

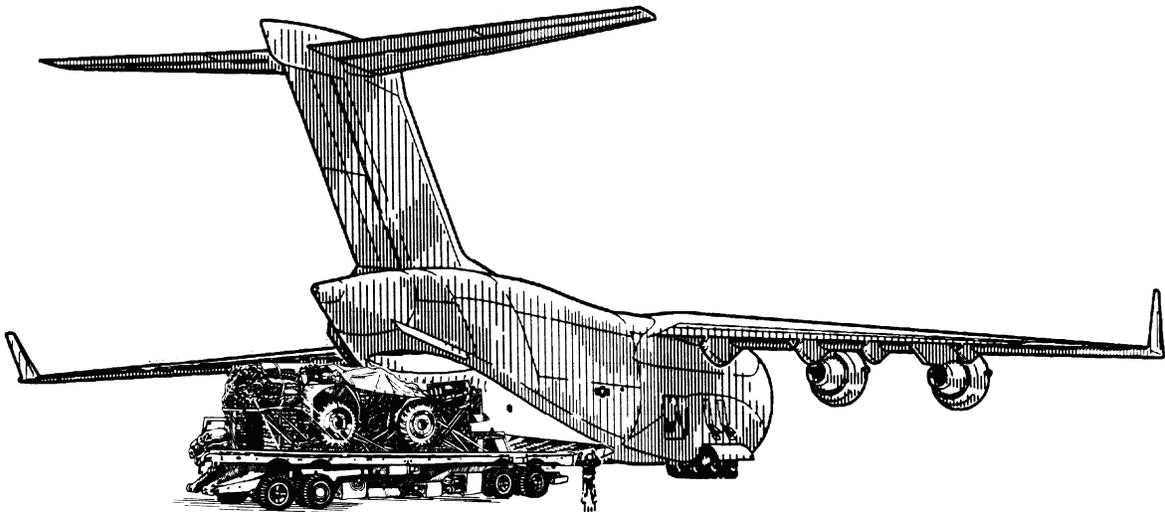
**FM 4-20.105-1**  
**TO 13C7-1-51 VOL I**  
August 2006

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**Airdrop of Supplies and Equipment:  
Dual Row Airdrop Systems**

**Volume I**

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No. 4-20.105-1  
Technical Order  
No. 13C7-1-51 Volume I

Headquarters  
Department of the Army  
Department of the Air Force  
Washington, DC, 29 August 2006

# **Airdrop of Supplies and Equipment: Dual Row Airdrop Systems**

## **Volume I**

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# Preface

## SCOPE

The purpose of this manual is to provide the latest approved procedures for rigging Dual Row Airdrop System (DRAS) platforms. This manual is written for use by the parachute rigger.

The procedures contained in this manual are typical and serve as the standard from which all DRAS platform rigging is derived. Due to the uniqueness of some equipment and items, **the procedures in a specific rigging chapter may be different from those in chapters 1 and 2. When procedures are different, those in the specific chapter will be followed. When an item of equipment is specified to be used for which its minimum or maximum capacity is exceeded, a notice of exception will be printed at the beginning of each paragraph in each rigging chapter where the exception is authorized.**

Chapters 1 and 2 contain specific limitations and general information about the rigging of DRAS airdrop platform loads for low-velocity airdrop from the C-17 (Globemaster) aircraft, shows and tells how to prepare, attach, and safety tie some of the components and systems used in the specific rigging chapters of the FM 4-20.105-1-1/TO 13C7-1-51 VOL I.

## USER INFORMATION

This publication applies to the Active Army, the Army National Guard/Army National Guard of the United States, and United States Army Reserve, unless otherwise stated.

The proponent of this publication is the United States Training and Doctrine Command (TRADOC). You are encouraged to report any errors or omissions and to suggest ways of making this a better manual.

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# Chapter 1

## Airdrop Information

### RESPONSIBILITIES

1-1. US Air Force personnel are responsible for loading rigged Dual Row Airdrop System (DRAS) platform loads into the C-17 (Globemaster) aircraft and installing and operating the airdrop system.

### SAFETY PRECAUTIONS

1-2. Safety precautions **MUST** be closely followed when airdrop platform 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 a DRAS platform unless absolutely necessary.
- Cover all wet cell batteries in service with plastic or nonflammable material.
- Check fuel tanks to ensure that they do not exceed the fuel level of the specific rigging chapter. 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.
- Package, mark, and label hazardous materials according to AFMAN 24-204(I)/TM 38-250.

#### CAUTION

Only ammunition listed in FM 4-20.153/MCRP 4-11.3B/TO 13C7-18-41 may be airdropped.

### TYPE AND METHOD OF AIRDROP

1-3. As used in this manual, DRAS allows platforms to be loaded side-by-side inside C-17 aircraft. DRAS airdrop is designed to supplement the usual surface methods of delivering supplies and equipment to forces in the field.

- **Type of airdrop.** Currently the only type of airdrop used to deliver platform loads is low-velocity airdrop. DRAS low-velocity airdrop delivers platform loads from C-17 aircraft. The G-11D cargo parachutes are used to slow the descent of the loads to ensure minimum landing shock. The number of cargo parachutes can vary as shown in Table 1-1. Loads with different quantities of the same type parachute may be airdropped from the same aircraft or element provided the following conditions are met:
  - Airdrop altitude for the aircraft or element will be determined by the type and number of parachutes on the load requiring the highest airdrop altitude.
  - Aircraft or elements with lower airdrop altitudes will drop before aircraft or elements with higher airdrop altitudes.

- The transported force accepts strike report responsibility for loads other than the first platform to exit the aircraft or element lead for formation airdrops.

**Table 1-1. Type and Number of Parachutes for Low-Velocity Airdrop**

<i>Minimum Drop Altitude (Feet AGL)</i>	<i>Parachutes</i>
1,200	2 to 4 G-11D

**CAUTION**

Drop altitudes reflect MINIMUM drop altitudes.

- **Method of airdrop.** The gravity method is used for DRAS platform loads delivered by low-velocity airdrop. The aircraft flies at an incline of approximately 4 degrees, the locks holding the platforms are removed, and the loads roll out of the aircraft by gravitational pull.

## COMMONLY USED ITEMS

1-4. Items commonly used for rigging DRAS platform loads are described in this section. Each rigging chapter in FM 4-20.105-1-1/TO 13C7-1-51 VOL I contains one or more tables of equipment required. These tables list the NSN, item, and quantity of each item needed to prepare and rig the load covered in that chapter. Standard DRAS hardware items are shown in Figure 1-1. Standard DRAS straps and canvas items are shown in Figure 1-2. Some textile, wood, and miscellaneous items are described below.

- **Textile Items.** The most common textile items and their uses are as follows:
  - **Type III nylon cord** is used to make safety ties and to hold items in place. It has a tensile strength of 550 pounds.
  - **½-inch tubular nylon webbing** is used to secure items during airdrop. It has a tensile strength of 1,000 pounds.
  - **5/8-inch or 9/16-inch tubular nylon webbing** may be used for parachute clustering ties in place of ½-inch tubular nylon webbing. Five eighths inch tubular nylon webbing has a tensile strength of 2,250 pounds and 9/16-inch tubular nylon webbing has a tensile strength of 1,500 pounds.
  - **¾-inch tubular nylon webbing** is used to secure items during airdrop. It has a tensile strength of 2,300 pounds.
  - **Type VIII nylon webbing** is used for parachute restraint and to safety tie the rectangular outrigger foot assembly. It has a tensile strength of 4,000 pounds.
  - **Type I ¼-inch cotton webbing** is used to make safety ties and to hold items in place. It has a tensile strength of 80 pounds.
- **Wood Items.** Wood items used when DRAS loads are rigged for specific airdrop are made locally. Details for building these wood items are in the rigging chapter.

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*Note.* Plywood will be grade AC or AD.

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- **Miscellaneous Items.** Miscellaneous items that may be used when a platform load is rigged are discussed below. The proper use of these items will be covered in detail in the specific rigging chapter for the load.
  - **Adhesive tape (masking tape), 2 inches wide,** is used to secure folds of excess webbing. It is also used to protect honeycomb from being cut by type III nylon cord and to hold padding in place. It can be used for other tasks also.

- **Type IV, cloth-backed adhesive tape, 2 inches wide**, is used to protect honeycomb from being cut by type III nylon cord and to hold padding in place. It can be used for other tasks also.
- **Cellulose wadding and felt sheets** have many uses. They may be used to pad fragile items, to prevent sharp edges from cutting, and to protect slings during airdrop.
- **Energy-dissipating pads (honeycomb)** are used to absorb the landing shock. Honeycomb is also used to level, pad, and fill empty spaces.

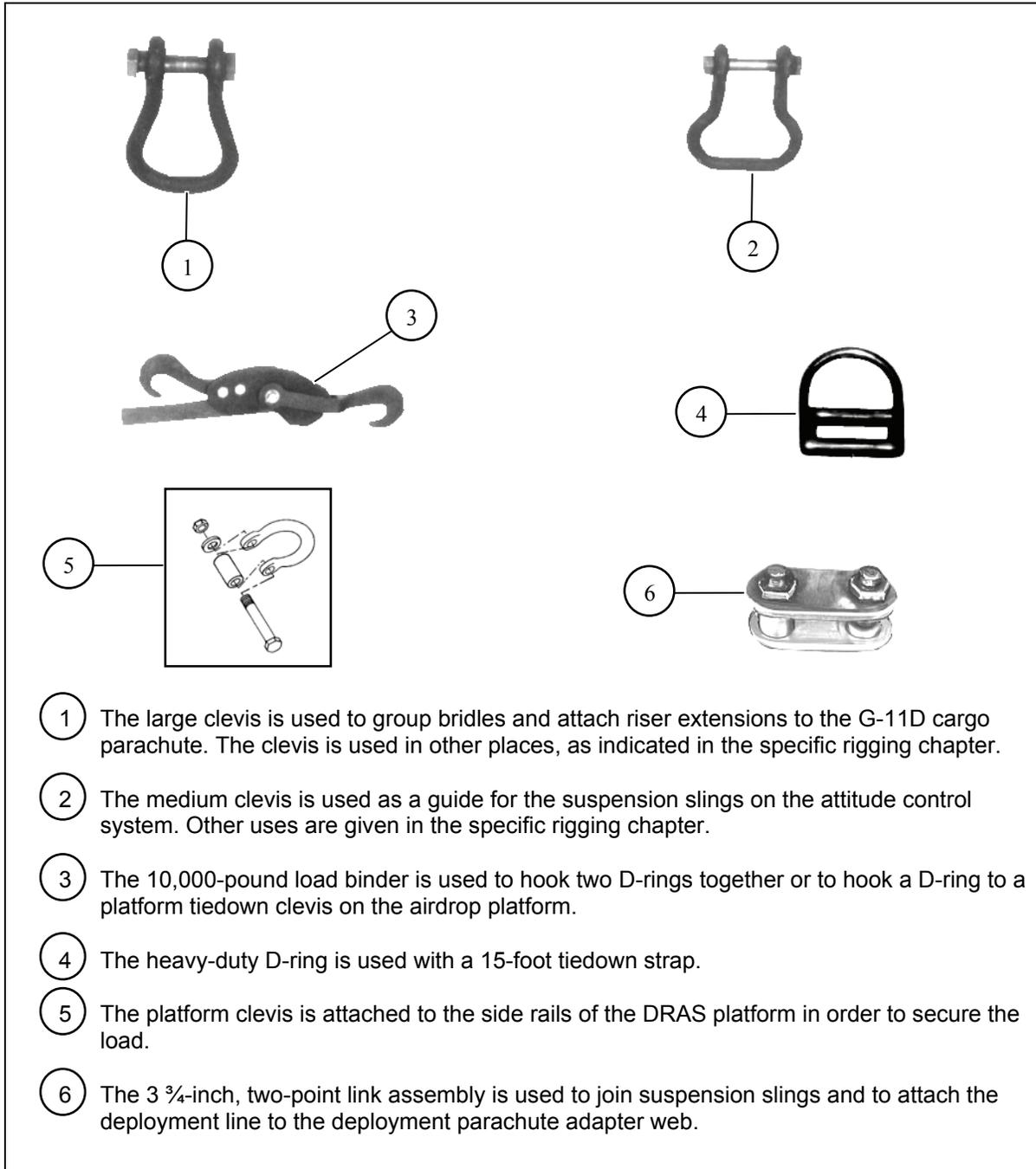
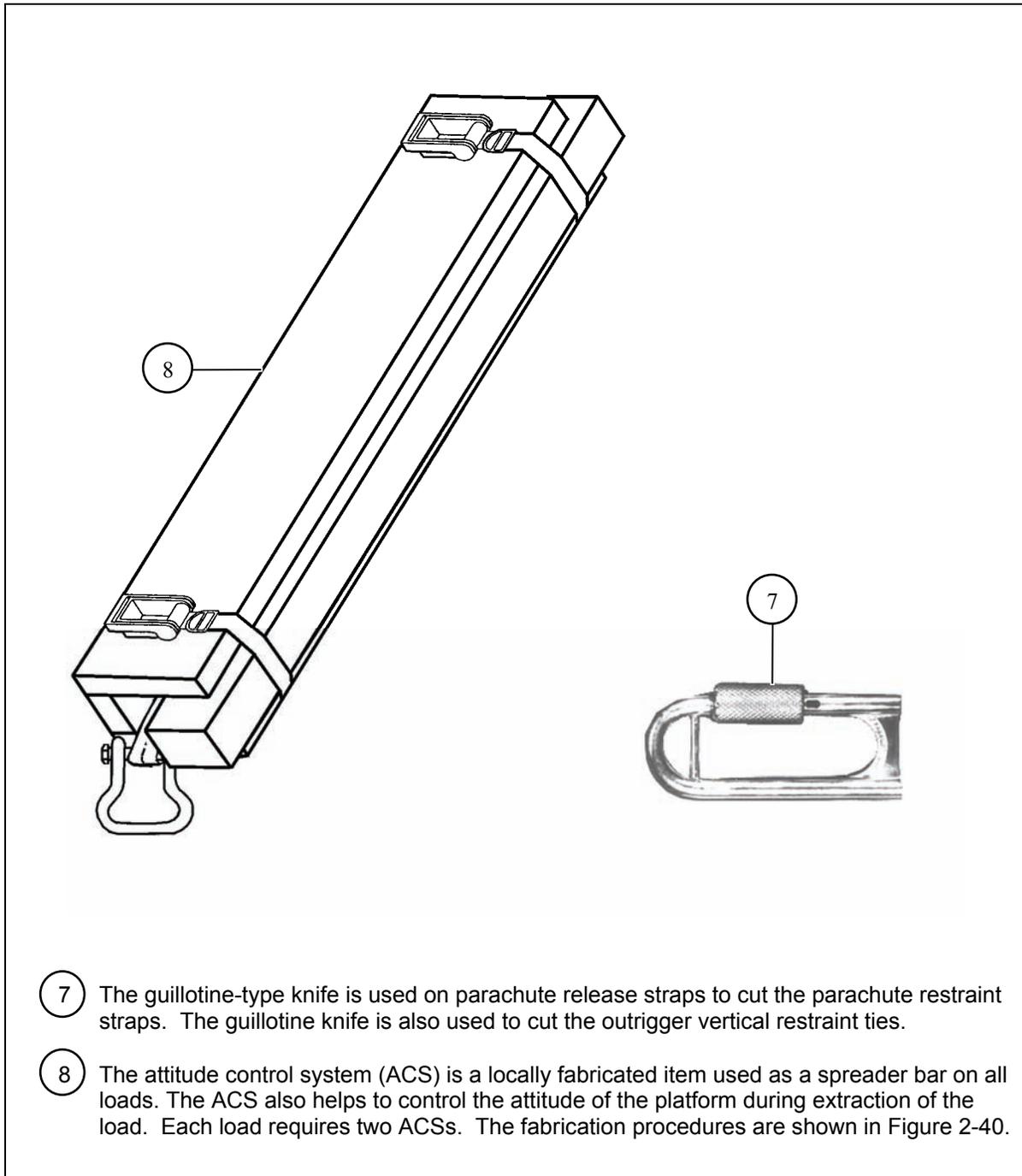
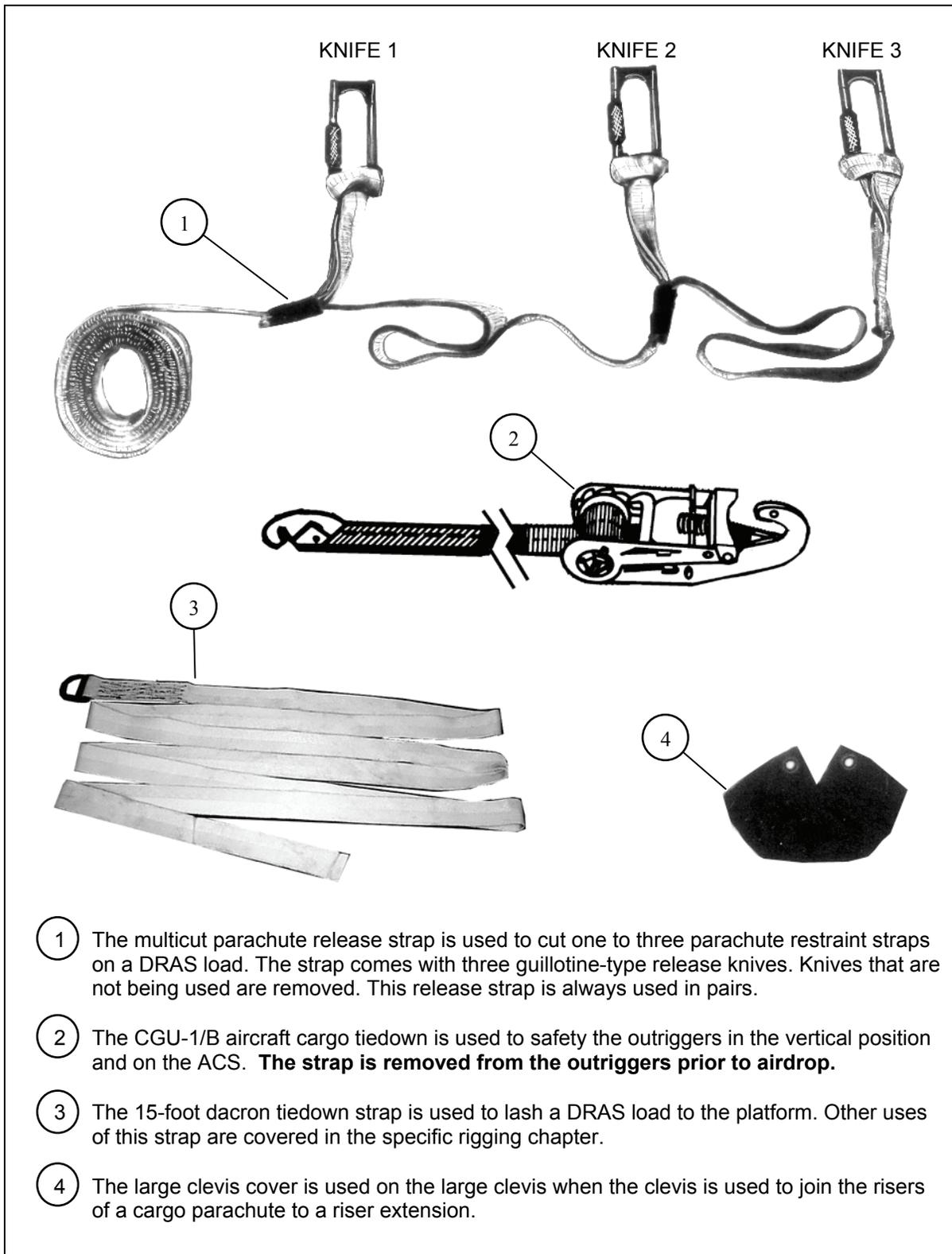


Figure 1-1. Hardware Items Used for Rigging DRAS Loads



**Figure 1-1. Hardware Items Used for Rigging DRAS Loads (Continued)**



**Figure 1-2. Straps and Canvas Items Used for Rigging DRAS Loads**

## INSPECTION OF ITEMS

1-5. Canvas, metal, webbing, and wood items are inspected according to TM 10-1670-296-20&P/TO 13C7-49-2.

## MAXIMUM RIGGED WEIGHT

1-6. The weight cited in the rigged load data for each specific load is typical for the load as shown. Some amount of overweight is allowed as long as load dimensions and rigging procedures are not changed. The maximum rigged weight for a DRAS platform is 14,500 pounds.

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**Note.** When a maximum allowable rigged weight is specified in the rigged load data, this weight is the absolute maximum and will not be exceeded.

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## ACCOMPANYING LOADS

1-7. Accompanying loads are items of supplies and equipment that may be added to a primary load. Each airdrop chapter states whether an accompanying load is authorized.

## STOWING ACCOMPANYING LOAD

1-8. Each specific rigging chapter contains the weight limitations, placement, and any additional restrictions on accompanying loads.

### CAUTIONS

1. Accompanying loads may vary, however, accompanying load locations will not.
2. Only ammunition listed in FM 4-20.153/MCRP 4-11.3B/TO 13C7-18-41 may be rigged for airdrop.
3. Hazardous materials must be packaged, marked, and labeled as required by AFMAN 24-204(I)/TM 38-250.
4. At least two layers of honeycomb must be placed under all ammunition rigged for airdrop unless the specific rigging chapter states differently.

## PREPARING DROP ITEMS

1-9. Some items need to be prepared for rigging. This preparation can include removing, reinforcing, stowing, and securing components. Detailed preparation instructions will be included in the specific rigging chapter.

## COVERING LOAD

1-10. Covers may be needed to protect the load and keep the suspension slings from fouling. To keep the load from being damaged by falling hardware such as parachute releases, it may be necessary to cover portions of the load with honeycomb or cloth protectors. If a cover is needed, the specific rigging chapter will include this information and the procedures for its installation.

## **CENTER OF BALANCE**

1-11. The center of balance (CB) of a DRAS airdrop platform load is based on the total rigged weight and is given in the rigging chapter for a particular item. The CB must fall between 85 and 99 inches from the front of the platform. The CB of each load must be verified. Methods for computing the CB are in Appendix A.

## **ITEMS AND LOADS DROPPED IN COLD CLIMATES**

1-12. Some items to be dropped may have been modified for use in cold climates by the installation of extra equipment. Special rigging procedures may be needed when the drop item has been so modified. When loads are to be dropped in cold climates, all excess webbing of suspension slings and tie-down straps must be folded and tied with type I, ¼-inch cotton webbing.

# KNOTS

1-13. Some of the knots used for rigging platform loads are shown in Figure 1-3.

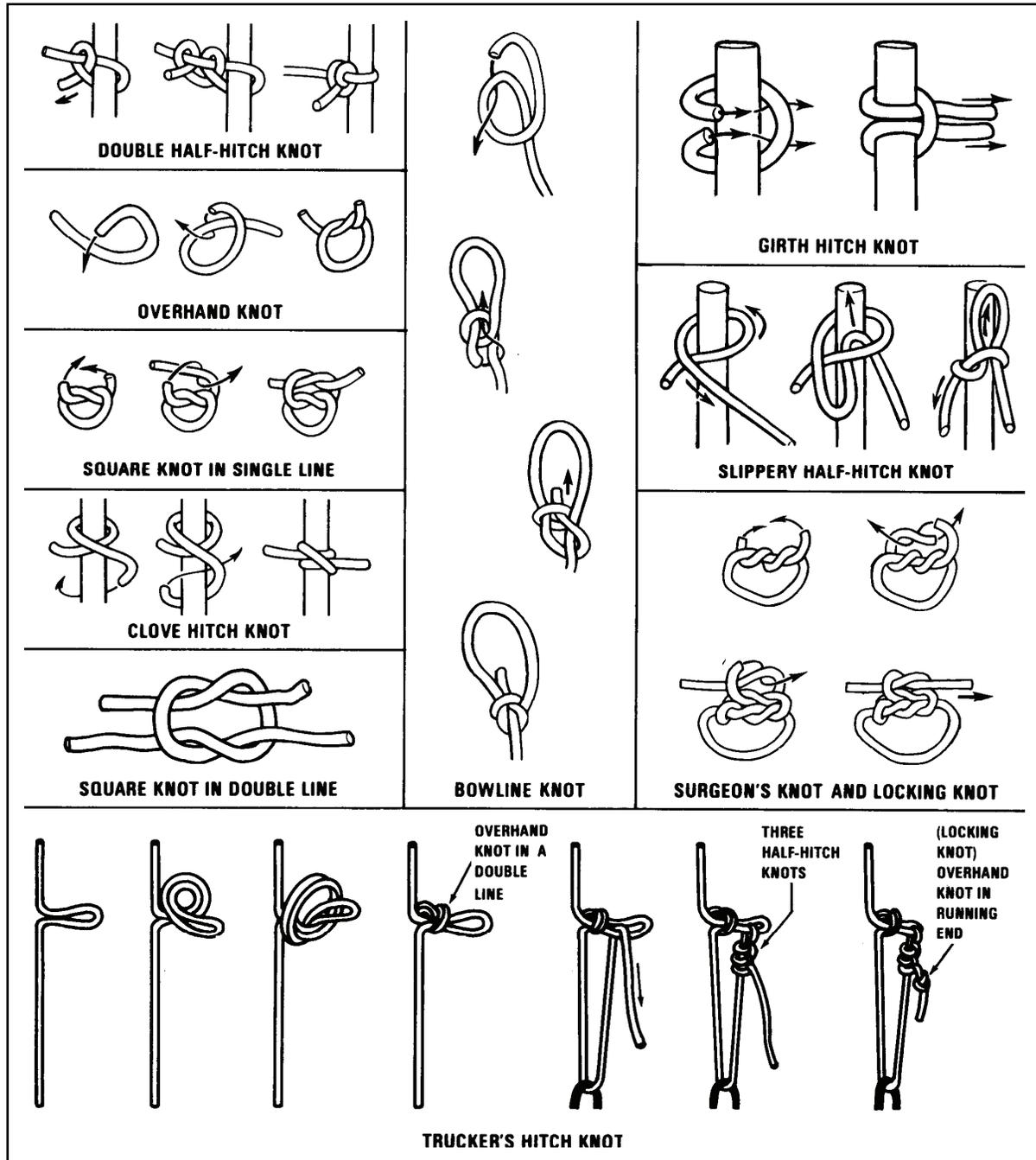


Figure 1-3. Knots Used During Rigging

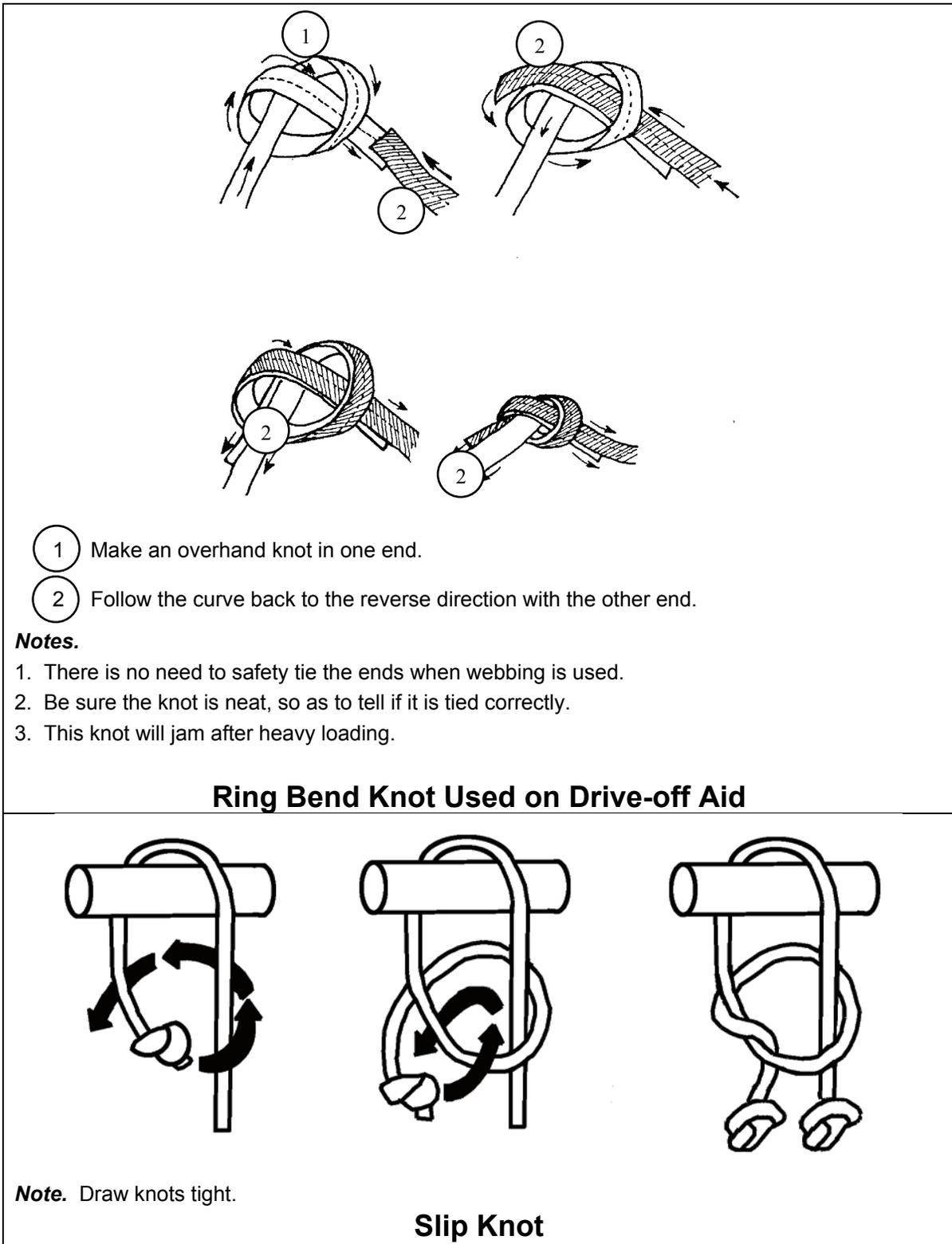


Figure 1-3. Knots Used During Rigging (Continued)

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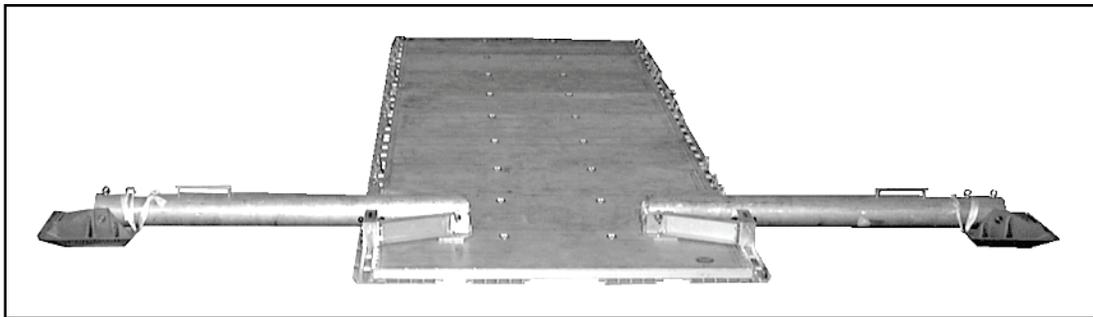
## Chapter 2

# Rigging and Procedural Information

### SECTION I – DUAL ROW AIRDROP PLATFORM

#### GENERAL INFORMATION

2-1. The DRAS platform, as shown in Figure 2-1, serves as the base on which supplies and equipment are restrained. This platform also supports the load during the extraction, parachute deployment, suspension, and recovery phases. The DRAS platform is used for low-velocity airdrop. The DRAS platform is 18 feet long. The assembled platform is 88 inches wide. A detailed description of this platform is in TM 10-1670-268-20&P/TO 13C7-52-22. The DRAS platform spreads the shock of ground impact. The outrigger assembly helps to prevent the platform from rolling over. Limitations for the DRAS platform are listed in Table 2-1.



**Figure 2-1. Dual Row Airdrop System Platform**

**Table 2-1. Limitation for DRAS Platform when Dropping from a C-17 Aircraft**

<i>Length (Feet)</i>	<i>Width (Inches)</i>	<i>Weight (Pounds)</i>	<i>Platform Surface (Square Feet)</i>	<i>Minimum Rigged Weight (Pounds)</i>	<i>Maximum Rigged Weight (Pounds)</i>
18	88	1,590 w/o outriggers	132	5,040	14,500
18	88	1,942 w/outriggers	132	5,040	14,500

#### PLATFORM LIMITATIONS

2-2. The C-17 (Globemaster) aircraft is specifically designed to deliver supplies and equipment using the DRAS during airborne operations. Platform loads are generally restricted to a height of 118 inches. Platform loads are generally restricted to a weight of 14,500 pounds. For multiple platforms, up to 116,000 pounds of airdrop load may be airdropped. The aircraft has a capability of eight DRAS platforms, six on the floor and two on the ramp.

## **PLATFORM PREPARATION**

2-3. The DRAS platform is inspected, or assembled and inspected, as outlined in TM 10-1670-268-20&P/TO 13C7-52-22.

## **PREPARING THE PLATFORM**

2-4. The platform must be prepared by attaching outrigger link assemblies and the outrigger platform support weldments according to TM 10-1670-268-20&P/TO 13C7-52-22. Install the clevises according to the specific rigging chapter. Figure 2-2 gives an example of how to bolt the clevises to the bushings in the platform side rails and how to number them.

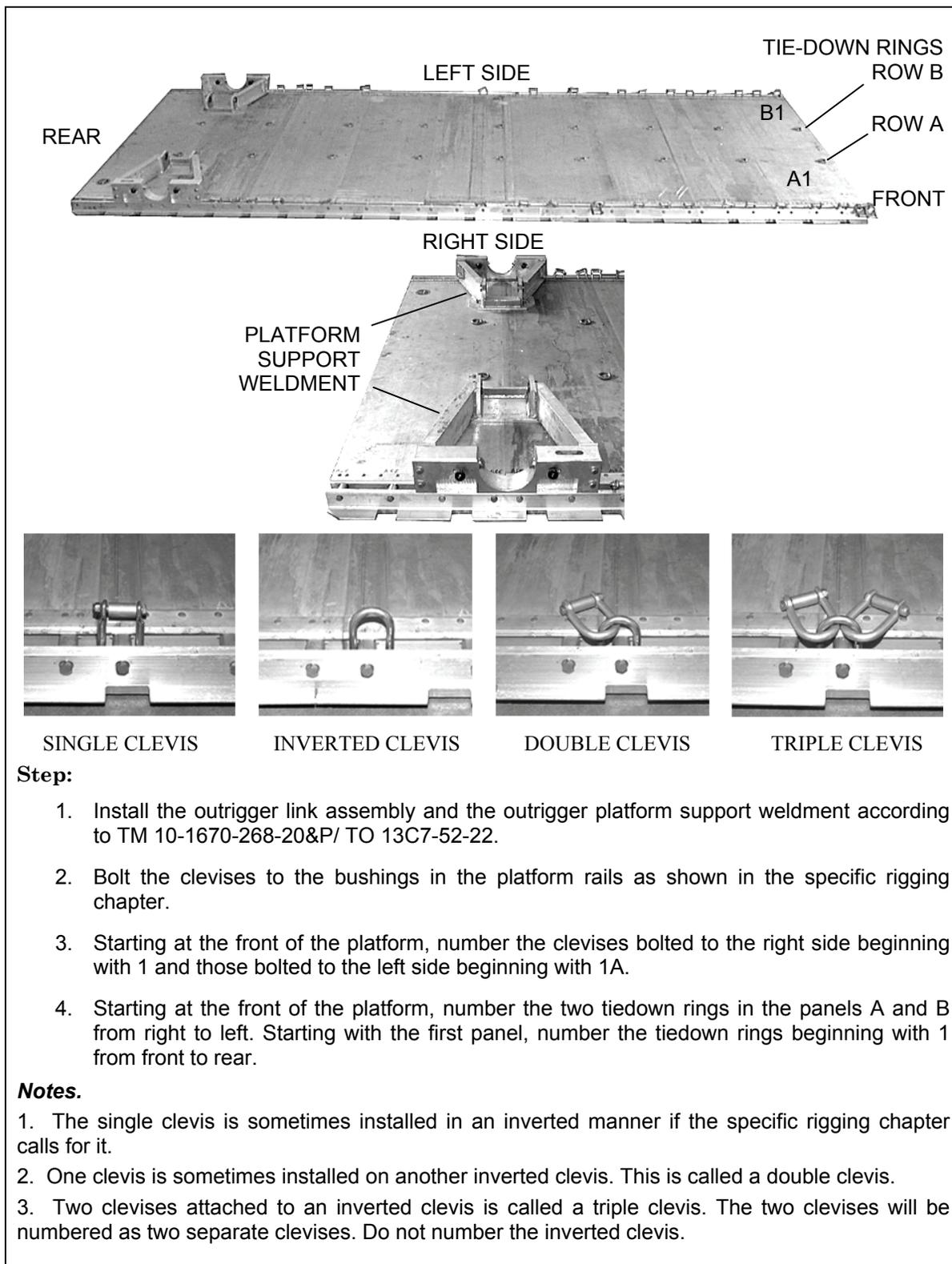
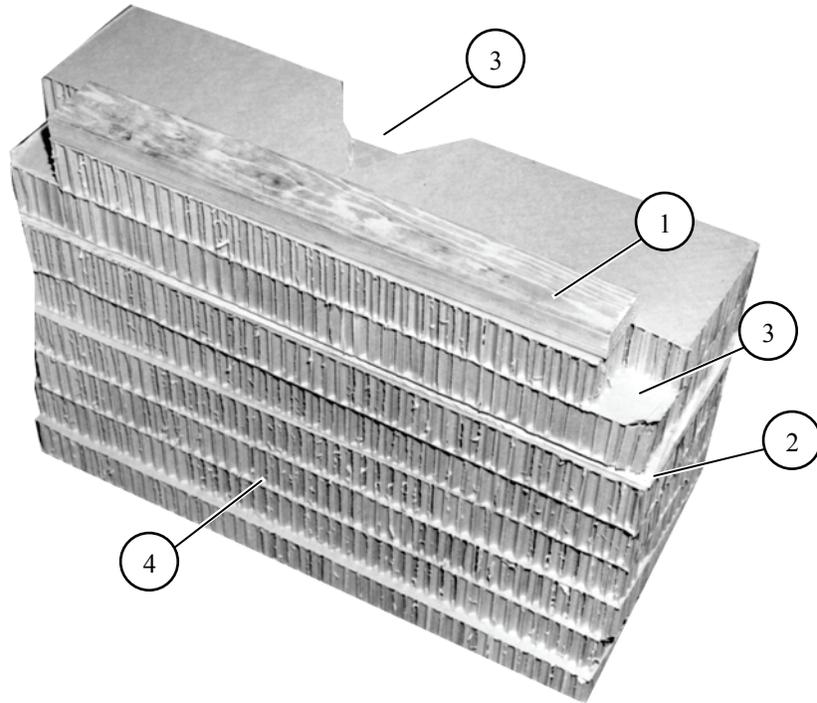


Figure 2-2. DRAS Platform Prepared

## BUILDING HONEYCOMB STACKS

2-5. Honeycomb stacks must be prepared according to the specific rigging chapter. Honeycomb is used to absorb the landing shock. Figure 2-3 shows a typical honeycomb stack.

**Note.** When honeycomb stacks are longer than 96 inches or wider than 36 inches, alternate the layers to build a solid, cohesive stack.



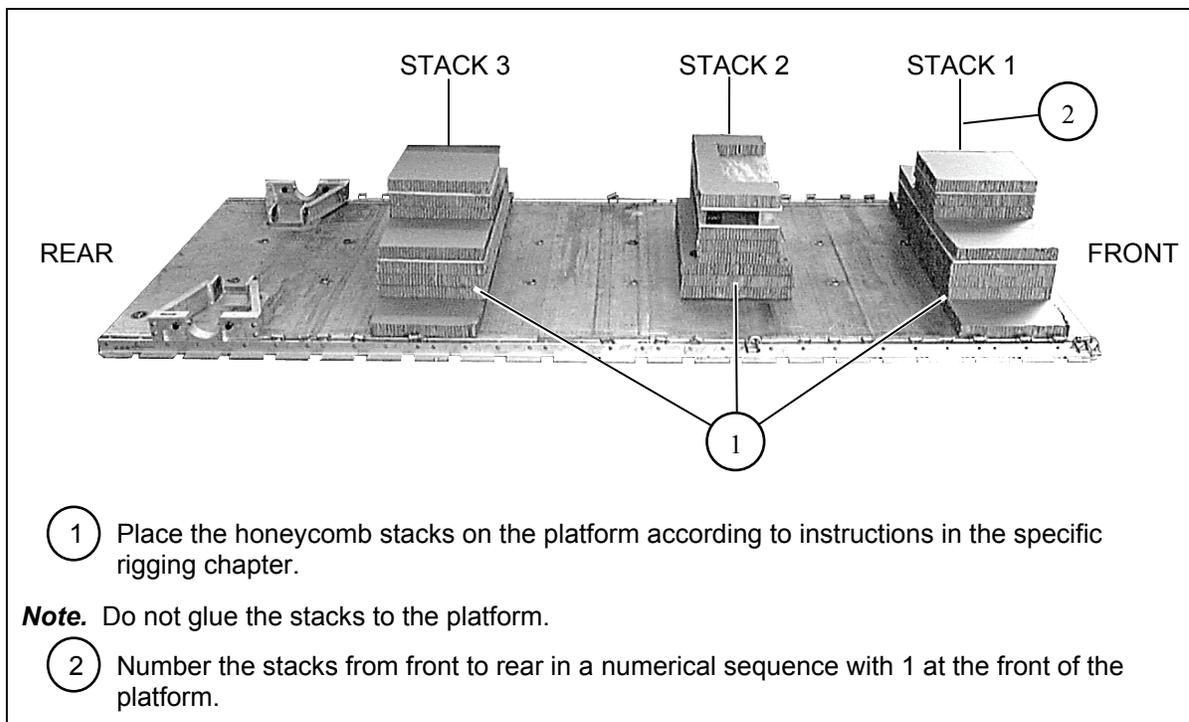
- ① Lumber.
- ② Plywood.
- ③ Cutouts or notches.
- ④ Layers of honeycomb.

**Note.** Glue the layers of the stack together.

**Figure 2-3. Typical Honeycomb Stack**

## PLACING HONEYCOMB STACKS

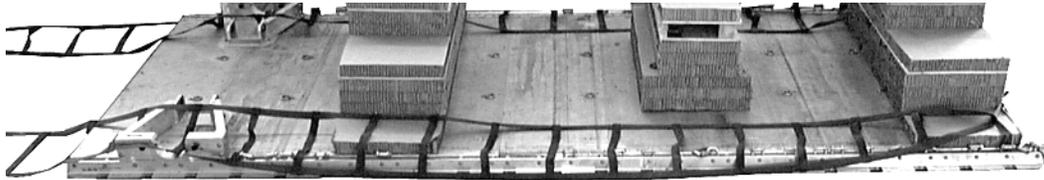
2-6. Honeycomb stacks must be set on the platform according to instructions in the specific rigging chapter. Figure 2-4 shows a typical placement of honeycomb stacks on a DRAS platform.



**Figure 2-4. Typical Placement of Honeycomb on DRAS Platform**

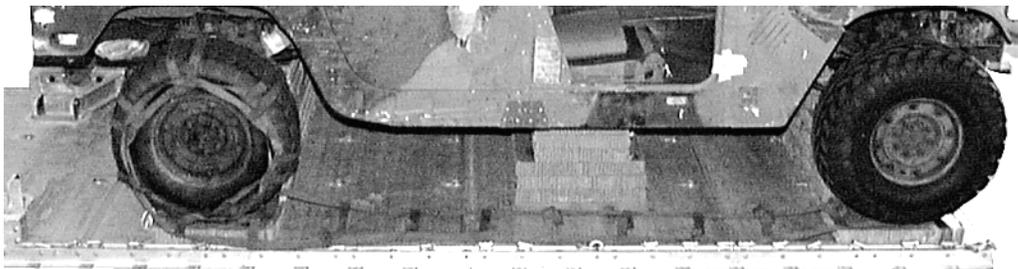
## DRIVE-OFF AID AIRDROP

2-7. The drive-off aid may be used with the HMMWV truck. The drive-off aid, showing the front platform attachment (Figure 2-5), consists of a fabric track constructed of type X webbing sewn into a ladder-type configuration. The system is placed on two of the identified vehicle's tires and attached to the DRAS platform with type V webbing or 1-inch tubular nylon webbing. There are two tracks to each system. Each track is 30 feet long and 22 inches wide and weighs 21 pounds. When powered up, the vehicle (with tiedown assemblies removed), will progressively wrap the webbed ladder around the two tires (using the platform for leverage) and pull itself clear of the honeycomb and platform.



FRONT PLATFORM ATTACHMENT

**Note.** If the vehicle is to be driven off the front of the platform, tie a length of type V nylon webbing or 1-inch tubular nylon webbing from the first bushing through the end loop of the drive-off aid, and through the nearest tie-down ring. When attaching the drive-off aid to the platform using type V or 1-inch tubular webbing, tie the free ends with a ring bend knot as shown in Figure 1-3. Tie the drive-off aid to tie-down rings or platform bushings with type I, ¼-inch cotton webbing.



**Note.** Wrap the drive-off aid around the wheel of the vehicle on each side as shown. Tie the end loop of each drive-off aid to the nearest cross piece with a doubled length of type I, ¼-inch cotton webbing. Wrap the drive-off aid around the wheel until the webbing lays flat on the platform, but is not under tension. Tie the drive-off aid to adjacent tie-down rings or platform bushings on each side with type I, ¼-inch cotton webbing.

Figure 2-5. Drive-Off Aids Installed on Platform

## SECTION II – SUSPENSION SLINGS

### CARGO SLINGS

2-8. Cargo slings (Figure 2-6) are used as suspension slings on DRAS loads. These slings suspend the load under the cargo parachutes during descent. Suspension slings connect the cargo parachute to the load using a parachute release assembly. Cargo slings may also be used as deployment lines and to extend the risers of cargo parachutes. Cargo slings are also used in the fabrication of the ACS.

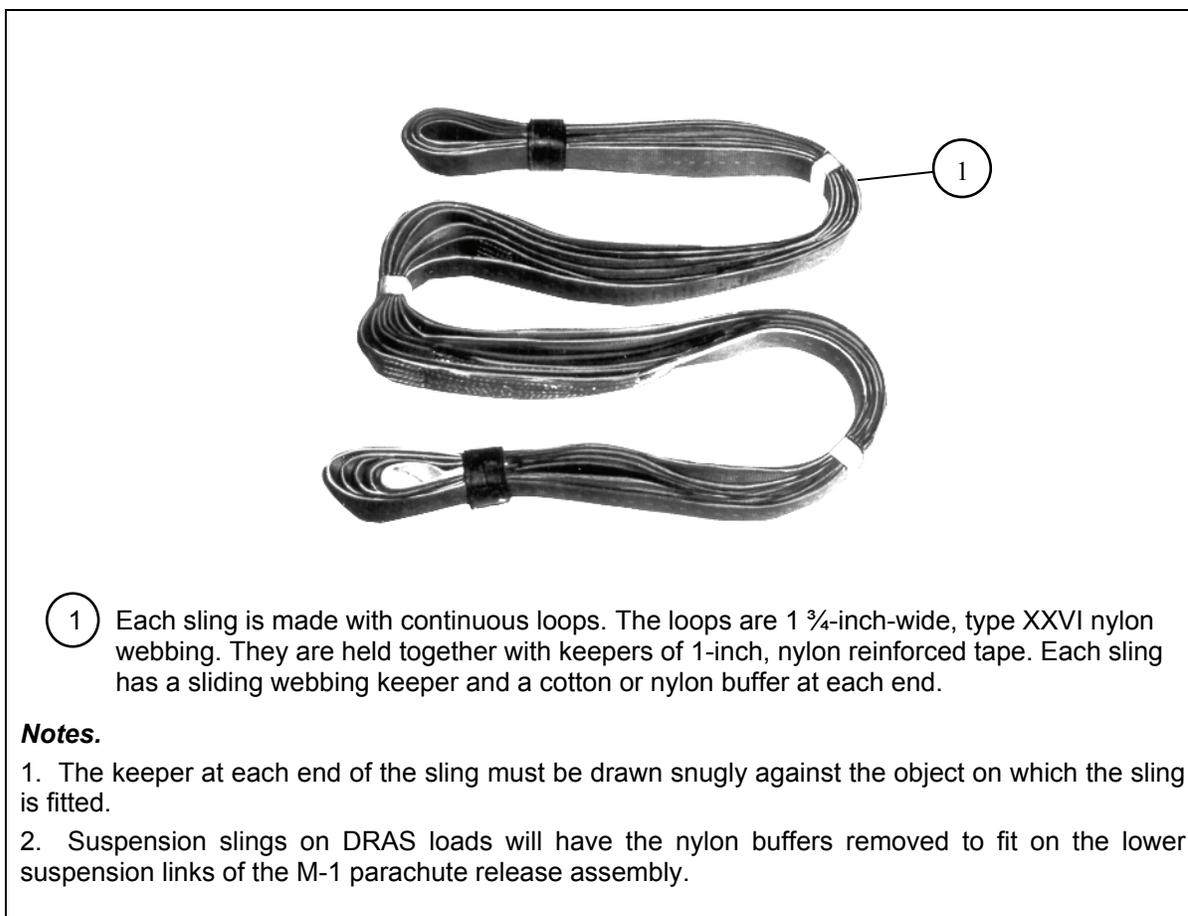


Figure 2-6. Cargo Slings

## REQUIREMENTS

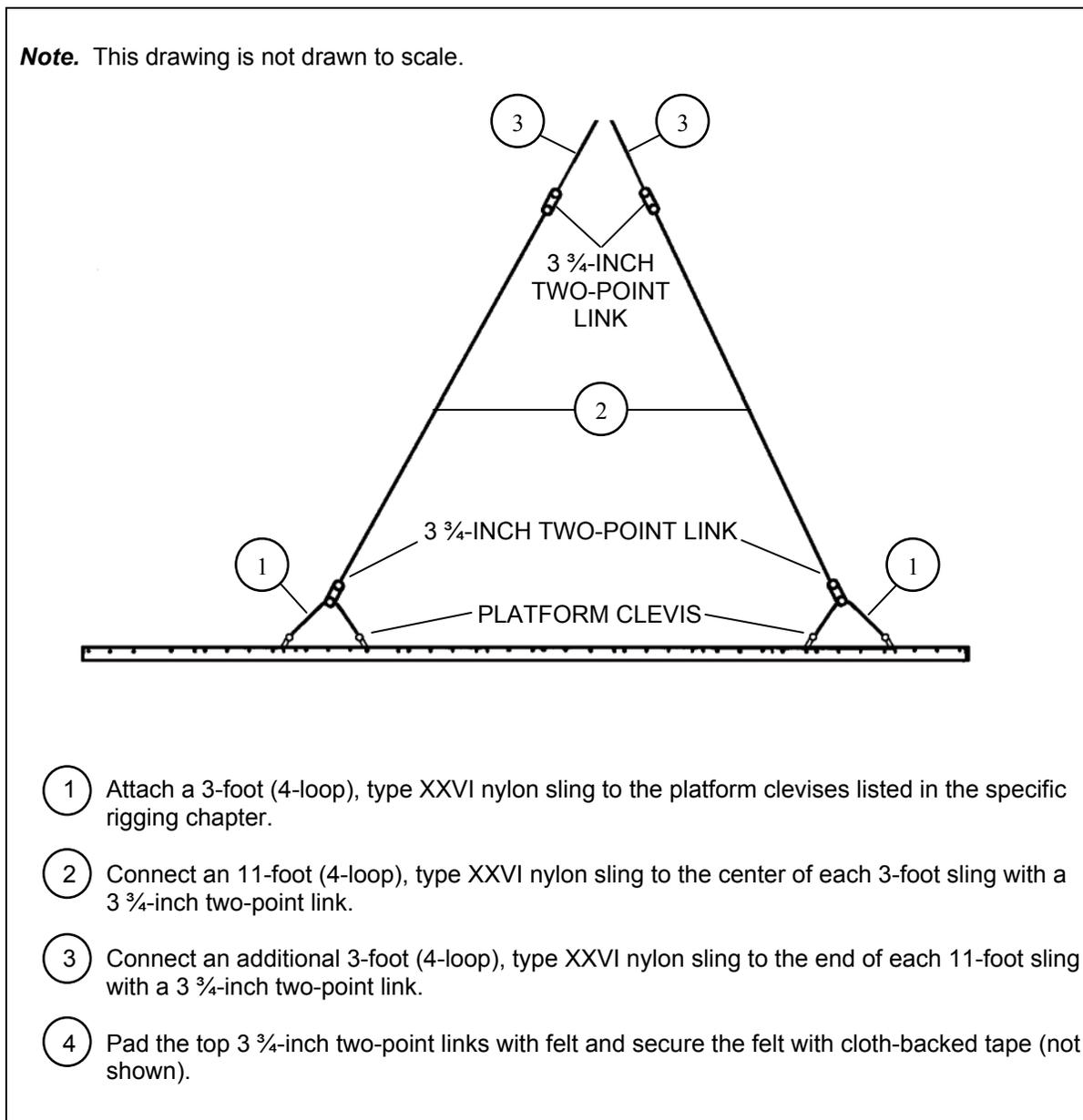
2-9. Loads rigged for use on the DRAS platform require 4-loop, type XXVI nylon suspension slings. The type and length of cargo slings authorized for use on a DRAS load are listed in Table 2-2.

**Table 2-2. Cargo Slings for DRAS Airdrop**

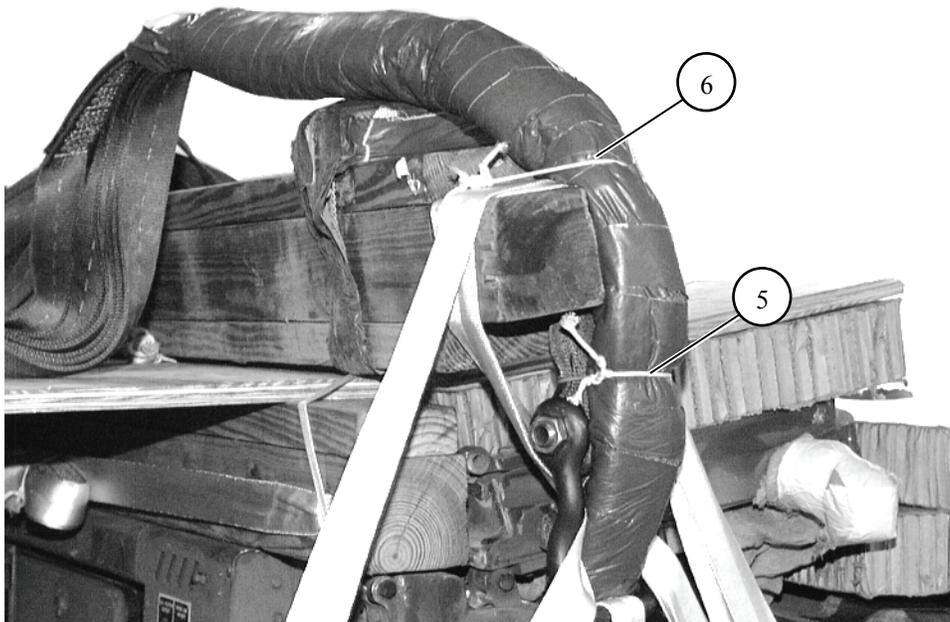
<i>National Stock Number</i>	<i>Length (Feet)</i>	<i>Number of Loops</i>	<i>Used for</i>
1670-01-062-6306	3	4	Suspension sling
1670-01-062-6310	11	4	Suspension sling
1670-01-063-7761	16	2	Attitude control system
1670-01-062-6302	20	2	Riser extension
1670-01-062-6313	60	3	Riser extension

## ATTACHING SLINGS AND SAFETY TIEING SUSPENSION SLINGS

2-10. The DRAS platform is suspended using 3-foot and 11-foot (4-loop), type XXVI nylon slings as shown in Figure 2-7. The clevis positions will be given in the specific chapter for the load being rigged. Safety tie the suspension slings as shown in Figure 2-7.



**Figure 2-7. Suspension System and Safety Ties Installed**



- 5 Remove all slack from the slings. Tie a length of type III nylon cord around the 11-foot sling and the ACS sling.
- 6 Tie a length of type III nylon cord around the 11-foot nylon sling, behind all lashings, and around the 4- by 4-inch piece of lumber of the ACS and tie the ends together.
- 7 Repeat steps 5 and 6 on all slings (not shown).

