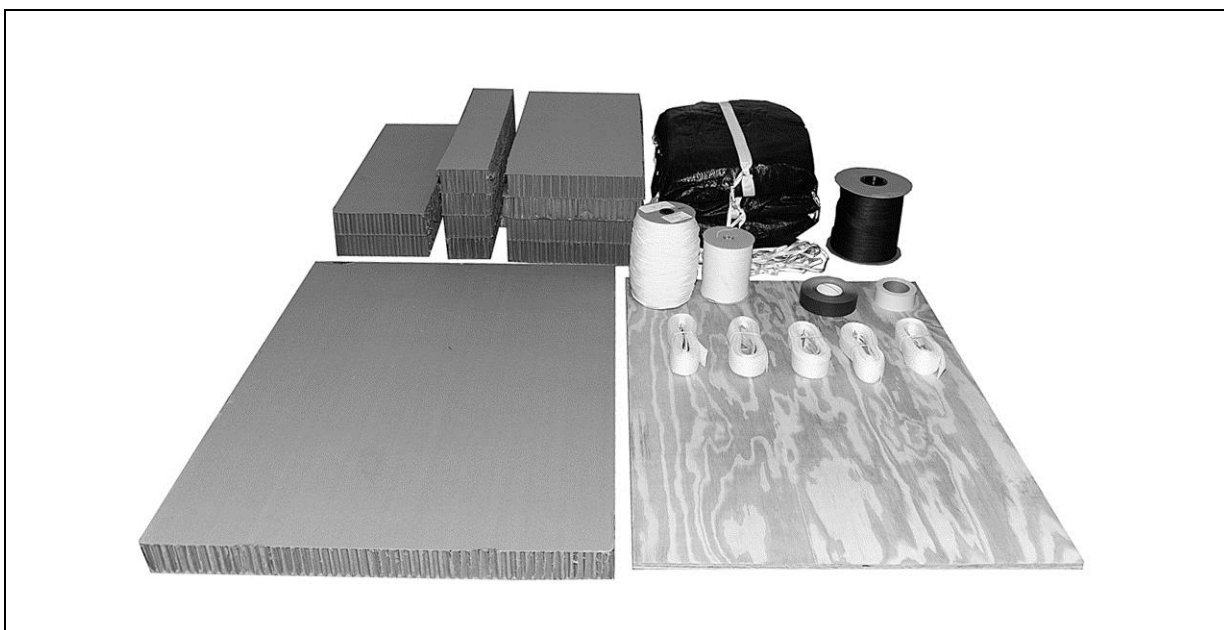


Figure 14-19. Load description

PREPARING SKID BOARD, AND POSITIONING STRAPS

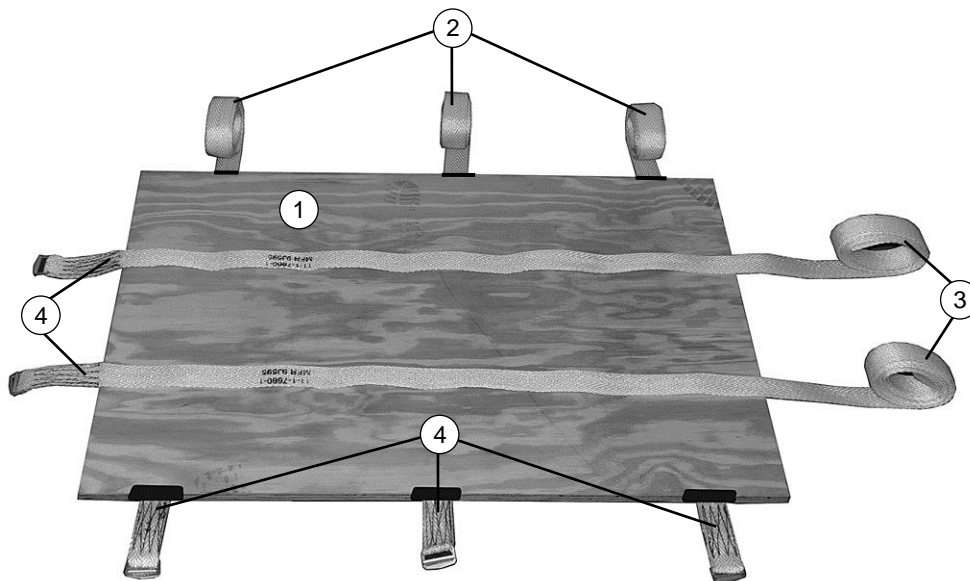
14-18. Prepare the skid board using Figure 14-20. Prepare the items to be dropped according to load's sensitivity. Items must be well padded to prevent damage during airdrop.

Note. The procedures described below will be utilized for all three configurations.

CAUTION

Only ammunition listed in TM 4-48.16/MCRP 4-11.3B/TO 13C7-18-41 may be airdropped.

Notes. 1. Tape all plywood edges where the straps make contact with the plywood.
2. These instructions are load specific.



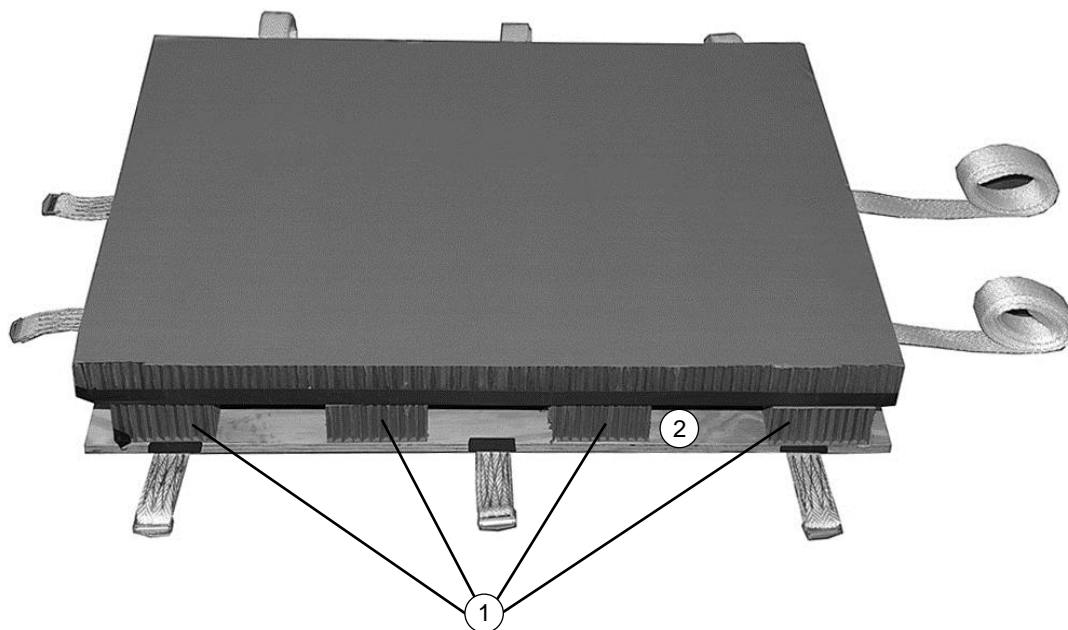
- ① Cut a $\frac{3}{4}$ - by 48- by 36-inch piece of A/C plywood. If $\frac{3}{4}$ -inch plywood is unavailable, use 1-inch plywood as a substitute. Lay on a flat surface with smooth side down (A side).
- ② Position three LCLA resupply load straps lengthwise under the plywood with the outside straps 4 inches from the edge of the plywood. Center the third strap between the two outside straps.
- ③ Position the two remaining LCLA resupply load straps widthwise on top of the plywood, 6-inches from each edge.
- ④ Place the sewn portion of the all the straps facing up.

Figure 14-20. Skid board prepared

PREPARING AND PLACING HONEYCOMB

14-19. Prepare and place the honeycomb as shown in Figure 14-21.

Note. Glue all honeycomb to the skid board.



- ① Glue two 36- by 6-inch pieces of honeycomb along the 36-inch edges of the plywood, 1-inch in from the edge. Center and glue the remaining two pieces of honeycomb between the outside two pieces of honeycomb.
- ② Glue a 48-inch by 36-inch piece of honeycomb on top of the previous honeycomb pieces. Tape the bottom edges of the honeycomb using 2-inch cloth-backed adhesive tape..

Figure 14-21. Honeycomb prepared and placed

POSITIONING AND SECURING LOAD

14-20. The load can be configured in three ways, without cover, wrapped with shrink wrap, or with an LCLA resupply load lightweight polypropylene material (to be used as a cover). Center the load on the honeycomb. Secure load as shown in Figure 14-22.

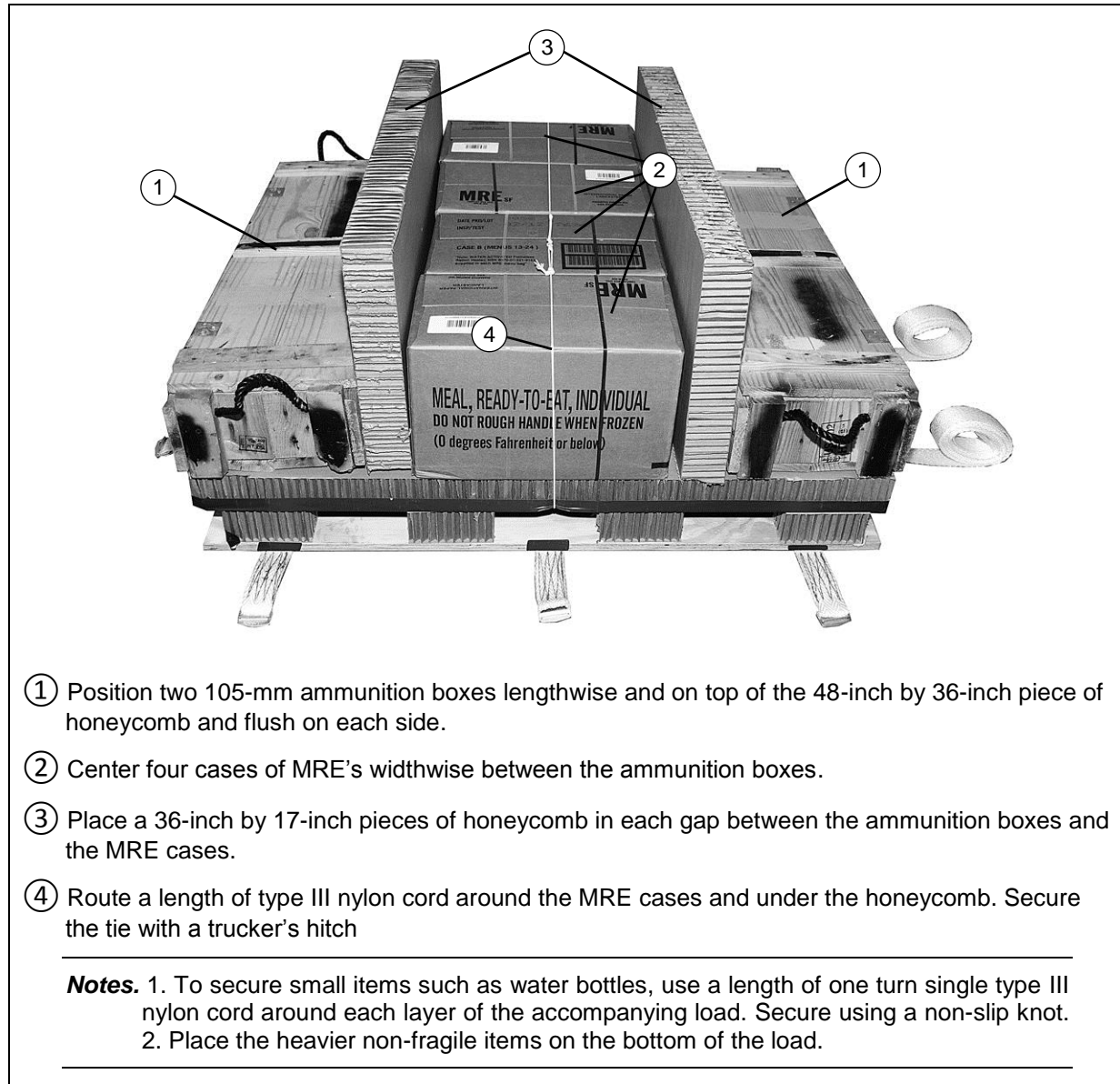
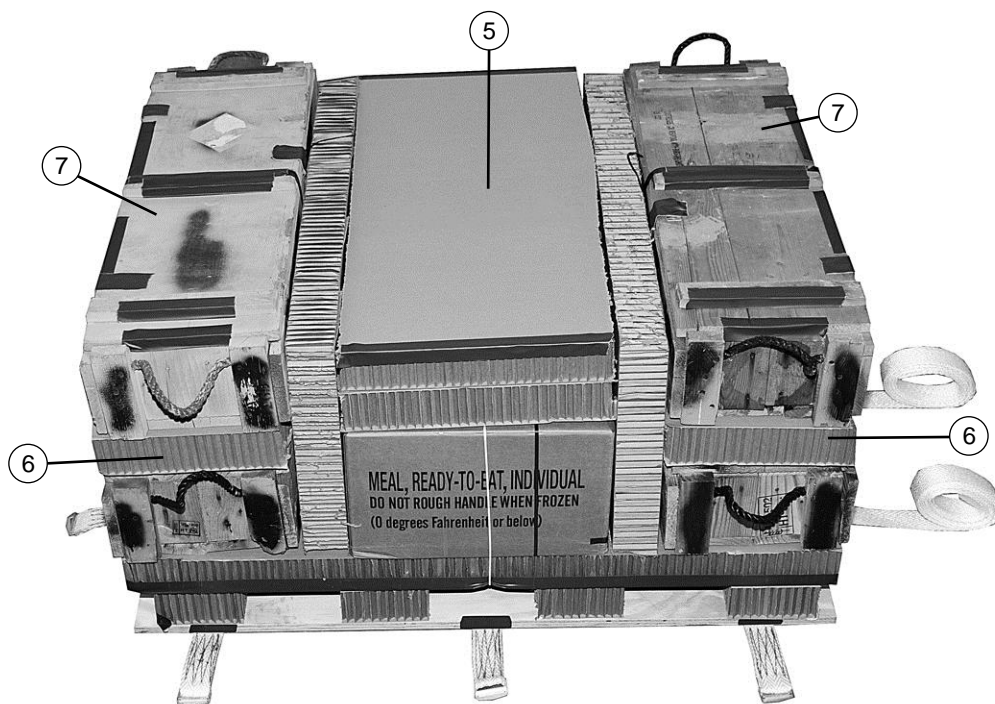


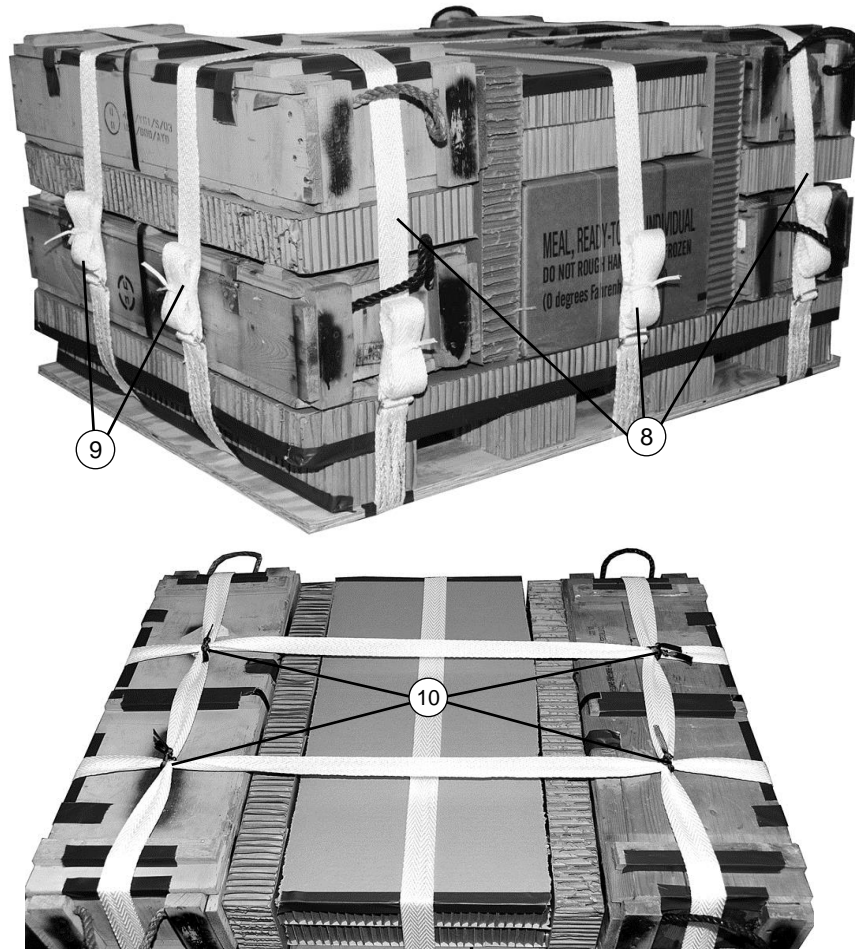
Figure 14-22. Load positioned and secured



- ⑤ Place two 36- by 17-inch pieces of honeycomb on top of the MRE cases. Tape the front and rear edges of the honeycomb with cloth-backed tape.
- ⑥ Place a 36- by 12-inch pieces of honeycomb on top of each ammunition box.
- ⑦ Position a 105-mm ammunition box lengthwise and on top of each 36- by 12-inch piece of honeycomb, flush on each side.

Note. Place a piece of 2-inch cloth-backed tape where any sharp edges, metal or honeycomb contact the LCLA straps.

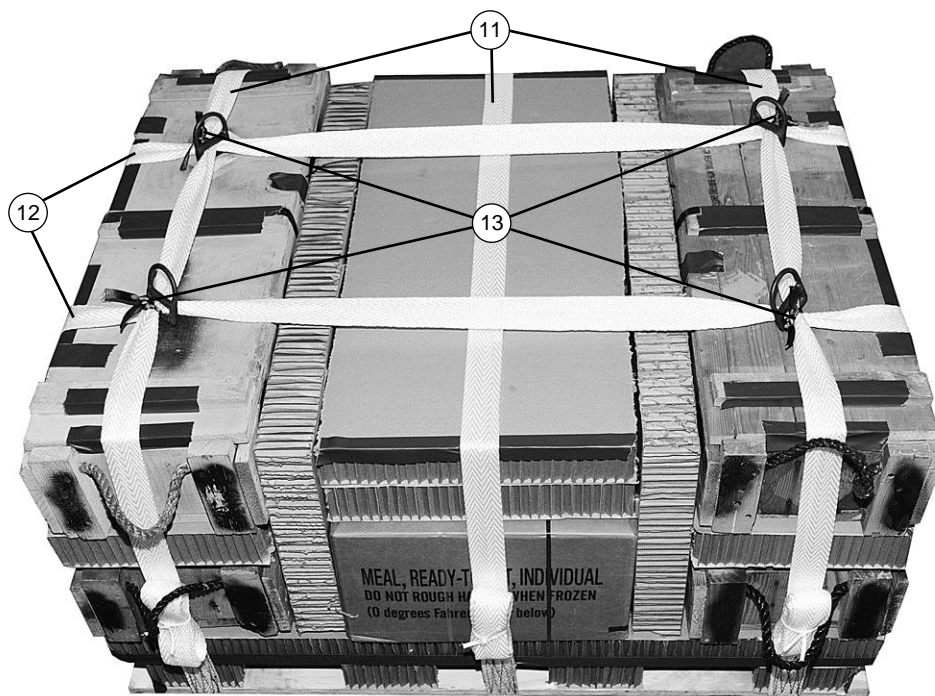
Figure 14-22. Load positioned and secured (continued)



Note. Steps 8 through 10 are used when heavy duty D-rings are not available.

- ⑧ Route the running end of the LCLA straps that run lengthwise up through the carrying handle of the ammunition boxes, over the top of the load, down through the carrying handle of the ammunition boxes, and through the friction adapter end of the LCLA straps. Fold and secure the excess strap using type I, ¼-inch cotton webbing.
- ⑨ Route the running end of the LCLA straps that run widthwise up and over the top of the load and down through the friction adapter end of the LCLA straps. Fold and secure the excess strap using type I, ¼-inch cotton webbing.
- ⑩ Secure the LCLA straps where the straps form a cross on the top of the load with ½-inch tubular nylonwebbing. Route the ½-inch tubular nylon webbing under both straps and secure it on top using a surgeon's knot and locking knot and an overhand knot in the running ends. Secure all four points.

Figure 14-22. Load positioned and secured (continued)



Note. Steps 11 through 13 are used when heavy duty D-rings are available.

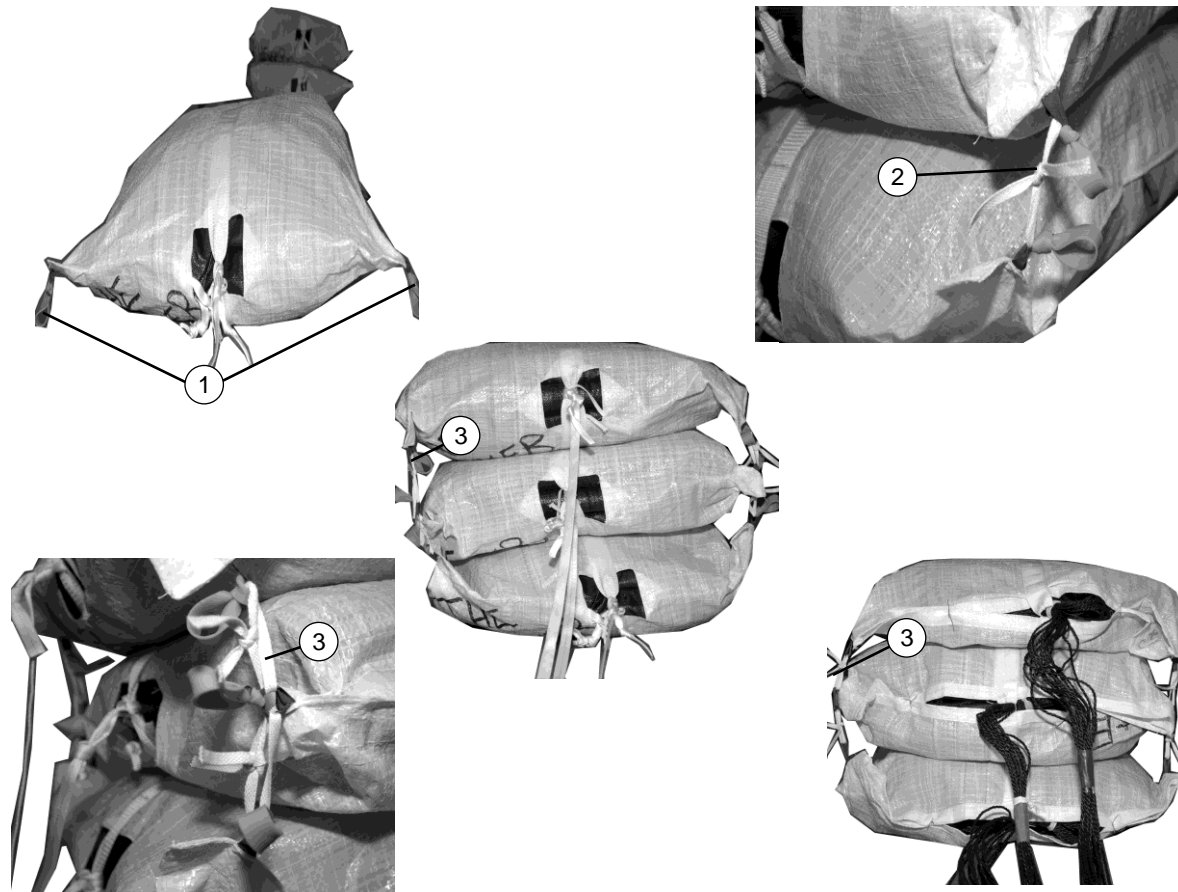
- ⑪ Route the running end of the outside LCLA straps that run lengthwise up through the carrying handle of the ammunition boxes, over the top of the load, through the rectangular portion of the first D-ring, through the rectangular portion of the second D-ring, down through the carrying handle of the ammunition boxes and through the friction adapter of the LCLA strap. Route the inside LCLA around the load and through the friction adapter. Fold and secure the excess strap using type I, ¼-inch cotton webbing. Ensure the heavy duty D-rings is facing the center of the load.
- ⑫ Route the running end of the LCLA straps that runs widthwise up and over the top of the load, through the rectangular portion of the first D-ring, through the rectangular portion of the second D-ring and down through the friction adapter of the LCLA strap. Fold and secure the excess strap using type I, ¼-inch cotton webbing. Ensure all four heavy duty D-rings are facing the center of the load.
- ⑬ Secure the LCLA straps where the straps form a cross on the top of the load using a length of ½-inch tubular nylon webbing. Route the ½-inch tubular nylon webbing under both straps and secure it on top using a surgeon's knot and locking knot. Secure all four points.

Figure 14-22. Load positioned and secured (continued)

CLUSTERING PARACHUTES

14-21. Cluster three Cross parachutes to form the Triple Cross parachute as shown in Figure 14-23.

Note. The Cross parachute comes pre-packed from the manufacturer and needs to be clustered to form the Triple Cross parachute.



- ① Prepare three Cross parachutes by girth hitch a retainer band on each front clustering tab on the static line end of the parachute.
- ② Place a second Cross parachute on top of the first parachute and secure each corner (front and rear) together with a single turn of $\frac{1}{4}$ -inch cotton webbing leaving $\frac{1}{2}$ -inch loop.
- ③ Repeat step 2 for the third parachute.

Figure 14-23. Triple cross parachute clustered

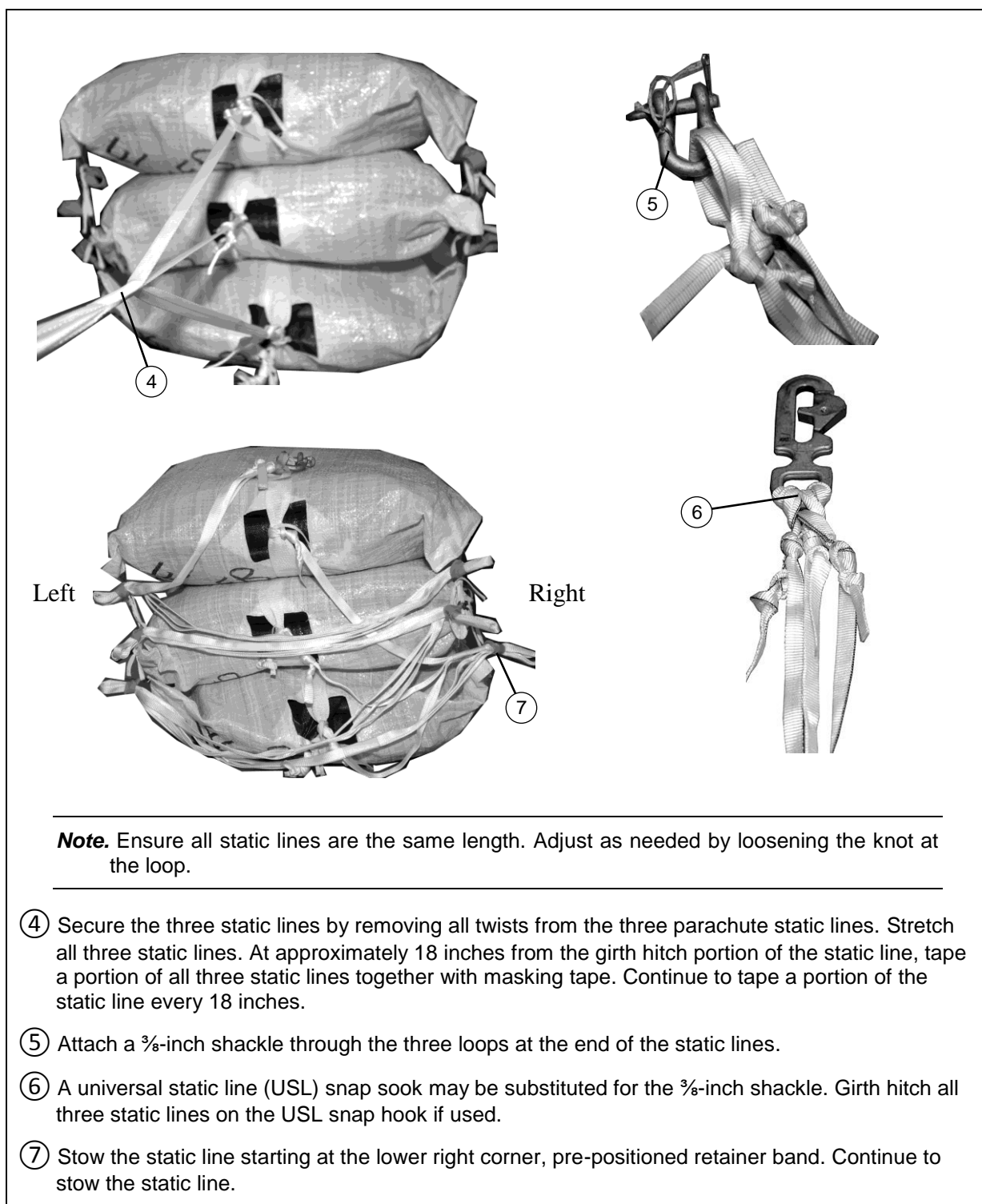
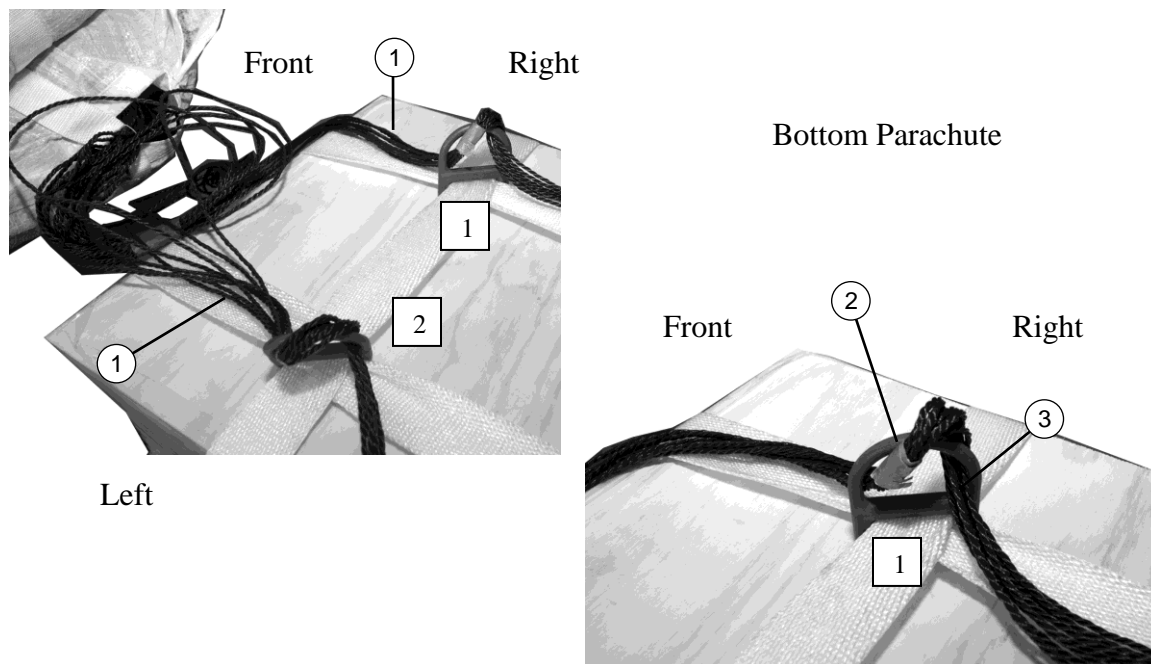


Figure 14-23. Triple cross parachute clustered (continued)

INSTALLING PARACHUTE

14-22. Install the Triple Cross parachute as shown in Figure 14-24.

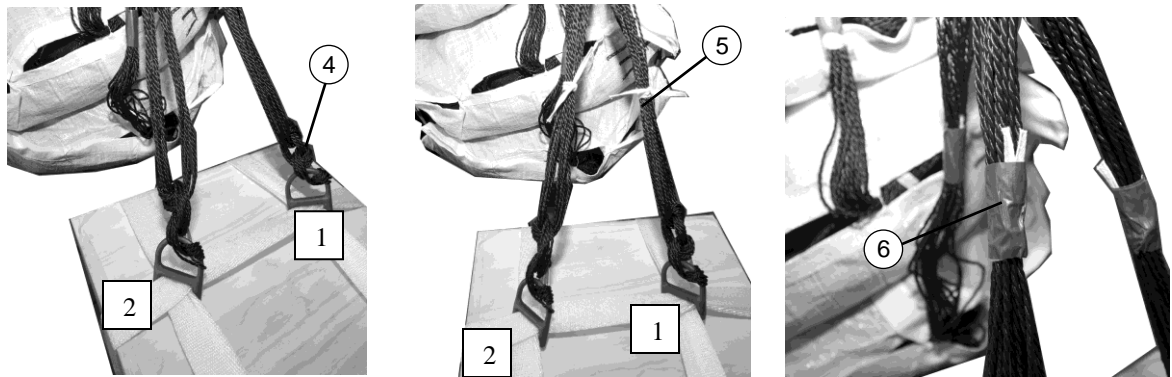


- ① Prepare the parachutes by separating the two groups of suspension lines. Each group will have an identification mark approximately 18-inches from the running end. Label D-rings (1 through 4) starting with front right, front left, rear right, and then rear left.
- ② Route the running ends of each group of suspension lines from the bottom parachute through the D-rings 1 and 2 from the front to rear. Align the identification mark with the D-ring.

Note. For the first parachute, attach the group of suspension lines on the D-rings placed on the left and right side of load.

- ③ Wrap each group of suspension lines around the D-rings once.

Figure 14-24. Triple cross parachute installed



- ④ Secure the running ends in place using two alternating half hitches.
- ⑤ Secure the running ends of the suspension lines 6-inches from the alternating half-hitches using a length of one turn doubled, type I, $\frac{1}{4}$ -inch cotton webbing. Secure with a surgeons knot and locking knot and trim the ends to 2-inches.
- ⑥ Wrap each type I, $\frac{1}{4}$ -inch cotton webbing tie with a single wrap of 2-inch cloth-backed tape.

Figure 14-24. Triple cross parachute installed (continued)

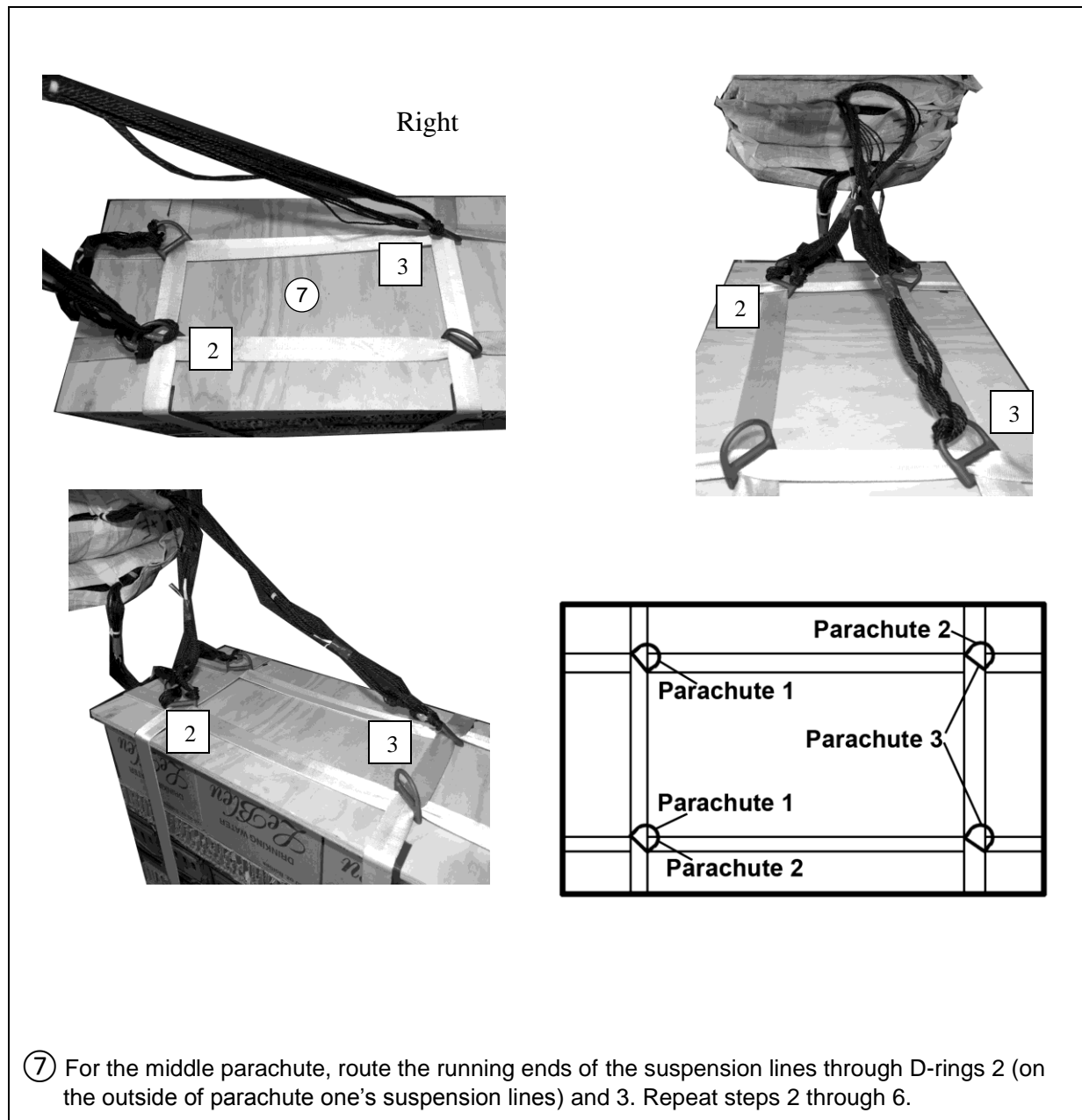


Figure 14-24. Triple cross parachute installed (continued)

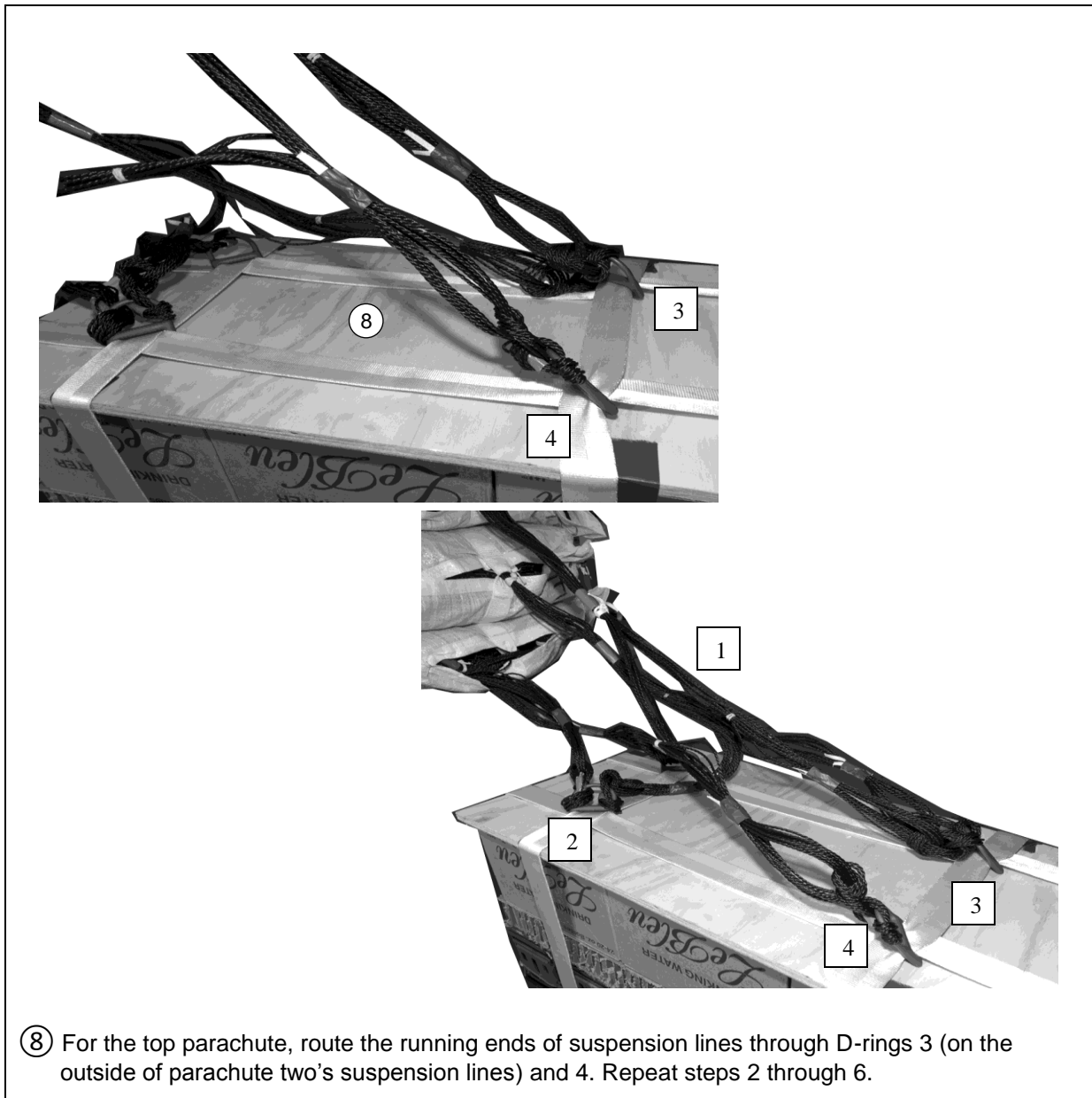
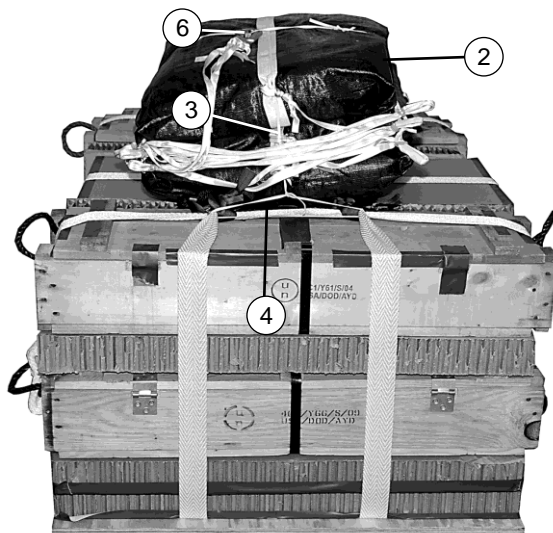


Figure 14-24. Triple cross parachute installed (continued)

SECURING PARACHUTE

14-23. Secure the Triple Cross parachute configuration as shown in Figure 14-25.



- ① Position the remaining suspension lines on top of the load (not shown).
- ② Position the parachutes on top of the suspension lines, ensuring the static lines face towards either 36-inch edge of the load.
- ③ Route a length of type I, ¼-inch cotton webbing behind the static line and through the girth-hitched portion of the static line at the rear of the parachute. Repeat this step for each remaining parachute. Ensure that the type I, ¼-inch cotton webbing is running through the static line attaching loop and not the break cord tie.
- ④ Secure the running end to the LCLA resupply load straps running widthwise using a surgeon's knot and locking knot. Trim the running ends of the webbing to 1-inch.
- ⑤ Route the opposite end of the type I, ¼-inch cotton webbing over the top of the parachutes to the opposite side of the load. Secure the type I, ¼-inch cotton webbing to the straps using a trucker's hitch. Trim the ends to 1-inch (not shown).
- ⑥ Route a second length of type I, ¼-inch cotton webbing between the top and middle parachutes, up through both top parachute's center clustering tabs, and through the ¾-inch shackle or Universal Static Line Snap hook. Secure the tie to itself using a surgeon's knot and locking knot or bow knot.

CAUTION

The tie in step 6 is a transportation tie and must be removed before airdrop.

Figure 14-25. Triple cross parachute secured

MARKING RIGGED LOAD

14-24. Mark the rigged load according to Paragraph 1-5 using the data given in Figure 14-26. If the load varies from the one shown in Figure 14-26, recompute the data. An AMC IMT 1033, 20050204, V1. (Shipper's Declaration for Dangerous Goods) may be required.

CAUTION

Make the final inspection IAW TM 4-48.03/MCRP 4-11.3C/TO 13C7-1-11 and AR 59-4/OPNAVINST 4630.24C/AFJ 13-210(I)/MCO 13480.1B before loaded on the aircraft.



RIGGING LOAD DATA

Rigged weight (as shown)	639 pounds
Suspended weight (as shown)	600 pounds
Height: (as shown)	40 inches
Maximum height (as shown)	64 1/4 inches
Width:	48 inches
Length: (as shown)	36 inches

Figure 14-26. LCLA resupply load rigged for low-velocity airdrop with triple cross parachute

EQUIPMENT REQUIRED

14-25. Use the equipment listed in Table 14-3 to rig the load shown in Figure 14-26.

Table 14-3. Equipment required for rigging triple cross parachute for low-cost low-altitude resupply load for low-velocity airdrop

<i>National Stock Number</i>	<i>Item</i>	<i>Quantity</i>
8040-00-273-8713	Adhesive, paste, 1 gallon	As required
4030-00-678-8560	Clevis, shackle, 3/8-inch diameter	1
	OR	
1670-01-476-3142	Snap Hook, universal static line (USL)	1
4020-00-240-2146	Cord, nylon, type III	As required
5365-00-937-0147	D-ring, heavy-duty	4
1670-00-753-3928	Pad, energy-dissipation material, honeycomb	1 sheet
1670-01-551-5433	Parachute, Cross	3
5530-00-128-4981	Plywood, 3/4- by 48- by 96-inch	1 sheet
	or	
5530-00-914-5118	Plywood, 1- by 48- by 96-inch	1 sheet
	Polypropylene, lightweight material	As required
8135-00-476-5268	Shrink wrap	As required
1670-01-554-0755	Sling Assembly, cargo airdrop (LCLA resupply load)	5
7510-00-074-5124	Tape, pressure sensitive, 2-inch (cloth-backed)	As required
7510-00-266-6712	Tape, pressure sensitive, masking	As required
8305-00-268-2411	Webbing, Cotton, type I, 1/4-inch	As required
8305-00-082-5752	Webbing, nylon, tubular, 1/2-inch	As required
8305-00-268-2455	Webbing, nylon, tubular, 1-inch	As required

SECTION IV – RIGGING LCLA RESUPPLY LOAD WITH LCLA 35-FOOT DIAMETER CARGO PARACHUTE AND 18- BY 24-INCH SKID BOARD FOR LOW-VELOCITY AIRDROP

DESCRIPTION OF LOAD

14-26. Four PA-120 metal cases of 40-mm ammunition and two cases of 20-oz water bottles are rigged in a LCLA resupply load for low-velocity airdrop. The LCLA resupply load consists of the LCLA 35-foot diameter cargo parachute, four 188-inch LCLA straps, four D-rings, and a cut-to-fit load cover (optional). The LCLA resupply load is capable of being rigged in three different configurations [(Configuration 1 – No Cover; Configuration 2 – Shrink Wrap; Configuration 3 – Polypropylene Load Cover)] for low-velocity airdrop using a ¾- or 1- by 24- by 18-inch A/C grade plywood skid board. The LCLA 35-foot diameter cargo parachute is pre-packed into a polypropylene D-bag. The load has a suspended weight of 260 pounds. The load has a total rigged weight of 279 pounds. The total rigged weight range is 119 to 469 pounds. The maximum dimensions for this load is 48- by 30- by 66-inches including parachutes.

Note. These procedures can be used to rig similar loads.