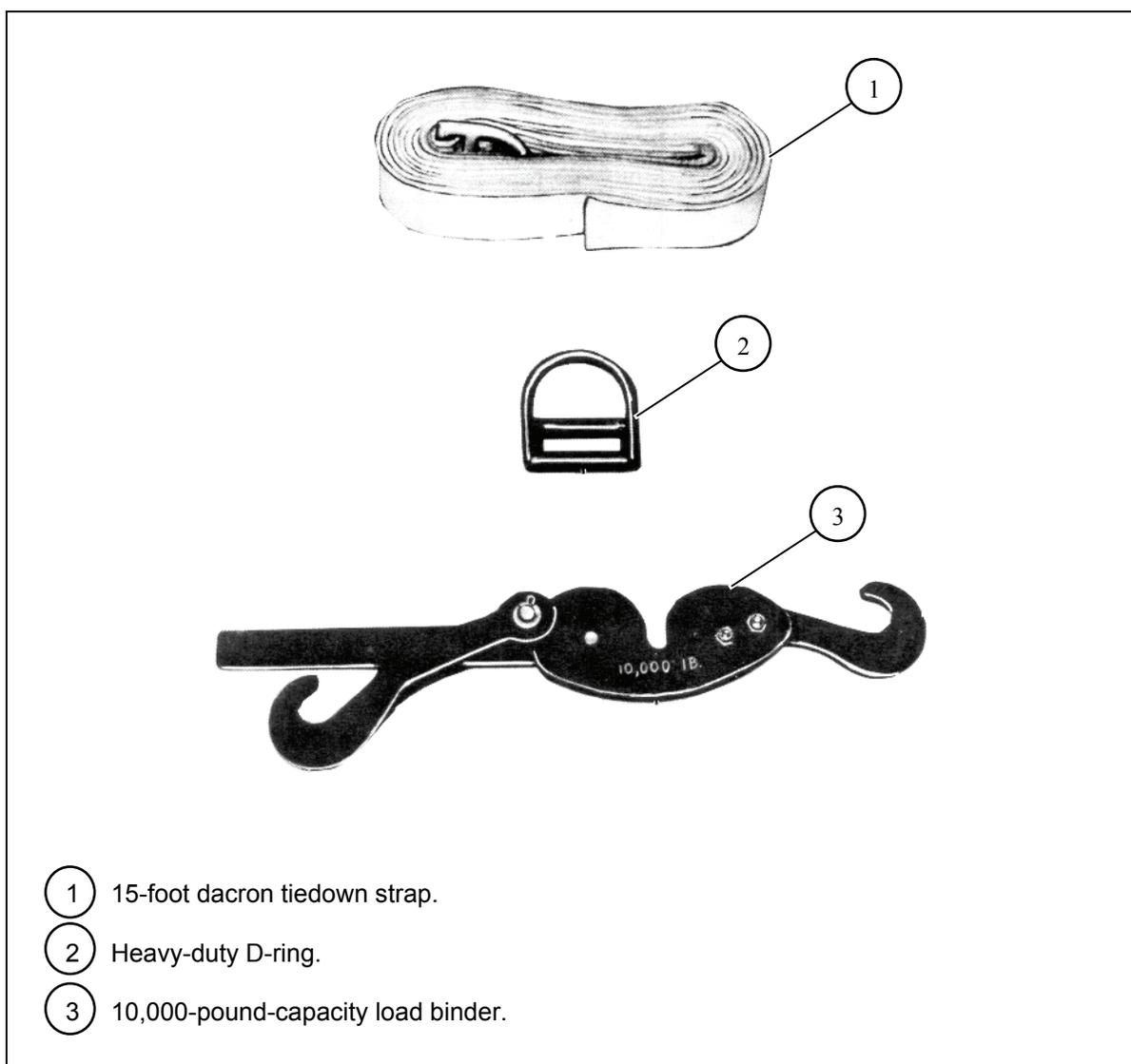
**Figure 2-7. Suspension System and Safety Ties Installed (Continued)**

**SECTION III – LASHINGS****USE**

2-11. The drop item and the accompanying load are lashed to the platform to prevent damage to the load or to the aircraft during airdrop. The accompanying load is lashed to the platform to withstand the same force as the drop item.

**COMPONENTS AND STRENGTHS**

2-12. The components of the lashings used on DRAS loads are shown in Figure 2-8. The maximum strengths of the various forms of lashings are given in Figure 2-9.



**Figure 2-8. Components of a Tiedown Assembly**

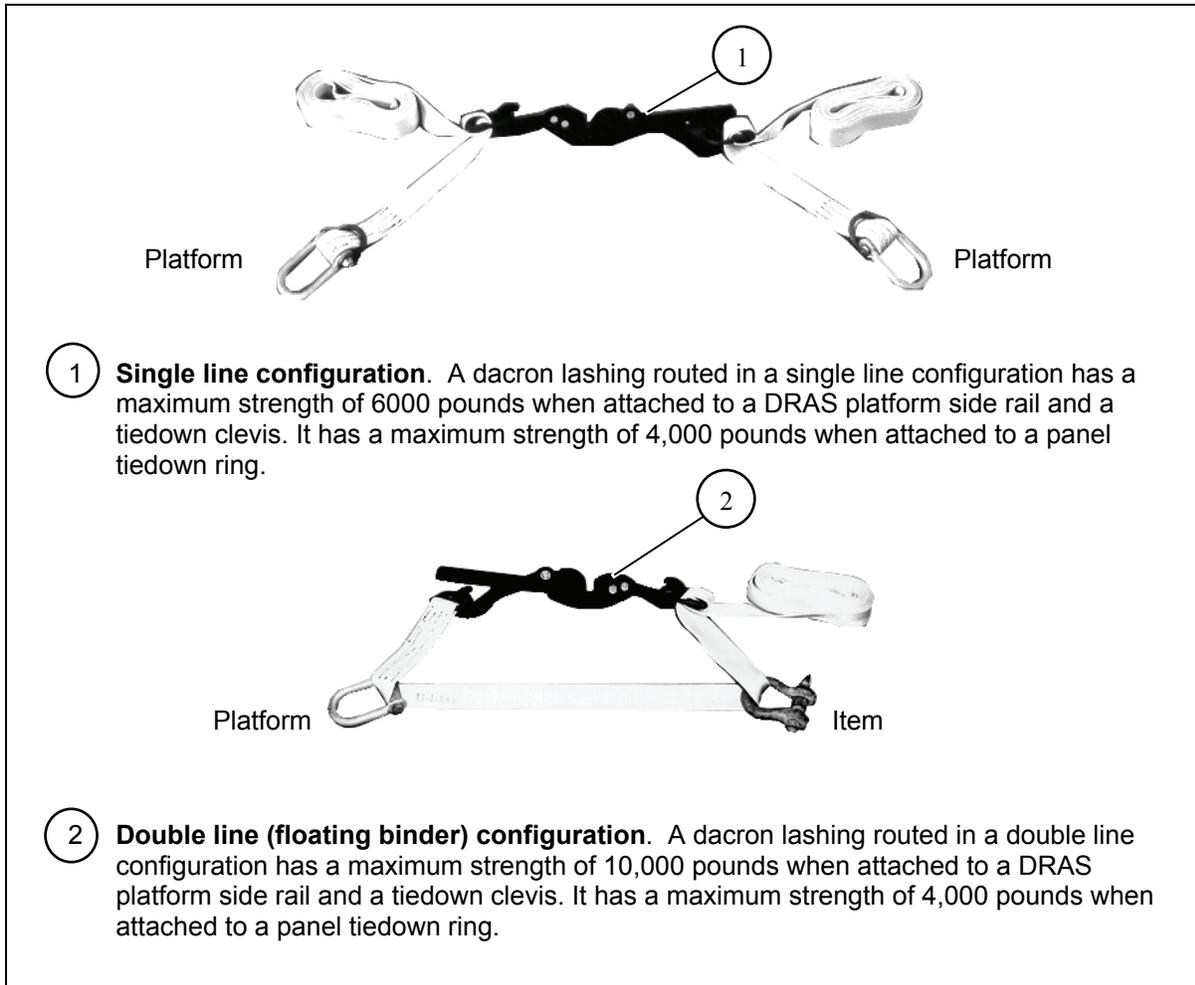


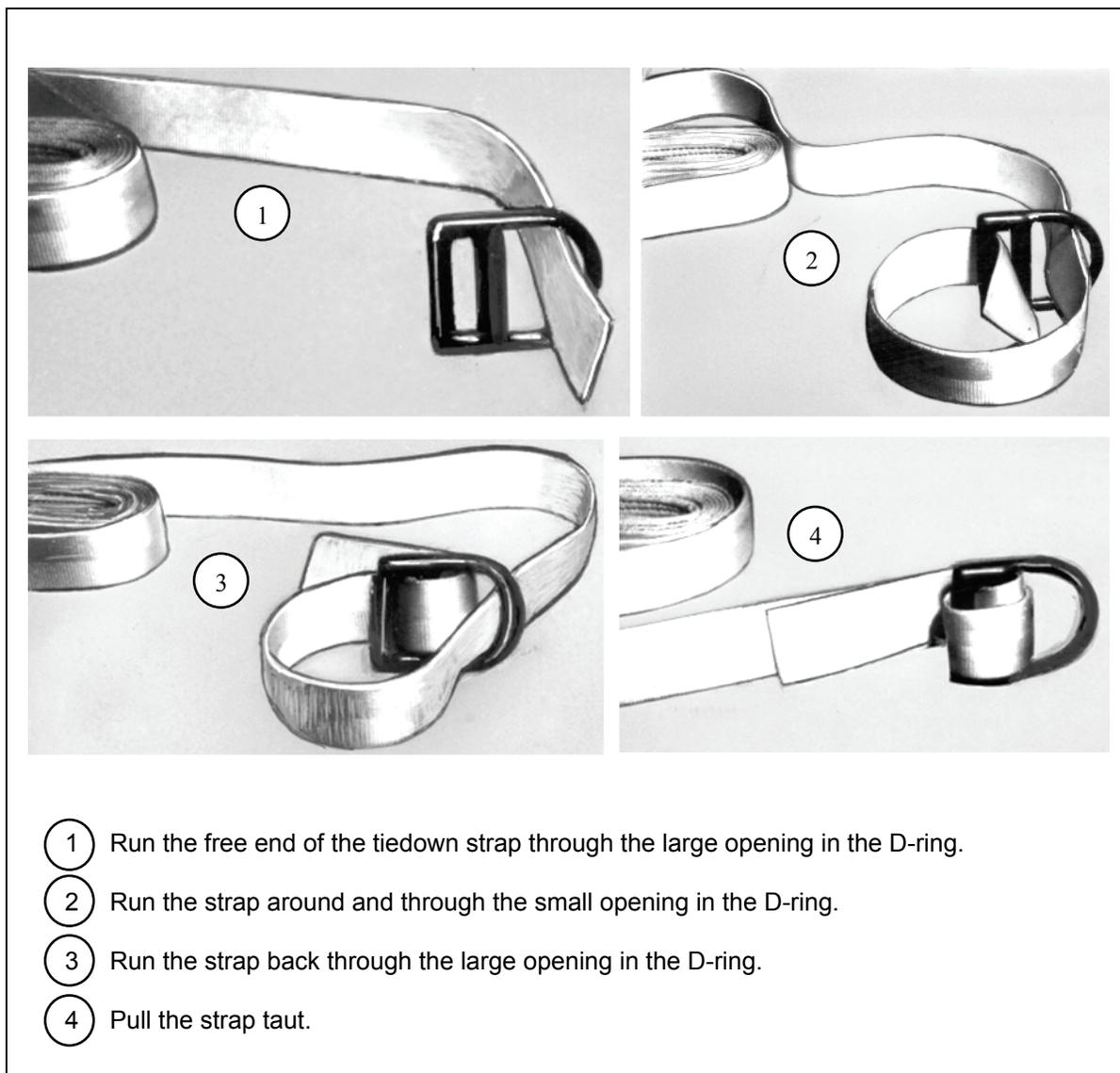
Figure 2-9. Maximum Strength of Lashings

## FITTING D-RINGS

2-13. Fit a D-ring to the end of each tiedown strap as shown in Figure 2-10.

## LASHING LOAD

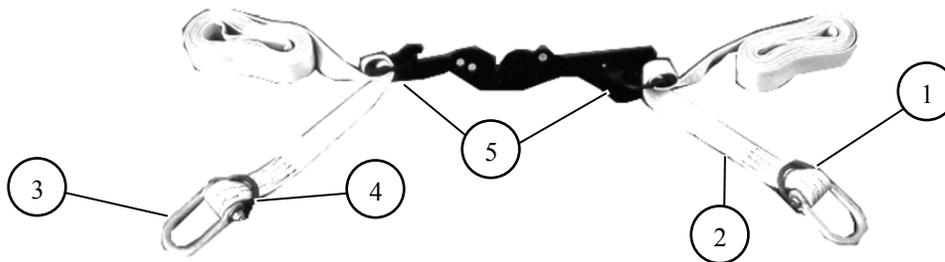
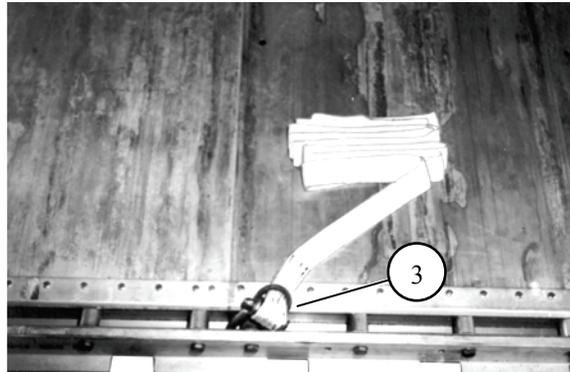
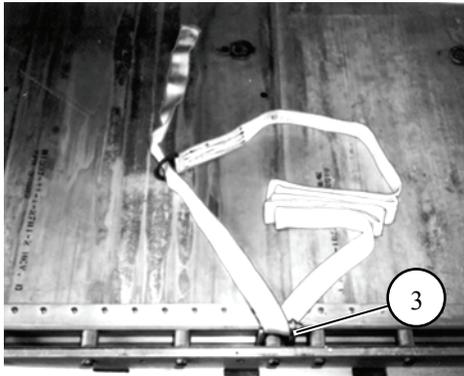
2-14. Lash a DRAS load to the platform according to the instructions in the specific rigging chapter. Install the lashings as shown in Figures 2-11 and 2-12.



**Figure 2-10. D-Ring Fitted to Tiedown Strap**

**CAUTION**

Do not tighten the lashings so tight that they cause the platform to bow especially in the aircraft.

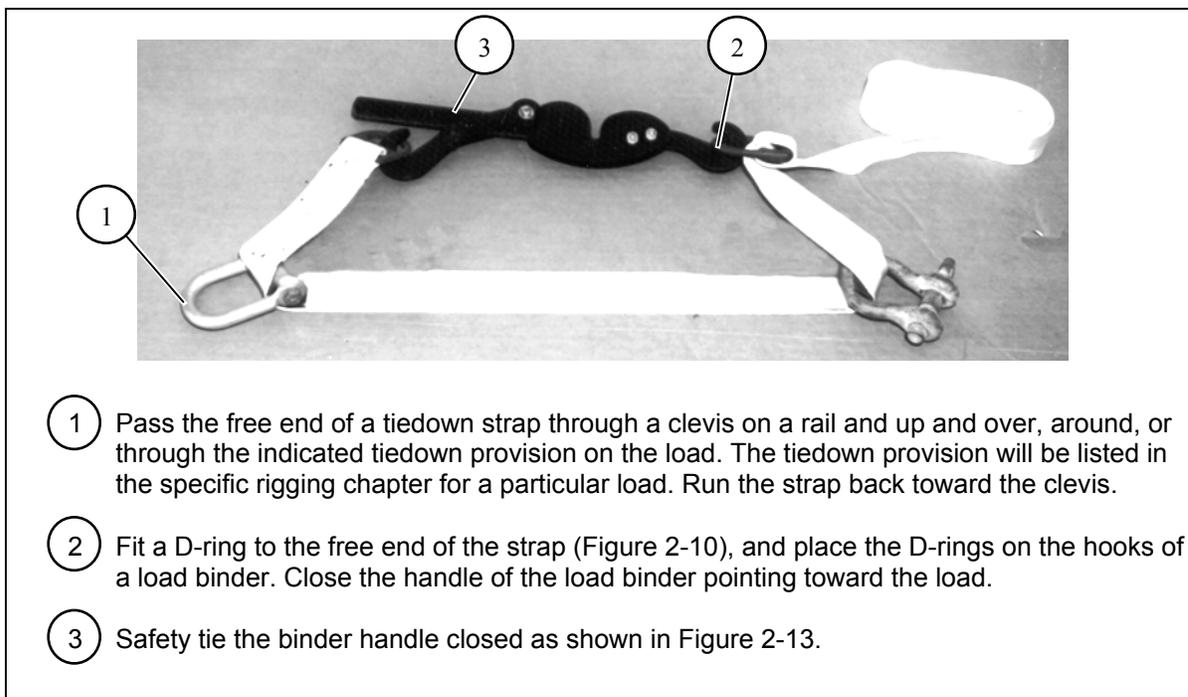


- 1 Pass the free end of one tiedown strap through a clevis on the right rail and through its own D-ring. Pull the strap taut.
- 2 Run the free end of the strap up over the load.
- 3 Pass the free end of a second tiedown strap through a clevis on the left rail and through its own D-ring. Pull the strap taut.
- 4 Run the free end of the strap up over the load.
- 5 Fit a D-ring on the free end of each strap as described in Figure 2-10, and place the D-rings on the hooks of a load binder. Safety the binder handle closed as shown in Figure 2-13.

**Notes.**

1. When the tiedown strap length is not a factor, it is permissible to use a single tiedown strap and D-ring with a load binder attached directly to a side rail clevis or tiedown ring.
2. Pad all sharp edges that may touch the strap with cellulose wadding or other suitable material.

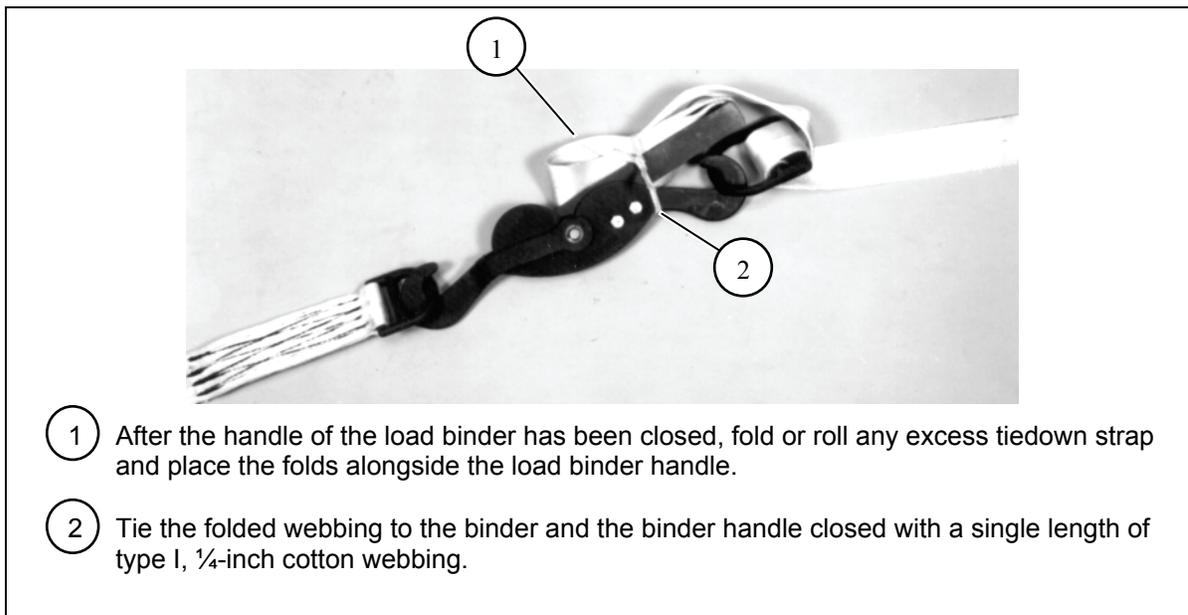
**Figure 2-11. Single Line Lashing Installed**



**Figure 2-12. Looped (Floating Binder) Lashing**

## SAFETY TIEING LOAD BINDER HANDLES

2-15. Fold the excess tiedown strap, and place the folds alongside the load binder handle. Safety tie the load binder handle closed as shown in Figure 2-13.



**Figure 2-13. Load Binder Handle Safety Tied**

## FORMING A 30-FOOT, 45-FOOT, OR GREATER LENGTH TIEDOWN STRAP

2-16. When needed, attach 15-foot tiedown straps together to form a 30-foot, 45-foot, or greater length tiedown strap as shown in Figure 2-14.

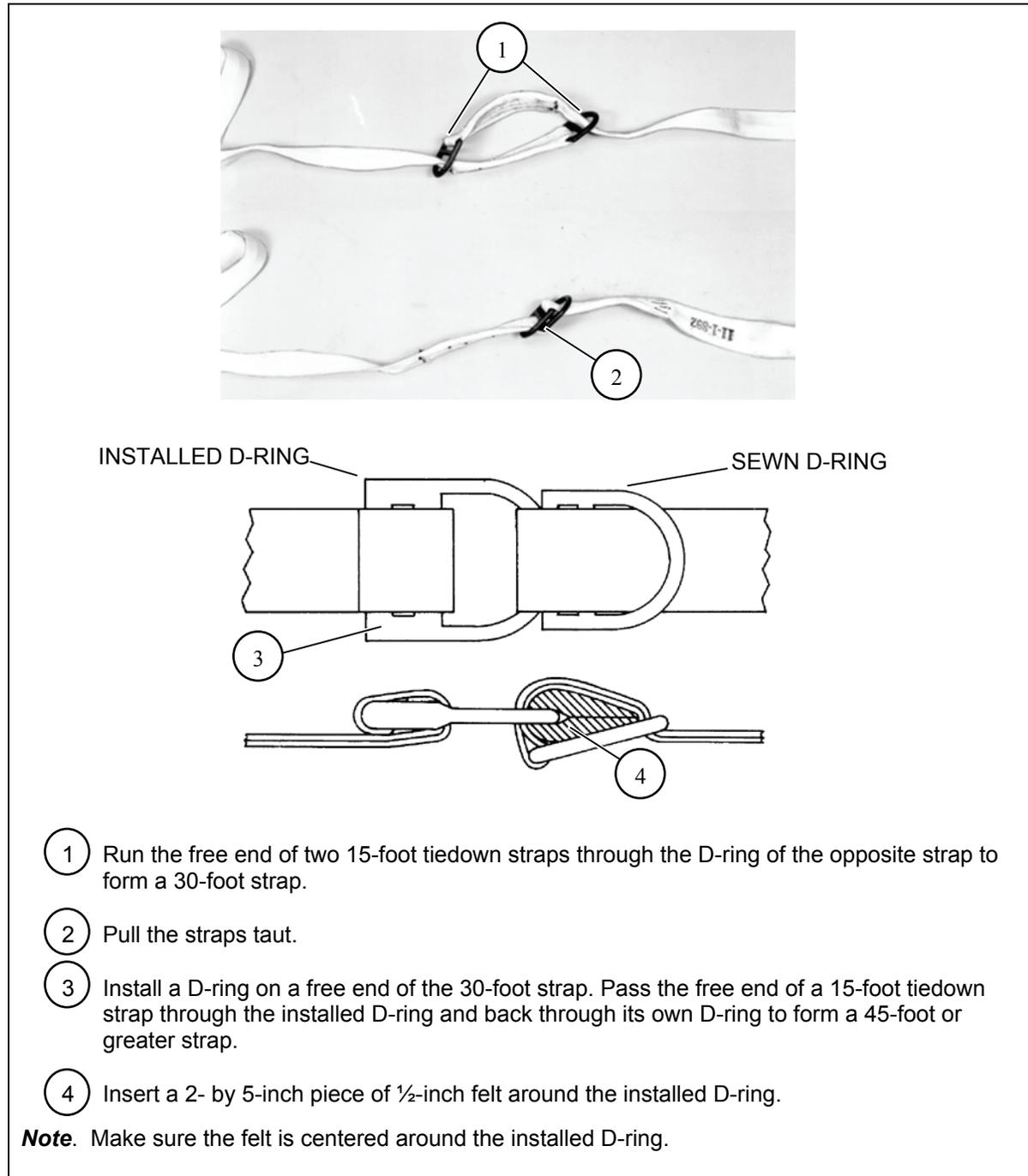


Figure 2-14. A 30-Foot, 45-Foot, or Greater Length Tiedown Strap Formed

## SECTION IV – CARGO PARACHUTES

### USE

2-17. Cargo parachutes, also called recovery parachutes, are used to slow the descent of a DRAS platform load. Table 2-3 lists the weight limitations for cargo parachutes used with DRAS platform loads.

**Table 2-3. General Weight Limitation for Cargo Parachutes**

<i>Parachutes</i>	<i>Minimum Suspended Weight* (pounds)</i>	<i>Maximum Suspended Weight* (pounds*)</i>
G-11D		
2	6,950	8,500
3	8,501	12,750
4	12,751	13,400

\*Suspended weight in pounds is the total rigged weight less the weight of the cargo parachutes.

### TYPES

2-18. The G-11D cargo parachute is used when loads are rigged for DRAS. The parachute has a 100-foot-diameter canopy. It has 120 suspension lines (35-foot, type III nylon cord). The parachute has four 2-second cutters and four 12-foot reusable reefing lines. When packed, the assembly weighs 250 pounds.

### RISER EXTENSION REQUIREMENTS

2-19. Cargo parachutes are used in a cluster. When parachutes are used in a cluster, the risers of each parachute are lengthened so the canopies remain almost vertical as they descend to increase the effectiveness of each canopy. The length of a riser extension and the number of stows used in stowing the extensions are given in Table 2-4.

**Table 2-4. Riser Requirements for G-11D Cargo Parachute Clusters**

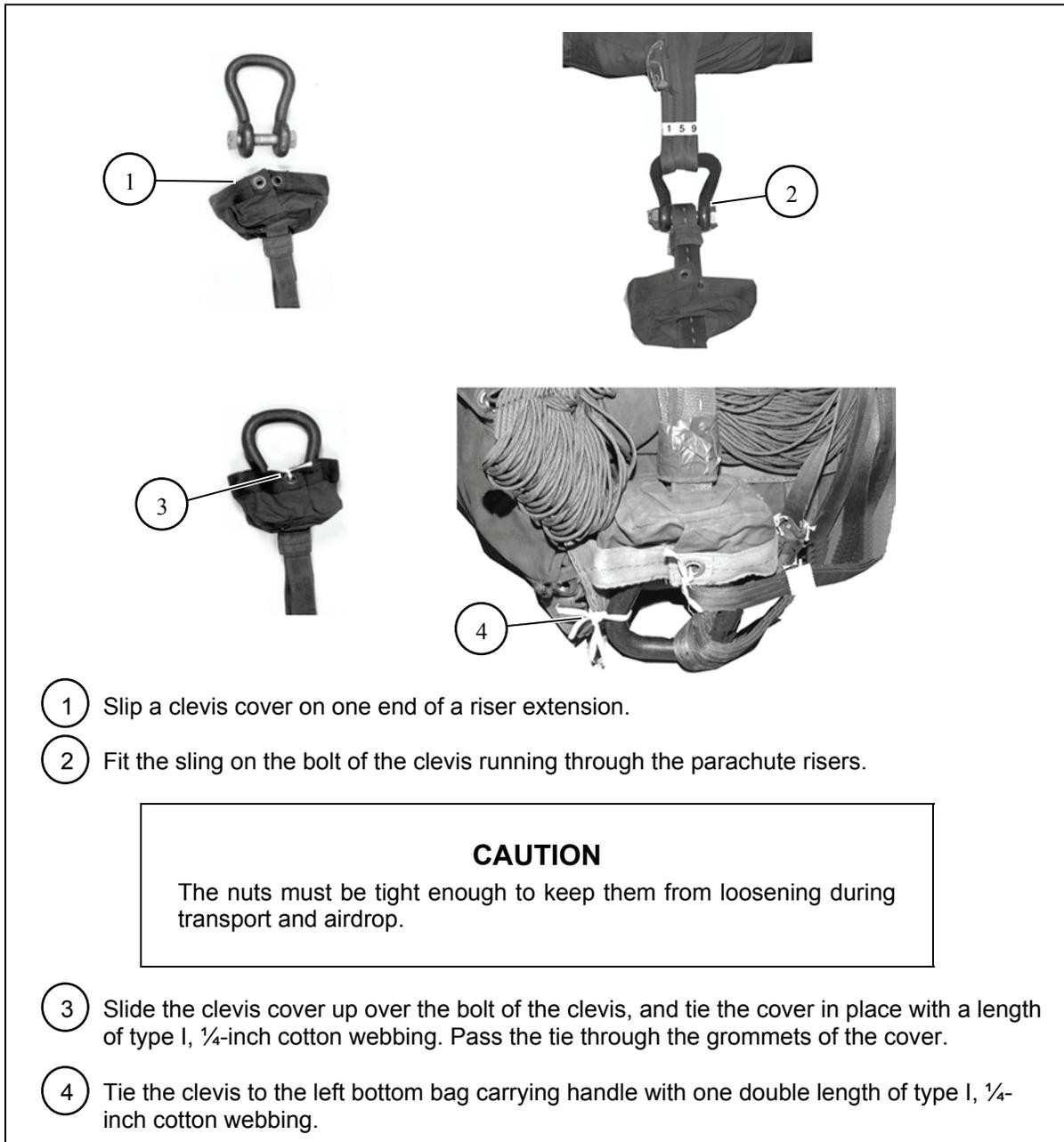
<i>Number of Parachute in Cluster</i>	<i>Length of Riser Extension (feet)</i>	<i>Number of Stows</i>	<i>Type XXVI Nylon Webbing Slings</i>
2	20	2	20-foot (2-loop)
3 or 4	60	8	60-foot (3-loop)

*Note.* All riser extensions must be continuous type XXVI nylon slings and each must be the same length.

## RISER EXTENSIONS

2-20. The risers of a cluster of G-11D cargo parachutes used on DRAS loads must be extended (lengthened). The length of the extension needed for the cluster is given in Table 2-4.

- **Forming extensions.** Only continuous riser extensions may be used.
- **Bolting extensions to risers.** Bolt the riser extension to the risers of a cargo parachute as shown in Figure 2-15.

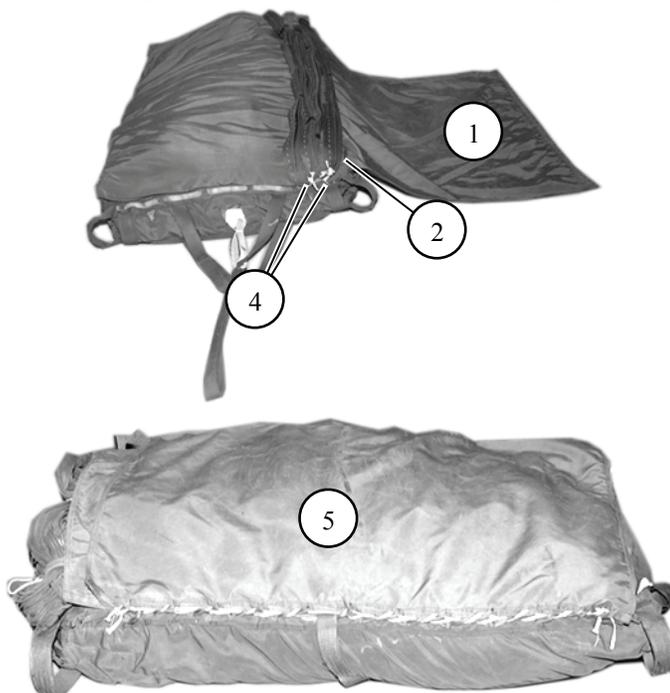


**Figure 2-15. Riser Extension Bolted to Risers**

## STOWING RISER EXTENSIONS

2-21. The riser extensions for the G-11D cargo parachutes must be stowed as shown in Figures 2-16 through 2-18.

**Note.** The nylon deployment bags have the riser extension securing line permanently attached.



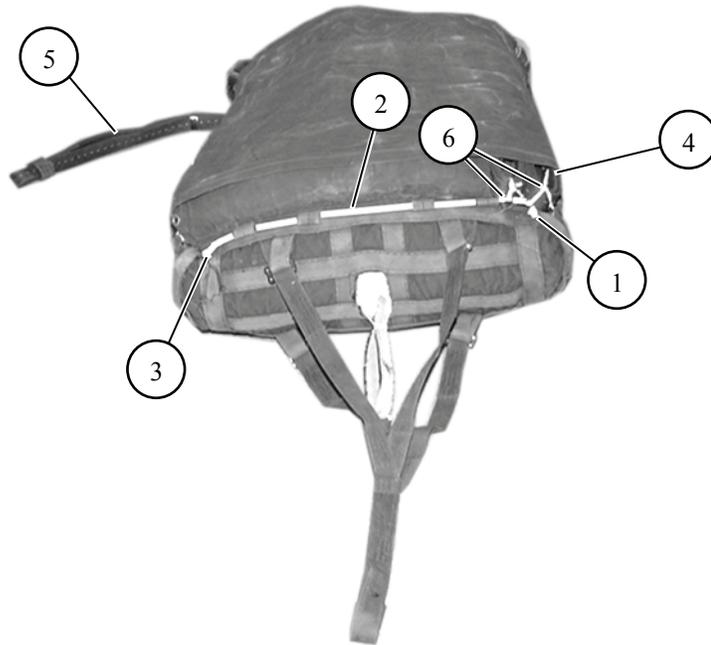
- ① Open the riser extension flap which is attached with type I, ¼-inch cotton webbing.
- ② Start at the end of the riser extension fitted to the clevis and S-fold the extension into the riser extension compartment.
- ③ Leave approximately 3 feet of the free end of the extension outside the riser end of the compartment. (Not shown)
- ④ Tie each stow to the riser extension securing line with one turn double, type I, ¼-inch cotton webbing.

### CAUTION

Do not girth hitch the type I, ¼-inch cotton webbing ties to the riser extension securing line.

- ⑤ Close the riser flap according to TM 10-1670-280-23&P/TO 13C5-31-2.

**Figure 2-16. Riser Extension Stowed on Nylon Bag**



- 1 Fold an 8-foot length of ½-inch tubular nylon webbing in half lengthwise. Run the loop in the folded end through the left carrying handle. Run the free ends of the webbing through this loop, and pull the webbing taut.
- 2 Run the webbing across the parachute, passing it through the riser extension retaining loops (end tabs).

**Note.** Do not pull the webbing tight across the parachute.

- 3 Tie the webbing to the right top carrying handle with three alternating half hitches and an overhand knot in each free running end.
- 4 Start at the end of the riser extension fitted to the clevis and S-fold the riser extension into the riser extension compartment.
- 5 Leave about 3 feet of the free end of the extension outside the riser end of the compartment.

**CAUTION**

Do not girth hitch the type I, ¼-inch cotton webbing ties to the riser extension securing line.

- 6 Tie each stow to the riser extension securing line with ties of one turn double type I, ¼-inch cotton webbing.

**Figure 2-17. Riser Extension Stowed on Cotton Bag**

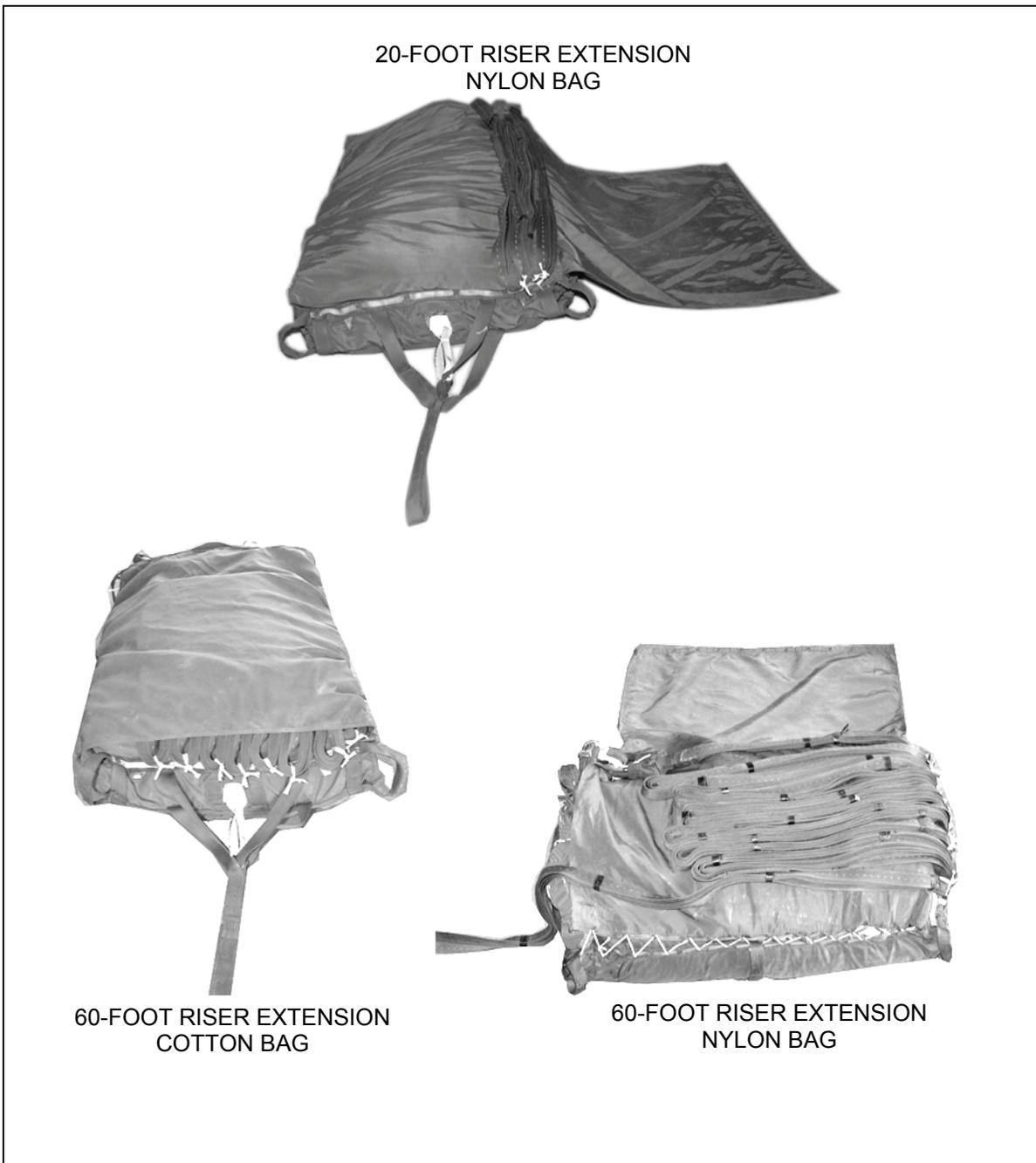


Figure 2-18. 20- and 60-Footer Riser Extensions Stowed

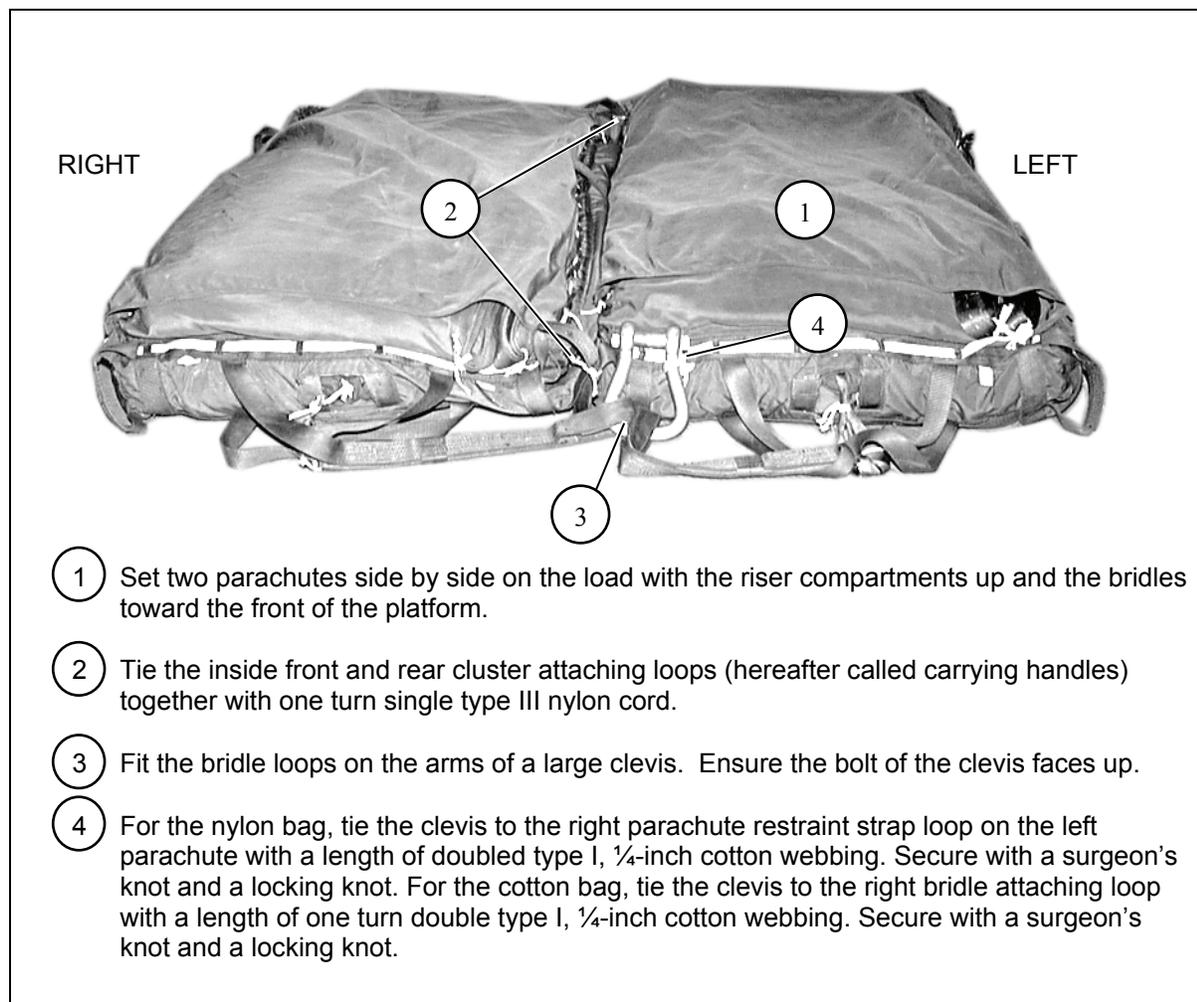
## STOWING CARGO PARACHUTES

2-22. When referring to cargo parachutes, stowing consists of three steps. First, place the cargo parachutes on the load or on a parachute stowage platform. Second, cluster the parachutes by tying their deployment bags handles together. Third, group the bridles on a large clevis. Stow the parachutes as shown in Figures 2-19 through 2-22.

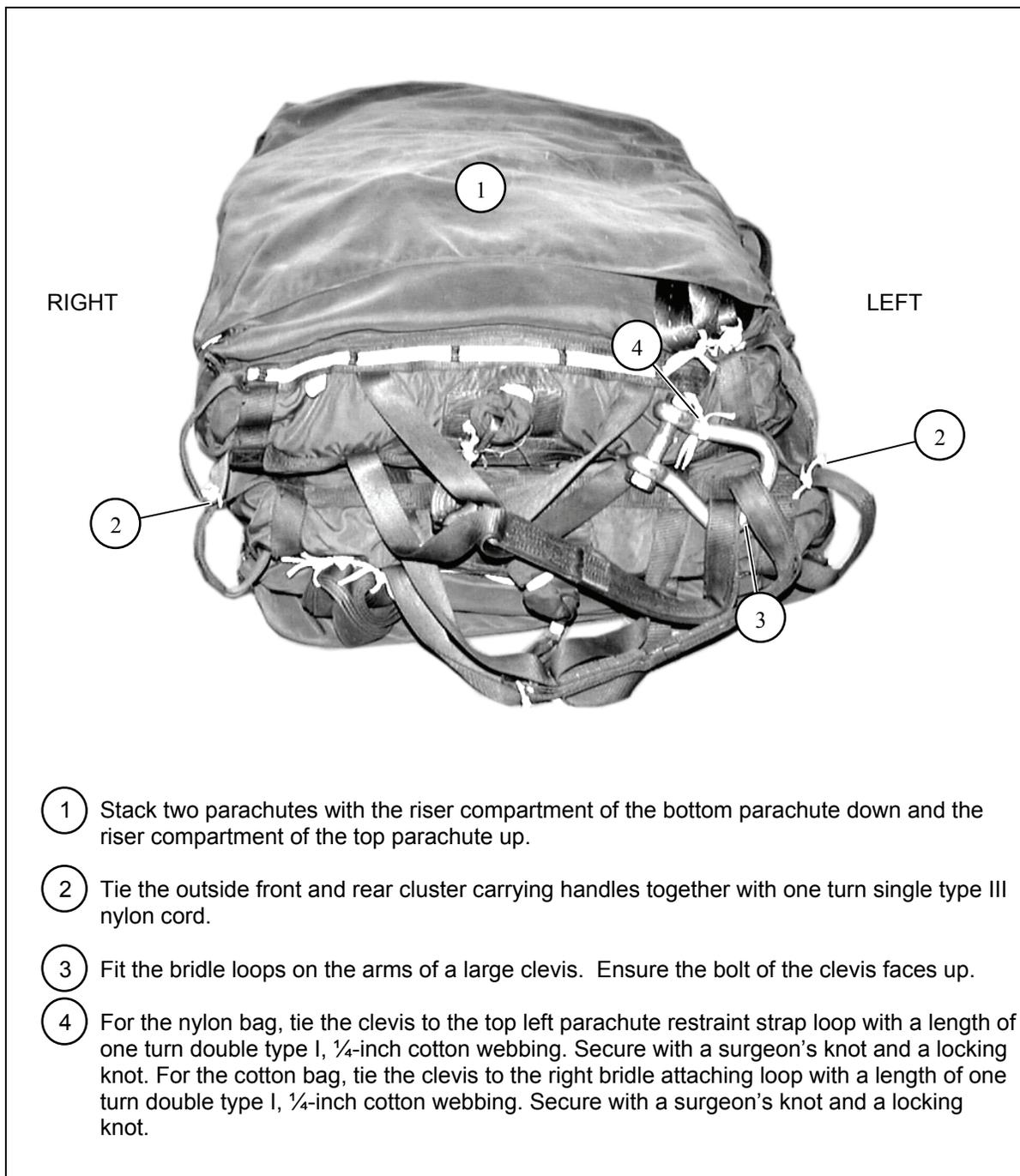
*Note.* Nylon and cotton bags may be mixed on the same load.

## USING DEPLOYMENT LINES

2-23. The deployment line for DRAS loads is a 3-foot (4-loop), type XXVI nylon webbing sling. One end of the deployment line is fitted on a 3 3/4-inch two-point link attached to the adapter web of the deployment parachute. The other end of the line is fitted to the bolt of the large clevis grouping the bridles of a cluster of parachutes.

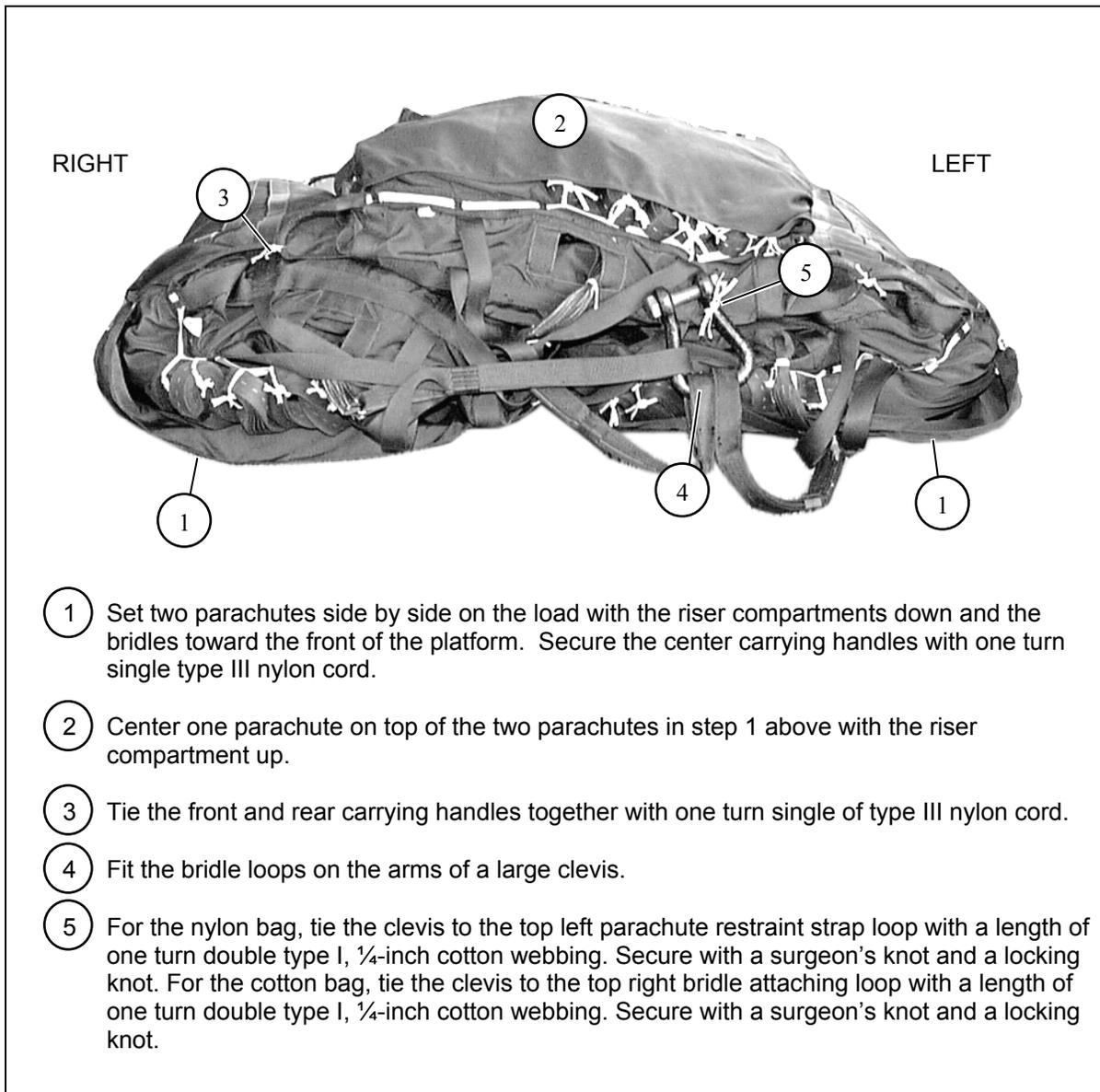


**Figure 2-19. Two Parachutes Stowed Side by Side**



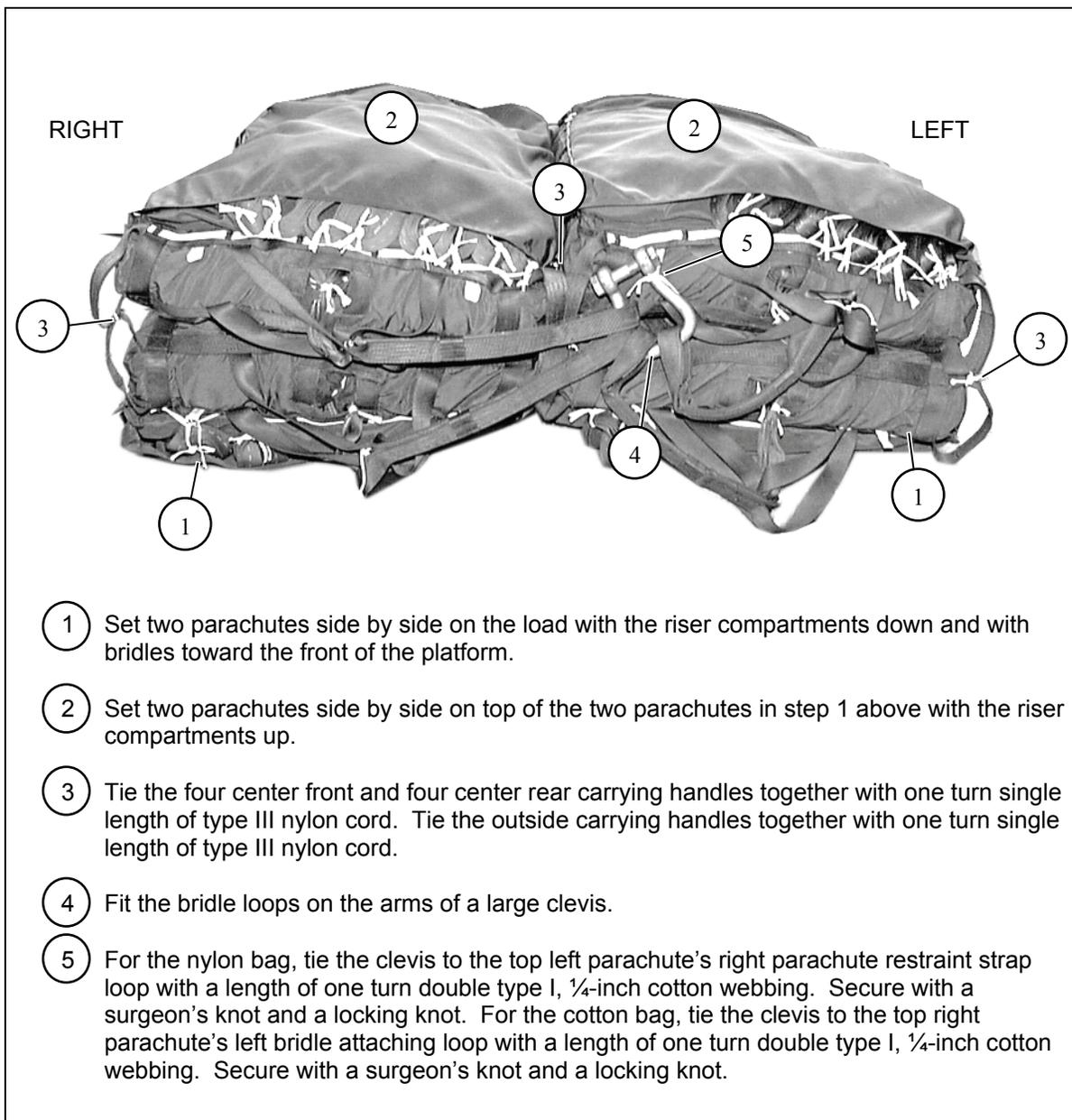
- ① Stack two parachutes with the riser compartment of the bottom parachute down and the riser compartment of the top parachute up.
- ② Tie the outside front and rear cluster carrying handles together with one turn single type III nylon cord.
- ③ Fit the bridle loops on the arms of a large clevis. Ensure the bolt of the clevis faces up.
- ④ For the nylon bag, tie the clevis to the top left parachute restraint strap loop with a length of one turn double type I, 1/4-inch cotton webbing. Secure with a surgeon's knot and a locking knot. For the cotton bag, tie the clevis to the right bridle attaching loop with a length of one turn double type I, 1/4-inch cotton webbing. Secure with a surgeon's knot and a locking knot.

**Figure 2-20. Two Parachute Stacked**



- ① Set two parachutes side by side on the load with the riser compartments down and the bridles toward the front of the platform. Secure the center carrying handles with one turn single type III nylon cord.
- ② Center one parachute on top of the two parachutes in step 1 above with the riser compartment up.
- ③ Tie the front and rear carrying handles together with one turn single of type III nylon cord.
- ④ Fit the bridle loops on the arms of a large clevis.
- ⑤ For the nylon bag, tie the clevis to the top left parachute restraint strap loop with a length of one turn double type I, 1/4-inch cotton webbing. Secure with a surgeon's knot and a locking knot. For the cotton bag, tie the clevis to the top right bridle attaching loop with a length of one turn double type I, 1/4-inch cotton webbing. Secure with a surgeon's knot and a locking knot.

**Figure 2-21. Three Parachutes Stowed**



**Figure 2-22. Four Parachutes Stowed**

## RESTRAINING TWO TO FOUR PARACHUTES

2-24. The following parachute restraint systems are used to restrain two to four cargo parachutes.

- **Two Parachutes.** The restraint system for two cargo parachutes consists of two lengths of type VIII nylon webbing (restraint straps) and two multicut parachute release straps for the stacked configuration and one length of type VIII nylon webbing (restraint strap) and two multicut parachute release straps for the side by side configuration as shown in Figures 2-23 through 2-26.