Figure 14-27. Load description

PREPARING ITEMS, SKID BOARD, AND POSITIONING STRAPS

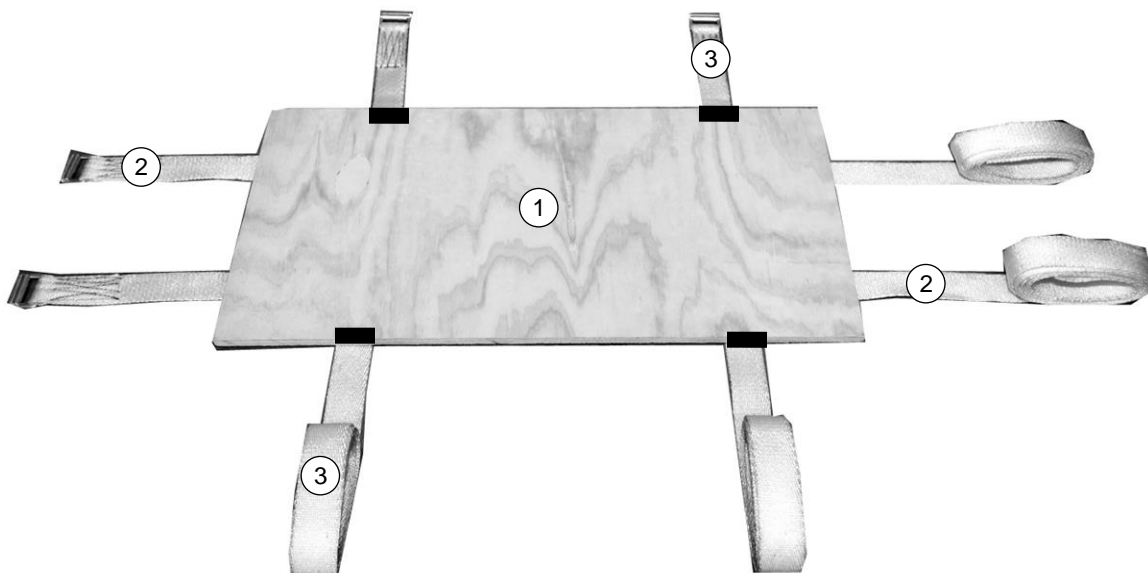
14-27. Prepare the skid board using Figure 14-28. Prepare the items to be dropped according to load's sensitivity. Items must be well padded to prevent damage during airdrop.

Note. The procedures described below will be utilized for all three configurations.

CAUTION

Only ammunition listed in TM 4-48.16/MCRP 4-11.3B/TO 13C7-18-41 may be airdropped.

Note. Tape all plywood edges where the straps make contact with the plywood.



- ① Cut a $\frac{3}{4}$ - by 24- by 18-inch piece of plywood. If $\frac{3}{4}$ -inch plywood is unavailable, use 1-inch plywood as a substitute. Lay on a flat surface with smooth side down (A side).
- ② Position and center two LCLA straps lengthwise under the plywood.
- ③ Position the two remaining LCLA load straps widthwise under the plywood, 4-inches from each edge.

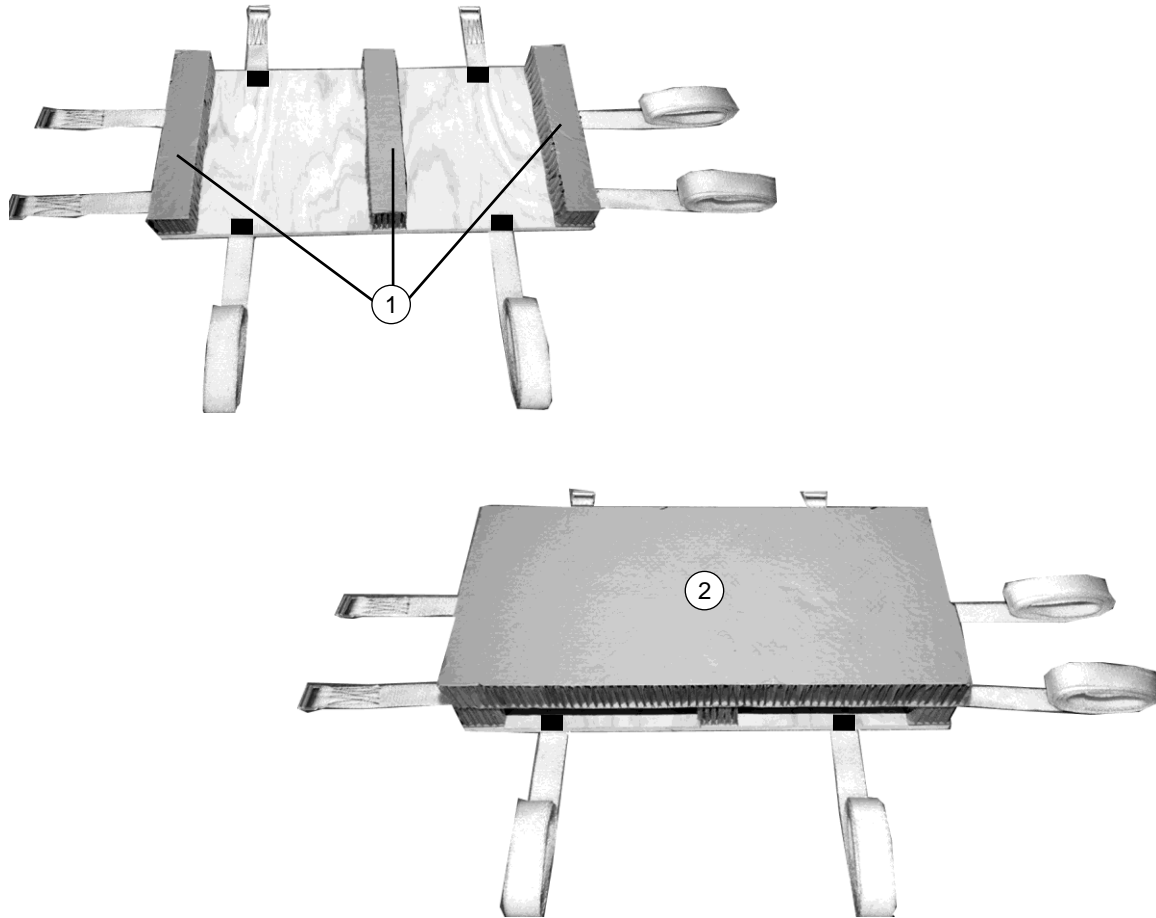
Figure 14-28. Skid board and items prepared

PREPARING AND PLACING HONEYCOMB

14-28. Prepare and place the honeycomb as shown in Figure 14-29.

- This is for configurations 1, 2, and 3.

Note. Glue all honeycomb to the skid board.



- ① Cut three, 3- by 18-inch pieces of honeycomb. Position two of the honeycomb pieces flush along the 18-inch edges of the plywood base. Center the third piece between the two pieces of honeycomb.
- ② Cut and glue a 24- by 18-inch piece of honeycomb on top of the previous honeycomb pieces.

Figure 14-29. Honeycomb prepared and placed

POSITIONING AND SECURING LOAD

14-29. The load can be configured in three ways, without cover, wrapped with shrink wrap, or with a LCLA resupply load lightweight polypropylene material (to be used as a cover). Center the load on the honeycomb. Secure load as shown in Figures 14-30 through 14-32 for all three configurations. .

- Configuration 1 without cover.

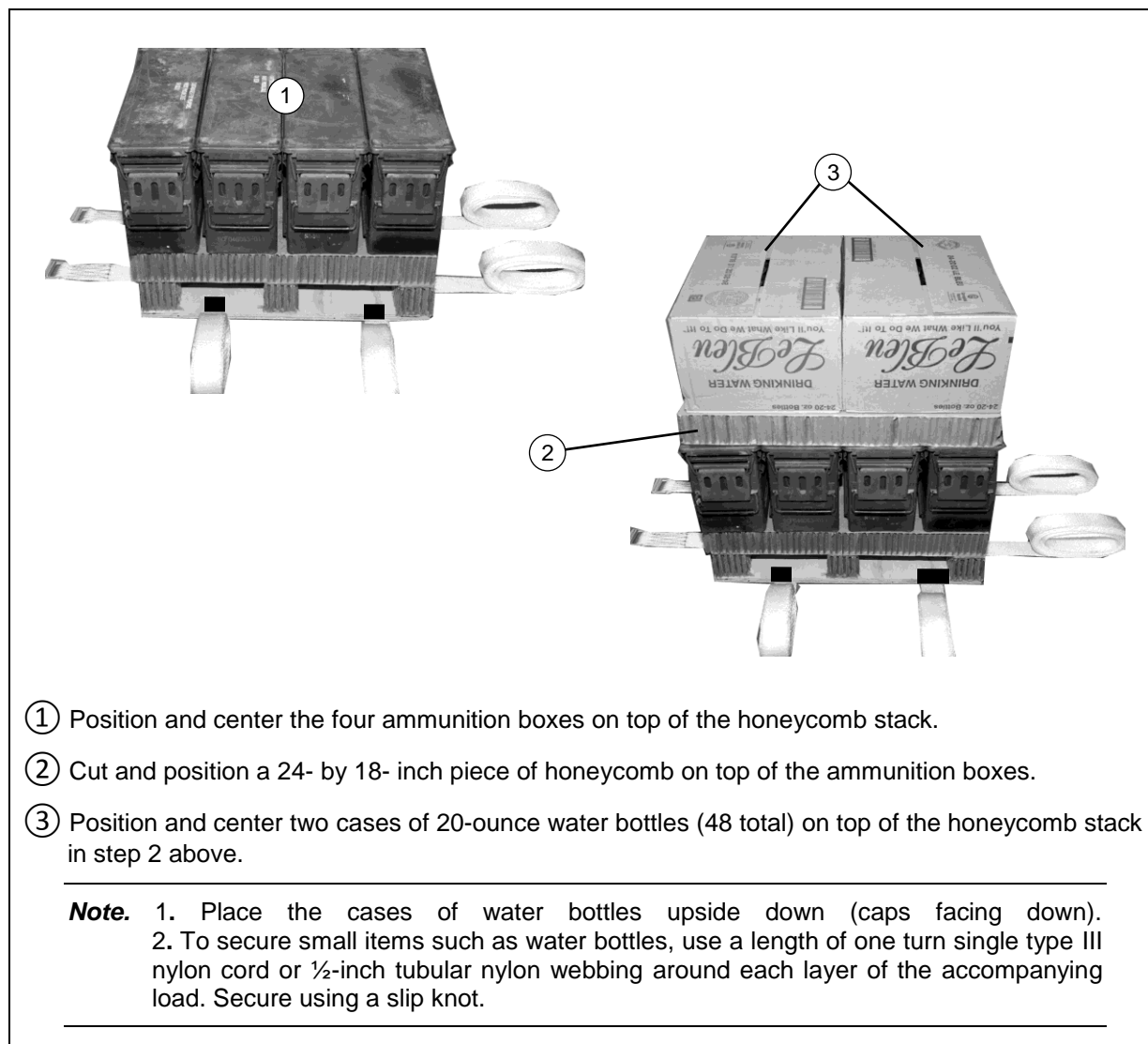
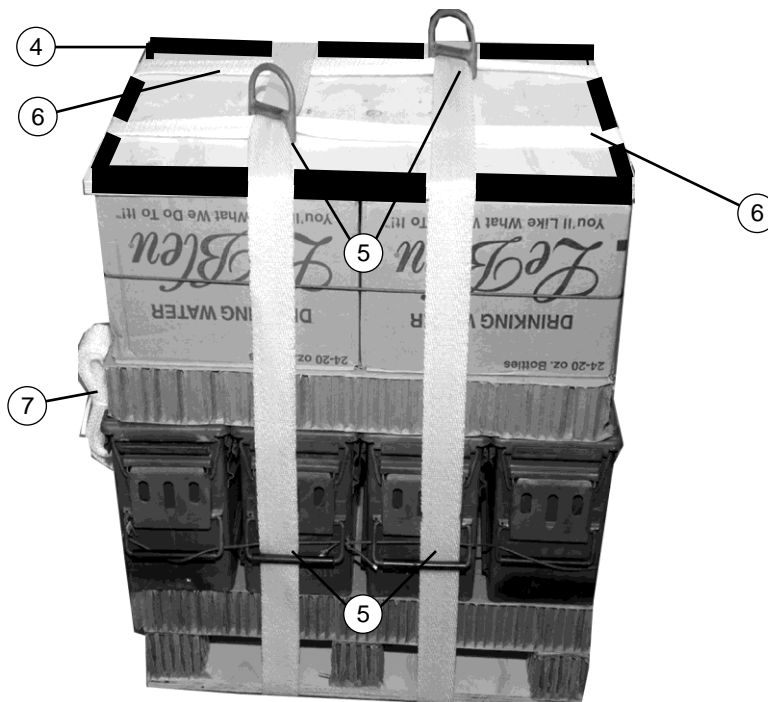


Figure 14-30. Load positioned and secured for configuration 1

- Notes.** 1. Tape all plywood edges where the straps make contact with the plywood.
2. Do not use the 1-inch tubular nylon webbing alternate suspension points on this type of load.



- ④ Position a $\frac{3}{4}$ - by 24- by 18-inch piece of A/C grade plywood on top of the water bottle cases.
- ⑤ Route the running ends of the LCLA resupply load straps that run lengthwise up through the carrying handle of the outside ammunition box, up and over the top of the load, through the rectangular portion of the first D-ring, through the rectangular portion of the second D-ring, and down to and through the friction adapter end of the strap.
- ⑥ Route the running ends of the LCLA resupply load straps that run widthwise up and over the top of the load, through the rectangular portion of the first D-ring, through the rectangular portion of the second D-ring, and down to and through the friction adapter end of the strap.
- ⑦ Secure the straps on the sides of the load and secure the excess webbing using type I, $\frac{1}{4}$ -inch cotton webbing.

Figure 14-30. Load positioned and secured for configuration 1 (continued)

- Configuration 2 with shrink wrap.



- ① Use steps 1 through 3 in Figure 14-30 for positioning load (not shown).
- ② Secure the load using two wraps of shrink wrap.
- ③ Use steps 4 through 7 of Figure 14-30 to complete rigging Configuration 2. Do not route straps through the ammunition box carrying handles

Figure 14-31. Load positioned and secured for configuration 2

- Configuration 3 with a LCLA resupply load lightweight polypropylene material (to be used as a cover).

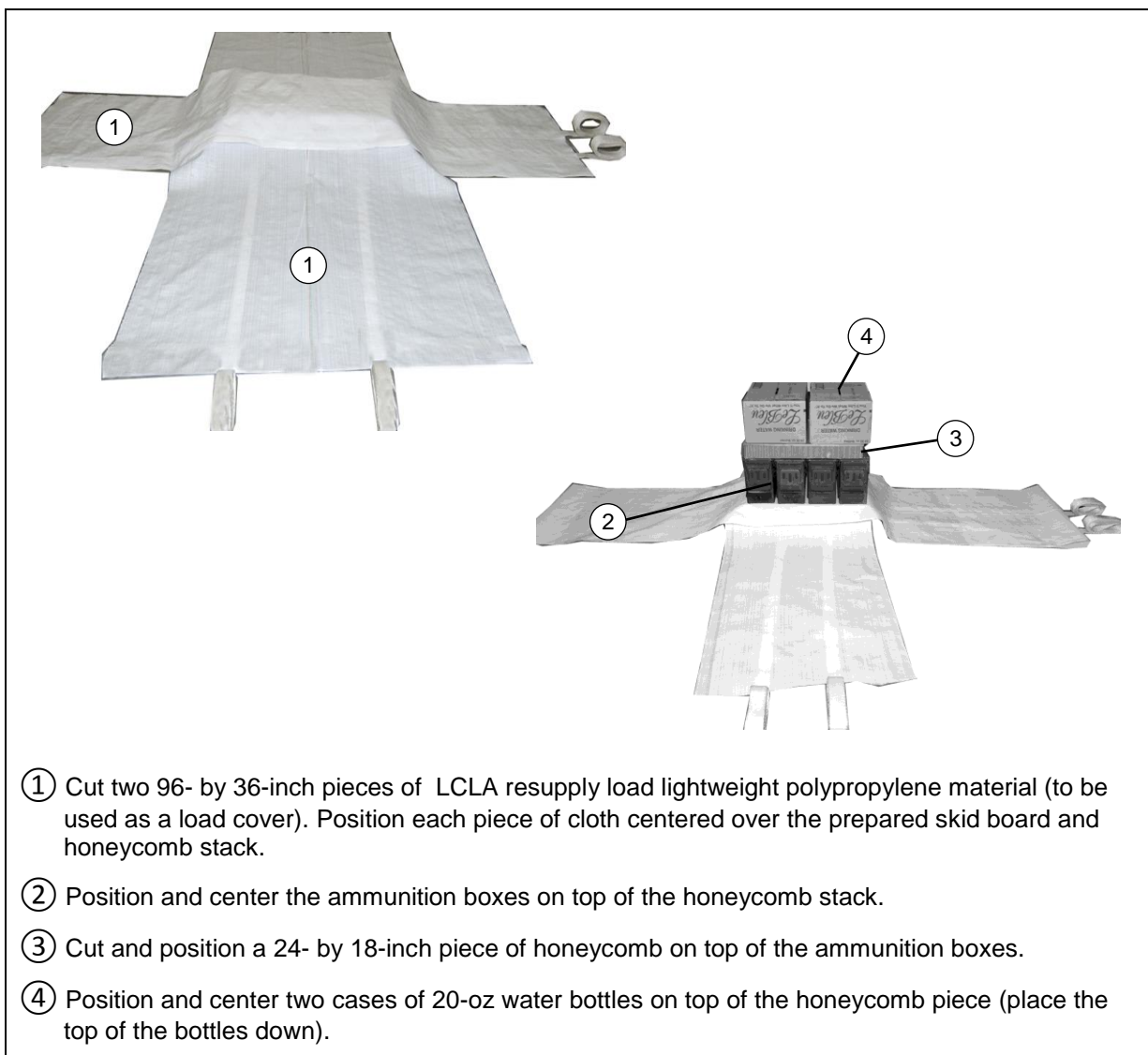
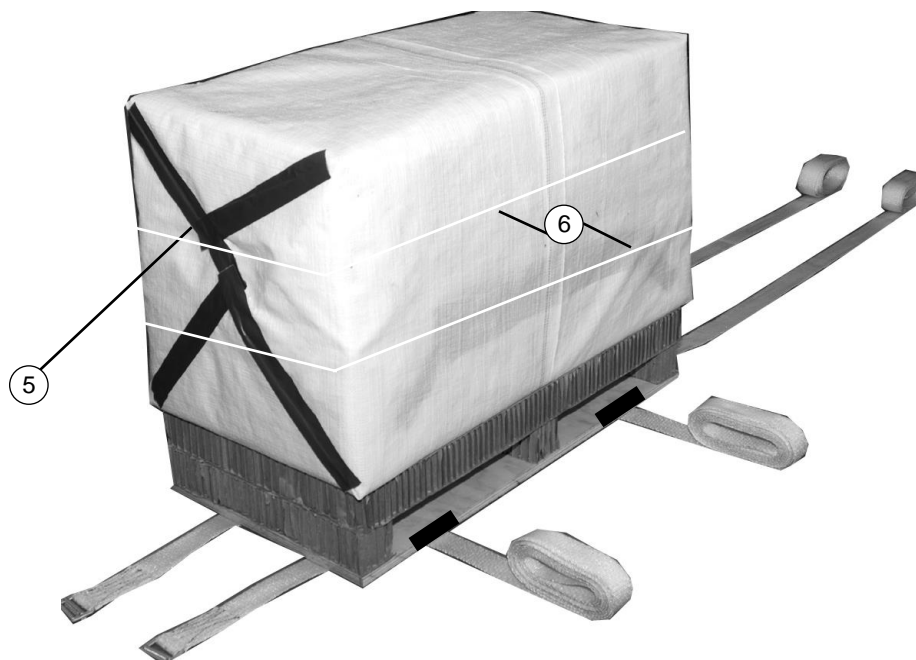


Figure 14-32. Load positioned and secured for configuration 3

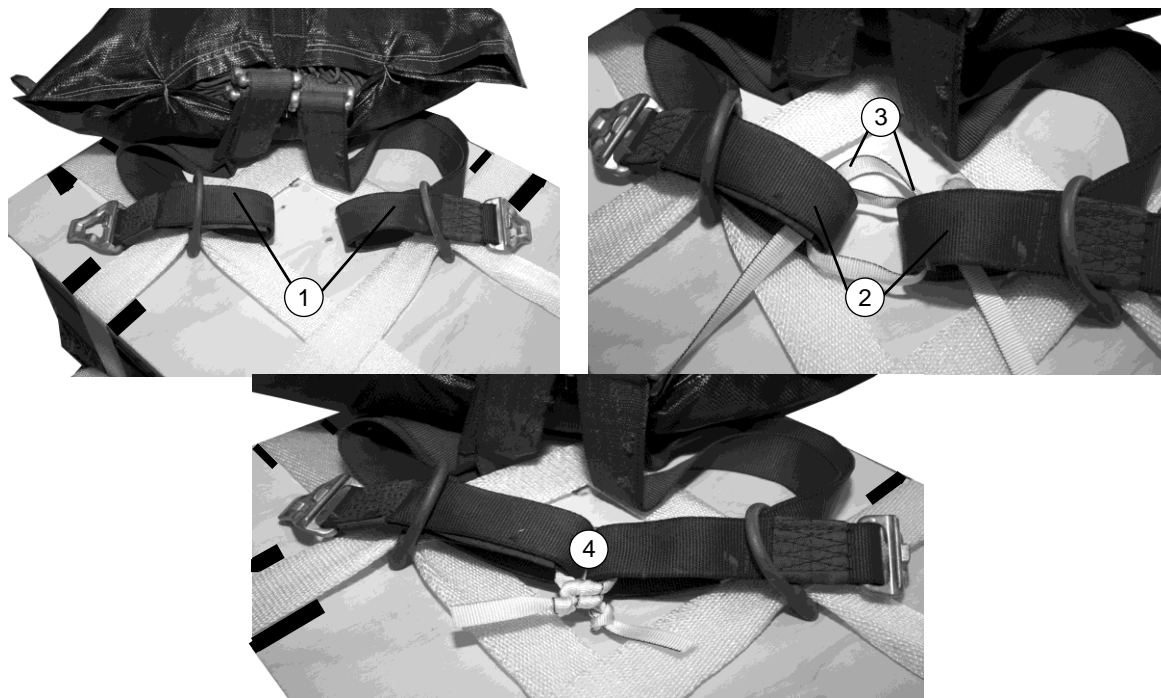


- ⑤ Fold the load cover over the sides of the load. Tuck the sides in and secure the excess using 2-inch cloth-backed tape.
- ⑥ Route a single length of type III, nylon cord around the covered load evenly spaced. Secure using a non-slip knot.
- ⑦ Use steps 4 through 7 of Figure 15-23 to complete rigging Configuration 3. Do not route straps through the ammunition box carrying handles.

Figure 14-32. Load positioned and secured for configuration 3 (continued)

INSTALLING PARACHUTE

14-30. Install the LCLA 35-foot diameter cargo parachute as shown in Figure 14-33 for all three configurations.



- ① Prepare the parachutes by separating the two groups of risers.
- ② Fold each set of risers forming a loop on each riser and run the loop (outboard/inboard) through each D-ring.
- ③ Route a length of ½-inch tubular nylon, two turns single through the formed loops on the risers.
- ④ Secure the running ends in place using a surgeon's knot, locking knot, and an overhand knot in each running end.

CAUTION

The ½-inch tubular nylon tie on the risers must be tight with no loop, otherwise, the parachute may separate from the load causing the load to be destroyed.

Figure 14-33. LCLA 35-foot diameter cargo parachute installed

SECURING PARACHUTE

14-31. Secure the LCLA 35-foot diameter cargo parachute configuration as shown in Figure 14-34 for all three configurations.

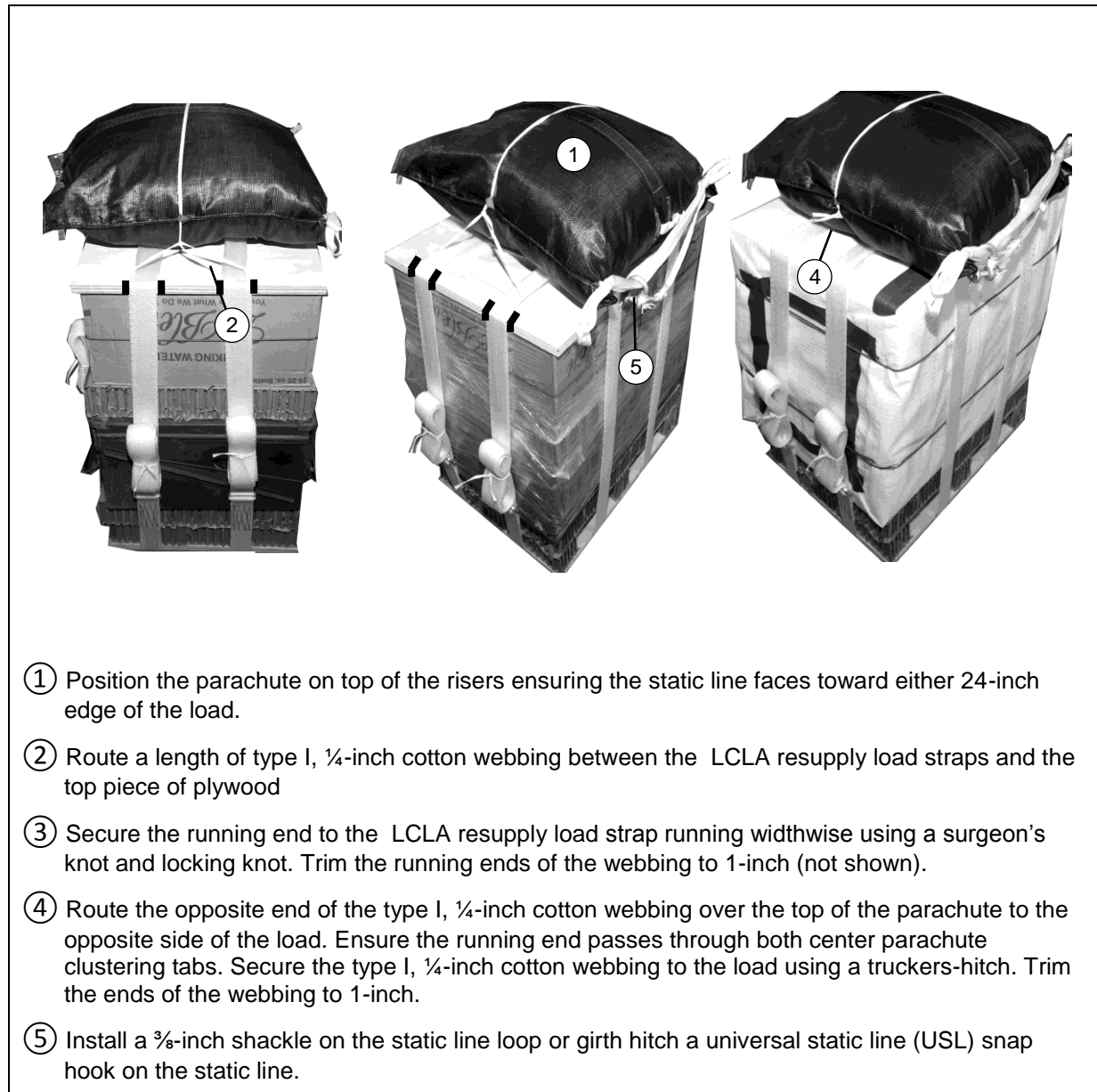


Figure 14-34. LCLA 35-foot diameter cargo parachute secured

MARKING RIGGED LOAD

14-32. Mark the rigged load according to Paragraph 1-5 using the data given in Figure 14-35. If the load varies from the one shown in Figure 15-34, recompute the data. An AMC IMT 1033, 20050204, V1. (Shipper's Declaration for Dangerous Goods) may be required.

CAUTION

Make the final inspection IAW TM 4-48.03/MCRP 4-11.3C/TO 13C7-1-11 and AR 59-4/OPNAVINST 4630.24C/AFJ 13-210(I)/MCO 13480.1B before loaded on the aircraft.



RIGGING LOAD DATA

Rigged weight (as shown).....	279 pounds
Minimum load allowed.....	182 pounds
Maximum load allowed.....	364 pounds
Suspended weight (as shown).....	260 pounds
Height: (as shown)	39 inches
Maximum height (as shown)	48 inches
Width: (as shown)	24 inches
Length: (as shown).....	18 inches

Figure 14-35. LCLA resupply load rigged for low-velocity airdrop with LCLA 35-foot diameter cargo parachute

EQUIPMENT REQUIRED

14-33. Use the equipment listed in Table 14-4 to rig the load shown in Figure 14-35.

Table 14-4. Equipment required for rigging the low-cost low-altitude resupply load for low-velocity airdrop with an LCLA 35-diameter cargo parachute

<i>National Stock Number</i>	<i>Item</i>	<i>Quantity</i>
8040-00-273-8713	Adhesive, paste, 1 gallon	As required
4030-00-678-8560	Clevis, shackle, 3/8-inch diameter	1
4020-00-240-2146	Cord, nylon, type III	As required
5365-00-937-0147	D-ring, heavy-duty	2
1670-00-753-3928	Pad, energy-dissipation material, honeycomb	1 sheet
1670-01-578-6655	Parachute, LCLA 35-foot diameter, cargo	1
5530-00-128-4981	Plywood, 3/4- by 48- by 96-inch	1 sheet
	or	
5530-00-914-5118	Plywood, 1- by 48- by 96-inch	1 sheet
N/A	Polypropylene, lightweight material	As required
8135-00-476-5268	Shrink wrap	As required
1670-01-544-0755	Sling Assembly, cargo airdrop (LCLA resupply load)	4
1670-01-476-3142	Snap hook, universal static line (USL)	1
7510-00-074-5124	Tape, pressure sensitive, 2-inch (cloth-backed)	As required
8305-00-268-2411	Webbing, Cotton, type I, 1/4-inch	As required
8305-00-082-5752	Webbing, Nylon, tubular, 1/2-inch	As required
8305-00-268-2455	Webbing, Nylon, tubular, 1-inch	As required

SECTION V – RIGGING LCLA RESUPPLY LOAD WITH LCLA 35-FOOT DIAMETER CARGO PARACHUTE AND A 36- BY 48-INCH SKID BOARD FOR LOW-VELOCITY AIRDROP

DESCRIPTION OF LOAD

14-34. Four boxes of 105-mm ammunition are rigged in a LCLA resupply load for low-velocity airdrop. The LCLA resupply load consists of the LCLA 35-foot diameter cargo parachute and five 188-inch LCLA straps. The LCLA resupply load uses a $\frac{3}{4}$ - (or 1-) by 36- by 48-inch A/C grade plywood skid board. The LCLA 35-foot diameter cargo parachute is pre-packed into a polypropylene D-bag. This load has a suspended weight of 260 pounds. The load has a maximum total rigged weight of 517 pounds. The suspended weight range is 119 to 500 pounds.

Note. These procedures can be used to rig similar loads.

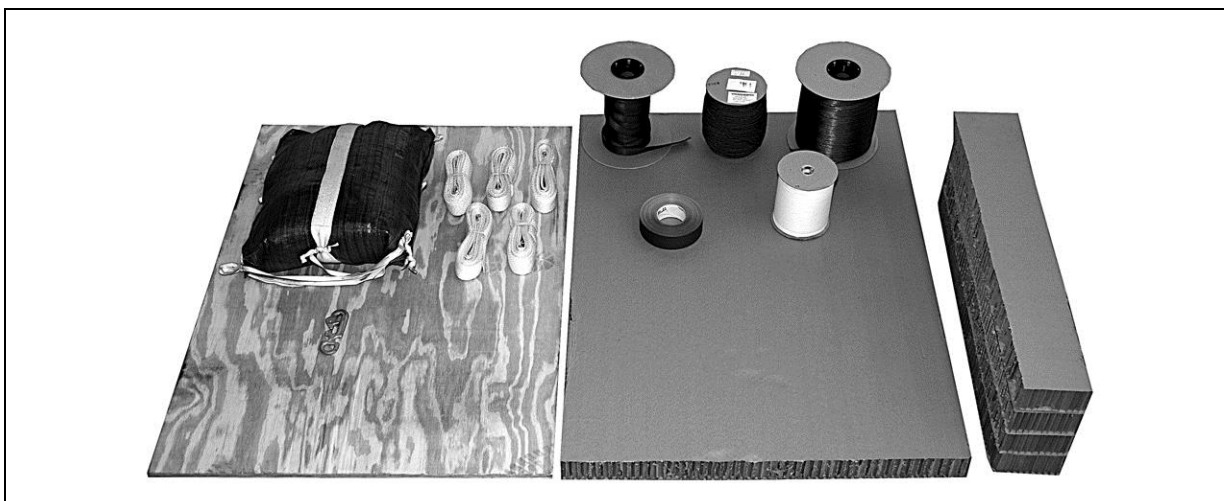


Figure 14-36. Load description

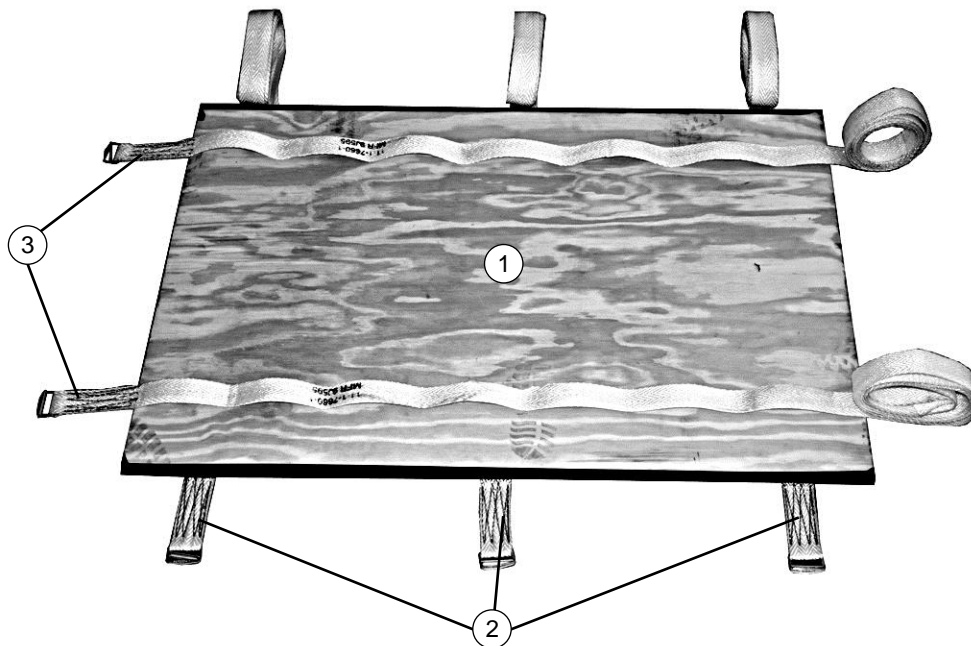
PREPARING SKID BOARD AND POSITIONING STRAPS

14-35. Prepare the skid board using Figure 15-37. Prepare the items to be dropped according to load's sensitivity. Items must be well padded to prevent damage during airdrop.

CAUTION

Only ammunition listed in TM 4-48.16/MCRP 4-11.3B/TO 13C7-18-41 may be airdropped.

Note. Tape all plywood edges where the straps make contact with the plywood.



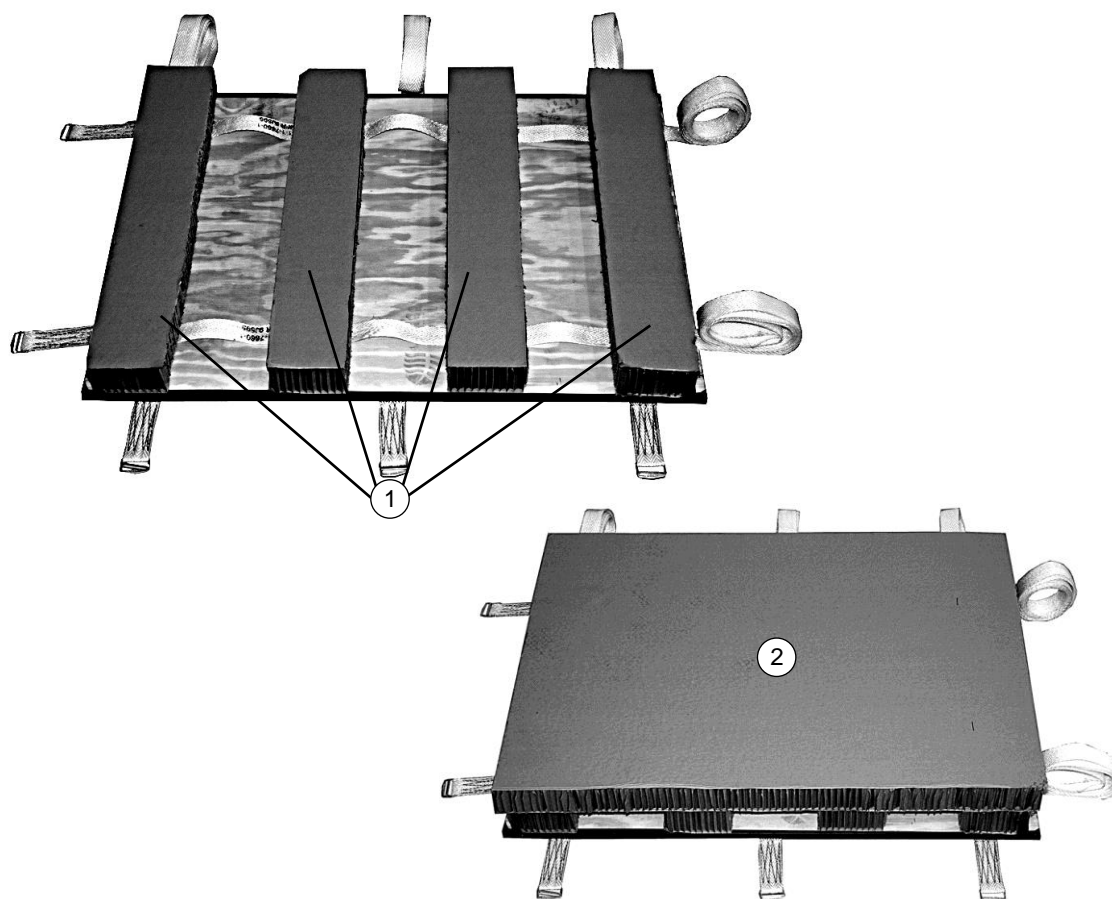
- ① Cut a $\frac{3}{4}$ - by 48- by 36-inch piece of A/C plywood. If $\frac{3}{4}$ -inch plywood is unavailable, use 1-inch plywood as a substitute. Lay on a flat surface with smooth side down (A side).
- ② Position the three LCLA load straps lengthwise under the plywood. The outside LCLA load straps are 4-inches from each edge. Center the third LCLA load strap under the skid board.
- ③ Position two LCLA straps widthwise on top of the plywood 4-inches from the front and rear edge of the skid board.

Figure 14-37. Skid board prepared

PREPARING AND PLACING HONEYCOMB

14-36. Prepare and place the honeycomb as shown in Figure 14-38.

Note. Glue all honeycomb to the skid board.



- ① Cut four, 3- by 36-inch pieces of honeycomb. Position two of the honeycomb pieces along the 36-inch edges of the plywood base, 1 inch in from the edge. Evenly space the remaining two pieces of honeycomb between the first two pieces of honeycomb. Tape the outside bottom edges of the first two pieces of honeycomb with cloth-backed tape.
- ② Cut and glue a 48- by 36-inch piece of honeycomb on top of the previous honeycomb pieces.

Figure 14-38. Honeycomb prepared and placed

POSITIONING AND SECURING LOAD

14-37. Center the load on the honeycomb. Secure load as shown in Figures 14-39 through 14-41.

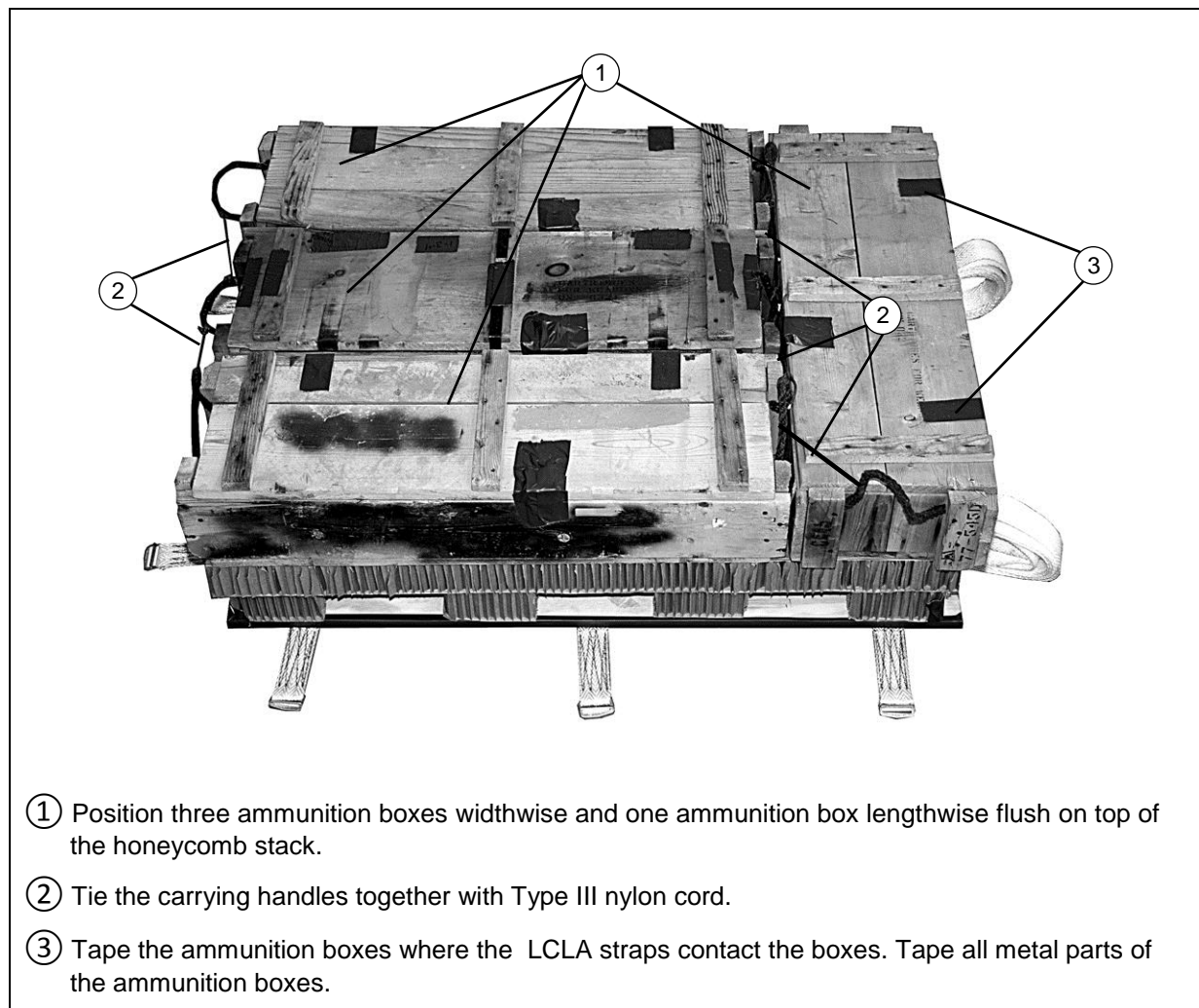
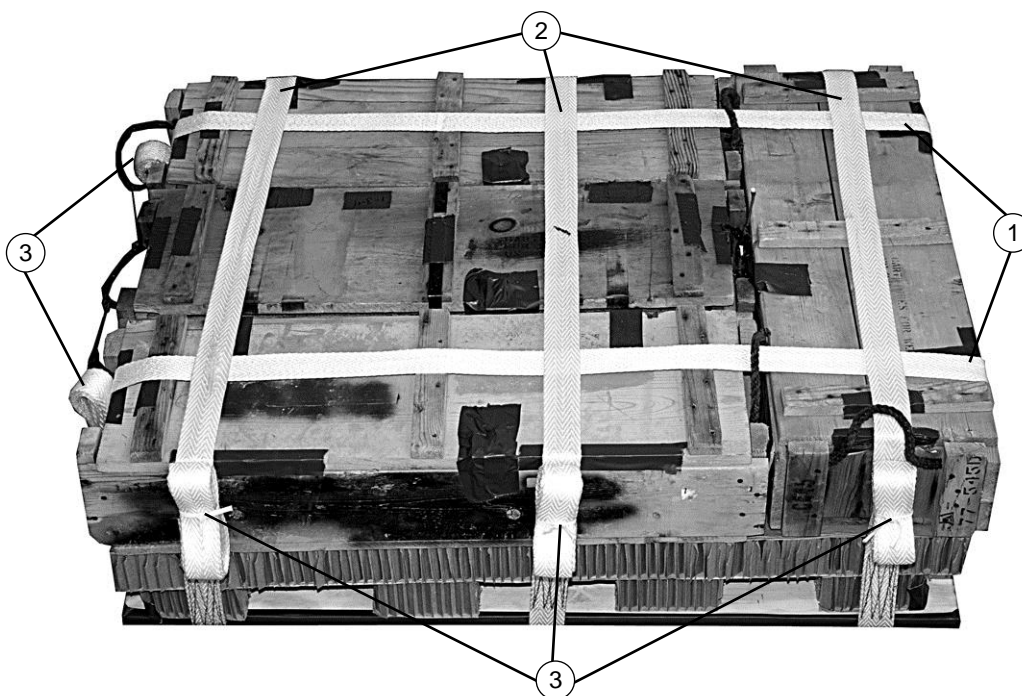


Figure 14-39. Load positioned

Note. Tape all sharp edges where the straps make contact with the boxes.



- ① Route the running ends of the LCLA resupply load straps that run widthwise up through the carrying handle of the outside ammunition box, up and over the top of the load, through the rectangular portion of the first D-ring, through the rectangular portion of the second D-ring, and down to and through the friction adapter end of the strap.
- ② Route the running ends of the LCLA resupply load straps that run lengthwise up through the carrying handles, over the top of the load, through the carrying handles, and down to and through the friction adapter end of the strap.
- ③ Secure the straps on the sides of the load and secure the excess webbing using type I, ¼-inch cotton webbing.

Figure 14-40. Load secured

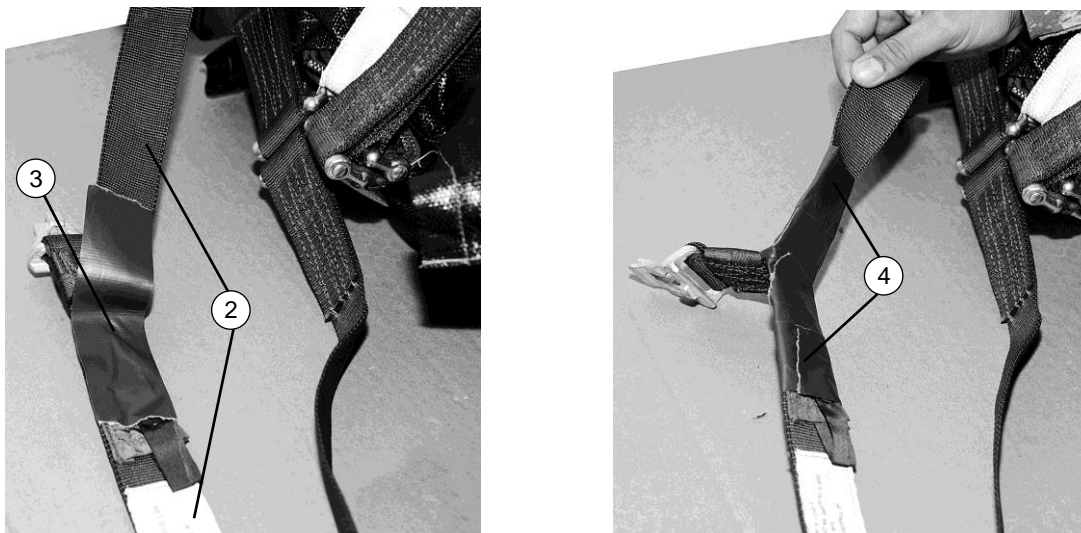


- ① Secure the LCLA straps where the straps form a cross on the top of the load with ½-inch tubular nylon webbing. Route the ½-inch tubular nylon webbing under both straps and secure it on top using a surgeon's knot and locking knot. Secure all six points.

Figure 14-41. Load safety tied

INSTALLING PARACHUTE

14-38. Install the LCLA 35-foot diameter cargo parachute as shown in Figure 14-42.



- ① Prepare the parachute by separating the two groups of risers (not shown).
- ② Separate one set of risers to expose the inner sewn portion at the canopy release assembly.
- ③ Place a piece of 2-inch cloth-backed adhesive tape approximately 8-inches in length at the sewn portion of the riser assembly.
- ④ Wrap the riser assembly and the previously placed tape using 2-inch cloth-backed adhesive tape.
- ⑤ Repeat steps 1 through 4 for the second set of risers.

Figure 14-42. LCLA 35-foot diameter cargo parachutes installed

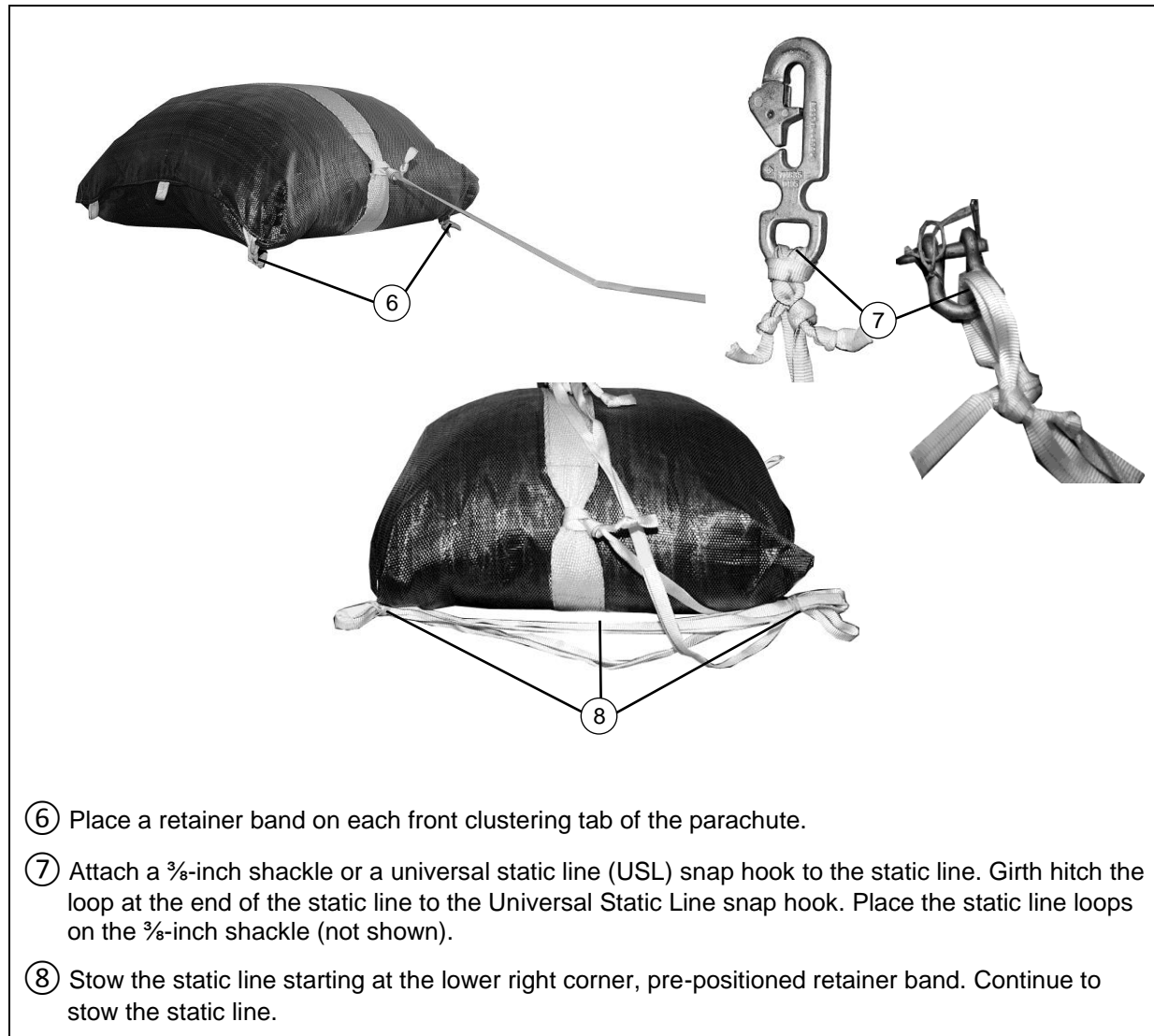
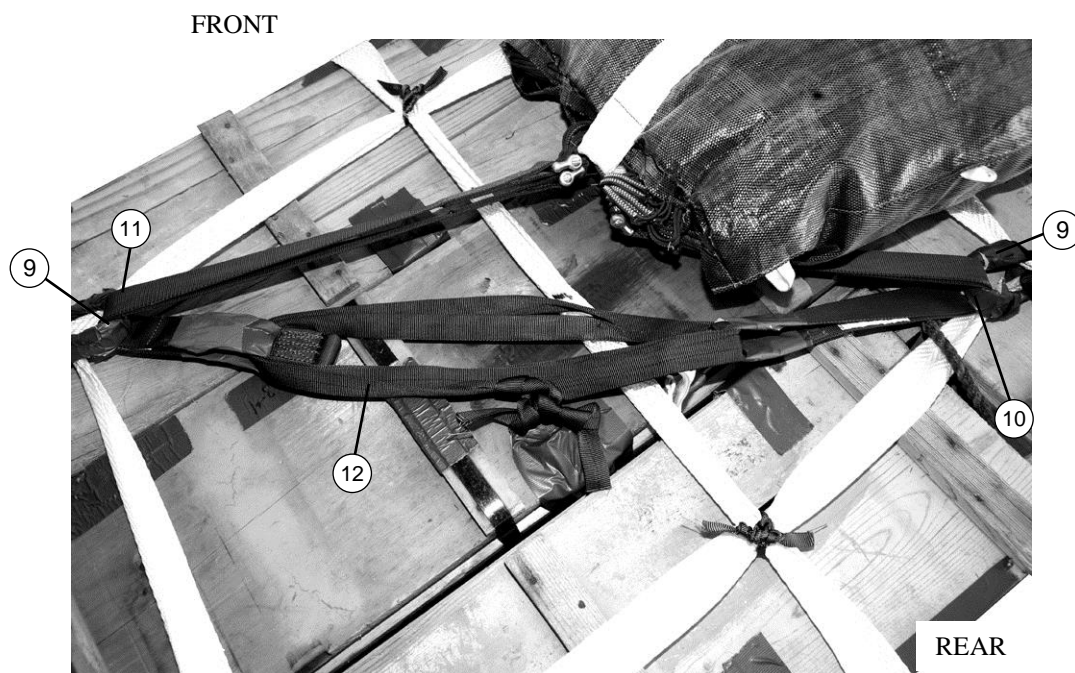


Figure 14-42. LCLA 35-foot diameter cargo parachutes installed (continued)

Note. These instructions are load specific.



CAUTION

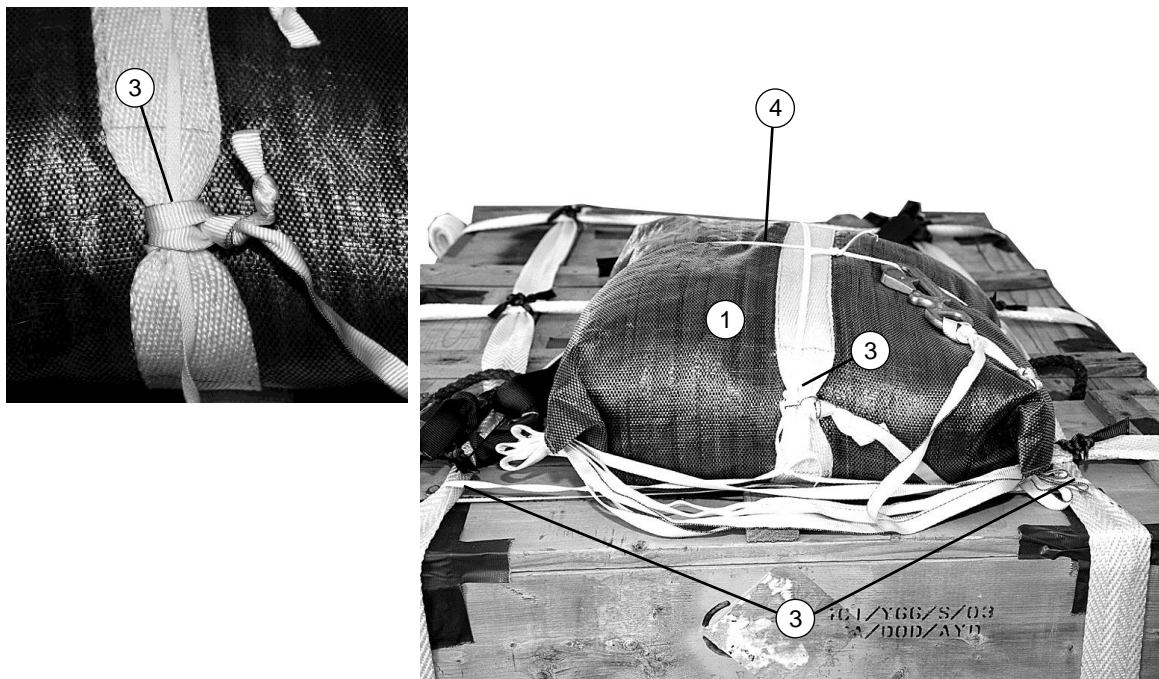
Do not use heavy duty D-rings on this load. Heavy duty D- rings must be replaced by 1-inch tubular nylon webbing.

- ⑨ Prepare two suspension points, diagonally across from each other, on the outside intersections of the LCLA straps as shown in Figure 14-5 using 1-inch tubular nylon webbing.
- ⑩ Route the right riser (Riggers View) under the parachute and through the rear right suspension point from outside to inside.
- ⑪ Route the left riser from outside to inside on the front left (diagonal corner) suspension point.
- ⑫ Route the 1-inch tubular nylon webbing through both sets of risers, two turns single. Ensure the 1-inch tubular nylon webbing is routed between each set of risers where the risers are taped. Remove all twists from the 1-inch tubular nylon webbing and secure the free running ends using a Surgeon's knot and locking knot. Trim the excess to two inches.

Figure 14-42. LCLA 35-foot diameter cargo parachutes installed (continued)

SECURING PARACHUTE

14-39. Secure the LCLA 35-foot diameter cargo parachute as shown in Figure 14-43.



- ① Position the parachute on top of the load ensuring the static line faces toward either 36-inch edge of the load.
- ② Route a length of type I, ¼-inch cotton webbing around the nearest LCLA resupply load strap and secure with a surgeons and locking knot (not shown).
- ③ Route the opposite end of the type I, ¼-inch cotton webbing over the top of the parachutes to the opposite side of the load and down through the static line attaching loop. Ensure the type I, ¼-inch cotton webbing is routed behind the static line of the parachutes. Route the free running end under both LCLA Strap on top of the load and secure using a trucker's hitch.
- ④ Route a length of type I, ¼-inch cotton under the parachute and through both center parachute clustering tabs. Secure the type I, ¼-inch cotton webbing to itself with a surgeons and locking knot or a bow knot. Attach the ⅜-inch shackle or universal static line (USL) snap hook to the tie.

CAUTION

The tie in step 4 is a transportation tie and must be removed before airdrop.

Figure 14-43. LCLA 35-foot diameter cargo parachutes secured

MARKING RIGGED LOAD

14-40. Mark the rigged load according to Paragraph 1-5 using the data given in Figure 14-44. If the load varies from the one shown in Figure 14-44, recompute the data. An AMC IMT 1033, 20050204, V1. (Shipper's Declaration for Dangerous Goods) may be required.

CAUTION

Make the final inspection IAW TM 4-48.03/MCRP 4-11.3C/TO 13C7-1-11 and AR 59-4/OPNAVINST 4630.24C/AFJ 13-210(I)/MCO 13480.1B before loaded on the aircraft.



RIGGING LOAD DATA

Rigged weight (as shown).....	517 pounds
Minimum load allowed.....	119 pounds
Maximum load allowed.....	500 pounds
Suspended weight (as shown).....	500pounds
Height: (as shown)	22 ½ inches
Maximum height (as shown)	50 inches
Width: (as shown)	48 inches
Length: (as shown).....	36 inches

Figure 14-44. LCLA resupply load rigged for low-velocity airdrop with LCLA 35-foot diameter cargo parachute

EQUIPMENT REQUIRED

14-41. Use the equipment listed in Table 14-5 to rig the load shown in Figure 14-44.

Table 14-5. Equipment required for rigging the low-cost low-altitude resupply load for low-velocity airdrop with an LCLA 35-diameter cargo parachute

<i>National Stock Number</i>	<i>Item</i>	<i>Quantity</i>
8040-00-273-8713	Adhesive, paste, 1 gallon	As required
4030-00-678-8560	Clevis, shackle, 3/8-inch diameter OR	1
1670-01-476-3142	Snap hook, universal static line (USL)	1
4020-00-240-2146	Cord, nylon, type III	As required
1670-00-753-3928	Pad, energy-dissipation material, honeycomb	1 sheet
1670-01-578-6655	Parachute, LCLA 35-foot diameter, cargo	1
5530-00-128-4981	Plywood, 3/4- by 48- by 96-inch or	1 sheet
5530-00-914-5118	Plywood, 1- by 48- by 96-inch	1 sheet
1670-01-544-0755	Sling Assembly, cargo airdrop (LCLA resupply load)	5
7510-00-074-5124	Tape, pressure sensitive, 2-inch (cloth-backed)	As required
8305-00-268-2411	Webbing, Cotton, type I, 1/4-inch	As required
8305-00-082-5752	Webbing, Nylon, tubular, 1/2-inch	As required
8305-00-268-2455	Webbing, Nylon, tubular, 1-inch	As required

SECTION VI – RIGGING AN LCLA RESUPPLY LOAD WITH DOUBLE LCLA 35-FOOT DIAMETER CARGO PARACHUTES AND A 36- BY 48-INCH SKID BOARD FOR LOW-VELOCITY AIRDROP

DESCRIPTION OF LOAD

14-42. Eight boxes of 105-mm ammunition are rigged in a low cost low altitude aerial delivery system (LCLA ADS) for low-velocity airdrop. The LCLA ADS consists of two, 35-foot diameter cargo parachutes, five 188-inch LCLA straps. The LCLA ADS is suspended for low-velocity airdrop using a $\frac{3}{4}$ -inch (or 1-inch) by 48- by 36-inch A/C grade plywood skid board. The double 35-foot diameter cargo parachutes are pre-packed into polypropylene deployment bags and can sustain a total rigged weight range of 501-1,000 pounds. This load has a total rigged weight of 1,034 pounds. It has a height of 38 $\frac{1}{2}$ - inches, a width of 48 inches and a length of 36 inches.

Note. These procedures can be used to rig similar loads.



Figure 14-45. Load description

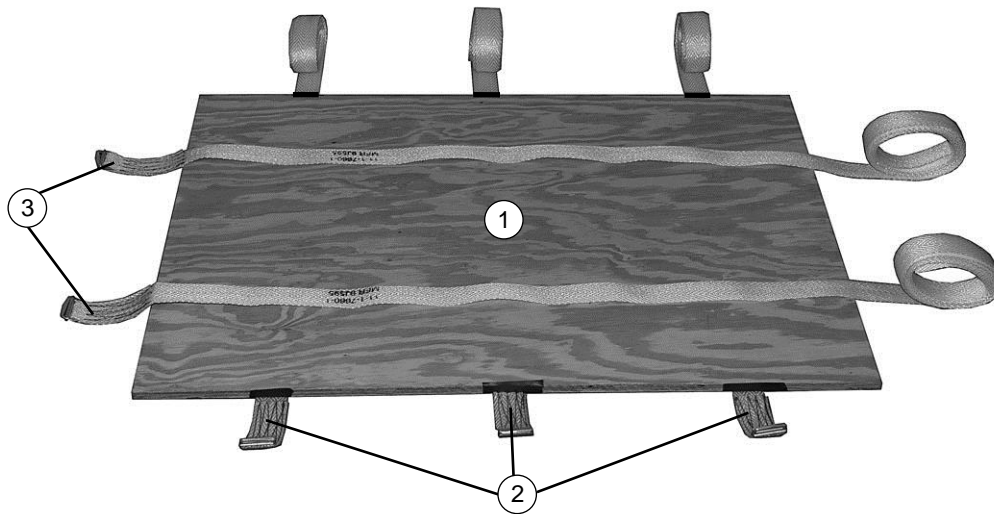
PREPARING ITEMS, SKID BOARD, AND POSITIONING STRAPS

14-43. Prepare the skid board using Figure 14-46. Prepare the items to be dropped according to the load's sensitivity. Items must be well padded to prevent damage during airdrop.

CAUTION

Only ammunition listed in TM 4-48.16/MCRP 4-11.3B/TO 13C7-18-41 may be airdropped.

Note. Tape all plywood edges where the straps make contact with the plywood.



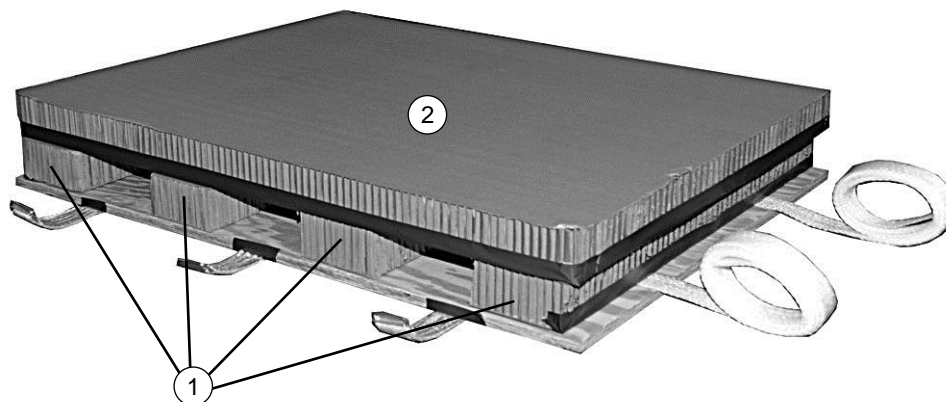
- ① Cut a $\frac{3}{4}$ - by 48- by 36-inch piece of plywood. If $\frac{3}{4}$ -inch plywood is unavailable, use 1-inch plywood as a substitute. Lay on a flat surface with smooth side down (A side).
- ② Position two LCLA straps lengthwise, 4-inches in from each edge under the plywood with the sewn portion facing up and against the edge of the plywood. Center a third LCLA strap lengthwise under the plywood with the sewn portion facing up and against the edge of the plywood.
- ③ Place two LCLA straps widthwise on top of the plywood. Ensure the sewn portion is facing up and against the edge of the plywood.

Figure 14-46. Skid board and items prepared

PREPARING AND PLACING HONEYCOMB

14-44. Prepare and place the honeycomb as shown in Figure 14-47.

Note. Glue all honeycomb to the skid board.



- ① Cut four 36- by 6-inch pieces of honeycomb. Position two of the honeycomb pieces along the 36-inch edges approximately 1-inch in from the edge of the plywood. Position the remaining two pieces of honeycomb evenly spaced between the two pieces of honeycomb. Tape the edges of the two outer pieces of honeycomb using 2-inch cloth-backed adhesive tape.
- ② Cut and glue a 48- by 36-inch piece of honeycomb on top of the previous honeycomb pieces. Tape the edges of the honeycomb using 2-inch cloth-backed adhesive tape.

Figure 14-47. Honeycomb prepared and placed

POSITIONING AND SECURING LOAD

14-45. The load can be configured in three ways, without cover, wrapped with shrink wrap (4 wraps), or with lightweight polypropylene material (to be used as a cover). Center the load on the honeycomb. Secure load as shown in Figures 14-48.

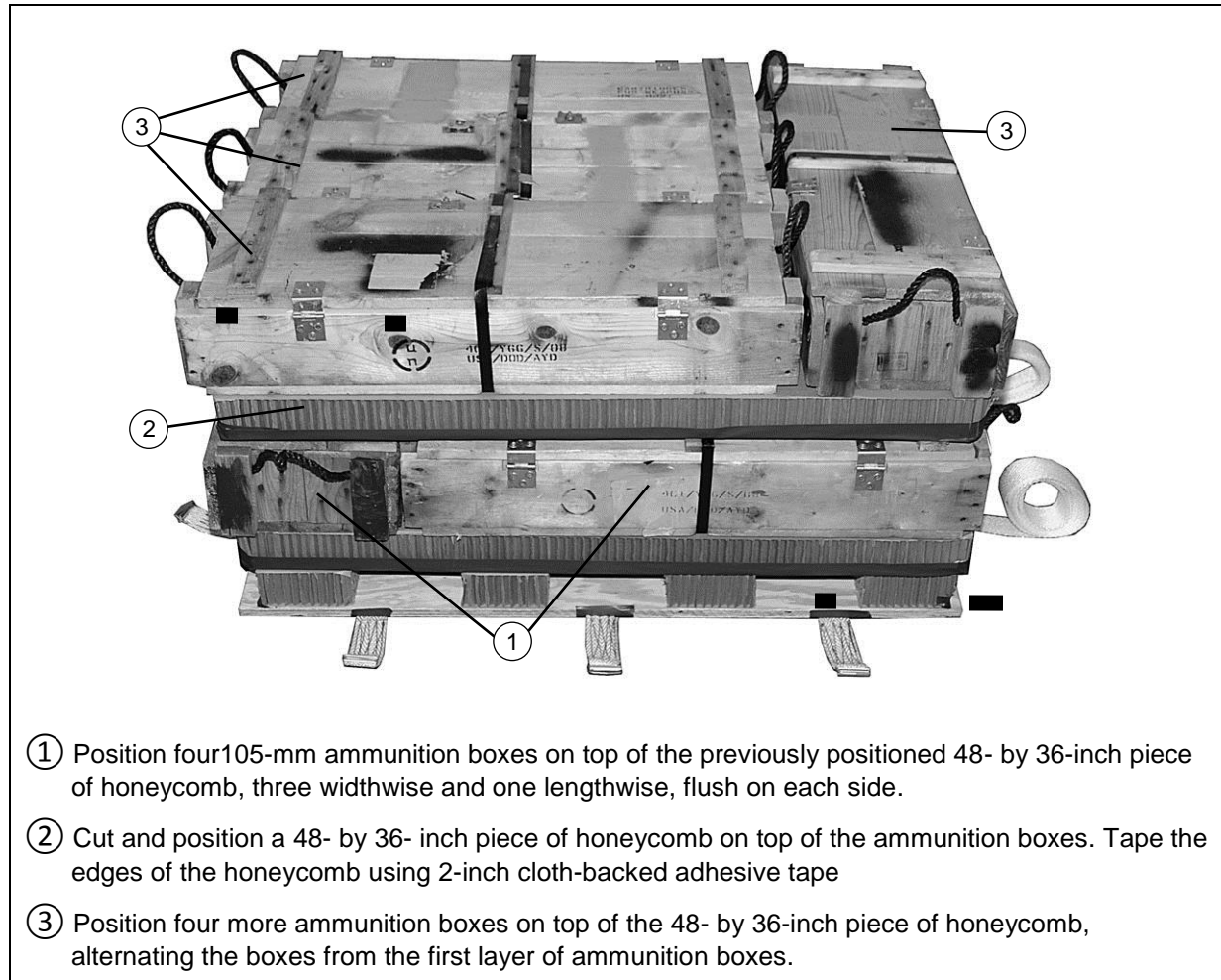
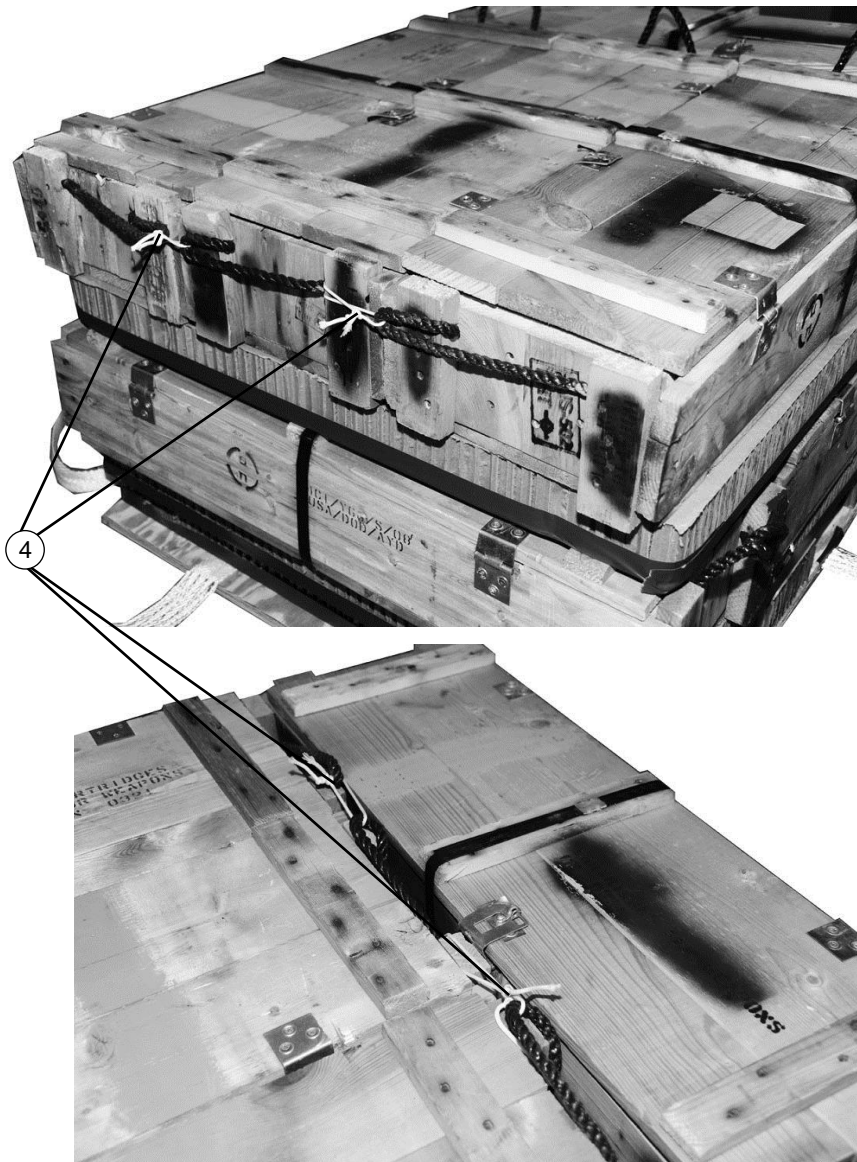


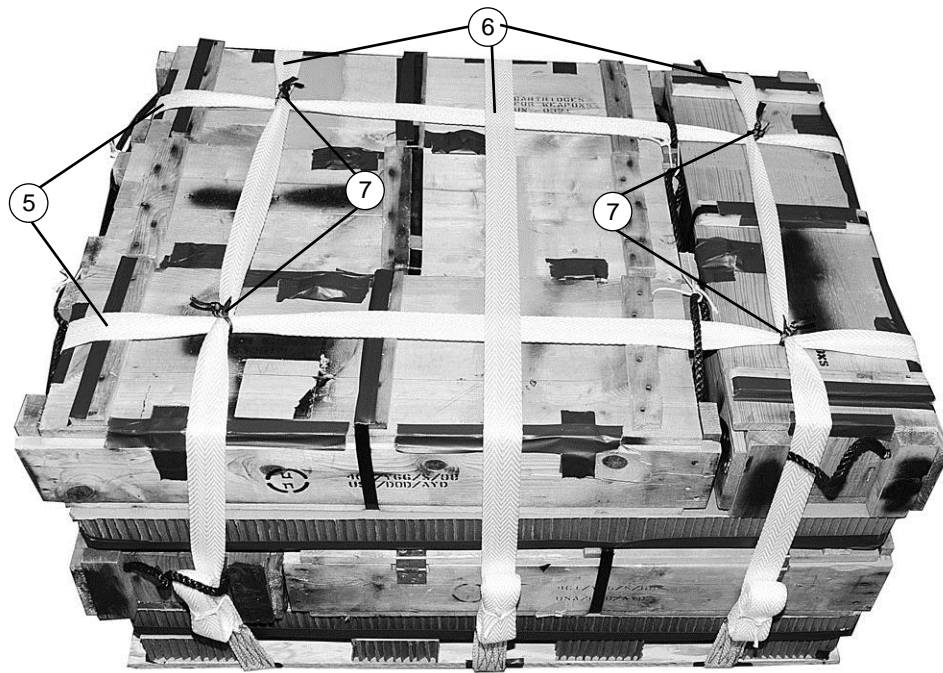
Figure 14-48. Load positioned and secured

Note. Tape all wood and metal edges where the straps make contact.



④ Secure all carrying handles together using a length of type III nylon cord.

Figure 14-48. Load positioned and secured (continued)

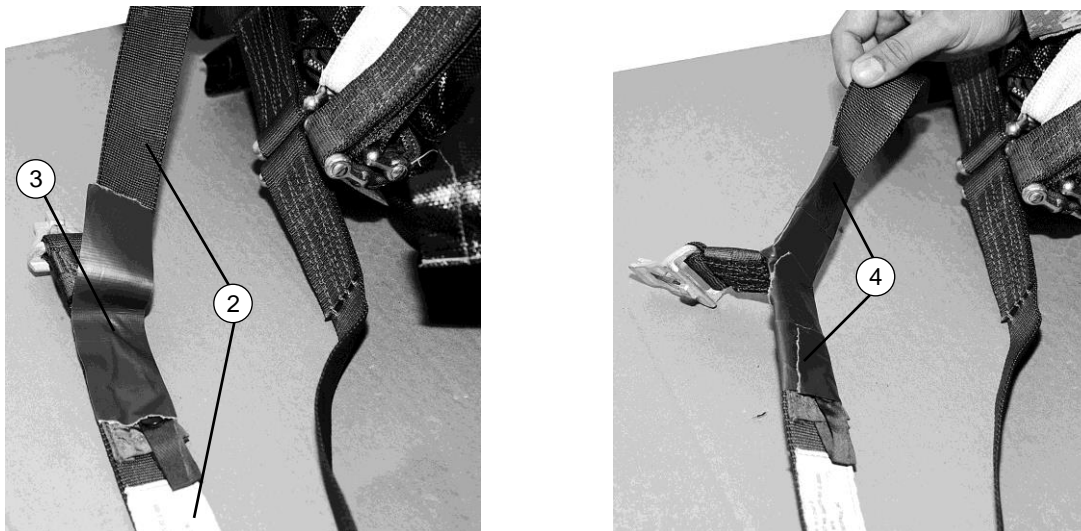


- ⑤ Route the running ends of the LCLA straps that run widthwise up through the carrying handles of the ammunition boxes, over the top of the load, through the carrying handles of the ammunition boxes, through the friction adapter end of the LCLA straps. Fold and secure the excess strap using type I, ¼-inch cotton webbing.
- ⑥ Route the running ends of the LCLA straps that run lengthwise through the carrying handles of the ammunition boxes, over the top of the load, through the carrying handles of the ammunition boxes, and down through the friction adapter end of the LCLA straps. Fold and secure the excess strap using type I, ¼-inch cotton webbing.
- ⑦ Secure the LCLA straps where the straps form a cross on the top of the load using a length of ½-inch tubular nylon webbing. Route the ½-inch tubular nylon webbing under both straps and secure it on top using a surgeon's knot and locking knot. Secure the outside four points of the load.

Figure 14-48. Load positioned and secured (continued)

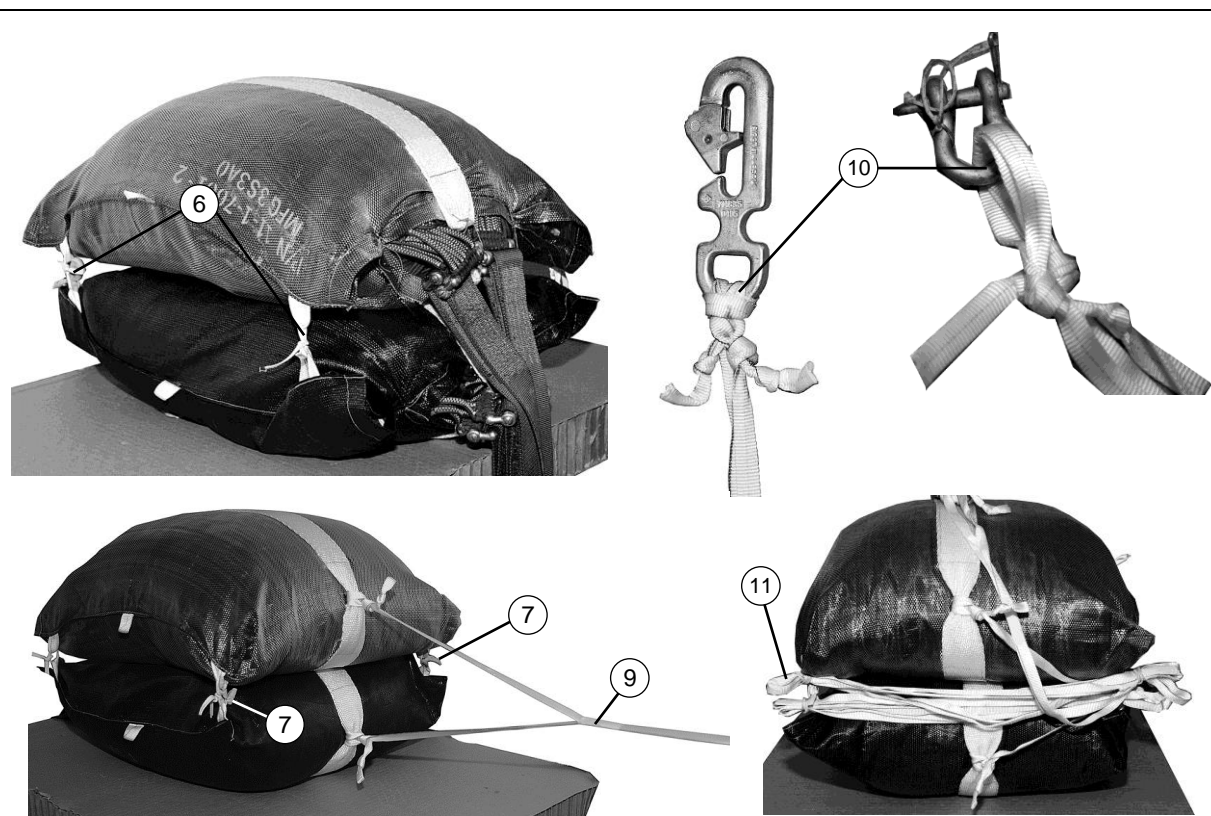
INSTALLING PARACHUTES

14-46. Install two LCLA 35-foot diameter cargo parachutes as shown in Figure 14-49.



- ① Prepare the parachutes by separating the two groups of risers (not shown).
- ② Separate one set of risers to expose the inner sewn portion at the canopy release assembly.
- ③ Place a piece of 2-inch cloth-backed adhesive tape approximately 8-inches in length at the sewn portion of the riser assembly.
- ④ Wrap the riser assembly and the previously placed tape using 2-inch cloth-backed adhesive tape.
- ⑤ Repeat steps 1 through 4 for the second set of risers and the second parachute.

Figure 14-49. Double LCLA 35-foot diameter cargo parachutes installed



Note. Ensure all static lines are the same length. Adjust as needed by loosening the knot at the loop.

- ⑥ Place one 35-foot diameter cargo parachute on top of another 35-foot diameter cargo parachute and secure each corner (front and rear) with a single turn, type I, 1/4-inch cotton webbing leaving a 1/2-inch loop.
- ⑦ Place a retainer band on each front clustering tab of the top and bottom parachutes.
- ⑧ Remove all twists from both parachute's static lines.
- ⑨ Stretch both static lines. At a point approx. 18 inches from the girth hitch portion of the static line, tape both static lines together with masking tape. Continue to tape the static lines together every 18 inches.
- ⑩ Attach a 3/8-inch shackle or a universal static line (USL) snap hook to the static line. Girth hitch both loops at the end of the each static line to the Universal Static Line snap hook. Place both static line loops on the 3/8-inch shackle (not shown).
- ⑪ Stow the static line starting at the lower right corner, pre-positioned retainer band. Continue to stow the static line.

Figure 14-49. Double LCLA 35-foot diameter cargo parachutes installed (continued)

Note. These instructions are load specific.



CAUTION

Do not use D-rings on this load. D-rings will be replaced by 1-inch tubular nylon webbing.

- ⑫ Prepare four suspension points on the outside intersections of the LCLA straps as shown in Figure 14-5 using 1-inch tubular nylon webbing.
- ⑬ Route the right riser (Riggers View) of the bottom parachute under the parachute and through the front left suspension point from outside to inside.
- ⑭ Route the left riser of the bottom parachute from outside to inside on the rear right (diagonal corner) suspension point.
- ⑮ Route the left riser (Riggers View) of the top parachute under both parachute and through the rear left suspension point from outside to inside.
- ⑯ Route the right riser of the bottom parachute from outside to inside on the front right (diagonal corner) suspension point.

Figure 14-49. Double LCLA 35-foot diameter cargo parachutes installed (continued)

Note. These instructions are load specific.



CAUTION

Do not use D-rings on this load. D-rings will be replaced by 1-inch tubular nylon webbing.

- ⑪ Cut a length of 1-inch tubular nylon webbing approximately 60-inches long.
- ⑫ Route the 1-inch tubular nylon webbing through all four sets of risers, two turns single. Ensure the 1-inch tubular nylon webbing is routed between each set of risers where the risers are taped. Secure the free running ends using a Surgeon's knot, locking knot, and an overhand knot in the running ends. Trim the excess to two inches.

Figure 14-49. Double LCLA 35-foot diameter cargo parachutes installed (continued)

SECURING PARACHUTE

14-47. Secure the double LCLA 35-foot diameter cargo parachute configuration as shown in Figure 14-50.

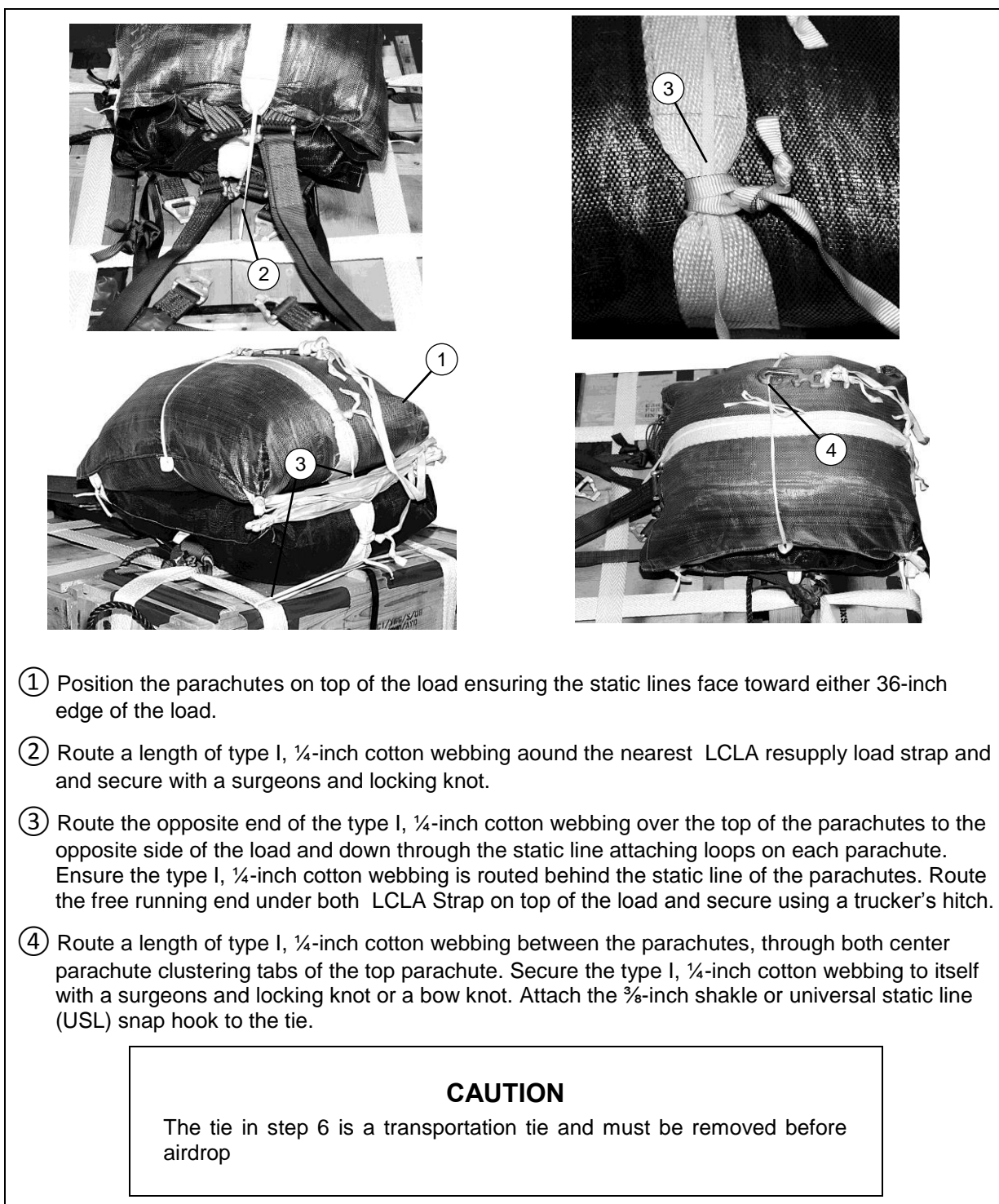


Figure 14-50. Double LCLA 35-foot diameter cargo parachutes secured

MARKING RIGGED LOAD

14-48. Mark the rigged load according to Paragraph 1-5 using the data given in Figure 14-51. If the load varies from the one shown in Figure 14-51, recompute the data. An AMC IMT 1033, 20050204, V1. (Shipper's Declaration for Dangerous Goods) may be required.

CAUTION

Make the final inspection IAW TM 4-48.03/MCRP 4-11.3C/TO 13C7-1-11 and AR 59-4/OPNAVINST 4630.24C/AFJ 13-210(I)/MCO 13480.1B before loaded on the aircraft.



RIGGING LOAD DATA

Rigged weight (as shown)	1,034 pounds
Minimum load allowed	501 pounds
Maximum load allowed	1,000 pounds
Suspended weight (as shown)	1,000pounds
Height: (as shown)	39 inches
Maximum height (as shown)	50 inches
Width: (as shown)	48 inches
Length: (as shown)	36 inches

Figure 14-51. LCLA resupply load rigged for low-velocity airdrop with double LCLA 35-foot diameter cargo parachutes

EQUIPMENT REQUIRED

14-49. Use the equipment listed in Table 14-6 to rig the load shown in Figure 14-51.

Table 14-6. Equipment required for rigging the low-cost low-altitude resupply load for low-velocity airdrop with double LCLA 35-foot diameter cargo parachutes

<i>National Stock Number</i>	<i>Item</i>	<i>Quantity</i>
8040-00-273-8713	Adhesive, paste, 1 gallon	As required
4030-00-678-8560	Clevis, shackle, 3/8-inch diameter	1
	OR	
1670-01-476-3142	Snap Hook, universal static line (USL)	1
4020-00-240-2146	Cord, nylon, type III	As required
1670-00-753-3928	Pad, energy-dissipation material, honeycomb	1 sheet
1670-01-578-6655	Parachute, LCLA 35-foot diameter, cargo	2
5530-00-128-4981	Plywood, 3/4- by 48- by 96-inch	1 sheet
	or	
5530-00-914-5118	Plywood, 1- by 48- by 96-inch	1 sheet
N/A	Polypropylene, lightweight material	As required
8135-00-476-5268	Shrink wrap	As required
1670-01-544-0755	Sling Assembly, cargo airdrop (LCLA resupply load)	5
7510-00-074-5124	Tape, pressure sensitive, 2-inch (cloth-backed)	As required
8305-00-268-2411	Webbing, Cotton, type I, 1/4-inch	As required
8305-00-082-5752	Webbing, Nylon, tubular, 1/2-inch	As required
8305-00-268-2455	Webbing, Nylon, tubular, 1-inch	As required

SECTION VII – RIGGING LCLA RESUPPLY LOAD WITH LCLA 24-FOOT DIAMETER CARGO PARACHUTE FOR LOW-VELOCITY AIRDROP

DESCRIPTION OF LOAD

14-50. Four PA-120 metal cases of 40-mm ammunition and two cases of 20-oz water bottles are rigged in a LCLA resupply load for low-velocity airdrop. The LCLA resupply load consists of the LCLA 24-foot Diameter Cargo Parachute, four 188-inch LCLA straps, four D-rings, and a cut-to-fit load cover (optional). The LCLA resupply load is capable of being rigged in three different configurations [(Configuration 1 – No Cover; Configuration 2 – Shrink Wrap; Configuration 3 – Polypropylene Load Cover)] for low-velocity airdrop using a $\frac{3}{4}$ - (or 1-) by 24- by 18-inch A/C grade plywood skid board. The LCLA 24-foot diameter cargo parachute is packed into a polypropylene D-bag. The load has a suspended weight of 255 pounds. The load has a total rigged weight of 265 pounds. The total rigged weight range is 90 to 310 pounds. . It has a total height of 39 inches, width of 24 inches, and a length of 18 inches.

Note. These procedures can be used to rig similar loads.

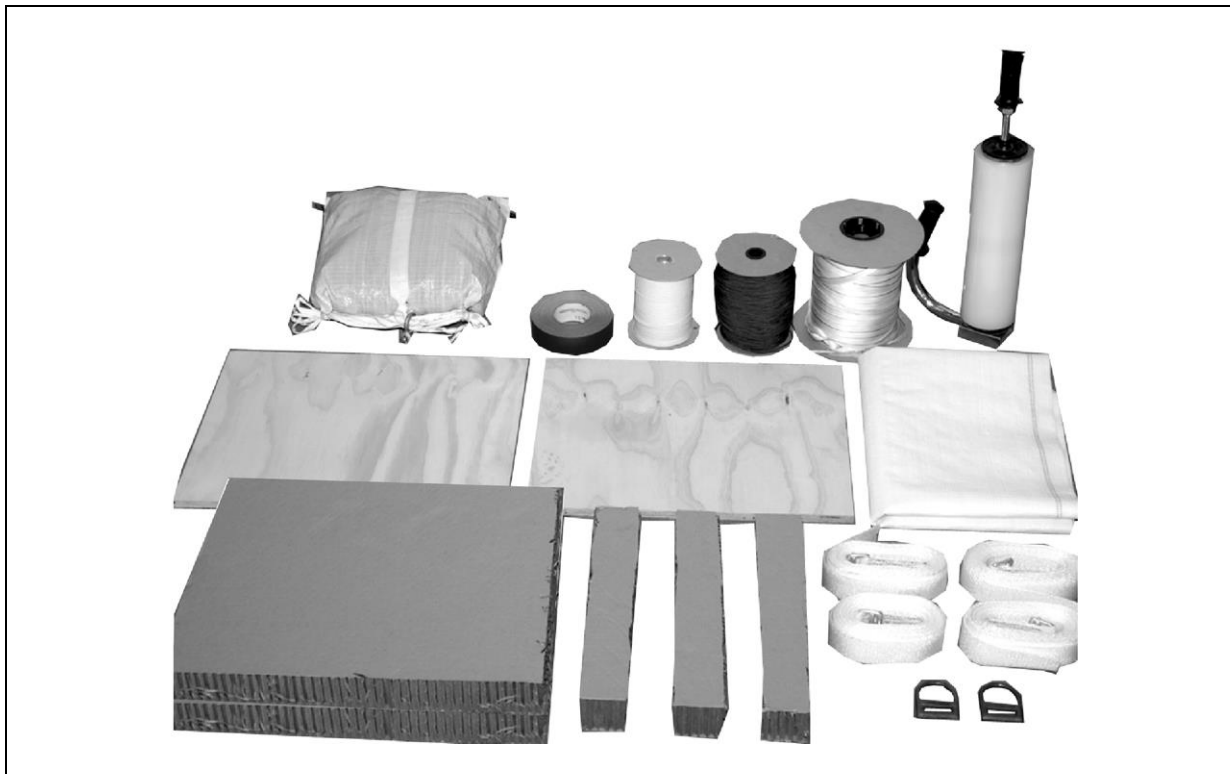


Figure 14-52. Load description

PREPARING ITEMS, SKID BOARD, AND POSITIONING STRAPS

14-51. Prepare the items, skid board, and position the straps according to Paragraph 14-53.

CAUTION

Only ammunition listed in TM 4-48.16/MCRP 4-11.3B/TO 13C7-18-41 may be airdropped.

PREPARING AND PLACING HONEYCOMB

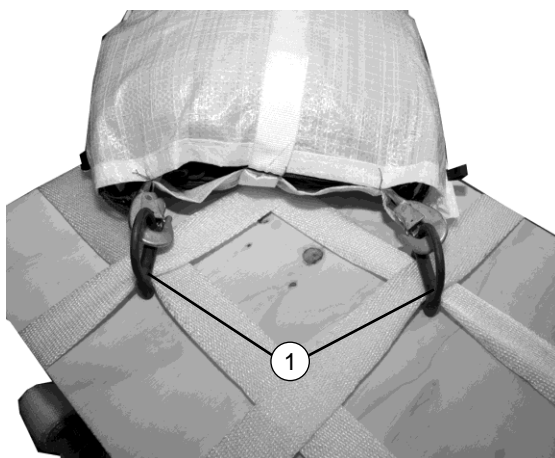
14-52. Prepare and place the honeycomb according to Paragraph 14-3.

POSITIONING AND SECURING LOAD

14-53. Position and secure the load according to Paragraph 14-30.

INSTALLING PARACHUTE

14-54. Install the LCLA 24-foot diameter cargo parachute as shown in Figure 14-53.