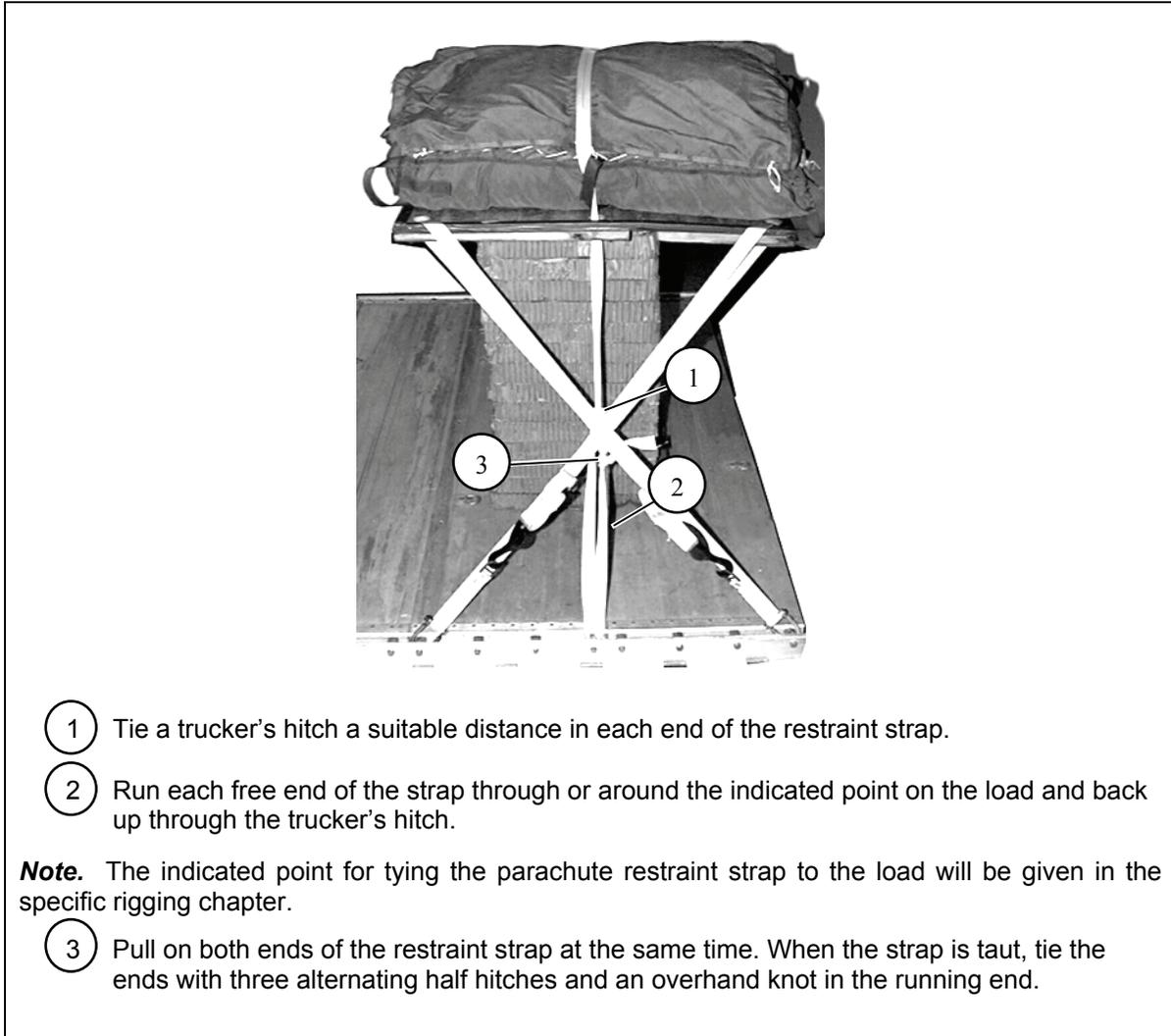
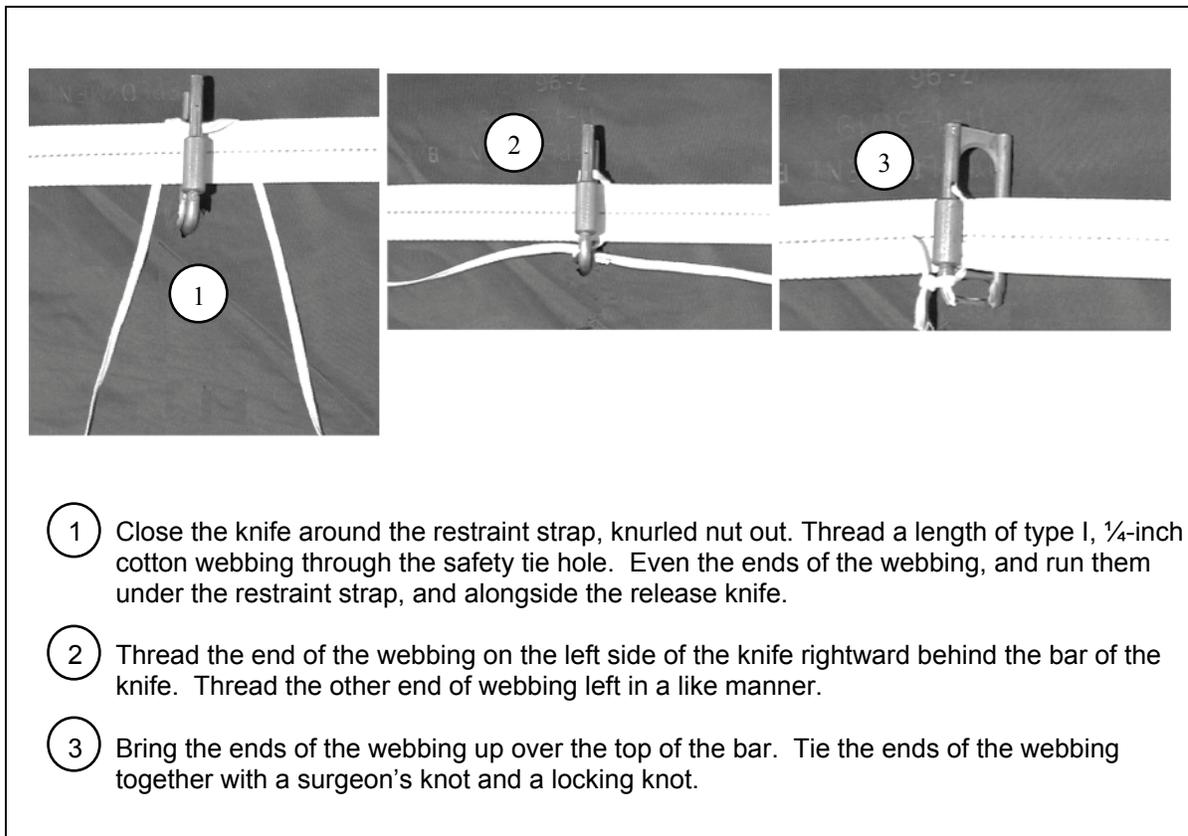
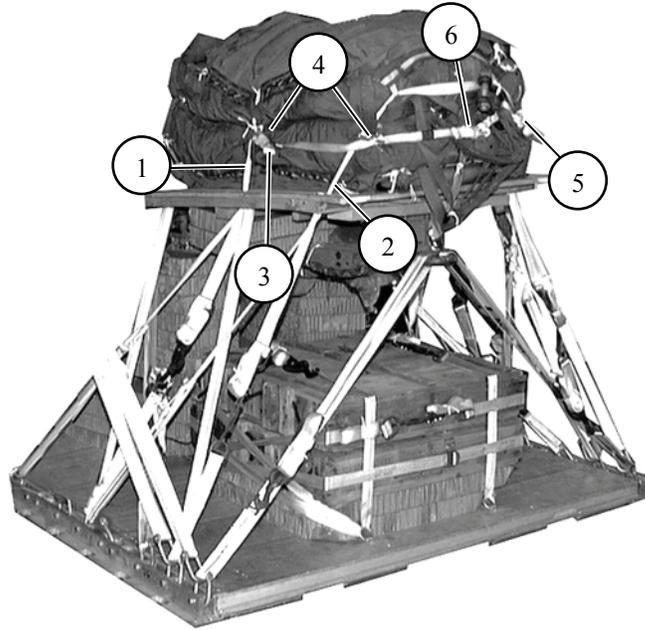


Figure 2-23. Restraint Strap Tied



**Figure 2-24. Guillotine Knife Safety Tied**

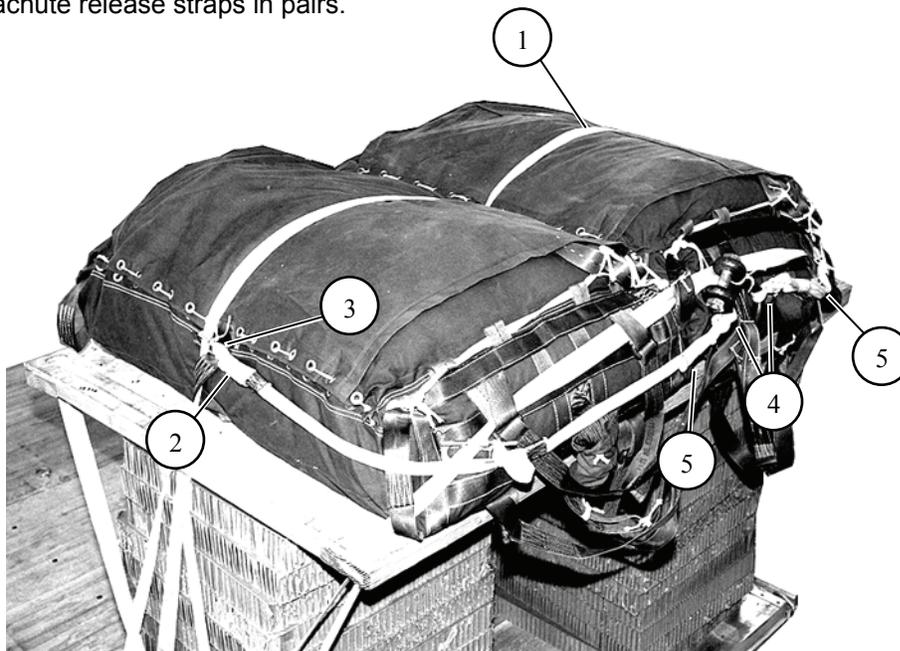
**Note.** When a stowage platform is used, the restraint strap runs through the platform. Always use multicut parachute release straps in pairs.



- 1 Run the restraint strap through the center carrying handles on the left side of the parachutes, up to the top of the parachutes, and down through the center carrying handles on the right side of the parachutes. Tie the ends of the restraint strap to the load as described in Figure 2-23.
- 2 Run the second restraint strap through the front carrying handles of the left parachutes. Run the restraint strap through the bridle attaching loops of the top parachute for the cotton bags or through the parachute restraint strap loops for the nylon bag, and down through the front carrying handles of the right parachutes. Tie the ends of the restraint strap to the load as described in Figure 2-23.
- 3 Remove guillotine knives (Figure 1-1, number 7) from each multicut parachute release strap. Fold the unused loops, and tape the folds in place.
- 4 Close each knife around the restraint strap, with the knurled nut out between the top and bottom carrying handles. Safety tie the guillotine knife as shown in Figure 2-24.
- 5 Tie the free end of each release strap to the large clevis grouping the bridles. Use three alternating half hitches and an overhand knot in each running end. Make sure that the parachute release straps are not routed under the parachute restraint or parachute bridles. Make sure that the release straps are as tight as possible to ensure that the deployment force is applied to the strap before the bridles.
- 6 Fold or roll any excess strap, and tape the folds in place.

**Figure 2-25. Multicut Parachute Release Straps Installed on Two Stack Parachutes**

**Note.** When a stowage platform is used, the restraint strap runs through the platform. Always use multicut parachute release straps in pairs.

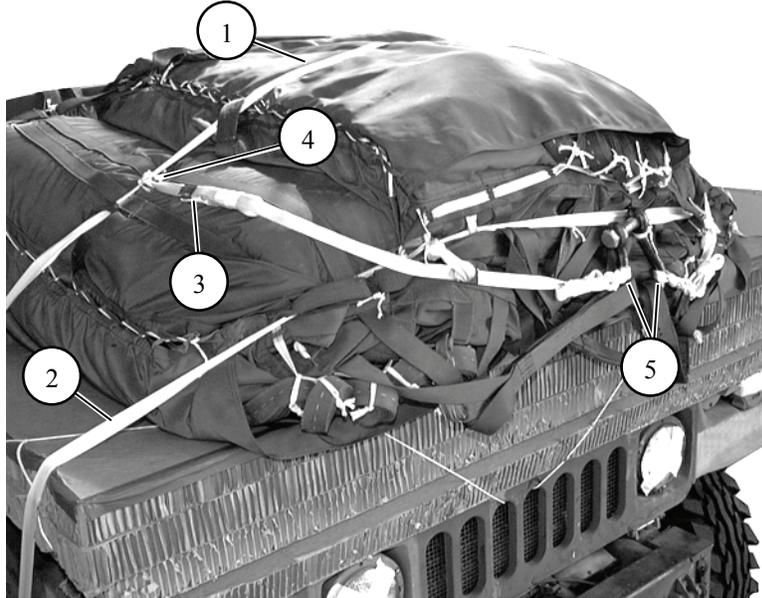


- 1 Run the restraint strap through the center carrying handle on the left side of the parachute. Run the restraint strap over the top of the parachute, and down through the left center carrying handle. Continue to run the restraint strap up through the right center inside carrying handle. Run the restraint strap over the right parachute and down through the right outside carrying handle. Tie the ends of the restraint strap to the load as described in Figure 2-23.
- 2 Remove guillotine knife from each of two multicut parachute release straps. Fold the unused loops, and tape the folds in place.
- 3 Close and safety tie the guillotine knives as shown in Figure 2-24.
- 4 Tie the free end of each release strap to the large clevis grouping the bridles. Use three alternating half hitches and an overhand knot in each running end. Make sure that the parachute release straps are not routed under the parachute restraint or parachute bridles. Make sure that the release straps are as tight as possible to ensure that the deployment force is applied to the strap before the bridles.
- 5 Fold or roll any excess strap, and tape the folds in place.

**Figure 2-26. Multicut Parachute Release Straps Installed on Two Side-by-Side Parachutes**

- **Three and four parachutes.** The restraint system for three and four cargo parachutes consists of two lengths of type VIII nylon webbing (restraint straps) and two multicut parachute release straps. Restrain three and four cargo parachutes as shown in Figures 2-27 and 2-28.

**Note.** When a stowage platform is used, the restraint strap runs through the platform. Always use multicut parachute release straps in pairs.

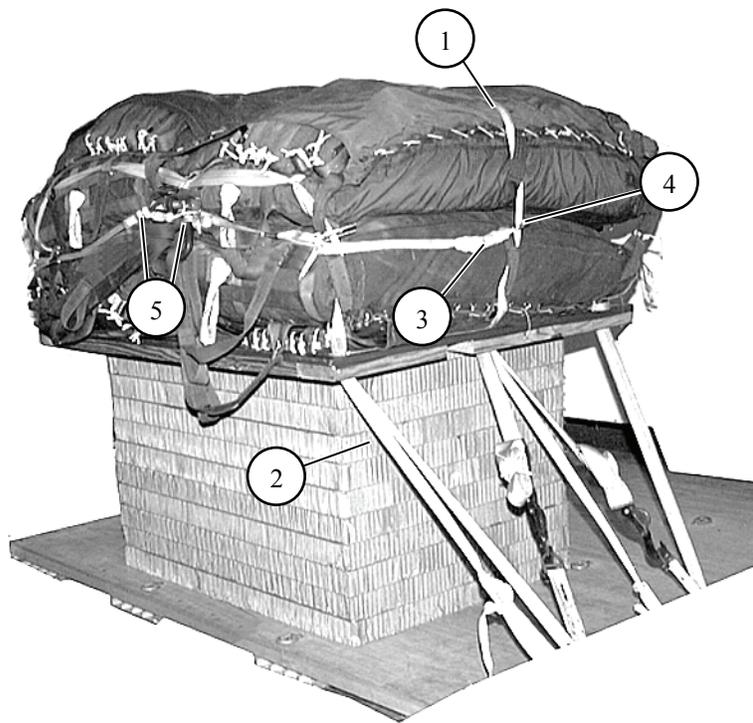


- 1 Run the first restraint strap through the center carrying handles on the left side of the parachutes. Run the restraint strap over the top of the parachute and down through the right center carrying handles. Tie the ends of the restraint strap to the load as described in Figure 2-23.
- 2 Run the second restraint strap through the outside front carrying handle of the bottom left parachute, up through the top left front carrying handle and both bridle attaching loops of the top parachute for the cotton bags or through the parachute restraint strap loops for the nylon bag, and down through the outside front carrying handles of the top and bottom right parachute. Tie the restraint strap to the load as described in Figure 2-23.
- 3 Remove guillotine knife from each of two multicut parachute release straps. Fold the unused loops, and tape the folds in place.
- 4 Close and safety tie the guillotine knives as shown in Figure 2-24.
- 5 Tie the release straps to the large clevis as in step 4, Figure 2-26.

**Note.** Place the knives around the restraint straps between the carrying handles of the top and bottom parachutes.

**Figure 2-27. Three Parachutes Restrained and Multicut Parachute Release Strap Installed**

**Note.** When a stowage platform is used, the restraint strap runs through the platform. Always use multicut parachute release straps in pairs.



- 1 Run the restraint strap through the center carrying handles on the left side of the parachutes. Run the restraint strap over the top of the parachute, and down through the left inside center carrying handle. Continue to run the restraint strap up through the right inside center carrying handle. Run the restraint strap over the right parachute and down to the right outside carrying handles. Tie the ends of the restraint strap to the load as described in Figure 2-23.
- 2 Run the second restraint strap through the outside front carrying handles of the left parachutes. Run the restraint strap through the bridle attaching loops of the top parachutes for the cotton bags or through the parachute restraint strap loops for the nylon bag, and down through the outside front carrying handles of the right parachutes. Tie the ends of the restraint strap to the load as described in Figure 2-23.
- 3 Remove guillotine knife from each of two multicut parachute release straps. Fold the unused loops, and tape the folds in place.
- 4 Close and safety tie the guillotine knives as shown in Figure 2-24.
- 5 Tie the release straps to the large clevis as in step 4, Figure 2-26.

**Note.** Place the knives around the restraint straps between the carrying handles of the top and bottom parachutes.

**Figure 2-28. Four Parachutes Restrained and Multicut Parachute Release Strap Installed**

## SECTION V – DEPLOYMENT LINE AND PARACHUTE

### USE

2-25. A deployment parachute is used on every DRAS load to deploy the G-11D cargo parachutes as the load leaves the aircraft. The deployment parachute is a 28-foot extraction parachute packed in a deployment bag and rigged with a release-away static line assembly.

### INSPECTING AND MAINTAINING

2-26. Deployment parachutes are inspected, maintained, and packed as outlined in TM 10-1670-277-23&P/TO 13C5-28-2. See the specific TM for more information on inspecting, maintaining, and packing these parachutes. The 28-foot extraction parachute deployment bag modification procedures are located in TM 10-1670-277-23&P. The release-away static line assembly is inspected and maintained as outlined in TM 10-1670-277-23&P/TO 13C5-28-2.

### ATTACHING THE DEPLOYMENT LINE

2-27. The 3-foot (4-loop), type XXVI nylon webbing sling is used as the deployment line for DRAS airdrop and connects the deployment parachute to the cargo parachutes. Adapt the procedures as shown in Figure 2-29 to connect the deployment line to the deployment parachute.

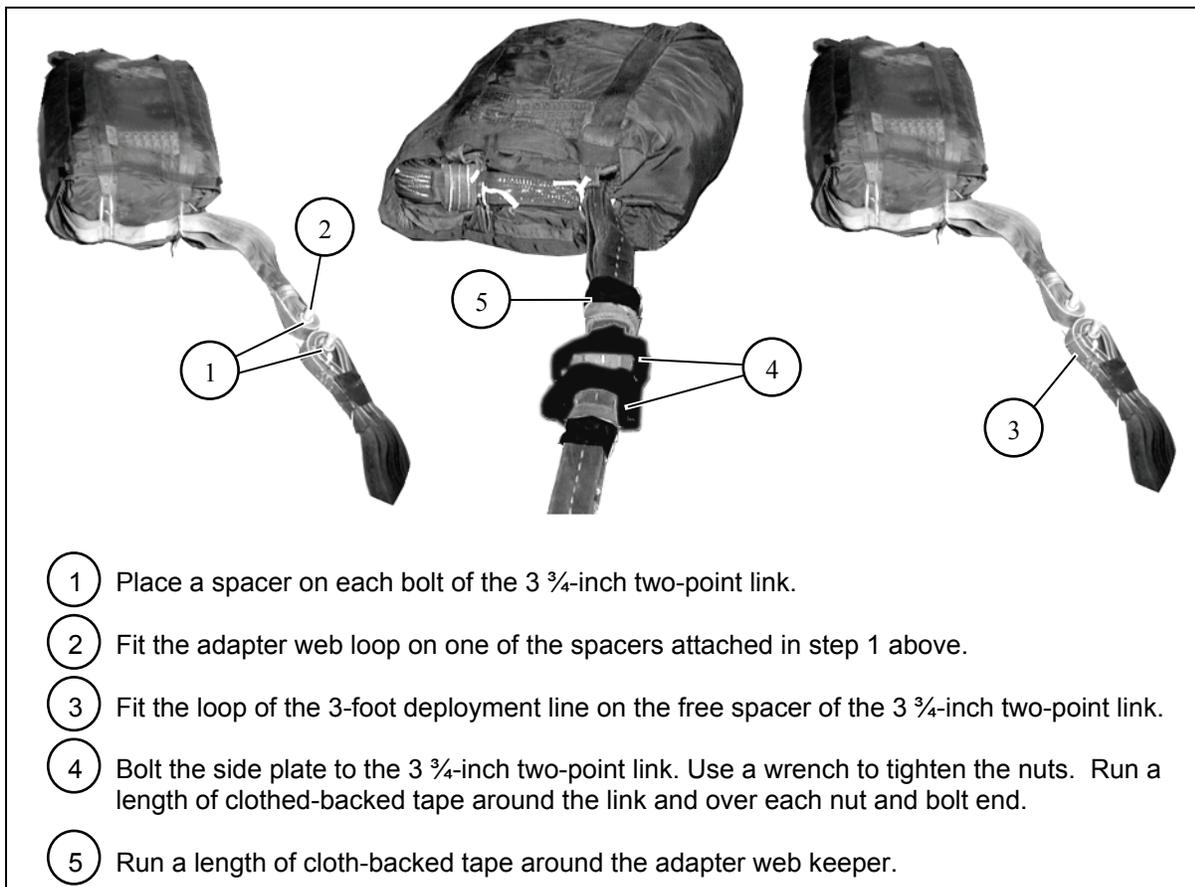
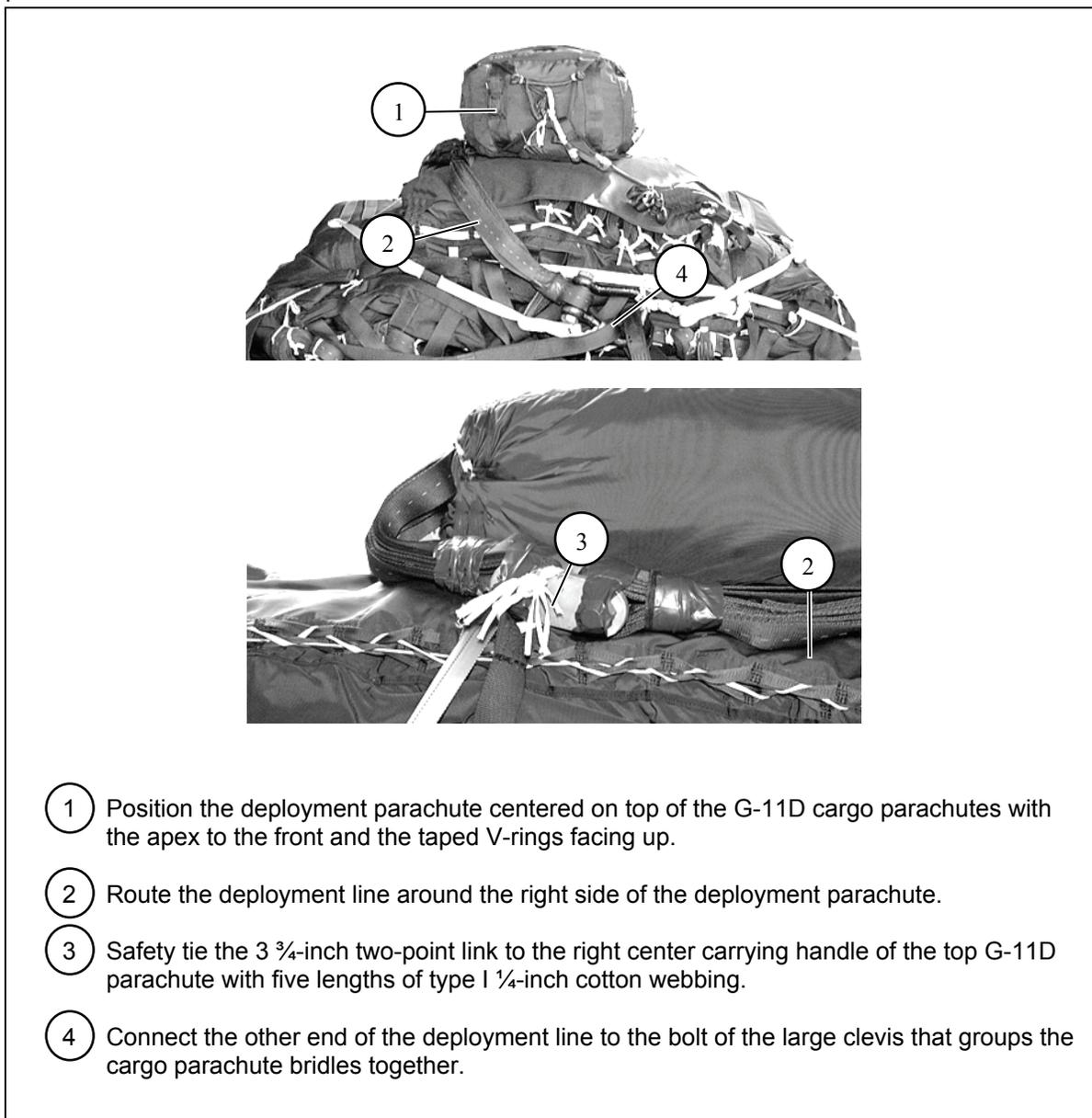


Figure 2-29. Deployment Line Attached

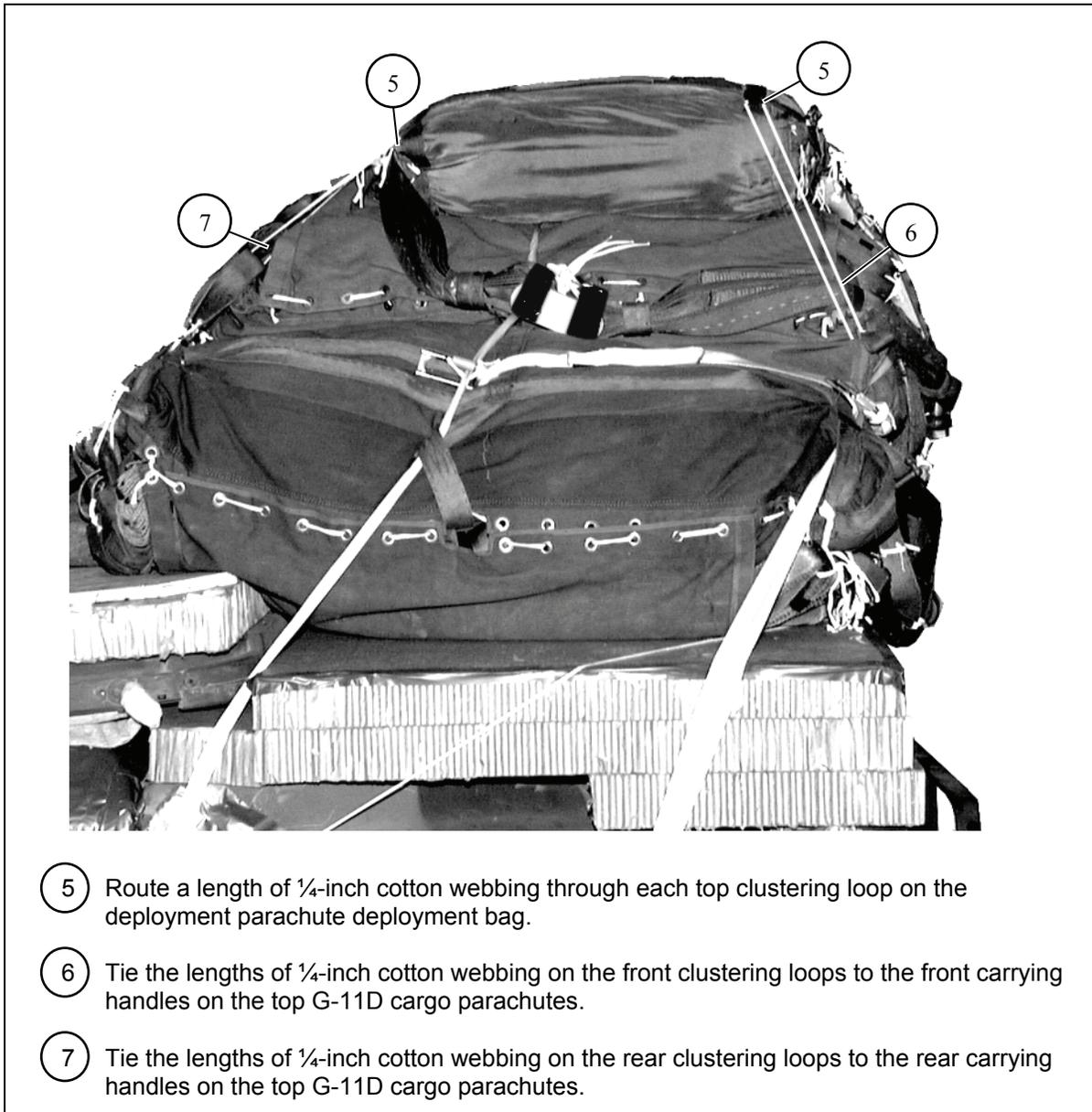
## POSITIONING AND SECURING THE DEPLOYMENT PARACHUTE AND LINE

2-28. Position and secure the deployment parachute as described below:

- **On two stacked or three parachutes.** Position and secure the deployment parachute on two parachutes stacked or three parachutes as shown in Figure 2-30.



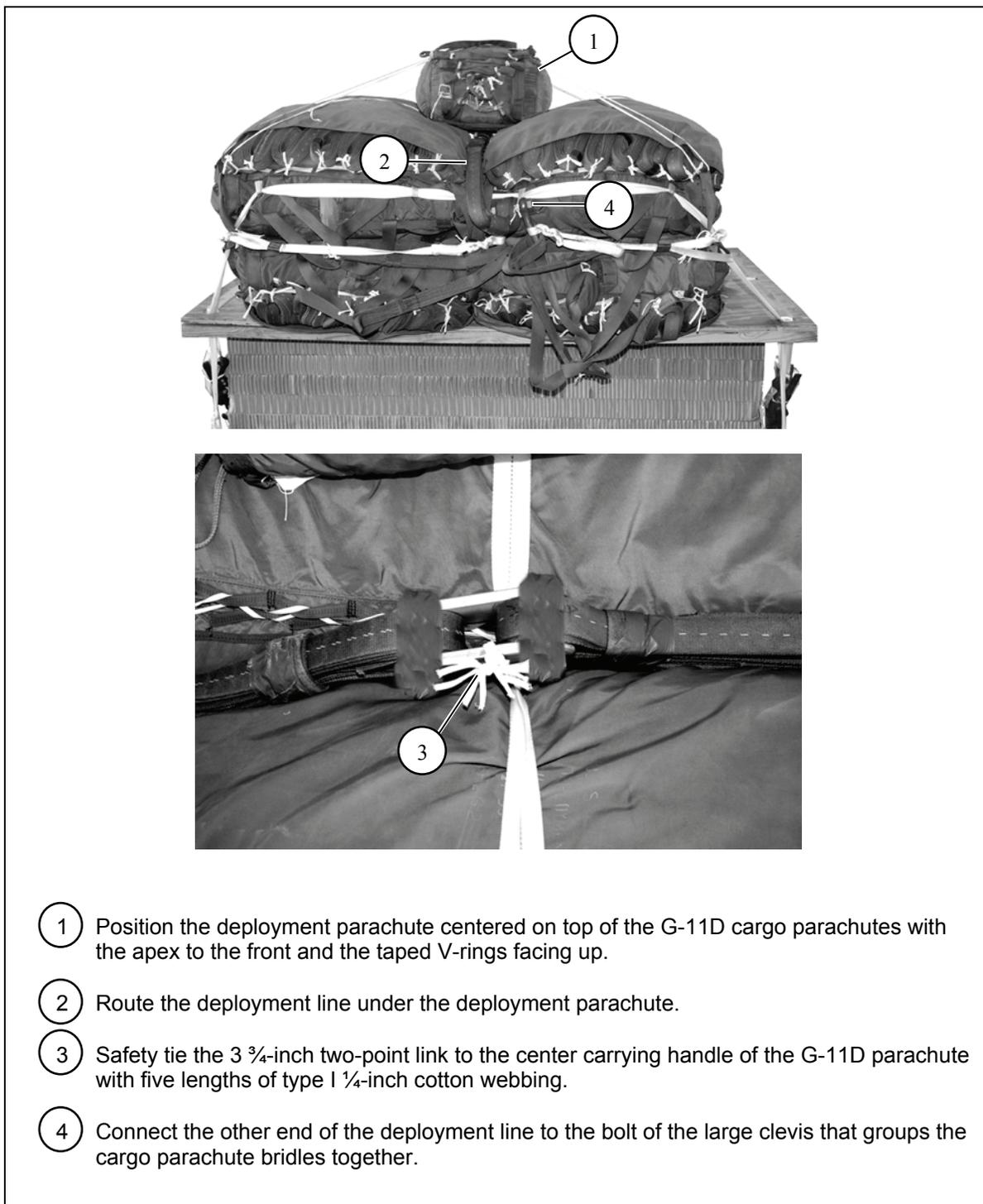
**Figure 2-30. Deployment Parachute and Line Positioned and Secured to Two Parachutes Stacked or Three Parachute Load**



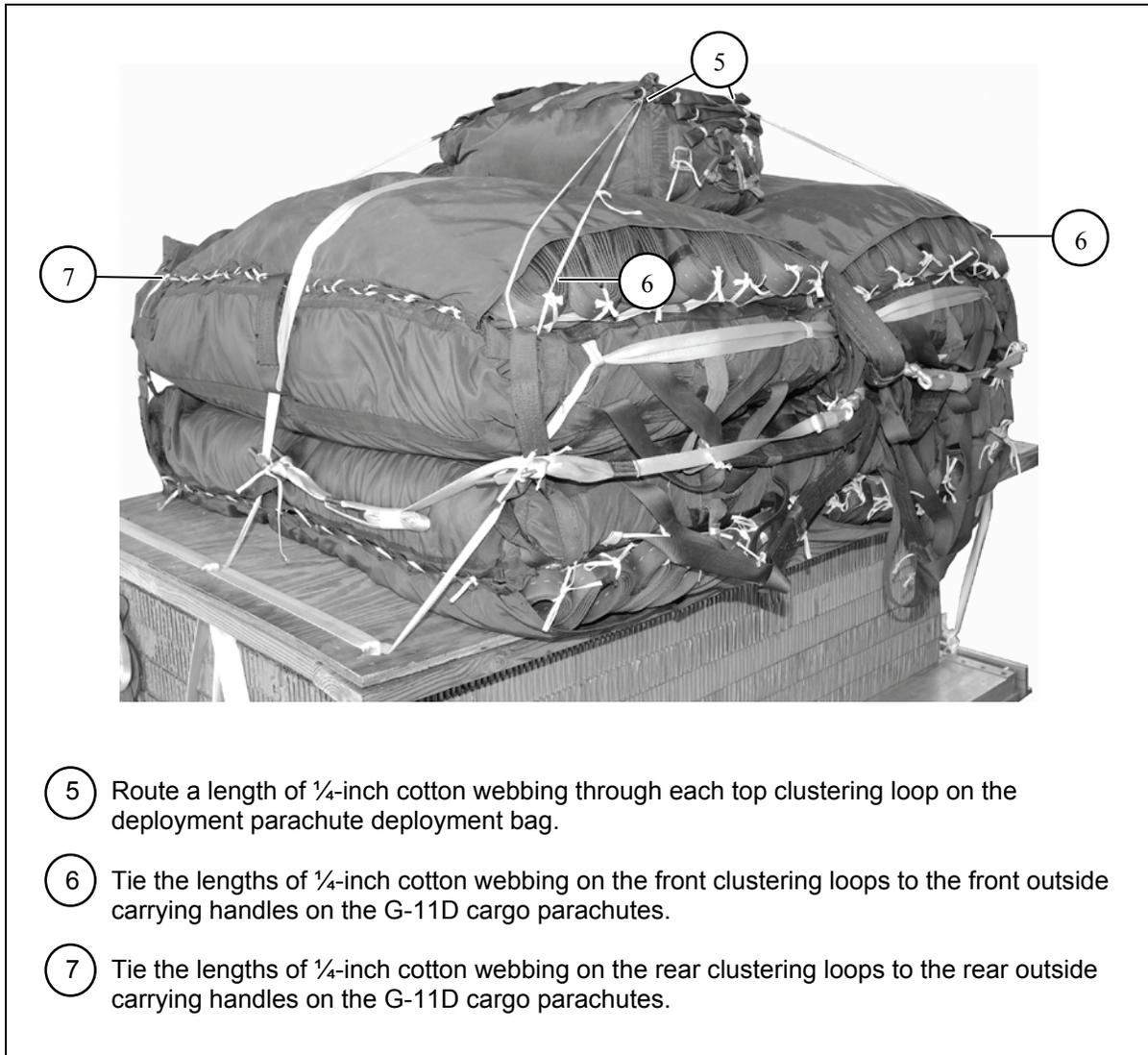
- 5 Route a length of ¼-inch cotton webbing through each top clustering loop on the deployment parachute deployment bag.
- 6 Tie the lengths of ¼-inch cotton webbing on the front clustering loops to the front carrying handles on the top G-11D cargo parachutes.
- 7 Tie the lengths of ¼-inch cotton webbing on the rear clustering loops to the rear carrying handles on the top G-11D cargo parachutes.

**Figure 2-30. Deployment Parachute and Line Positioned and Secured to Two Parachutes Stacked or Three Parachute Load (Continued)**

- **On two side-by-side or four parachutes.** Position and secure the deployment parachute on two side-by-side parachutes or four parachutes as shown in Figure 2-31.



**Figure 2-31. Deployment Parachute and Line Positioned and Secured on Two Side-by-Side Parachutes or Four Parachute Loads**



- 5 Route a length of ¼-inch cotton webbing through each top clustering loop on the deployment parachute deployment bag.
- 6 Tie the lengths of ¼-inch cotton webbing on the front clustering loops to the front outside carrying handles on the G-11D cargo parachutes.
- 7 Tie the lengths of ¼-inch cotton webbing on the rear clustering loops to the rear outside carrying handles on the G-11D cargo parachutes.

**Figure 2-31. Deployment Parachute and Line Positioned and Secured on Two Side-by-Side Parachutes or Four Parachute Loads (Continued)**

## SECTION VI – RELEASE ASSEMBLIES

### USE

2-29. The cargo parachute release assembly separates the parachutes from the load when the load touches the ground. The separation reduces the chance of the wind dragging or overturning the load.

### DESCRIPTION

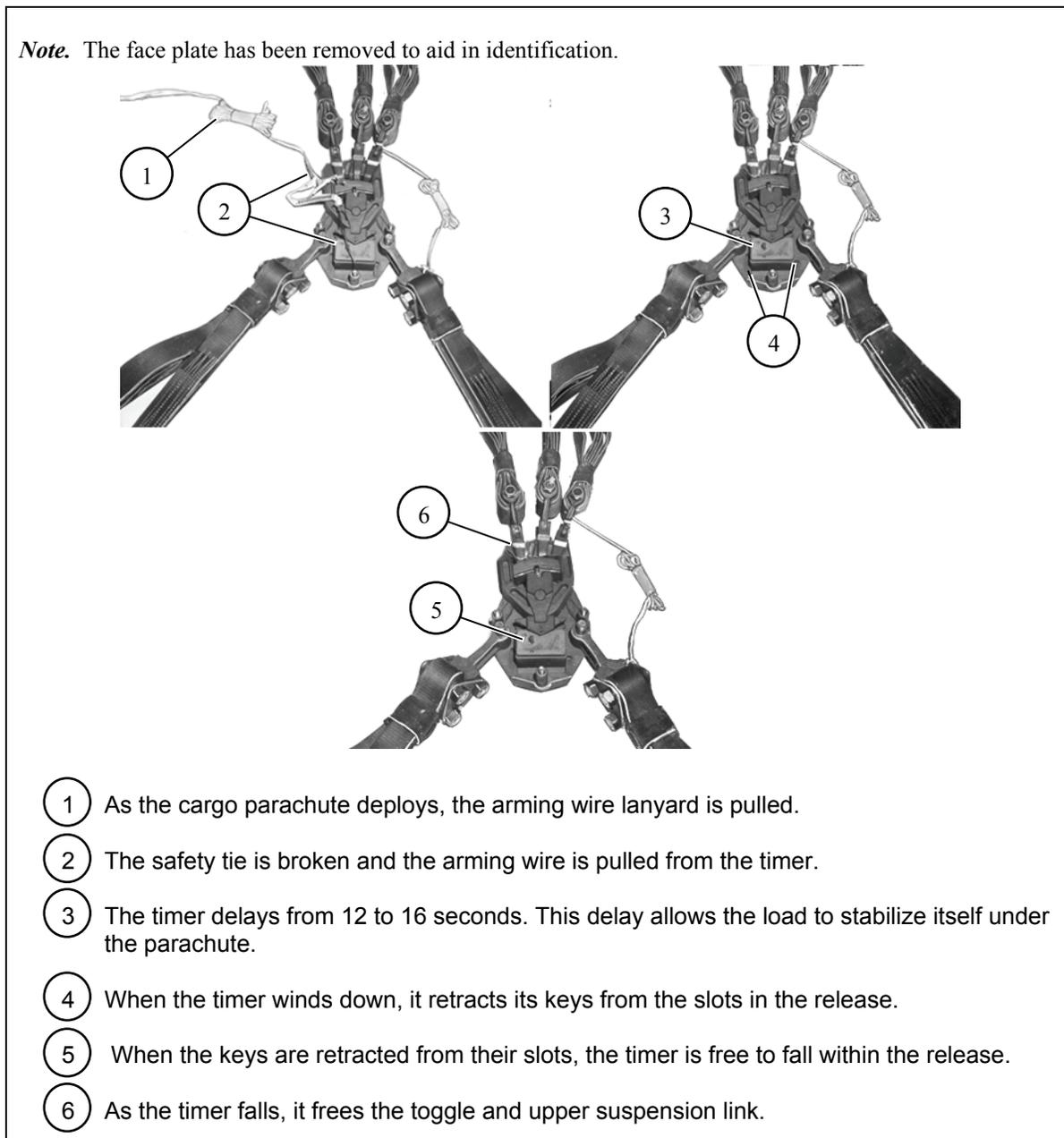
2-30. The M-1 release is used when a DRAS load is rigged for airdrop. This release is used with DRAS rigged loads weighing up to 13,400 pounds suspended.

## INSPECTING AND MAINTAINING

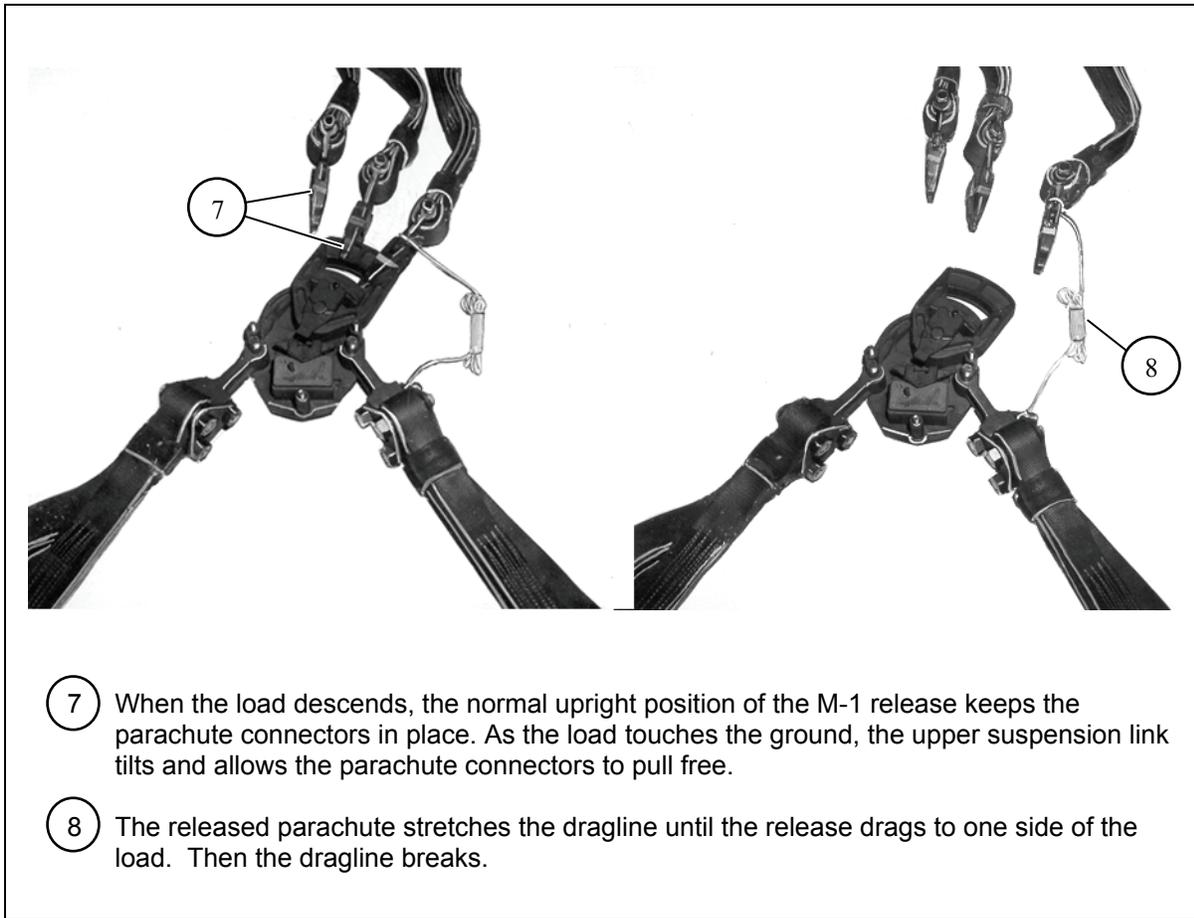
2-31. The M-1 release is inspected and maintained as outlined in TM 10-1670-296-20&P/TO 13C7-49-2. See the TM for specifics on inspection and maintenance.

## OPERATION

2-32. The operation of the airdrop cargo parachute release is given below. The release works when the load touches the ground and upper suspension link tilts or moves to the side. When the release tilts, the parachutes are released from the load. Figure 2-32 shows how the release operates.



**Figure 2-32. Typical Operation of the M-1 Cargo Parachute Release**



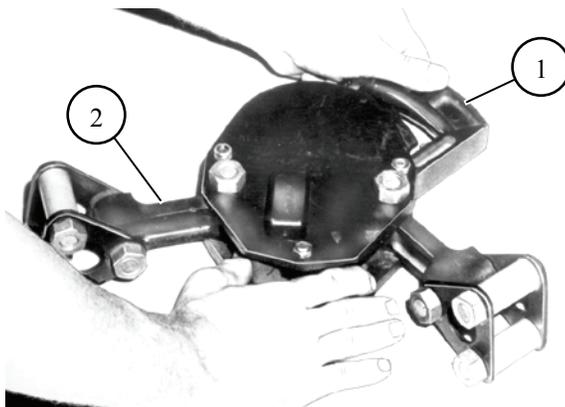
- 7 When the load descends, the normal upright position of the M-1 release keeps the parachute connectors in place. As the load touches the ground, the upper suspension link tilts and allows the parachute connectors to pull free.
- 8 The released parachute stretches the dragline until the release drags to one side of the load. Then the dragline breaks.

**Figure 2-32. Typical Operation of the M-1 Cargo Parachute Release (Continued)**

## PREPARING THE M-1 CARGO PARACHUTE RELEASE

2-33. Test, attach, and safety the M-1 cargo parachute release as follows:

- **Testing timer.** Before each use, seat, arm, and test the delay timer as shown in Figures 2-33 through 2-35.



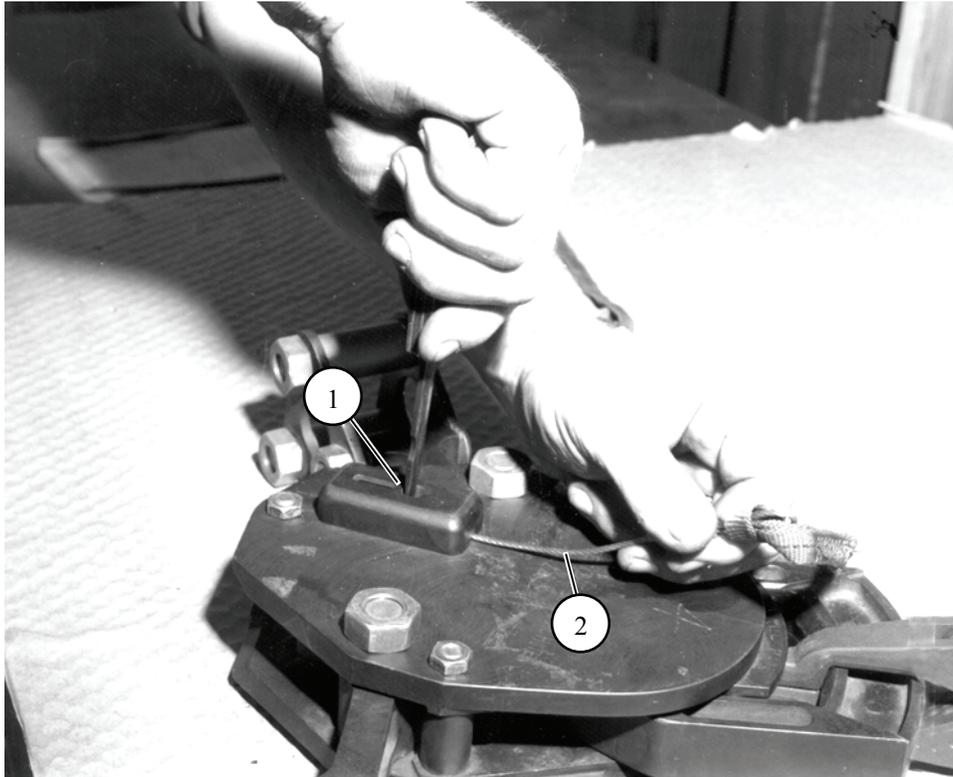
- 1 Align and center the upper suspension link with the release side plates.

### CAUTION

If the timer is not correctly seated in the upper position in the release when it is armed, the keys will not fit into the slots in the back side plate and could damage the timer.

- 2 Reach between the side plates, and slide the timer up until the toggles fit in the toggle lock slides, making sure the timer slides freely. You should be able to see the winding shaft of the timer through the guide block winder access hole.

**Figure 2-33. Delay Release Timer Seated**



- 1 Put the tip of a flat-tip screwdriver through the guide block winder access hole and into the slot in the timer winding shaft. Gently turn the shaft one-quarter turn to the right and stop, holding the shaft with the screwdriver.

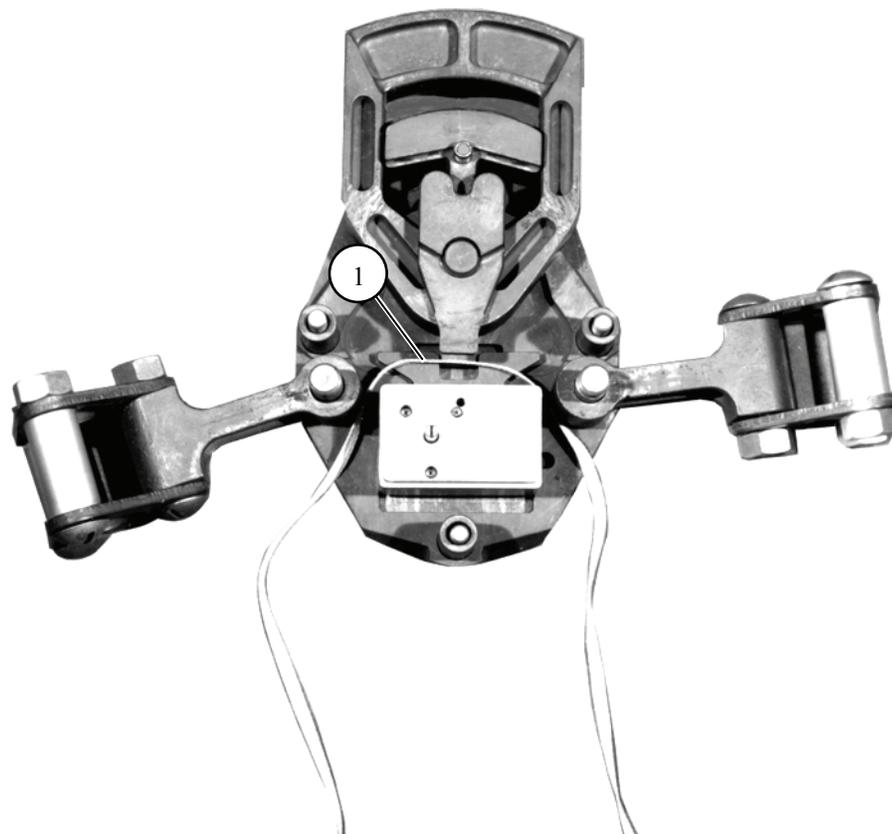
**Note.** If the winding shaft is hard to turn, hold the shaft with the screwdriver and move the timer around until the keys align with the slots in the back plate.

- 2 Hold the shaft, and push the arming wire down through the hole in the guide block and the hole in the winding shaft.

**Note.** When the timer is correctly armed, about ½ inch of the arming wire can be seen through the slot below the guide block winder access hole.

**Figure 2-34. Timer Armed**

**Note.** A delay release timer will be tested before each use.

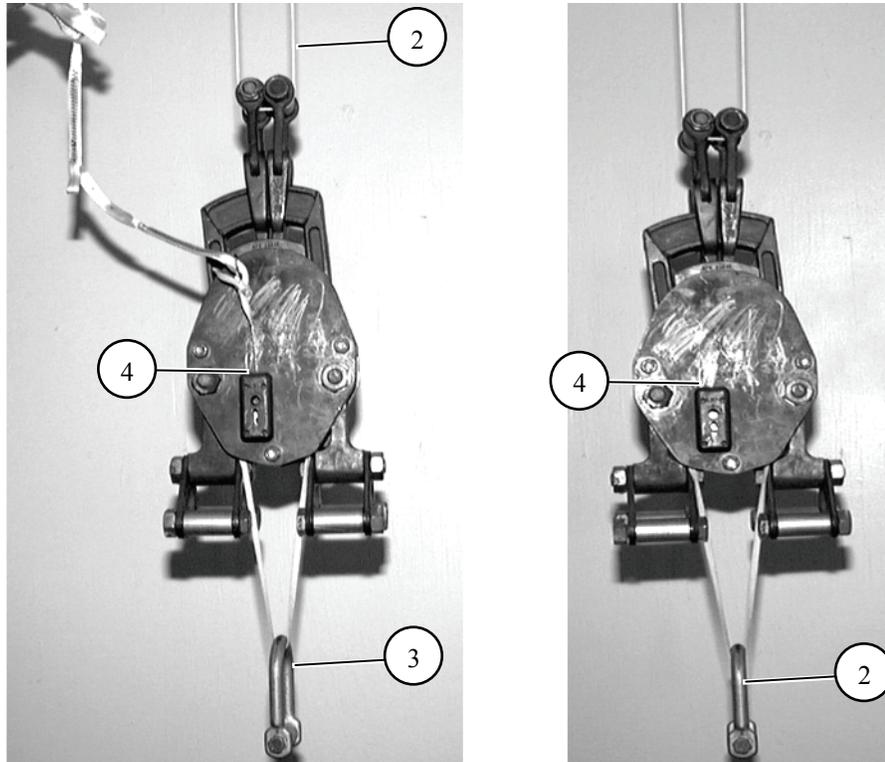


- 1 Pass a length of type I, 1/4-inch cotton webbing up between the release side plates, over and around the center of the timer, and back down between the side plates. The side plate and a toggle lock slide have been removed to show how the webbing passes around the timer. You may use a length of wire to help you pass the webbing around the timer.

**Figure 2-35. Timer Tested**

**CAUTION**

Do not over tighten the face side plate. Make sure the bolts are tightened in an alternating sequence.

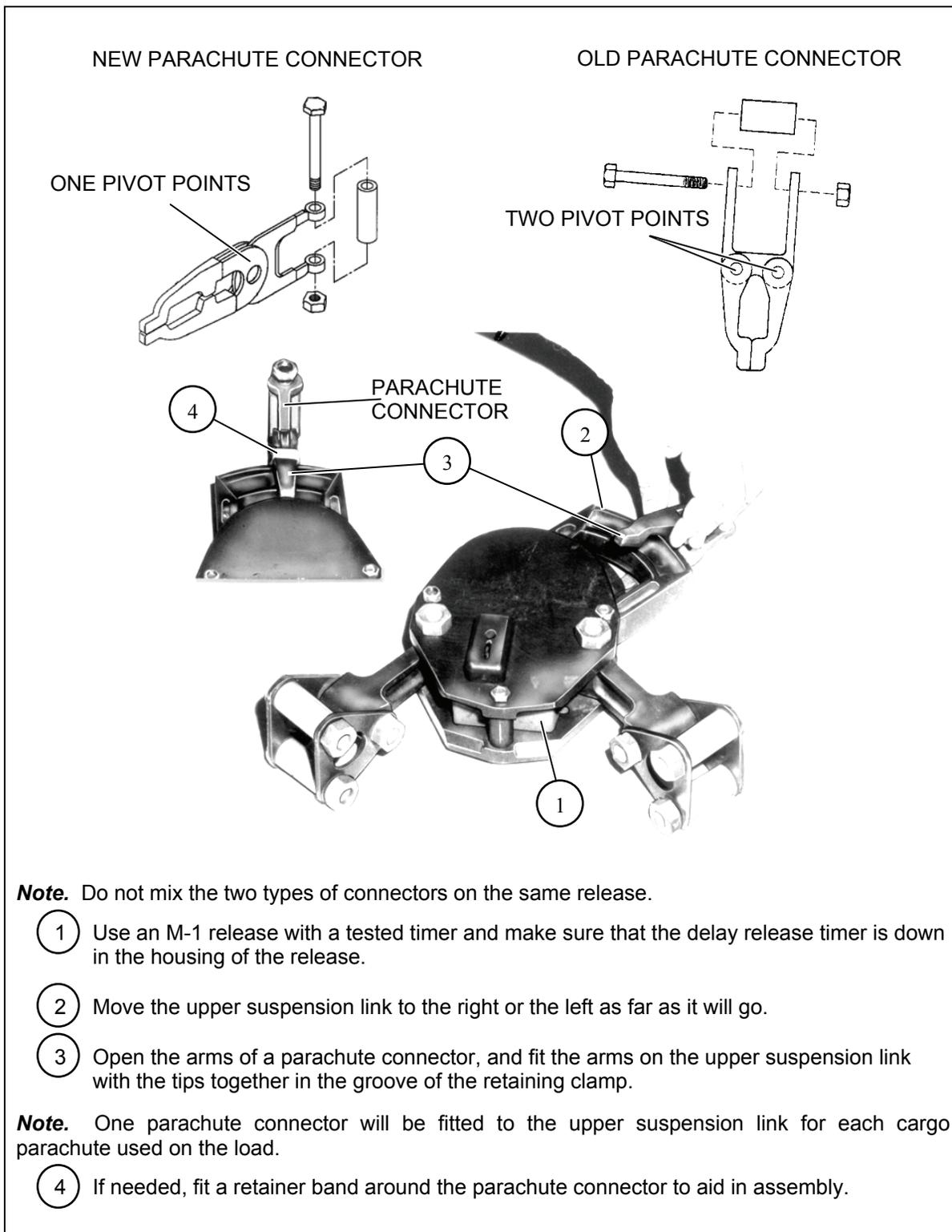


- 2 Hang the release in a straight, level position.
- 3 Tie a 10-ounce weight, such as a platform clevis with bolt or a parachute release connector, without the nut and bolt, to the type I, ¼-inch cotton webbing.
- 4 Pull the arming wire from the timer. Count the seconds from the time the wire is pulled until the timer falls within the release.

**Note.** If the timer fails to fall after the allotted time (12 to 16 seconds), remove the side plate and check the four screws holding the arming wire guide block to the side plate for burrs. If the screw heads are burred, remove the burrs by filing or replace the screws. Retest the timer. If there is a second failure, remove and replace the timer.

**Figure 2-35. Timer Tested (Continued)**

- **Preparing, Attaching, and Safety Tying Release.** Prepare, attach, and safety tie the M-1 cargo parachute release as shown in Figures 2-36 through 2-38.



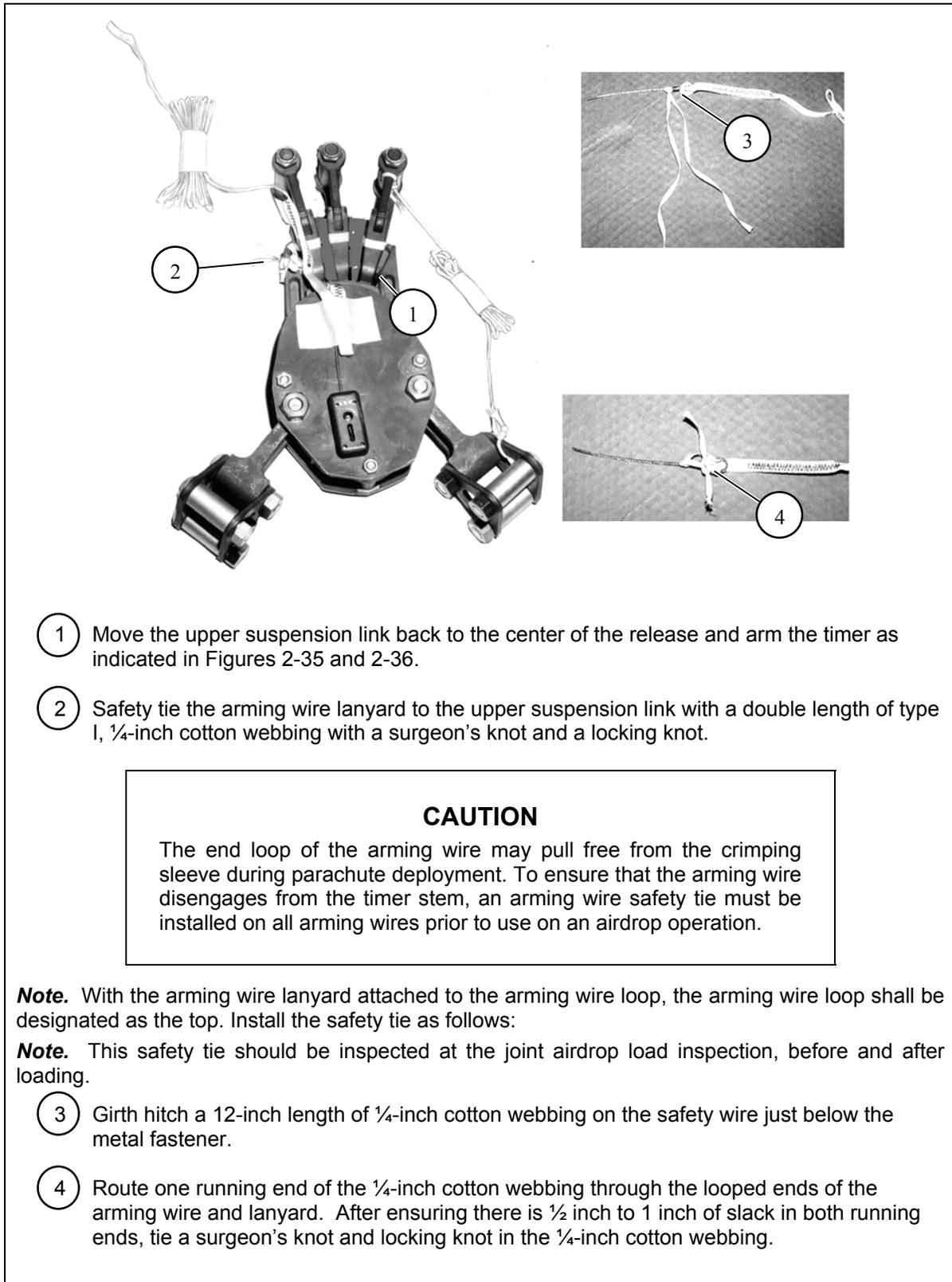
**Note.** Do not mix the two types of connectors on the same release.

- 1 Use an M-1 release with a tested timer and make sure that the delay release timer is down in the housing of the release.
- 2 Move the upper suspension link to the right or the left as far as it will go.
- 3 Open the arms of a parachute connector, and fit the arms on the upper suspension link with the tips together in the groove of the retaining clamp.

**Note.** One parachute connector will be fitted to the upper suspension link for each cargo parachute used on the load.

- 4 If needed, fit a retainer band around the parachute connector to aid in assembly.

**Figure 2-36. Parachute Connector Fitted to Upper Suspension Link of M-1 Release**



- 1 Move the upper suspension link back to the center of the release and arm the timer as indicated in Figures 2-35 and 2-36.
- 2 Safety tie the arming wire lanyard to the upper suspension link with a double length of type I, ¼-inch cotton webbing with a surgeon's knot and a locking knot.

**CAUTION**

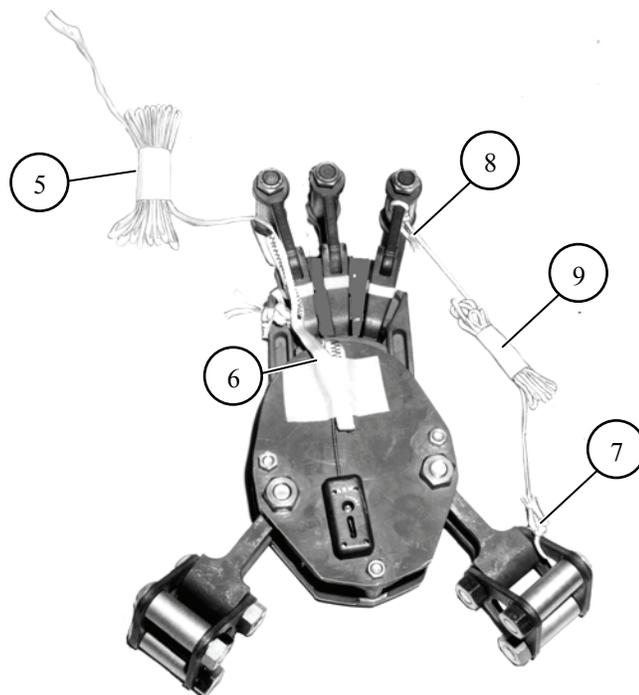
The end loop of the arming wire may pull free from the crimping sleeve during parachute deployment. To ensure that the arming wire disengages from the timer stem, an arming wire safety tie must be installed on all arming wires prior to use on an airdrop operation.

**Note.** With the arming wire lanyard attached to the arming wire loop, the arming wire loop shall be designated as the top. Install the safety tie as follows:

**Note.** This safety tie should be inspected at the joint airdrop load inspection, before and after loading.

- 3 Girth hitch a 12-inch length of ¼-inch cotton webbing on the safety wire just below the metal fastener.
- 4 Route one running end of the ¼-inch cotton webbing through the looped ends of the arming wire and lanyard. After ensuring there is ½ inch to 1 inch of slack in both running ends, tie a surgeon's knot and locking knot in the ¼-inch cotton webbing.

**Figure 2-37. M-1 Release Prepared**



5 Fold the slack in the lanyard, and tape the folds in place with one turn of masking tape.

6 Fold the slack in the lanyard, between the safety tie and the arming wire, and tape the fold to the face side plate with one piece of masking tape.

**Note.** Include the following data on the masking tape: name, date, and timer seconds.

7 Tie one end of a 5-foot length of type III nylon cord (dragline) to one side of the lower suspension link.

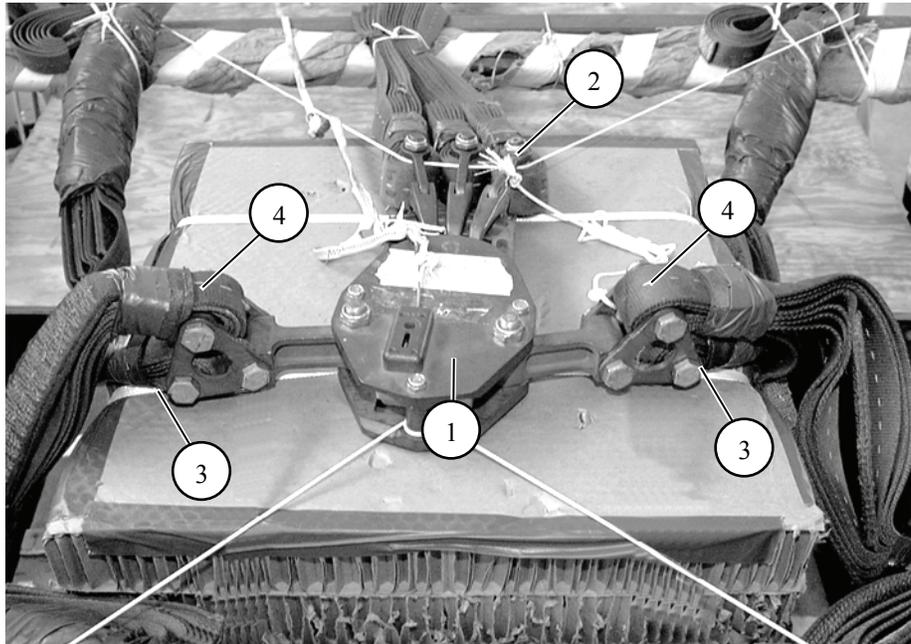
8 Tie the other end of the dragline to a parachute connector.

9 Fold the slack in the dragline and tape the folds in place with one turn of masking tape.

**Figure 2-37. M-1 Release Prepared (Continued)**

**CAUTION**

Place the release on the load with the parachute connectors toward the front of the platform and with the guide block up. Bolt the suspension slings to the lower suspension links so that they will not change position when the load is suspended. Make sure the arming wire lanyard is routed over all items.

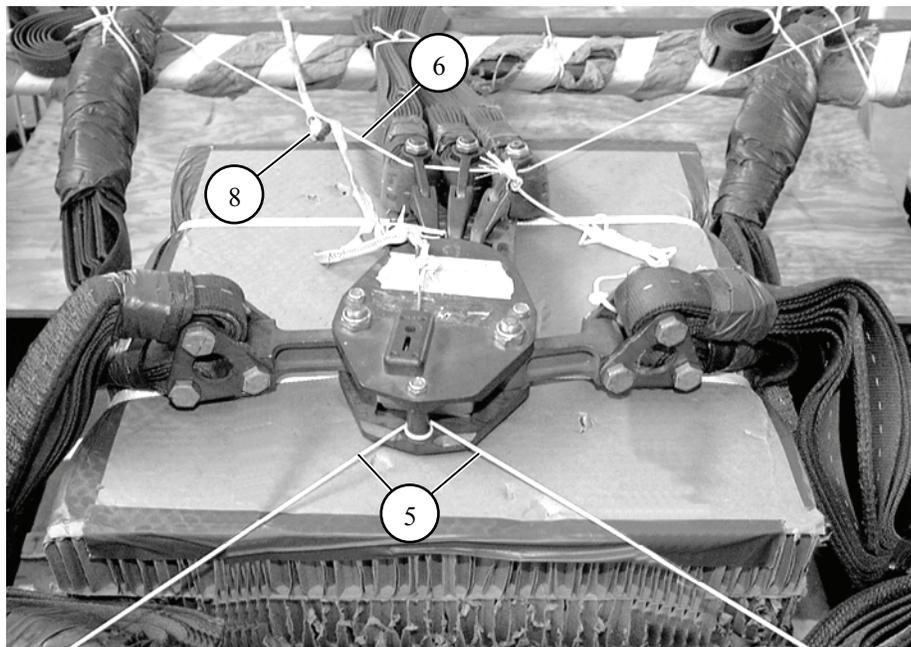


- 1 Put the release on the load as instructed in the specific rigging chapter for the load.
- 2 Bolt the riser extensions of the G-11D cargo parachutes to the parachute connectors already fitted to the release.
- 3 Attach the front suspension slings to the lower bolts of the lower suspension link. The front slings will have a half twist towards the parachutes.
- 4 Attach the rear suspension slings to the top bolts of the lower suspension link.

**Notes:**

1. The keeper at each end of the sling must be drawn snugly against the object on which the sling is fitted.
2. Suspension slings on DRAS loads will have the nylon buffers removed to fit on the lower suspension links of the M-1 parachute release assembly.

**Figure 2-38. M-1 Release Attached and Safetied to Load**



- 5 Run a length of type III nylon cord to encircle the lower spacer, and tie the ends of the cord to points on the rear of the load or platform.
- 6 Run a length of type III nylon cord through the parachute connectors, and tie the ends of the cord to points on the front of the load or platform.
- 7 Tie the lanyard to a carrying handle of a parachute with three alternating half hitches and an overhand knot in the running end (not shown).
- 8 Fold the slack in the lanyard, and tape the folds in place with one turn of masking tape.

**Figure 2-38. M-1 Release Attached and Safetied to Load (Continued)**

## ATTACHING PARACHUTE RISERS TO THE PARACHUTE RELEASE

2-34. Lay the parachute release on top of the load with the bolt end of the parachute connectors toward the cargo parachutes. Bolt the parachute riser extensions to the parachute connectors of the M-1 parachute release as shown in Figure 2-39.

*Note.* Bolt the parachute riser extensions to the parachute connectors from rigger's left to right. They must be in the numerical order given for four parachute loads.

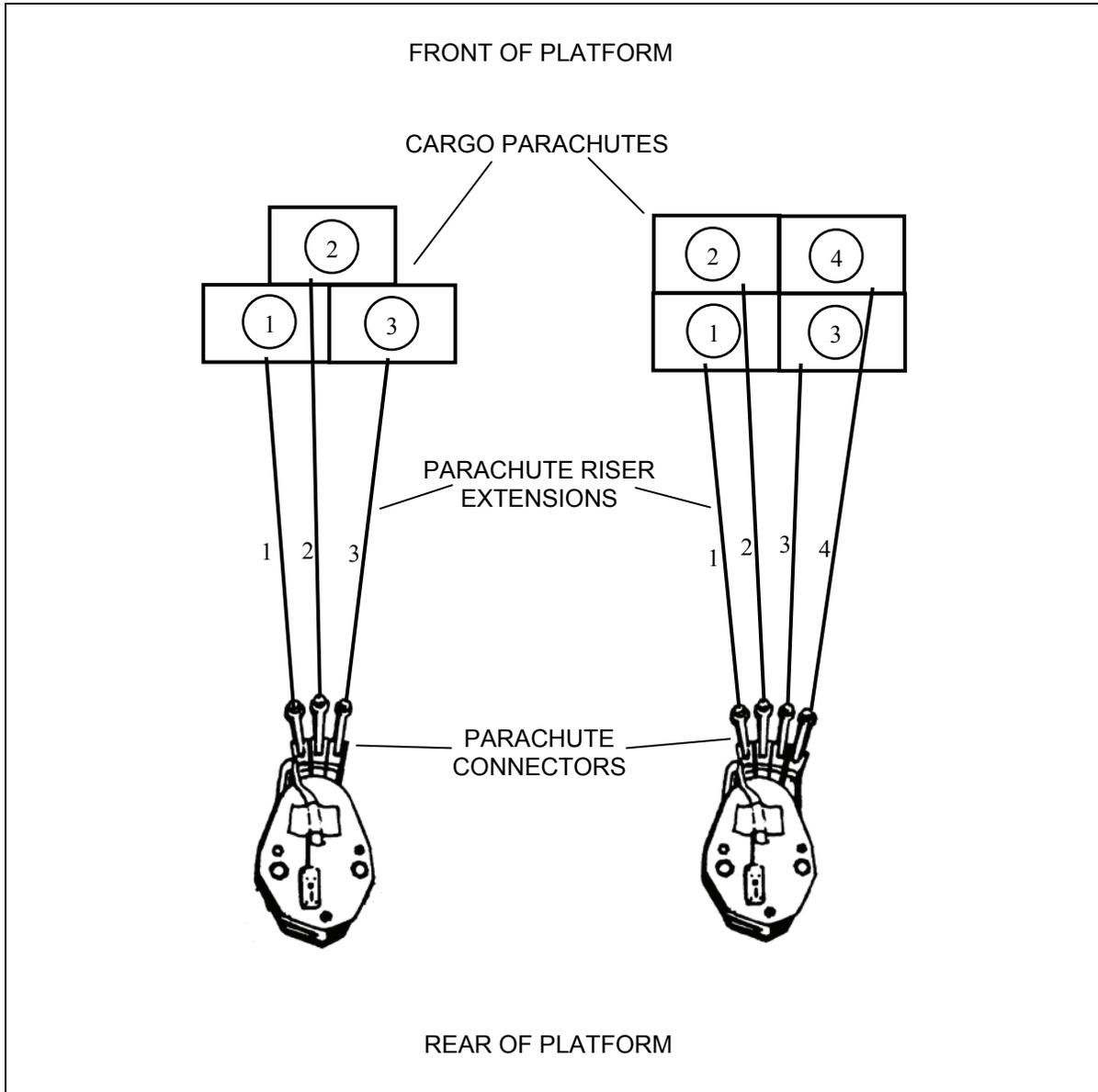


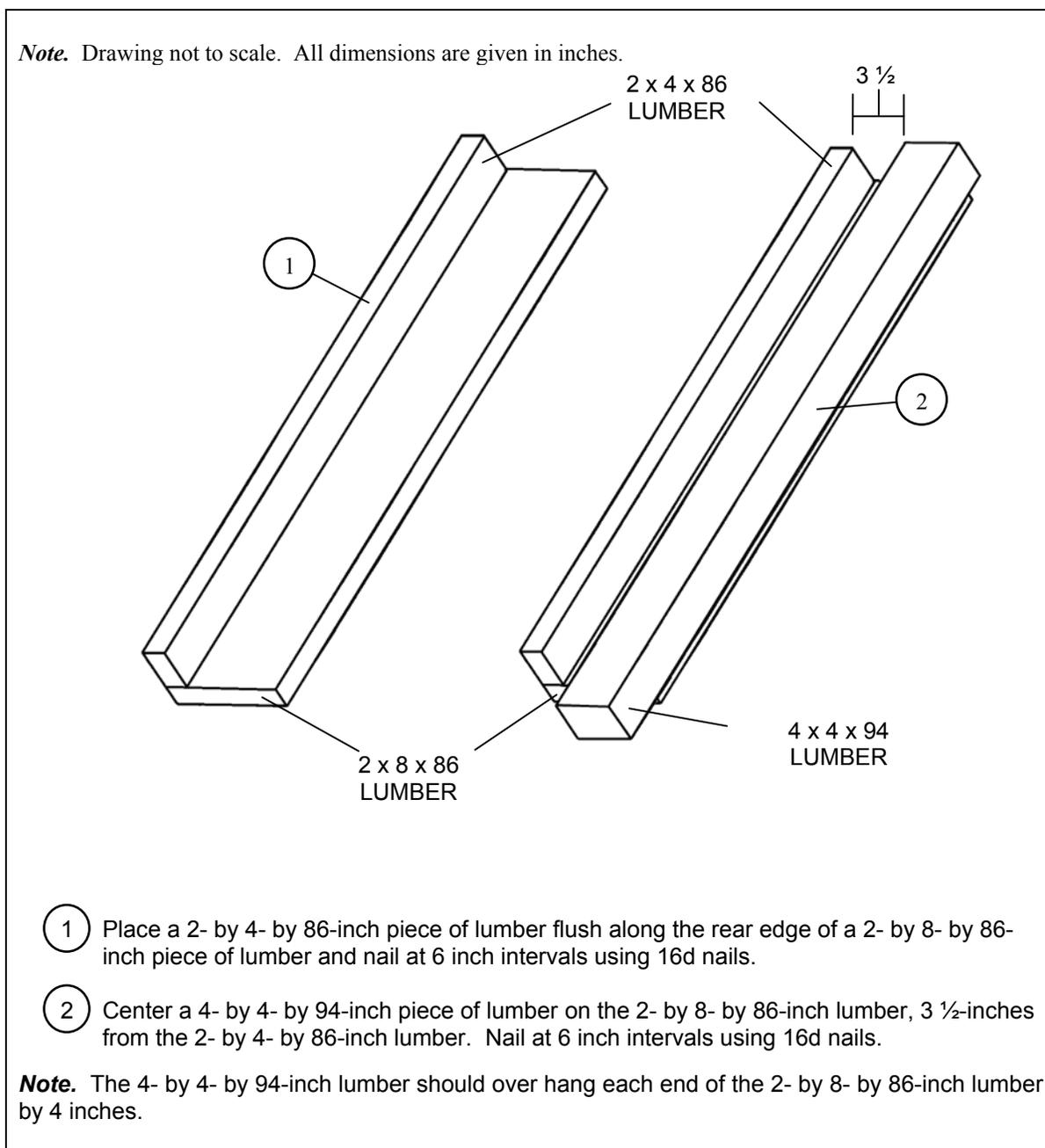
Figure 2-39. Three and Four Parachute Riser Extensions Attached to the Parachute

## SECTION VII – ATTITUDE CONTROL SYSTEMS

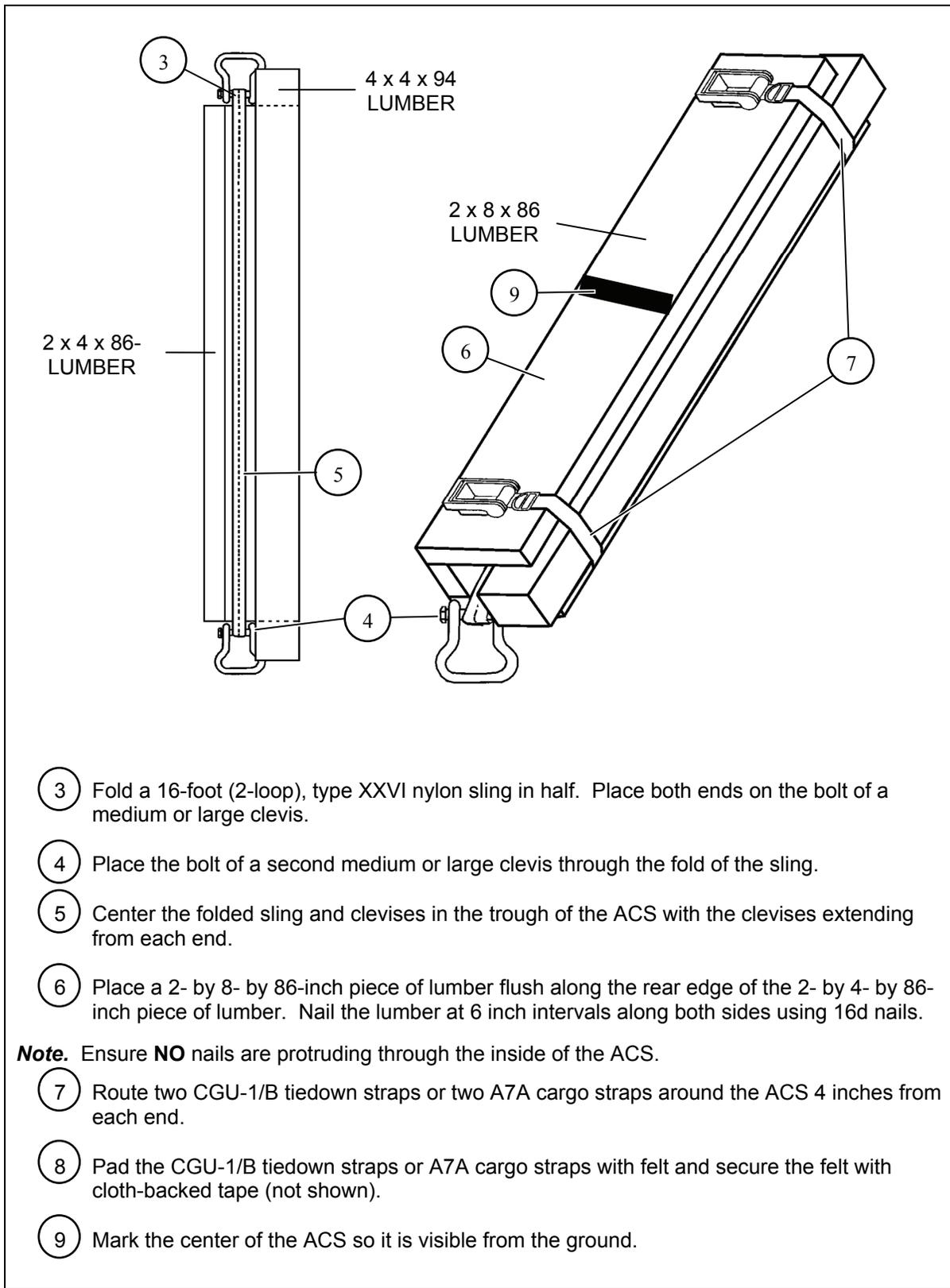
### ATTITUDE CONTROL SYSTEM

2-35. Assemble and inspect two attitude control systems for each load as follows:

- **Assembling the ACS.** Assemble the ACS as shown in Figure 2-40.



**Figure 2-40. Attitude Control System Assembled**



- ③ Fold a 16-foot (2-loop), type XXVI nylon sling in half. Place both ends on the bolt of a medium or large clevis.
- ④ Place the bolt of a second medium or large clevis through the fold of the sling.
- ⑤ Center the folded sling and clevises in the trough of the ACS with the clevises extending from each end.
- ⑥ Place a 2- by 8- by 86-inch piece of lumber flush along the rear edge of the 2- by 4- by 86-inch piece of lumber. Nail the lumber at 6 inch intervals along both sides using 16d nails.

**Note.** Ensure **NO** nails are protruding through the inside of the ACS.

- ⑦ Route two CGU-1/B tiedown straps or two A7A cargo straps around the ACS 4 inches from each end.
- ⑧ Pad the CGU-1/B tiedown straps or A7A cargo straps with felt and secure the felt with cloth-backed tape (not shown).
- ⑨ Mark the center of the ACS so it is visible from the ground.

**Figure 2-40. Attitude Control System Assembled (Continued)**

- **Inspecting the ACS.** Inspect the ACS for the following items:
  - Lumber. Inspect the lumber for splits or excess damage. If the damage interferes with the proper functioning of the ACS, discard and use a new ACS.
  - Slings. Inspect the slings according to TM 10-1670-296-20&P/TO 13C7-49-2. Ensure the slings move freely through the ACS.
  - Clevises. Inspect the clevises according to TM 10-1670-296-20&P/TO 13C7-49-2.
  - Serviceable slings and clevises may be used on another ACS.

## SECTION VIII – OUTRIGGER ASSEMBLY

### USE

2-36. An outrigger assembly is used on every DRAS load to help prevent the load from turning over after landing on the ground. The assembly is attached to the DRAS platform and is deployed from the vertical to the horizontal position after the load clears the ramp of the aircraft. The component parts of the outrigger assembly are shown in Figure 2-41.

### INSPECTING AND MAINTAINING

2-37. Outriggers are inspected and maintained as outlined in TM 10-1670-268-20&P/TO 13C7-52-22. See the specific TM for more information on inspecting and maintaining the outrigger assembly.

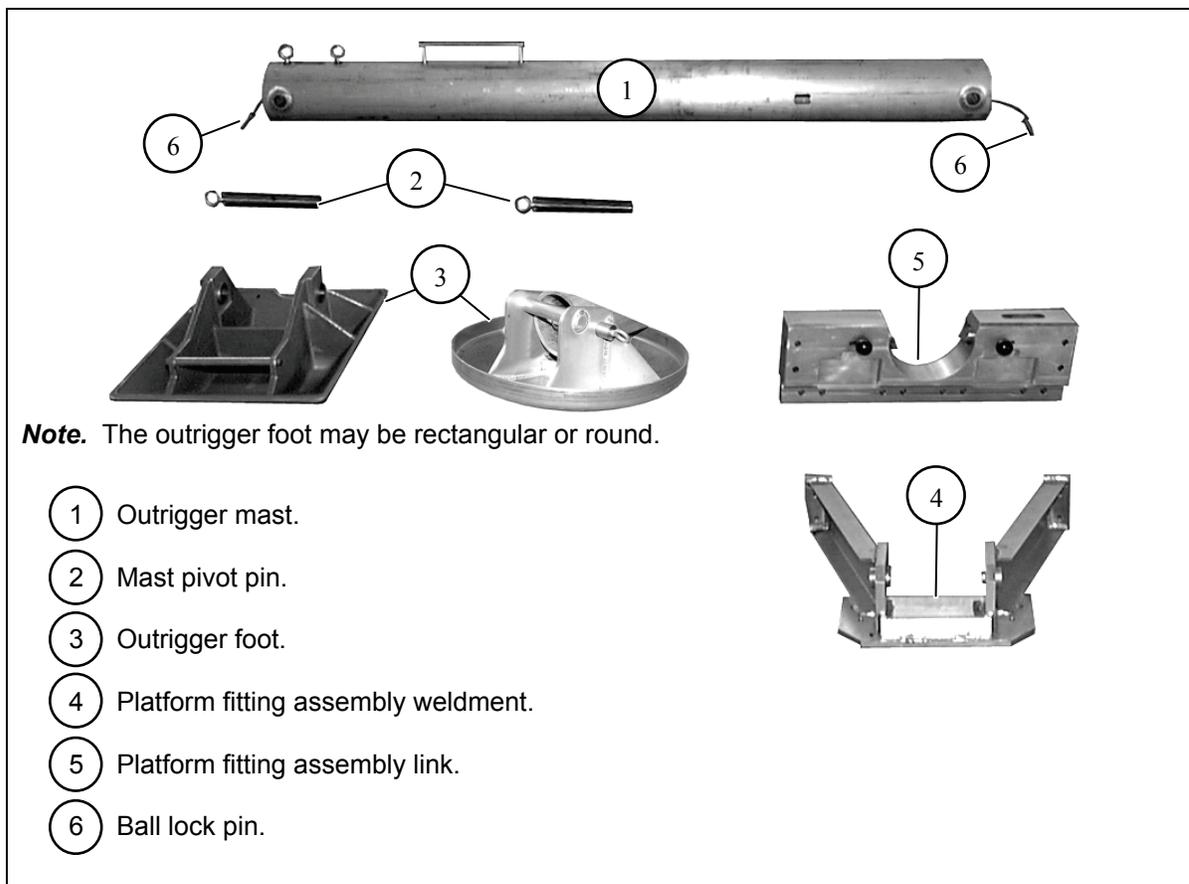


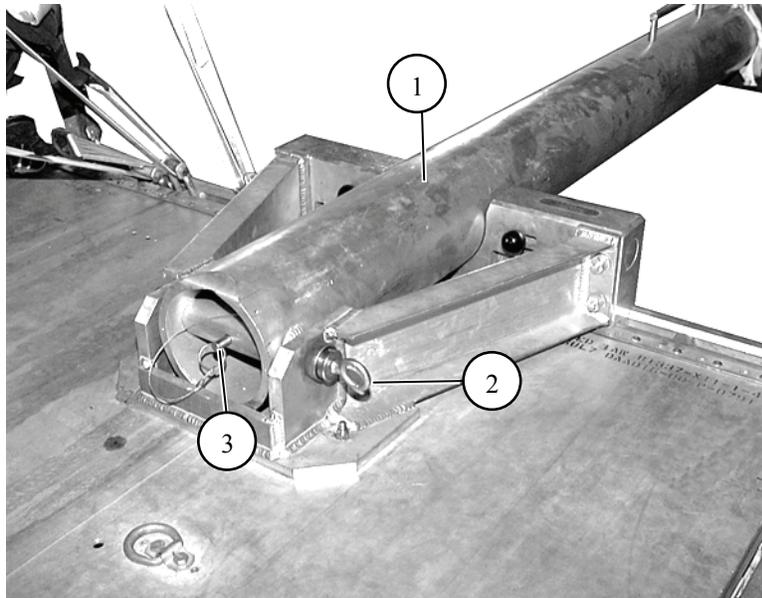
Figure 2-41. Deployable Outrigger Assembly

## PLATFORM FITTING ASSEMBLY (PFA) WELDMENT AND LINK ASSEMBLIES

2-38. The PFA weldment and the link assembly are designed to be installed on either platform side rail. Assemble and install the PFA weldment and the link assembly on the DRAS platform according to TM 10-1670-268-20&P/TO13C7-52-22.

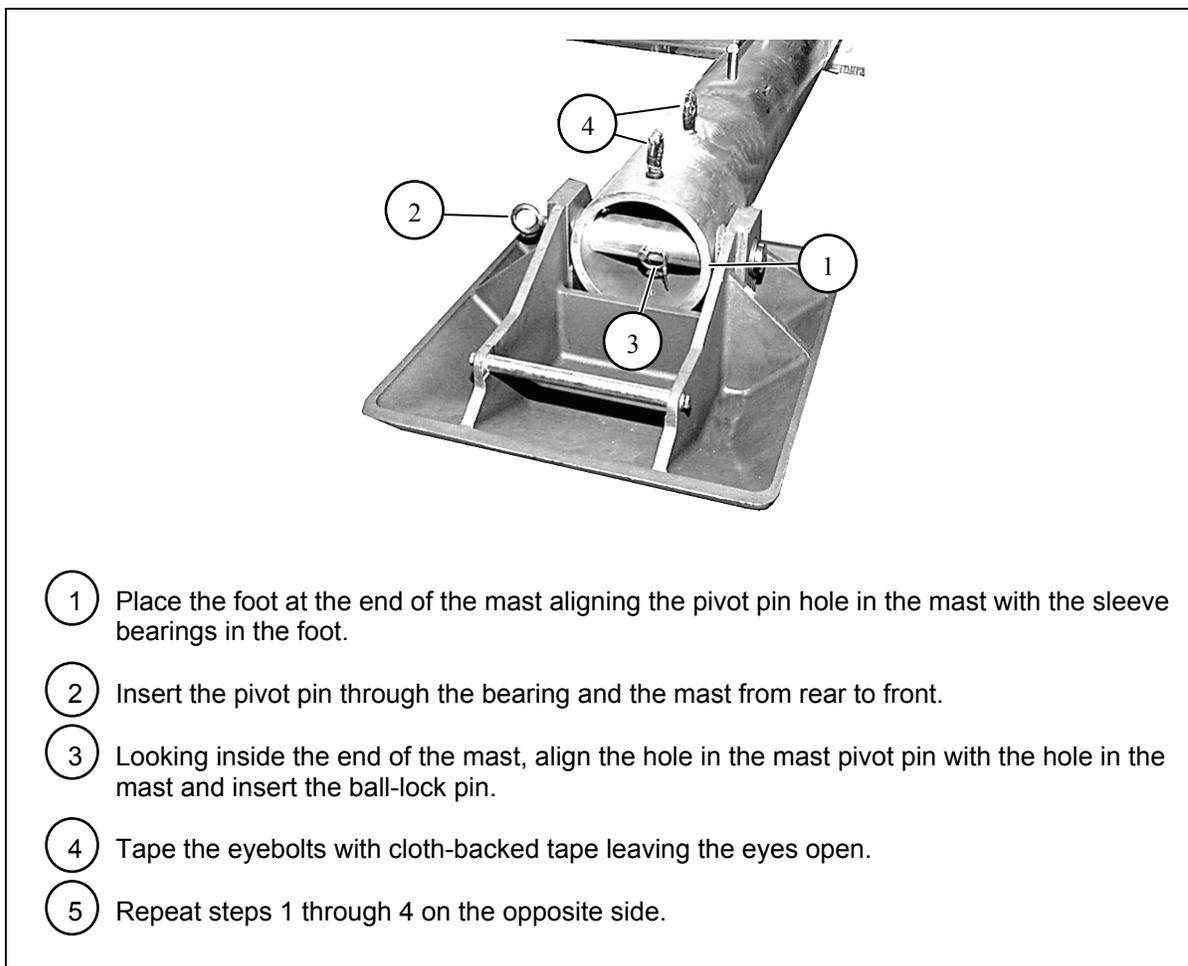
## OUTRIGGER MAST AND FOOT

2-39. The outrigger mast and foot are interchangeable and may be used on either side of the platform. Assemble, install, and safety the mast and foot on the DRAS platform according to TM 10-1670-268-20&P/TO13C7-52-22 and as shown in Figures 2-42 through 2-45.

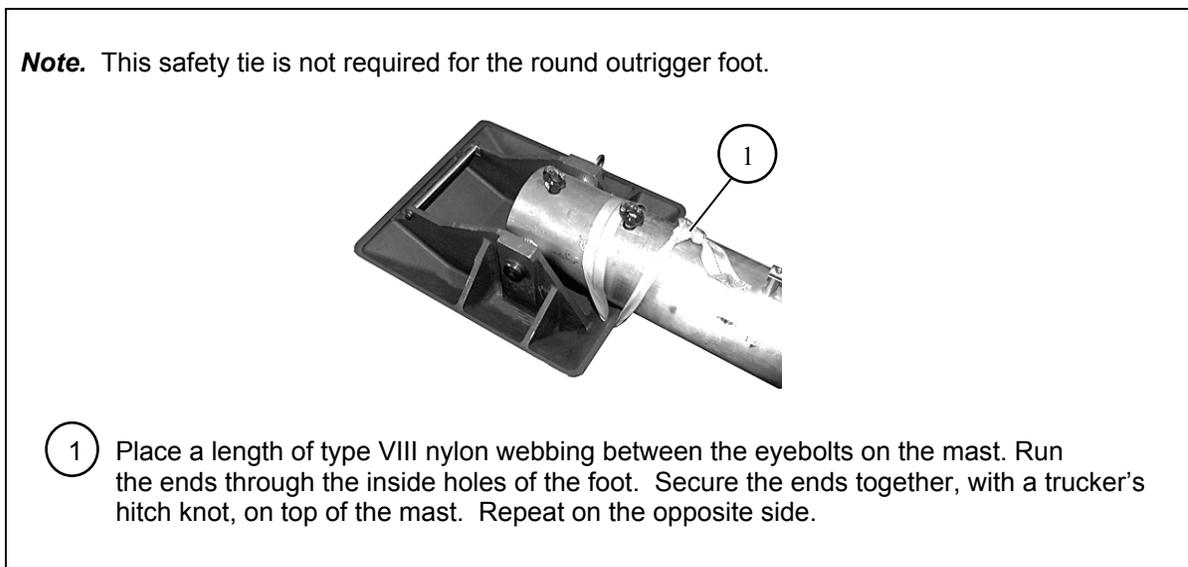


- 1 Place the mast in the PFA weldment in the horizontal position aligning the shaft hole in the mast with the sleeve bearings in the PFA weldment.
- 2 Insert the mast pivot pin through the bearing and the mast from rear to front.
- 3 Looking inside the bottom of the mast, align the hole in the mast pivot pin with the hole in the mast and insert the ball-lock pin.

Figure 2-42. Mast Installed



**Figure 2-43. Foot Installed**



**Figure 2-44. Foot Safety Tied**

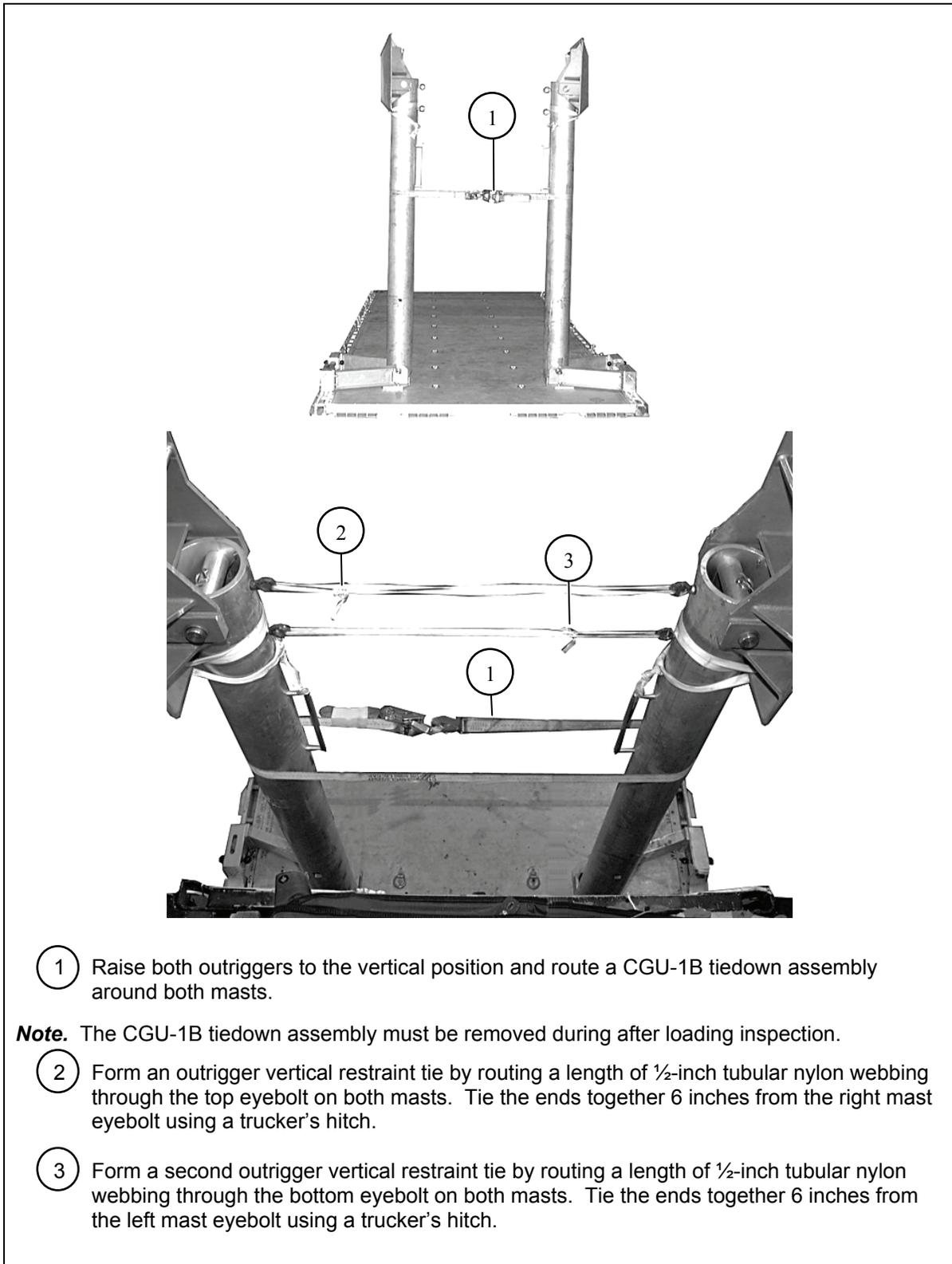


Figure 2-45. Mast Safety Tied



## SECTION IX – LOAD MARKING AND INSPECTION

### MARKING RIGGED LOAD

2-40. Each rigged load must have a data tag prepared for it, and some rigged loads may require a Shipper's Declaration for Dangerous Goods. The center of balance must also be clearly marked on both sides of the platform.

- **Data Tag.** A data tag is prepared and secured on the rear of each platform load. Entries on the tag are used by the Army and Air Force in making inspections and in finding causes for malfunctions. The entries are also used to help the loadmaster determine where to place the load in the aircraft. Use a ballpoint pen or other waterproof marking device to record the following information on the tag:
  - Total rigged weight.
  - Height, including parachutes.
  - Width.
  - Overall length.
  - Overhang (specify front, rear, or side of load).
  - Longitudinal center of balance (measured from the front edge of the platform).
- **Shipper's Declaration for Dangerous Goods.** This form is prepared and secured on each load that has any type of hazardous material such as fuel, ammunition, or a battery.
- **Center of Balance.** In addition to being included on the data tag, the longitudinal center of balance must also be marked on the platform. The vertical line of the symbol CB is placed at the center of balance on both sides of the platform.

## SECTION X – TRANSPORTATION OF RIGGED LOADS

### RESPONSIBILITIES

2-41. The using unit is responsible for coordinating transportation of the rigged load from the rigging site to the aircraft. To prevent damage, loads must be lashed to the transporting vehicle and protected during transport. The transporting force must ensure that the off-loading equipment is compatible with the aircraft to be used.

### TYPICAL LOADING AND TRANSPORTING EQUIPMENT

2-42. Some of the equipment that may be used to load and transport rigged loads is listed below.

- **Materials-Handling Equipment.** If a loading ramp is not available to use in loading the rigged load onto the transporting vehicle, the load is hoisted aboard the vehicle. The materials-handling equipment used to hoist the loads may include but are not limited to the 5-ton wrecker, the 10,000- or 15,000-pound-capacity warehouse crane, or the 10,000- or 15,000-pound-capacity forklift truck.
- **Transporting Vehicle.** Any standard military truck or semi-trailer with sufficient cargo space and payload capacity can be modified to transport a rigged load from the loading area to the cargo aircraft. However, not all military trucks are compatible with the cargo-loading system of all types of cargo aircraft now in use. Rigged platform loads require straight-in loading over a horizontally positioned ramp from a truck, a forklift, a flatbed, or a cargo loader. Consequently, this may require transfer of the rigged load at the aircraft site before it is off-loaded into the cargo aircraft. The following types of materials-handling equipment can be used to transport and/or off-load platform loads:
  - The 6- or 10-ton cargo semitrailer can transport loads rigged on airdrop platforms.

- The 25,000-pound-capacity cargo loader can move the maximum weight of 25,000 pounds up a 3-percent incline at 15 miles per hour. It can be used for loading all aircraft.
  - The 40,000-pound-capacity cargo loader can move the maximum weight of 40,000 pounds up a 3-percent incline at 15 miles per hour.
  - The 60,000-pound-capacity cargo loader (the Tunner) can move the maximum weight of 60,000 pounds up a 3-percent incline at 15 miles per hour.
- 

***Notes.***

1. The DRAS platform must be loaded centerline on the 25,000- and 60,000-pound capacity loaders.
  2. The 40,000-pound capacity loader requires the right side loads to be against the loader's right side rails and left side loads must be against the loader's left side rails.
-

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## Chapter 3

# Rigging M998/M1038/M1097 Cargo/Troop Carrier HMMWV on Dual Row Airdrop System Platform

## SECTION I – RIGGING THE M998/M1038/M1097 CARGO/TROOP CARRIER

### DESCRIPTION OF LOAD

3-1. The HMMWV truck is rigged on a DRAS platform for DRAS airdrop. An accompanying load weighing a minimum of 800 pounds and a maximum of 2,000 pounds must be rigged in the truck. The load is rigged with three G-11D cargo parachutes.

- The M998 Cargo/Troop Carrier (Figure 3-1). It weighs 5,200 pounds. It is 180 inches long and 85 inches wide. The reduced height of the vehicle is 54 inches.
- The M998A1 Cargo/Troop Carrier. It weighs 5,380 pounds. It is 180 inches long and 86 inches wide. The reduced height of the vehicle is 56 inches.
- The M1038 Cargo/ Troop Carrier with winch. It weighs 5,327 pounds. It is 180 inches long and 86 inches wide. The reduced height of the vehicle is 54 inches.
- The M1038A1 Cargo/Troop Carrier with winch. It weighs 5,507 pounds. It is 186 inches long and 86 inches wide. The reduced height of the vehicle is 56 inches.
- The M1097 Cargo/Troop Carrier. It weighs 5,600 pounds. It is 180 inches long and 85 inches wide. The reduced height of the vehicle is 54 inches.

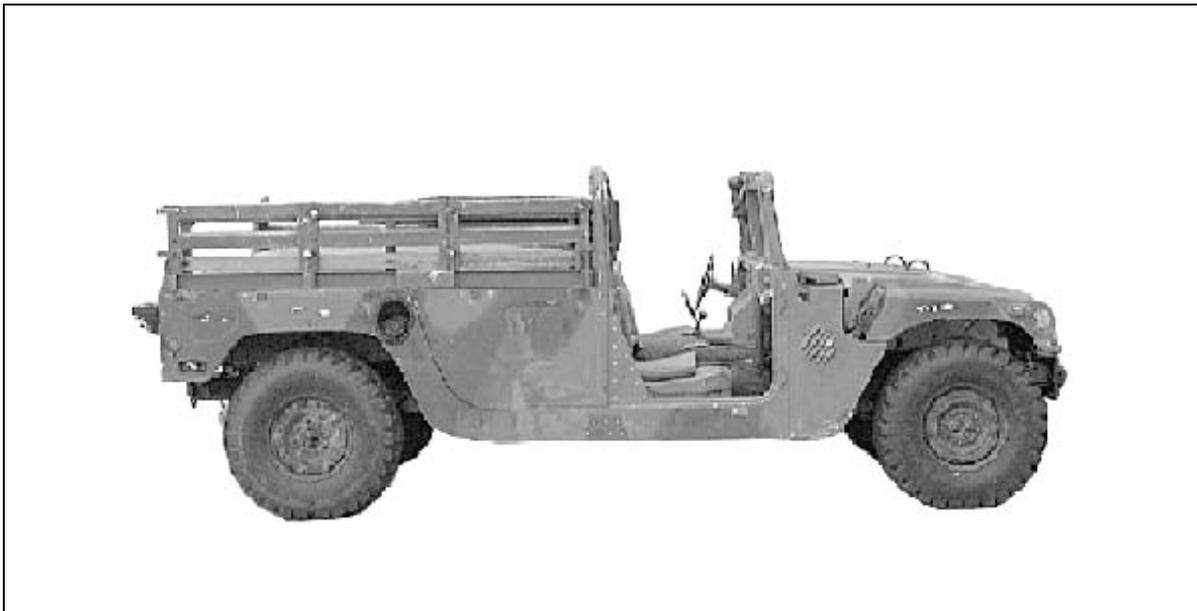
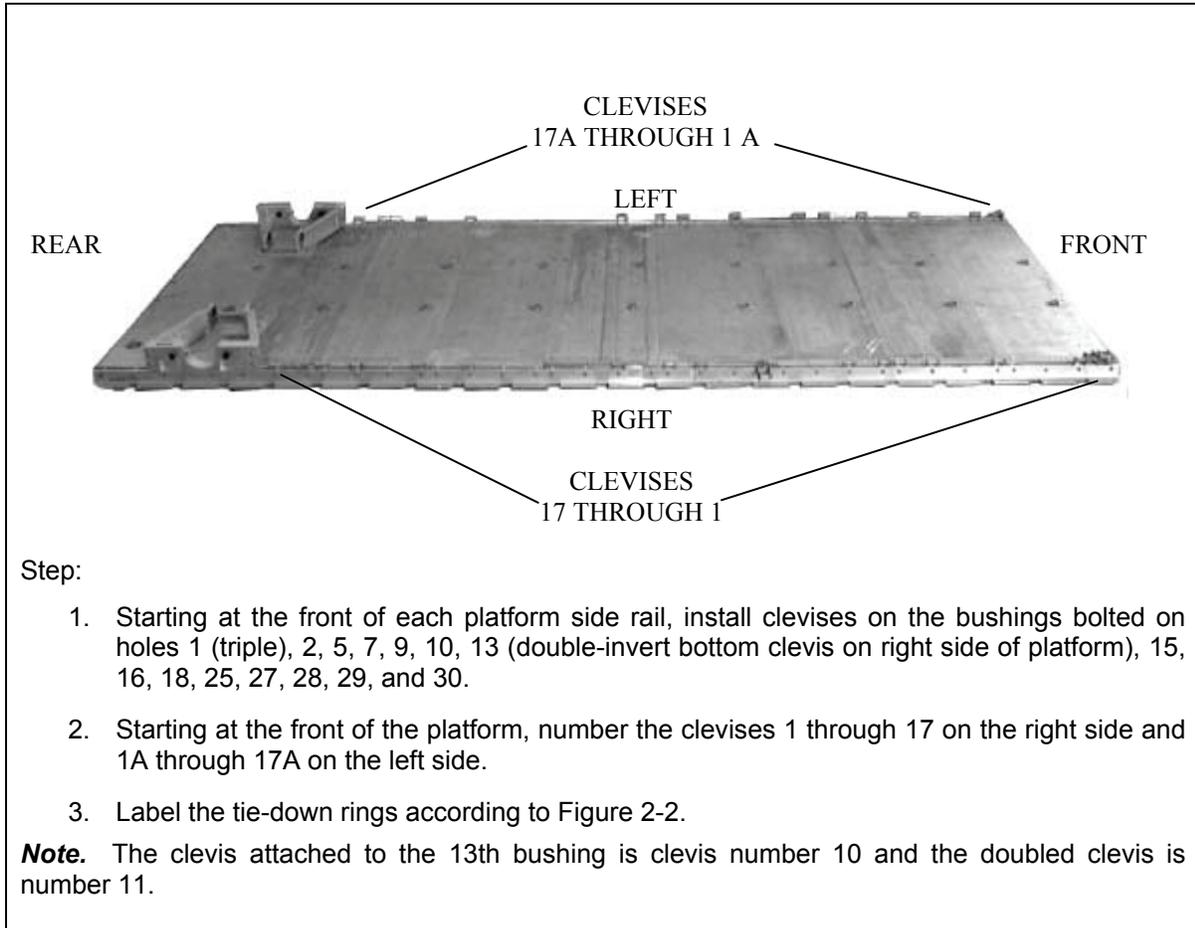


Figure 3-1. M998/M1038/M1097 Cargo/Troop Carrier HMMWV

## PREPARING PLATFORM

3-2. Inspect, or assemble and inspect, a DRAS platform with outrigger assemblies and outrigger platform support weldments and link assemblies according to TM 10-1670-268-20&P/TO 13C7-52-22 and as shown in Figure 3-2.



**Step:**

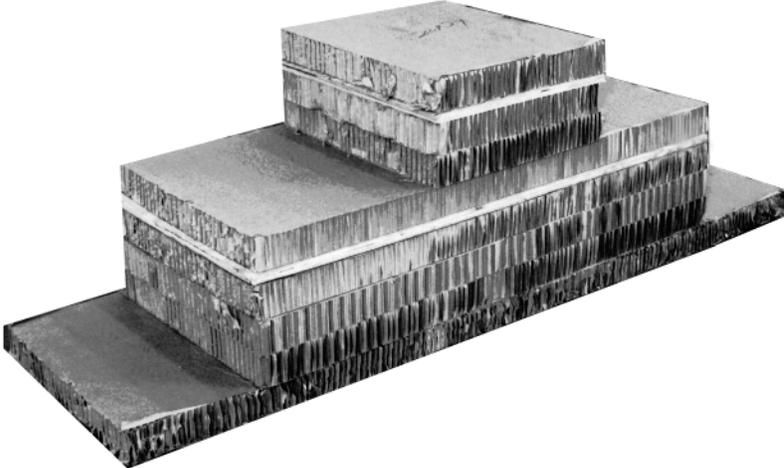
1. Starting at the front of each platform side rail, install clevises on the bushings bolted on holes 1 (triple), 2, 5, 7, 9, 10, 13 (double-invert bottom clevis on right side of platform), 15, 16, 18, 25, 27, 28, 29, and 30.
2. Starting at the front of the platform, number the clevises 1 through 17 on the right side and 1A through 17A on the left side.
3. Label the tie-down rings according to Figure 2-2.

**Note.** The clevis attached to the 13th bushing is clevis number 10 and the doubled clevis is number 11.

**Figure 3-2. Platform Prepared**

## BUILDING AND PLACING HONEYCOMB STACK

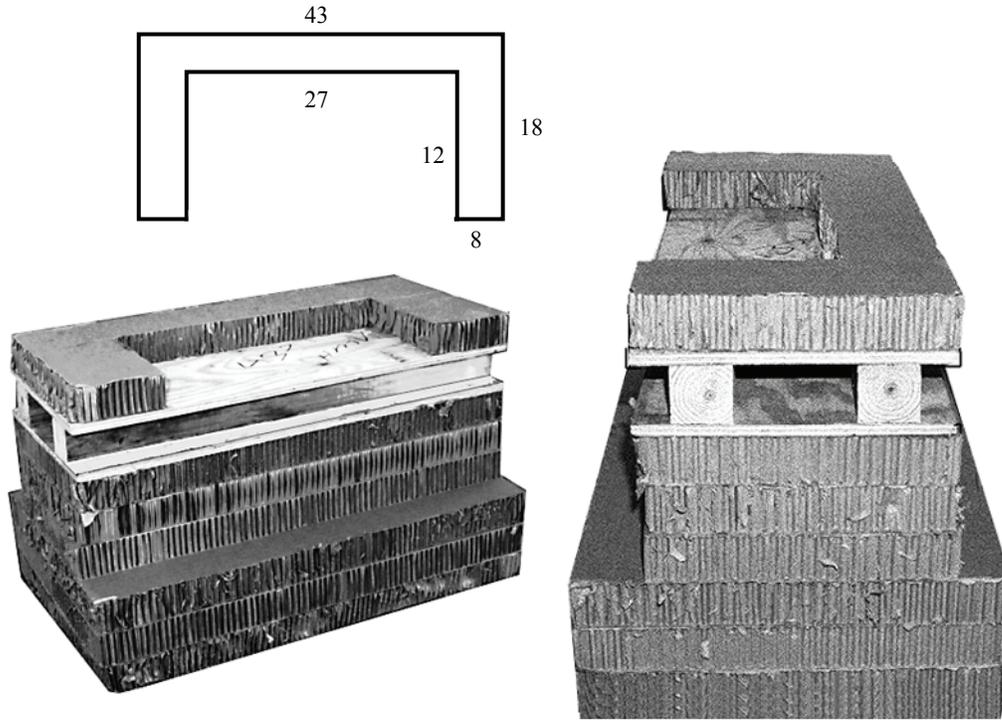
3-3. Prepare the honeycomb stacks for the trucks as shown in Figure 3-3. Position the honeycomb stacks as shown in Figure 3-4.