- ① Attach an LCLA 24-foot diameter cargo parachute connector snap to each D-ring or 1-inch tubular nylon suspension points.

Figure 14-53. LCLA 24-foot diameter cargo parachute installed

SECURING PARACHUTE

14-55. Secure the LCLA 24-foot diameter cargo parachute as shown in Figure 14-54.

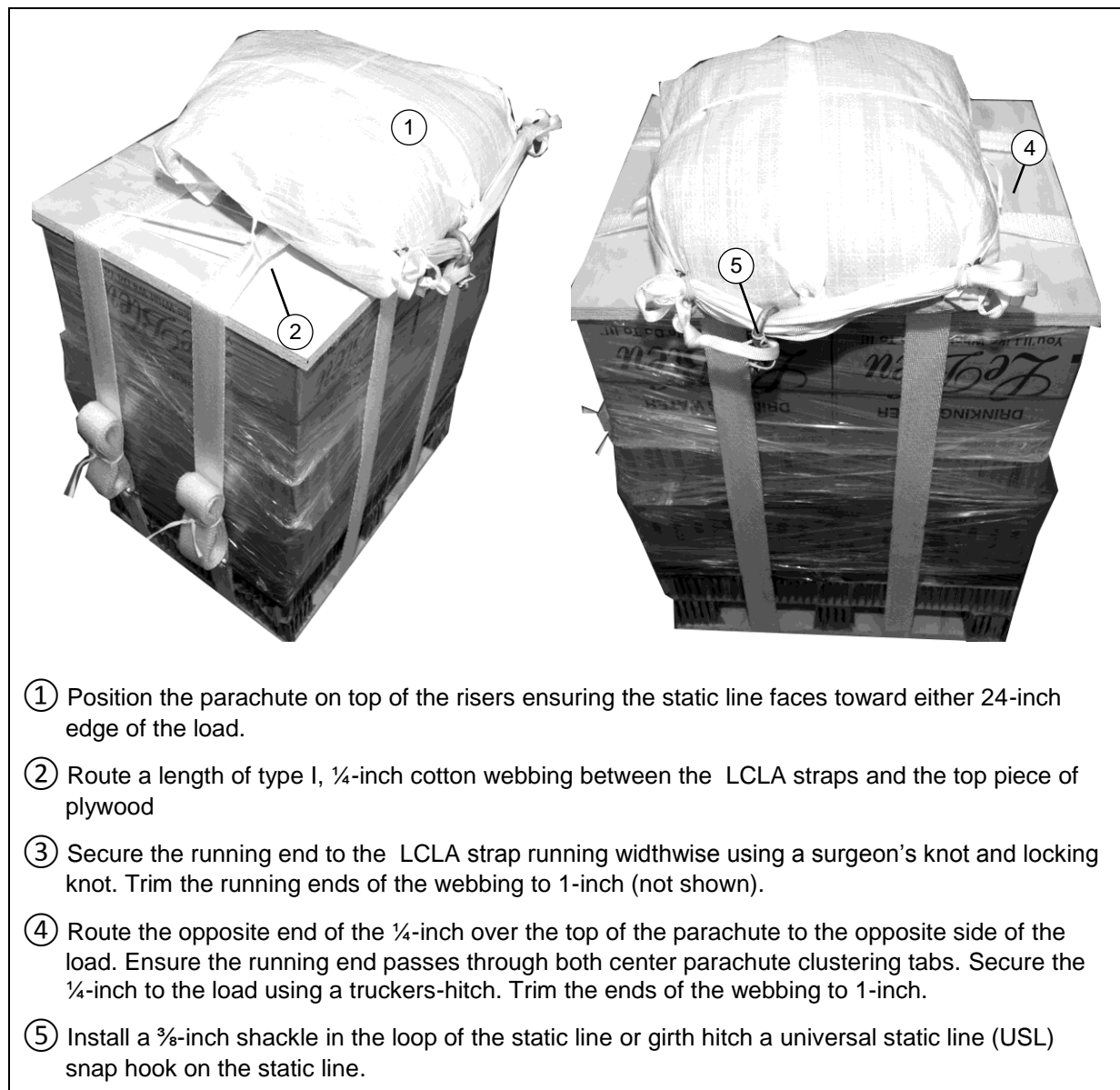


Figure 14-54. LCLA 24-foot diameter cargo parachute secured

MARKING RIGGED LOAD

14-56. Mark the rigged load according to Paragraph 1-5 using the data given in Figure 14-55. If the load varies from the one shown in Figure 14-55, recompute the data. An AMC IMT 1033, 20050204, V1. (Shipper's Declaration for Dangerous Goods) may be required.

CAUTION

Make the final inspection IAW TM 4-48.03/MCRP 4-11.3C/TO 13C7-1-11 and AR 59-4/OPNAVINST 4630.24C/AFJ 13-210(I)/MCO 13480.1B before loaded on the aircraft.



RIGGING LOAD DATA

Rigged weight (as shown).....	265 pounds
Minimum load allowed.....	90 pounds
Maximum load allowed.....	310 pounds
Suspended weight (as shown).....	255 pounds
Height: (as shown)	39 inches
Maximum height (as shown)	48 inches
Width: (as shown)	24 inches
Length: (as shown).....	18 inches

Figure 14-55. LCLA resupply load rigged for low-velocity airdrop with an LCLA 24-foot diameter cargo parachute

EQUIPMENT REQUIRED

14-57. Use the equipment listed in Table 14-7 to rig the load shown in Figure 14-55.

Table 14-7. Equipment required for rigging the low-cost low-altitude resupply load with an LCLA 24-foot diameter cargo parachute for low-velocity airdrop

<i>National Stock Number</i>	<i>Item</i>	<i>Quantity</i>
8040-00-273-8713	Adhesive, paste, 1 gallon	As required
4030-00-678-8560	Clevis, shackle, 3/8-inch diameter	1
	OR	
1670-01-476-3142	Snap hook, universal static line (USL)	1
4020-00-240-2146	Cord, nylon, type III	As required
5365-00-937-0147	D-ring, heavy-duty	2
1670-00-753-3928	Pad, energy-dissipation material, honeycomb	1 sheet
N/A	Parachute, LCLA 24-foot diameter, cargo	1
5530-00-128-4981	Plywood, 3/4- by 48- by 96-inch	1 sheet
	or	
5530-00-914-5118	Plywood, 1- by 48- by 96-inch	1 sheet
1670-01-578-6654	Polypropylene, lightweight material	As required
8135-00-476-5268	Shrink wrap	As required
1670-01-544-0755	Sling Assembly, cargo airdrop (LCLA resupply load)	4
7510-00-074-5124	Tape, pressure sensitive, 2-inch (cloth-backed)	As required
8305-00-268-2411	Webbing, Cotton, type I, 1/4-inch	As required
8305-00-082-5751	Webbing, nylon, tubular, 1/2-inch	As required
8305-00-268-2455	Webbing, nylon, tubular, 1-inch	As required

SECTION VIII – RIGGING LCLA RESUPPLY LOAD WITH DOUBLE LCLA 24-FOOT DIAMETER CARGO PARACHUTES FOR LOW-VELOCITY AIRDROP

DESCRIPTION OF LOAD

14-58. Four boxes of simulated 105-mm ammunition and four cases of Meals Ready to Eat are rigged in a Low Cost Low Altitude Aerial Delivery System LCLA ADS for low-velocity airdrop. The LCLA ADS consists of two 24-foot diameter cargo parachutes clustered in a double 24-foot diameter cargo parachute configuration, six 188-inch LCLA Straps and four Heavy Duty D-rings. The use of 1-inch tubular nylon webbing is authorized to replace the Heavy Duty D-Rings. The LCLA ADS, is capable of being rigged for low-velocity airdrop using a ¾-inch (or 1-inch) - by 48-inch by 36-inch piece of A/C grade plywood skid board. The 24-foot diameter cargo parachute is pre-packed into a polypropylene D-Bag and a cluster of two can sustain a total suspended weight range of 301 to 600 pounds. This load has a suspended weight of 600 pounds and a total rigged weight of 619 pounds. It has a height of 33 ½- inches, but can not to exceed 48-inches, a width of 48-inches and a length of 36-inches.

Note. These procedures can be used to rig similar loads.

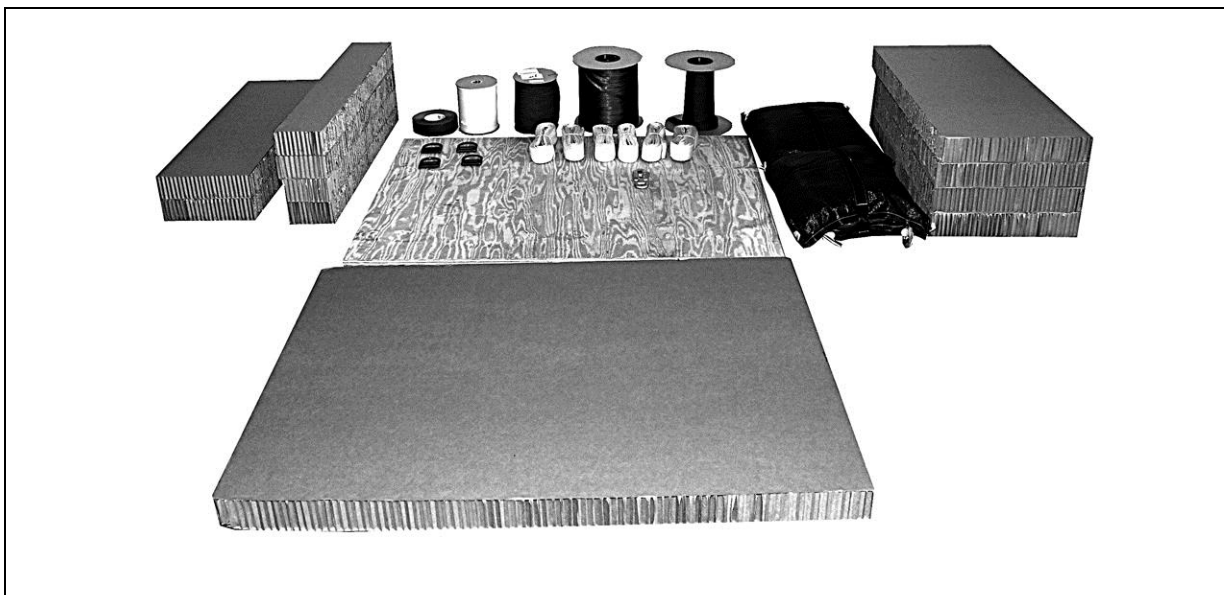


Figure 14-56. Load description

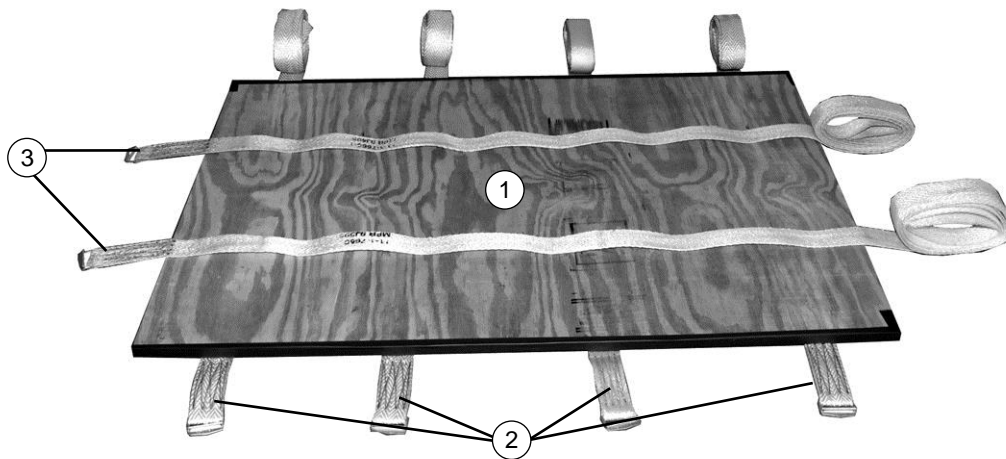
PREPARING ITEMS, SKID BOARD, AND POSITIONING STRAPS

14-59. Prepare the items, skid board, and position the straps according to Paragraph 14-57.

CAUTION

Only ammunition listed in TM 4-48.16 /MCRP 4-11.3B/TO 13C7-18-41 may be airdropped.

Note. Tape all plywood edges where the straps make contact with the plywood.



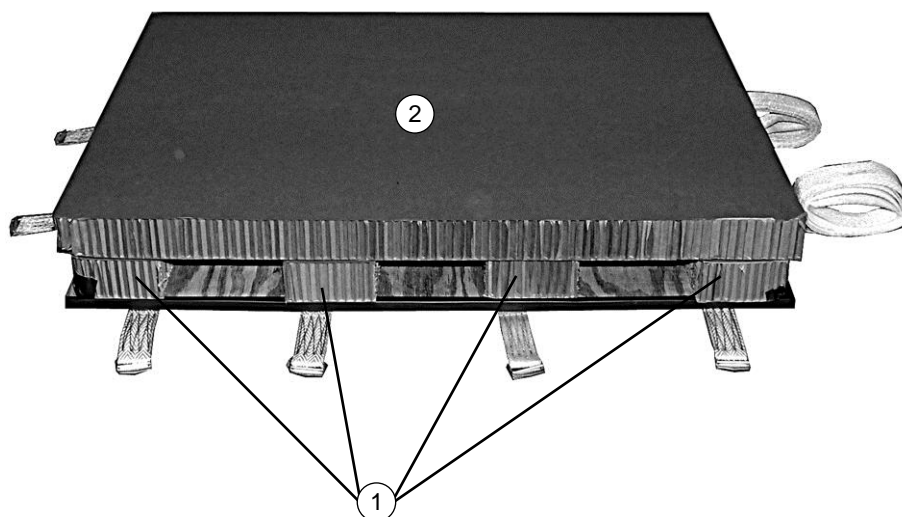
- ① Cut a $\frac{3}{4}$ - by 48- by 36-inch piece of plywood. If $\frac{3}{4}$ -inch plywood is unavailable, use 1-inch plywood as a substitute. Lay on a flat surface with smooth side down (A side).
- ② Position two LCLA straps lengthwise, 2 inches in from each edge under the plywood with the sewn portion facing up and against the edge of the plywood. Evenly space two LCLA straps between the first two straps lengthwise under the plywood with the sewn portion facing up . and against the edge of the plywood
- ③ Place two LCLA straps widthwise on top of the plywood 4 inches from the edge of the plywood. Ensure the sewn portion is facing up and against the edge of the plywood.

Figure 14-57. Skid board prepared

PREPARING AND PLACING HONEYCOMB

14-60. Prepare and place the honeycomb as shown in Figure 14-58.

Note. Glue all honeycomb to the skid board.

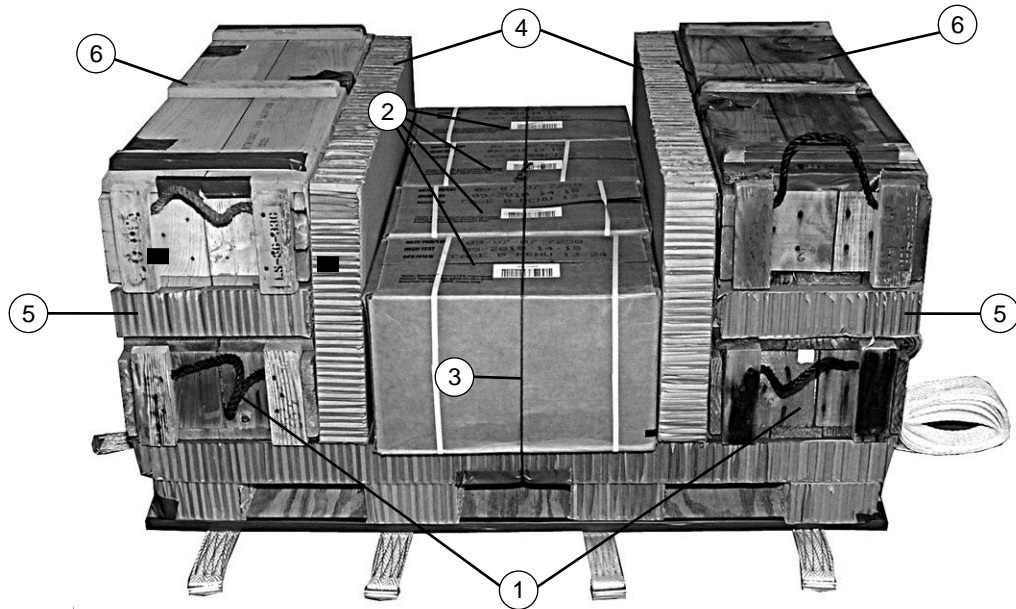


- ① Cut four 36- by 6-inch pieces of honeycomb. Position two of the honeycomb pieces along the 36-inch edges approximately 1-inch in from the edge of the plywood. Position the remaining two pieces of honeycomb evenly spaced between the two pieces of honeycomb. Tape the edges of the two outer pieces of honeycomb using 2-inch cloth-backed adhesive tape.
- ② Cut and glue a 48- by 36-inch piece of honeycomb on top of the previous honeycomb pieces. Tape the edges of the honeycomb where the LCLA straps contact the honeycomb using 2-inch cloth-backed adhesive tape.

Figure 14-58. Honeycomb prepared and placed

POSITIONING AND SECURING LOAD

14-61. Center the load on the honeycomb. Secure load as shown in Figures 14-59.



- ① Position two 105-mm ammunition boxes on top of the previously positioned 48- by 36-inch piece of honeycomb, three widthwise and one lengthwise, flush on each side.
- ② Place four cases of MRE's widthwise and centered between the ammunition boxes.
- ③ Route a length of Type III nylon cord around the MRE cases, ensuring the Type III nylon cord is routed under the honeycomb. Secure the tie using a trucker's hitch.
- ④ Place a 36-inch by 17-inch piece of honeycomb in each gap between the ammunition boxes and the MRE cases.
- ⑤ Place a 36-inch by 12-inch pieces of honeycomb on top of each ammunition box.
- ⑥ Place two 105-mm ammunition boxes lengthwise and on top of the previously positioned 36-inch by 12-inch pieces of honeycomb, flush on each side.
- ⑦ Tape the ammunition boxes where the LCLA straps touch with 2-inch cloth-backed tape (not shown).

Figure 14-59. Load positioned and secured

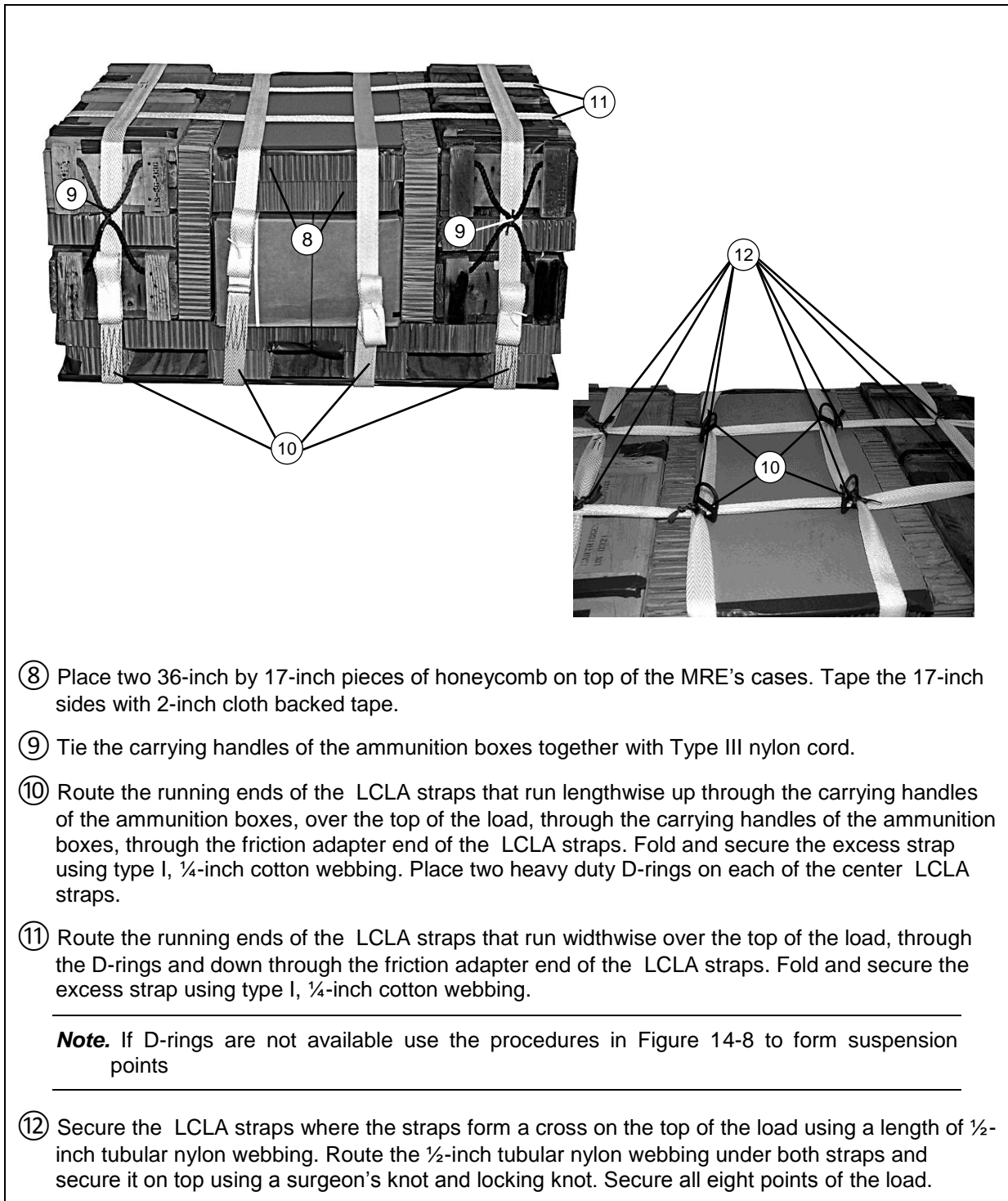
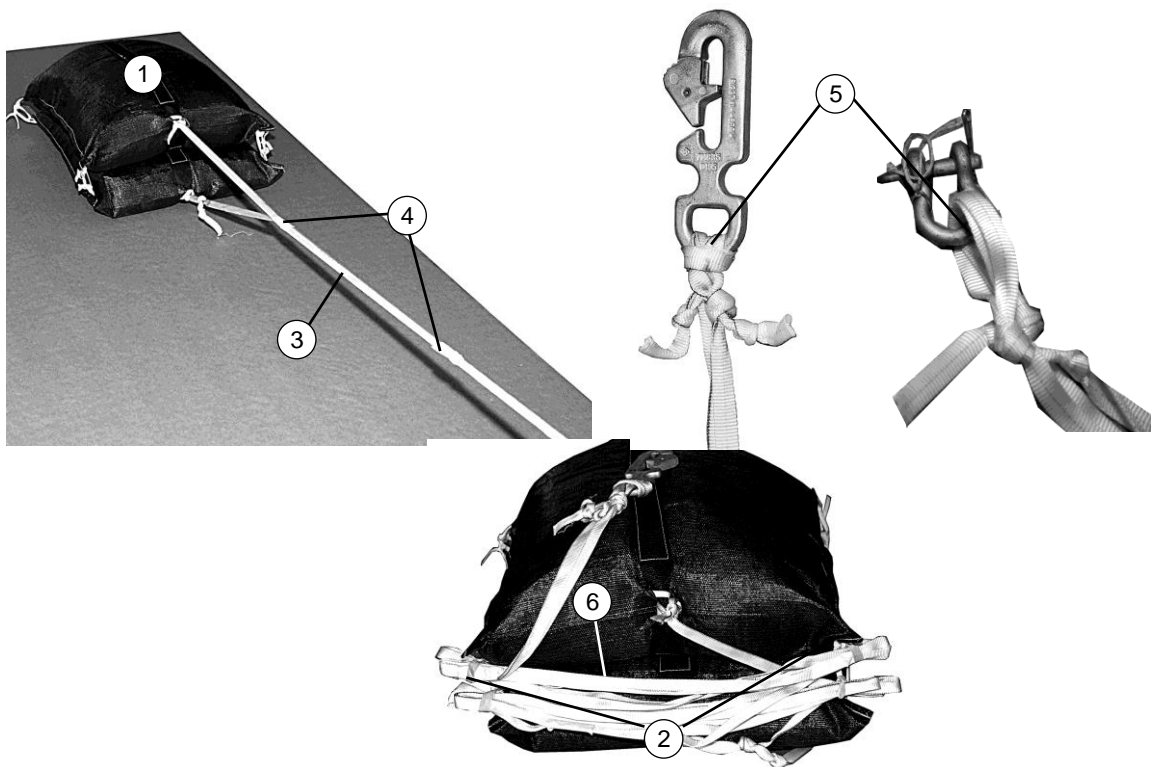


Figure 14-59. Load positioned and secured (continued)

INSTALLING PARACHUTE

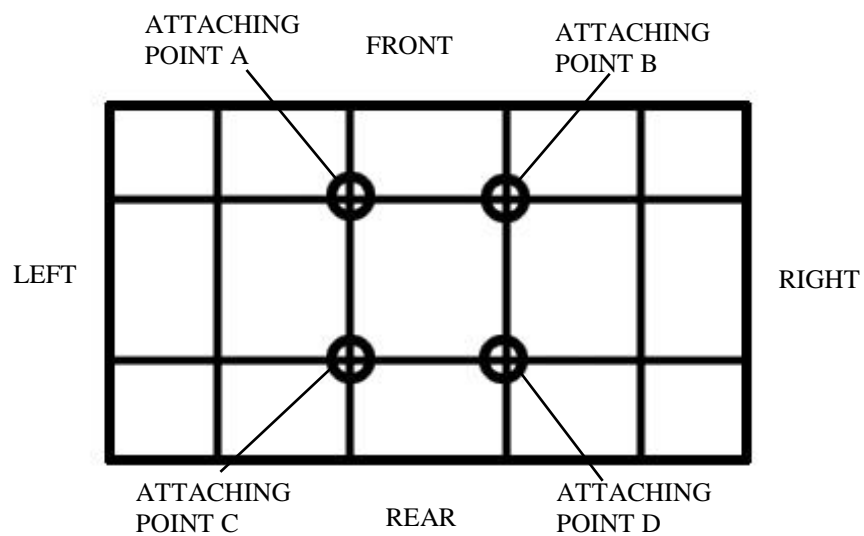
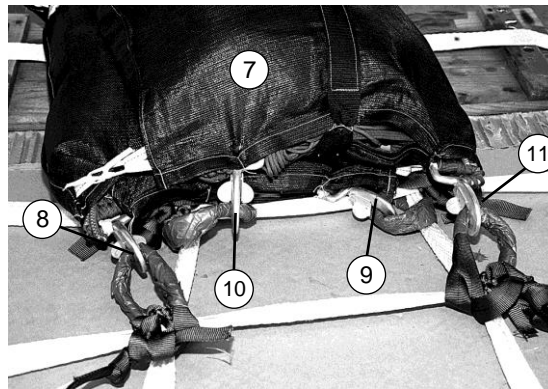
14-62. Install the double LCLA 24-foot diameter cargo parachutes as shown in Figure 14-60.



Note. Ensure all static lines are the same length. Adjust as needed by loosening the knot at the loop.

- ① Place one 24-foot diameter cargo parachute on top of another 24-foot diameter cargo parachute and secure each corner (front and rear) with a single turn, type I, $\frac{1}{4}$ -inch cotton webbing leaving a $\frac{1}{2}$ -inch loop.
- ② Girth hitch a retainer band on each front clustering tab of the top and bottom parachutes.
- ③ Remove all twists from both parachute's static lines.
- ④ Stretch both static lines. At a point approx. 18 inches from the girth hitch portion of the static line, tape both static lines together with masking tape. Continue to tape the static lines together every 18 inches.
- ⑤ Attach a $\frac{3}{8}$ -inch shackle or a universal static line (USL) snap hook to the static line. Girth hitch both loops at the end of the each static line to the Universal Static Line snap hook. Place both static line loops on the $\frac{3}{8}$ -inch shackle (not shown).
- ⑥ Stow the static line starting at the lower right corner, pre-positioned retainer band. Continue to stow the static line.

Figure 14-60. Double LCLA 24-foot diameter cargo parachutes installed

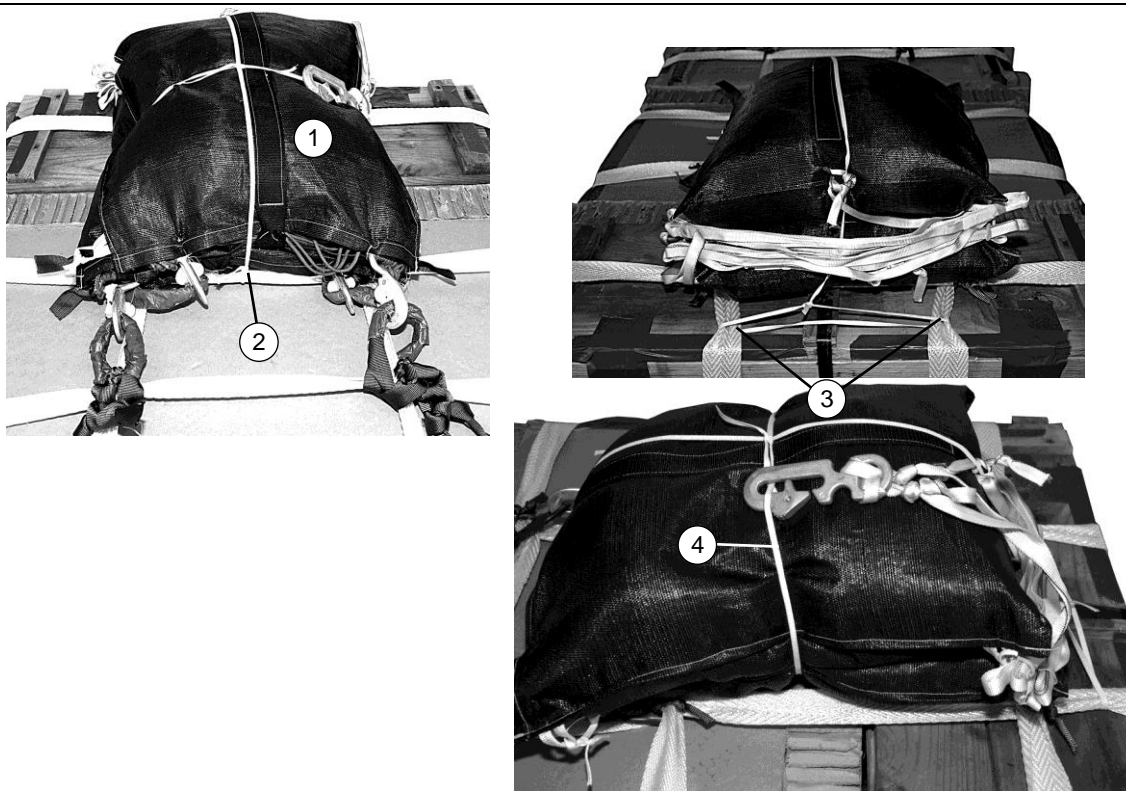


- ⑦ Place the parachutes on top of the load.
- ⑧ Attach the left connector snap of the bottom parachute to attaching point C.
- ⑨ Attach the right connector snap of the bottom parachute to attaching point B.
- ⑩ Attach the left connector snap of the top parachute to attaching point A.
- ⑪ Attach the right connector snap of the top parachute to attaching point D.

Figure 14-60. Double LCLA 24-foot diameter cargo parachutes installed (continued)

SECURING PARACHUTE

14-63. Secure the double LCLA 24-foot diameter cargo parachutes as shown in Figure 14-61.



- ① Position the parachutes on top of the risers ensuring the static line faces toward either 36-inch edge of the load.
- ② Route a length of type I, ¼-inch cotton webbing around the nearest LCLA strap and secure with a surgeons and locking knot.
- ③ Route the running end of the type I, ¼-inch cotton webbing over the top of the parachutes to the opposite side of the load and down through the static line attaching loops on each parachute. Ensure the type I, ¼-inch cotton webbing is routed behind the static line of the parachutes. Route the free running end under both LCLA Strap on top of the load and secure using a trucker's hitch.
- ④ Route a length of type I, ¼-inch cotton webbing under both parachutes, through both center parachute clustering tabs. Secure the type I, ¼-inch cotton webbing to itself with a surgeons and locking knot or a bow knot. Attach the ⅝-inch shackle or universal static line (USL) snap hook to the tie.

CAUTION

The tie in step 4 is a transportation tie and must be removed before airdrop.

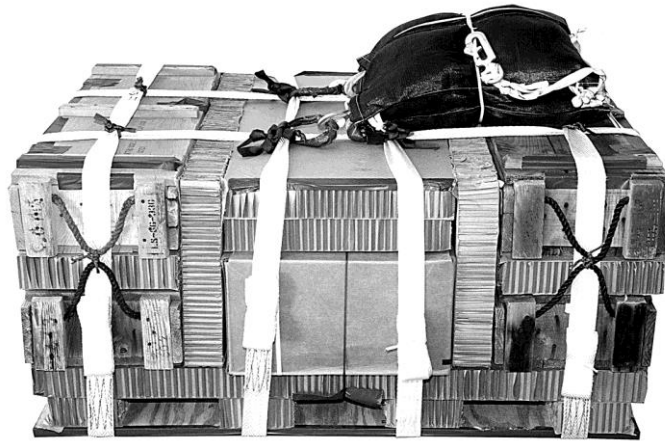
Figure 14-61. Double LCLA 24-foot diameter cargo parachute secured

MARKING RIGGED LOAD

14-64. Mark the rigged load according to Paragraph 1-5 using the data given in Figure 14-62. If the load varies from the one shown in Figure 14-62, recompute the data. An AMC IMT 1033, 20050204, V1. (Shipper's Declaration for Dangerous Goods) may be required.

CAUTION

Make the final inspection IAW TM 4-48.03/MCRP 4-11.3C/TO 13C7-1-11 and AR 59-4/OPNAVINST 4630.24C/AFJ 13-210(I)/MCO 13480.1B before loaded on the aircraft.



RIGGING LOAD DATA

Rigged weight (as shown).....	619 pounds
Minimum load allowed.....	310 pounds
Maximum load allowed.....	600 pounds
Suspended weight (as shown).....	600 pounds
Height: (as shown)	33 ½ inches
Maximum height (as shown)	64 ¼ inches
Width: (as shown)	48 inches
Length: (as shown).....	36 inches

Figure 14-62. LCLA resupply load rigged for low-velocity airdrop with double LCLA 24-foot diameter cargo parachutes

EQUIPMENT REQUIRED

14-65. Use the equipment listed in Table 14-8 to rig the load shown in Figure 14-62.

Table 14-8. Equipment required for rigging the low-cost low-altitude resupply load with double LCLA 24-foot diameter cargo parachutes for low-velocity airdrop

<i>National Stock Number</i>	<i>Item</i>	<i>Quantity</i>
8040-00-273-8713	Adhesive, paste, 1 gallon	As required
4030-00-678-8560	Clevis, shackle, 3/8-inch diameter	1
	OR	
1670-01-476-3142	Snap hook, universal static line (USL)	1
4020-00-240-2146	Cord, nylon, type III	As required
5365-00-937-0147	D-ring, heavy-duty	4
1670-00-753-3928	Pad, energy-dissipation material, honeycomb	2 sheet
1670-01-578-6654	Parachute, LCLA 24-foot diameter, cargo	2
5530-00-128-4981	Plywood, 3/4- by 48- by 96-inch	1 sheet
	OR	
5530-00-914-5118	Plywood, 1- by 48- by 96-inch	1 sheet
N/A	Polypropylene, lightweight material	As required
8135-00-476-5268	Shrink wrap	As required
1670-01-544-0755	Sling Assembly, cargo airdrop (LCLA resupply load)	6
7510-00-074-5124	Tape, pressure sensitive, 2-inch (cloth-backed)	As required
8305-00-268-2411	Webbing, Cotton, type I, 1/4-inch	As required
8305-00-082-5751	Webbing, nylon, tubular, 1/2-inch	As required
8305-00-268-2455	Webbing, nylon, tubular, 1-inch	As required

PART SEVEN

Rigging JPADS 2K for Airdrop

Chapter 15

Rigging a Typical A-22 Container using the JPADS 2K System

DESCRIPTION OF THE LOAD

1-18. A typical A-22 container load is rigged for Low-Velocity Airdrop using an A-22 cargo bag and the Joint Precision Airdrop System (JPADS 2K) (Figure 15-1). Typical loads include rations, repair parts, water cans and other small items. Items to be dropped may be rigged in their original shipping container or may be repacked for airdrop. The minimum rigged weight for the load when using JPADS 2K is 880 pounds to include the Autonomous Guidance Unit (AGU) and the parachute. Maximum weight is 2,281 pounds. The recovery procedures for JPADS are located in Appendix A of this manual.

Note. The minimum rigged weight for the A-22 cargo bag when rigged for JPADS is 700 pounds.



Figure 15-1. A-22 cargo bag and JPADS 2k

PREPARING SKID BOARD

1-19. Construct and prepare a skid board as shown in Paragraph 8-3. Precut skid boards, ordered by National Stock Number, do not require the preparation in Paragraph 8-3.

POSITIONING HONEYCOMB

1-20. Position honeycomb as shown in Paragraph 8-4. Glue the pieces of honeycomb together; however, the stack does not have to be glued to the skid board.

POSITIONING A-22 CONTAINER SLING, COVER AND LOAD

1-21. Position and prepare the A-22 sling assembly, cover, and load as shown in Paragraph 8-5.

CAUTION

This load must not exceed 59 inches in height without AGU and parachute.

SECURING A-22 CARGO BAG COVER

1-22. Secure the A-22 cover and sling assembly as shown in Paragraph 8-6.

SECURING A-22 CARGO BAG SLING

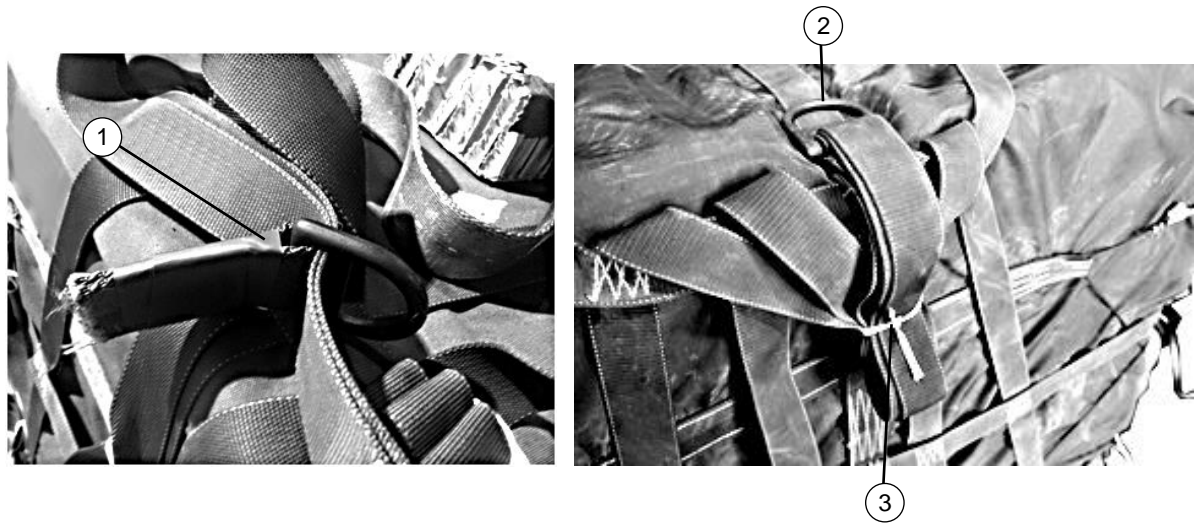
1-23. Secure the sling assembly as shown in Paragraph 8-7.

SECURING SKID BOARD TO A-22 CONTAINER

1-24. Secure the skid board to the A-22 container as shown in Paragraph 8-8.

INSTALLING THE JPADS 2K TO THE LOAD

1-25. Install the JPADS 2K as shown in Figure 15-2.



- ① Install an 8-inch piece of type VIII or Type XXVI nylon webbing between the D-ring and the webbing of the sling assembly. Wrap the cotton webbing with cloth-backed adhesive tape.
- ② Place the D-ring at the top edge of the container.
- ③ Fold the excess sling assembly and secure to the center tiedown strap with Type I ¼-inch cotton webbing using a surgeons and locking knot.

Figure 15-2. JPADS 2k installed

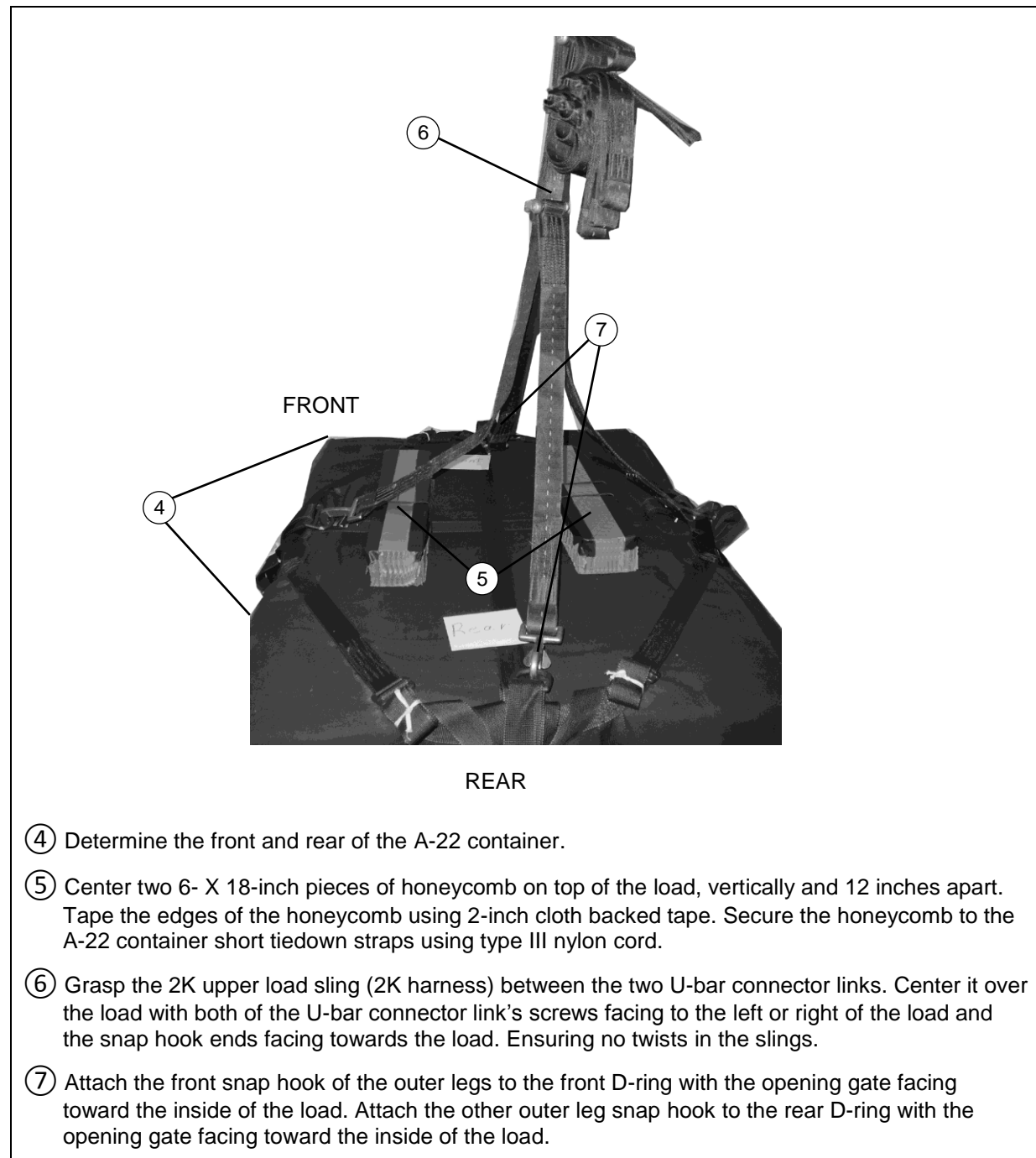
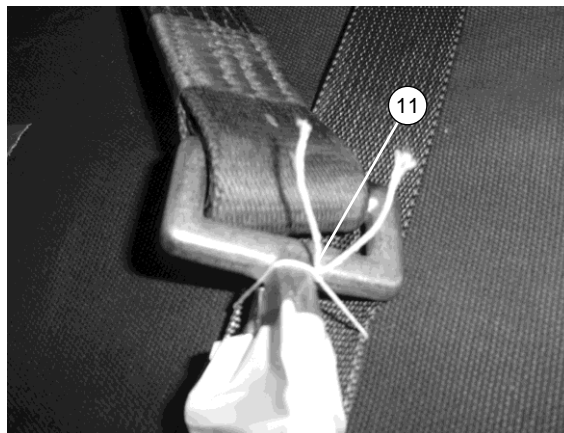
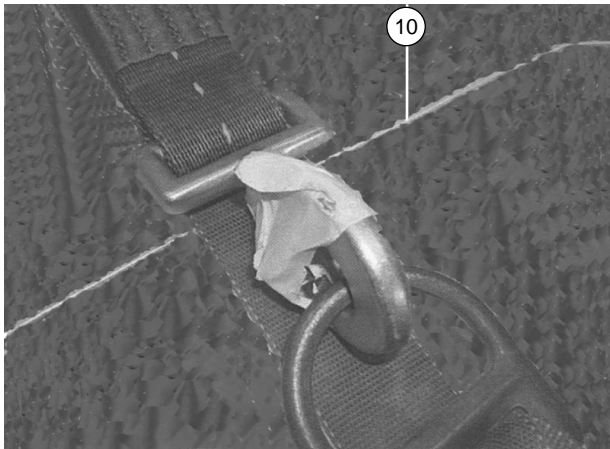


Figure 15-2. JPADS 2k installed (continued)

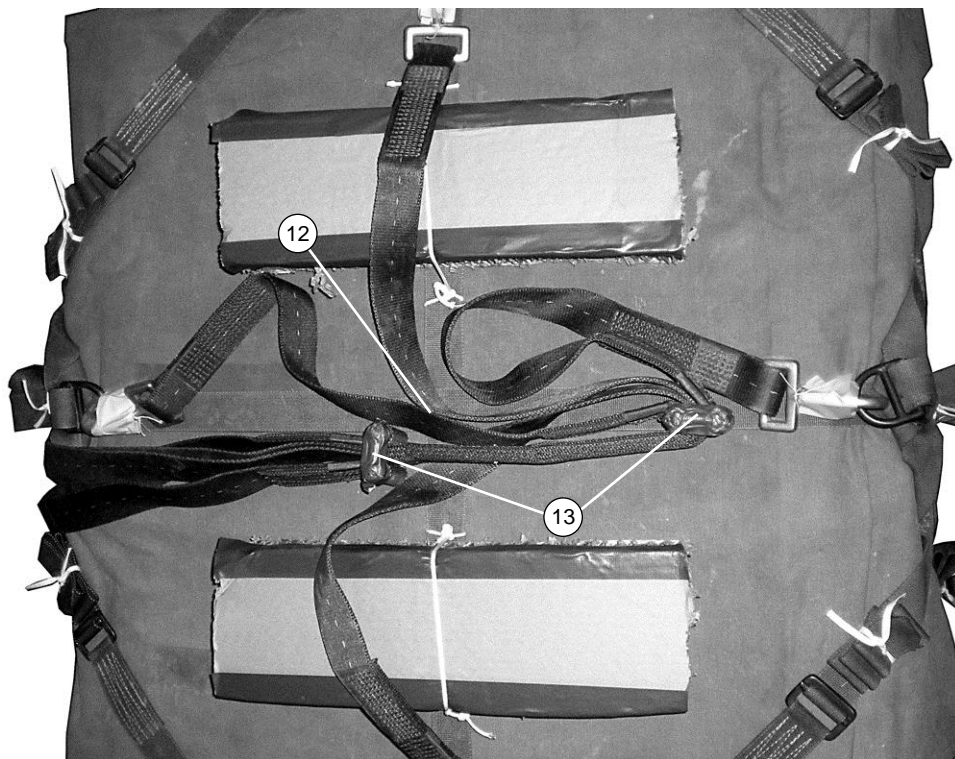
- ④ Determine the front and rear of the A-22 container.
- ⑤ Center two 6- X 18-inch pieces of honeycomb on top of the load, vertically and 12 inches apart. Tape the edges of the honeycomb using 2-inch cloth backed tape. Secure the honeycomb to the A-22 container short tiedown straps using type III nylon cord.
- ⑥ Grasp the 2K upper load sling (2K harness) between the two U-bar connector links. Center it over the load with both of the U-bar connector link's screws facing to the left or right of the load and the snap hook ends facing towards the load. Ensuring no twists in the slings.
- ⑦ Attach the front snap hook of the outer legs to the front D-ring with the opening gate facing toward the inside of the load. Attach the other outer leg snap hook to the rear D-ring with the opening gate facing toward the inside of the load.