<b>Stack Number</b>	<b>Pieces</b>	<b>Width (inches)</b>	<b>Length (inches)</b>	<b>Material</b>	<b>Instructions</b>
1 and 3	1	24	80	Honeycomb	This is the base.
	3	24	54	Honeycomb	Center and glue together and glue to base.
	1	24	54	¾-inch Plywood	Center and glue to top of 24-inch by 54-inch honeycomb.
	1	24	54	Honeycomb	Center and glue to top of 24-inch by 54-inch plywood.
	2	24	20	Honeycomb	Center and glue to top of 24-inch by 54-inch honeycomb.
	1	24	20	¾-inch Plywood	Center and glue to top of 24-inch by 20-inch honeycomb.
	1	24	20	Honeycomb	Center and glue to top of 24-inch by 20-inch plywood.

Figure 3-3. Honeycomb Stacks Prepared

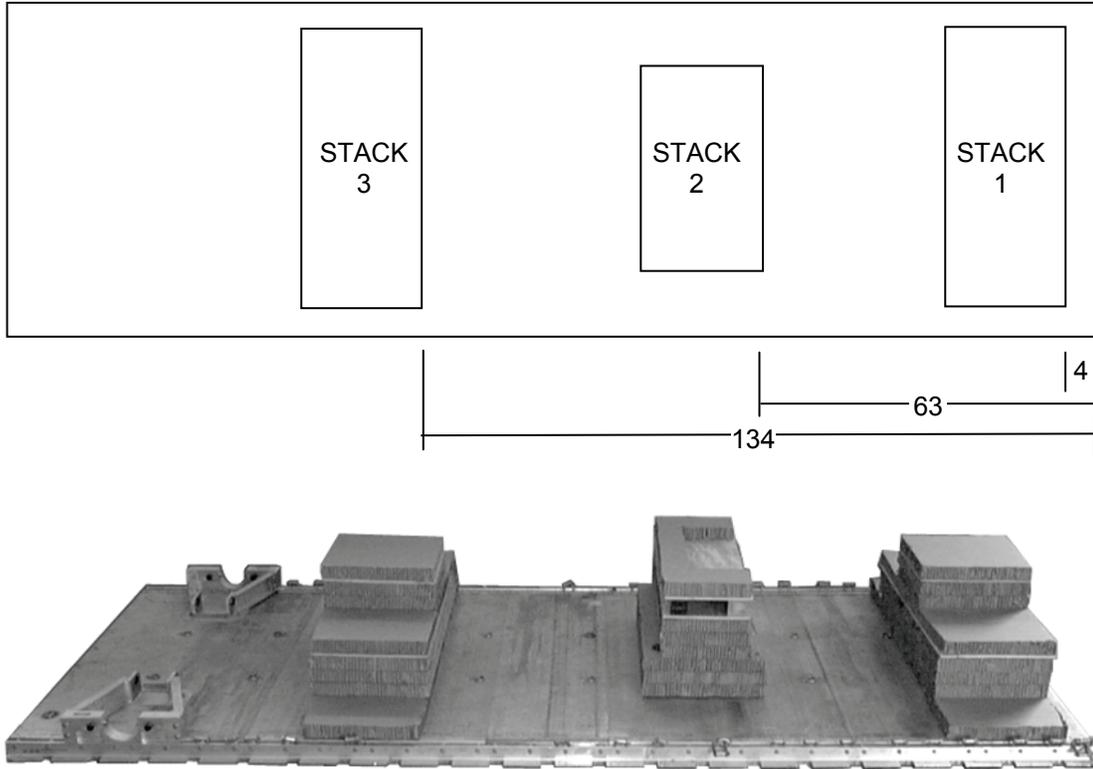
- Notes.** 1. This drawing is not drawn to scale.  
 2. All dimensions are given in inches.



Stack Number	Pieces	Width (inches)	Length (inches)	Material	Instructions
2	3	26	43	Honeycomb	Glue together to form base.
	3	18	43	Honeycomb	Center and glue to top of base.
	1	18	43	¾-inch Plywood	Use in next step.
	2	4	43	4x4 Lumber	Nail one piece to the 18-inch by 43-inch by ¾-inch plywood, at 1 ½-inches from the edge.
	1	18	43	¾-inch Plywood	Nail on top of the 4X4 lumber and glue to the 18-inch by 43-inch honeycomb.
	1	18	43	Honeycomb	Cut out an 12-inch by 27-inch section centered on the honeycomb and glue to the 18-inch by 43-inch by ¾-inch plywood (shown above).

Figure 3-3. Honeycomb Stacks Prepared (Continued)

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



<b>Stack Number</b>	<b>Position of Stack on Platform</b>
	Place stack:
1	4 inches from front edge of platform and centered.
2	63 inches from the front edge of the platform and centered.
3	134 inches from the front edge of the platform and centered.

**Figure 3-4. Honeycomb Stacks Placed on Platform**

## INSTALLING DRIVE-OFF AIDS ON PLATFORM

3-4. Install the drive-off aids on the platform as described in Paragraph 2-7.

---

**Note.** The use of the drive-off aids is optional.

---

## PREPARING TRUCK

3-5. Prepare the truck as described below.

- Make sure the fuel tank is no more than  $\frac{3}{4}$  full. Prepare the fuel tank filler cap and fuel filler opening as shown in Figure 3-5. Prepare the fuel tank drain plug as shown in Figure 3-6.

---

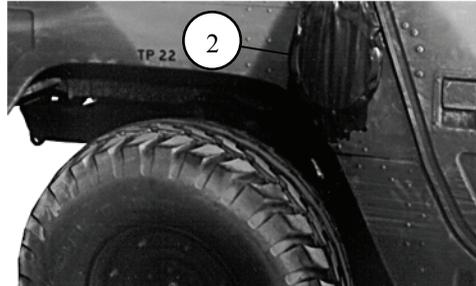
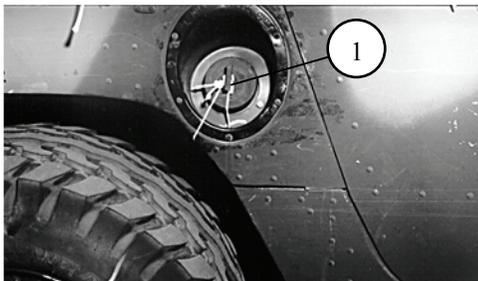
**Note.** Certain units may be authorized a waiver allowing 95% fuel. One way to verify the tank is 95% full is to fill the tank and withdraw 1  $\frac{1}{4}$ -gallons with a hand pump.

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### CAUTION

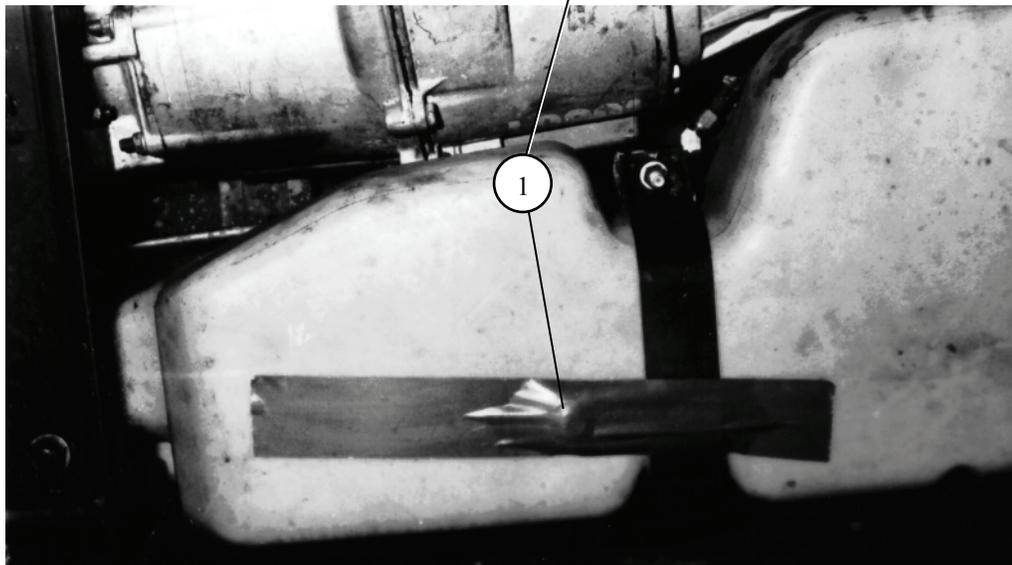
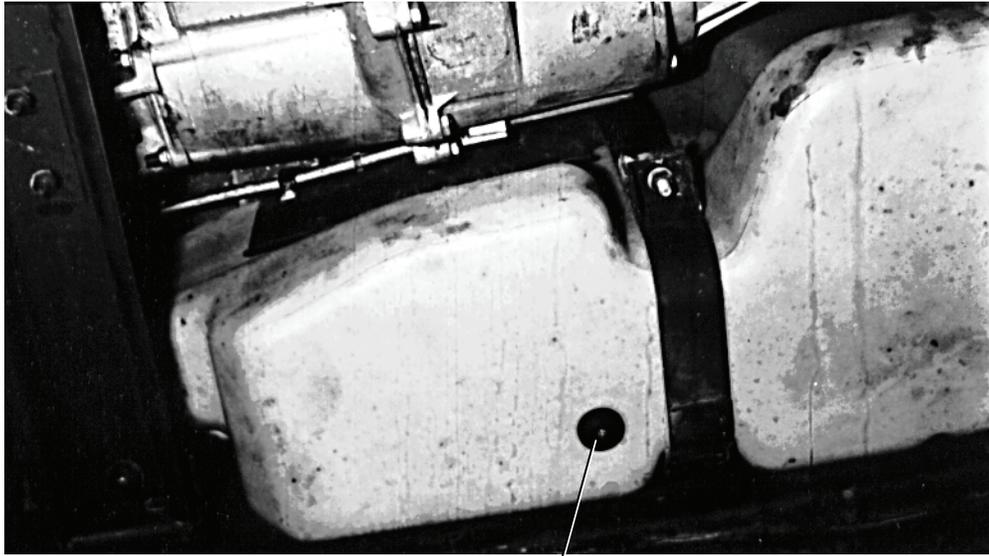
A full tank does not allow for expansion and is a danger to the aircraft and air crew.

- Make sure the batteries and battery compartment comply with AFMAN 24-204(I)/TM 38-250.
- Prepare the cab of the truck as shown in Figure 3-7.



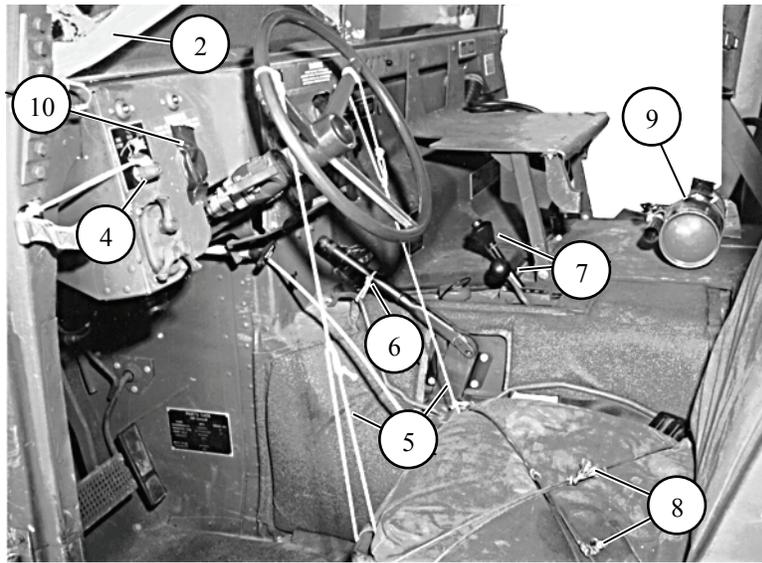
- 1 Tie the fuel filler cap to the body of the truck with type III nylon cord.
- 2 Tape the fuel filler opening.

**Figure 3-5. Fuel Tank Filler Cap and Opening Prepared**



- 1 Place a 12-inch length of cloth-backed tape over the fuel tank drain plug.

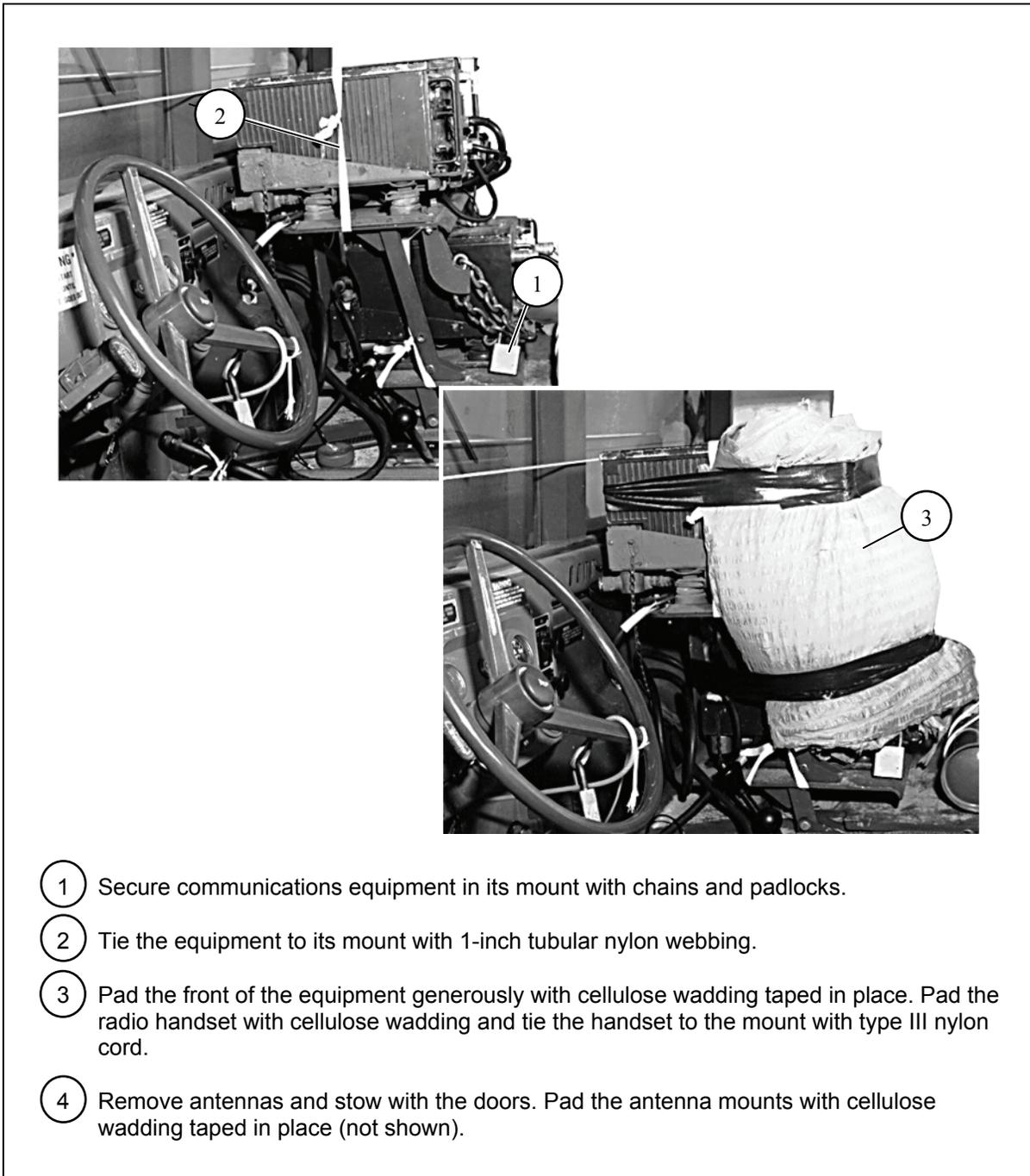
**Figure 3-6. Fuel Tank Drain Plug Prepared**



- ① Remove all doors, covers, and supporting bows (not shown).
- ② Tape the windshield glass on both sides in an X formation.
- ③ Remove and pad the mirrors. Secure them under the driver's seat with type III nylon cord (not shown).
- ④ Tie the engine start switch in the engine stop position with type I, ¼-inch cotton webbing.
- ⑤ Tie the steering wheel to the seat frame in two places with type III nylon cord, or use the retractable steering wheel locking cable. If the locking cable is used, secure it to the steering wheel with type III nylon cord, not a padlock.
- ⑥ Tie the emergency brake handle in the off position with type III nylon cord.
- ⑦ Place the transmission and four-wheel drive levers in the neutral position.
- ⑧ Tie the seat cushions to the seat frames with type III nylon cord. Fold the passenger seats in four-door trucks and secure them with the pins provided.
- ⑨ Tie the fire extinguisher in place in its designed rack with two lengths of type III nylon cord.
- ⑩ Tape all instrument panel gauges.

**Figure 3-7. Cab Prepared**

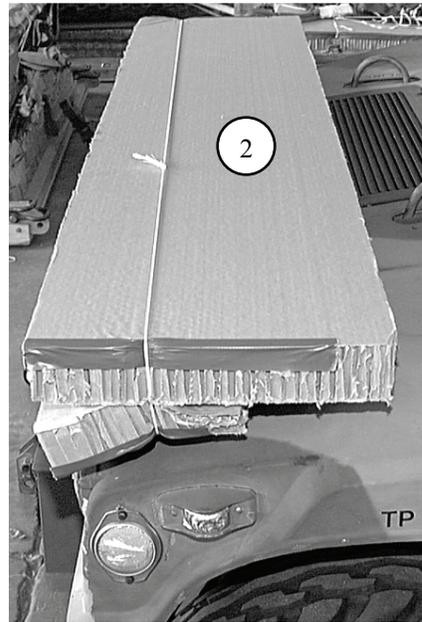
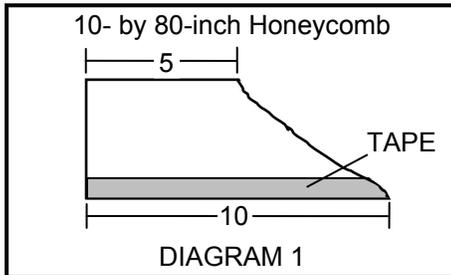
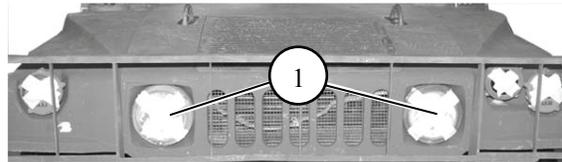
- Secure and pad radio equipment in the cab section as shown in Figure 3-8.



**Figure 3-8. Communications Secured and Padded**

- Prepare the front of soft-top trucks with foldable windshields as shown in Figure 3-9.

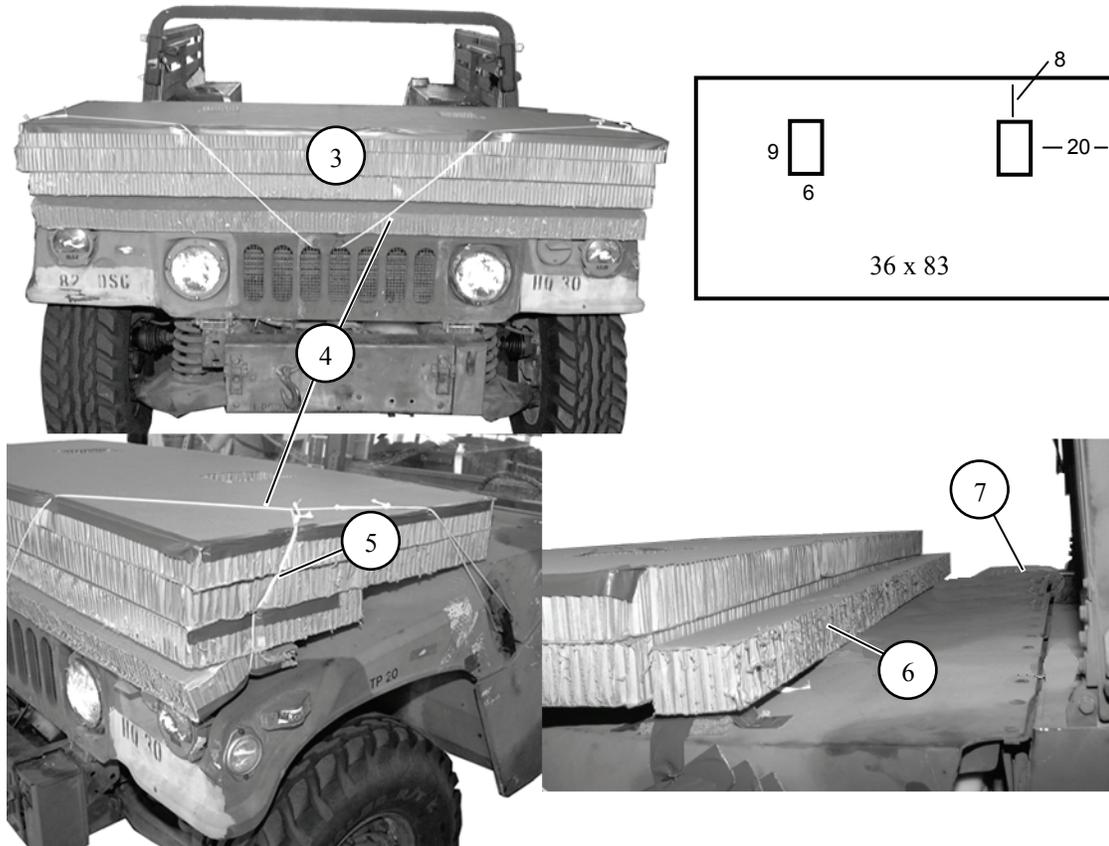
- Notes.**
1. All measurements are given in inches.
  2. This drawing is not drawn to scale.



- 1 Tape all lights and reflectors.
- 2 Cut a 10-inch by 80-inch piece of honeycomb. Taper crush 5 inches the length of the honeycomb. Tape the 10-inch width of the honeycomb (See diagram 1). Place the honeycomb flush on the front end of the hood with the taper up and to the rear of the vehicle. Cut an 18-inch by 80-inch piece of honeycomb. Position on top of and flush with the front of the 10-inch by 80-inch piece of honeycomb. Tie the two pieces of honeycomb together with type III nylon cord around the 80 inch length. Tape top piece of honeycomb where the type III nylon cord will come in contact.

**Figure 3-9. Front of Truck Prepared**

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



- 3 Place two 36-inch by 83-inch pieces of honeycomb, with cutouts as shown, on top of the previously positioned honeycomb and flush with the front. Tape the 36 inch sides and front edge on the top piece of honeycomb.
- 4 Secure the 36-inch by 83-inch honeycomb pieces with a length of type III nylon cord. Tie the type III nylon cord to the left hood latch over the honeycomb, through the center of the grill, over the right side of the honeycomb and tie to the right hood latch.
- 5 Run a length of type III nylon cord through the securing tie on the bottom two layers of honeycomb and through the securing tie on the top two layers of honeycomb on each side of the load.
- 6 Cut a 4-inch by 80-inch length of honeycomb. Position the honeycomb behind the installed honeycomb. Mark and crush an area for the windshield wipers.
- 7 Cover the breather cap with one layer of felt and tape in place with cloth-backed tape.

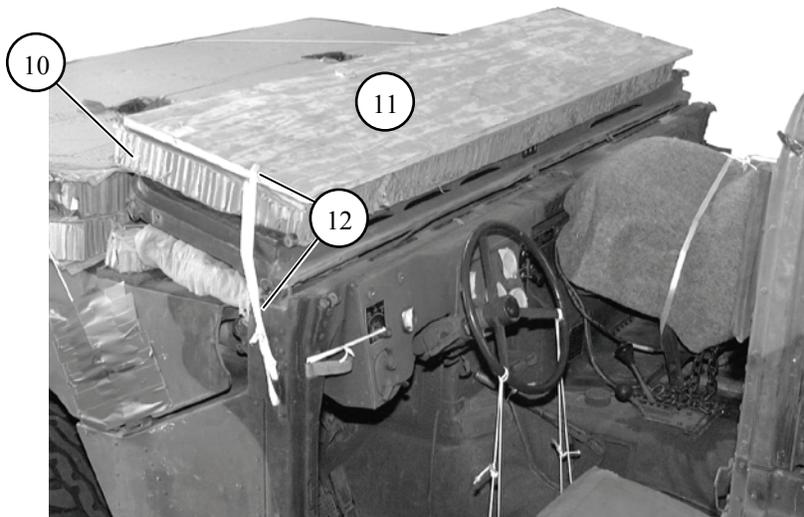
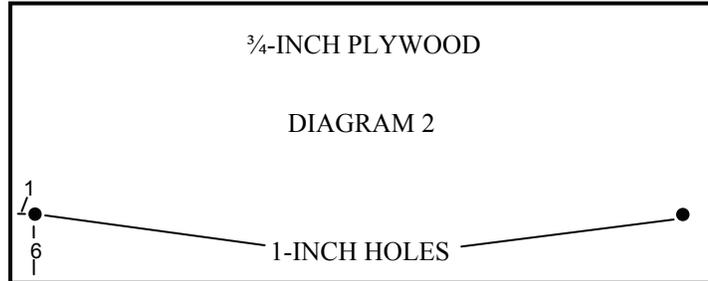
**Figure 3-9. Front of Truck Prepared (Continued)**



- 8 Cut four 4-inch by 4-inch by ½-inch pieces of felt. Position two pieces of felt under each end of the 4-inch by 80-inch honeycomb. Pad and tape the hood latches and tape the 4-inch by 4-inch pieces of felt in position.
- 9 Fill the void between the 4-inch by 80-inch honeycomb and the windshield with cellulose wadding. Ensure the entire void is filled to prevent the windshield from breaking.

**Figure 3-9. Front of Truck Prepared (Continued)**

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



- (10) Lay the windshield down. Cut a 19-inch by 78-inch piece of honeycomb to protect the windshield. Cut out an opening for the windshield wiper motor. Position honeycomb on top of the windshield.
- (11) Cut and position the 19-inch by 78-inch by  $\frac{3}{4}$ -inch piece of plywood, as shown in diagram 2, on top of the 19-inch by 78-inch honeycomb with the holes toward the rear of the vehicle.
- (12) Secure a length of  $\frac{1}{2}$ -inch tubular nylon through the  $\frac{1}{2}$ -inch hole in the plywood and through the top door hinge bracket on each side of the load.

**Figure 3-9. Front of Truck Prepared (Continued)**

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

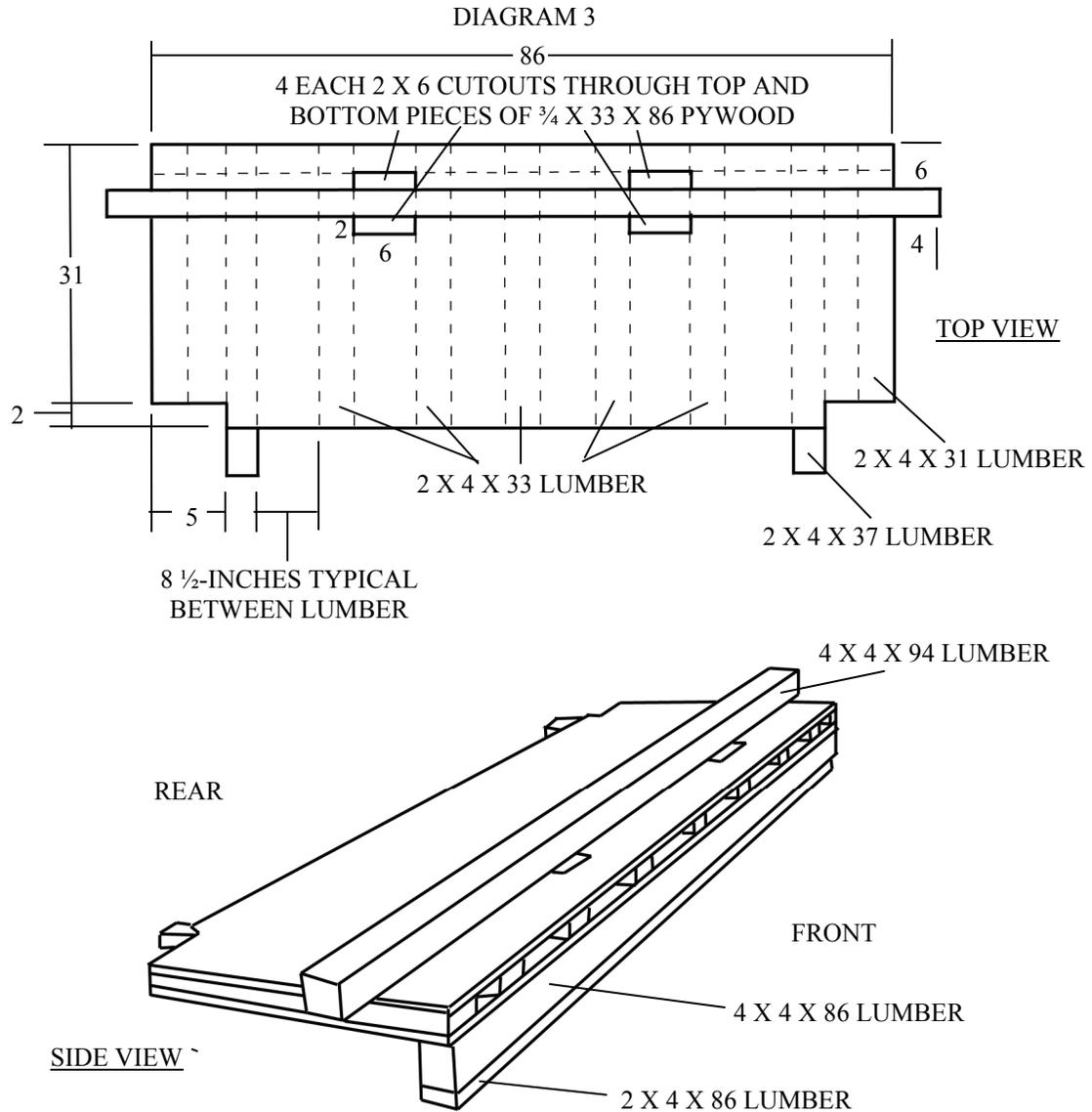
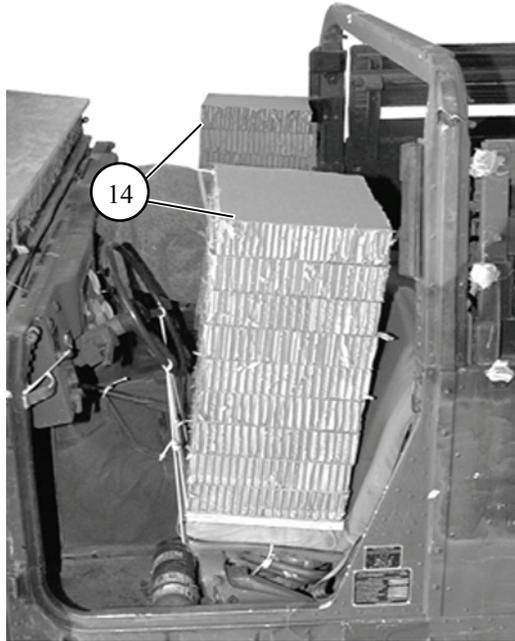
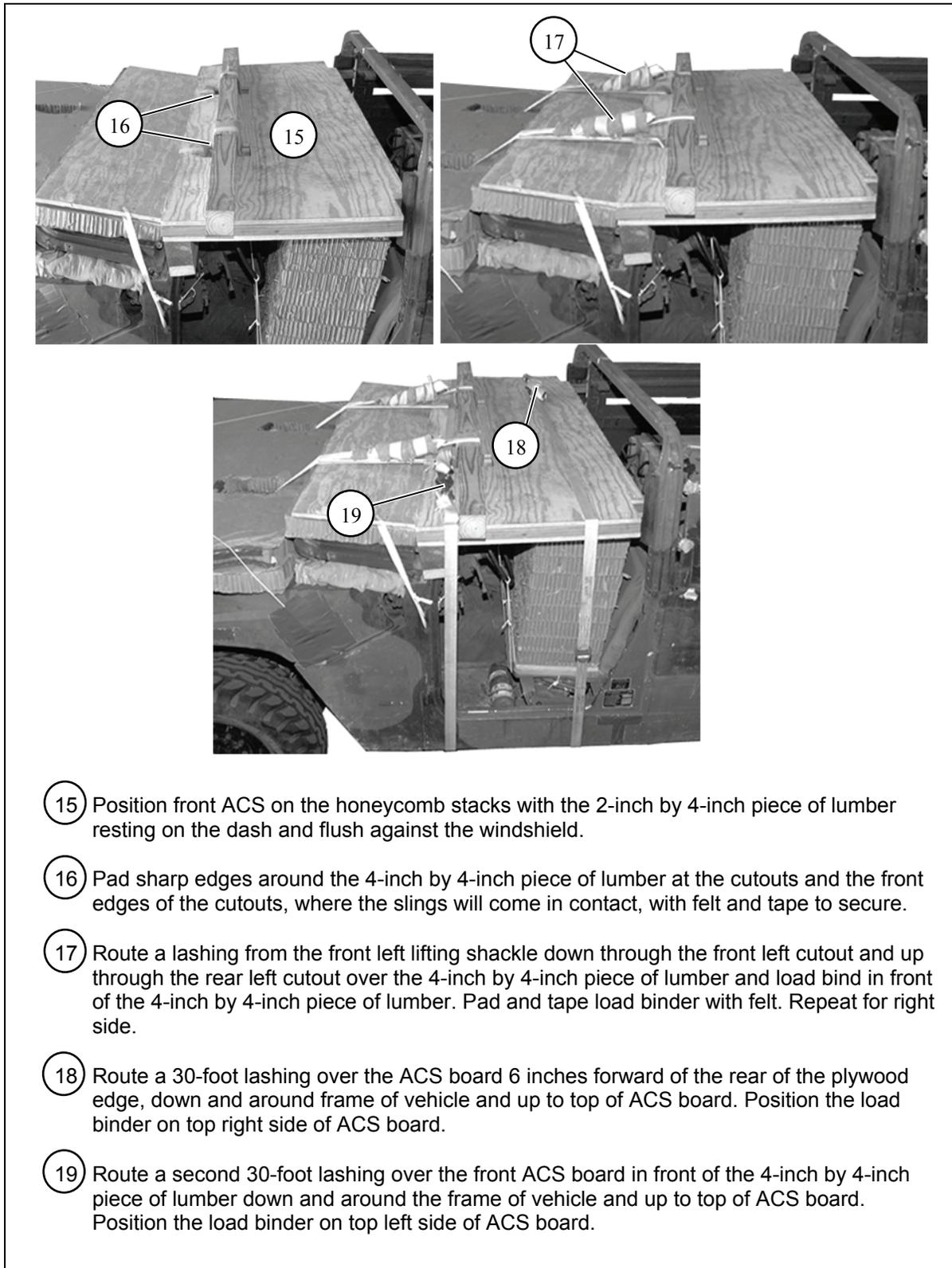


Figure 3-9. Front of Truck Prepared (Continued)



- 13 Build the soft top HMMWV front attitude control system (ACS) as described below and as shown in diagram 3 on previous page.
- Make four 2- by 6-inch cutouts through the top and bottom of the plywood sheets 21  $\frac{3}{4}$ -inches in from the edge of the plywood as shown in diagram 3.
  - Nail two pieces of plywood with the 2- by 4-inch pieces of lumber between them as shown in diagram 3 using 8d nails every 6 inches. Nail one 4- by 4- by 94-inch piece of lumber on top of the plywood sandwich, centered and 6-inches from the front edge using 40d nails every 10 inches.
  - Nail one 4- by 4- by 86-inch piece of lumber on the bottom front edge of the plywood sandwich using 40d nails every 10 inches.
  - Nail one 2- by 4- by 86-inch piece of lumber to the bottom of the 4- by 4- by 86-inch piece of lumber previously installed using 10d nails every 10 inches.
- 14 Build two honeycomb stacks using nine 14- by 20-inch sheets of honeycomb glued together with a  $\frac{3}{4}$ - by 14- by 20-inch piece of plywood glued to the bottom. Place one on each seat with the plywood to the bottom.

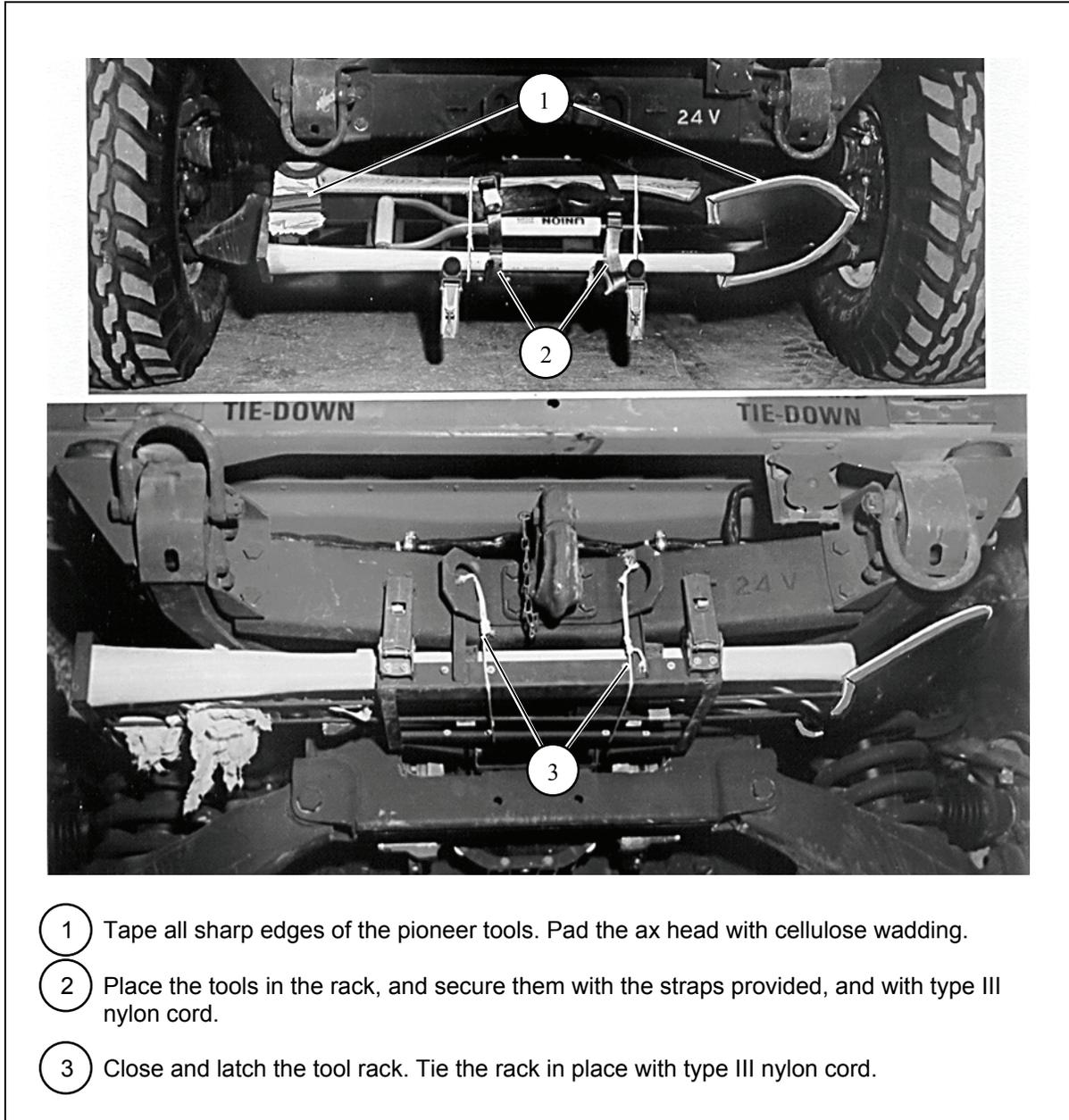
Figure 3-9. Front of Truck Prepared (Continued)



- 15 Position front ACS on the honeycomb stacks with the 2-inch by 4-inch piece of lumber resting on the dash and flush against the windshield.
- 16 Pad sharp edges around the 4-inch by 4-inch piece of lumber at the cutouts and the front edges of the cutouts, where the slings will come in contact, with felt and tape to secure.
- 17 Route a lashing from the front left lifting shackle down through the front left cutout and up through the rear left cutout over the 4-inch by 4-inch piece of lumber and load bind in front of the 4-inch by 4-inch piece of lumber. Pad and tape load binder with felt. Repeat for right side.
- 18 Route a 30-foot lashing over the ACS board 6 inches forward of the rear of the plywood edge, down and around frame of vehicle and up to top of ACS board. Position the load binder on top right side of ACS board.
- 19 Route a second 30-foot lashing over the front ACS board in front of the 4-inch by 4-inch piece of lumber down and around the frame of vehicle and up to top of ACS board. Position the load binder on top left side of ACS board.

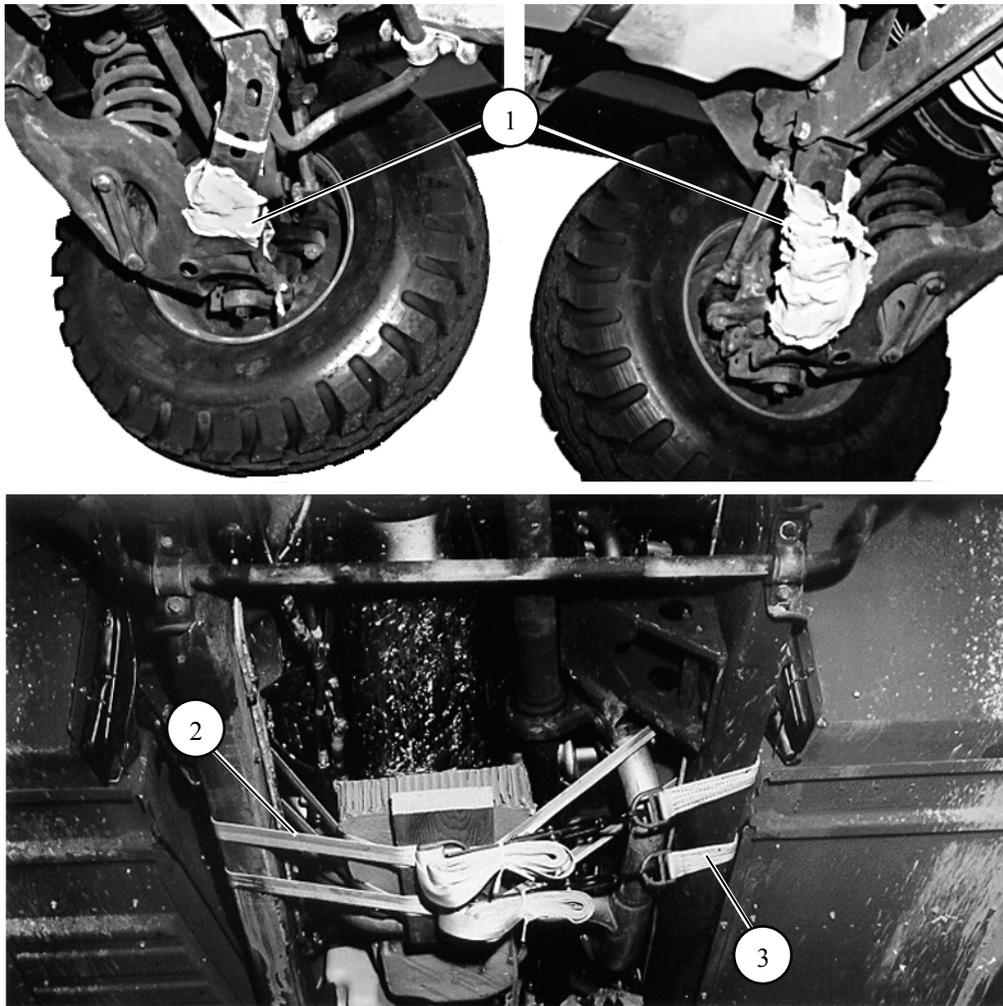
Figure 3-9. Front of Truck Prepared (Continued)

- Prepare and secure the pioneer tool kit according to TM 9-2320-280-10/TO 36A12-1A-2091-1/TM 2320-10/6B, and as shown in Figure 3-10.



**Figure 3-10. Pioneer Tool Kit Secured**

- Prepare the underside of the truck as shown in Figure 3-11.



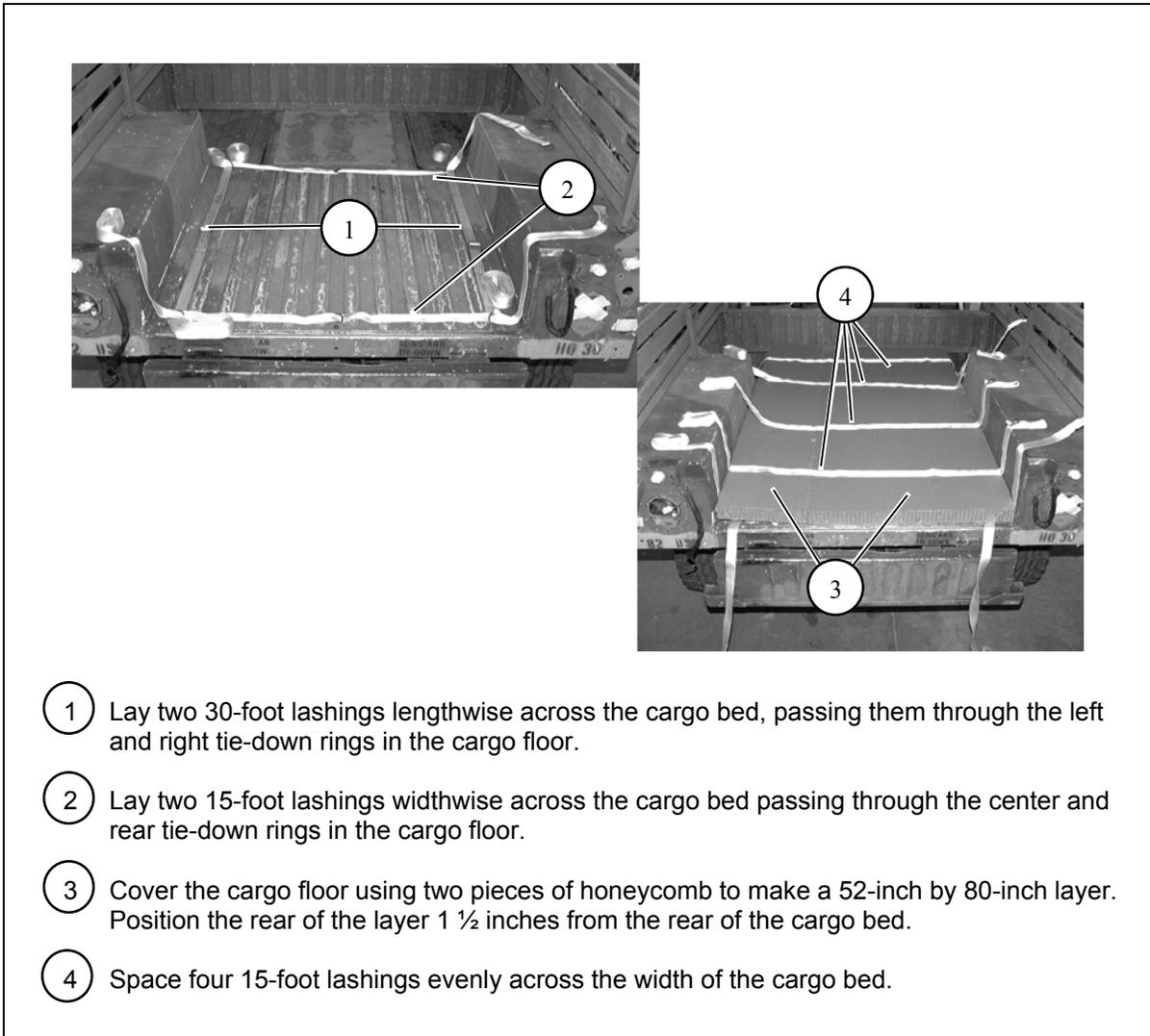
- 1 Pad the lower control arms on the front and rear of the truck with cellulose wadding taped in place.
- 2 Pass a 15-foot lashing over the right frame rail, under the oil pan, and over the left frame rail. Make sure the lashing goes over the exhaust pipe and then under it. Make sure the wires running along the frame rail are to the outside of the lashing. Place a 12- by 12-inch piece of honeycomb and a 2- by 6- by 16-inch piece of lumber between the lashing and the oil pan. Fasten the lashing with a D-ring and a load binder.
- 3 Install another lashing just to the rear of the lashing installed in step 2. Route the lashing in the same way.

Figure 3-11. Underside of Truck Prepared

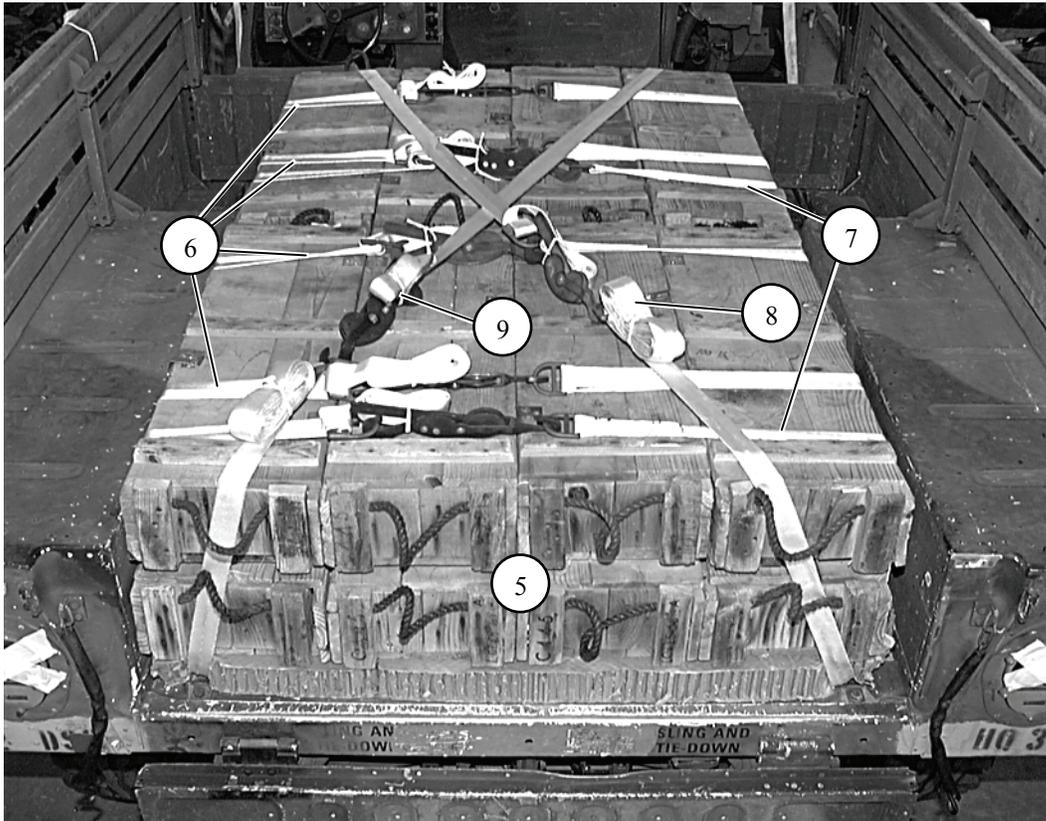
## STOWING ACCOMPANYING LOAD

3-6. Use the procedures shown in Figure 3-12 to stow 16 boxes of 105-mm ammunition and truck equipment.

*Note.* The accompanying load may vary from the one shown. Ensure the load is properly secured and weighs between 800 and 2,000 pounds.

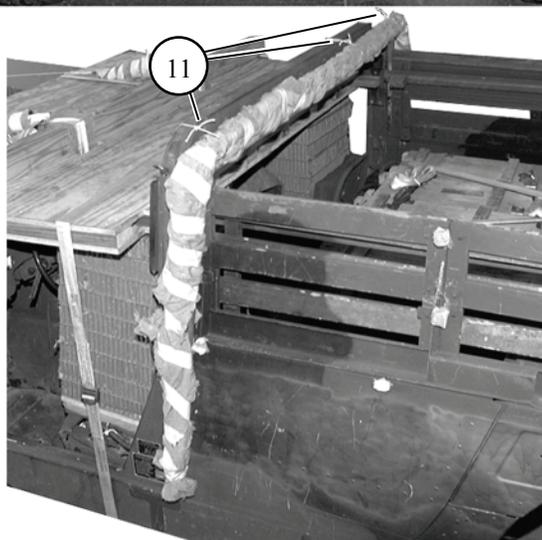
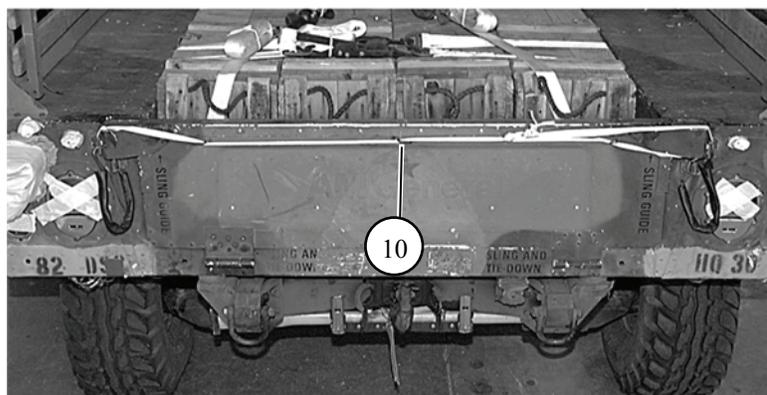


**Figure 3-12. Ammunition and Truck Equipment Stowed**



- 5 Position 16 boxes of 105-mm ammunition on the honeycomb in two layers of eight boxes.
- 6 Bind the boxes together with the four side-to-side lashings placed in step 4.
- 7 Secure the lashings placed in step 2.
- 8 Join the left front and right rear 30-foot lashings placed in step 1 with two D-rings and load binder.
- 9 Join the left rear and right front 30-foot lashings placed in step 1 in the same way as in step 8.

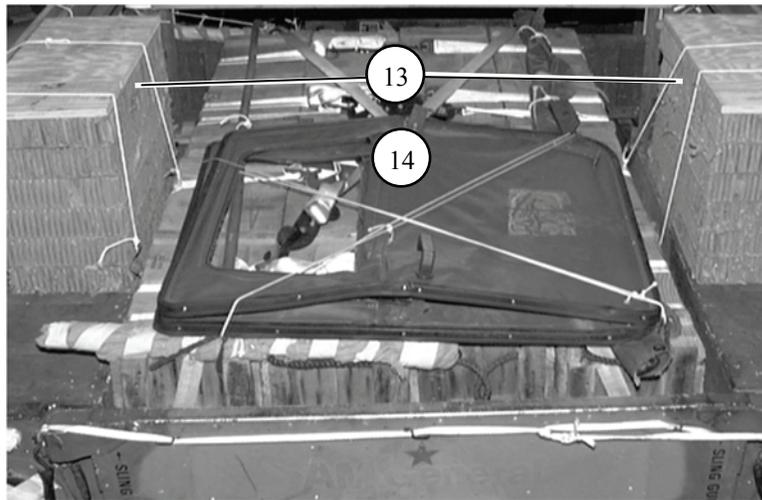
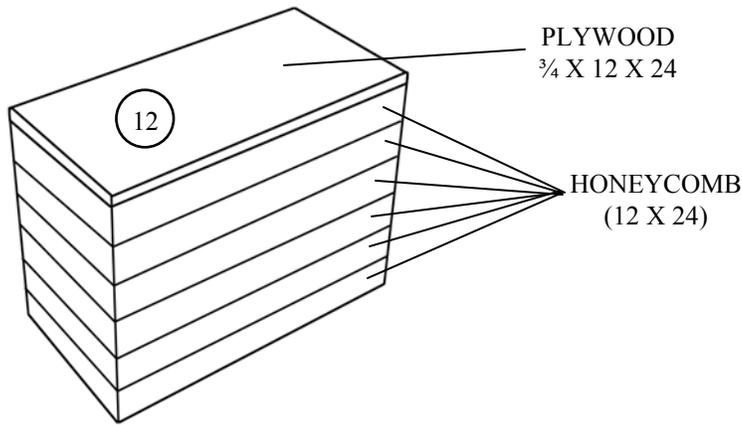
**Figure 3-12. Ammunition and Truck Equipment Stowed (Continued)**



- ⑩ Close the tailgate. Secure it to the chain hook brackets with a double length of ½-inch tubular nylon.
- ⑪ Wrap the truck tarpaulin bows in cellulose wadding and tape the wadding in place. Position the bows with the legs on the outside of the sideboards on the front of the cargo bed. Secure the bows to the top crew compartment cross-member with type III nylon cord.

**Figure 3-12. Ammunition and Truck Equipment Stowed (Continued)**

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



- 12) Cut twelve 12-inch by 24-inch pieces of honeycomb. Form two rear ACS support stacks by gluing six layers of 12-inch by 24-inch honeycomb. Cut two 12-inch by 24-inch by  $\frac{3}{4}$ -inch pieces of plywood and glue one piece on top of each stack as shown in diagram above.
- 13) Position the rear ACS support stacks on the front edge of the rear wheel wells. Secure the support stacks with two lengths of type III nylon cord to a convenient point on the load.
- 14) Wrap the cross pieces of the center beam support with cellulose wadding and tape padding in place. Place the center support beam, doors, and cargo covers in the cargo bed and secure with type III nylon cord to convenient points on the load.

**Figure 3-12. Ammunition and Truck Equipment Stowed (Continued)**

## LIFTING AND POSITIONING TRUCK AND INSTALLING OPTIONAL DRIVE-OFF AIDS

3-7. Install the lift slings and position the truck on the honeycomb stacks as shown in Figure 3-13. Attach the optional drive-off aids to the wheels of the truck as shown in Chapter 2.

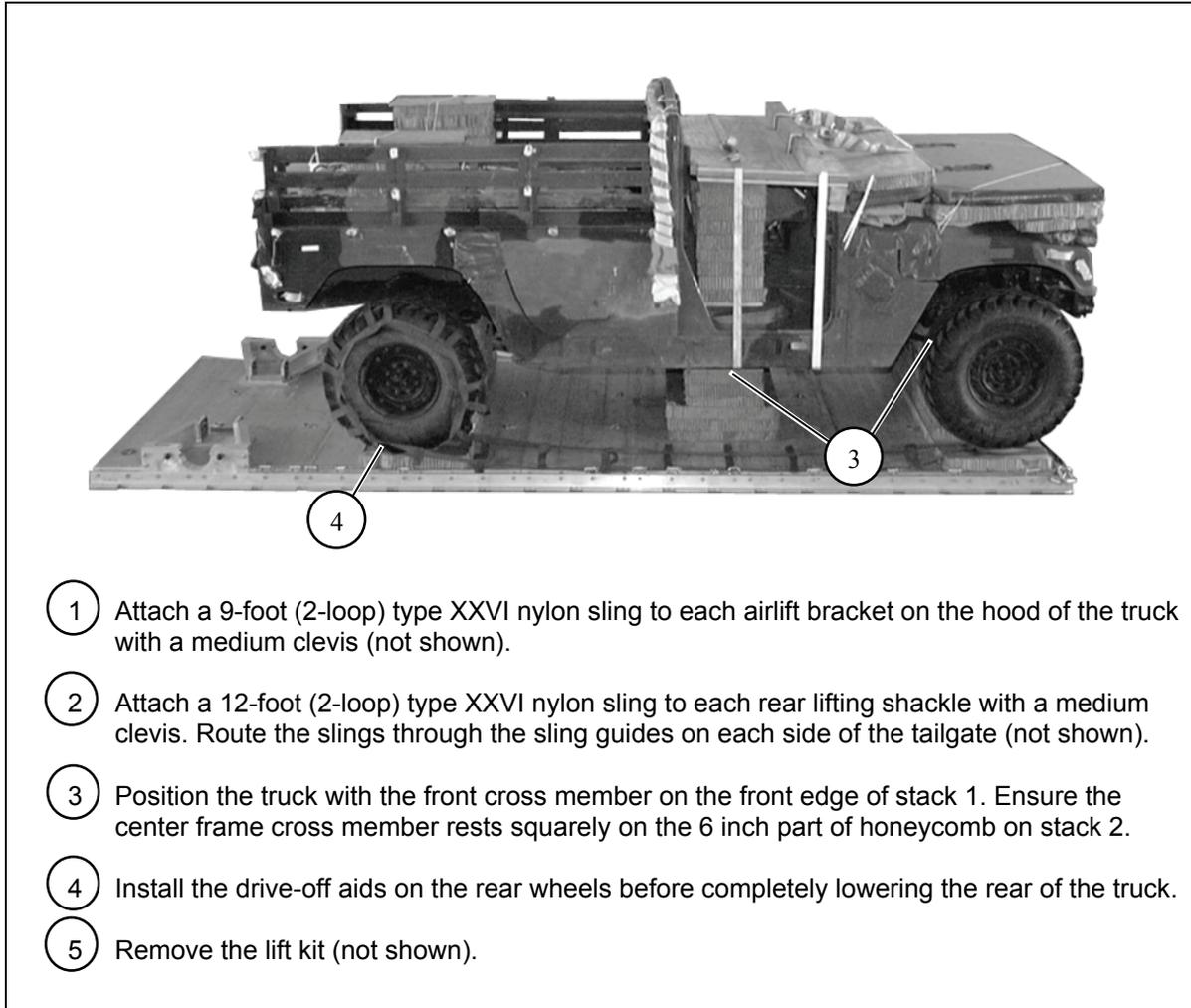
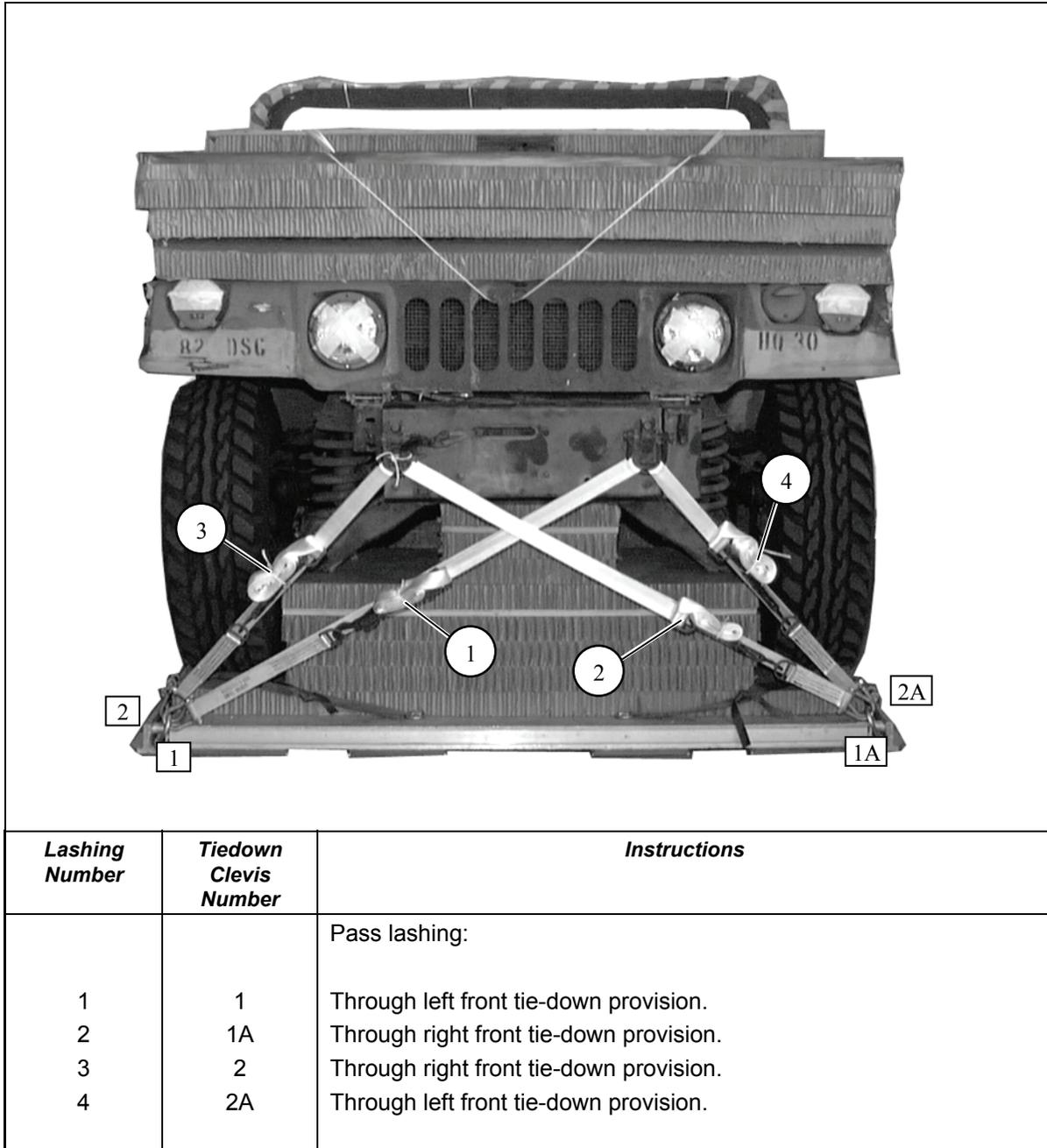


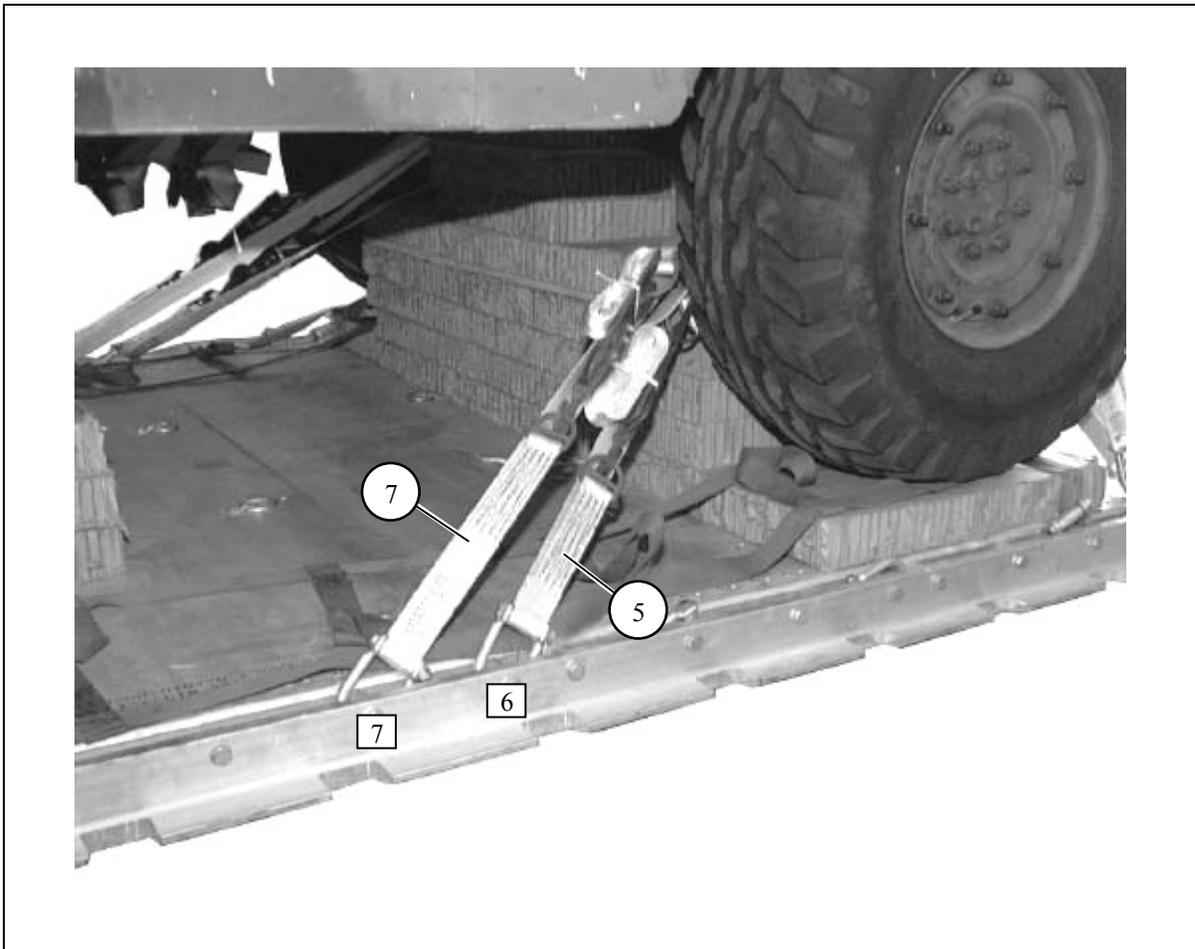
Figure 3-13. Truck Positioned

## LASHING TRUCK

3-8. Lash the truck to the platform according to Chapter 2 and as shown in Figures 3-14 through 3-17.

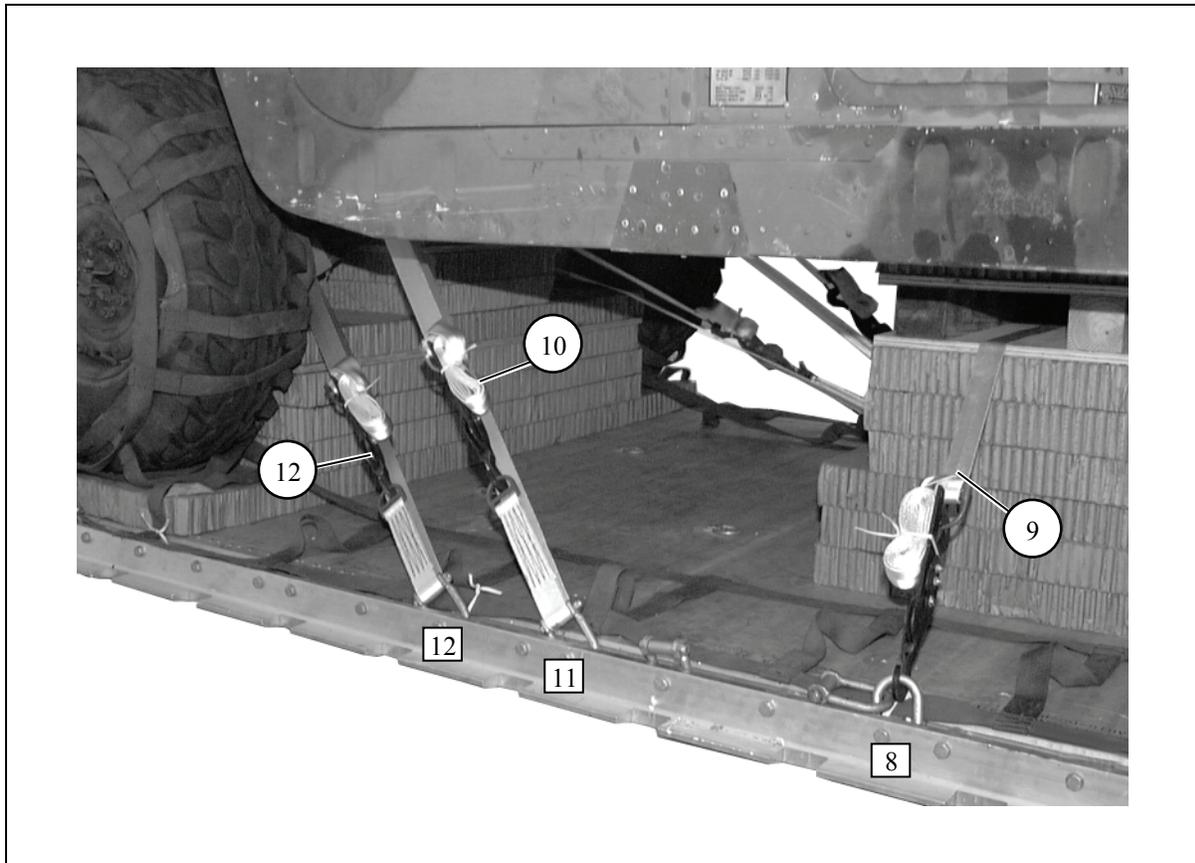


**Figure 3-14. Lashings 1 through 4 Installed**



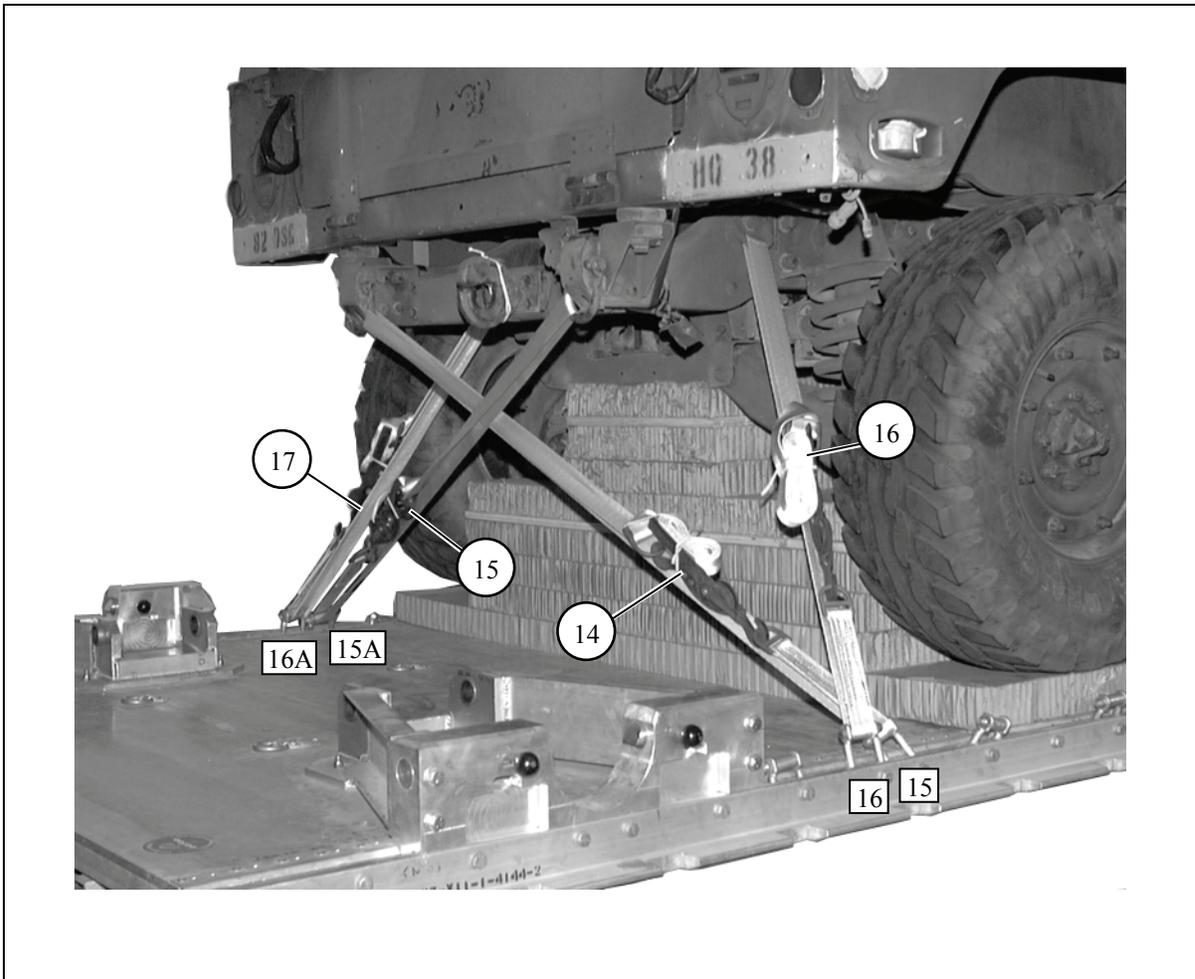
<i>Lashing Number</i>	<i>Tiedown Clevis Number</i>	<i>Instructions</i>
5	6	Pass lashing: Around right front lower control arm.
6	6A	Around left front lower control arm.
7	7	Through tiedown bracket behind right front coil spring.
8	7A	Through tiedown bracket behind left front coil spring.

**Figure 3-15. Lashings 5 through 8 Installed**



<i>Lashing Number</i>	<i>Tiedown Clevis Number</i>	<i>Instructions</i>
9	8A and 8	Pass lashing: Through clevis 8A and back through its own D-ring through stack 2. Load bind to clevis 8.
10	11	Through tiedown bracket in front of right rear coil spring.
11	11A	Through tiedown bracket in front of left rear coil spring.
12	12	Around right rear lower control arm.
13	12A	Around left rear lower control arm.

**Figure 3-16. Lashings 9 through 13 Installed**

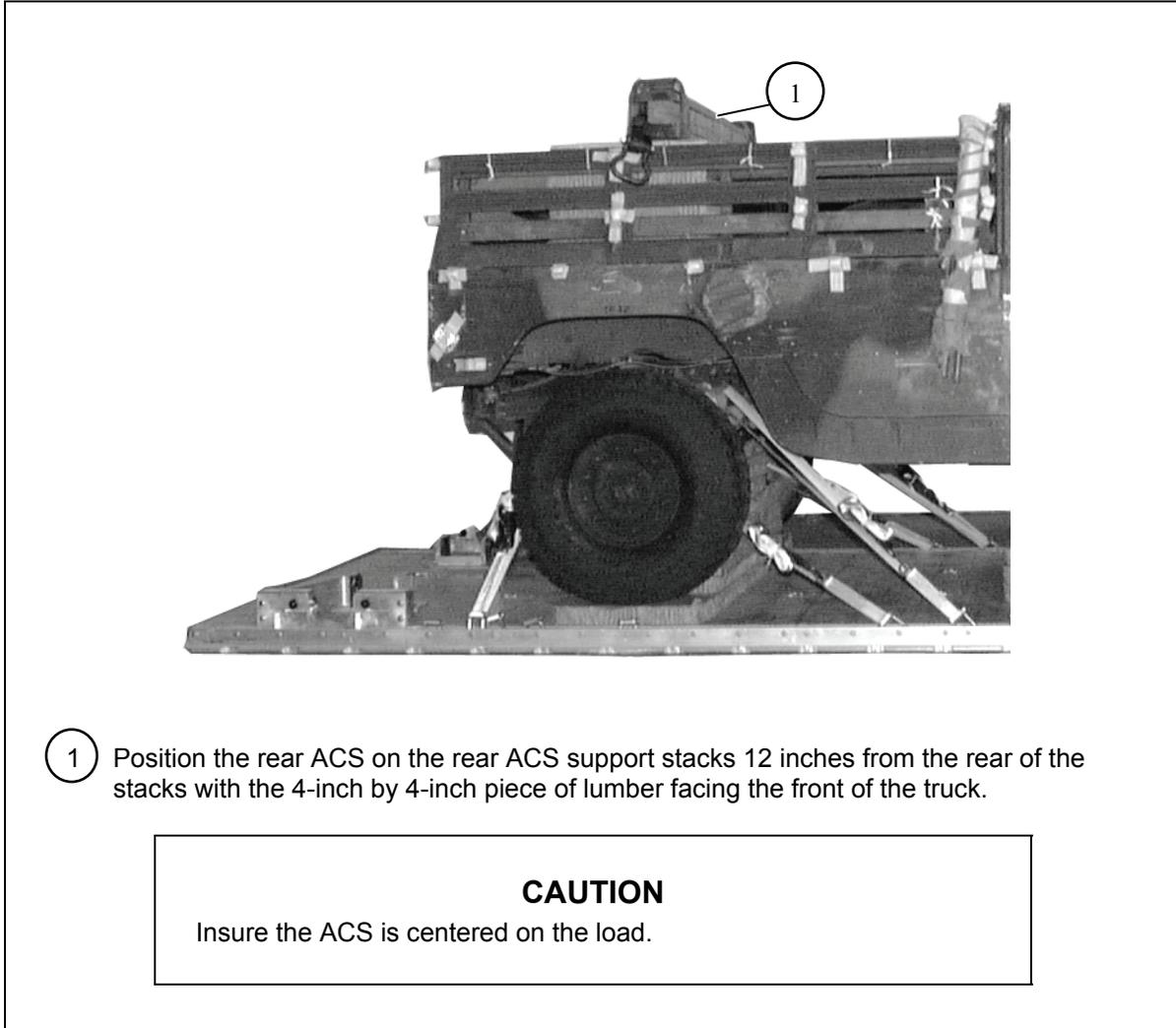


<i>Lashing Number</i>	<i>Tiedown Clevis Number</i>	<i>Instructions</i>
14	15	Pass lashing: Through left rear tiedown point.
15	15A	Through right rear tiedown point.
16	16	Through right rear tiedown point behind the coil spring.
17	16A	Through left rear tiedown point behind the coil spring.

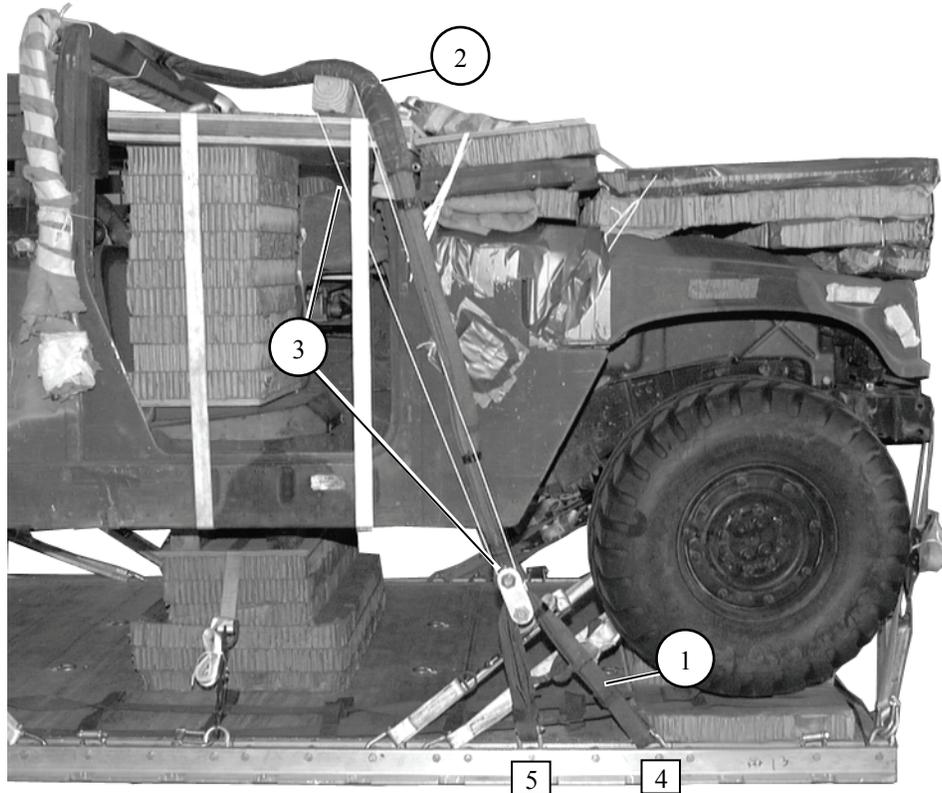
**Figure 3-17. Lashings 14 through 17 Installed**

## INSTALLING SUSPENSION SLINGS AND REAR ATTITUDE CONTROL SYSTEM

3-9. Construct, inspect, and position the rear Attitude Control System (ACS) according to Chapter 2 and as shown in Figure 3-18. Install the suspension slings and secure ACS according to Chapter 2 and as shown in Figure 3-19.

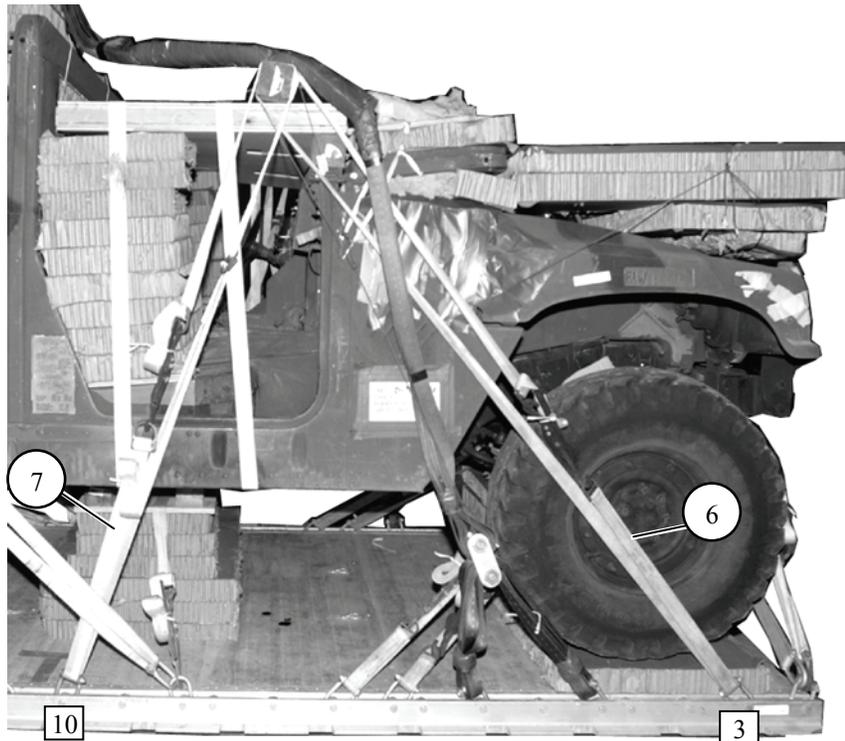


**Figure 3-18. Rear Attitude Control System Positioned**



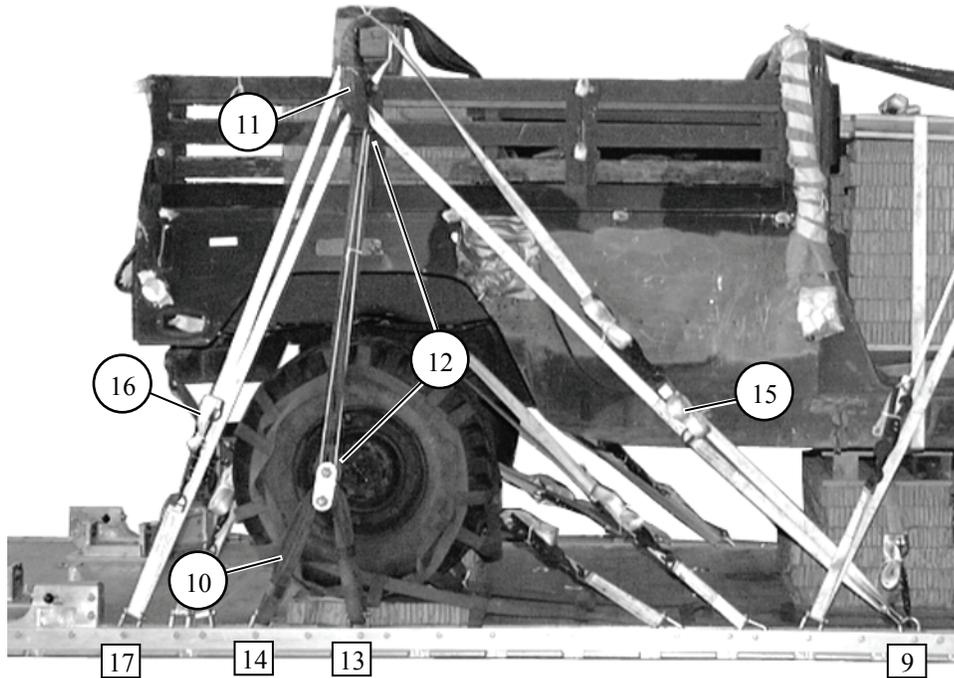
- ① Install a 3-foot (4-loop), type XXVI nylon sling to clevises 4 and 5. Connect an 11-foot (4-loop), type XXVI nylon sling to the center of the 3-foot sling with a 3 ¾-inch two-point link.
- ② Route the sling over ACS 4-inch by 4-inch piece of lumber from front to rear. Pad and tape the 11-foot sling with felt from a point 6 inches below the 4-inch by 4-inch piece of lumber to a point 6-inches above the top of the ACS.
- ③ Safety tie the 3 ¾-inch two-point link to the ACS 4x4 with a loop of type III nylon cord. Ensure the tie is tight.
- ④ Install a 3-foot (4-loop), type XXVI nylon sling to the other end of the 11-foot sling with a 3 ¾-inch two-point link. Pad and tape the link with felt (not shown). See Chapter 2.
- ⑤ Repeat steps 1 through 4 on the left side of load using clevises 4A and 5A.

**Figure 3-19. Slings Installed and ACS Secured**



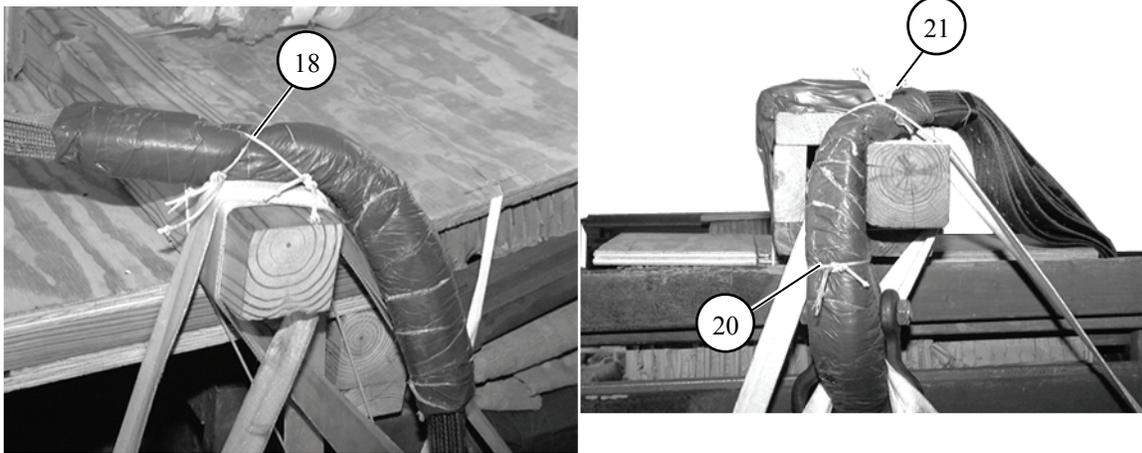
- ⑥ Route a lashing from clevis 3 under right ACS 4-inch by 4-inch piece of lumber from rear to front, around the ACS 4-inch by 4-inch lumber and back to clevis 3.
- ⑦ Route a lashing from clevis 10 under right ACS 4-inch by 4-inch piece of lumber from front to rear, up and around the ACS 4- by 4-inch piece of lumber and back to clevis 10.
- ⑧ Repeat steps 7 through 9 on the left side of load using clevises 3A and 10A (not shown).
- ⑨ Ensure the ACS is straight and centered on load. Load binders on both sides of the load must be closed at the same time in the following sequence: 3 and 3A, 10 and 10A.

**Figure 3-19. Slings Installed and ACS Secured (Continued)**



- ⑩ Install a 3-foot (4-loop), type XXVI nylon sling to clevises 13 and 14. Connect an 11-foot (4-loop), type XXVI nylon sling to the center of the 3-foot sling with a 3 ¾-inch two-point link.
- ⑪ Route the sling through the clevis on the ACS from rear to front. Pad and tape the 11-foot sling with felt from a point 6 inches below the clevis to a point 6 inches above the top of the ACS.
- ⑫ Safety tie the 3 ¾-inch two-point link to the ACS clevis with a loop of type III nylon cord. Ensure the tie is tight.
- ⑬ Install a 3-foot (4-loop), type XXVI nylon sling to the other end of the 11-foot sling with a 3 ¾-inch two-point link. Pad and tape the link (not shown). See Chapter 2.
- ⑭ Repeat steps 10 through 13 on the left side using clevises 13A and 14A (not shown).
- ⑮ Route a 30-foot lashing from clevis 9, through the right rear ACS clevis from outside to inside, rear to front, around the ACS 4-inch by 4-inch piece of lumber and back to clevis 9.
- ⑯ Route a lashing from clevis 17 through right rear ACS clevis from outside to inside, front to rear, around ACS 4-inch by 4-inch piece of lumber and back to clevis 17.
- ⑰ Repeat steps 15 and 16 on left side of load using clevises 9A and 17A (not shown).

**Figure 3-19. Slings Installed and ACS Secured (Continued)**



- 18 Remove all slack from the right front sling and lay sling across the top of the ACS 4-inch by 4-inch piece of lumber from front to rear. Tie two lengths of type III nylon cord over the sling, behind all lashings, and around ACS 4-inch by 4-inch piece of lumber forming a crisscross pattern.
- 19 Repeat step 18 for left front sling (not shown).
- 20 Remove all slack from the right rear sling. Tie a length of type III nylon cord around the 11-foot sling and the ACS sling.
- 21 Tie a length of type III nylon cord around the 11-foot nylon sling, behind all lashings, and the ACS 4-inch by 4-inch piece of lumber, tie the ends together.
- 22 Repeat steps 20 and 21 for left rear sling (not shown).

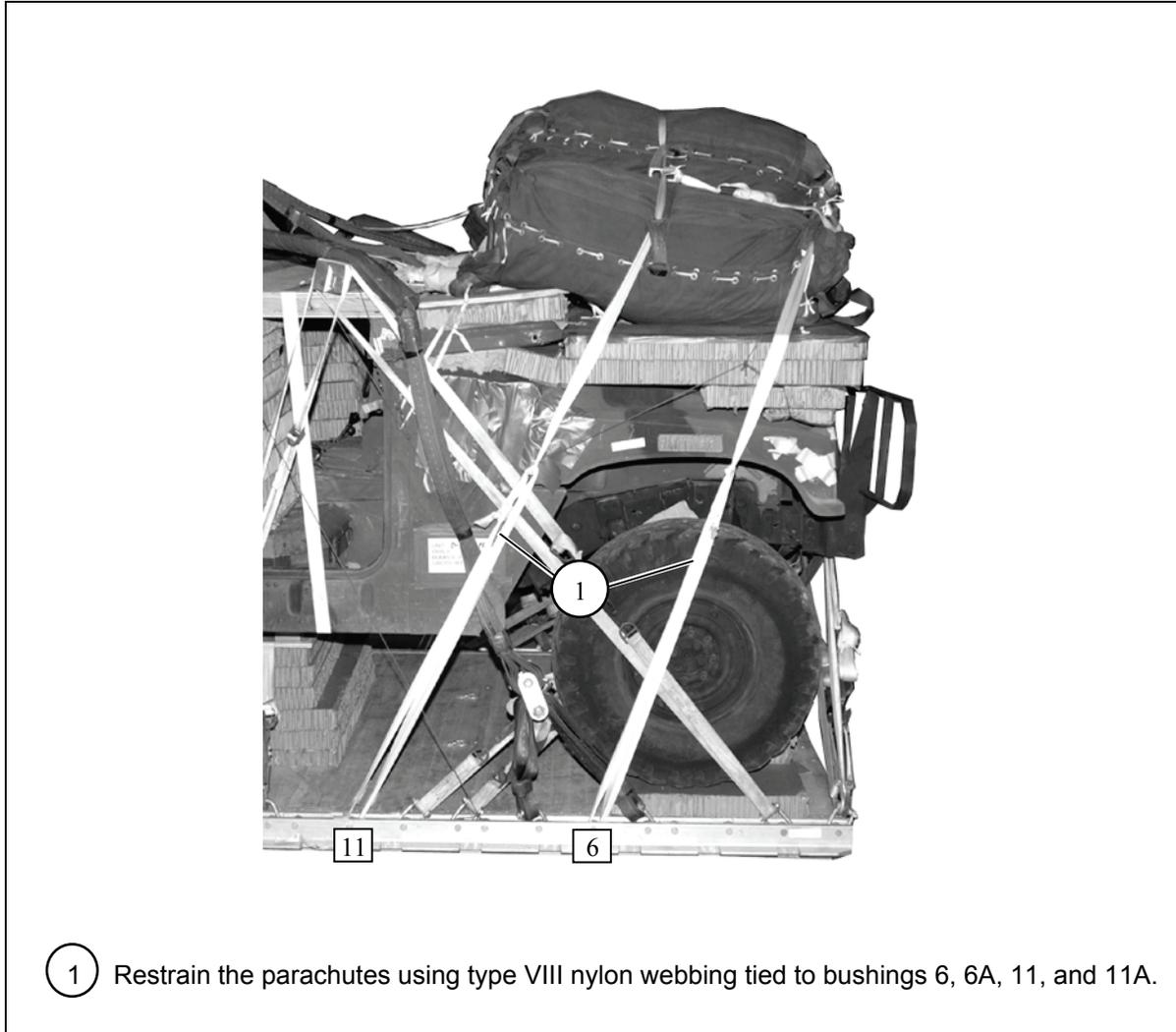
**Figure 3-19. Slings Installed and ACS Secured (Continued)**

## INSTALLING OUTRIGGER ASSEMBLIES

3-10. Assemble, install, and safety the mast and foot assemblies on the DRAS platform according to TM 10-1670-268-20&P/TO 13C7-52-22 and as shown in Chapter 2, Figures 2-42 through 2-44 and Figure 2-45 steps 1, 2, and 3.

## STOWING CARGO PARACHUTES

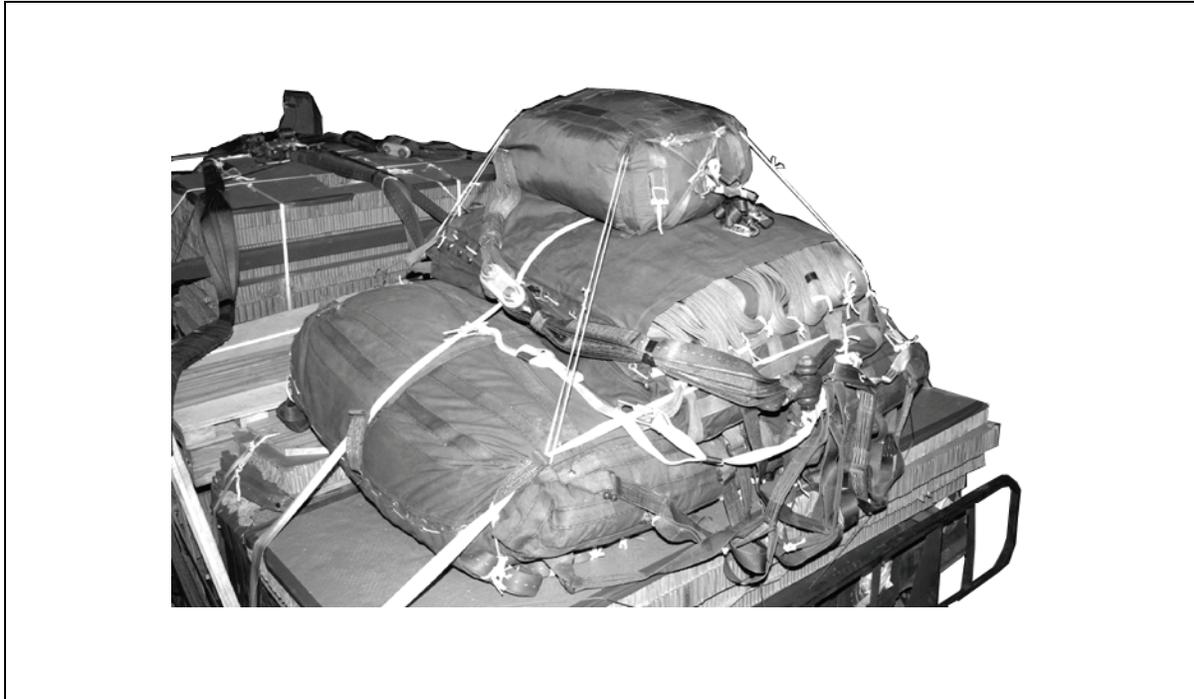
3-11. Prepare, stow, and restrain three G-11D cargo parachutes on top of the hood of the truck as shown in Chapter 2 and as shown in Figure 2-27.



**Figure 3-20. Cargo Parachutes Installed**

## STOWING DEPLOYMENT PARACHUTE

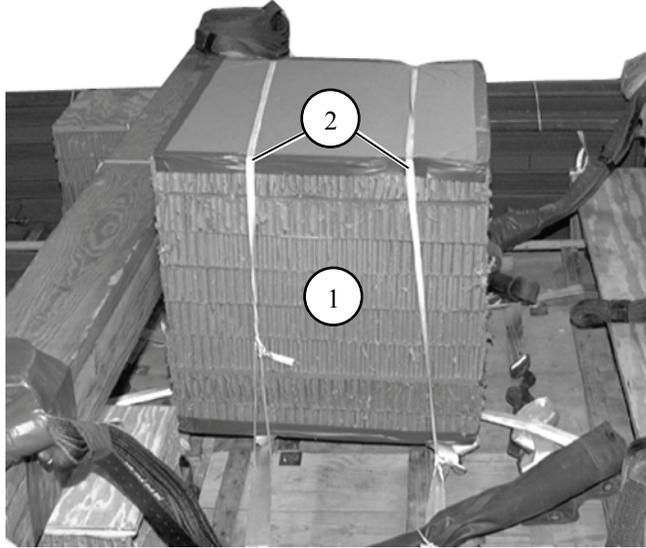
3-12. Prepare, stow, and install the deployment parachute according to Chapter 2, Section V and as shown in Figure 3-21.



**Figure 3-21. Deployment Parachute Installed**

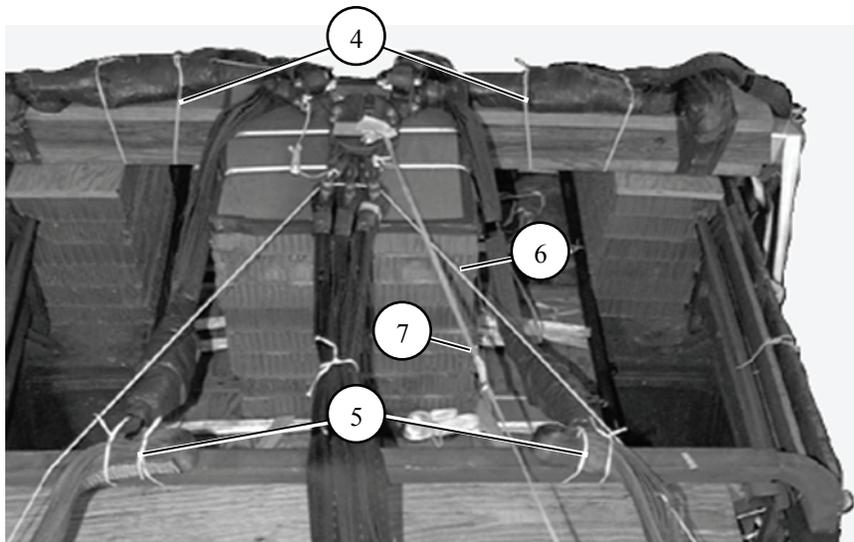
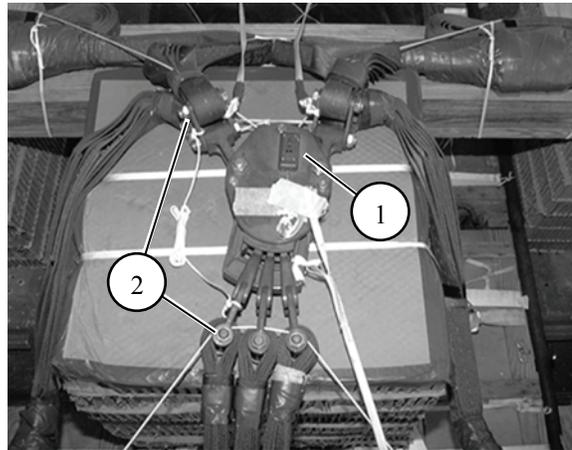
## INSTALLING PARACHUTE RELEASE SYSTEM

3-13. Build an M-1 release stack as shown in Figure 3-22. Prepare and install an M-1 release system according to Chapter 2, Section VI and as shown in Figure 3-23.



- ① Cut eight 24-by 24-inch pieces of honeycomb and glue together to form the M-1 release parachute stack. Ensure the support stack is higher than the highest point in the cargo bed. Tape the top edges of the honeycomb.
- ② Center the M-1 release support stack in front of the rear ACS. Secure the support stack to convenient points in the cargo bed with two lengths of ½-inch tubular nylon webbing.

**Figure 3-22. Parachute Release Stack Positioned**

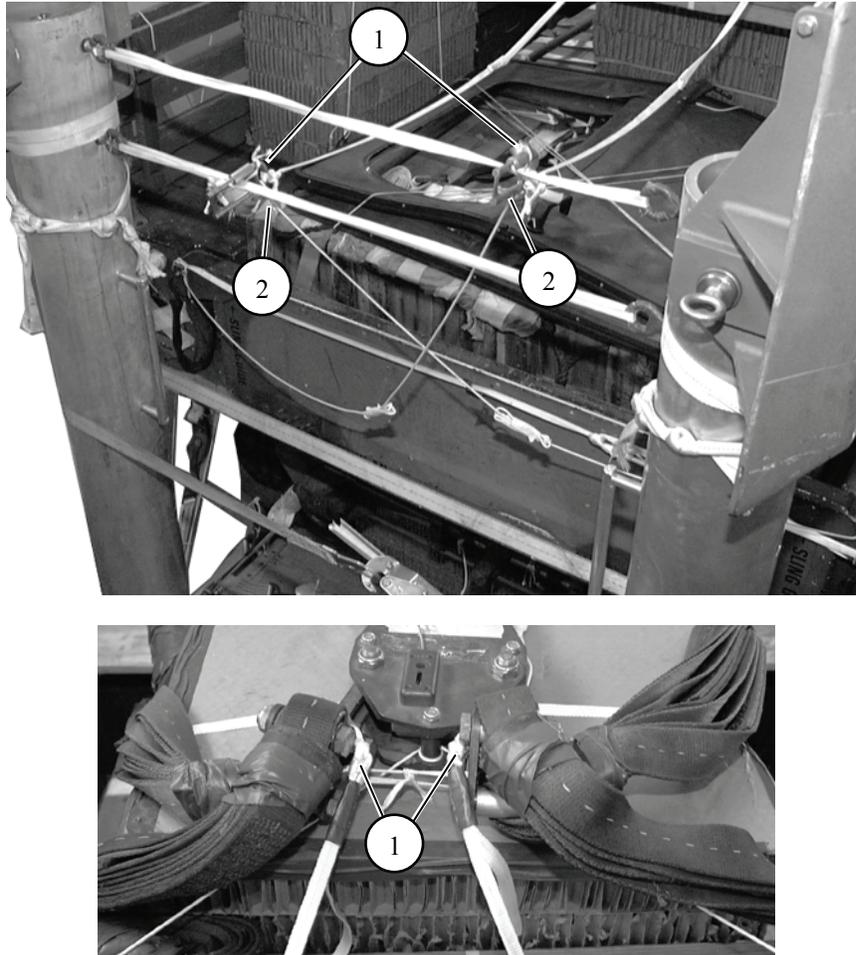


- ① Center the M-1 release on the support stack.
  - ② Attach riser extensions and suspension slings to the M-1 release.
- Note.** Remove the buffers from the ends of the suspension slings that attach to the M-1 release.
- ③ Group the riser extensions together and tie with type I, ¼-inch cotton webbing, making three ties (not shown).
  - ④ S-fold the slack in the rear suspension slings on top of the rear ACS. Make two ties with type I, ¼-inch cotton webbing around each sling and the rear ACS.
  - ⑤ S-fold the slack in the front suspension slings on top of the crew compartment cross member. Make two ties with type I, ¼-inch cotton webbing around each sling and the cross member.
  - ⑥ Safety tie to a convenient place on the load with type III nylon cord.
  - ⑦ Secure arming wire and lanyard to a carrying handle of a parachute with three alternating half hitches and an overhand knot in the running end.

**Figure 3-23. M-1 Parachute Release Installed**

## INSTALLING MAST RELEASE KNIVES

3-14. Install the mast release knives according to Chapter 2, Figure 2-45, steps 4 through 10 and as shown in Figure 3-24.



- ① The length of the left and right ½-inch tubular nylon webbing from the base of the guillotine knives to the lower suspension links of the M-1 release is 67 inches (shown in steps 5 through 7 of Figure 2-45).
- ② Tie a length of type III nylon cord through the left tailgate sling guide and to the body of the right top guillotine knife that measures 86-inches from the tailgate sling guide to the base of the guillotine knife. Repeat for right tailgate sling guide and left lower guillotine knife (shown in steps 9 and 10 of Figure 2-45).

**Note.** All measurements are from knot to knot.

**Figure 3-24. Mast Release Knives Installed**

## MARKING RIGGED LOAD

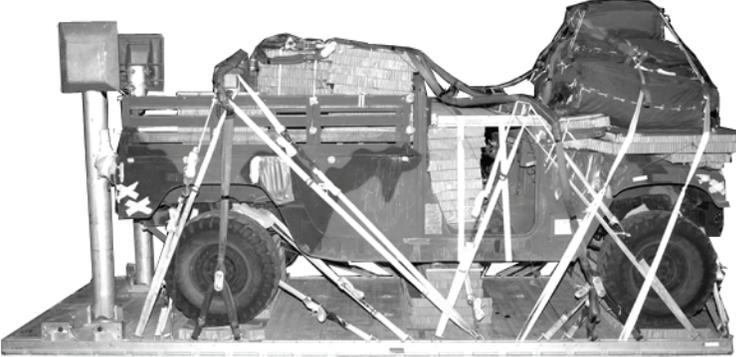
3-15. Mark the rigged load according to Chapter 2, Section IX and as shown in Figure 3-25. A Shipper's Declaration for Dangerous Goods is required. If the load varies from the one shown, the weight, height, CB, and parachute requirements must be recomputed.

## EQUIPMENT REQUIRED

3-16. The equipment required to rig these loads is listed in Table 3-1.

**CAUTION**

Make the final rigger inspection required by Chapter 2, Section IX before the load leaves the rigging site.



**RIGGED LOAD DATA**

Weight: M998.....	10,912 pounds
M1038 .....	11,165 pounds
M1097 .....	10,097 pounds
Maximum load allowed.....	12,750 pounds
Height .....	98 inches
Width.....	94 inches
Overall Length .....	228 inches
Overhang: Front .....	12 inches
Rear.....	0 inches
Center of Balance (from front edge of platform):	
M998.....	89 inches
M1038.....	91 inches
M1097.....	90 inches

**Figure 3-25. M998/M1038/M1097 Cargo/Troop Carriers Rigged on DRAS Platform**

**Table 3-1. Equipment Required for Rigging M998/M1038/M1097 Cargo/Troop Carrier on DRAS Platform**

<i>National Stock Number</i>	<i>Item</i>	<i>Quantity</i>
8040-00-273-8713	Adhesive paste, 1-gallon	As required
4020-00-240-2146	Cord, nylon, type III, 550-pound	As required
	Clevis,	
4030-00-090-5354	Large	3
4030-00-678-8562	Medium	6
1670-00-360-0328	Cover, clevis, large	3
8135-00-664-6958	Cushioning material, packaging, cellulose wadding	As required
8305-00-191-1101	Felt, ½-inch	As required
1670-01-493-6418	Link assembly, two-point, 3 ¾-inch	9
	Lumber:	
5510-00-220-6146	2- by 4-inch	As required
5510-00-220-6148	2- by 6-inch	As required
5510-00-220-6274	4- by 4-inch	As required
5530-00-618-8073	Plywood, ¾-inch	5 sheets
	Nail, steel wire, common,	
5315-00-010-4659	8d	As required
5315-00-753-3883	10d	As required
5315-00-010-4666	40d	
1670-00-753-3928	Pad, energy dissipating, honeycomb	18 sheets
1670-01-487-5461	Static line assembly release away	1
	Parachute:	
	Cargo:	
1670-01-016-7841	G-11D	3
1670-00-040-8135	Cargo extraction: 28-foot (deployment parachute)	1
	Platform, dual row, 18-foot	
1670-01-485-1654	Rail, DRAS	2
1670-01-486-1342	Roller Pad, DRAS	4
1670-01-486-1656	Panel Assembly, Main	9
1670-01-162-2372	Clevis assembly	36
1670-01-097-8816	Release, cargo parachute, M-1	1
	Sling, cargo airdrop	
	For suspension:	
1670-01-062-6310	11-ft (4-loop), type XXVI nylon webbing	4
1670-01-062-6306	3-ft (4-loop), type XXVI nylon webbing	8
	For deployment:	
1670-01-062-6306	3-ft (4-loop), type XXVI nylon webbing	1
	For riser extension:	
1670-01-062-6313	60-ft (3-loop), type XXVI nylon webbing	3

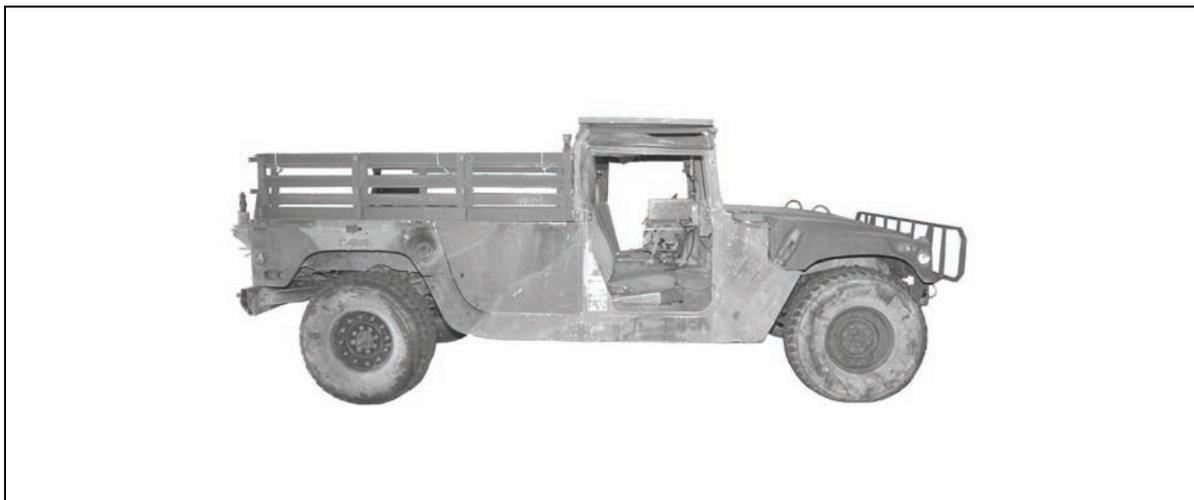
**Table 3-1. Equipment Required for Rigging M998/M1038/M1097 Cargo/Troop Carrier on DRAS Platform (Continued)**

<i>National Stock Number</i>	<i>Item</i>	<i>Quantity</i>
1670-01-063-7761	For ACS: 16-ft (2-loop), type XXVI nylon webbing	1
1670-01-062-6304	For lifting: 9-ft (2-loop), type XXVI nylon webbing	2
1670-01-062-6303	12-ft (2-loop), type XXVI nylon webbing	2
1670-00-040-8219	Strap, parachute release, multicut	2
1670-00-937-0271	Knife release, cargo (guillotine)	6
1670-01-487-5464	Outrigger assembly	1
7510-00-266-5016	Tape, adhesive, 2-in	As required
1670-00-937-0271	Tie-down assembly, 15-ft	45
1670-00-725-1437	Tie-down, cargo, aircraft, (CGU-1B)	3
8305-00-268-2411	Webbing: Cotton, ¼-in, type I	As required
8305-00-082-5752	Nylon: Tubular, ½-in	As required
8305-00-263-3591	Type VIII	As required

## SECTION II – RIGGING THE M1097 VARIANT CARGO/TROOP CARRIER

### DESCRIPTION OF LOAD

3-17. The M1097 variant cargo/troop carrier (Figure 3-26) is rigged on a DRAS platform with an accompanying load weighing a minimum of 800 pounds and a maximum of 2,000 pounds. It is 202 inches long, 85 inches wide and its height is 102 inches.