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- ⑩ Cut four 18 inch lengths of ticket No. 8/7 cotton thread. Route the ticket No 8/7 cotton thread under the tiedown strap and around the neck of the snap hook.
- ⑪ Secure the thread on top of the snap fastener with a surgeon's knot and locking knot trimming excess to 1 inch. Repeat these procedures for the remaining three snap fasteners.

Figure 15-2. JPADS 2k installed (continued)



- ⑫ Center the 2K upper load sling between the two pieces of honeycomb. Ensure the 2K upper load sling connector link screws, closest to the snap hooks, are facing up and towards the rear edge of the two pieces of honeycomb.

Note. Check to ensure the screws are tight on the U-bar connector links.

- ⑬ Cut two pieces of 1- by 2-inches cloth backed adhesive tape. Place a piece of tape over each the screws on the 2K upper load sling connector links.

Figure 15-2. JPADS 2k installed (continued)

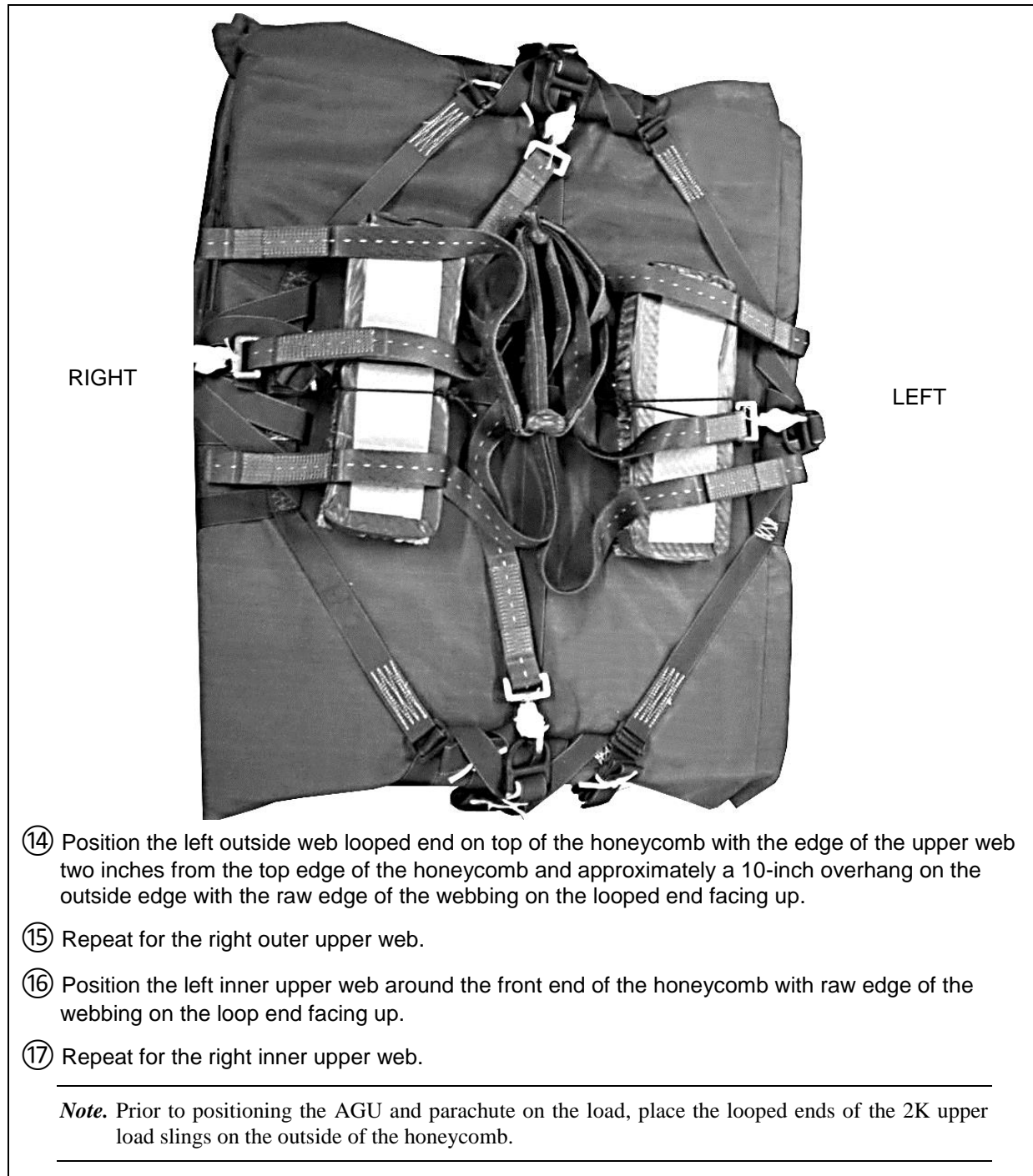


Figure 15-2. JPADS 2k installed (continued)

WARNING

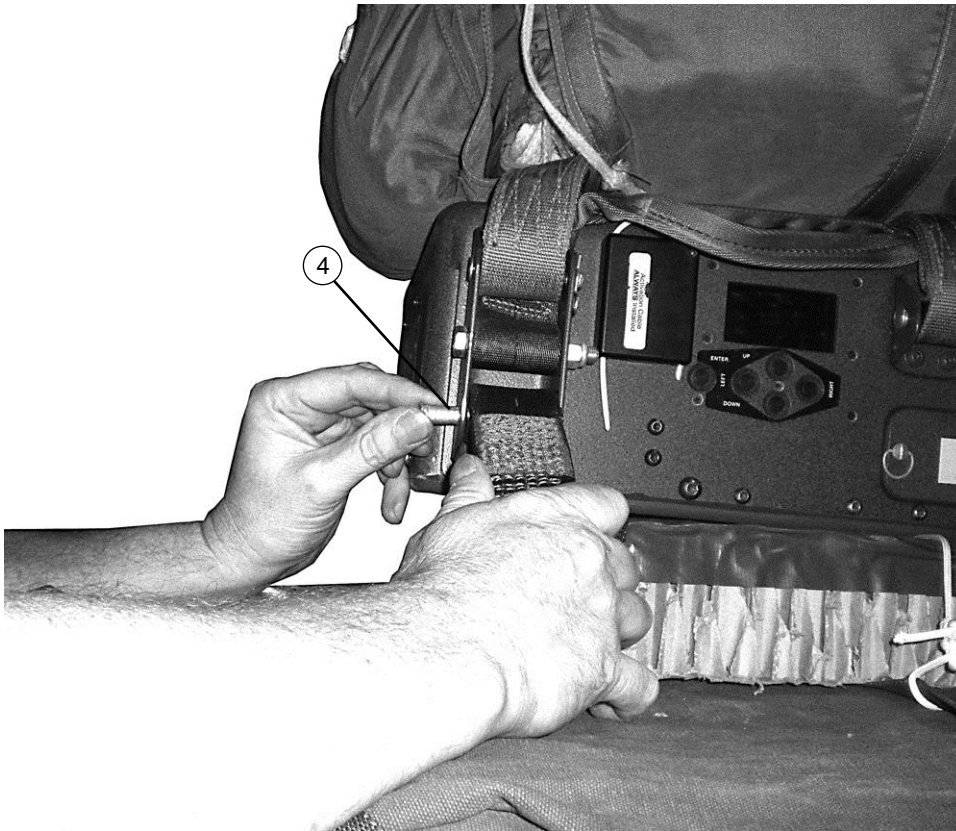
The JPADS 2K AGU and parachute system is a minimum two person lift.
(Weight: 167 pounds)



FRONT VIEW

- ① Center the AGU and parachute system on top of the honeycomb with the front AGU riser mounting corner brackets adjacent to the outside upper webs that run over the honeycomb.
- ② Ensure the drogue parachute is facing to the front of the load.

Figure 15-2. JPADS 2k installed (continued)



- ③ Remove the retaining clip pin, clevis pins and sleeves that are located on the bottom rows of the front and rear corner brackets of the AGU (not shown).
- ④ Insert the riser bracket spacer in the upper loop web (2K Harness) and align the web loop with the bottom hole on the corner bracket of the AGU. Install the clevis pin into the bracket hole and spacer from outboard to inboard. Secure the clevis pin with the cottor pin from outward to inward.

Note. Ensure the spacer and the pin are through the buffers on the webs.

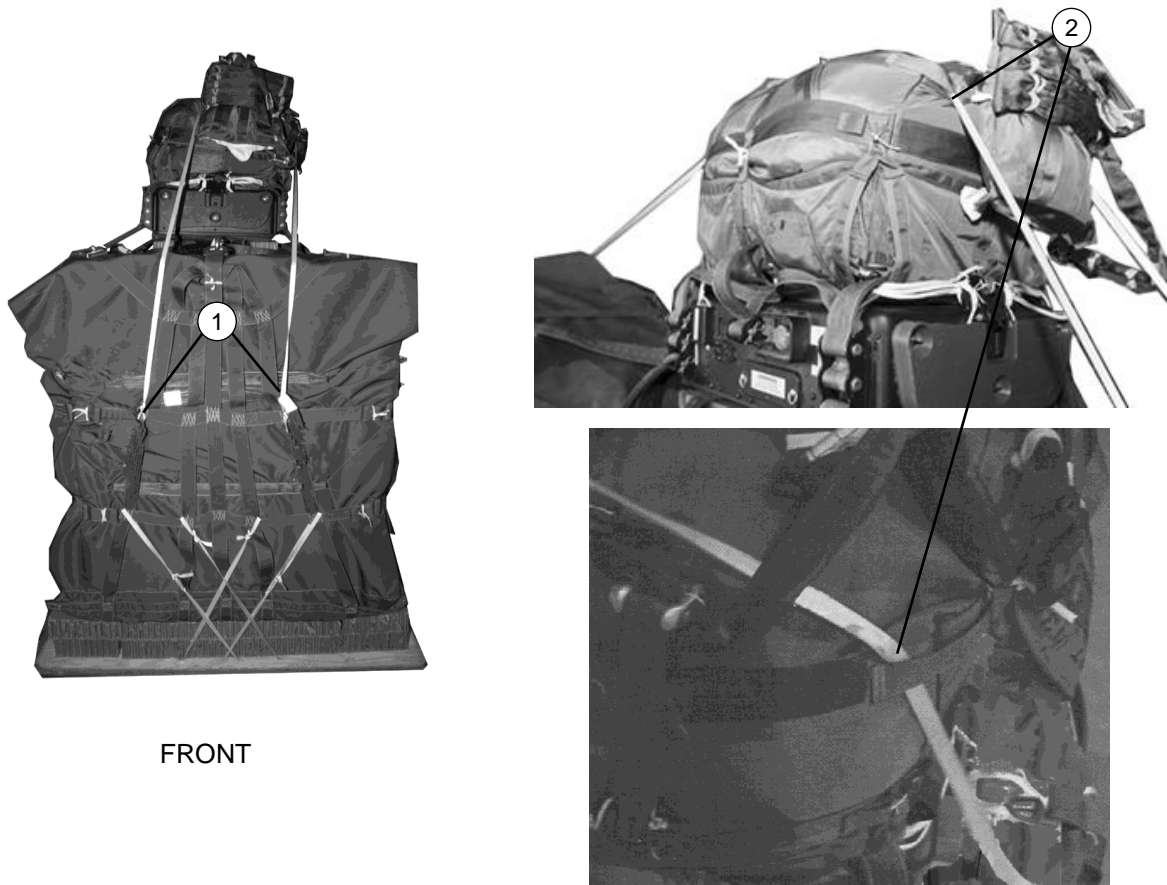
- ⑤ Repeat steps 3 and 4 for the remaining brackets (not shown).

Figure 15-2. JPADS 2k installed (continued)

SECURING THE JPADS 2K ON THE LOAD

1-26. Secure the JPADS 2K to the load as shown in Figure 15-3.

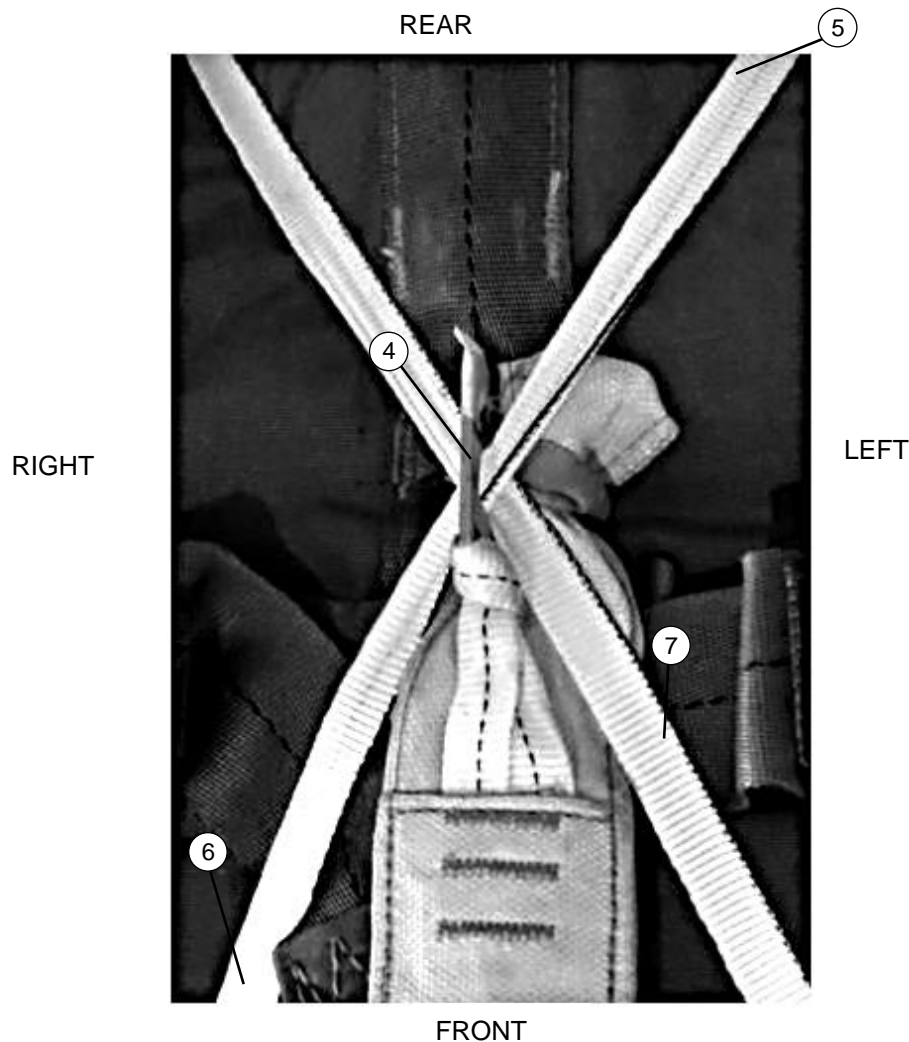
Note. Ensure the ½- or 9/16-inch tubular nylon webbing DOES NOT pass over the Release Away Static Line (RASL) or the Drogue parachute.



FRONT

- ① Secure two 13 foot lengths of ½- or 9/16-inch tubular nylon webbing to the outside vertical/lateral straps of the A-22 container at the front with three alternating half hitches and a overhand knot in the running end.
- ② Facing the control line spool cover of the AGU, route the left free end of ½- or 9/16-inch tubular nylon webbing up through the guide loop located on the left top corner of the parachute deployment bag.
- ③ Repeat step 2, for the right side (not shown).

Figure 15-3. JPADS 2k secured to the load



- ④ Place the master cut knife on its side and parallel with the drogue parachute bridle.
- ⑤ Route the free end of the left length of $\frac{1}{2}$ - or $\frac{9}{16}$ -inch tubular nylon webbing through the master cut knife from left to right between the bar and the ticket no. 8/7 cotton thread tie that is already attached to the drogue parachute bridle and under the master cut knife lanyard.
- ⑥ Continue routing the free end of the left length of $\frac{1}{2}$ - or $\frac{9}{16}$ -inch tubular nylon webbing down through the rear right guide loop of the deployment bag.
- ⑦ Repeat steps 5 through 6 for the right side.

Figure 15-3. JPADS 2k secured to the load (continued)



- ⑧ Facing the rear of the load secure the ½- or 9/16-inch tubular nylon webbing parachute restraint by routing it around the left outside vertical/lateral straps and tighten.
- ⑨ Secure with a trucker's-hitch knot.
- ⑩ Repeat steps 8 and 9 for the right side.

Figure 15-3. JPADS 2k secured to the load (continued)

MARKING RIGGED LOAD

1-27. Mark the rigged load as shown in Figure 15-4.

CAUTION

Make the final rigger inspection required by TM 4-48.02/MCRP 4-11.3J/NAVSEA SS40-AB-MMO-010/TO 13C7-1-5 and AR 59-4/OPNAVINST 4630.24C/AFJ 13-210(I)/MCO 13480.1B before the load leaves the rigging site.



RIGGED LOAD DATA

Maximum gross rigged weight (GRW).....	2,281 pounds
Minimum gross rigged weight:.....	880 pounds
Height	83 inches (including AGU and Parachute)
Width.....	48 inches
Overall Length	48 inches

Figure 15-4. A-22 container load rigged with JPADS 2k

EQUIPMENT REQUIRED

1-28. Use the equipment listed in Table 15-1 to rig this load.

Table 15-1. Equipment required to rig an A-22 container load with JPADS 2k.

<i>National Stock Number</i>	<i>Items</i>	<i>Quantity</i>
8040-00-273-8713	Adhesive, paste, 1-gallon	As required
1670-00-587-3421	Bag Assembly, Cargo, A-22	1
4020-00-240-2146	Cord, nylon, type III	As required
1670-01-569-5340	Joint Precision Airdrop System, 2K	1
1670-01-569-5340	Pad, energy-dissipation material, honeycomb	As required
	Plywood:	
5530-00-128-4981	¾- by 48- by 48-inch (locally fabricated skid board)	1 sheet
	or	
1670-00-883-1654	...1- by 48- by 48-inch (locally fabricated skid board)	1 sheet
	Skid Board:	
5530-00-914-5118	(¾- by 48- by 48-inch)	1
	or	
1670-01-342-5913	(1- by 48- by 48-inch)	1
	Tape:	
7510-00-266-6710	Adhesive, Masking, 2-inch	As required
7510-00-266-5016	2-inch Cloth-Backed	As required
8310-00-917-3945	Thread, cotton, ticket number 8/7	As required
	Webbing:	
8305-00-268-2411	Cotton, ¼-inch, type I	As required
8305-00-260-6909	Nylon, Tubular, 9/16-inch	As required
8305-00-082-5752	Nylon, Tubular, ½-inch	As required
8305-00-263-3598	Nylon, Type VIII	As required
8305-00-177-5069	Nylon, Type XXVI	As required

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Chapter 16

Rigging MV700 Polaris All Terrain Vehicle In A Double A-22 Container With The JPADS 2K System

DESCRIPTION OF THE LOAD

16-1. The MV700 Polaris All-Terrain Vehicle (ATV), Figure 16-1, is rigged for low-velocity airdrop in a Double A-22 container. The MV700 Polaris weighs 1,042 pounds and measures 89 inches long, 48 inches wide and 58 inches high. The load is airdropped using the Joint Precision Airdrop System (JPADS 2K). The total rigged load weighs 1,602 pounds and is 96-inches long, 48-inches wide, and the maximum height with the JPADS 2K and parachute is 83-inches. The total suspended weight is 1,432 pounds.

- Notes.** 1. See TM 4-48.03/MCRP 4-11.C/TO 13C7-1-11, Chapter 2 for aircraft capabilities and limitations.
2. A minimum of 80 pounds accompanying load must be dropped on the rear cargo rack.
3. No accompanying load may be placed on the front cargo rack during airdrop.



Figure 16-1. MV700 ATV

PREPARING SKID BOARD

16-2. Prepare the skid board as shown in Paragraph 8-21.

PREPARING THE SKID BOARD TIES

16-3. Prepare the skid board ties as shown in Figure 16-2.

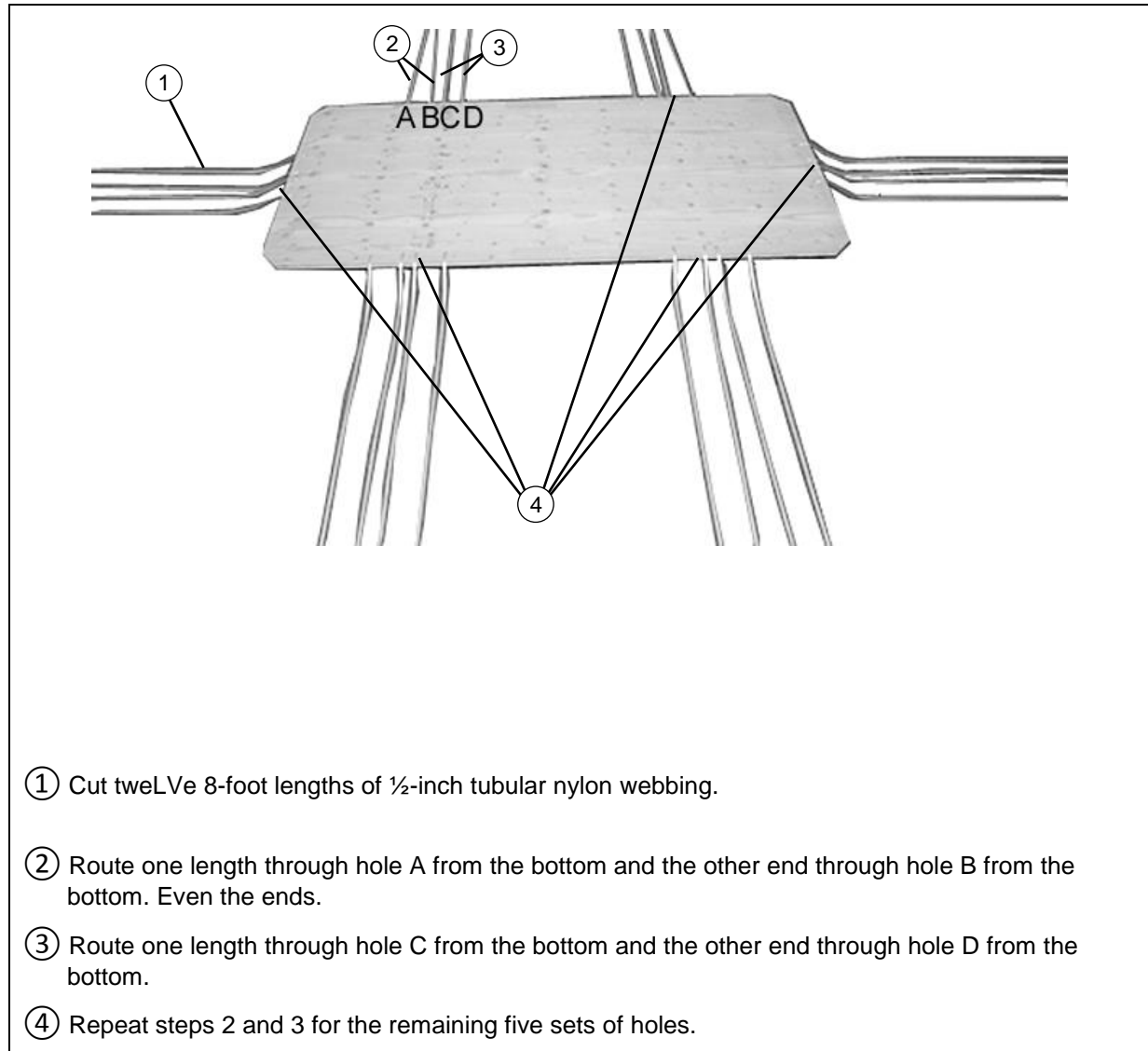


Figure 16-2. Skid board ties prepared for a double A-22 container load

POSITIONING AND SECURING THE A-22 SLING ASSEMBLIES

16-4. Position and secure the two A-22 sling assemblies on the skid board as shown in Figure 16-3.

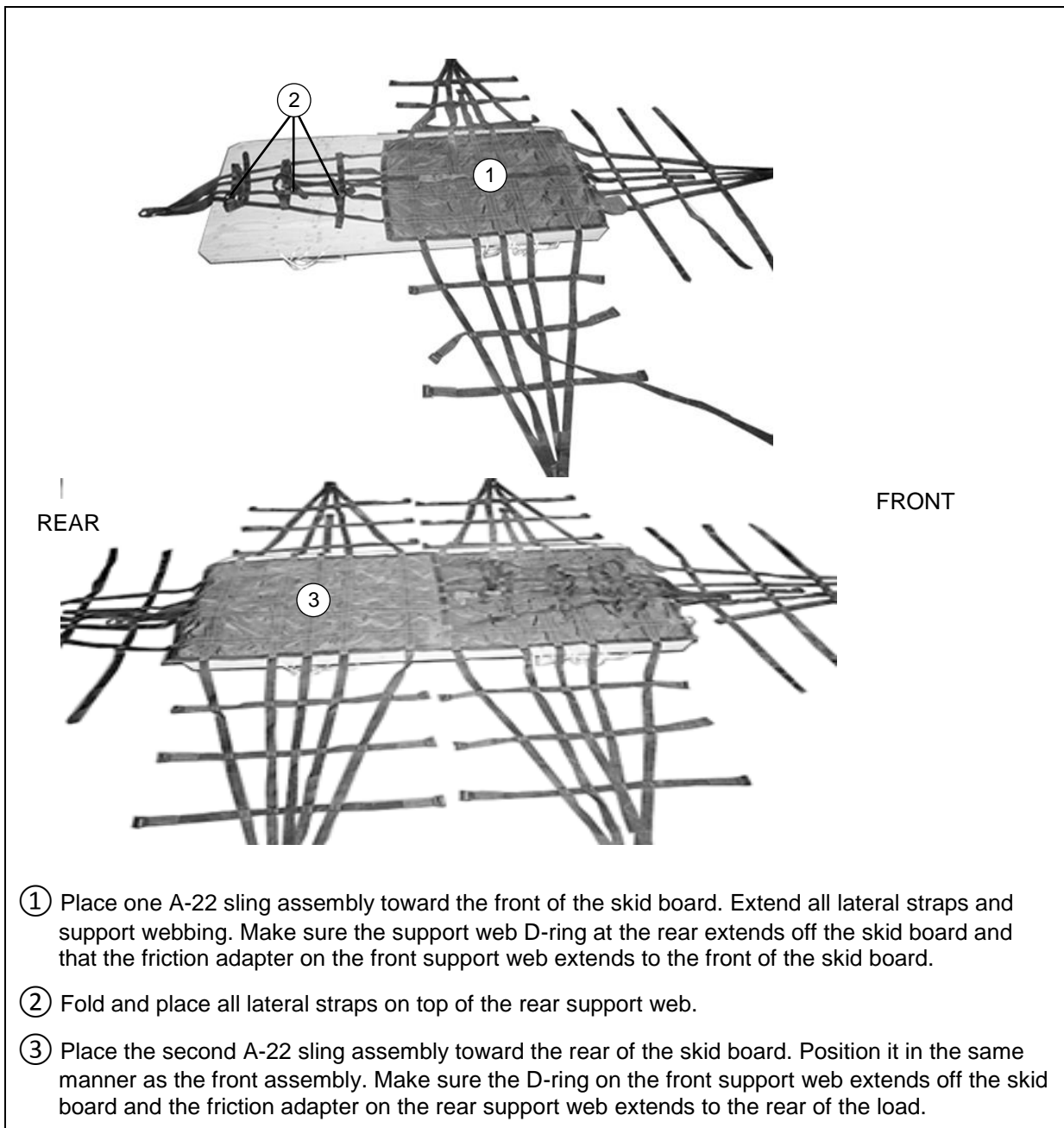
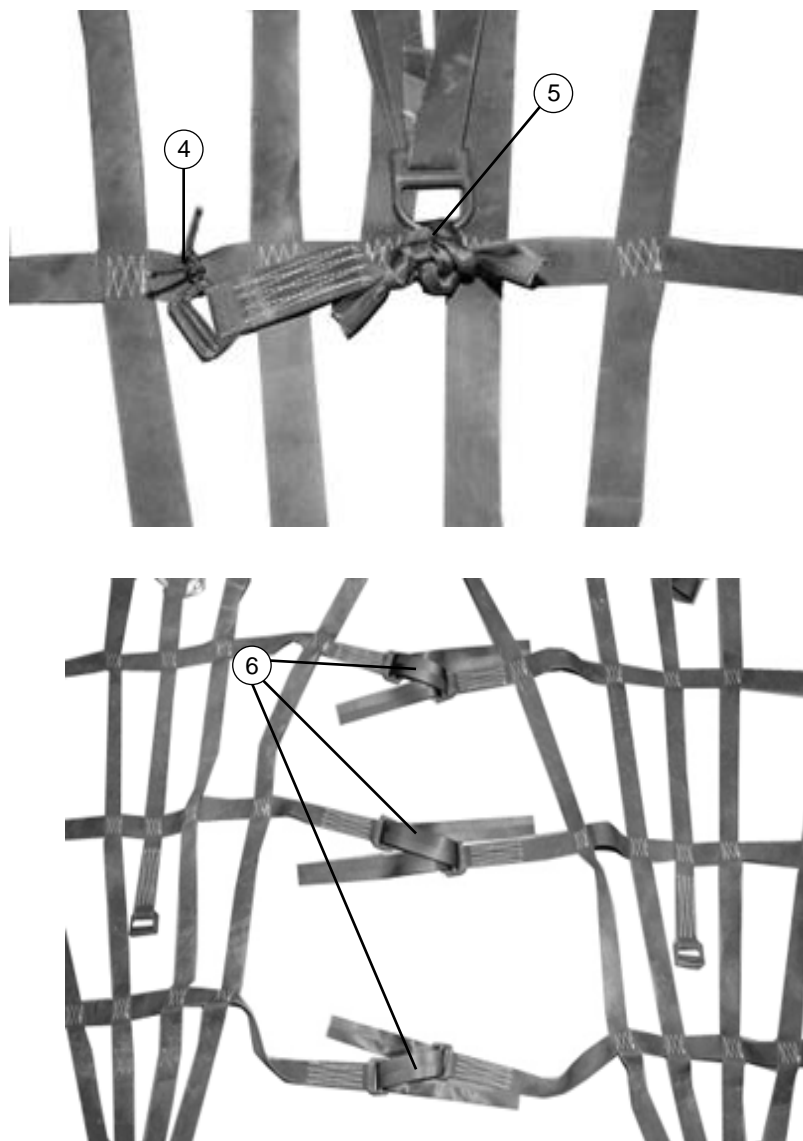


Figure 16-3. A-22 sling assemblies positioned



- ④ Use a length of $\frac{1}{2}$ -inch tubular nylon webbing to tie the friction adapters exposed at the front and rear of the load to the top lateral strap of their A-22 sling assembly as shown.
- ⑤ Use a length of type VIII nylon webbing to tie the support web D-ring exposed at the front and rear of the load to the top lateral strap of their A-22 sling assembly as shown
- ⑥ Cut six lengths of type VIII nylon webbing. Route one length through each set of friction adapters at the midsection of the load as shown. Do not apply tension at this time.

Figure 16-3. A-22 sling assemblies positioned (continued)

POSITIONING COVERS

16-5. Position the A-22 covers as shown in Figure 16-4.

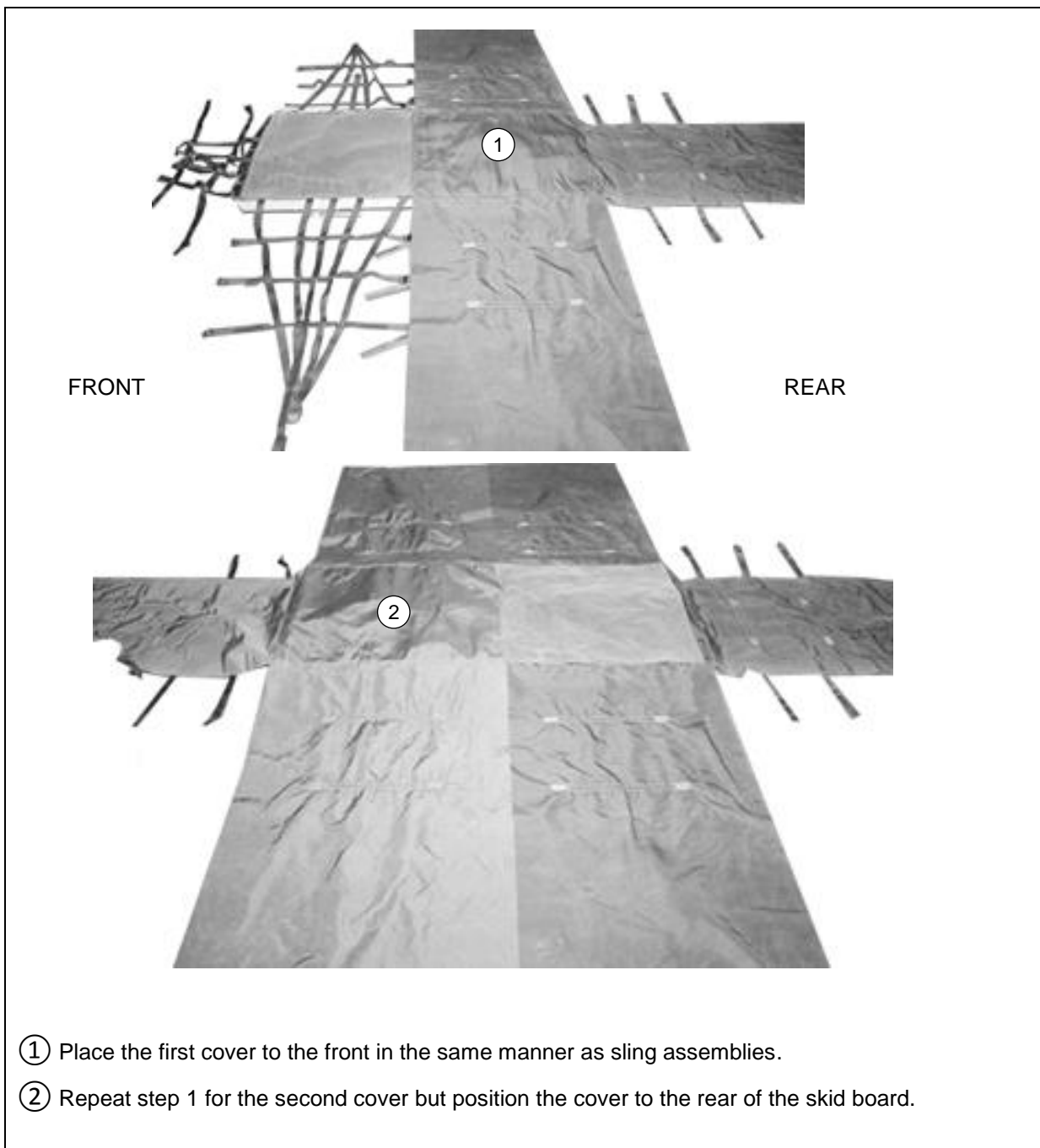


Figure 16-4. Covers positioned

PREPARING THE HONEYCOMB STACKS

16-6. Prepare 3 honeycomb stacks as shown in Figure 16-5.

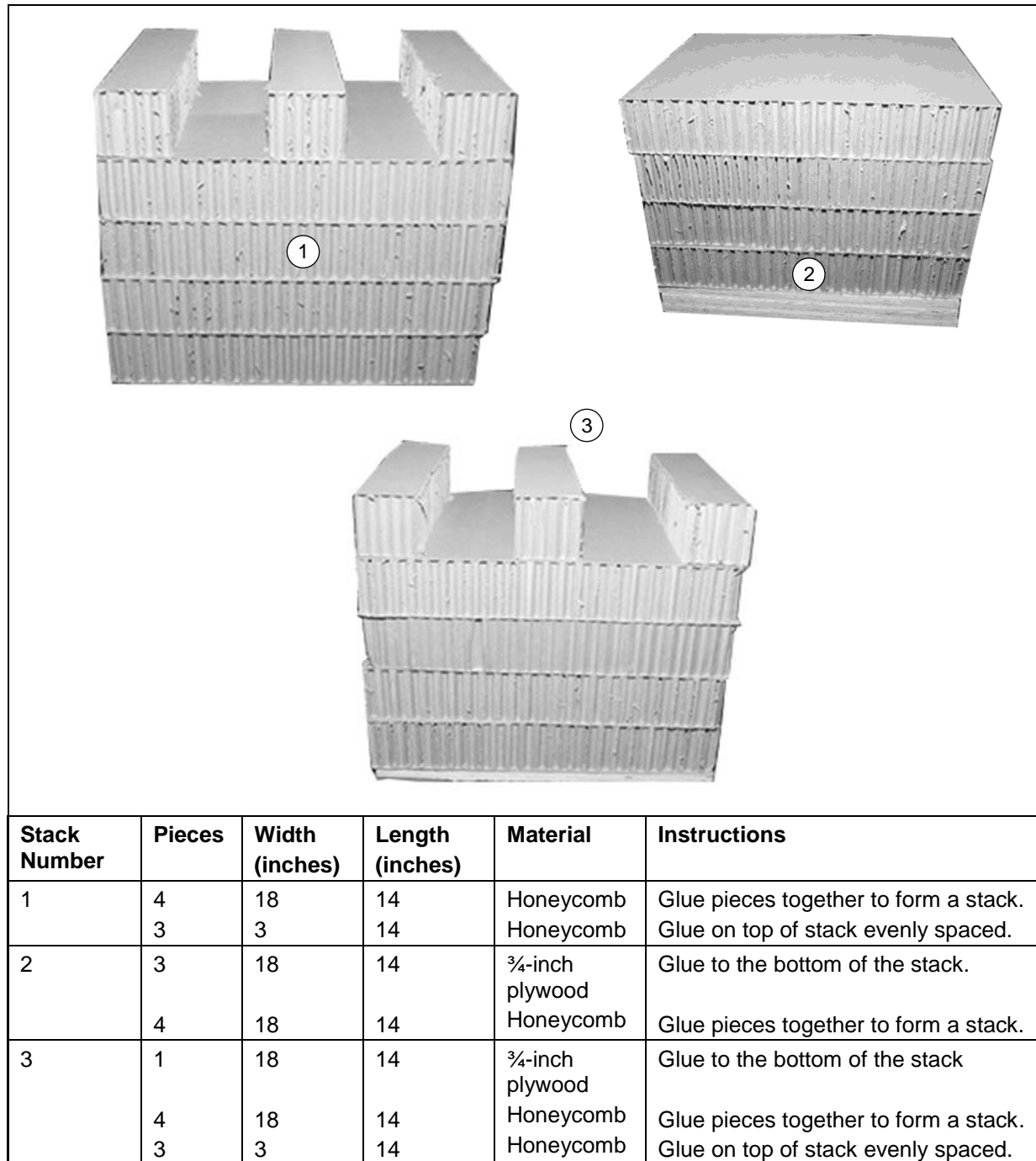
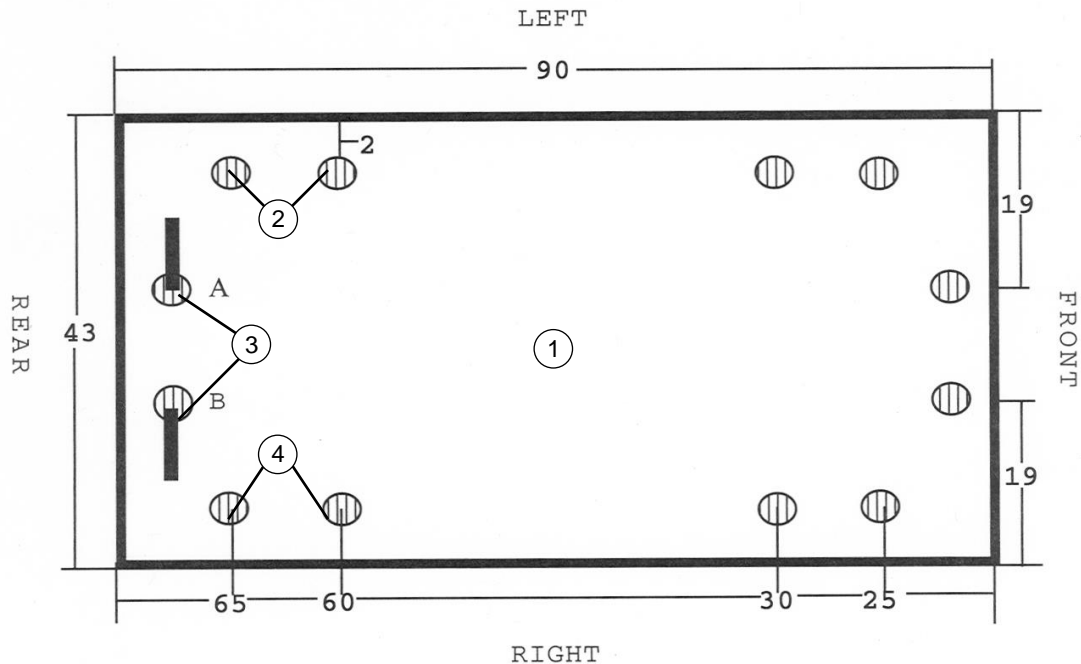


Figure 16-5. Honeycomb stacks prepared

PREPARING THE PLATFORM

16-7. Construct a platform as shown in Figure 16-6.

- Notes.** 1. This drawing is not drawn to scale.
 2. All dimensions are given in inches.
 3. Use only A-C grade plywood for platform.
 4. These ties will secure the ATV to the 1-inch plywood platform.



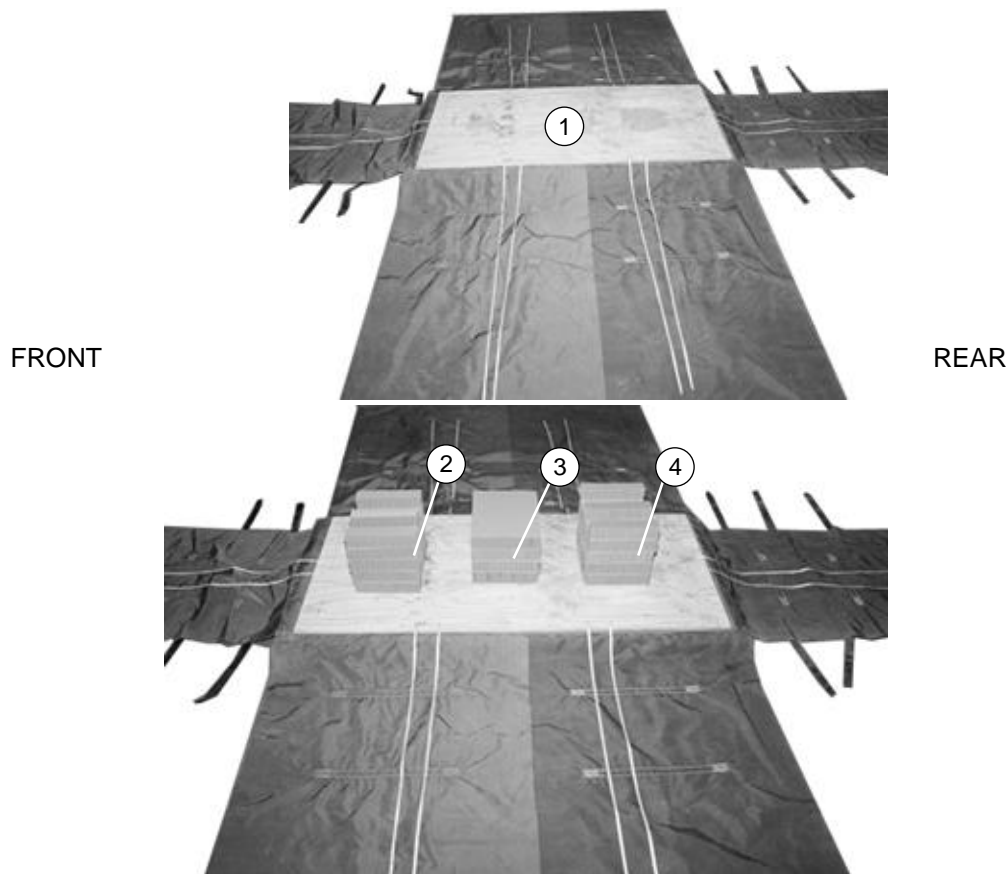
- ① Place a 1- by 43- by 90-inch sheet of plywood on a flat surface.
- ② Drill twelve $\frac{1}{2}$ -inch holes. Measure 2 inches in from edge of the platform as shown above.
- ③ Cut six 8-foot lengths of $\frac{1}{2}$ -inch tubular nylon webbing. Route one length through hole A from the bottom and the other end through hole B from the bottom. Even the ends of the $\frac{1}{2}$ -inch tubular webbing.
- ④ Repeat step 3 for the remaining holes.

Figure 16-6. Platform prepared

POSITIONING THE PLATFORM AND HONEYCOMB STACKS

16-8. Position the platform on the two A-22 covers and position the honeycomb stacks as shown in Figure 16-7.

Note. Glue the honeycomb stacks to the plywood platform.

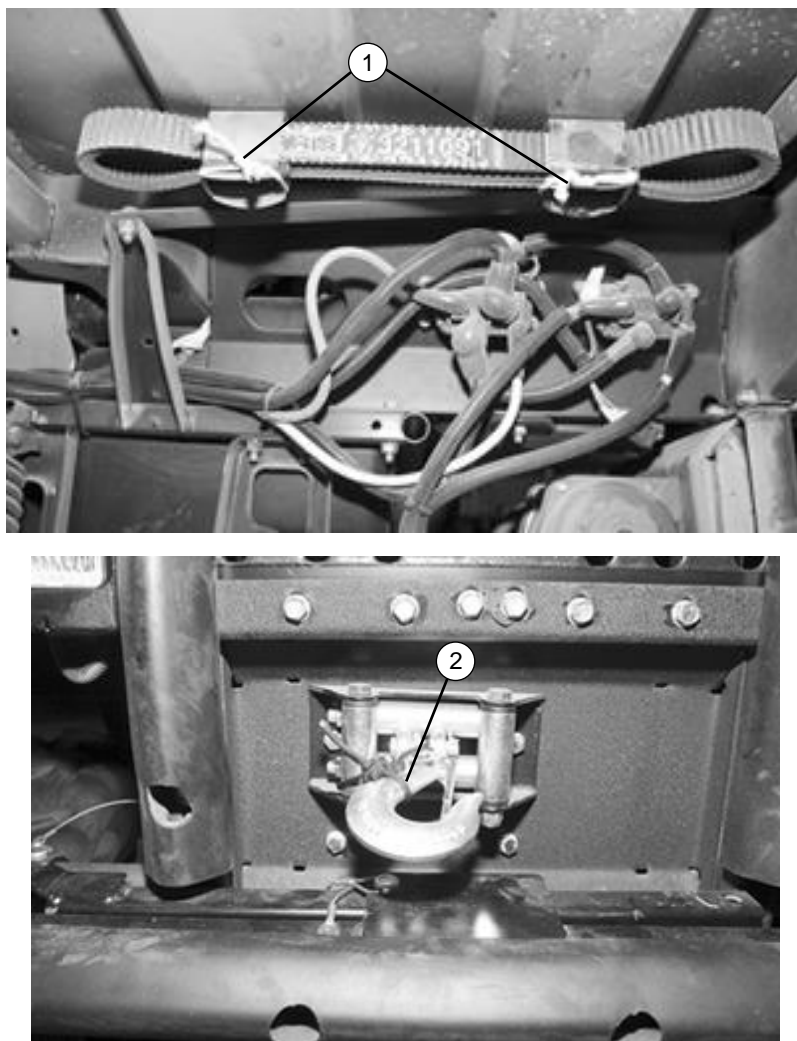


- ① Center the 1-by 43- by 90-inch piece of plywood platform directly on top of the A-22 covers.
- ② Position and glue honeycomb stack one 11 inches from the front edge of the platform.
- ③ Position and glue honeycomb stack two 36 inches from the front edge of the platform.
- ④ Position and glue honeycomb stack three 60 inches from the front edge of the platform.

Figure 16-7. Platform and honeycomb stacks positioned

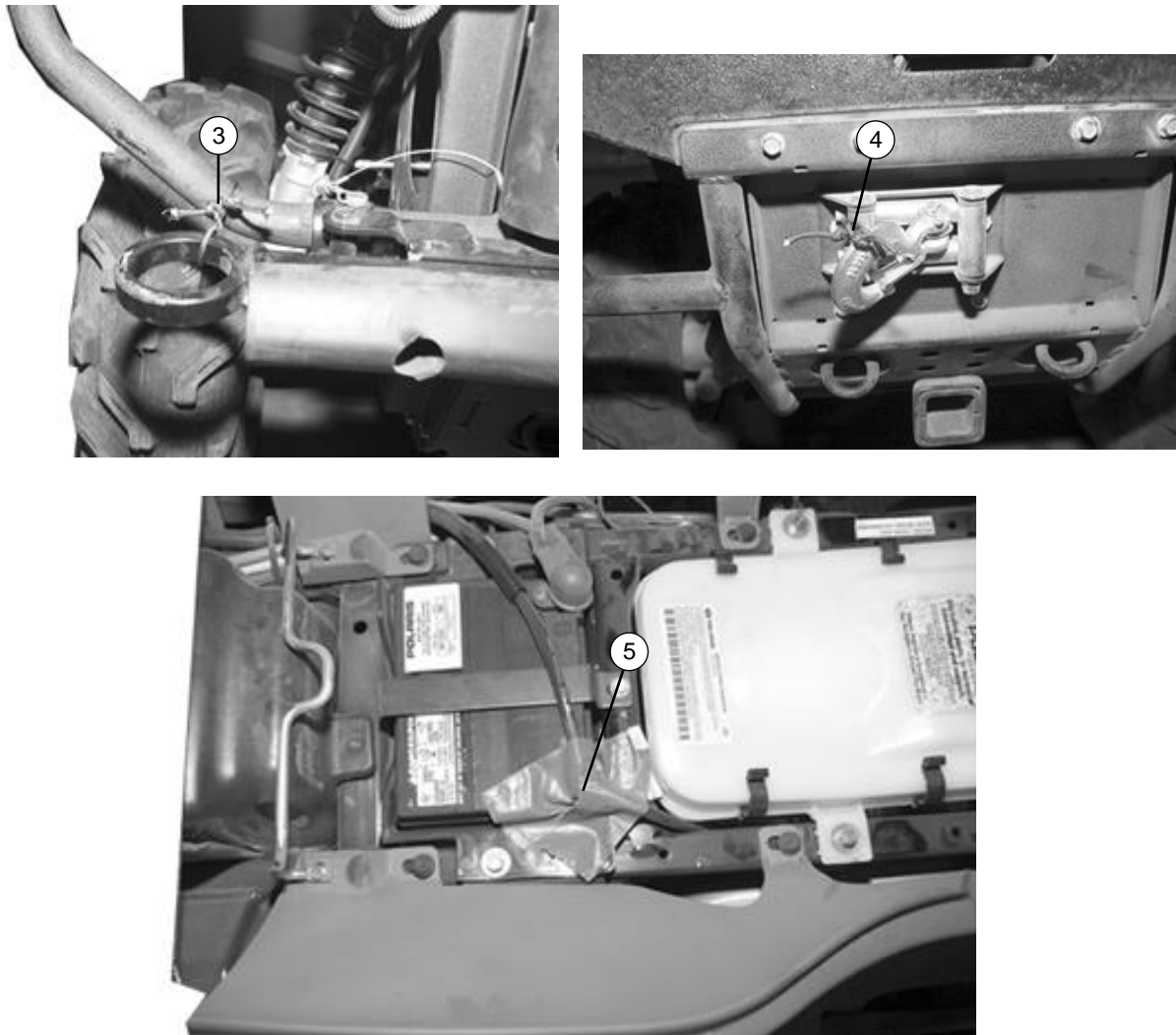
PREPARING THE LOAD

16-9. Prepare the load as shown in Figure 16-8.



- ① Secure the extra engine belt brackets with type III nylon cord.
- ② Secure the front winch hook with type III nylon cord.

Figure 16-8. Load prepared



- ③ Secure the front tow bar to the tube frame (if equipped) with type III nylon cord.
- ④ Secure the rear winch hook with type III nylon cord.
- ⑤ Remove the seat to expose the battery. Cover the negative battery post and cable using 2-inch cloth backed tape. Place the seat back into its place.

Figure 16-8. Load prepared (continued)

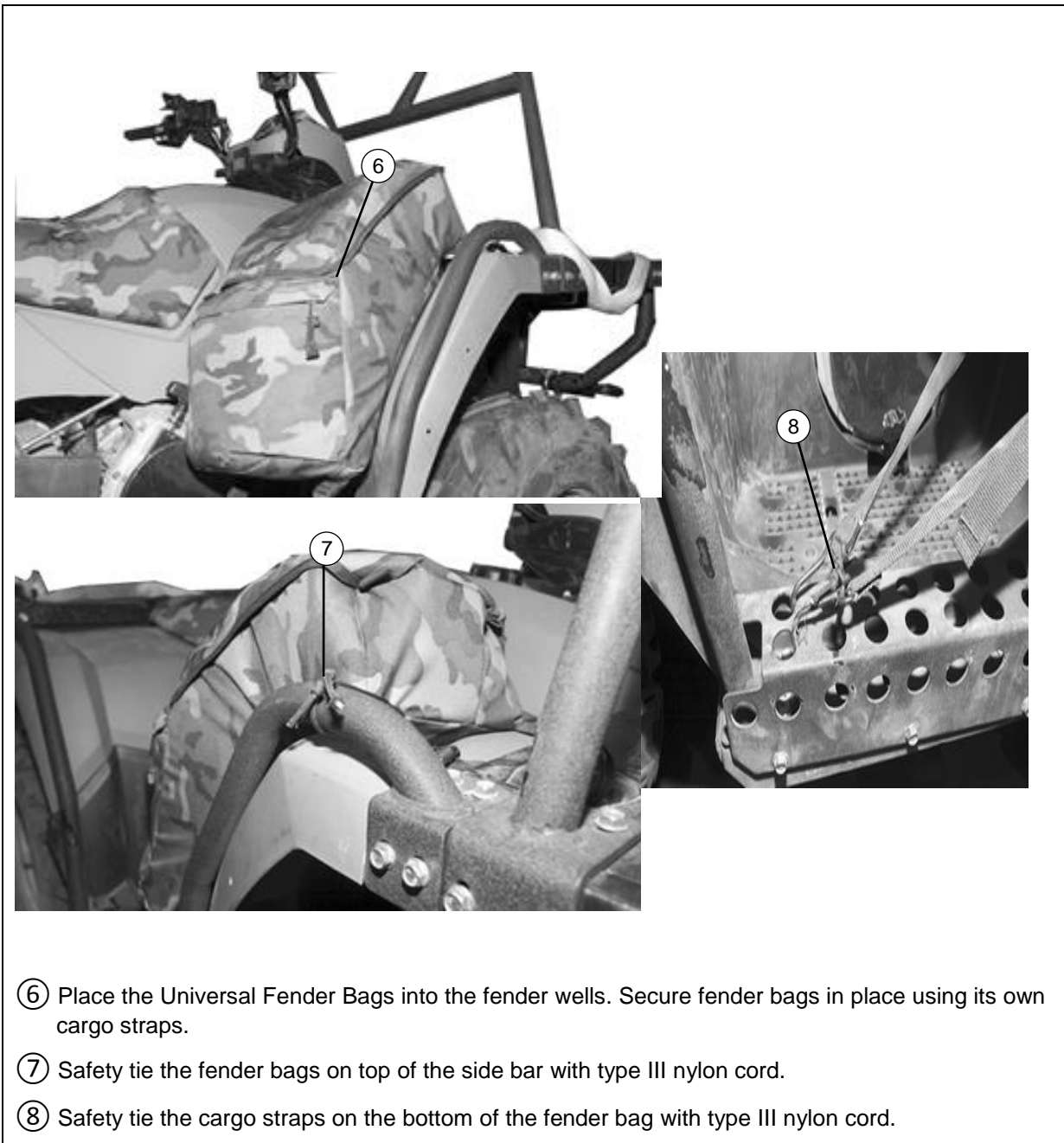
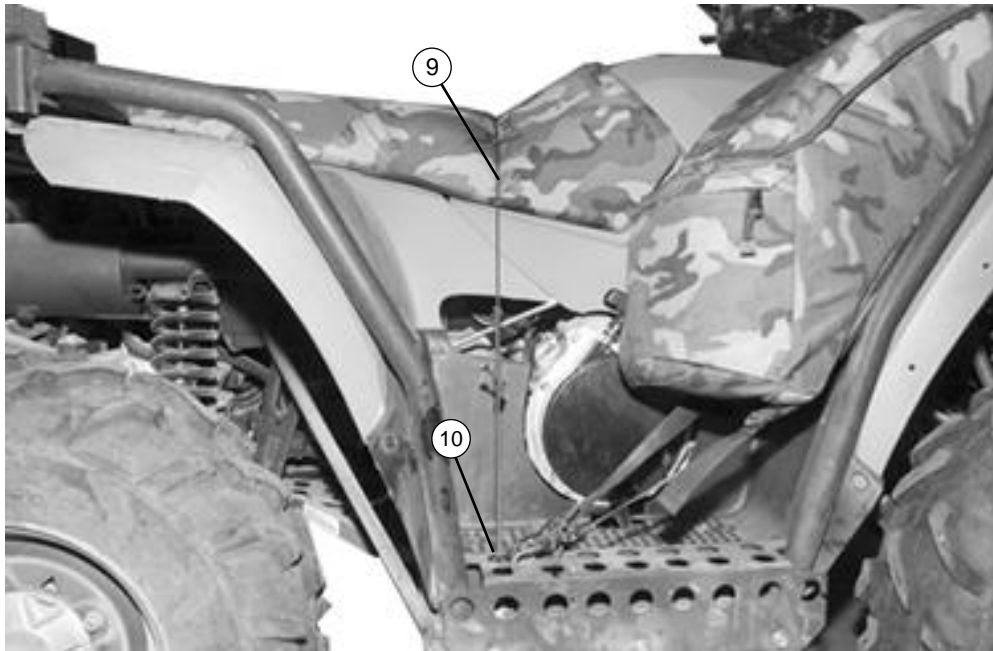


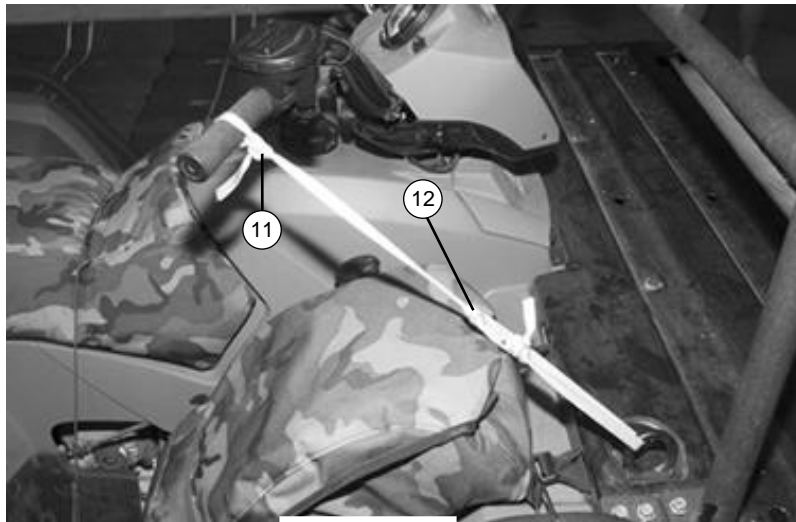
Figure 16-8. Load prepared (continued)



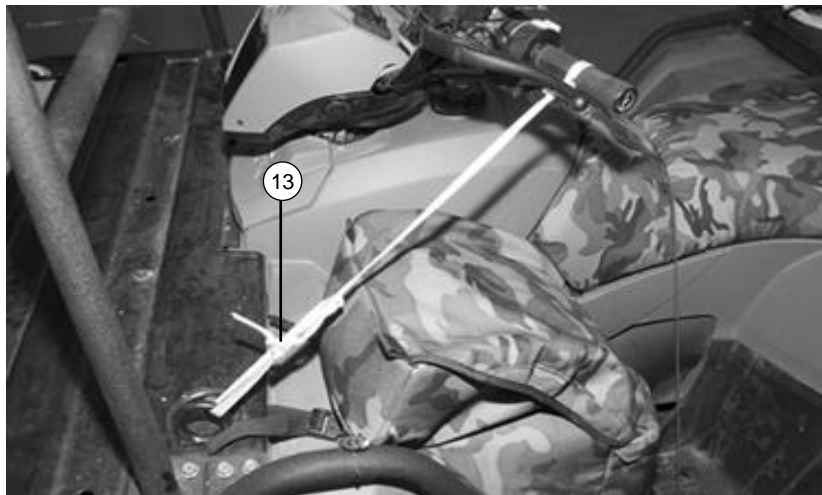
RIGHT

- ⑨ Cut a length of type III nylon cord. Tie a free end of the nylon cord to the left foot plate, route the type III nylon cord up and over the seat.
- ⑩ Tie the other free end to the right foot plate.

Figure 16-8. Load prepared (continued)



RIGHT



LEFT

- ⑪ Secure the handle bars with ½-inch tubular nylon. Tie one end to the right handle bar with three alternating half hitches and an overhand knot in the running end.
- ⑫ Route the free running end to the closest tiedown ring on the front cargo rack and secure with a trucker's hitch.
- ⑬ Repeat steps 11 and 12 for the left handle bar.
- ⑭ Place the hand break in the "On" position (not shown).

Figure 16-8. Load prepared (continued)

LIFTING AND POSITIONING THE ATV ON THE HONEYCOMB STACKS

16-10. Attach lifting lashings to the ATV and position the ATV onto the honeycomb stacks as shown in Figure 16-9.

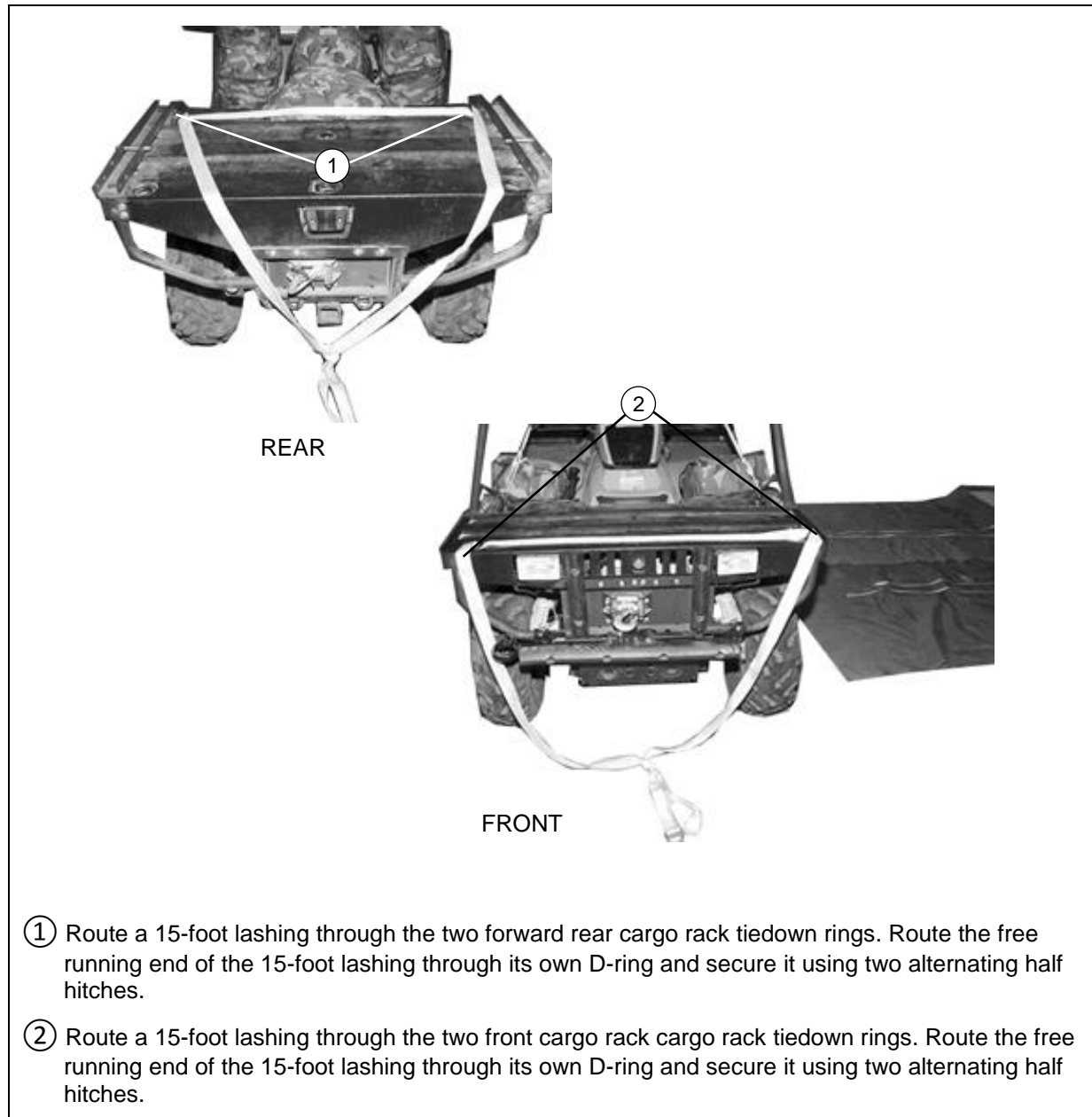


Figure 16-9. ATV positioned on the honeycomb stacks



- ③ Lift the ATV using the two previously installed 15-foot lashings.

Figure 16-9. ATV positioned on the honeycomb stacks (continued)

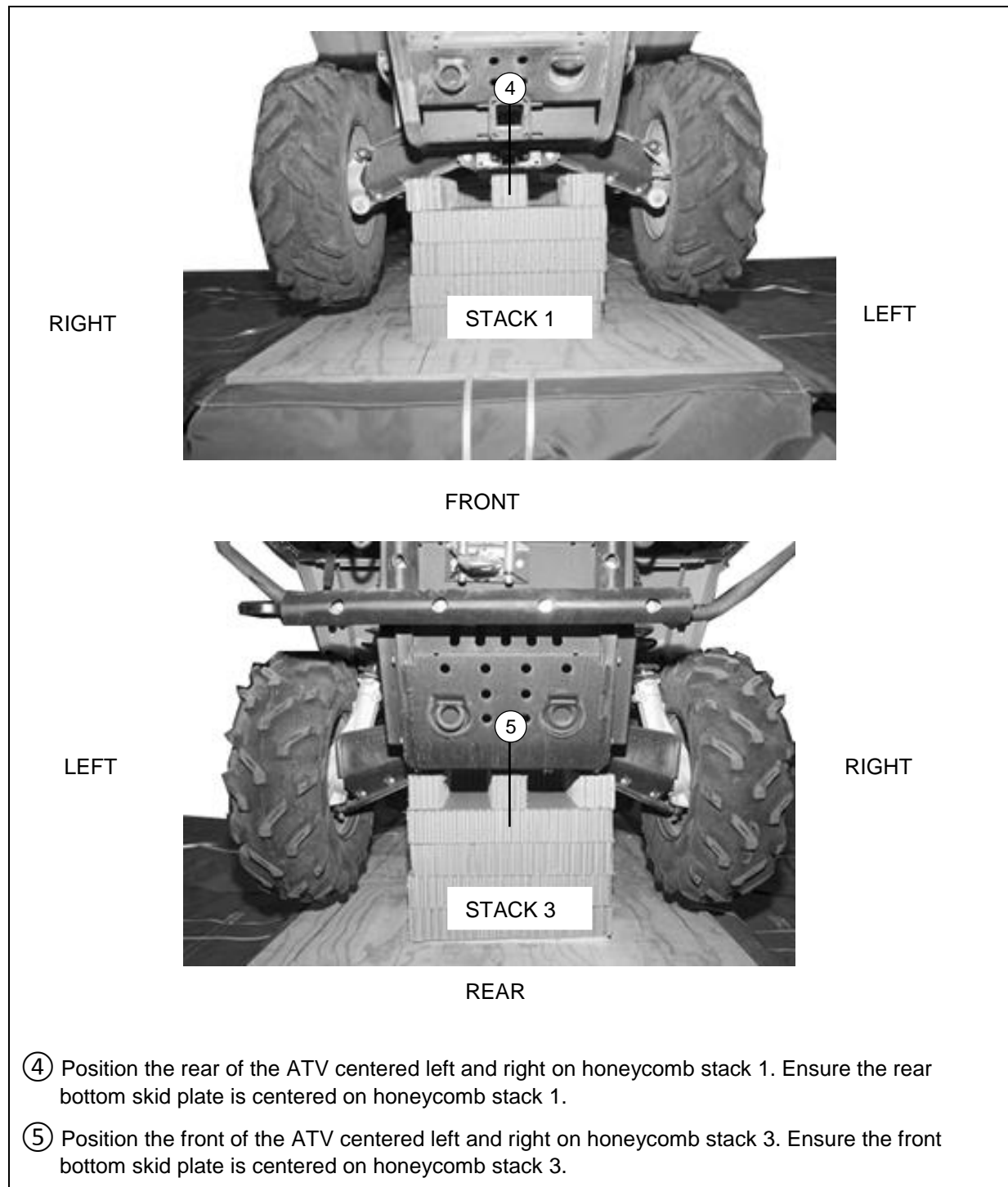
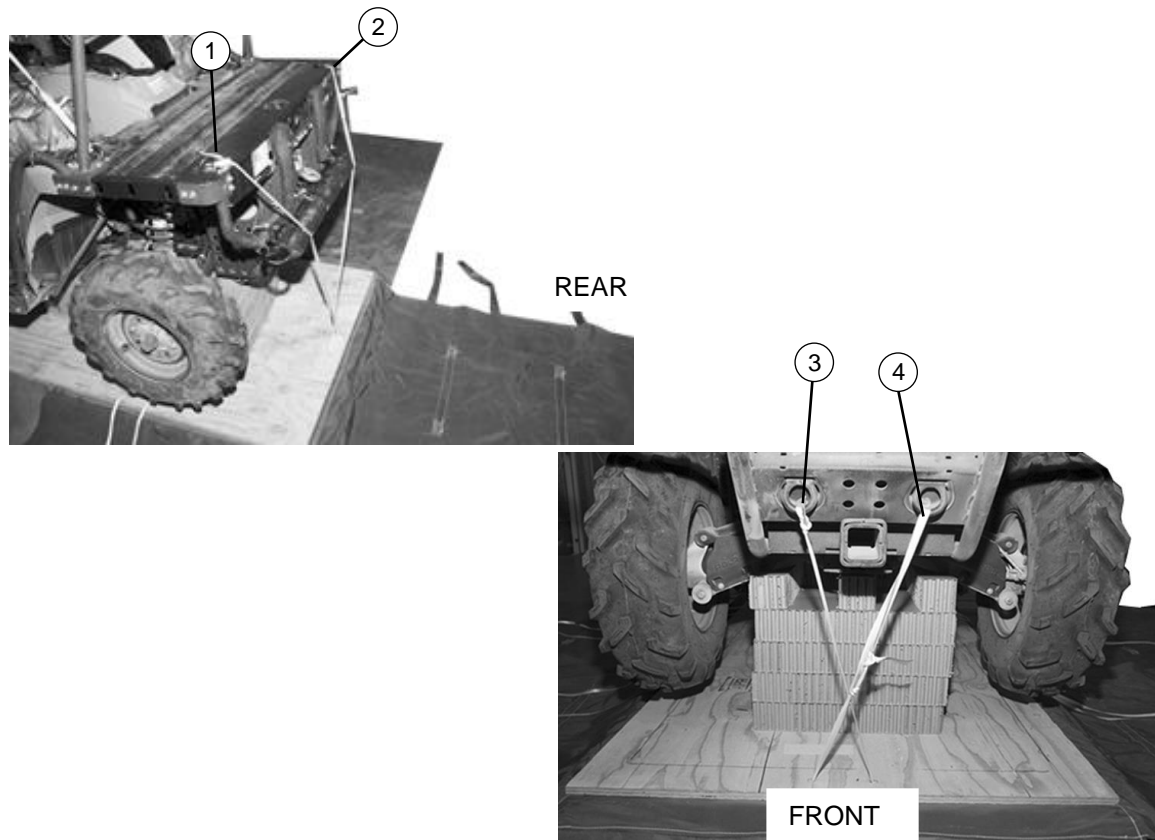


Figure 16-9. ATV positioned on the honeycomb stacks (continued)

SECURING THE ATV TO THE PLATFORM

16-11. Secure the ATV to the platform as shown in Figure 16-10.



- ① Secure the ATV front to the platform using the rear platform ties. Cross the rear platform ties and secure a free running end to one of the front cargo rack tiedown ring using three alternating half hitches. Tie an overhand knot in the running end.
- ② Secure the other free running end to the other front cargo rack tiedown ring using a trucker's hitch and an overhand knot in the running end.
- ③ Secure the ATV rear to the platform using the front platform ties. Cross the front platform ties and secure a free running end to one of the rear tiedown point using three alternating half hitches. Tie an overhand knot in the running end.
- ④ Secure the other free running end to the other tiedown point using a trucker's hitch and an overhand knot in the running end.

Figure 16-10. ATV secured to the platform

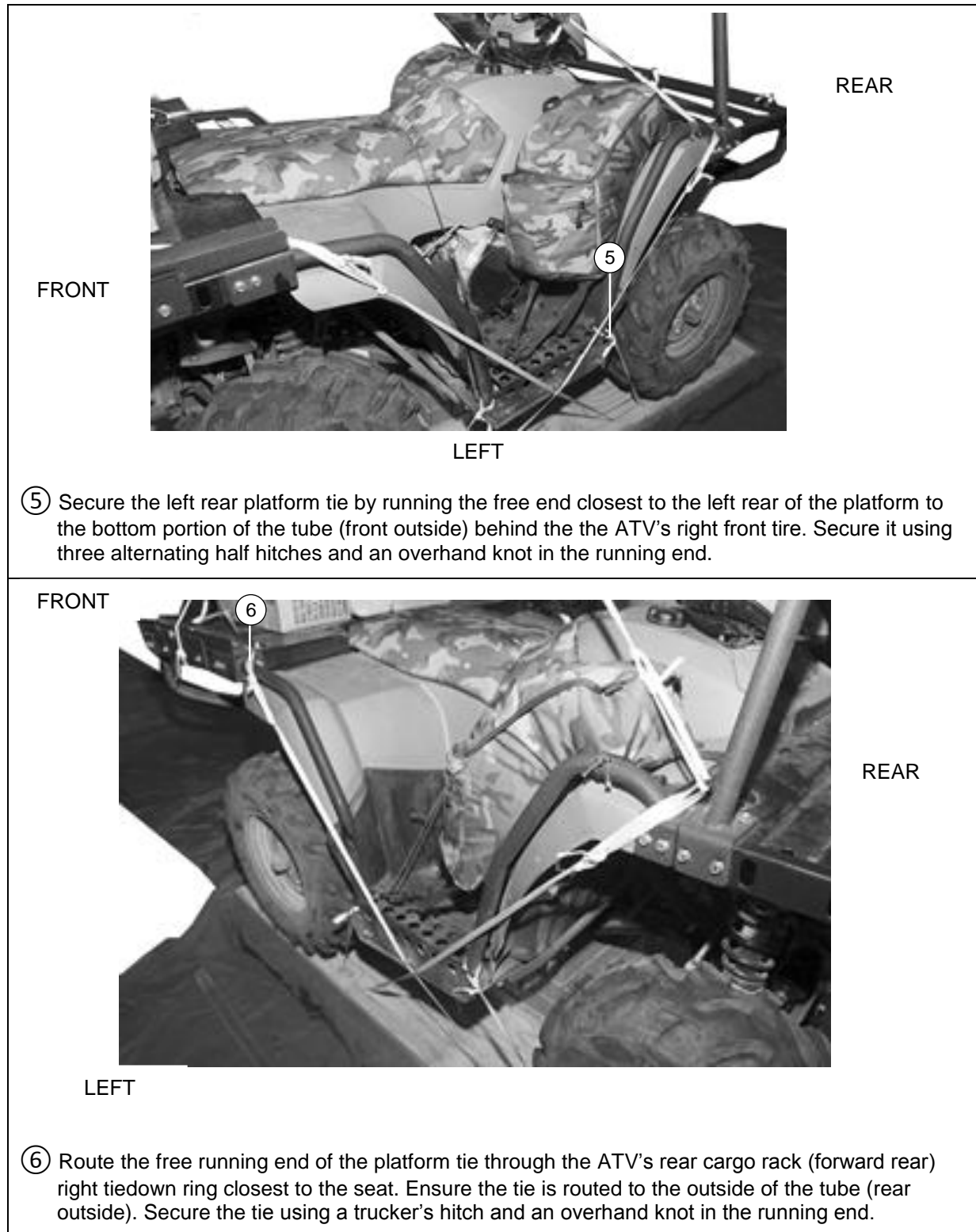


Figure 16-10. ATV secured to the platform (continued)

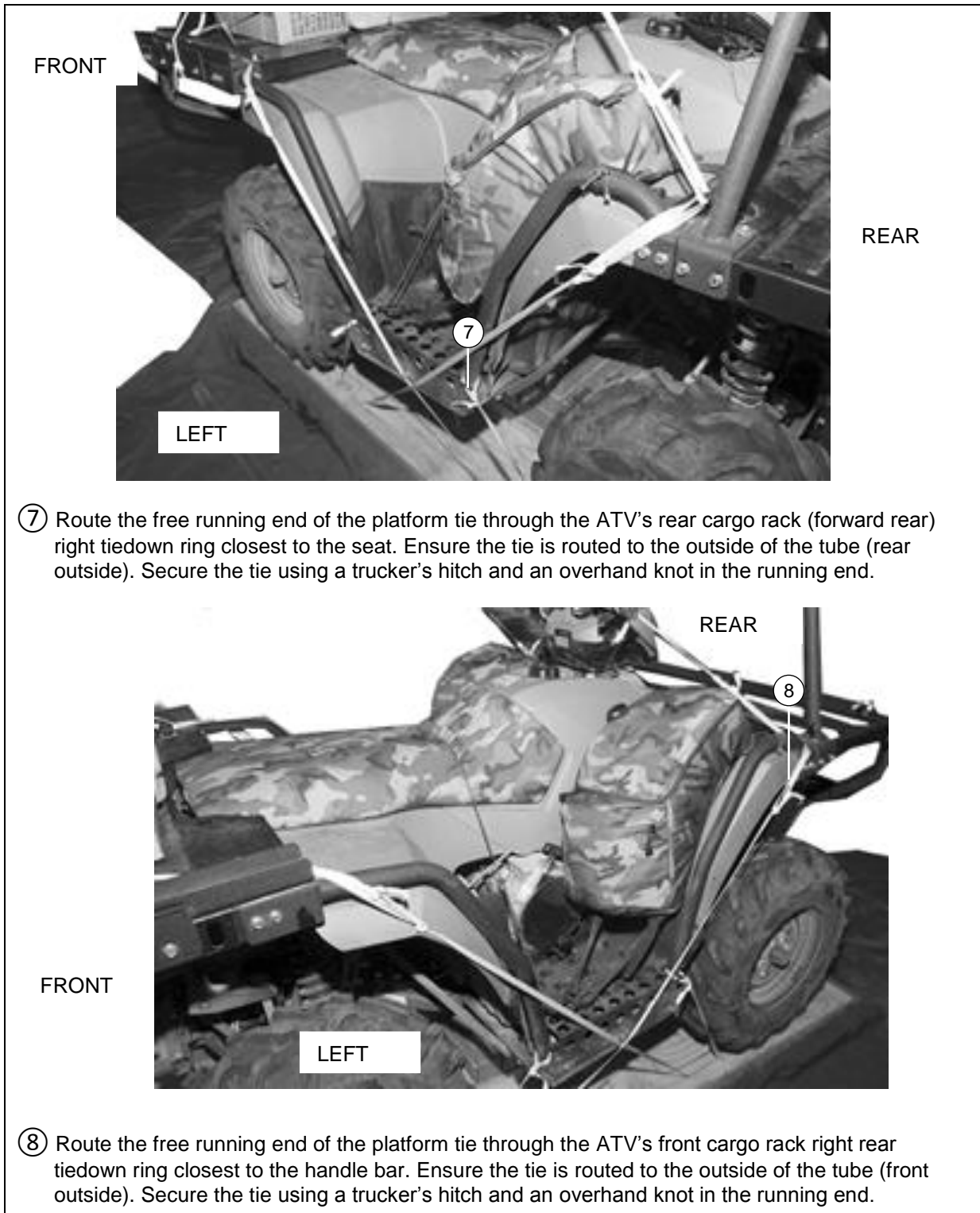


Figure 16-10. ATV secured to the platform (continued)

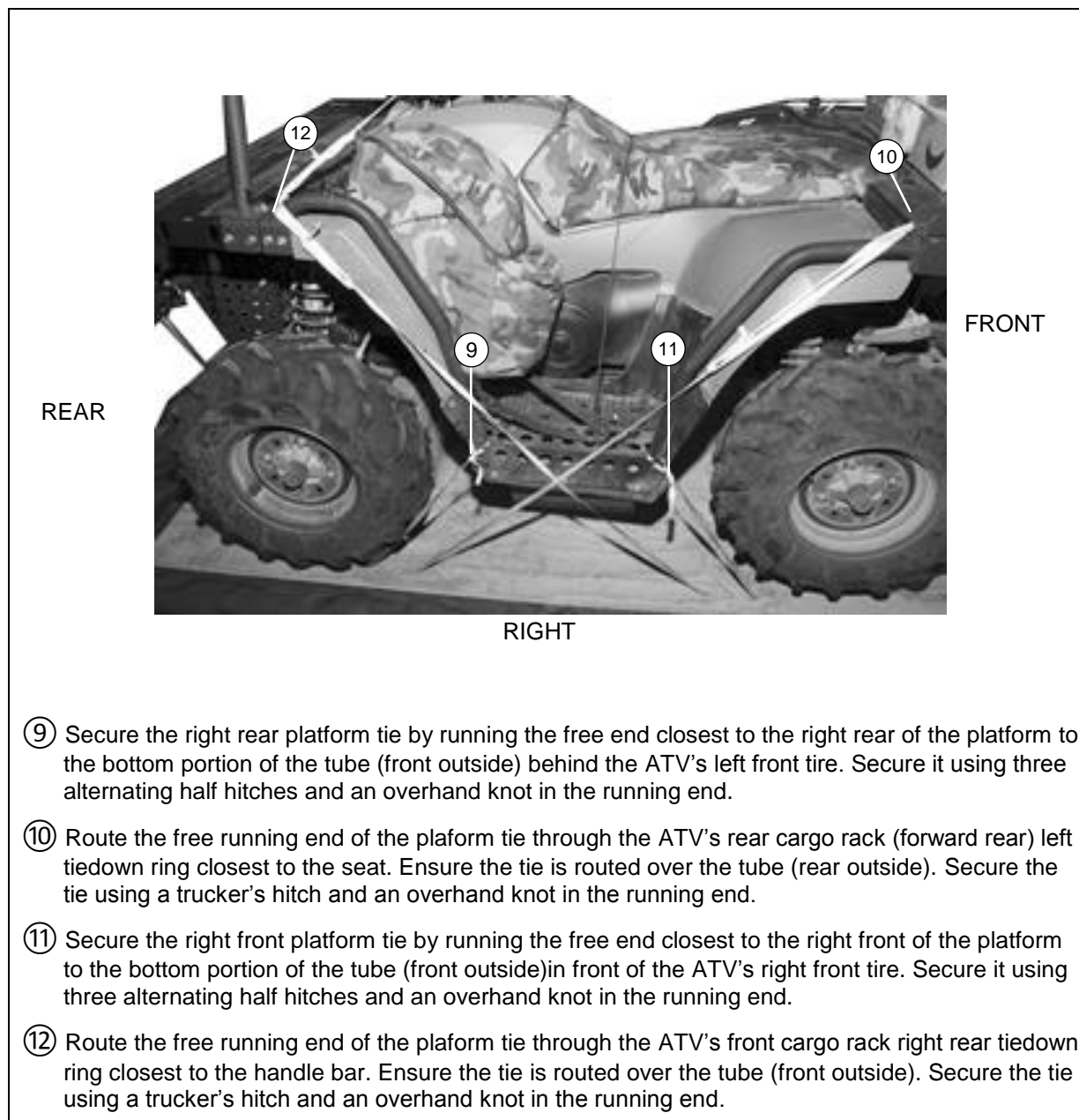
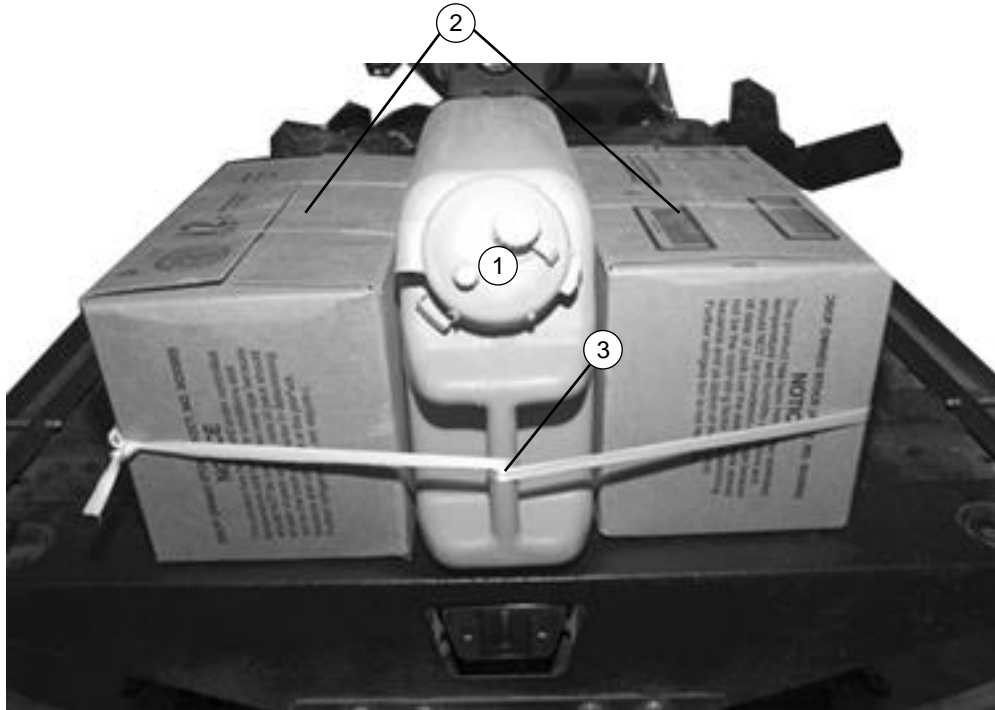


Figure 16-10. ATV secured to the platform (continued)

POSITIONING AND SECURING THE ACCOMPANYING LOAD

16-12. Position and secure the accompanying load as shown in Figure 16-11.

- Notes.** 1. A minimum of 80 pound accompanying load must be dropped on the rear cargo rack.
2. The accompanying load on the rear cargo rack must not exceed 400 lbs.
3. No accompanying load will be dropped using the front cargo rack.



- ① Place a 5-gallon water container centered and flush with the rear edge of ATV's rear cargo rack as shown. Ensure the carrying handle faces to the rear of the ATV.
- ② Place two cases of Meals-Ready-to-Eat (MRE's) on the rear cargo rack as shown. Ensure the accompanying load is flush with the rear edge of the cargo rack.
- ③ Secure the MRE's and the 5-gallon water container with ½-inch tubular nylon webbing as shown. Ensure the ½-inch tubular nylon webbing is routed around the carrying handle.

Figure 16-11. ATV accompanying load positioned and secured



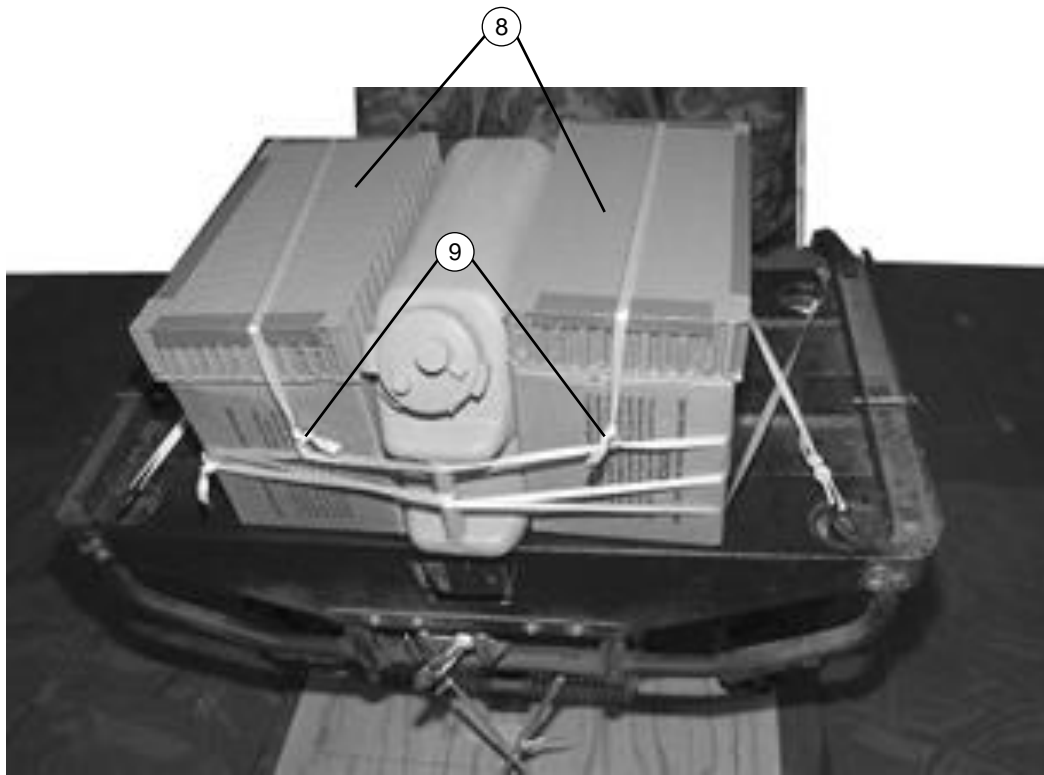
- ④ Cut a suitable length of ½-inch tubular nylon webbing. Secure one end of the ½-inch tubular nylon webbing to the ATV's rear cargo rack (left forward) tiedown ring closest to the seat.
- ⑤ Route the other end of the ½-inch tubular nylon webbing to the rear and around the cases of MRE's and secure the running end to the ATV's rear cargo rack (right forward) tiedown ring using a trucker's hitch.

Figure 16-11. ATV accompanying load positioned and secured (continued)



- ⑥ Cut a suitable length of ½-inch tubular nylon webbing. Secure one end of the ½-inch tubular nylon webbing to the ATV's cargo rack left rear tiedown ring.
- ⑦ Route the other end of the ½-inch tubular nylon webbing to the front and around the cases of MRE's and secure the running end to the ATV's rear cargo rack's right rear tiedown ring using a trucker's hitch.

Figure 16-11. ATV accompanying load positioned and secured (continued)



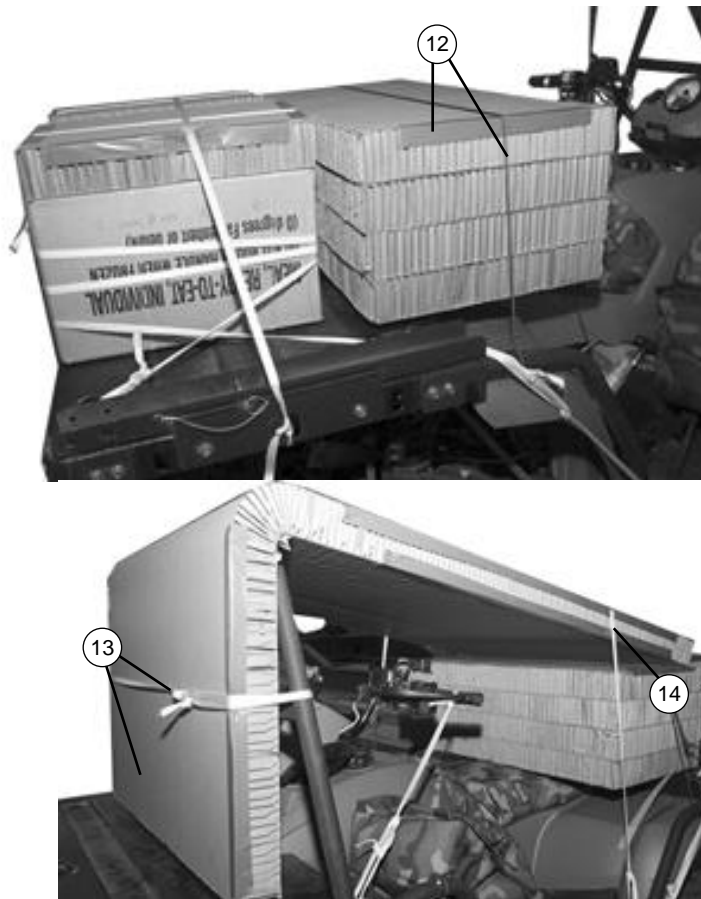
- ⑧ Cut two 17- by 9 ½-inch pieces of honeycomb and tape the edges using 2-inch cloth backed tape. Place a piece of honeycomb on top of each MRE box.
- ⑨ Secure each honeycomb piece to the previously routed ½-inch ties using ½-inch tubular nylon webbing.

Figure 16-11. ATV accompanying load positioned and secured (continued)



- ⑩ Cut a suitable length of ½-inch tubular nylon webbing. Secure one end of the ½-inch tubular nylon webbing to the right side of the ATV's rear cargo rack (center hole) (not shown).
- ⑪ Route the ½-inch tubular nylon webbing up and over the accompanying load as shown and down to the other side. Secure the tie on the left side of the rear cargo rack (center hole) using a trucker's hitch.

Figure 16-11. ATV accompanying load positioned and secured (continued)



- ⑫ Cut four 18-by 36-inch pieces of honeycomb. Glue the four pieces of honeycomb together to form a stack. Center the stack 2 inches in front of the accompanying load as shown. Tape the top left and right outer edges of the honeycomb with 2-inch cloth backed tape as shown and secure the stack to a convenient point using type III nylon cord.
- ⑬ Cut an 81-by 36-inch piece of honeycomb. Place one end of the honeycomb flush with the rear edge of the previously placed honeycomb stack and the other end over the ATV's front roll bar. Tape the outer edge of the honeycomb as shown. Bend the honeycomb down over the front roll bar and secure it to the front roll bar using ½-inch tubular nylon webbing.
- ⑭ Secure the rear portion of the 81-by 36-inch piece of honeycomb to a convenient point on the load using ½-inch tubular nylon webbing.

Figure 16-11. ATV accompanying load positioned and secured (continued)



Note. When tightening lashings, ensure excessive tension is not applied causing the front roll bar to bend.

- ⑮ Pass the free running end of a 15-foot lashing through the ATV's rear cargo rack forward right tiedown ring (the closest to the seat) and around the right side of the front roll bar. Secure the 15-foot lashing using a loadbinder and a D-ring.
- ⑯ Pass the free running end of a 15-foot lashing through the ATV's rear cargo rack forward left tiedown ring (the closest to the seat) and around the left side of the front roll bar. Secure the 15-foot lashing using a loadbinder and a D-ring .

Figure 16-11. ATV accompanying load positioned and secured (continued)

CLOSING COVERS

16-13. Close the covers using procedures in TM 4-48.03/MCRP 4-11.3C/TO 13C7-1-11 Chapter 8, Paragraph 8-25, and as shown in Figure 16-12.