**Figure 3-26. M1097 Variant Cargo/Troop Carrier**

## PREPARING PLATFORM

3-18. Inspect, or assemble and inspect, a DRAS platform with outrigger assemblies and outrigger platform support weldments and link assemblies according to TM 10-1670-268-20&P/TO 13C7-52-22 and as shown in Figure 3-27.

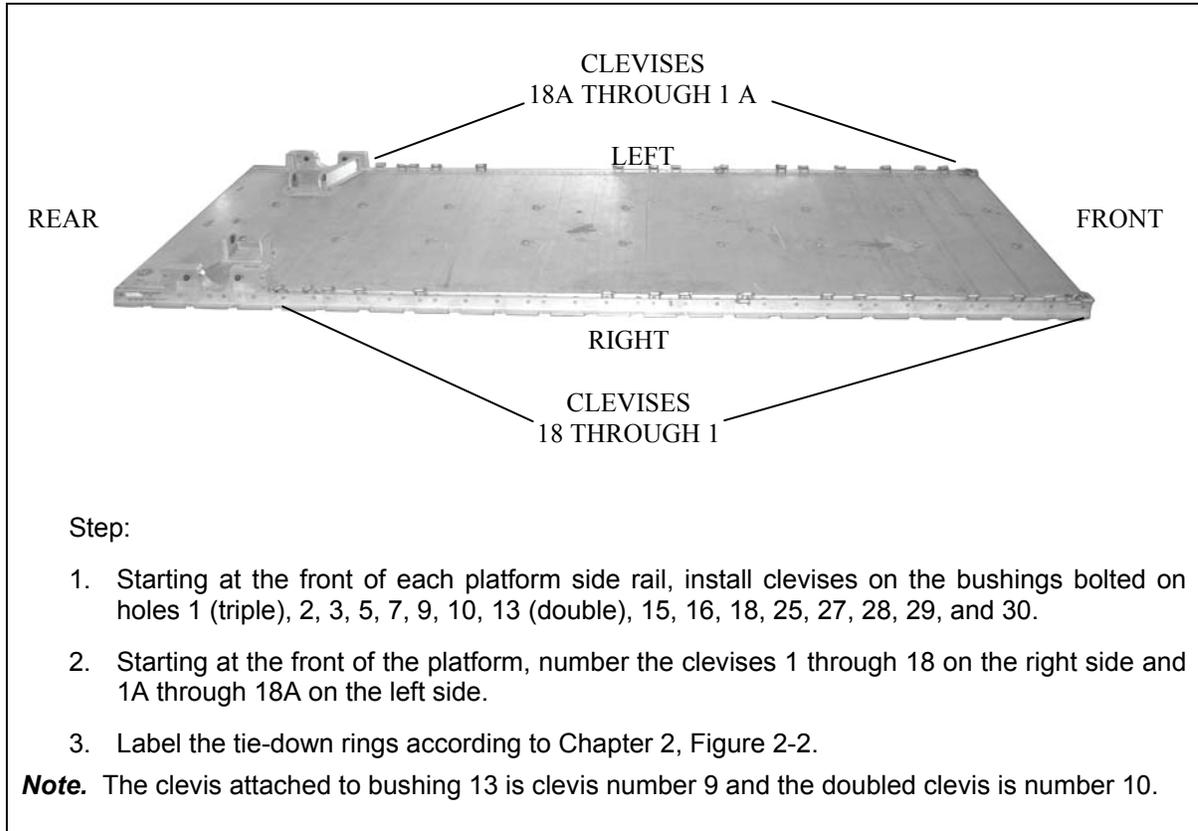


Figure 3-27. Platform Prepared

## BUILDING AND PLACING HONEYCOMB STACKS

3-19. Prepare the honeycomb stacks for the M1097 as shown in Figure 3-3. Position the honeycomb stacks as shown in Figure 3-4.

## INSTALLING OPTIONAL DRIVE-OFF AID ON PLATFORM

3-20. Install the drive-off aid as shown in Chapter 2, Figure 2-5.

## PREPARING TRUCK

3-21. Prepare the truck as described below.

- Make sure the fuel tank is no more than  $\frac{3}{4}$  full. Prepare the fuel tank filler cap and fuel filler opening as shown in Figure 3-5. Prepare the fuel tank drain plug as shown in Figure 3-6.

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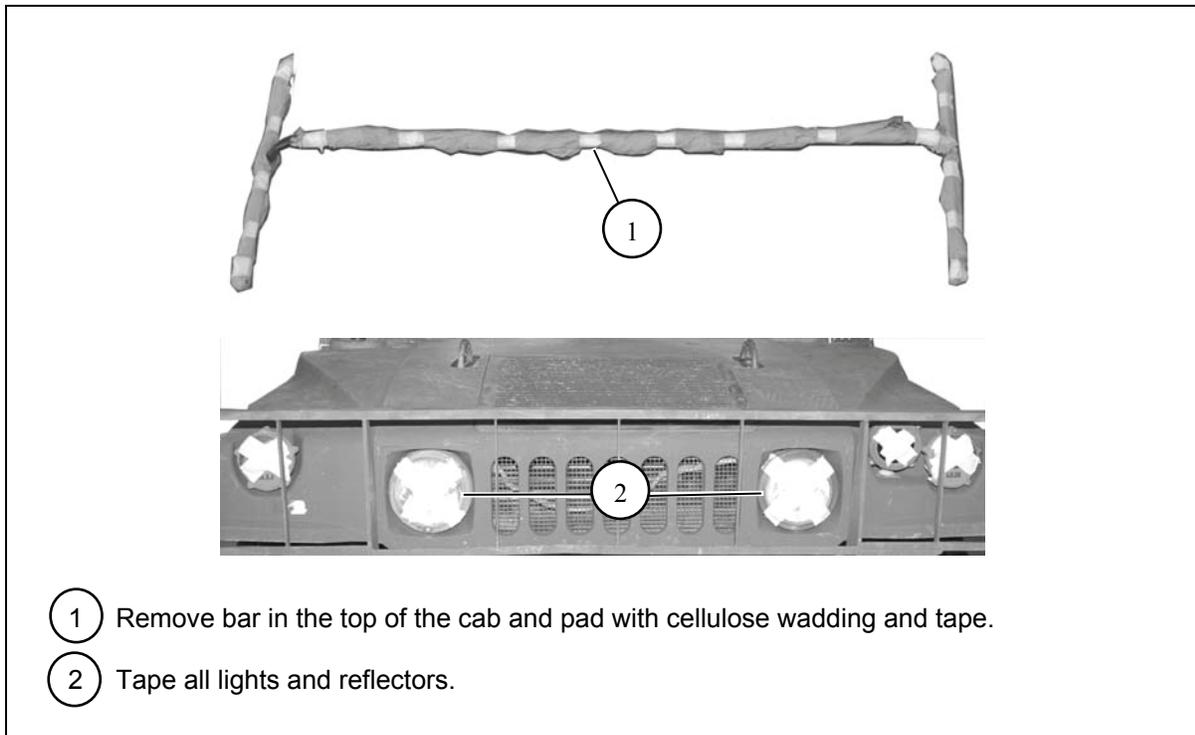
**Note.** Certain units may be authorized a waiver allowing 95% fuel. One way to verify the tank is 95% full is to fill the tank and withdraw 1  $\frac{1}{4}$ -gallons with a hand pump.

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### CAUTION

A full tank does not allow for expansion and is a danger to the aircraft and air crew.

- Make sure the batteries and battery compartment comply with AFMAN 24-204(I)/TM 38-250.
- Prepare the cab of the truck as shown in Figure 3-7.
- Secure and pad radio equipment in the cab section as shown in Figure 3-8.
- Remove the bar in the top of the cab and pad with cellulose wadding and tape as shown in Figure 3-28.
- Prepare front of vehicle as shown in Figure 3-28.
- Prepare and secure the pioneer tool kit according to TM 9-2320-280-10/TO 36A12-1A-2091-1/TM 2320-10/6B and as shown in Figure 3-10.
- Prepare the underside of the truck as shown in Figure 3-11.



- 1 Remove bar in the top of the cab and pad with cellulose wadding and tape.
- 2 Tape all lights and reflectors.

**Figure 3-28. Front of Truck Prepared**

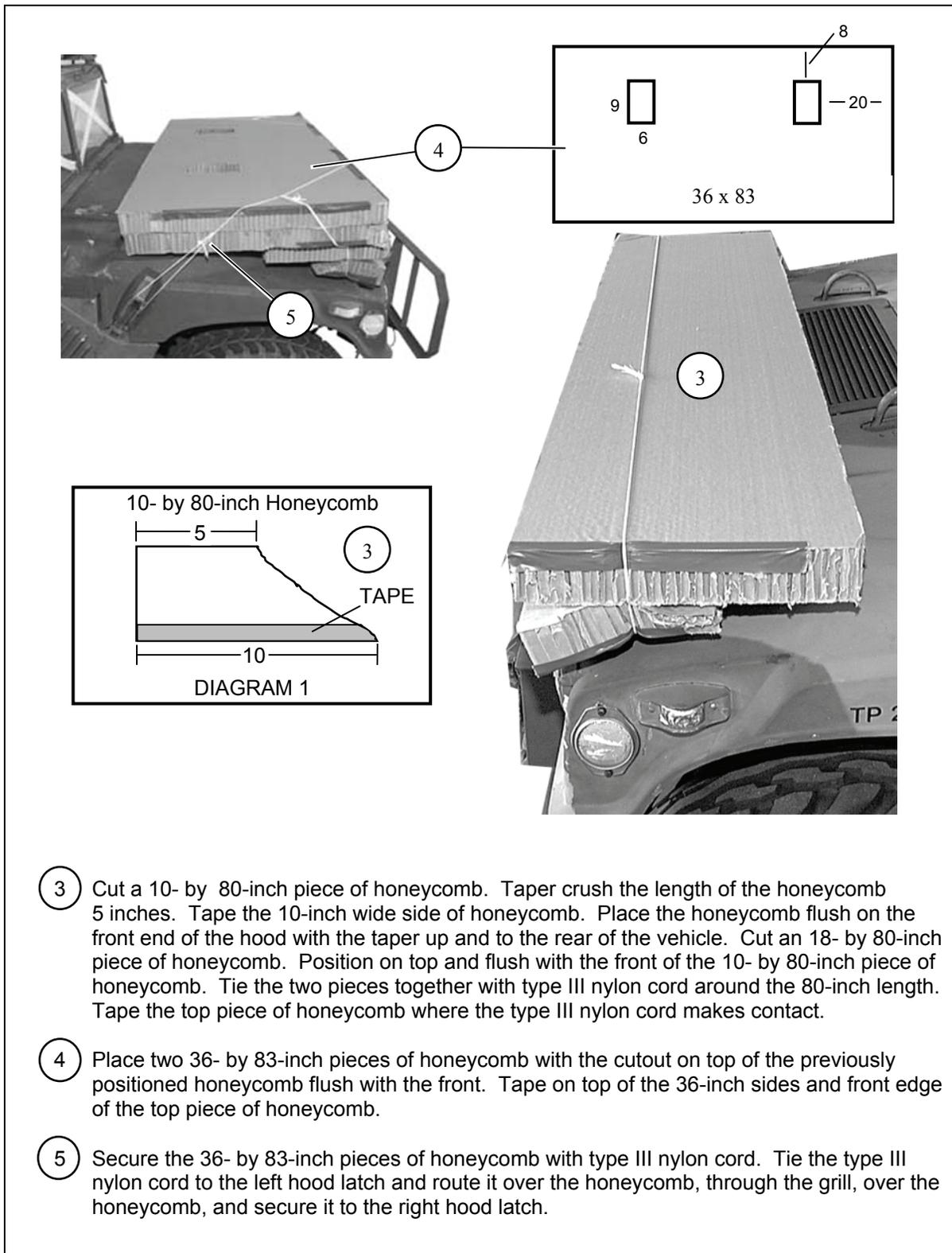
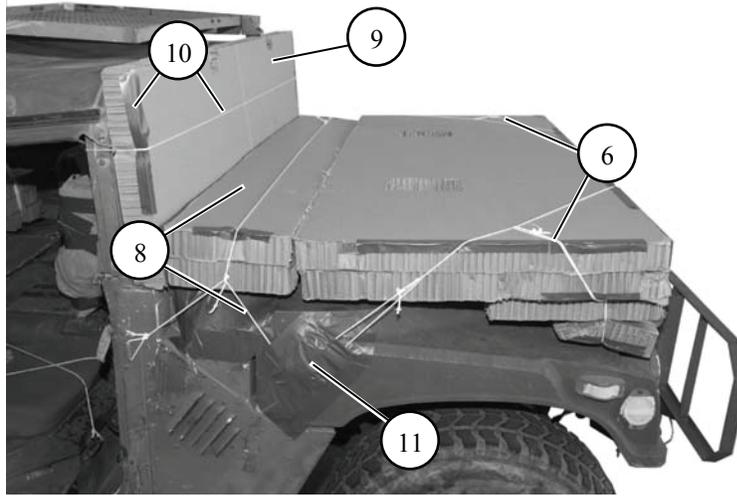


Figure 3-28. Front of Truck Prepared (Continued)



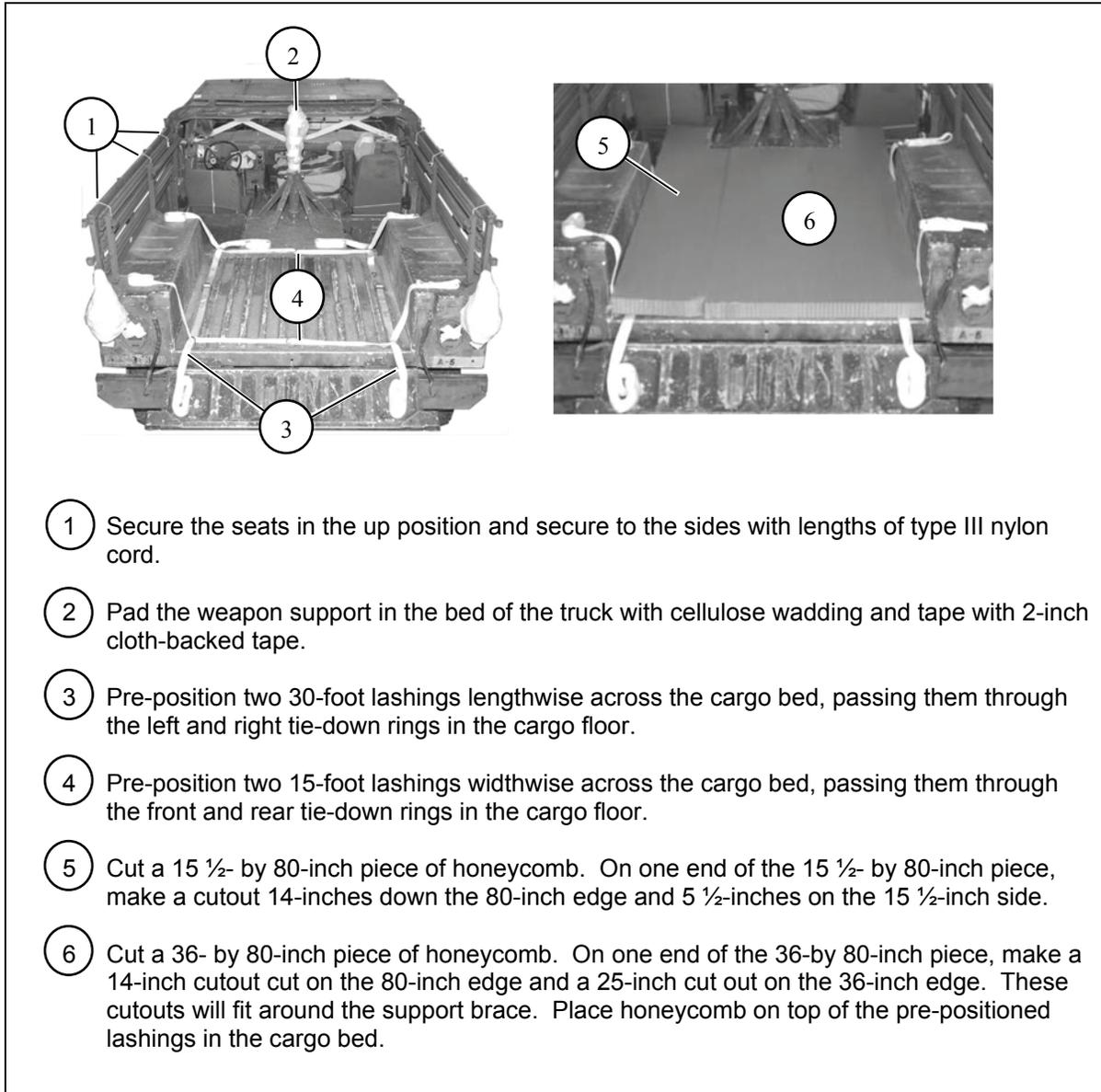
- ⑥ Run a length of type III nylon cord through the securing ties on the bottom two layers of honeycomb and through the securing ties on the top two layers of honeycomb on each side of load.
- ⑦ Remove the breather cap. Place a layer of felt over the intake hole, and tape the felt in place (not shown).
- ⑧ Cut and position two 12- by 83-inch pieces of honeycomb behind the 36- by 83-inch pieces of honeycomb. Tape along the top 12-inch sides and secure the honeycomb with a length of type III nylon cord to the hood latch and door hinge.
- ⑨ Cut a 21- by 83-inch piece of honeycomb and place it in front of the windshield. Make cutouts where the honeycomb makes contact with the ammunition rack braces.
- ⑩ Tape along the 21-inch edges on each side and secure it in place with a length of type III nylon cord.
- ⑪ Tape the hood latch with 2-inch cloth-backed tape.

**Figure 3-28. Front of Truck Prepared (Continued)**

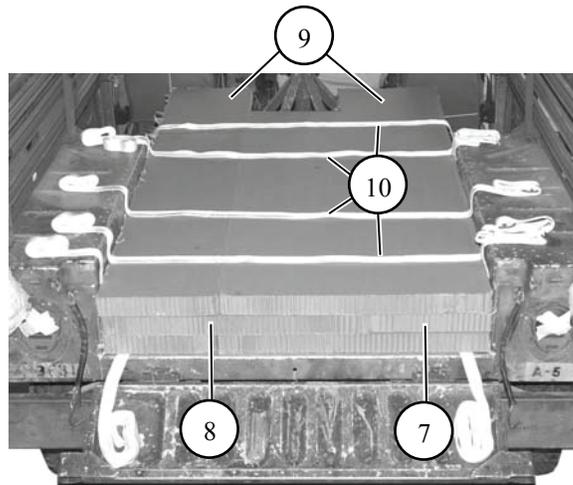
## STOWING ACCOMPANYING LOAD

3-22. Use the procedures shown in Figure 3-29 to stow ammunition boxes and truck equipment.

*Note.* The accompanying load may vary from the one shown. Ensure the load is properly secured and weighs between 800 and 2,000 pounds.

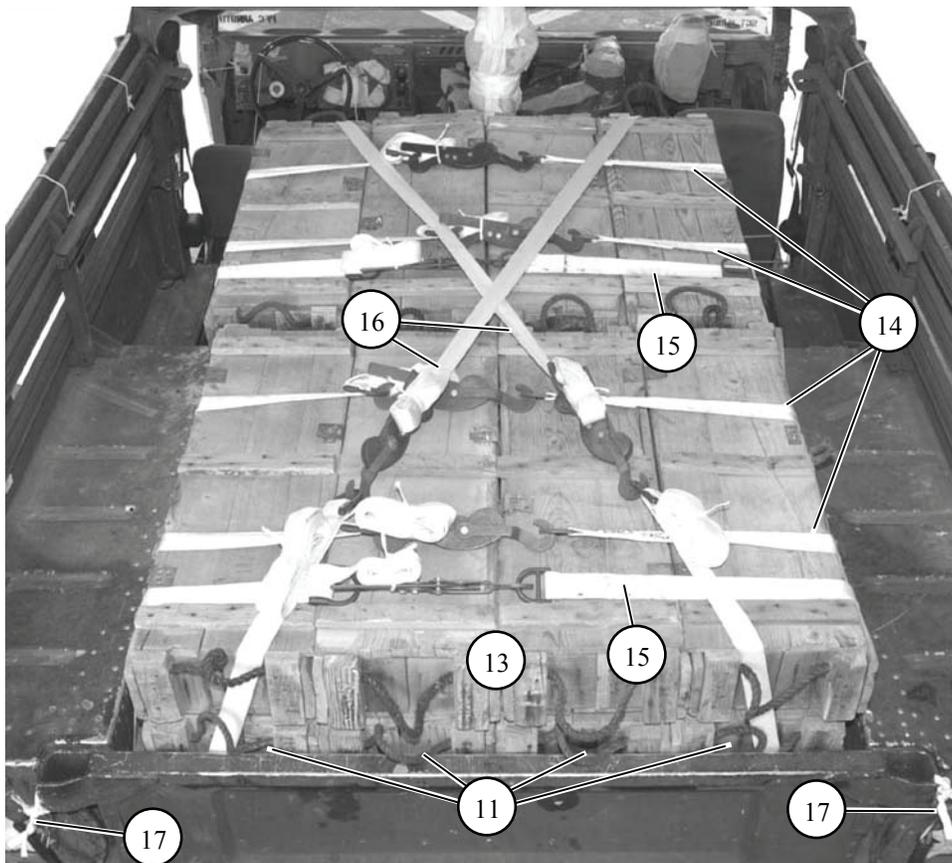


**Figure 3-29. Ammunition and Truck Equipment Stowed**



- 7 Cut a 15 ½- by 80-inch piece of honeycomb. On one end of the 15 ½- by 80-inch piece, make a cutout 12 inches down the 80-inch edge and 3 ½ inches on the 15 ½-inch side.
- 8 Cut a 36- by 80-inch piece of honeycomb. On one end of the 36-by 80-inch piece, make a 12-inch cutout on the 80-inch edge and a 23-inch cutout on the 36 inch edge. These cutouts will fit around the support brace. Place on top of the honeycomb previously positioned.
- 9 Cut a 15 ½- by 80-inch and a 36- by 80-inch piece of honeycomb. On one end of the 36-by 80-inch piece, make a 12-inch cutout on the 80-inch edge and a 19-inch cutout on the 36-inch edge. These cutouts will fit around the support brace. Place on top of the honeycomb previously positioned.
- 10 Position four 15-foot lashings evenly spaced across the honeycomb widthwise.

**Figure 3-29. Ammunition and Truck Equipment Stowed (Continued)**



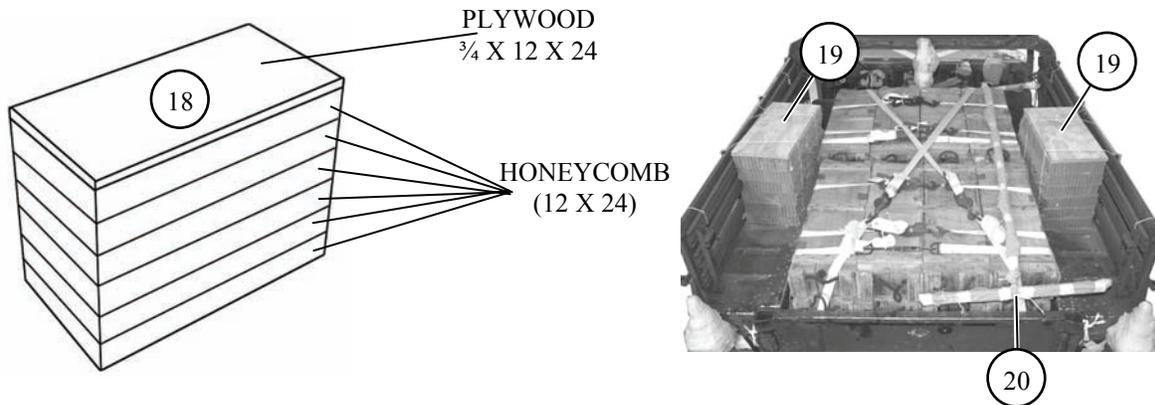
- ⑪ Position four ammunition boxes across and flush with the rear edge of the honeycomb.

**Note.** Lift the tailgate to ensure it closes completely. Do not close permanently.

- ⑫ Position four ammunition boxes in front of the previously positioned ammunition boxes on top of the honeycomb (not shown).
- ⑬ Position eight ammunition boxes on top of the previously positioned ammunition boxes.
- ⑭ Secure the four pre-positioned lashings on top of the honeycomb around all the ammunition boxes. Secure the load binders on top of the ammunition boxes.
- ⑮ Secure the two pre-positioned lashings that are routed through the cargo bed tie-down rings around the ammunition boxes. Secure the load binders on top of the ammunition boxes.
- ⑯ Join the pre-positioned left front and right rear and the right front and left rear 30-foot lashings to form an X. The load binders will be secured on top of the ammunition boxes.
- ⑰ Close the tailgate and secure the tailgate with two ½-inch tubular nylon webbing ties on each side.

**Figure 3-29. Ammunition and Truck Equipment Stowed (Continued)**

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



- 18 Cut twelve 12-inch by 24-inch pieces of honeycomb. Form two rear ACS support stacks by gluing six layers of 12-inch by 24-inch honeycomb. Cut two 12-inch by 24-inch by  $\frac{3}{4}$ -inch pieces of plywood and glue one piece on top of each stack as shown above.
- 19 Position the rear ACS support stacks on the front edge of the rear wheel wells. Secure the support stacks with two lengths of type III nylon cord to a convenient point on the load.
- 20 Position the cab bar on top of the ammunition boxes and secure the bar to a convenient point on the load. Ensure the bar can not move or shift.

**Figure 3-29. Ammunition and Truck Equipment Stowed (Continued)**

## BUILDING THE CAB SUPPORT

3-23. Build the cab support as shown in Figure 3-30.

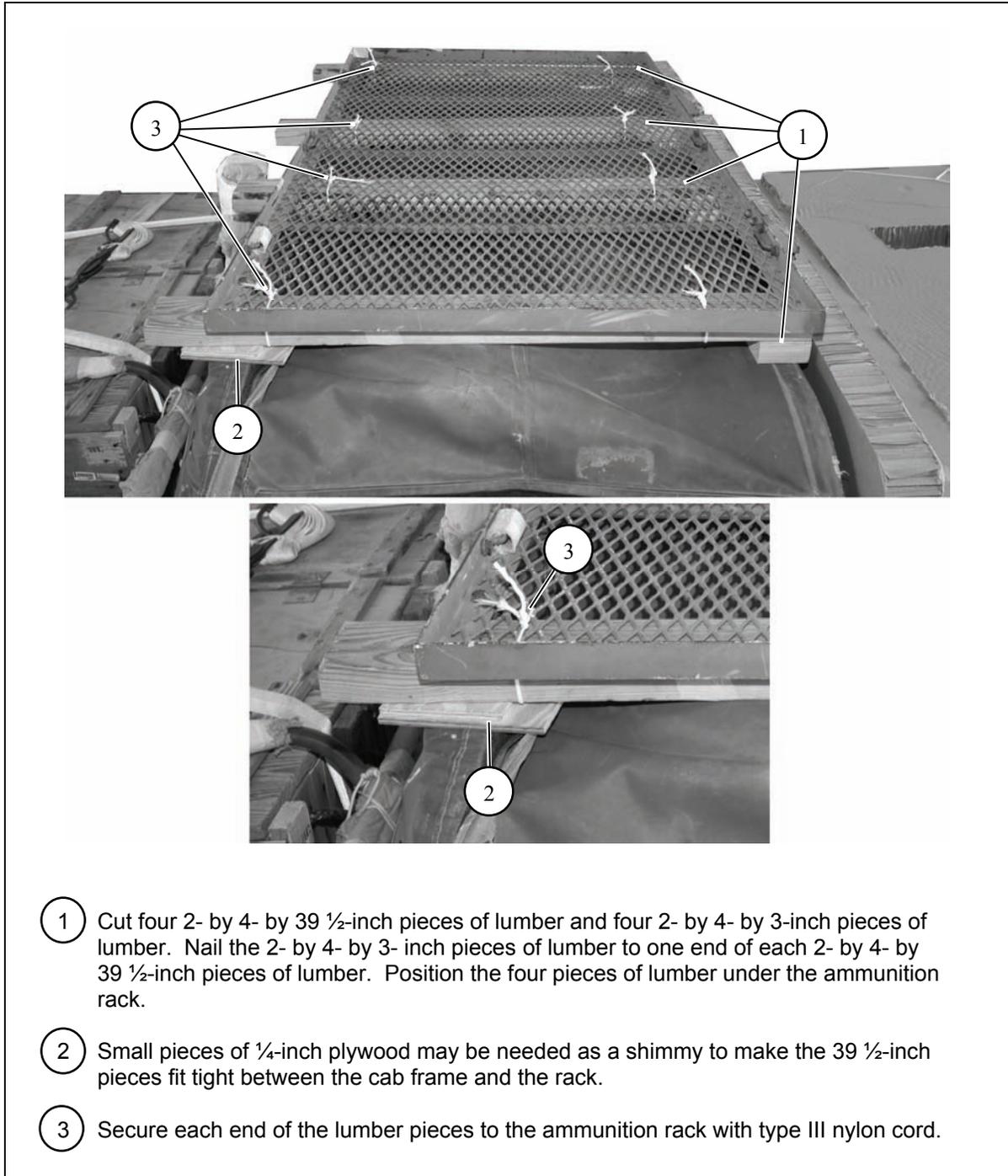
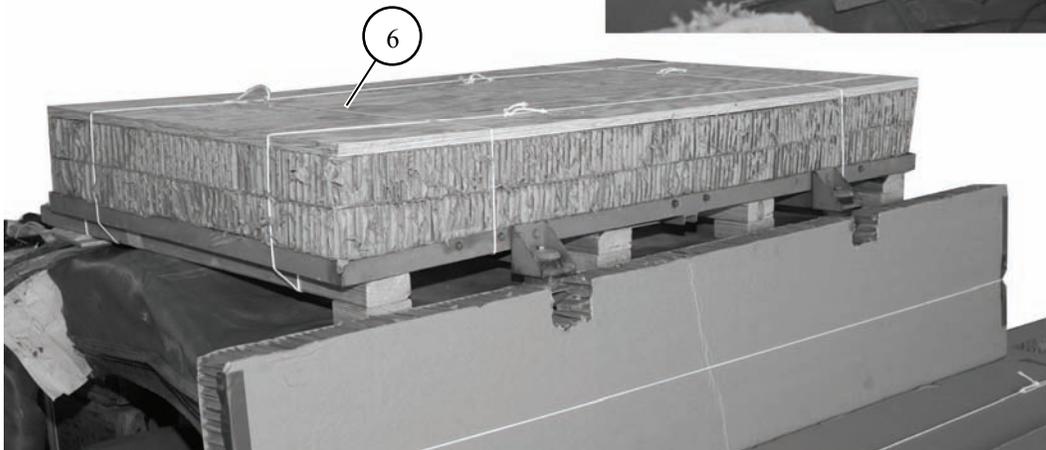
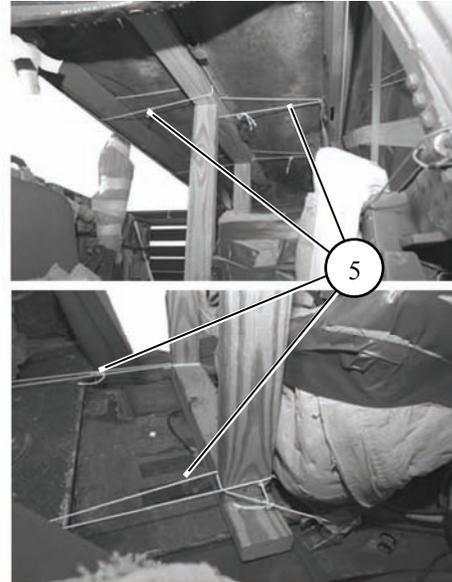
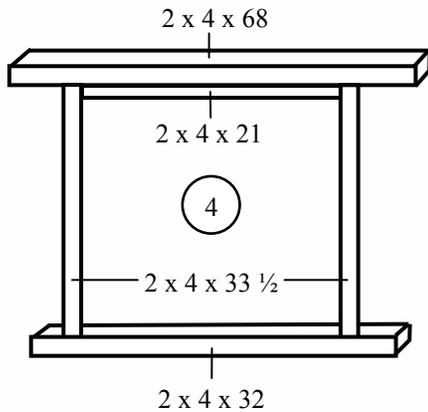


Figure 3-30. Cab Support Built

- Notes.** 1. Drawing not to scale.  
 2. All dimensions are given in inches.  
 3. Use 8d nails.



- ④ Build the cab support as shown above. Nail the lumber together with 8d nails.
- ⑤ Center the support under the ammunition rack running widthwise across. Secure the supports in place with several lengths of type III nylon cord to the front and rear cab frame supports. Secure the bottom of the support with lengths of type III nylon cord pulling in opposite directions to convenient points.
- ⑥ Cut two pieces of 64- by 35-inch honeycomb and one 64- by 35- by  $\frac{3}{4}$ -inch piece of plywood. Position the honeycomb inside the ammunition rack and the plywood on top. Secure the pieces in place with four lengths of type III nylon cord. Place two pieces of type III nylon cord running front to rear and two side to side under the ammunition rack and support pieces.

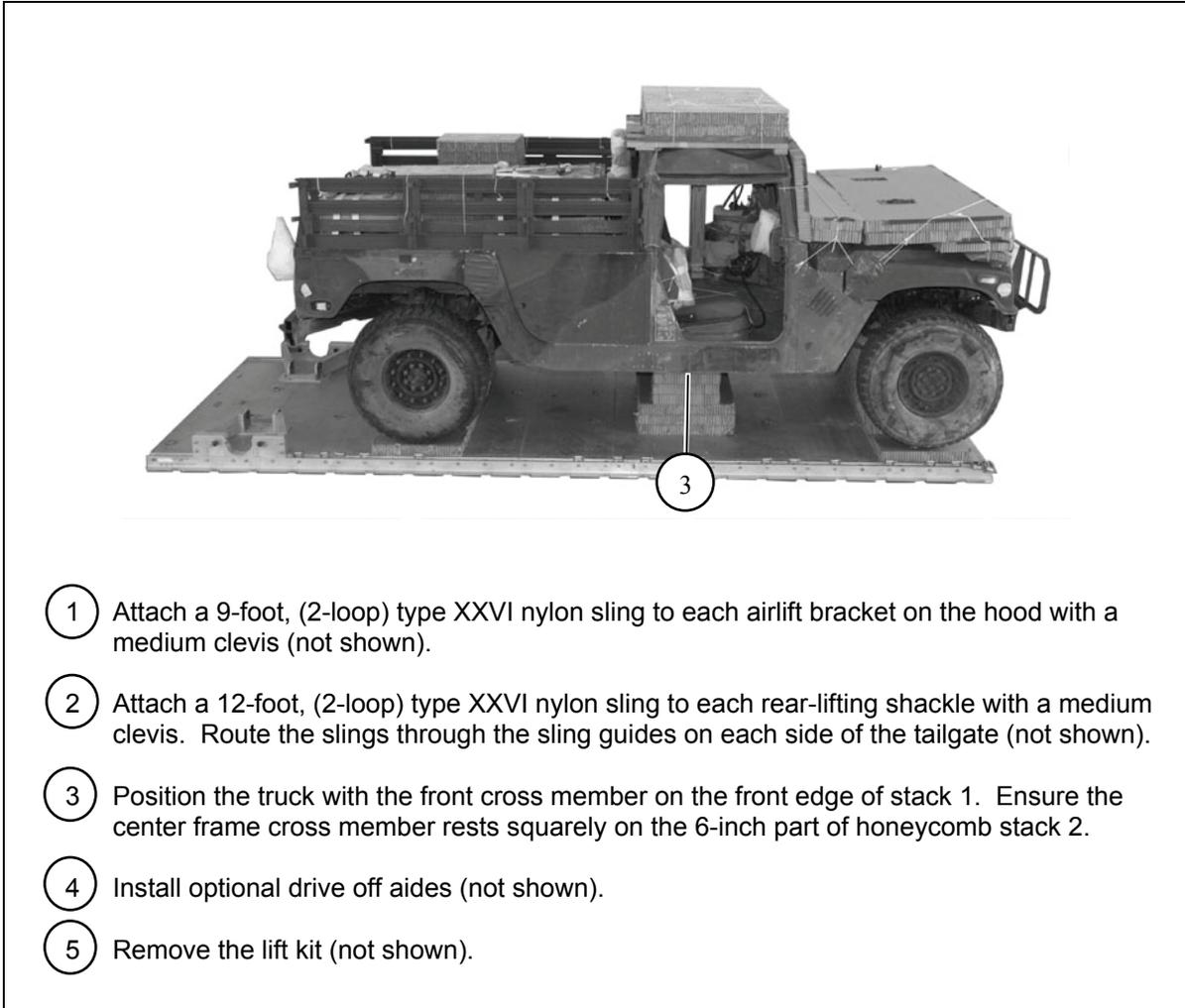
**Figure 3-30. Cab Support Built (Continued)**

## LIFTING AND POSITIONING TRUCK AND INSTALLING OPTIONAL DRIVE-OFF AIDS

3-24. Install the lifting slings and position the truck on the honeycomb stacks as shown in Figure 3-31. Attach the optional drive-off aids to the wheels of the truck as shown in Chapter 2.

## LASHING TRUCK

3-25. Lash the truck to the platform as shown in Figures 3-32 through 3-35.



**Figure 3-31. M1097 Positioned on Platform**

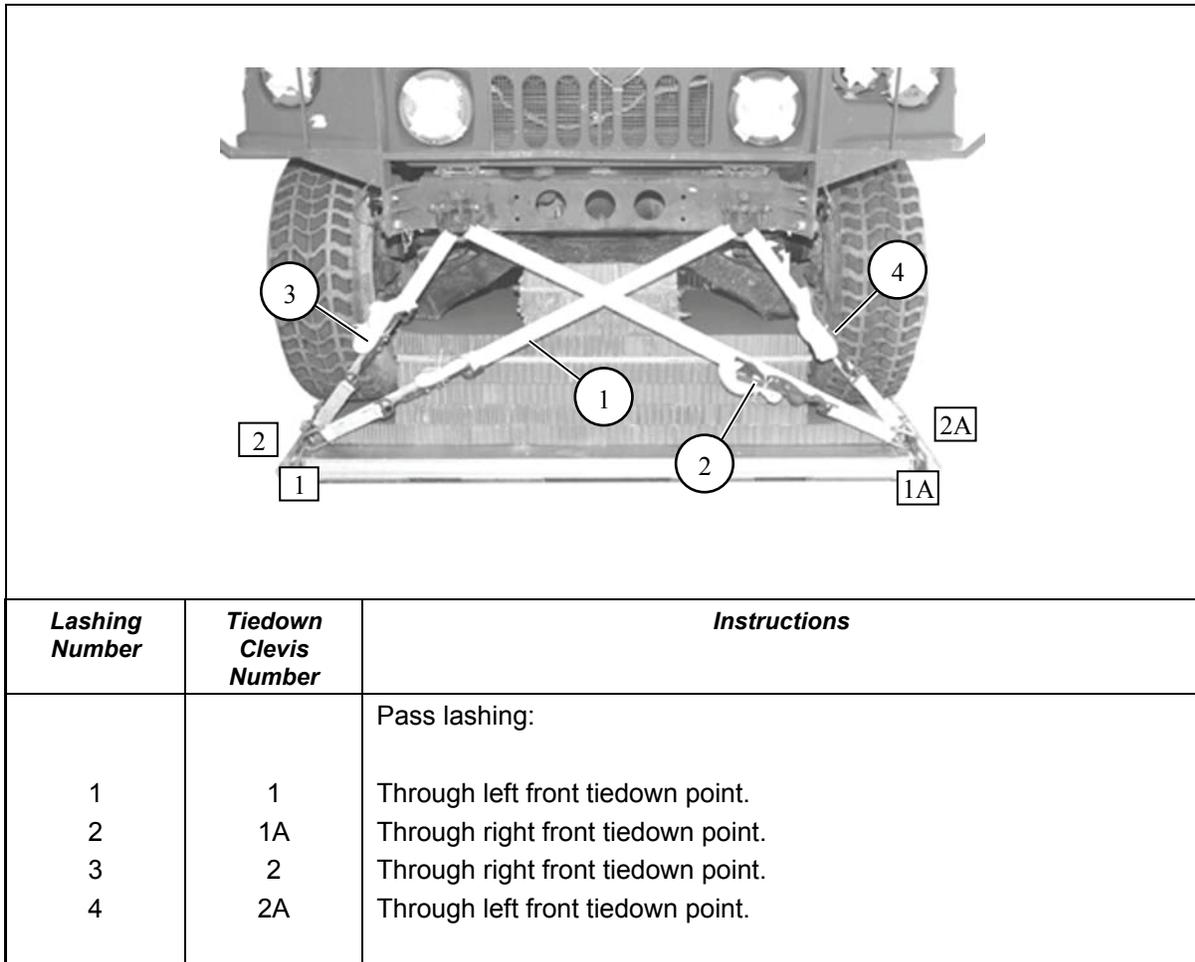
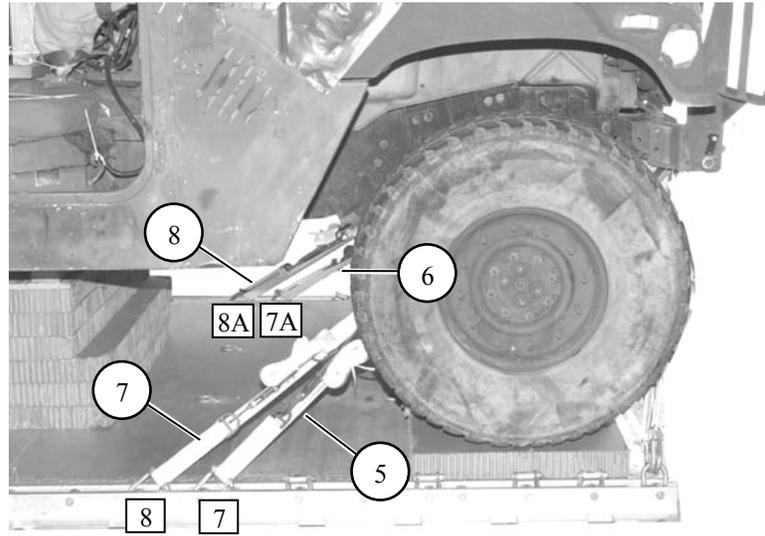
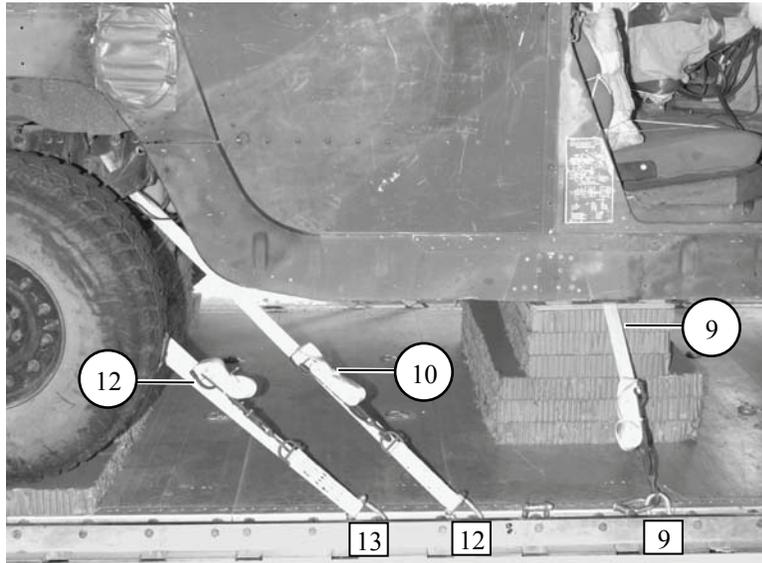


Figure 3-32. Lashings 1 Through 4 Installed



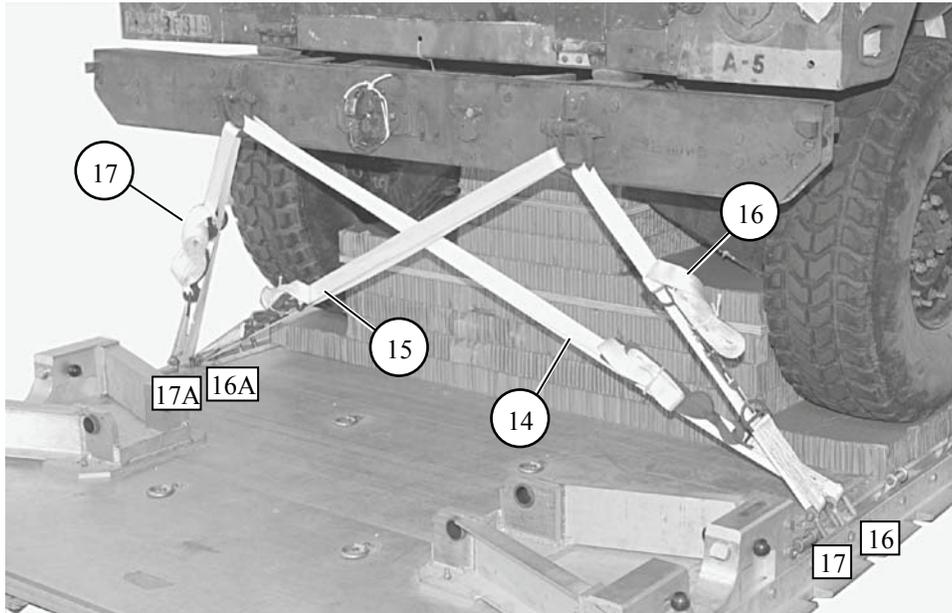
<b>Lashing Number</b>	<b>Tiedown Clevis Number</b>	<b>Instructions</b>
5	7	Pass lashing: Around right front lower control arm.
6	7A	Around left front lower control arm.
7	8	Through the tiedown bracket behind the right front coil spring.
8	8A	Through the tiedown bracket behind the left front coil spring.

**Figure 3-33. Lashings 5 Through 8 Installed**



<b>Lashing Number</b>	<b>Tiedown Clevis Number</b>	<b>Instructions</b>
9	9A and 9	Pass lashing: Through clevis 9A and back through its own D-ring through stack 2 and attach it with a loadbinder to clevis 9.
10	12	Through tiedown bracket behind right rear coil spring.
11	12A	Through tiedown bracket behind left rear coil spring.
12	13	Around right rear control arm.
13	13A	Around left rear control arm.

**Figure 3-34. Lashings 9 Through 13 Installed**

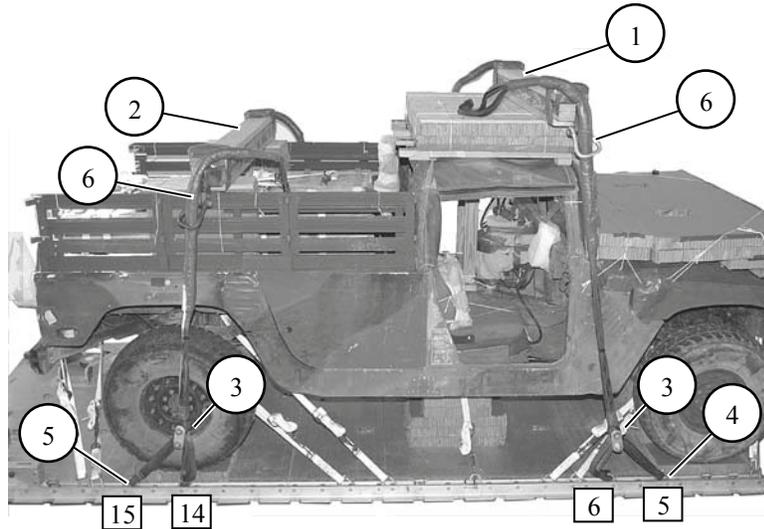


<i>Lashing Number</i>	<i>Tiedown Clevis Number</i>	<i>Instructions</i>
		Pass lashing:
14	16	Through left rear tiedown point.
15	16A	Through right rear tiedown point.
16	17	Through right rear tiedown point.
17	17A	Through left rear tiedown point.

Figure 3-35. Lashings 14 Through 17 Installed

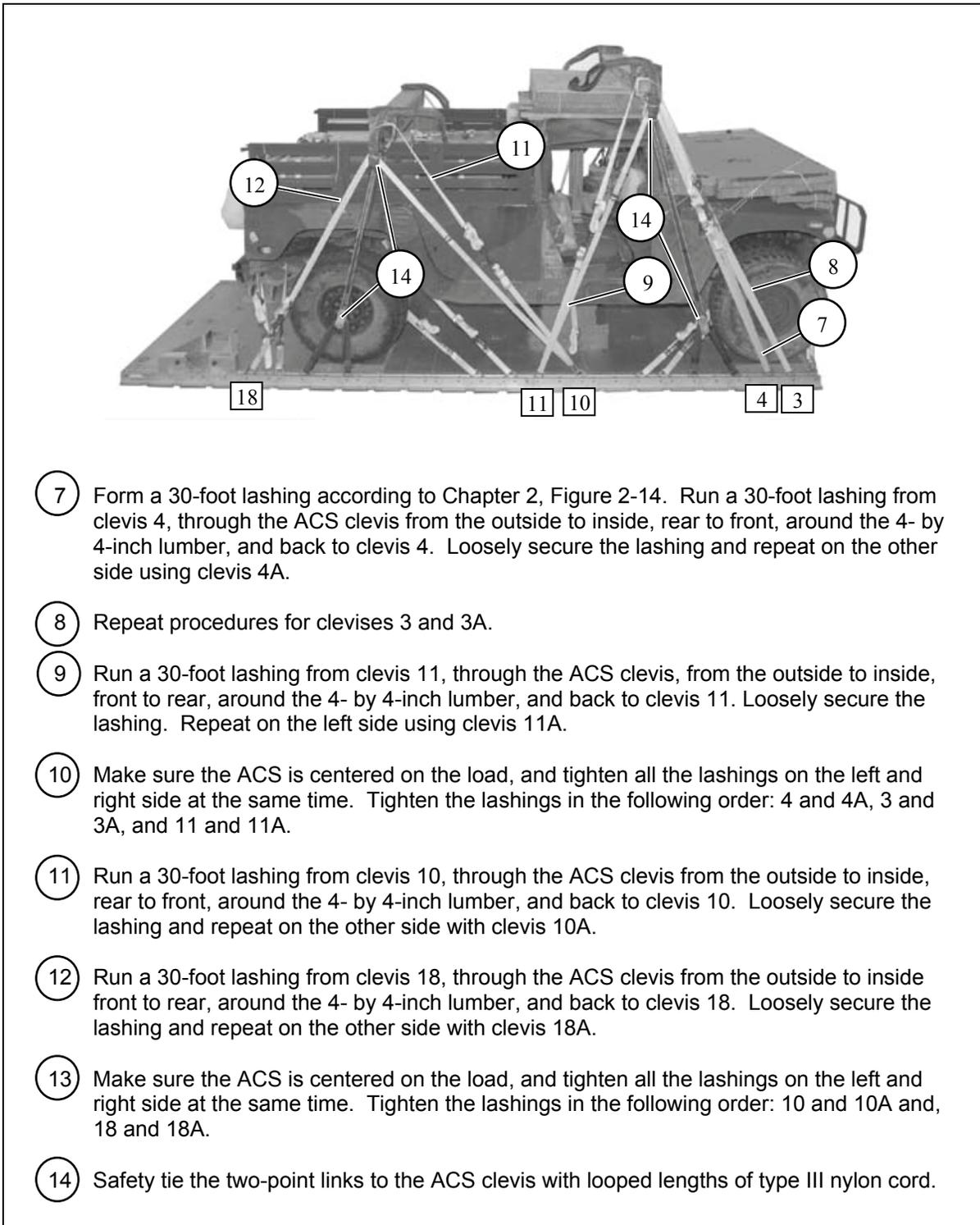
## INSTALLING SUSPENSION SLINGS AND THE ATTITUDE CONTROL SYSTEM

3-26. Construct and inspect the Altitude Control System (ACS) in accordance with Chapter 2, Section VII. Position and secure the front and rear ACS and install the suspension slings according to Figure 3-36. Secure the suspension slings according to Figure 3-37.



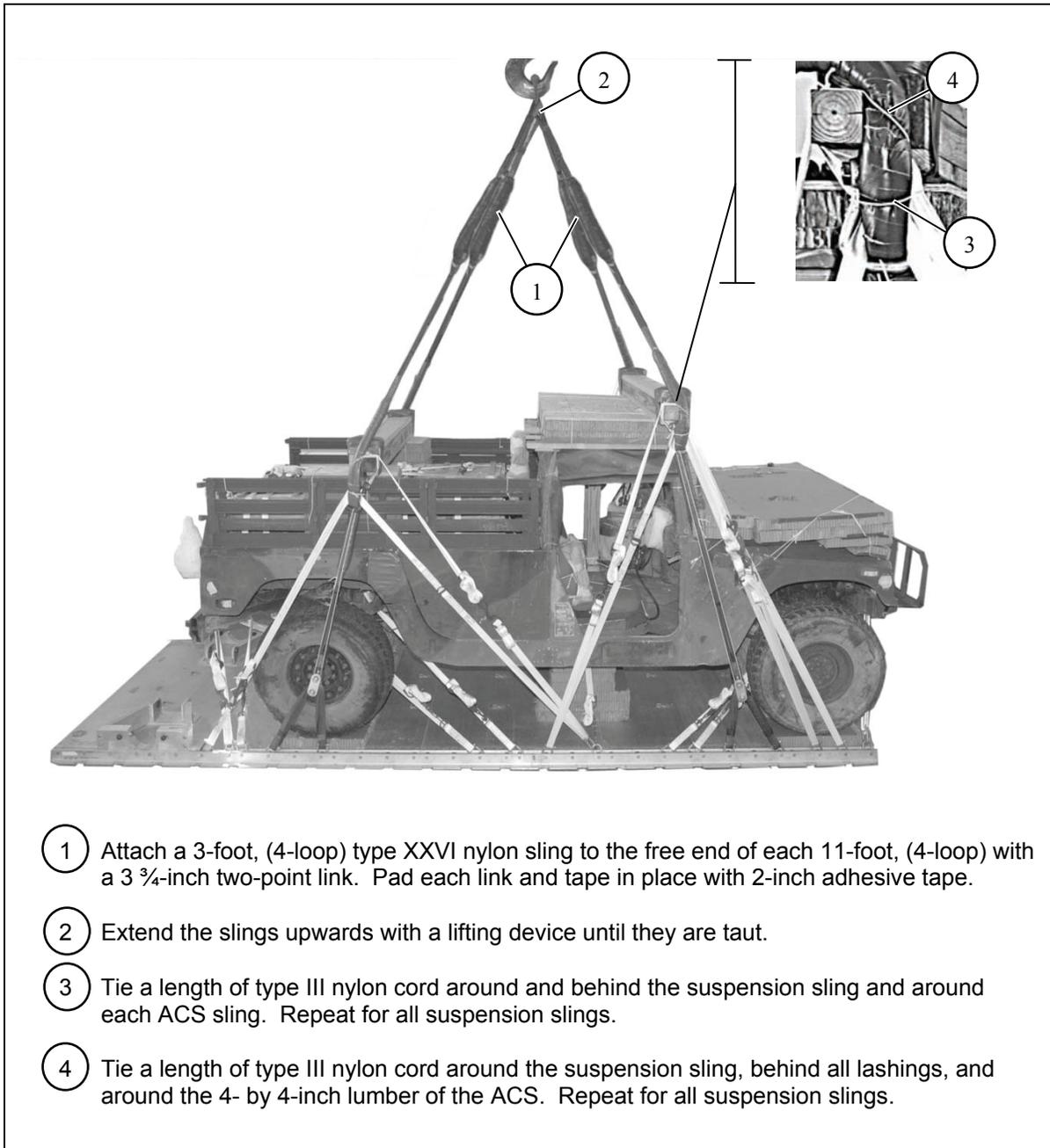
- 1 Position the front ACS even with the front edge of the honeycomb on top of the ammunition rack with the 4- by 4-inch lumber to the rear of the truck.
- 2 Position the rear ACS 12 inches from the rear of the ACS support stacks with the 4- by 4-inch lumber to the front of the truck.
- 3 Attach a 3 ¾-inch two-point link to an 11-foot, (4-loop) type XXVI nylon sling. Pass a 3-foot, (4-loop) type XXVI sling through the two-point link. Repeat this procedure three times.
- 4 Attach the ends of one 3-foot, (4-loop) nylon sling to clevises 5 and 6. Repeat for clevises 5A and 6A.
- 5 Attach the ends of one 3-foot, (4-loop) nylon sling to clevises 14 and 15. Repeat for clevises 14A and 15A.
- 6 Pad and tape the slings 6 inches above and 6 inches below the ACS clevis. Pass each sling through the closest ACS clevis.