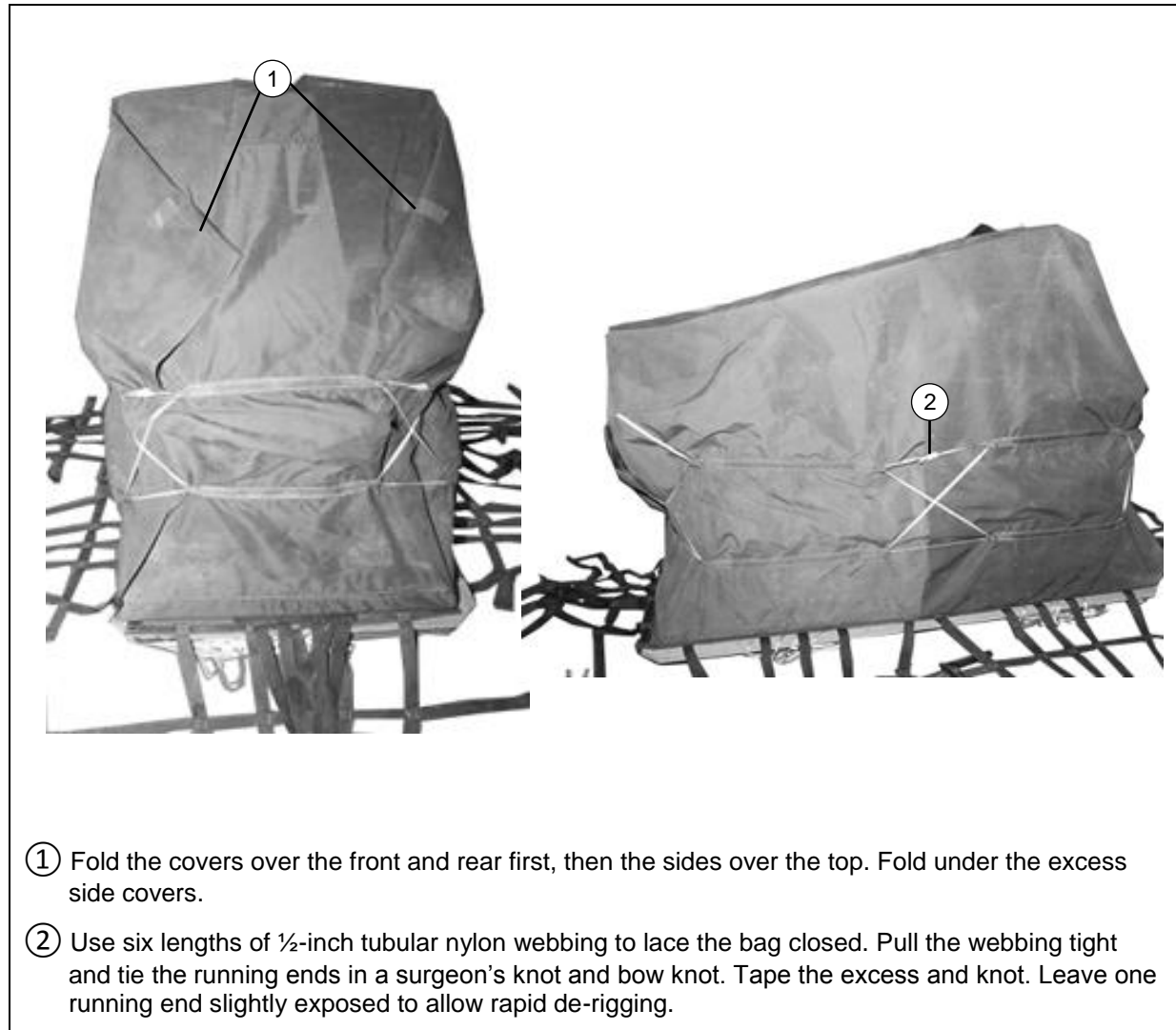


Figure 16-12. A-22 covers closed

SECURING TIEDOWN STRAPS

16-14. Secure the tiedown straps as shown in Figure 16-13.

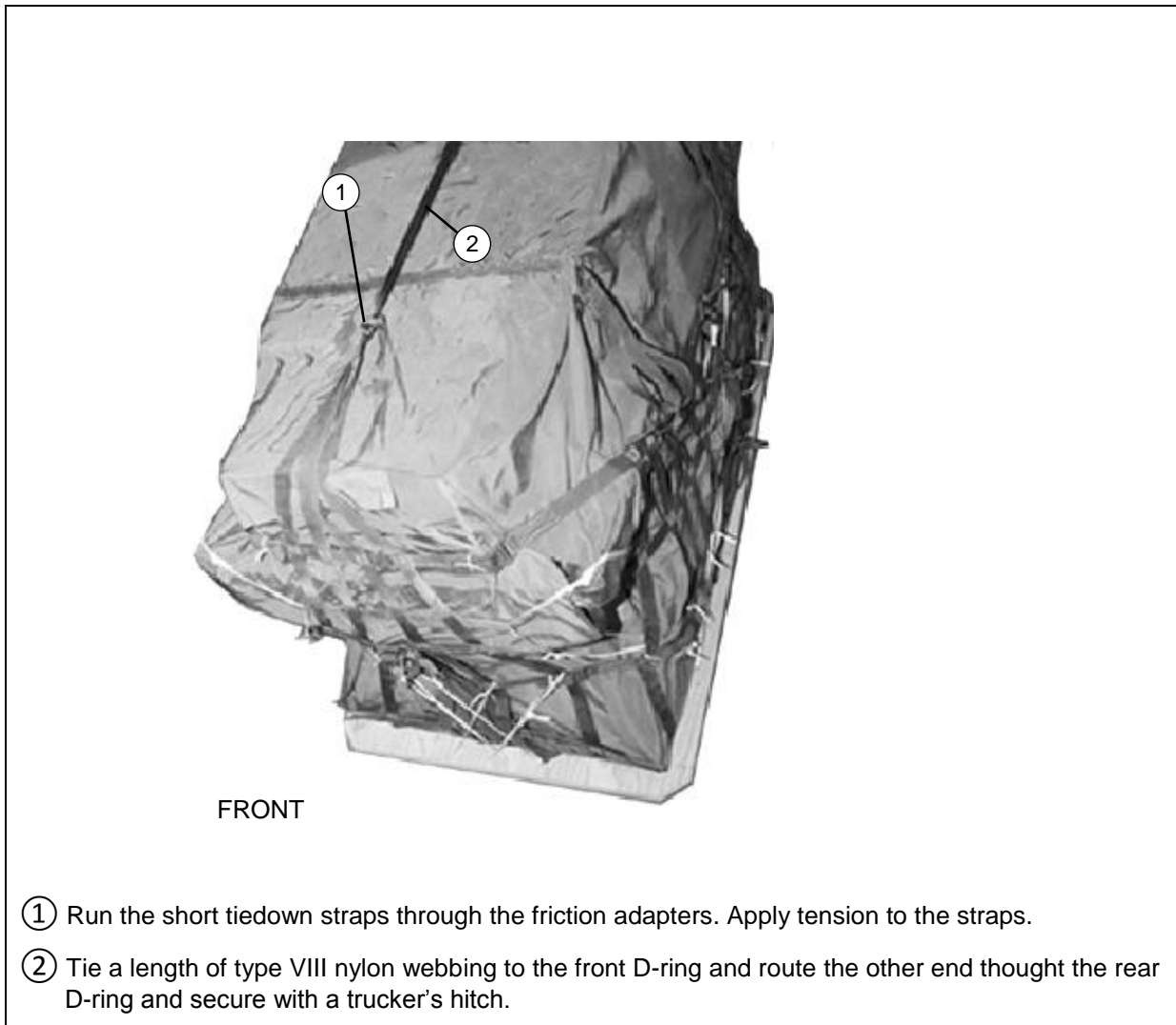
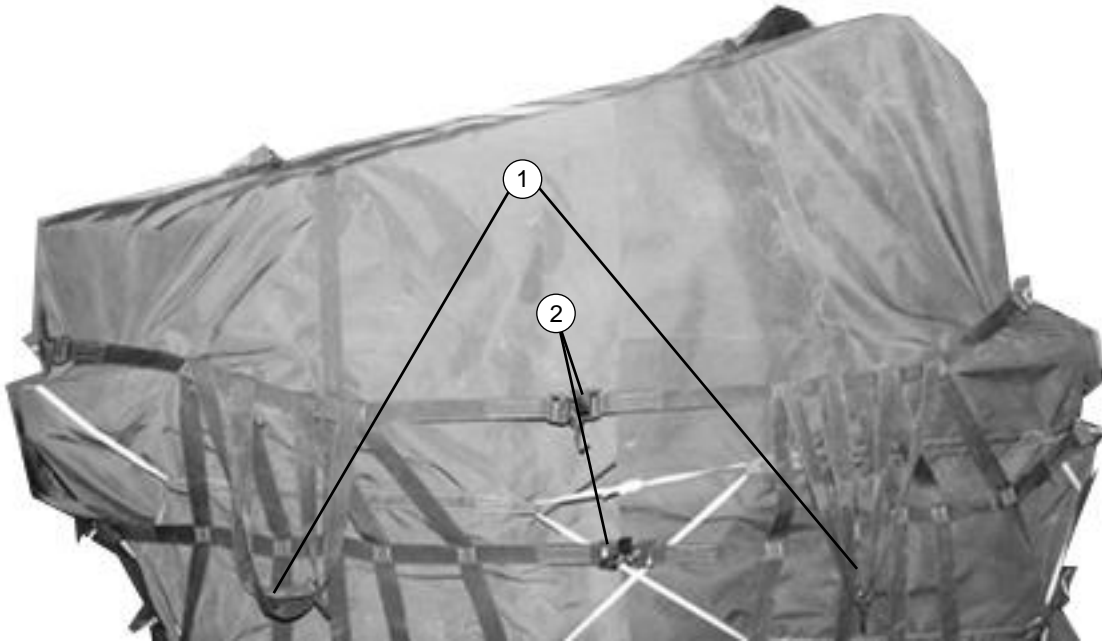


Figure 16-13. Tiedown straps secured

SECURING LATERAL STRAPS

16-15. Secure the tiedown straps shown in Figure 16-14.



- ① Lay the remaining portions of the sling assemblies over the load.
- ② Tighten the center friction adapter and type VIII nylon webbing so that the middle suspension web on each container is vertical. Install a knot in the running ends of the type VIII nylon webbing about 3 inches from the friction adapters.
- ③ Apply equal tension on the remaining lateral straps. Fold the excess and secure using type I, ¼-inch cotton webbing (not shown).

Figure 16-14. Lateral straps secured

SECURING SKID BOARD TIES

16-16. Secure the skid board ties using procedures in accordance with Chapter 8, Paragraph 8-28, and as shown in Figure 16-15.

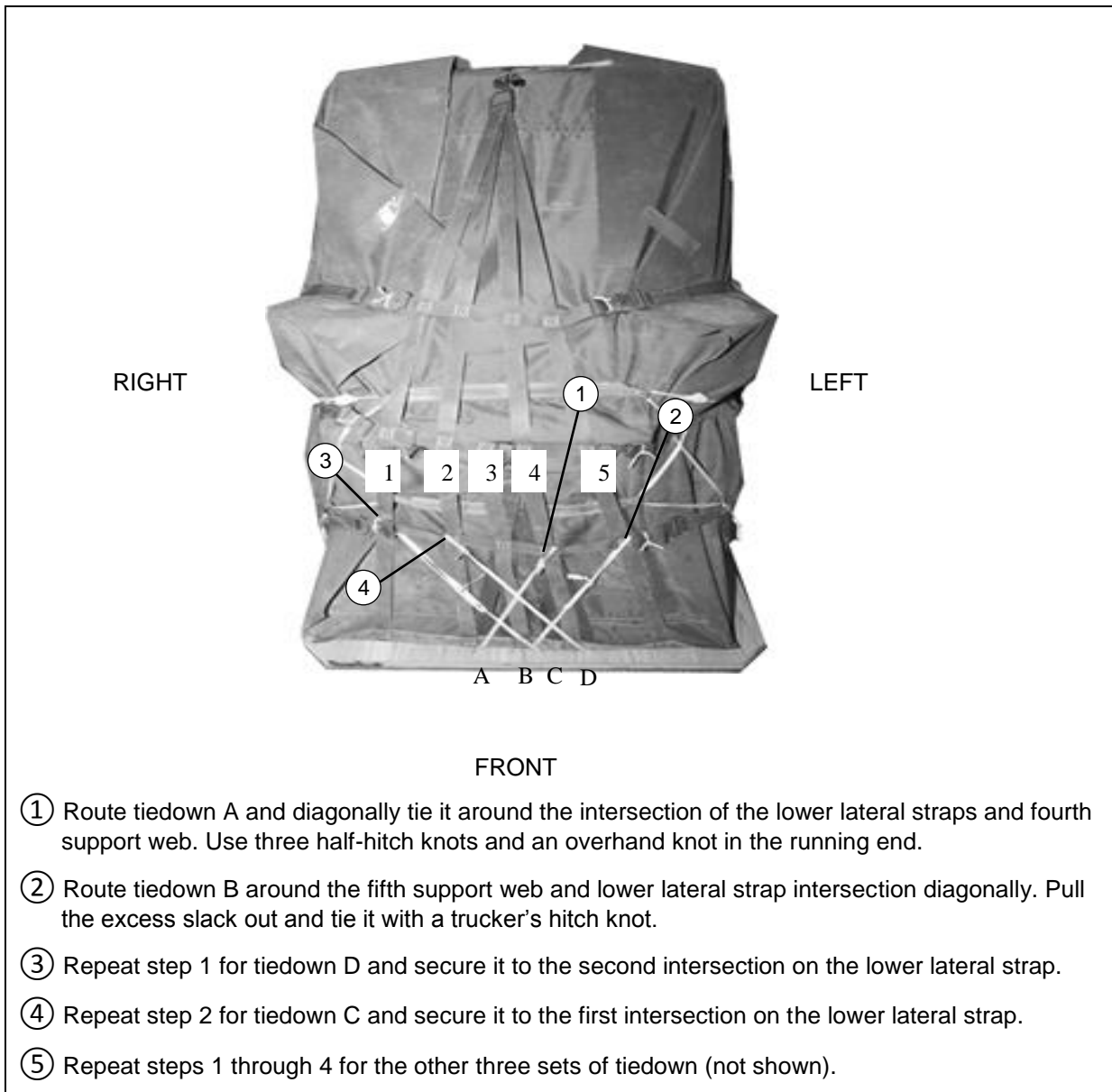


Figure 16-15. Skid board ties secured

INSTALLING THE JPADS 2K ON THE LOAD

16-17. Install the JPADS 2K as shown in Figure 16-16.

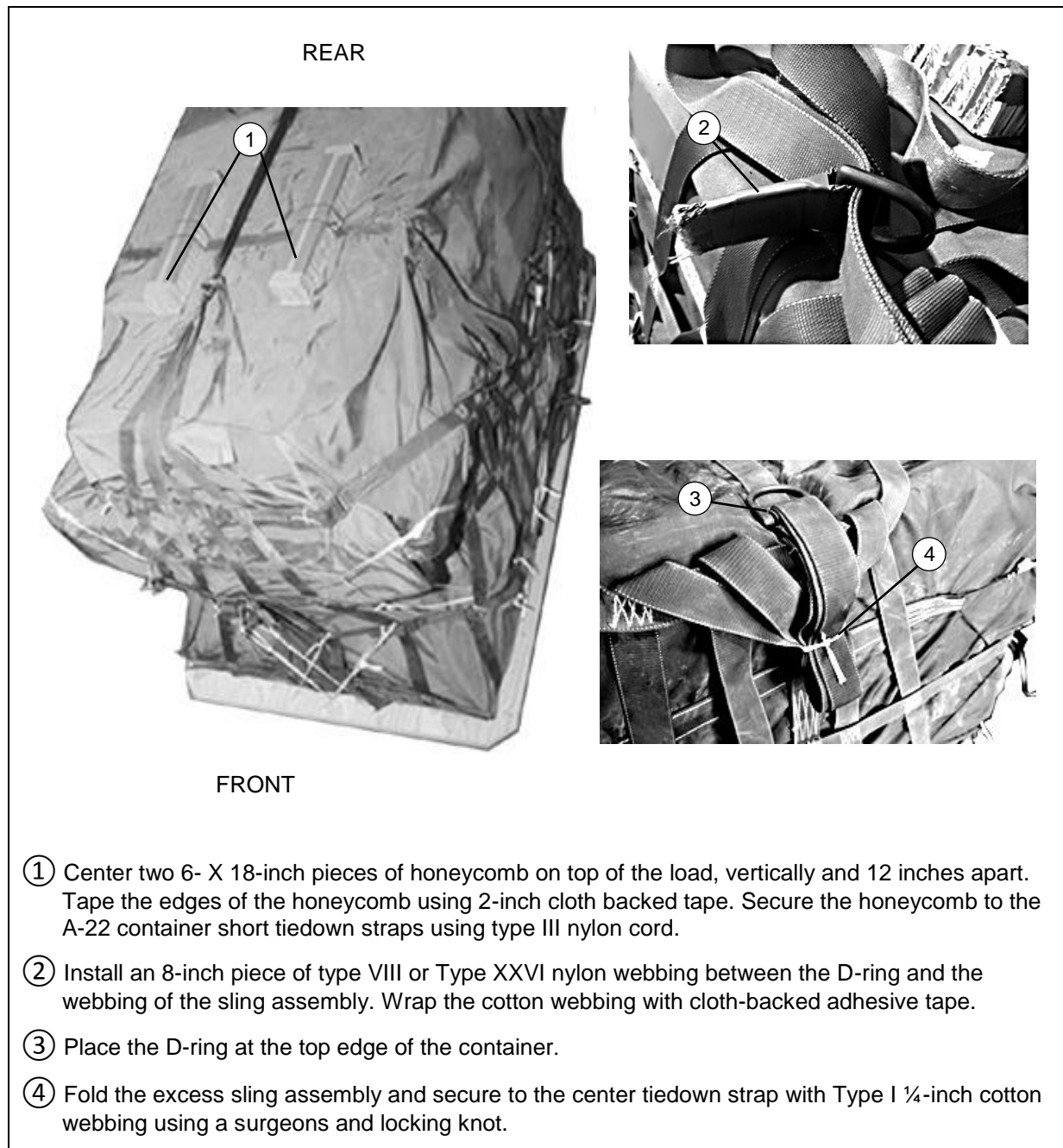


Figure 16-16. JPADS 2k installed

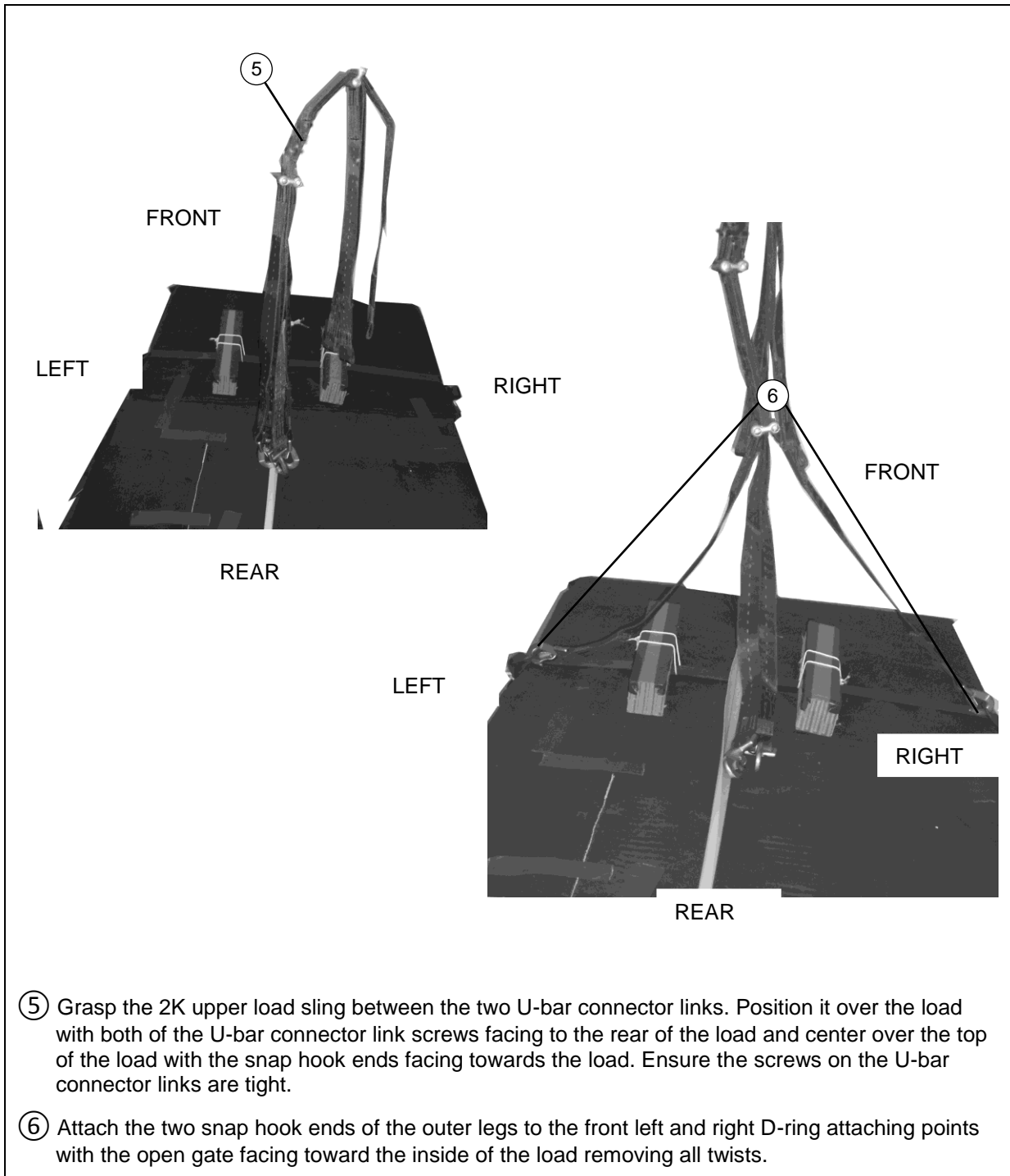


Figure 16-16. JPADS 2k installed (continued)

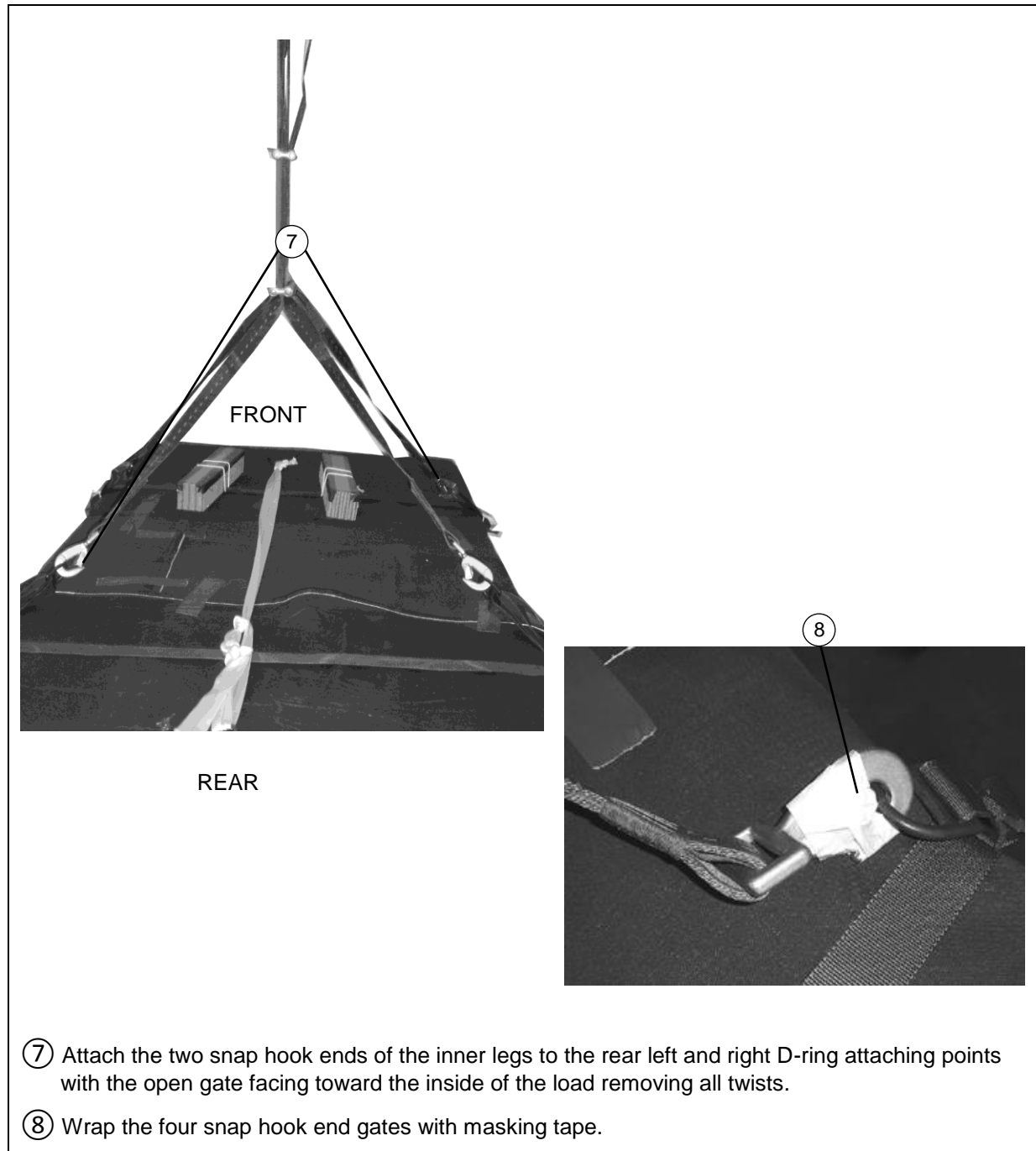
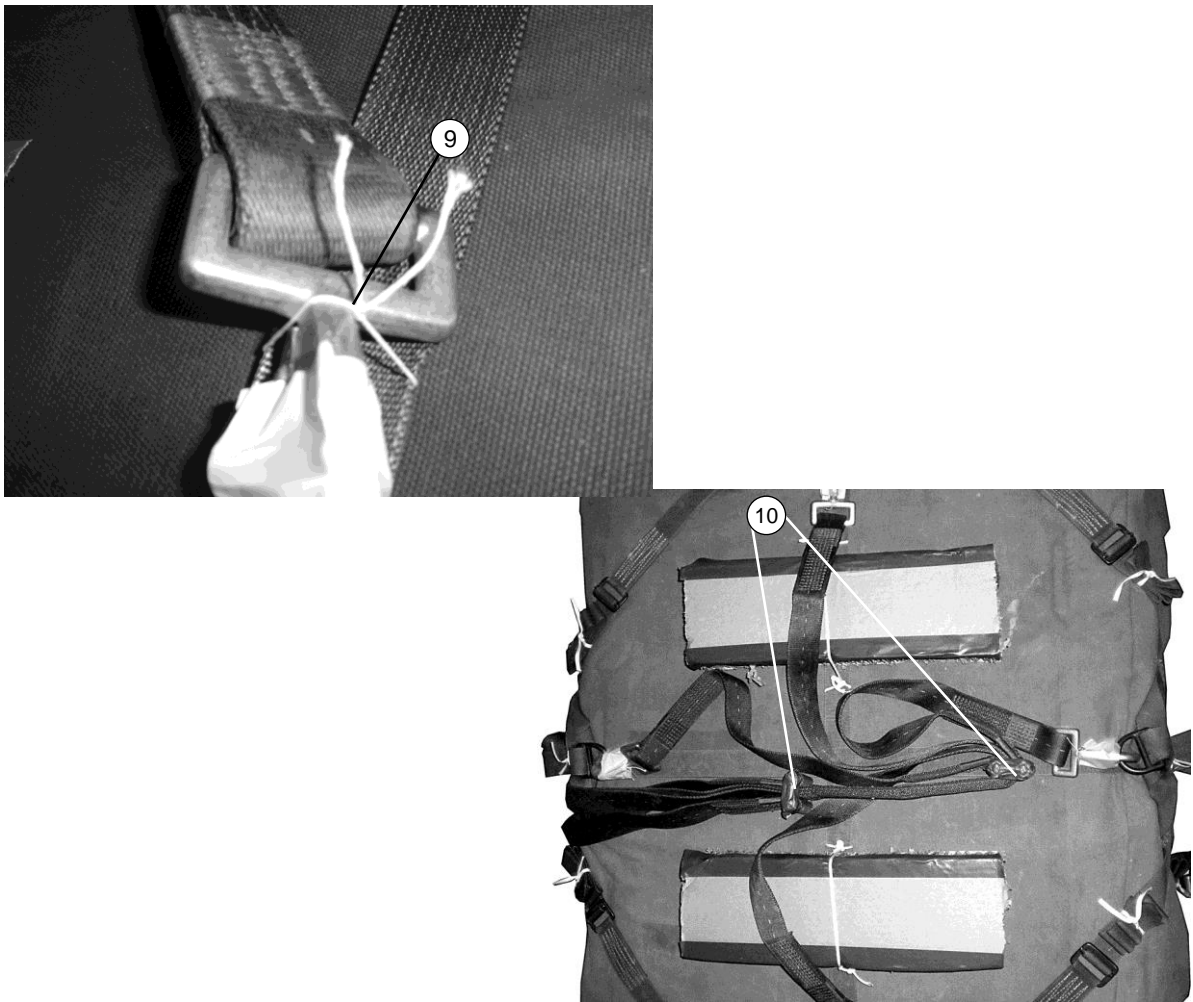


Figure 16-16. JPADS 2k installed (continued)



Note. Check the U-bar connector link screws to ensure they are tight.

- ⑨ Safety tie each snap hook in place to the A-22 containers lateral straps with a single length of ticket 8/7 cotton thread and secure with a surgeon's knot and locking knot.
- ⑩ Lay the 2K upper load sling down between the two pieces of honeycomb. Position the bottom U-bar connector link with the screws facing up and towards the rear edge of the two pieces of honeycomb. Place a piece of 2-inch cloth backed adhesive tape over the screw heads on both U-bar connector links.

Figure 16-16. JPADS 2k installed (continued)

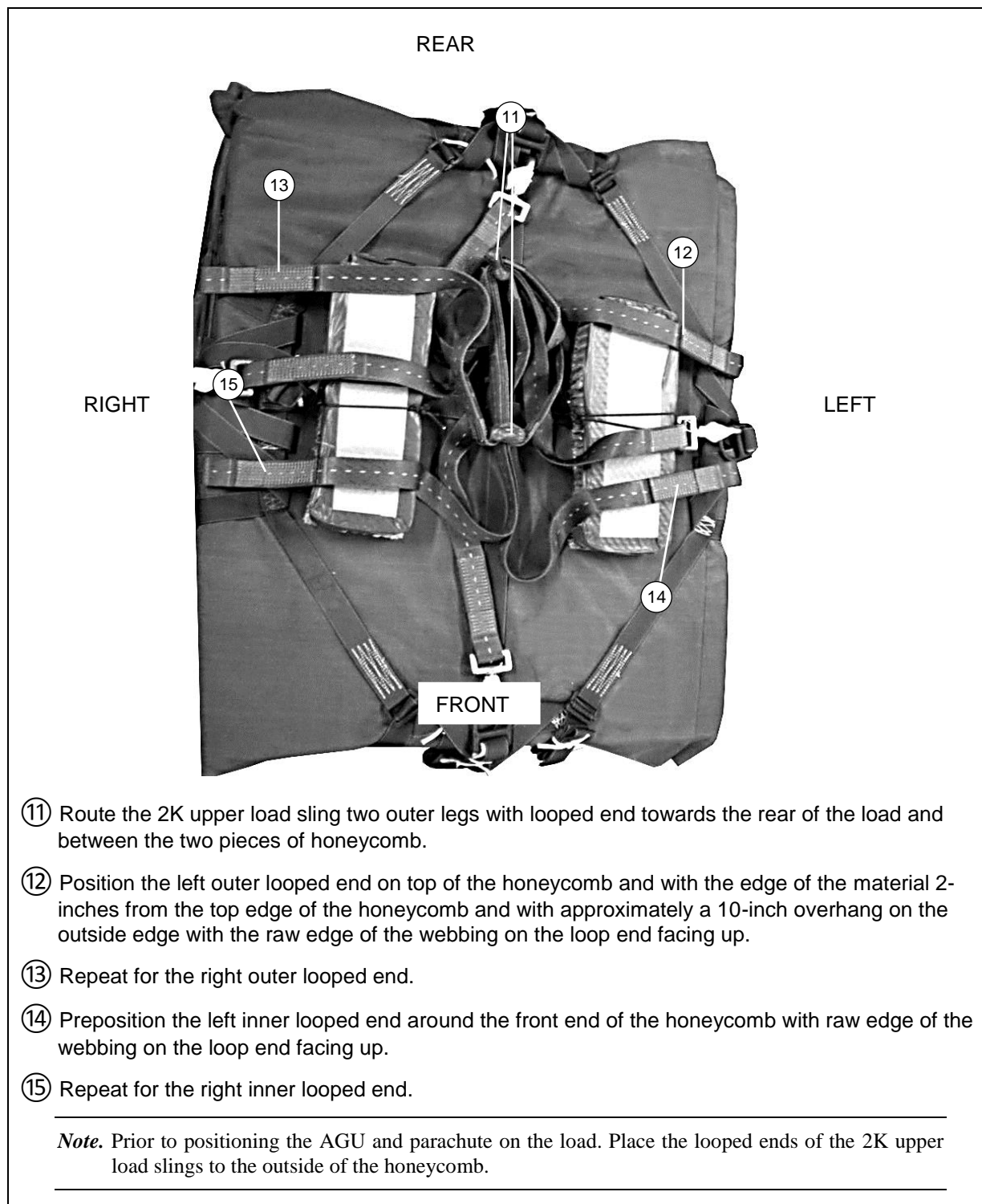
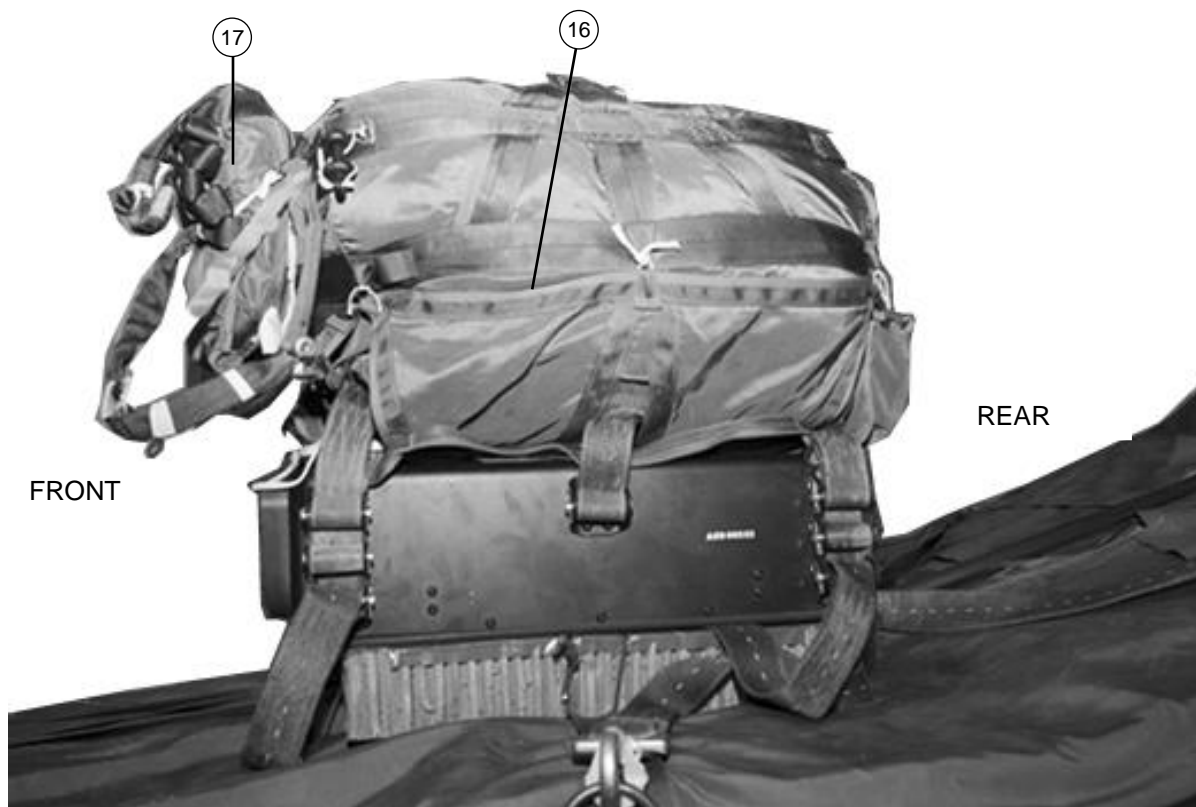


Figure 16-16. JPADS 2k installed (continued)

WARNING

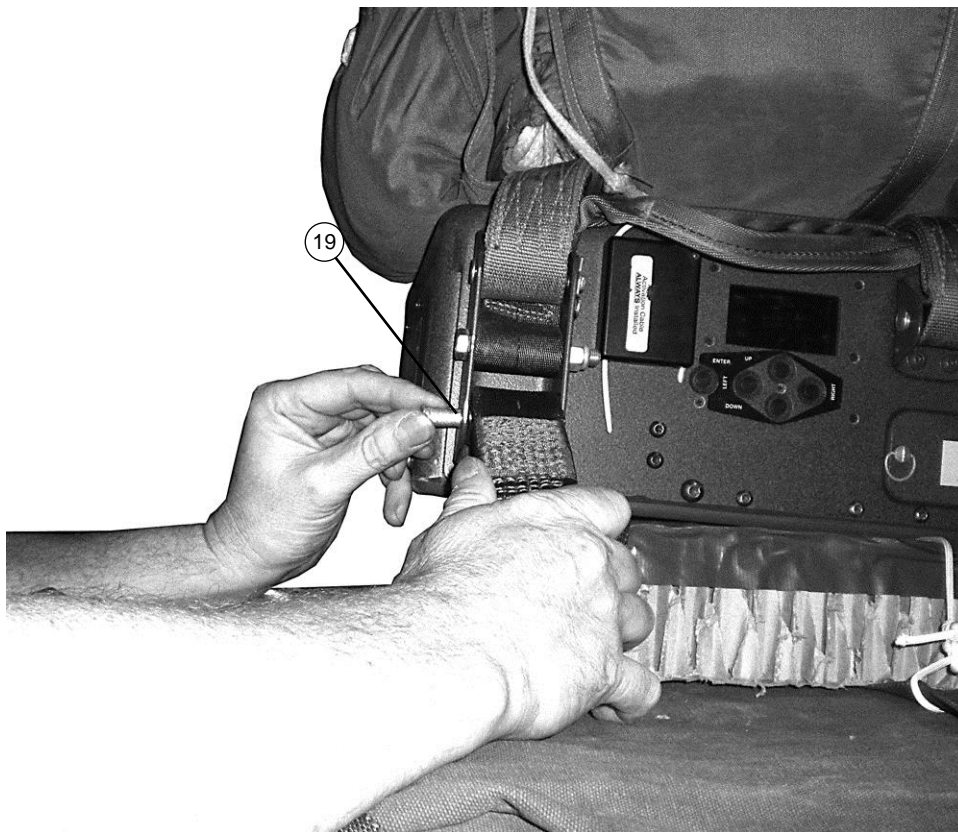
The JPADS 2K AGU and parachute system is a minimum two person lift.

(Weight: 167 pounds)



- ①⑥ Position the AGU and parachute system on top of the honeycomb and centered with the front AGU riser mounting corner brackets adjacent to the outside upper webs that run over the honeycomb.
- ①⑦ Ensure the drogue parachute is facing to the front of the load.

Figure 16-16. JPADS 2k installed (continued)



- ⑱ Remove the retaining clip pin (cotton pin), clevis pins and sleeves that are located on the four bottom rows of the front and rear corner brackets of the AGU (not shown).
- ⑲ Insert the riser bracket sleeve spacer in the upper loop web (2K Harness) and align the webb loop with the bottom hole on the corner riser bracket of the AGU. Install the clevis pin into the bracket hole and sleeve spacer from outboard to inboard. Secure the clevis pin with the cotton pin from outward to inward.

Note. Ensure the spacer and the pins are through the buffers on the webs.

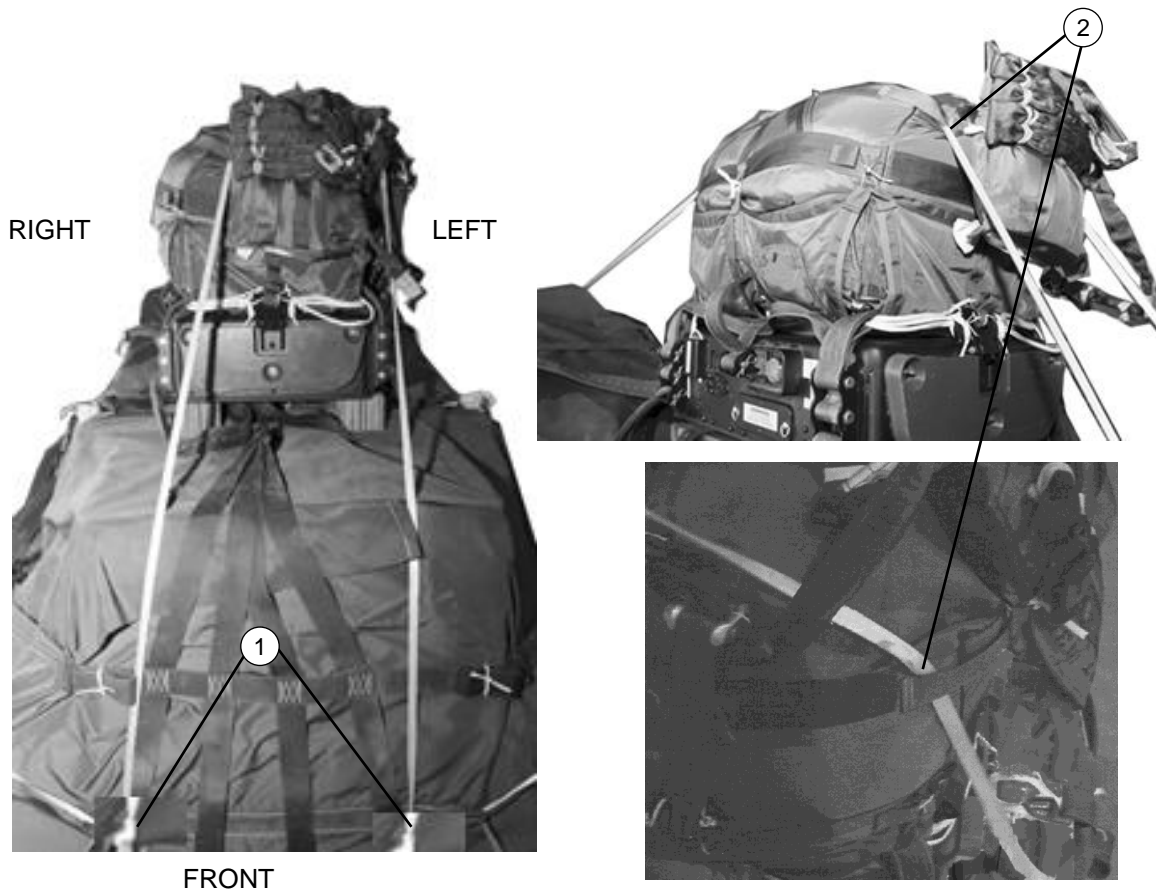
- ⑳ Repeat steps 15 and 16 for the remaining corner riser brackets (not shown).

Figure 16-16. JPADS 2k installed (continued)

SECURING THE JPADS 2K ON THE LOAD

16-18. Secure the JPADS 2K to the load as shown in Figure 16-17.

Note. Ensure the ½- or 9/16-inch tubular nylon webbing DOES NOT pass over the Release Away Static Line or the Drogue parachute.



- ① Secure two 13 foot length of ½- or 9/16-inch tubular nylon webbing to the outside vertical/lateral staps inside corners of the A-22 container at the control line spool cover of the AGU with three alternating half hitches and a overhand knot in the running end.
- ② Facing the control line spool cover of the AGU route the left free end of ½- or 9/16-inch tubular nylon webbing up through the guide loop located on the left top corner of the parachute deployment bag.
- ③ Repeat step 2, for the right side.

Figure 16-17. JPADS 2k secured to the load

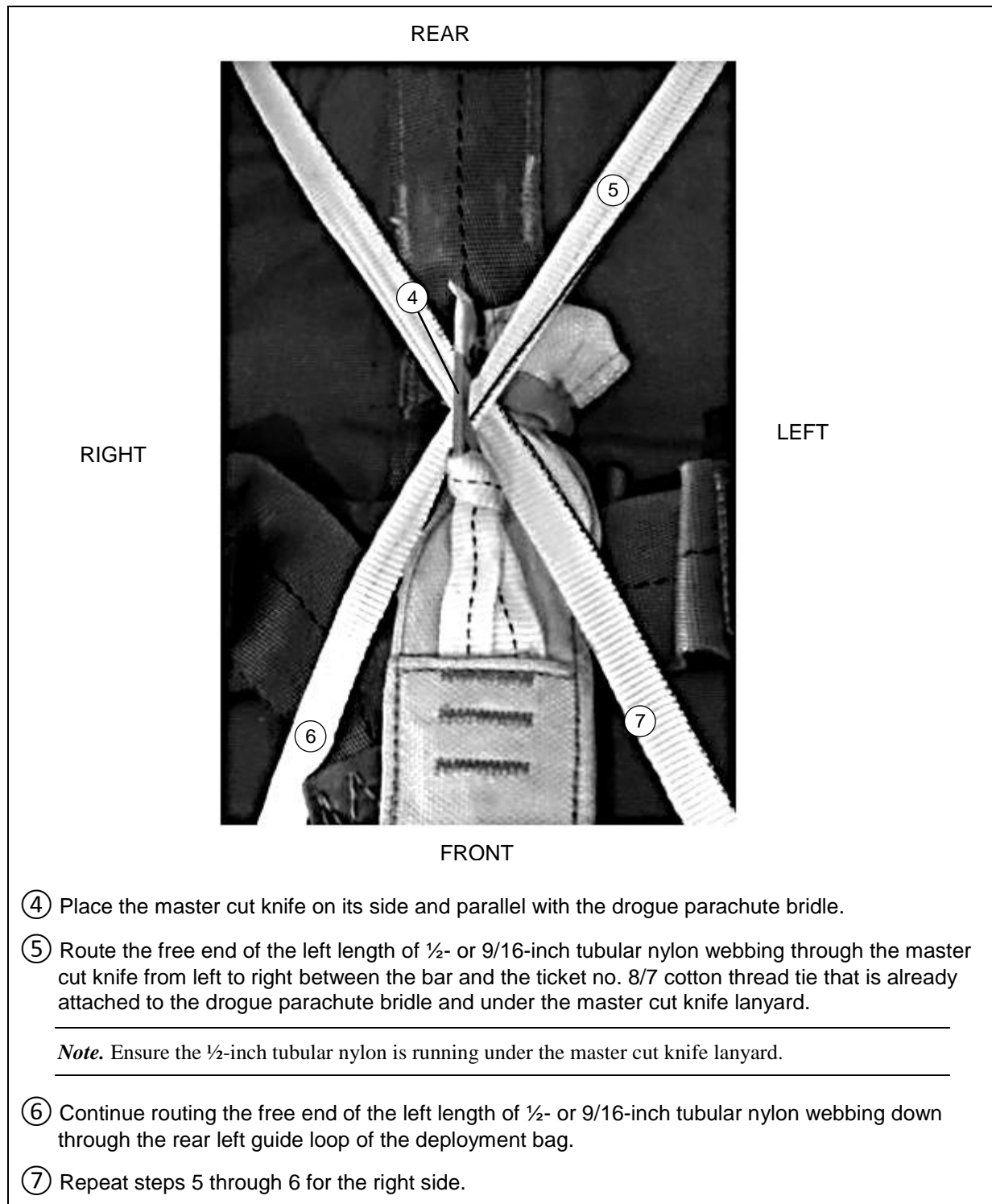


Figure 16-17. JPADS 2k secured to the load (continued)

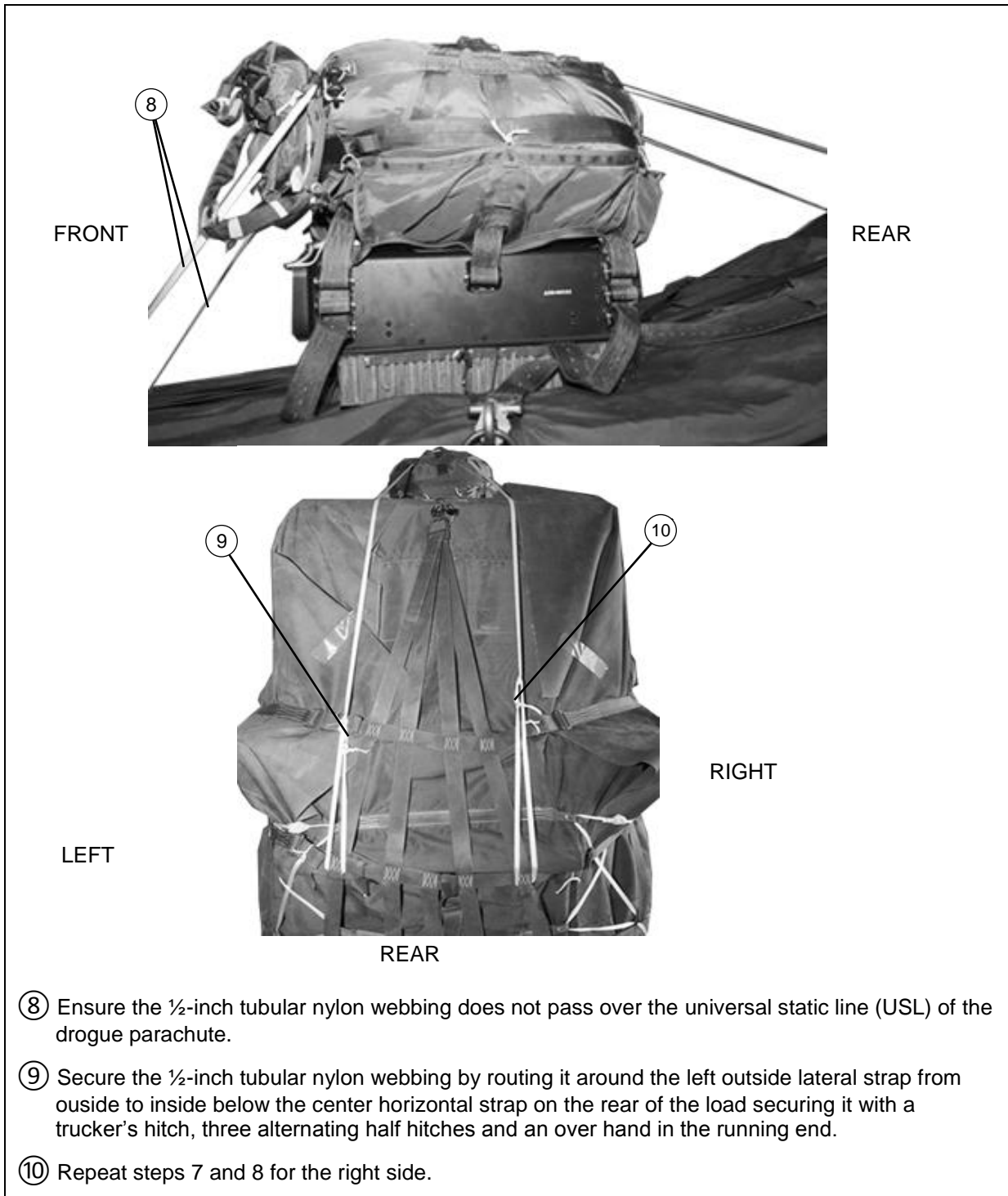


Figure 17-17. JPADS 2k secured to the load (continued)

JPADS 2K WARNINGS

16-19. The ATV load must comply with the warnings when airdropping the ATV with JPADS 2K in Figure 16-18.

WARNINGS

- 1. THIS LOAD MUST BE LOADED IN THE AIRCRAFT ON THE LEFT SIDE (TO FACILITATE THE READING OF THE AGU LCD) WITH THE PARACHUTE END BEING LOADED FIRST TO PREVENT THE LOAD FROM OVER ROTATING AT EXIT. FAILURE TO DO SO COULD RESULT IN A TOTAL MALFUNCTION AND LOSS OF THE EQUIPMENT.**
- 2. AN 80 POUND ACCOMPANYING LOAD MUST BE DROPPED ON THE REAR CARGO RACK. THE ACCOMPANYING LOAD ON THE REAR CARGO RACK MUST NOT EXCEED 400 POUNDS. NO ACCOMPANYING LOAD CAN BE DROPPED ON THE FRONT CARGO RACK.**
- 3. USE ONLY THE TWO LEFT AND THE TWO RIGHT A-22 CONTAINERS D-RINGS TO ATTACH THE RECOVERY PARACHUTE. DO NOT USE THE FORWARD AND AFT A-22 CONTAINERS D-RINGS FOR SUSPENSION POINTS AS THIS MAY CAUSE UNNECESSARY DAMAGE TO THE ATV.**

MARKING THE RIGGED LOAD

16-20. Mark the rigged load according to Figure 16-18. If the load varies from the one shown, the weight, height, and tip-off curve must be recomputed.

CAUTION

Make the final rigger inspection required by TM 4-48.02/MCRP 4-11.3J/NAVSEA SS400-AB-MM0-010/TO 13C7-1-5 and AR 59-4/OPNAVINST 4630.24C/AFJ 13-210(I)/MCO 13480.1B before the load leaves the rigging site.



RIGGED LOAD DATA

Maximum Weight	2,300 pounds
Minimum Weight:	1,602 pounds
Maximum Height:	83 inches
Width:	48 inches
Length	96 inches

Figure 16-18. MV700, ATV rigged in a double A-22 container for low-velocity airdrop using the JPADS 2k

EQUIPMENT REQUIRED

16-21. Use the equipment listed in Table 16-1 to rig this load.

Table 16-1. Equipment required for rigging the MV700, ATV on a double A-22 container for low-velocity airdrop using the JPADS 2k

National Stock Number	Items	Quantity
8040-00-273-8713	Adhesive, paste, 1-gallon	As required
1670-00-587-3421	Bag Assembly, Cargo, A-22	2
4020-00-240-2146	Cord, nylon, type III	As required
1670-01-569-5340	Joint Precision Airdrop System 2K	1
1670-00-753-3928	Pad, energy-dissipation material, honeycomb	As required
	Plywood:	
5530-00-128-4981	¾- by 48- by 98-inch	2
	or	
5530-00-914-5118	1- by 48- by 98-inch	2
	Tape:	1
7510-00-266-6710	Adhesive, Masking, 2-inch	As required
7510-00-266-5016	2-inch Cloth-Backed	As required
1670-00-937-0271	Tiedown assembly, 15-foot	5
8310-00-917-3945	Thread, cotton, ticket number 8/7	As required
	Webbing:	
8305-00-268-2411	Cotton, ¼-inch, type I	As required
	Nylon:	
8305-00-082-5752	Tubular, ½-inch	As required
8305-00-260-6909	Tubular, 9/16-inch	As required
8305-00-263-3591	Type VIII	As required
8305-00-177-5069	Type XXVI	As required

PART EIGHT

Rigging Specialized Loads and Equipment

Chapter 17

Fabricating Air Force Airdrop Equipment

SECTION I – AIR FORCE UNILATERAL TRAINING

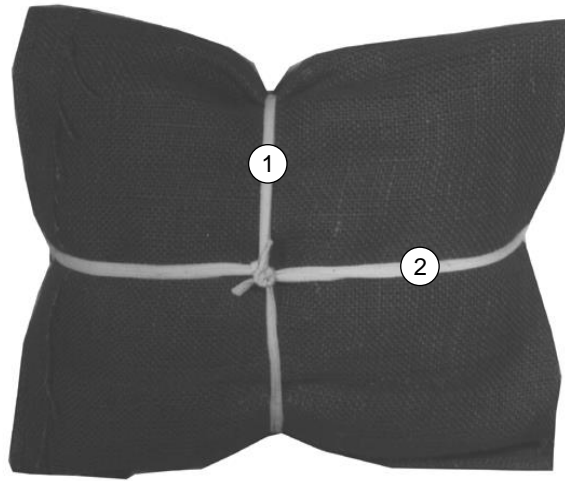
DESCRIPTION OF LOAD

17-1. This chapter shows how to make a standard airdrop training bundle (SATB) for use in unilateral training by the Air Force. The SATB is used to simulate personnel, heavy equipment, and container airdrops from a C-130 aircraft. It consists of a sandbag filled with 13 1/2 pounds of sand or gravel and a locally made canvas bag. A 15-foot cargo extraction parachute deployment bag may be substituted for the canvas bag.

-
- Notes.** 1. The honeycomb requirement in TM 4-48.03/TO 13C7-1-11 is for waived for Air Force unilateral training loads only. A minimum of two layers will be used on all high-velocity loads and a minimum of one layer for all low-velocity loads. Each piece of honeycomb will be a minimum of 36-by-44 inches.
2. This will reduce the life span of the loads and associated materials. Skid boards will not last as long and the ballast may shift more readily. Joint Airdrop Inspectors should increase their vigilance with loads in these configurations.
-

PREPARING SANDBAG

17-2. Fill the sandbag with 13 ½ pounds of sand or gravel. Wrap the excess portion of the bag around the filled portion to make a compact unit. Secure the bag as shown in Figure 17-1.



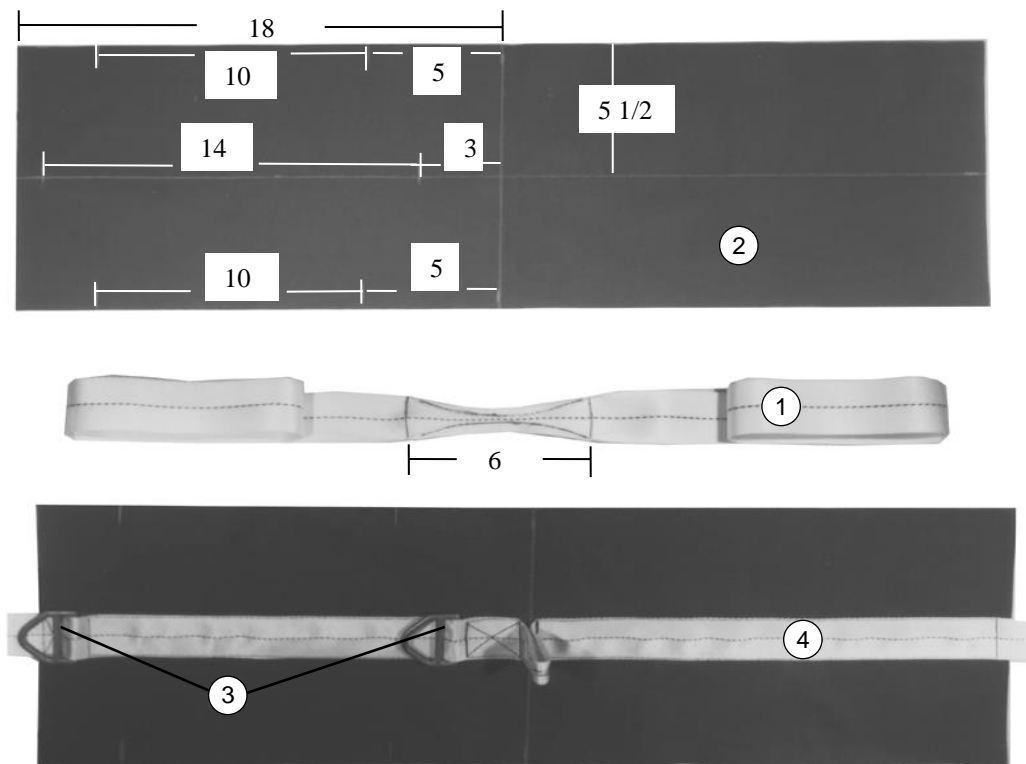
- ① Pass a length of type I, ¼-inch cotton webbing around two sides of the bag. Pull the webbing tight and tie the ends of the webbing together with a surgeon's knot and a locking knot.
- ② Pass a length of type I, ¼-inch cotton webbing around the opposite sides of the bag. Pull the webbing tight and tie the ends of the webbing together with a surgeon's knot and a locking knot.

Figure 17-1. Sandbag secured

FABRICATING SATB

17-3. Construct a canvas bag as shown in Figure 17-2.

Notes. 1. All dimensions are given in inches.
2. Stitches should be sewn with size FF, OD nylon thread.



Note. The canvas (duck cloth) may be painted orange or yellow for easy identification.

- ① Make a main body strap from a 56-inch length of type VIII nylon webbing. Mark the webbing at points 25 inches from each end. Form a pendulum line attaching loop by rolling the edges between the marks and sewing the rolls in place with a lockstitch.
- ② Lay out an 11- by 36-inch piece of canvas and mark it as shown.
- ③ Sew two V-rings to the canvas with a box stitch or a single X-box stitch as shown.
- ④ Sew the edges of the main body strap to the canvas as shown.

Figure 17-2. SATB fabricated

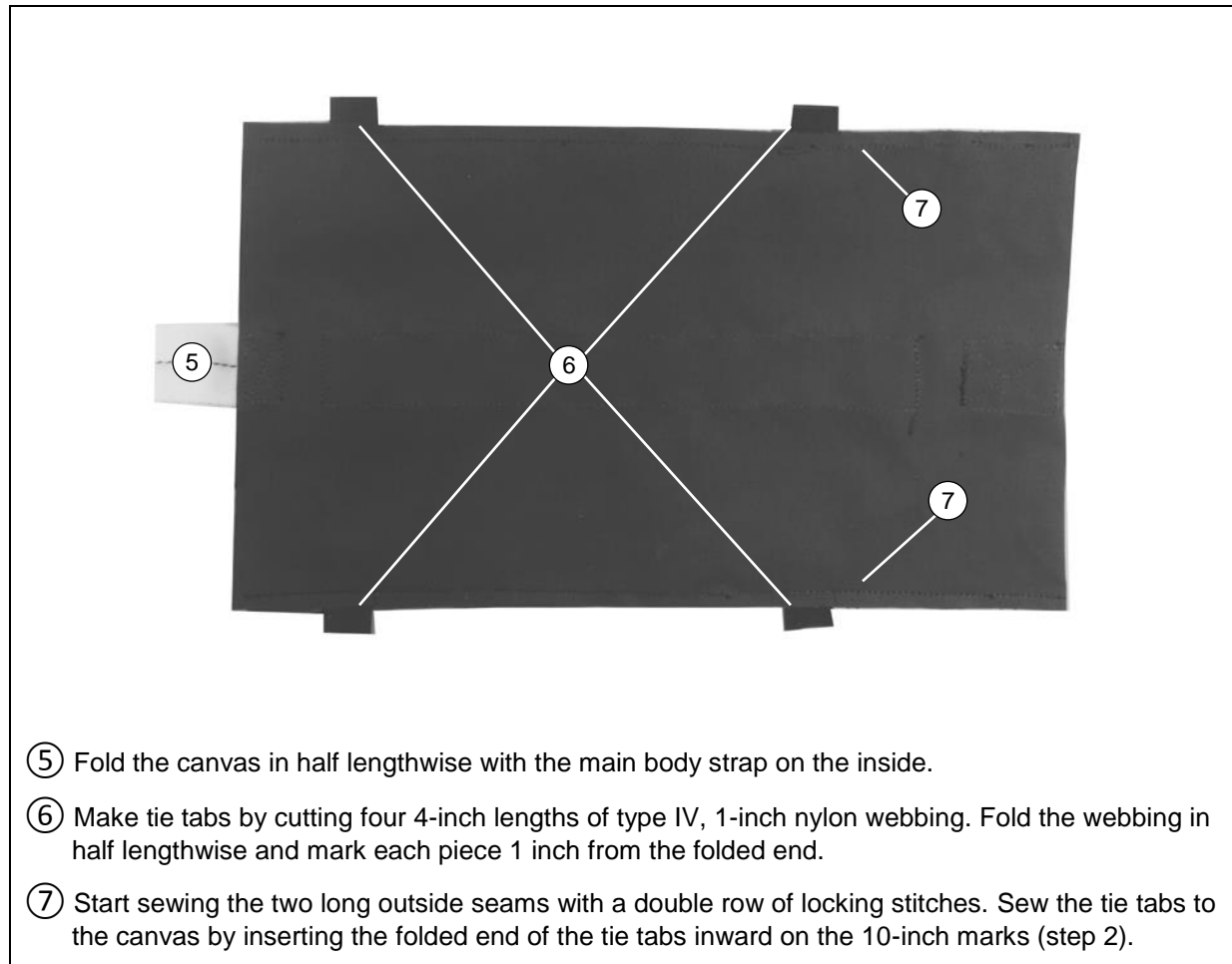


Figure 17-2. SATB fabricated (continued)

ATTACHING THE PENDULUM LINE

17-4. Attach a 40-inch, type IV coreless nylon cord pendulum line to the pendulum line attaching loop of the SATB as shown in Figure 17-3.

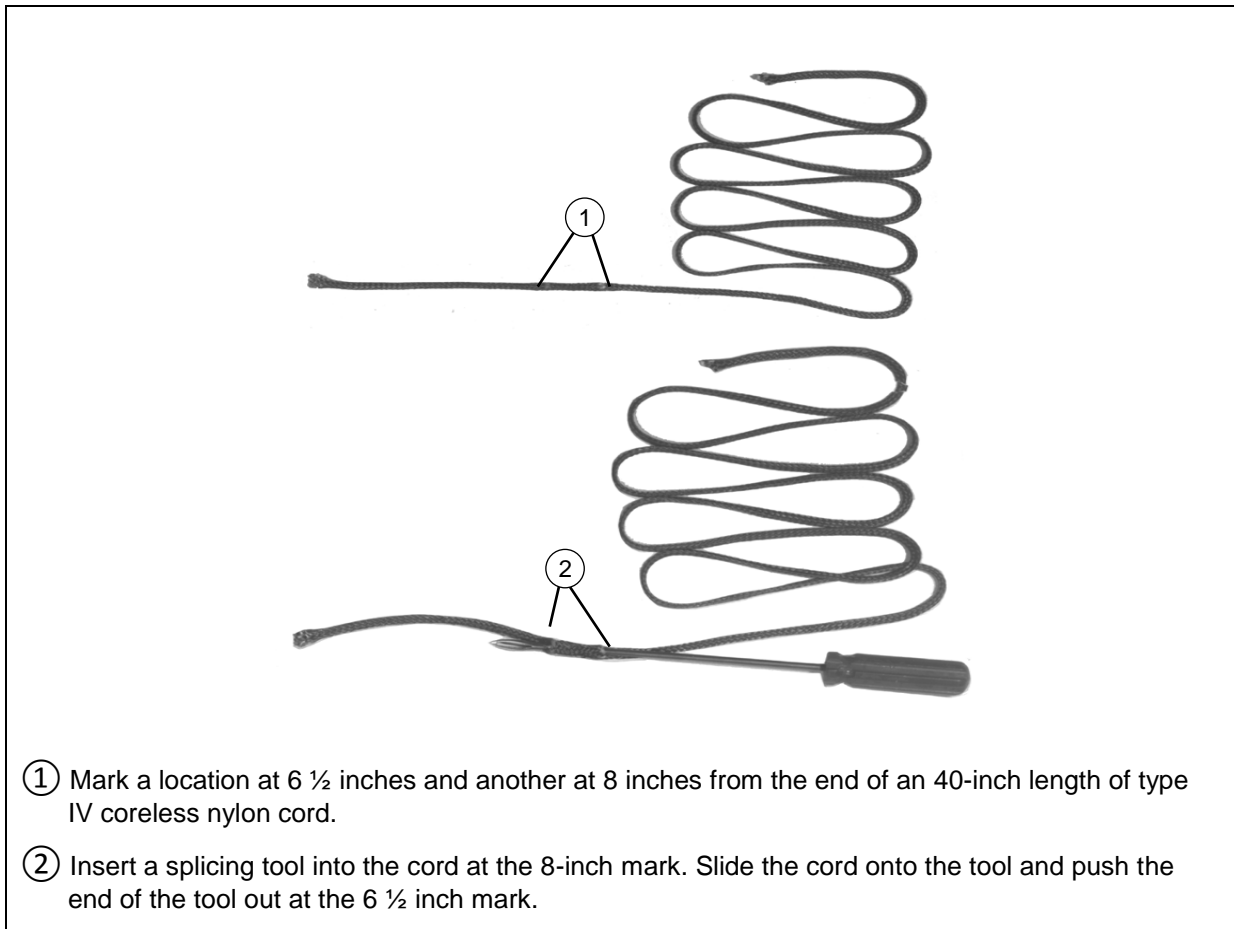


Figure 17-3. Pendulum attached to SATB

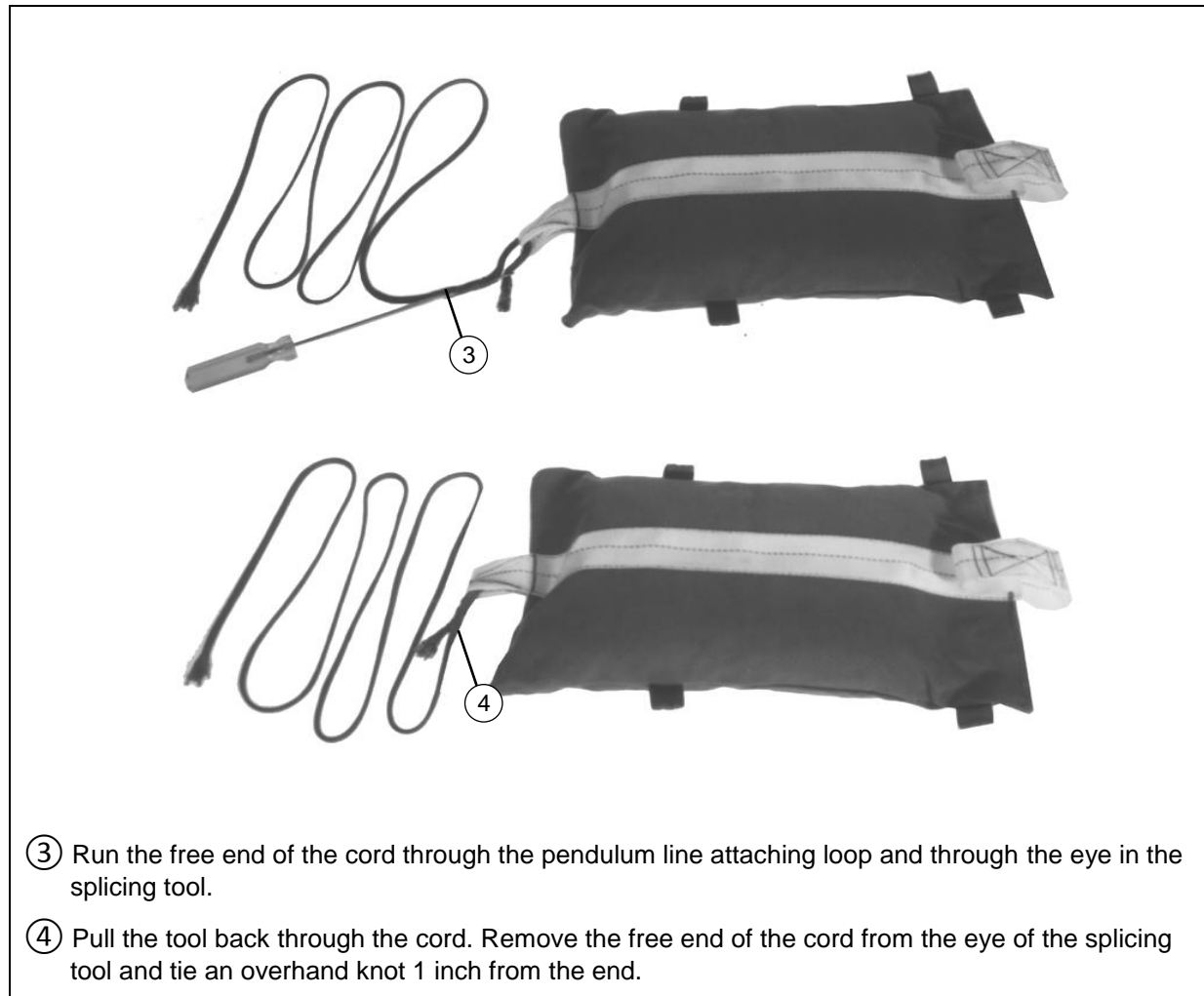


Figure 17-3. Pendulum Attached to SATB (Continued)

PACKING AND INSTALLING PILOT PARACHUTE

17-5. Pack a 68-inch pilot parachute as outlined in TM 10-1670-281-23&P/TO 13C5-32-2, but make the apex and bag-closing ties with single lengths of ticket number 8/4 cotton thread. Install the pilot parachute on the SATB as shown in Figure 17-4.

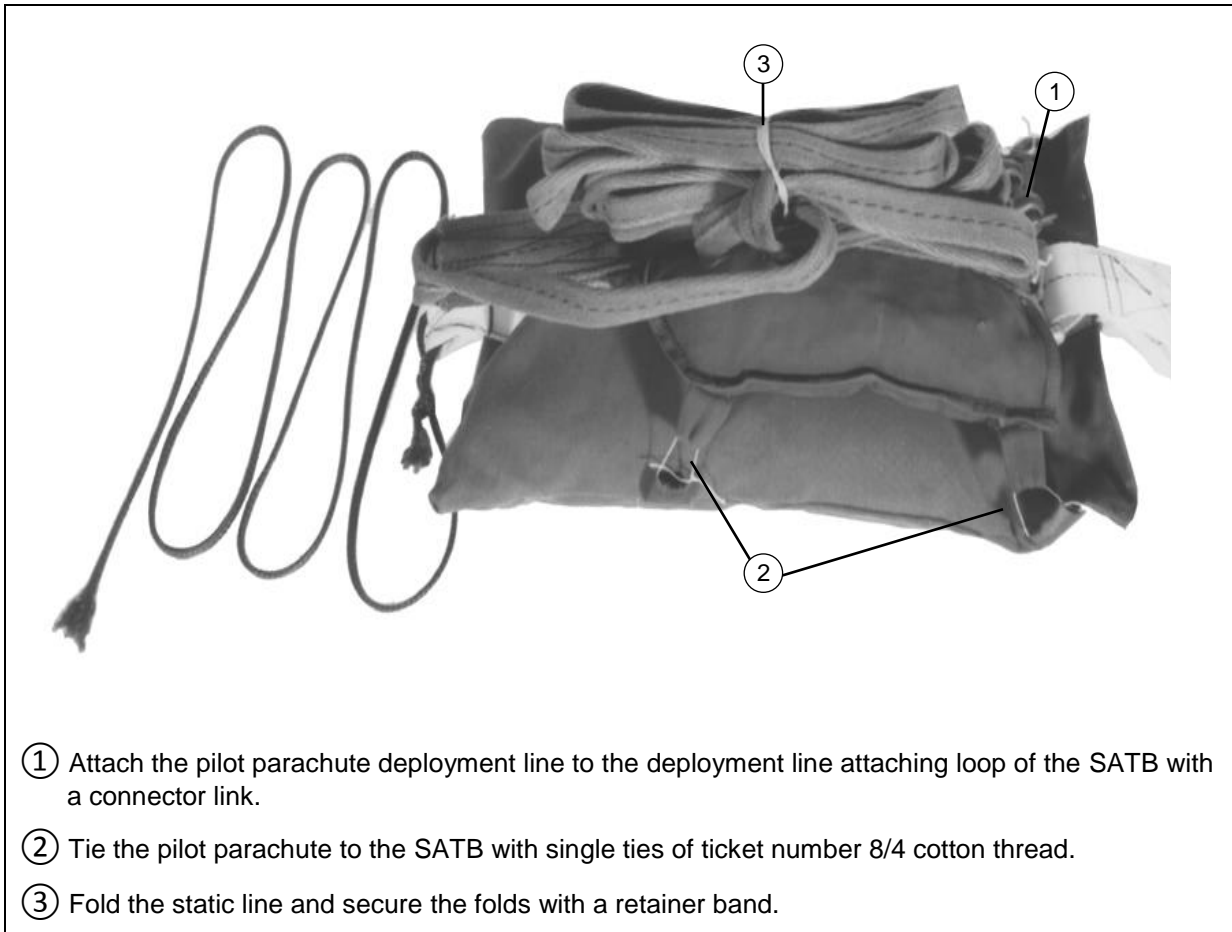


Figure 17-4. Pilot parachute installed on SATB

ATTACHING MARKER LIGHT

17-6. For night operations tie a distress marker light or chemical light to a tie tape with a double length of type I, 1 1/4-inch cotton webbing.

USING EXTRACTION PARACHUTE DEPLOYMENT BAG

17-7. If a 15-foot cargo extraction parachute deployment bag is substituted for the canvas bag used to enclose the sandbag, prepare the SATB as described below.

- Place the filled sandbag in the deployment bag and tie the deployment bag closed.
- Safety a 68-inch pilot parachute to the deployment bag as shown in Figure 17-5.

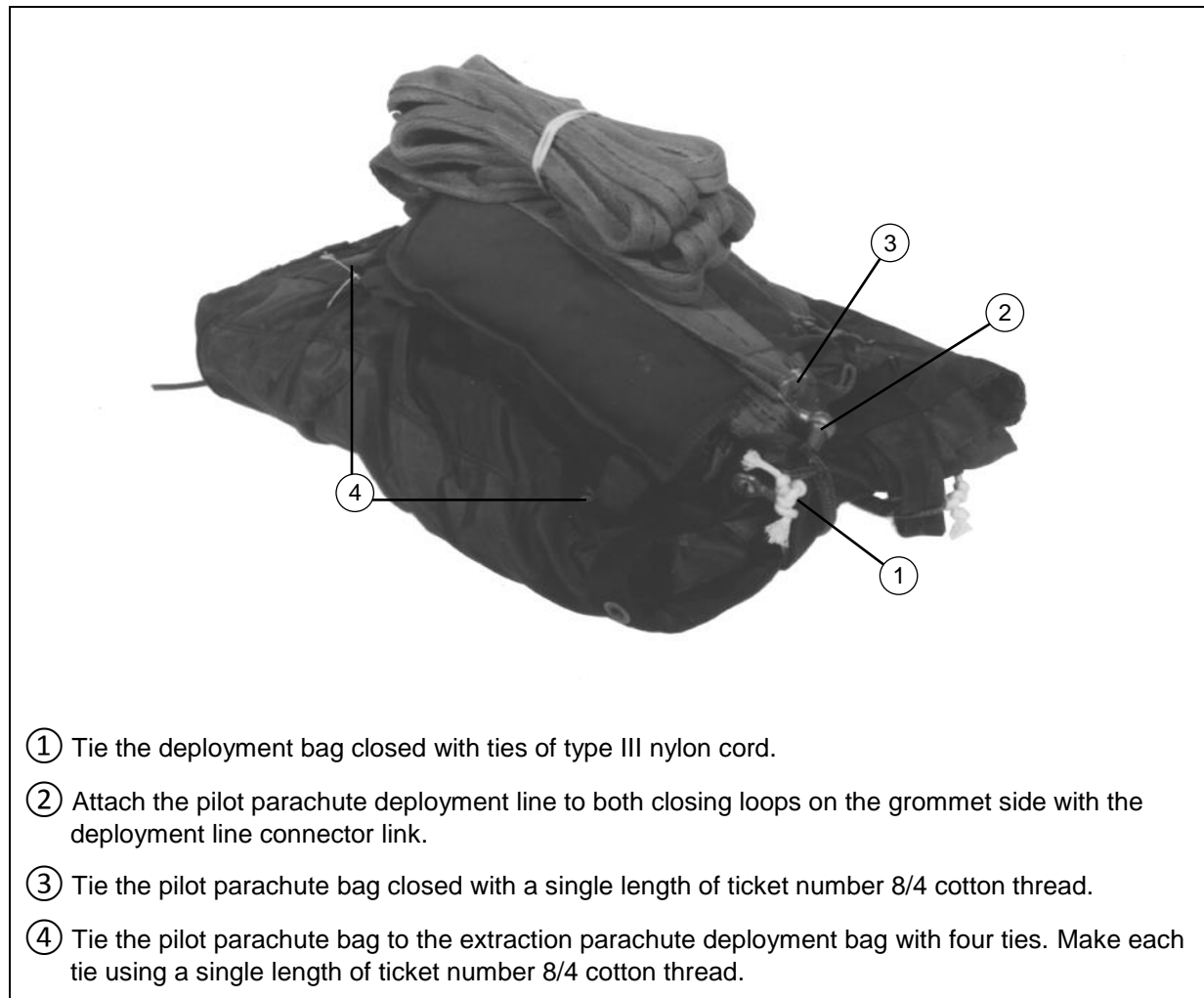


Figure 17-5. Pilot parachute tied to deployment bag

EQUIPMENT REQUIRED

17-8. Use the equipment listed in Table 17-1 to rig the SATB.

Table 17-1. Equipment required for rigging an SATB

<i>National Stock Number</i>	<i>Item</i>	<i>Quantity</i>
1670-00-815-2727	Bag, deployment, 15-foot, cargo parachute	1
1670-00-568-0323	Band, rubber, retainer	1
	Cord, nylon:	
4020-00-262-2020	Braided, type IV	As required
4020-00-240-2146	Type III, 550-pound	As required
1670-00-360-0324	Cover, cargo, side, tarpaulin	As required
1670-00-217-2421	Link assembly, L-bar type	1
1670-00-216-7297	Parachute, pilot, 68-inch diameter	1
8105-00-285-4744	Sandbag	1
8310-01-102-4478	Thread, cotton, ticket number 8/7	As required
1670-00-360-0471	V-ring	2
	Webbing:	
8305-00-268-2411	Cotton, ¼-inch, type I	As required
	Nylon:	
8305-00-268-2455	Tubular, 1-inch	As required
8305-00-263-3591	Type VIII, NT	As required

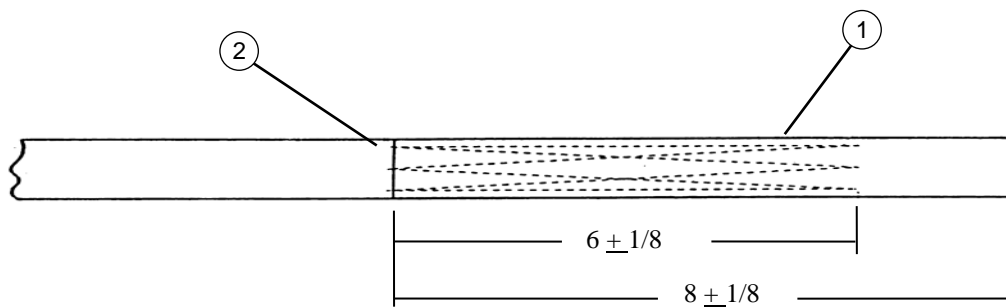
SECTION II – FABRICATION OF C-130 CDS PULLEY STRAP**DESCRIPTION OF C-130 CDS PULLEY STRAP**

17-9. This section shows how to make a 1-inch tubular nylon webbing CDS pulley strap for the use in C-130 aircraft. CDS pulley straps are used to suspend a pulley overhead in the aircraft to release the gate.

PREPARING C-130 CDS PULLEY STRAP

17-10. Prepare a 1-inch tubular nylon webbing CDS pulley strap in length as specified in Table 17-2 and as shown in Figure 17-6.

Notes. 1. All stitching will be 1/8 inch from sides or spaced 1/8 inch apart unless otherwise specified.
2. A 1/2-inch lock stitch must be made.
3. All exposed ends of nylon webbing must be fused. Make sure no sharp edges are formed.
4. All dimensions are in inches.



- ① Use thread, type I or II, Class I, size 3, OD S-1, with five to seven stitches per inch.
② Carry stitching over the end a minimum of one stitch.

Figure 17-6. C-130 CDS pulley strap prepared

SECTION III – CDS KIT

DESCRIPTION AND USE OF CDS KIT

17-11. A CDS kit for C-130 aircraft is locally assembled and includes all the equipment required to drop CDS. The CDS kit contains additional equipment not normally carried on aircraft.

EQUIPMENT REQUIRED

17-12. Use the equipment listed in Table 17-2 to assemble a CDS kit. The equipment list is for a single CDS kit single. Additional quantities may be required for multiple passes or a mass CDS drop.

Table 17-2. Equipment required for CDS kit

<i>National Stock Number</i>	<i>Item</i>	<i>Quantity</i>
5140-00-473-6256	Bag, tool, satchel	1
1670-00-406-2657	Ratchet, 10,000 pound	4
3020-00-517-1327	Pulley, assembly grooved	1
5305-00-167-0827	Bolt, machine for pulley	1
5310-00-167-0821	Washer, flat	2
5310-00-950-0039	Nut, self-locking	1
1670-01-162-2372	Assembly, clevis, type V	1
1670-00-738-5879	120-inch strap, type X nylon webbing	1
8305-00-268-2455	** 114-inch strap, 1-inch tubular nylon webbing	2
8305-00-268-2455	** 95-inch strap, 1-inch tubular nylon webbing	1
8305-00-261-8584	** 41-inch strap, type X nylon webbing	1
8305-00-268-2455	** 24-inch strap, 1-inch tubular nylon webbing	1
1670-00-836-2231	Knife, release, cargo, guillotine	2
1560-00-650-4219	Yoke, assembly for knives	2
4030-00-618-6824	Terminal, wire rope	1
5310-00-877-5796	Nut, self-locking for knife terminal	2
5306-00-151-1423	Bolt, machine for knife terminal	2
8305-00-177-5069	* Type XXVI nylon webbing release gate	As required
8305-00-268-2453	½-inch tubular nylon, retriever winch cable loop guide	1
* Normally provided by transported force.		
** Locally fabricated		

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Appendix A

JPADS 2K Recovery Procedures

INTRODUCTION

A-1. These procedures will be used to recover the JPADS 2K System from the drop zone following an airdrop mission. These procedures must be followed exactly to prevent damage to the Military Global Positioning System (GPS) unit, to prevent enemy use of the system, and to provide safety procedures for recovery crews on the DZ.

CAUTION

Do not attempt to recover or collapse the parachute while the canopy is inflated on the DZ. Serious injury to the recovery crew could occur due to the canopy remaining inflated following the airdrop.

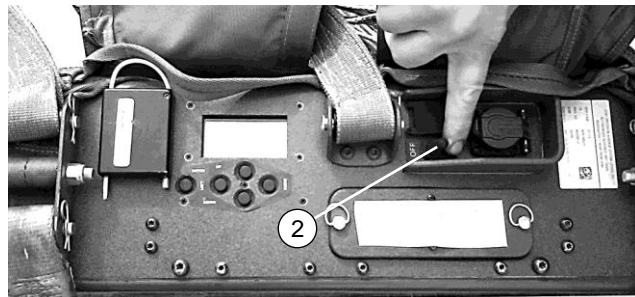
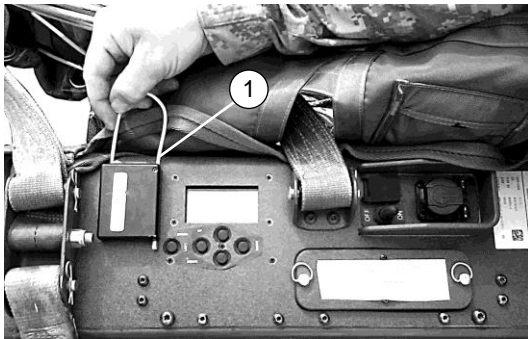
RECOVERY PROCEDURES

A-2. Use these established procedures to recover the JPADS 2K System following an airdrop as shown in Figures A-1 through A-10.

DEACTIVATE THE GPS

A-3. The JPADS 2K Autonomous Guidance Unit (AGU) is equipped with a removable Military GPS unit. During an airdrop mission, this unit arms a self-destruct feature called Render Unusable (RU). The RU prevents use of the JPADS 2K by the enemy if the system is not recovered by friendly forces on the ground. This feature must be disarmed within 45 days of activation to assure that the system will function properly for the next airdrop mission.

Note. The following steps must be followed to assure that the RU function is cleared.



- ① Re-insert the yellow activation cable.
- ② Turn the power switch off.

Figure A-1. Re-insert lanyard and switch off power



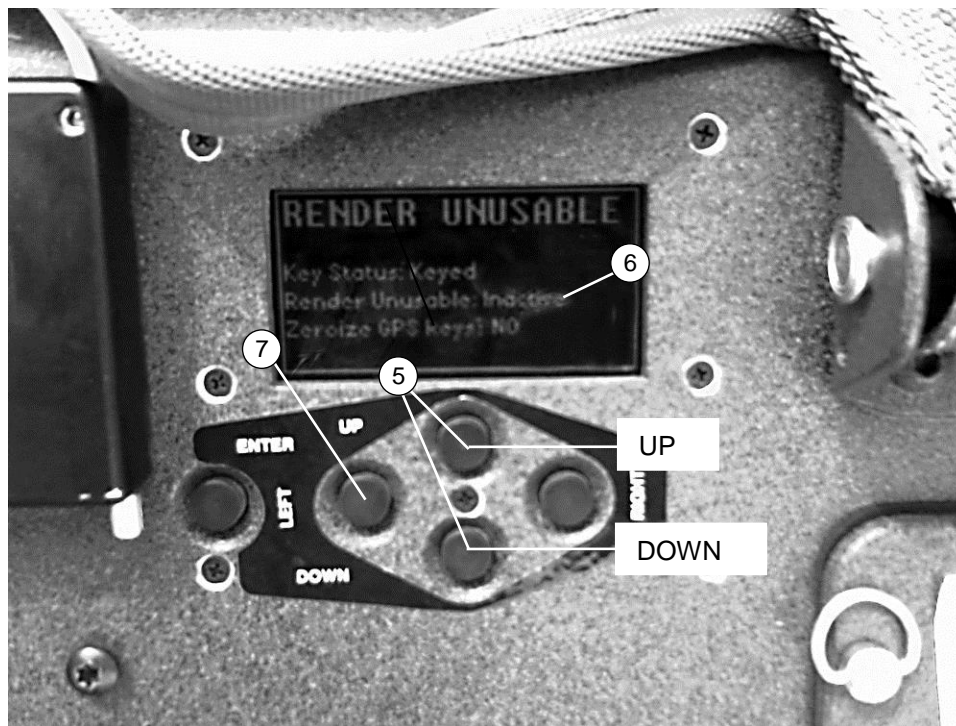
- ③ Power the AGU back up.

Figure A-2. AGU powered up



- ④ From the Startup Screen mode (screen which appears during and following power up of the AGU), press the right button to navigate to the RU Status Screen.

Figure A-3. RMDZ status screen



- ⑤ To clear the RU, press and hold the UP and Down buttons simultaneously for 3 seconds.
- ⑥ When the 2nd line reads “Render Unusable Inactive” the Military GPS RU has been disarmed.
- ⑦ Exit the RU screen by pressing the left button to return to the startup screen.
- ⑧ Shut down the AGU by moving the power switch to the off position (not shown).

Figure A-4. Press and hold buttons for 3 seconds

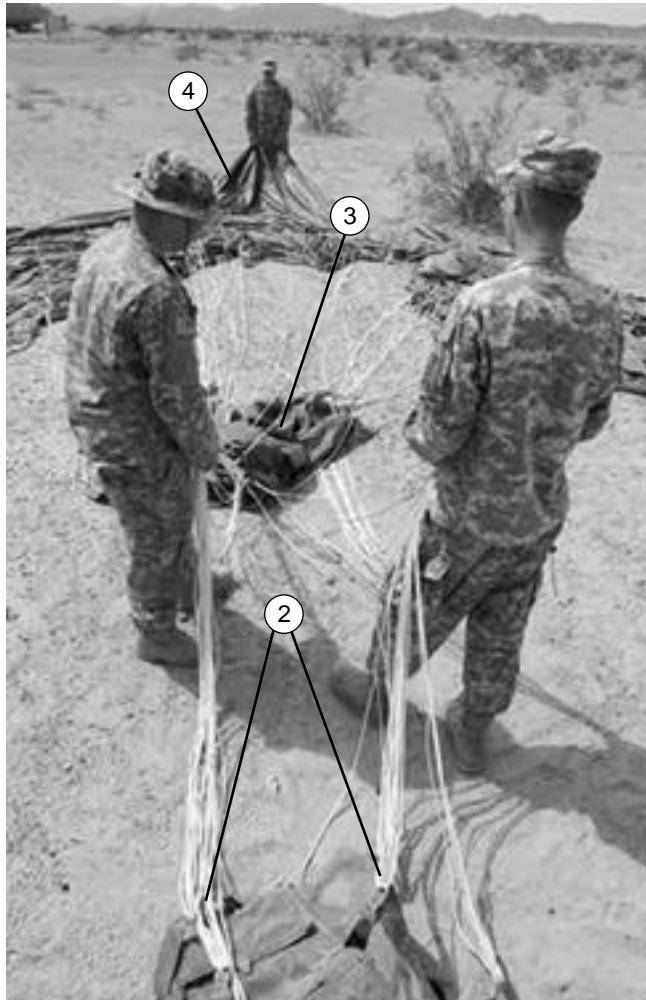
RECOVER THE JPADS 2K CANOPY

A-4. The JPADS 2K is equipped with its own recovery bag. It is located on the end flap of the Main Deployment Bag. Use these established procedures to recover the JPADS 2K canopy following an airdrop as shown in Figures A-5 through A-10.



- ① To remove the recovery bag from the storage pouch, cut the two pieces of ¼-inch cotton webbing which secures the recovery bag in the storage pouch.

Figure A-5. JPADS 2k canopy recovered



- ② Starting at the Main Deployment Bag, separate the two line groups using two people. Each person takes one group of lines and works their way toward the canopy removing as much debris as possible from the canopy and suspension lines.
- ③ Ensure the slider is pulled up the suspension lines as far as possible until the slider meets the skin of the canopy.
- ④ Stretch the canopy out over the DZ.

Figure A-5. JPADS 2k canopy recovered (continued)



⑤ Fold the outer edges of the canopy to the center.

Figure A-5. JPADS 2k canopy recovered (continued)



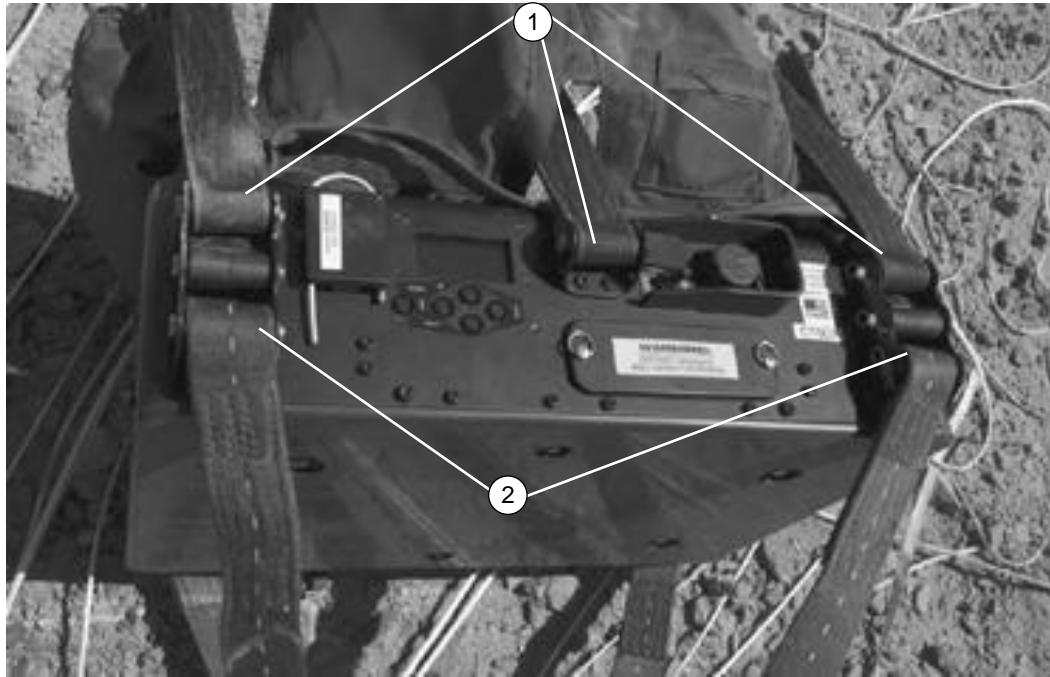
⑥ Stow the canopy inside the recovery bag.

Figure A-5. JPADS 2k canopy recovered (continued)

RECOVER THE AGU AND JPADS 2K SUSPENSION SYSTEM

A-5. The JPADS 2K System comes with its own suspension system. The risers of the Decelerator are attached to the AGU. The lower suspension sling is used to attach the AGU to the payload. There are six brackets (3 each side) positioned on the left and right sides of the AGU. The four connector snap hooks of the Lower suspension slings are used to connect the JPADS 2K System to the payload. All connections to the AGU are made using the pin, bushing, and cotter pins provided with the six suspension brackets as shown in Figure A-6.

Note. The complete suspension system MUST BE returned with the JPADS 2K System after recovery is made from the drop zone.



- ① The parachute is connected to the top pin on the corner brackets and on the two center brackets of the AGU.
- ② The lower suspension sling looped ends are connected to the four lower pins of each corner bracket of the AGU.

Figure A-6. Attachment points for decelerator and lower suspension system located



- ③ Remove the 2-inch masking tape from the four large connector snap hooks that connects the lower suspension system to the payload. Disconnect the connector snap hooks.

Figure A-7. Remove the 2-inch masking tape from four connector snap hooks.



- ④ S-fold the suspension lines into the recovery bag on top of the canopy.

Figure A-8. Suspension lines s-folded into recovery bag.



- ⑤ Place the AGU and JPADS 2K suspension sling into the recovery bag on top of the suspension lines.

Figure A-9. JPADS 2k system placed inside recovery bag (continued).

Note: If the recovery bag is missing, the main deployment bag can be used to recover the canopy from the drop zone. If the JPADS 2K main deployment bag is used to recover the canopy. Secure the AGU and suspension system on top of the main deployment bag as required.



⑥ Close the recovery bag using the drawstring and tie the recovery bag

Figure A-10. JPADS 2k system recovered and secured in recovery bag.

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Glossary

AFMAN	Air Force Manual
AGL	above ground level
AGU	Autonomous Guidance Unit
ATV	all terrain vehicle
CDS	container delivery system
CVRS	centerline vertical restraint system
DA	Department of the Army
FM	field manual
GPS	Global Positioning System
JPADS	Joint Precision Air Drop System
JPADS 2K	Joint Precision Airdrop Systems 2,200 pounds
LCADS	Low Cost Aerial Delivery System
LCLA	Low Cost Low Altitude
LCC	Low Cost Container
LVCP	Low-velocity Cargo Parachute
MCO	Marine Corps Order
MCRP	Marine Corps Reference Publication
NAVAIR	Naval Air Systems Command
NAVSEA	Naval Sea Command
NAVSUP	Naval Supply Systems Command
OPNAVINST	Operational Naval Instruction
PUB	Publication
RU	Render Unusable
SATB	standard airdrop training bundle
TM	Technical Manual
TO	technical order
USL	universal static line

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