**Figure 3-36. Suspension Slings Installed and ACS Secured**



- 7 Form a 30-foot lashing according to Chapter 2, Figure 2-14. Run a 30-foot lashing from clevis 4, through the ACS clevis from the outside to inside, rear to front, around the 4- by 4-inch lumber, and back to clevis 4. Loosely secure the lashing and repeat on the other side using clevis 4A.
- 8 Repeat procedures for clevises 3 and 3A.
- 9 Run a 30-foot lashing from clevis 11, through the ACS clevis, from the outside to inside, front to rear, around the 4- by 4-inch lumber, and back to clevis 11. Loosely secure the lashing. Repeat on the left side using clevis 11A.
- 10 Make sure the ACS is centered on the load, and tighten all the lashings on the left and right side at the same time. Tighten the lashings in the following order: 4 and 4A, 3 and 3A, and 11 and 11A.
- 11 Run a 30-foot lashing from clevis 10, through the ACS clevis from the outside to inside, rear to front, around the 4- by 4-inch lumber, and back to clevis 10. Loosely secure the lashing and repeat on the other side with clevis 10A.
- 12 Run a 30-foot lashing from clevis 18, through the ACS clevis from the outside to inside front to rear, around the 4- by 4-inch lumber, and back to clevis 18. Loosely secure the lashing and repeat on the other side with clevis 18A.
- 13 Make sure the ACS is centered on the load, and tighten all the lashings on the left and right side at the same time. Tighten the lashings in the following order: 10 and 10A and, 18 and 18A.
- 14 Safety tie the two-point links to the ACS clevis with looped lengths of type III nylon cord.

**Figure 3-36. Suspension Slings Installed and ACS Secured (Continued)**



- ① Attach a 3-foot, (4-loop) type XXVI nylon sling to the free end of each 11-foot, (4-loop) with a 3 ¾-inch two-point link. Pad each link and tape in place with 2-inch adhesive tape.
- ② Extend the slings upwards with a lifting device until they are taut.
- ③ Tie a length of type III nylon cord around and behind the suspension sling and around each ACS sling. Repeat for all suspension slings.
- ④ Tie a length of type III nylon cord around the suspension sling, behind all lashings, and around the 4- by 4-inch lumber of the ACS. Repeat for all suspension slings.

**Figure 3-37. Suspension Slings Secured**

## INSTALLING OUTRIGGER ASSEMBLIES

3-27. Assemble, install, and safety tie the mast and foot assemblies on the DRAS platform according to TM 10-1670-268-20&P/TO 13C7-52-22 and as shown in Chapter 2, Figures 2-42 through 2-45, steps 1, 2 and 3.

## STOWING CARGO PARACHUTES

3-28. Prepare, stow and restrain three G-11D cargo parachutes on the hood of the truck as shown in Chapter 2 and as shown in Figure 3-38.

## STOWING DEPLOYMENT PARACHUTE

3-29. Prepare, stow and install the deployment parachute according to Chapter 2, Section V and as shown in Figure 3-38.

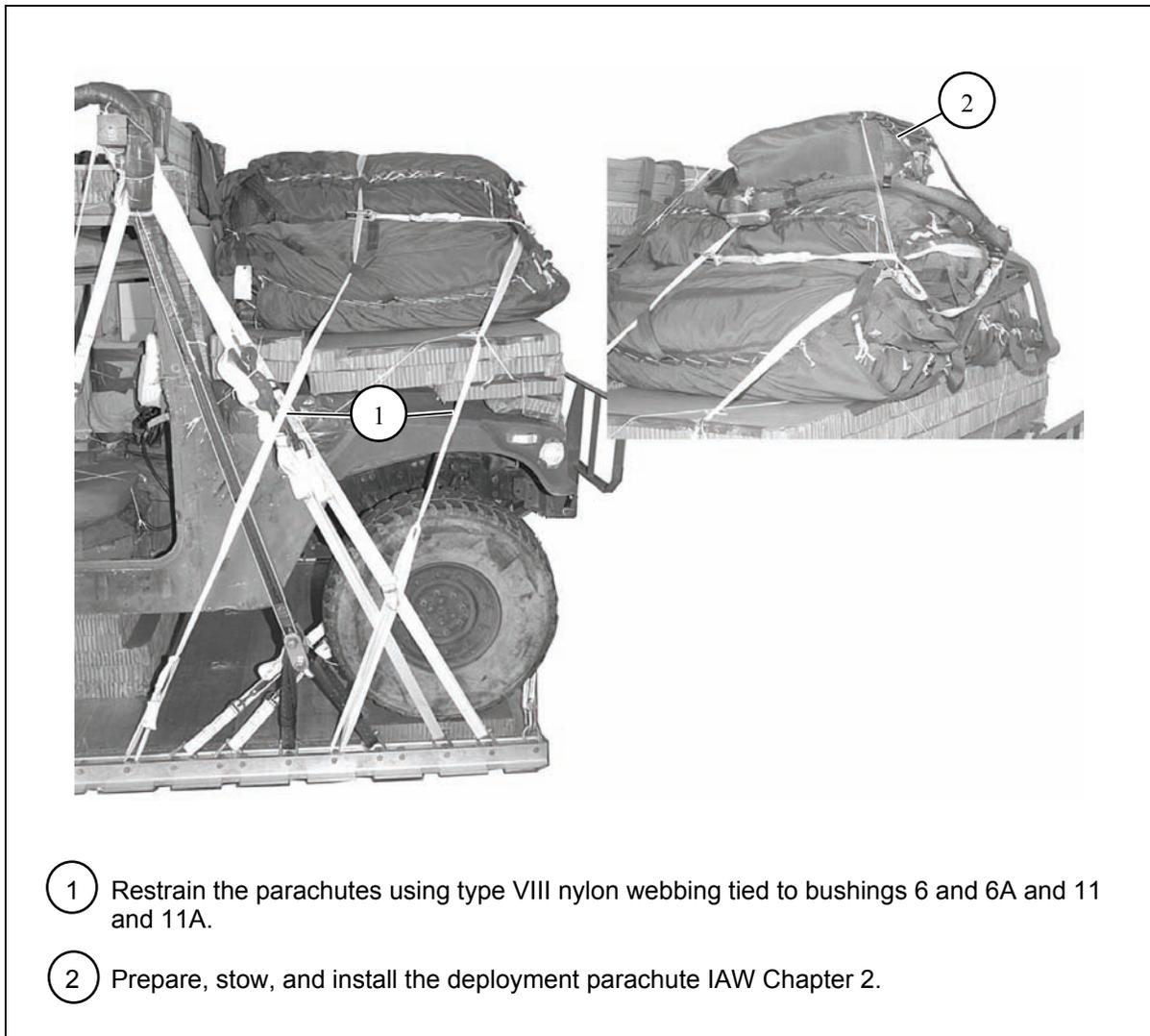
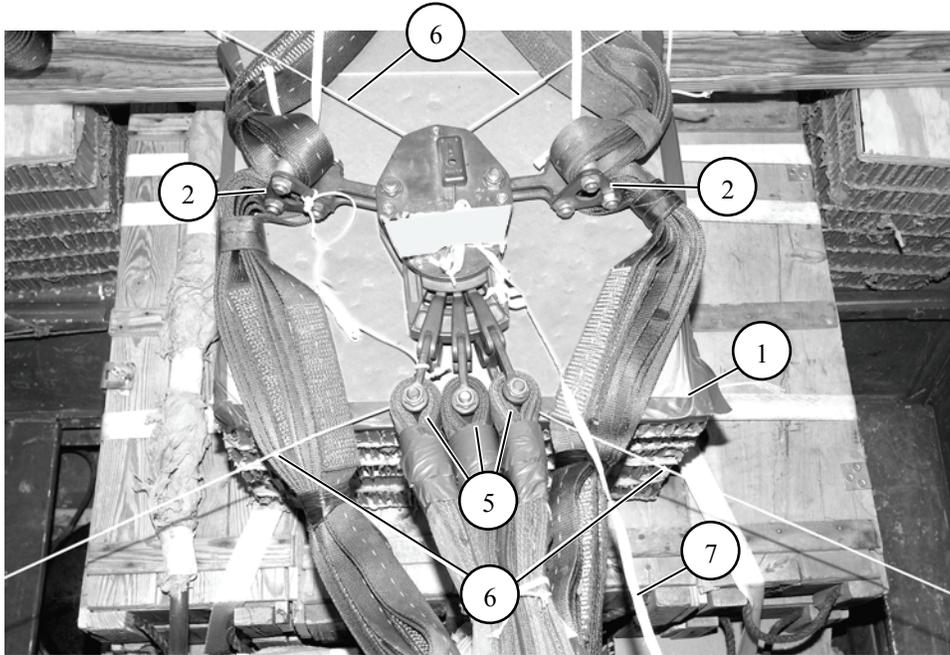


Figure 3-38. Cargo Parachutes and Deployment Parachute Installed

## INSTALLING PARACHUTE RELEASE SYSTEM

3-30. Build an M-1 release stack as shown in Figure 3-39. Prepare and install an M-1 release system according to Chapter 2, Section VI and as shown in Figure 3-39.

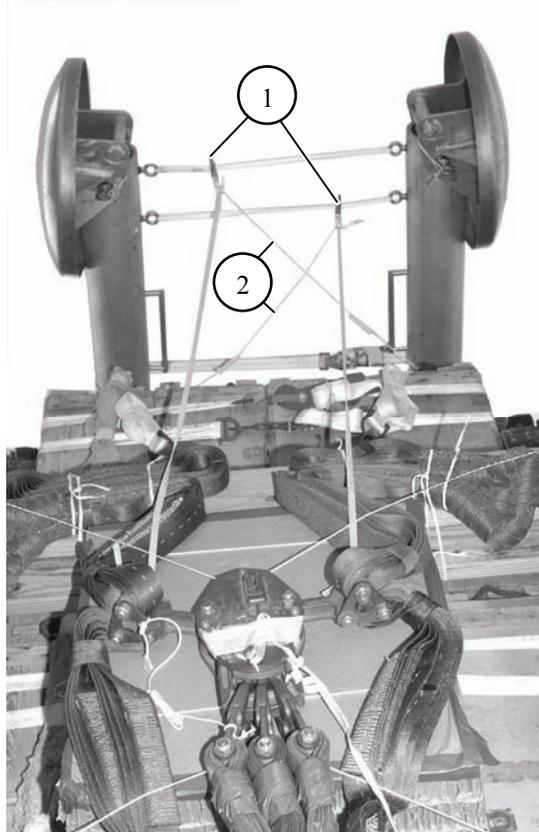


- 1 Cut and glue five 24- by 24-inch pieces of honeycomb. Center the stack in front of the rear ACS. Tape the top outside edges. Secure the stack with two lengths of type III nylon cord to convenient points on the load. Position the release centered on top of the stack.
- 2 Remove the cotton buffers from the free ends of the suspension slings and attach them to the release.
- 3 Secure the front suspension slings together above the 3 3/4-inch two-point links with one turn of 1/4-inch cotton webbing (not shown).
- 4 S-fold the slack in the rear suspension slings and tie them around the links with 1/4-inch cotton webbing (not shown).
- 5 Attach the riser extensions. Tie them in three places with 1/4-inch cotton webbing.
- 6 Secure the release to a convenient place on the load with type III nylon cord.
- 7 Secure arming wire and lanyard to a carrying handle of a parachute with three alternating half hitches and an overhand knot in the running end.

**Figure 3-39. M-1 Cargo Parachute Release Installed**

## INSTALLING MAST RELEASE KNIVES

3-31. Install the mast release knives as shown in Chapter 2, Figure 2-45, steps 4 through 10 and as shown in Figure 3-40.



- ① The length of the left and right ½-inch tubular nylon webbing from the base of the guillotine knives to the lower suspension links of the M-1 release is 67 inches (shown in steps 5 through 7 of Figure 2-45).
- ② Tie a length of type III nylon cord through the left tailgate sling guide and to the body of the right top guillotine knife that measures 86-inches from the tailgate sling guide to the base of the guillotine knife. Repeat for right tailgate sling guide and left lower guillotine knife (shown in steps 9 and 10 of Figure 2-45).

**Note.** All measurements are from knot to knot.

**Figure 3-40. Mast Release Knives Installed**

## MARKING RIGGED LOAD

3-32. Mark the rigged load according to Chapter 2, Section IX and as shown in Figure 3-41. If the load varies from the one shown, the weight, height, CB, and parachute requirements must be recomputed.

## EQUIPMENT REQUIRED

3-33. The equipment required to rig this load is listed in Table 3-2.

### CAUTION

Make the final rigger inspection required by Chapter 2, Section IX before the load leaves the rigging site.



### RIGGED LOAD DATA

Weight: Load shown .....	11,140 pounds
Maximum load allowed.....	12,750 pounds
Height (with three G-11D parachutes).....	104 inches
Width.....	94 inches
Overall Length .....	224 inches
Overhang: Front (brush guard).....	8 inches
Rear .....	0 inches
Center of Balance (from front edge of platform):.....	88 inches

**Figure 3-41. M1097 Variant Rigged on DRAS Platform**

**Table 3-2. Equipment Required for Rigging M1097 Variant Cargo/Troop Carrier on DRAS Platform**

<i>National Stock Number</i>	<i>Item</i>	<i>Quantity</i>
8040-00-273-8713	Adhesive paste, 1-gallon	As required
4020-00-240-2146	Cord, nylon, type III, 550-pound	As required
	Clevis,	
4030-00-090-5354	Large	5
4030-00-678-8562	Medium	4
1670-00-360-0328	Cover, clevis, large	3
8135-00-664-6958	Cushioning material, packaging, cellulose wadding	As required
8305-00-191-1101	Felt, ½-inch	As required
1670-01-493-6418	Link assembly, two-point, 3 ¾-inch	9
	Lumber:	
5510-00-220-6146	2- by 4-inch	As required
5510-00-220-6148	2- by 6-inch	As required
5510-00-220-6274	4- by 4-inch	As required
5530-00-618-8073	Plywood, ¾-inch	5 sheets
	Nail, steel wire, common,	
5315-00-010-4659	8d	As required
5315-00-753-3883	10d	As required
5315-00-753-3885	16d	As required
1670-00-753-3928	Pad, energy dissipating, honeycomb	18 sheets
1670-01-487-5461	Static line assembly release away	1
	Parachute:	
	Cargo:	
1670-01-016-7841	G-11D	3
1670-00-040-8135	Cargo extraction: 28-foot (deployment parachute)	1
	Platform, dual row, 18-foot	
1670-01-485-1654	Rail, DRAS	2
1670-01-486-1342	Roller Pad, DRAS	4
1670-01-486-1656	Panel Assembly, Main	9
1670-01-162-2372	Clevis assembly	38
N/A	Plywood, ¼-inch	1 sheet
1670-01-097-8816	Release, cargo parachute, M-1	1
	Sling, cargo airdrop	
	For suspension:	
1670-01-062-6310	11-ft (4-loop), type XXVI nylon webbing	4
1670-01-062-6306	3-ft (4-loop), type XXVI nylon webbing	8
	For deployment:	
1670-01-062-6306	3-ft (4-loop), type XXVI nylon webbing	1
	For riser extension:	
1670-01-062-6313	60-ft (3-loop), type XXVI nylon webbing	3

**Table 3-2. Equipment Required for Rigging M1097 Variant Cargo/Troop Carrier on DRAS Platform (Continued)**

<i>National Stock Number</i>	<i>Item</i>	<i>Quantity</i>
1670-01-063-7761	For ACS: 16-ft (2-loop), type XXVI nylon webbing	2
1670-01-062-6304	For lifting: 9-ft (2-loop), type XXVI nylon webbing	2
1670-01-062-6303	12-ft (2-loop), type XXVI nylon webbing	2
1670-00-040-8219	Strap, parachute release, multicut	2
1670-00-937-0271	Knife release, cargo (guillotine)	6
1670-01-487-5464	Outrigger assembly	1
7510-00-266-5016	Tape, adhesive, 2-in	As required
1670-00-937-0271	Tie-down assembly, 15-ft	43
1670-00-725-1437	Tie-down, cargo, aircraft, (CGU-1B)	5
8305-00-268-2411	Webbing: Cotton, ¼-in, type I	As required
8305-00-082-5752	Nylon: Tubular, ½-in	As required
8305-00-263-3591	Type VIII	As required

## Chapter 4

# Rigging M1025/M1121/M1114 Armament/TOW Carrier HMMWV on Dual Row Airdrop System Platform

## SECTION I – RIGGING M1025/M1121 ARMAMENT/TOW CARRIER HMMWV

### DESCRIPTION OF LOAD

4-1. The HMMWV truck is rigged on a DRAS platform for DRAS airdrop. An accompanying load weighing a minimum of 800 pounds and a maximum of 2,000 pounds must be rigged in the truck. The load is rigged with three G-11D cargo parachutes.

- The M1025 Armament Carrier (Figure 4-1). It weighs 5,960 pounds. It is 180 inches long, 85 inches wide and is 74 inches high.
- The M1025A1 Armament Carrier. It weighs 6,140 pounds. It is 180 inches long, 85 inches wide and is 74 inches high.
- The M1025A2 Armament Carrier. It weighs 6,780 pounds. It is 180 inches long, 85 inches wide and is 74 inches high.
- The M1121 TOW Carrier. It weighs 7,900 pounds. It is 180 inches long, 85 inches wide and is 74 inches high.

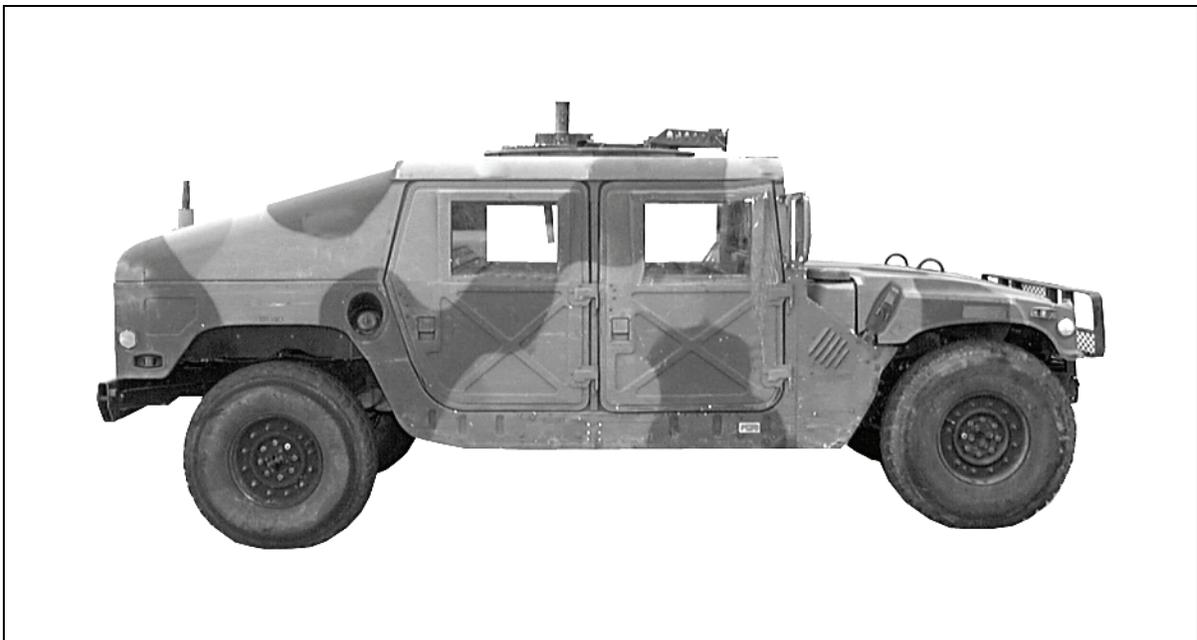


Figure 4-1. M1025/M1121 Armament/TOW Carrier HMMWV

## PREPARING PLATFORM

4-2. Inspect, or assemble and inspect, a DRAS platform with outrigger assemblies, outrigger platform support weldments, and link assemblies according to TM 10-1670-268-20&P/TO 13C7-52-22, and as shown in Figure 3-2.

## BUILDING AND PLACING HONEYCOMB STACK

4-3. Prepare the honeycomb stacks for the trucks as shown in Figure 3-3. Position the honeycomb stacks as shown in Figure 3-4.

## INSTALLING OPTIONAL DRIVE- OFF AID ON PLATFORM

4-4. Install the drive-off aid as described in Paragraph 2-7.

## PREPARING M1025/M1121 TRUCK

4-5. Prepare the M1025/M1121 truck as described below.

- Prepare the fuel tank as shown in Figures 3-5 and 3-6.

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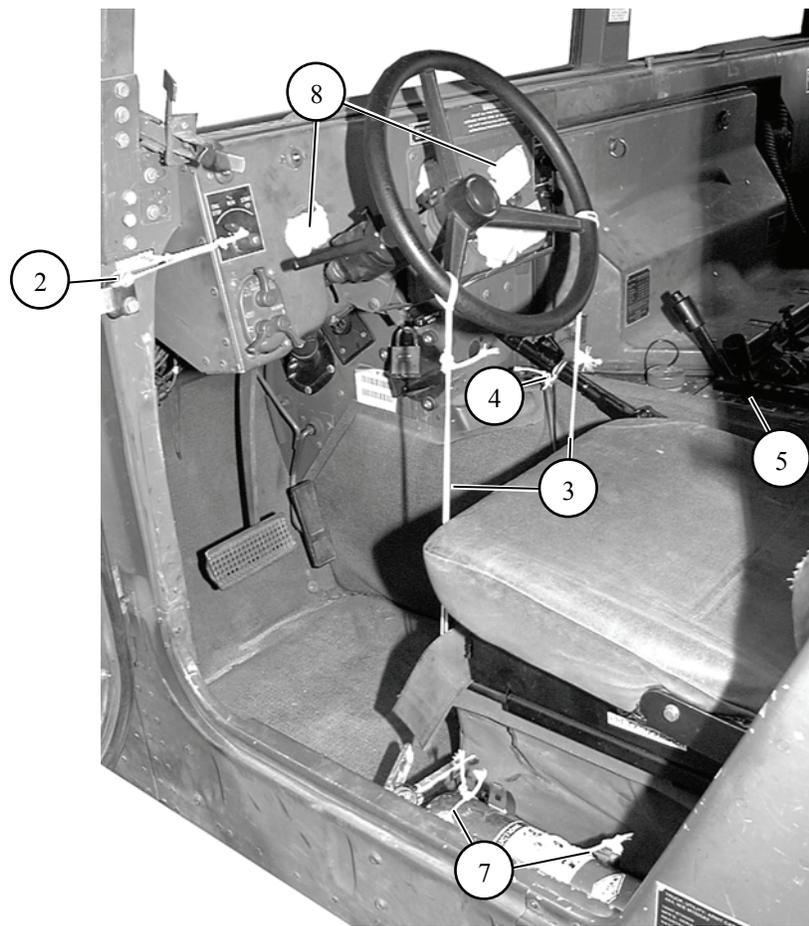
*Note.* Certain units may be authorized a waiver allowing 95% fuel. One way to verify the tank is 95% full is to fill the tank and withdraw 1 ¼ gallons with a hand pump.

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### CAUTION

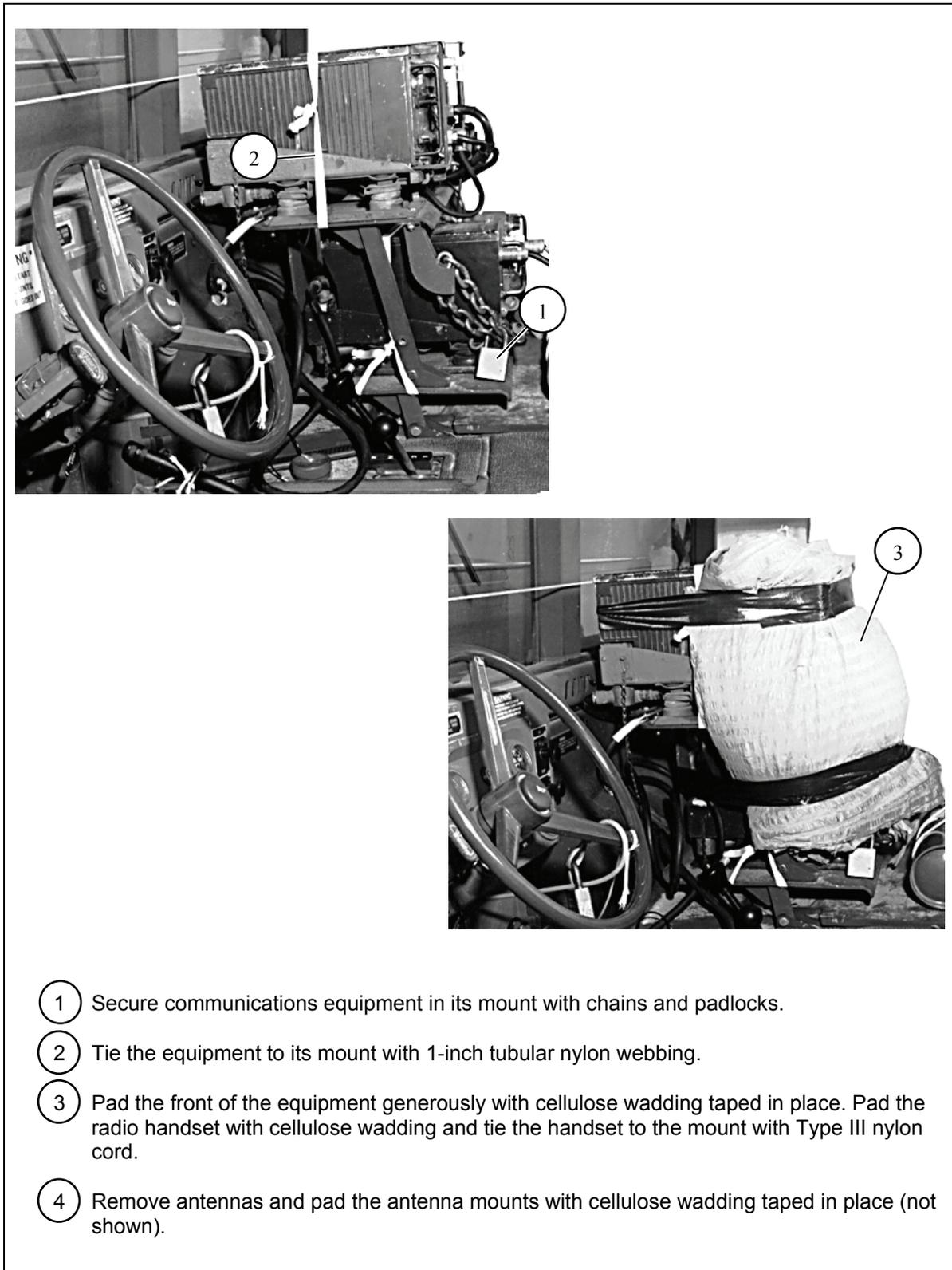
A full tank does not allow for expansion, and is a danger to aircraft and air crew.

- Make sure the batteries and battery compartment comply with AFMAN 24-204(I)/TM 38-250.
- Prepare the cab of the truck as shown in Figure 4-2.
- Secure and pad radio equipment in the cab section as shown in Figure 4-3.
- Prepare the front of the trucks as shown in Figure 4-4.
- Prepare the turret housing as shown in Figure 4-5.
- Prepare and secure the pioneer tool kit according to TM 9-2320-280-10/TO 36A12-1A-2091-1/TM 2320-10/6B and as shown in Figure 3-10.
- Prepare the underside of the truck as shown in Figure 3-11.



- ① Pad the mirrors with cellulose wadding and tape (not shown).
- ② Tie the engine start switch in the engine stop position with Type I, ¼-inch cotton webbing.
- ③ Tie the steering wheel to the seat frame in two places with Type III nylon cord, or use the retractable steering wheel locking cable. If the locking cable is used, secure it to the steering wheel with Type III nylon cord, not a padlock.
- ④ Tie the emergency brake handle in the off position with Type III nylon cord.
- ⑤ Place the transmission and four-wheel drive levers in the neutral position.
- ⑥ Tie the seat cushions to the seat frames with Type III nylon cord (not shown).
- ⑦ Tie the fire extinguisher and decontamination apparatus in place in its designated rack with two lengths of Type III nylon cord.
- ⑧ Tape all lights, reflectors, windshield and instrument panel gauges. Place the antenna with accompanying load.

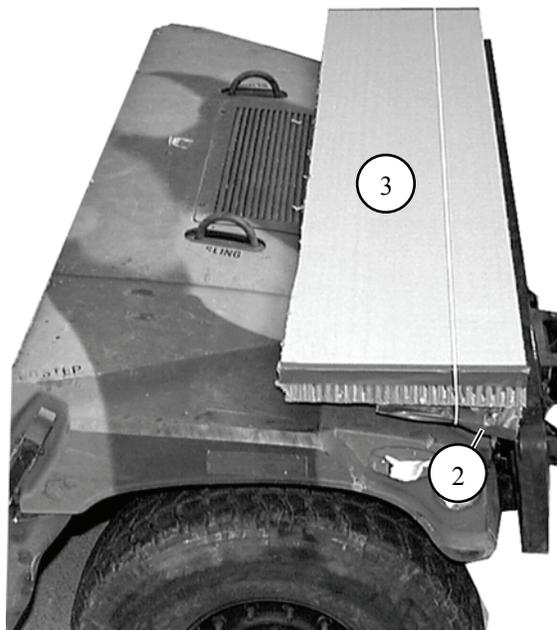
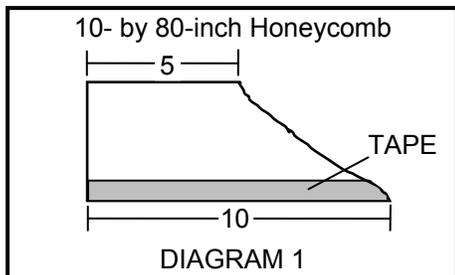
**Figure 4-2. Cab Prepared**



- ① Secure communications equipment in its mount with chains and padlocks.
- ② Tie the equipment to its mount with 1-inch tubular nylon webbing.
- ③ Pad the front of the equipment generously with cellulose wadding taped in place. Pad the radio handset with cellulose wadding and tie the handset to the mount with Type III nylon cord.
- ④ Remove antennas and pad the antenna mounts with cellulose wadding taped in place (not shown).

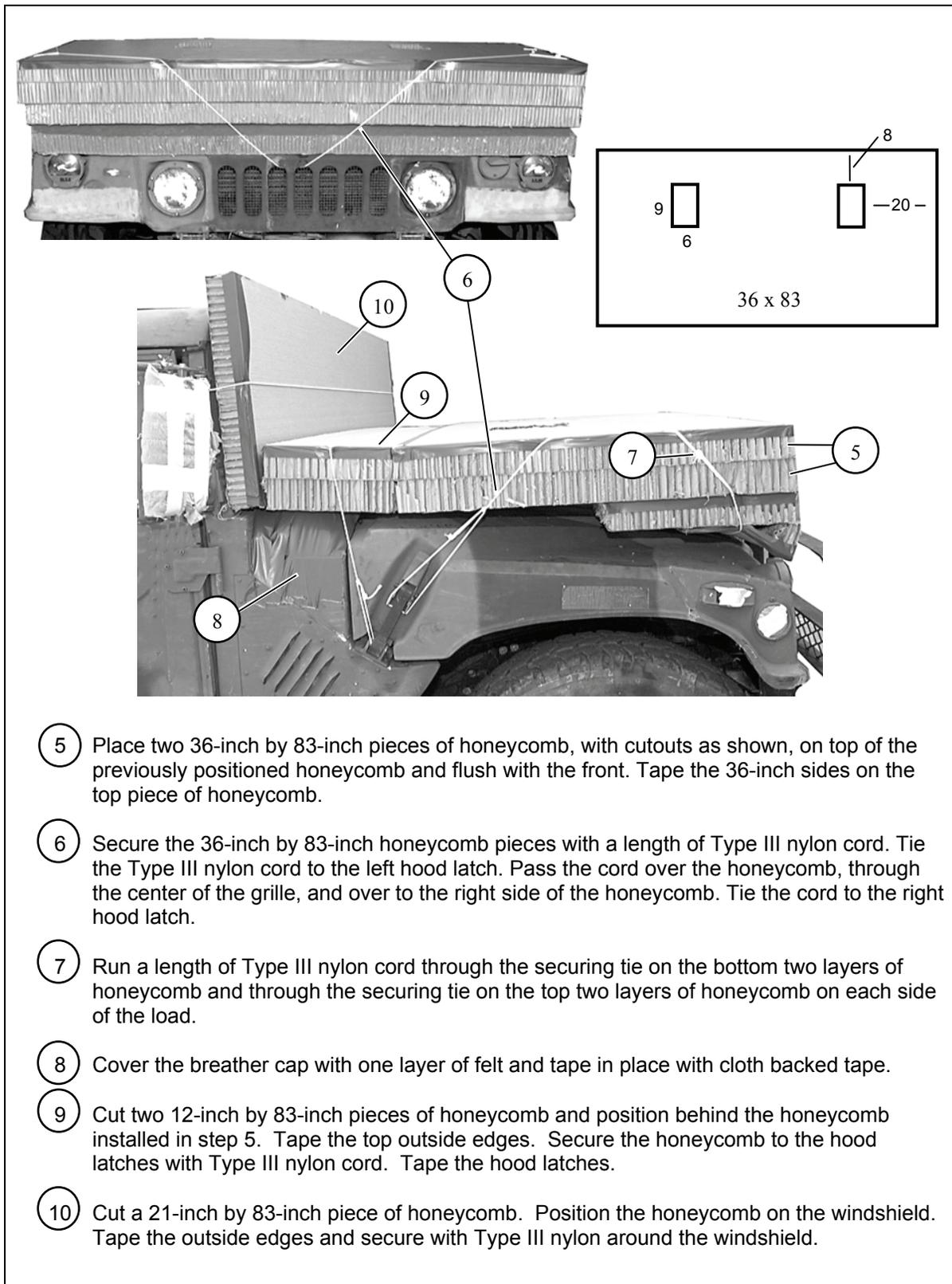
**Figure 4-3. Communications Equipment Secured and Padded**

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



- ① Cut a 10-inch by 80-inch piece of honeycomb. Taper crush 5 inches of the width along the entire length of the honeycomb. Tape the 10-inch width of the honeycomb (See diagram 1).
- ② Place the honeycomb flush on the front end of the hood with the tapered side up and to the rear of the truck.
- ③ Cut an 18-inch by 80-inch piece of honeycomb. Position on top of and flush with the front of the 10-inch by 80-inch piece of honeycomb. Tie the two pieces of honeycomb together with Type III nylon cord around the 80 inch length. Tape the top piece of honeycomb where the Type III nylon cord will come in contact.
- ④ Secure the winch hook with Type III nylon cord (not shown).

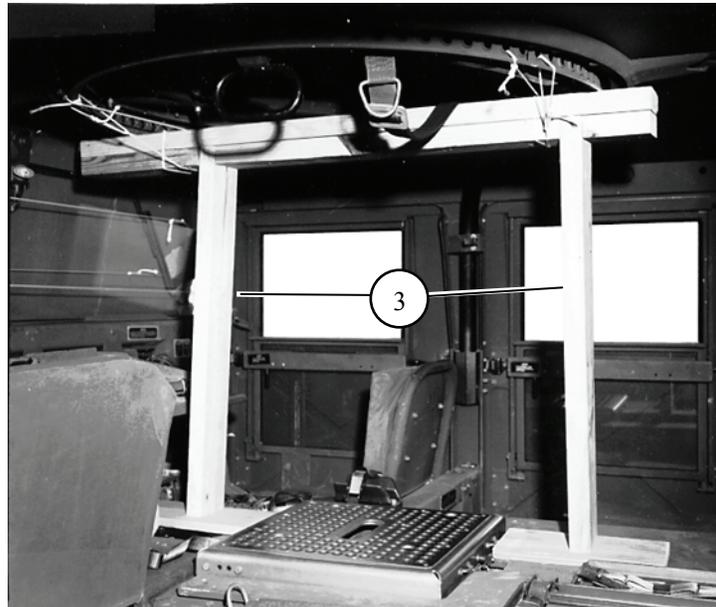
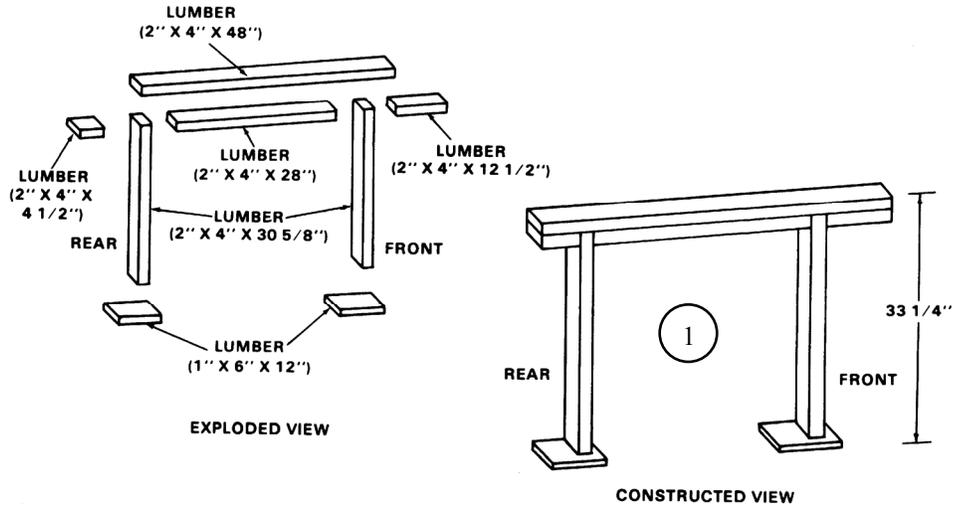
**Figure 4-4. Front of Truck Prepared**



- 5 Place two 36-inch by 83-inch pieces of honeycomb, with cutouts as shown, on top of the previously positioned honeycomb and flush with the front. Tape the 36-inch sides on the top piece of honeycomb.
- 6 Secure the 36-inch by 83-inch honeycomb pieces with a length of Type III nylon cord. Tie the Type III nylon cord to the left hood latch. Pass the cord over the honeycomb, through the center of the grille, and over to the right side of the honeycomb. Tie the cord to the right hood latch.
- 7 Run a length of Type III nylon cord through the securing tie on the bottom two layers of honeycomb and through the securing tie on the top two layers of honeycomb on each side of the load.
- 8 Cover the breather cap with one layer of felt and tape in place with cloth backed tape.
- 9 Cut two 12-inch by 83-inch pieces of honeycomb and position behind the honeycomb installed in step 5. Tape the top outside edges. Secure the honeycomb to the hood latches with Type III nylon cord. Tape the hood latches.
- 10 Cut a 21-inch by 83-inch piece of honeycomb. Position the honeycomb on the windshield. Tape the outside edges and secure with Type III nylon around the windshield.

Figure 4-4. Front of Truck Prepared (Continued)

- Notes.** 1. Drawing not to scale.  
2. All dimensions are given in inches.



- ① Build the turret housing support as shown. Nail the lumber together with 8d nails.
- ② Close the turret cover and secure it with the fasteners provided (not shown).
- ③ Center the support under the turret housing with the front end of the support toward the front end of the truck. Tie the support in place with two lengths of ½-inch tubular nylon webbing.

**Figure 4-5. Turret Support Built and Placed**

## STOWING ACCOMPANYING LOAD ON M1025 ARMAMENT CARRIER

4-6. Use the procedures shown in Figure 4-6 to stow ten 105-millimeter ammunition boxes and truck equipment.

*Note.* The accompanying load may vary from the one shown.

### CAUTION

Load weight limits of 800-2,000 pounds and CB requirements given in Chapter 1 must be strictly observed.

*Note.* The accompanying load rigging procedures for the M1121 TOW Carrier differ from those for the M1025 procedures and are described in paragraph 4-7.

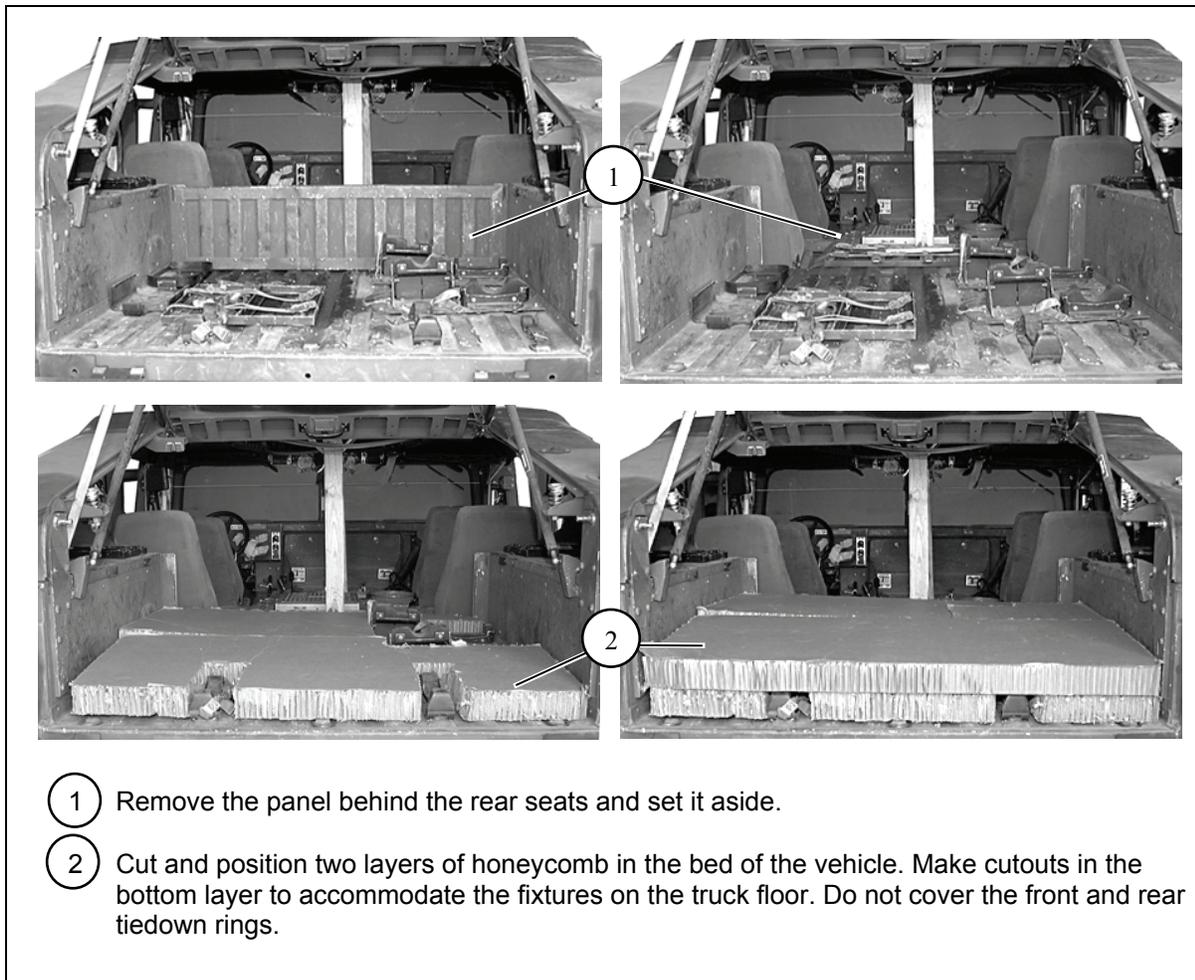
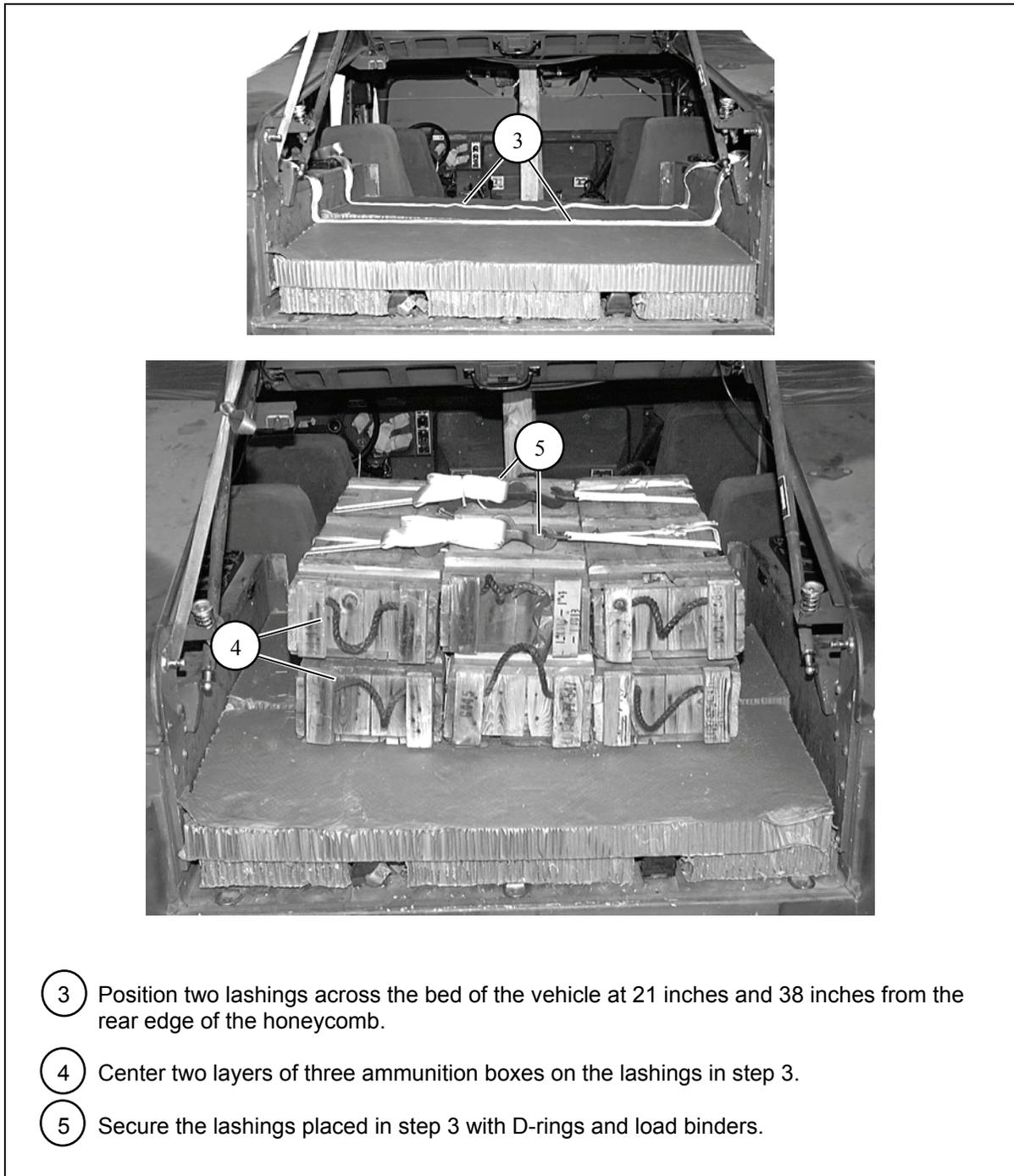


Figure 4-6. M1025 Accompanying Load Stowed

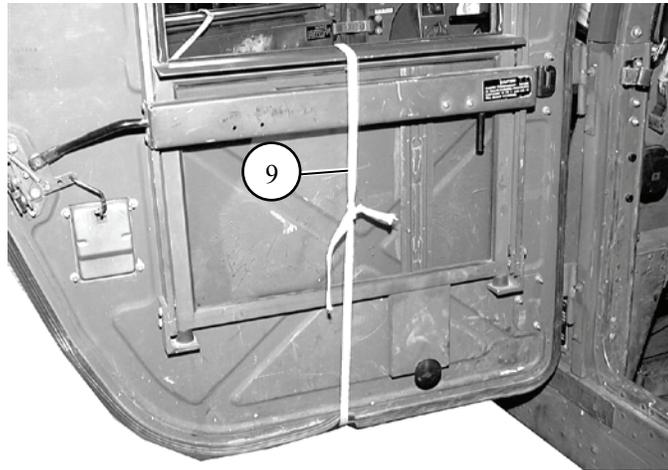
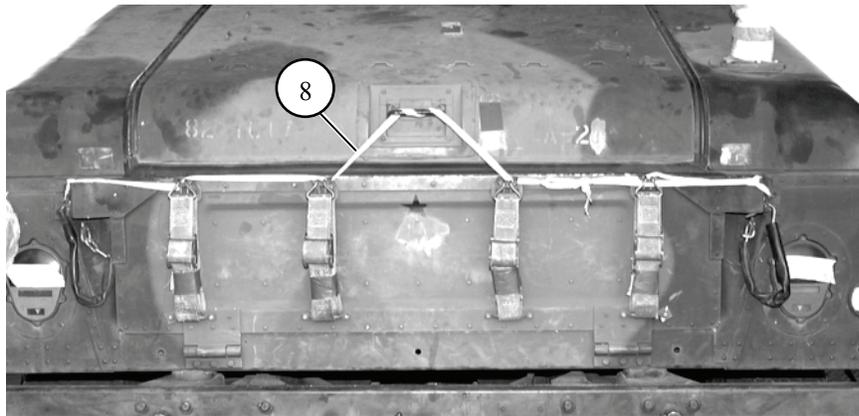


**Figure 4-6. M1025 Accompanying Load Stowed (Continued)**



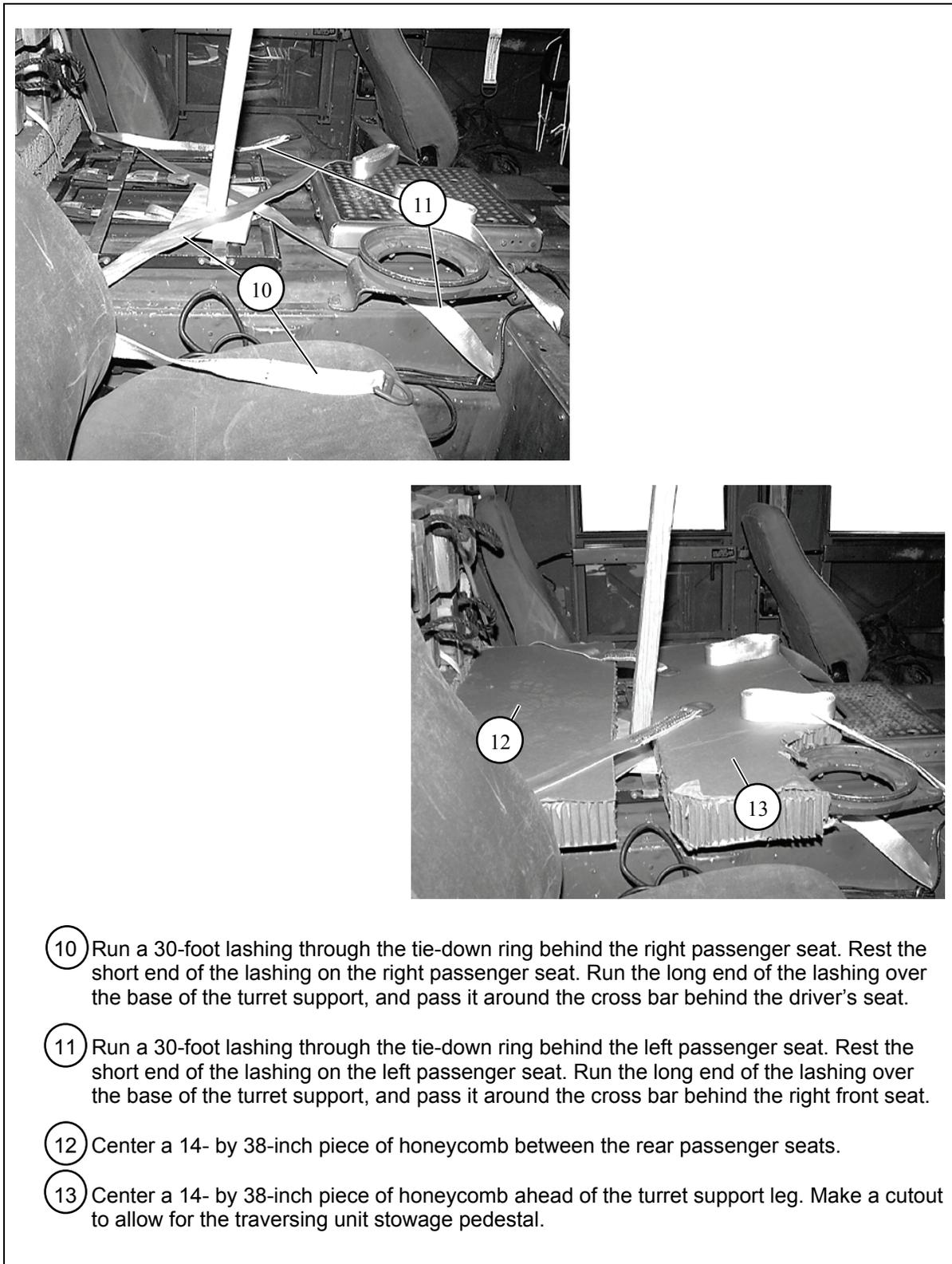
- ⑥ Route a 30-foot lashing through the right rear tiedown, over the ammunition boxes, and through the left front tiedown. Close the lashing with D-rings and a load binder on top of the boxes.
- ⑦ Route a 30-foot lashing through the left rear tiedown, over the ammunition boxes, and through the right front tiedown. Close the lashing with D-rings and a load binder on top of the boxes.

**Figure 4-6. M1025 Accompanying Load Stowed (Continued)**



- 8 Close the tailgate and hatch. Secure the tailgate and hatch with a doubled length of 1/2-inch tubular nylon webbing.
- 9 Lower all windows. Secure all windows in the lowered position with a length of 1/2-inch tubular nylon webbing.

**Figure 4-6. M1025 Accompanying Load Stowed (Continued)**



- 10 Run a 30-foot lashing through the tie-down ring behind the right passenger seat. Rest the short end of the lashing on the right passenger seat. Run the long end of the lashing over the base of the turret support, and pass it around the cross bar behind the driver's seat.
- 11 Run a 30-foot lashing through the tie-down ring behind the left passenger seat. Rest the short end of the lashing on the left passenger seat. Run the long end of the lashing over the base of the turret support, and pass it around the cross bar behind the right front seat.
- 12 Center a 14- by 38-inch piece of honeycomb between the rear passenger seats.
- 13 Center a 14- by 38-inch piece of honeycomb ahead of the turret support leg. Make a cutout to allow for the traversing unit stowage pedestal.

**Figure 4-6. M1025 Accompanying Load Stowed (Continued)**

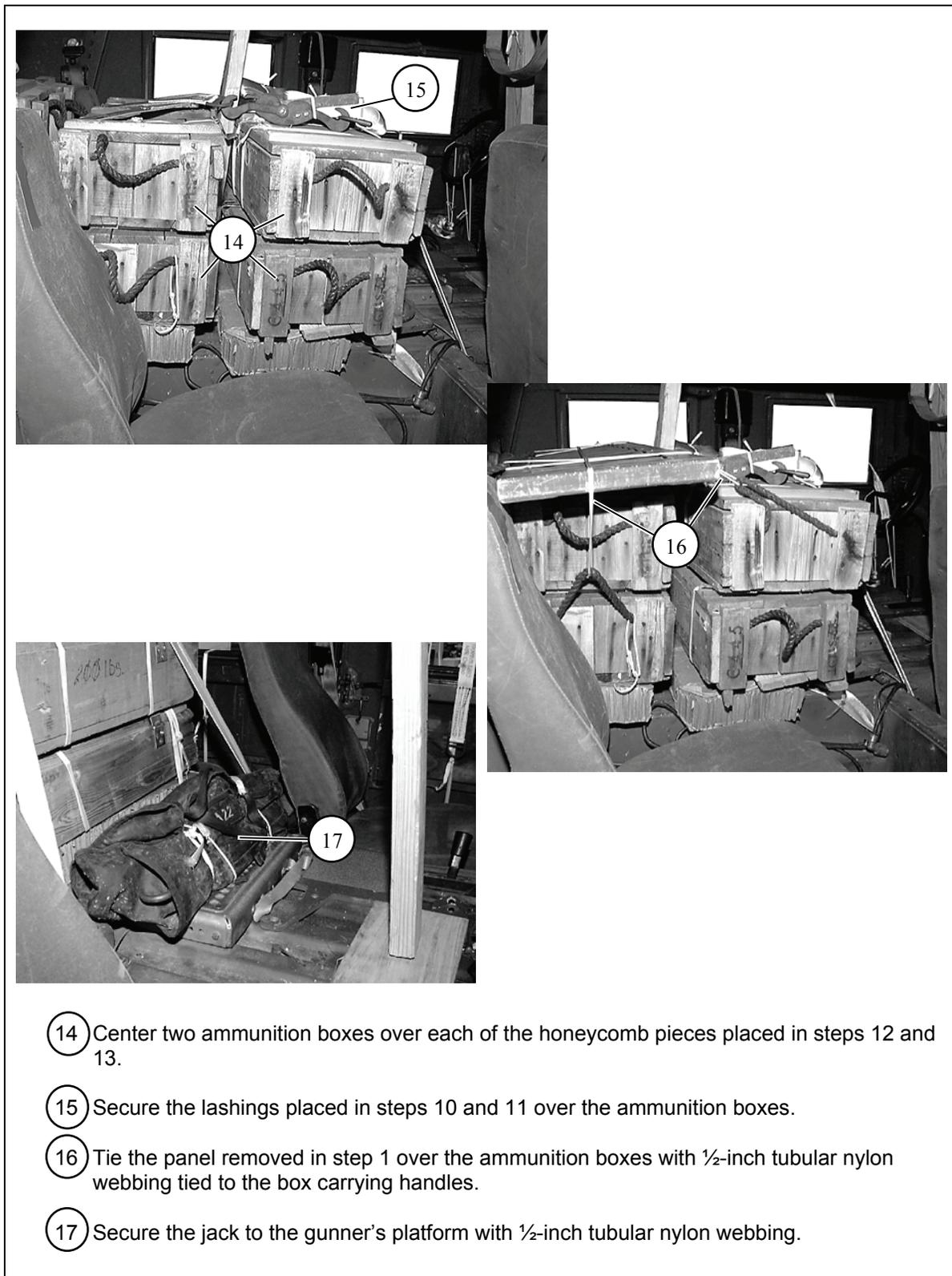
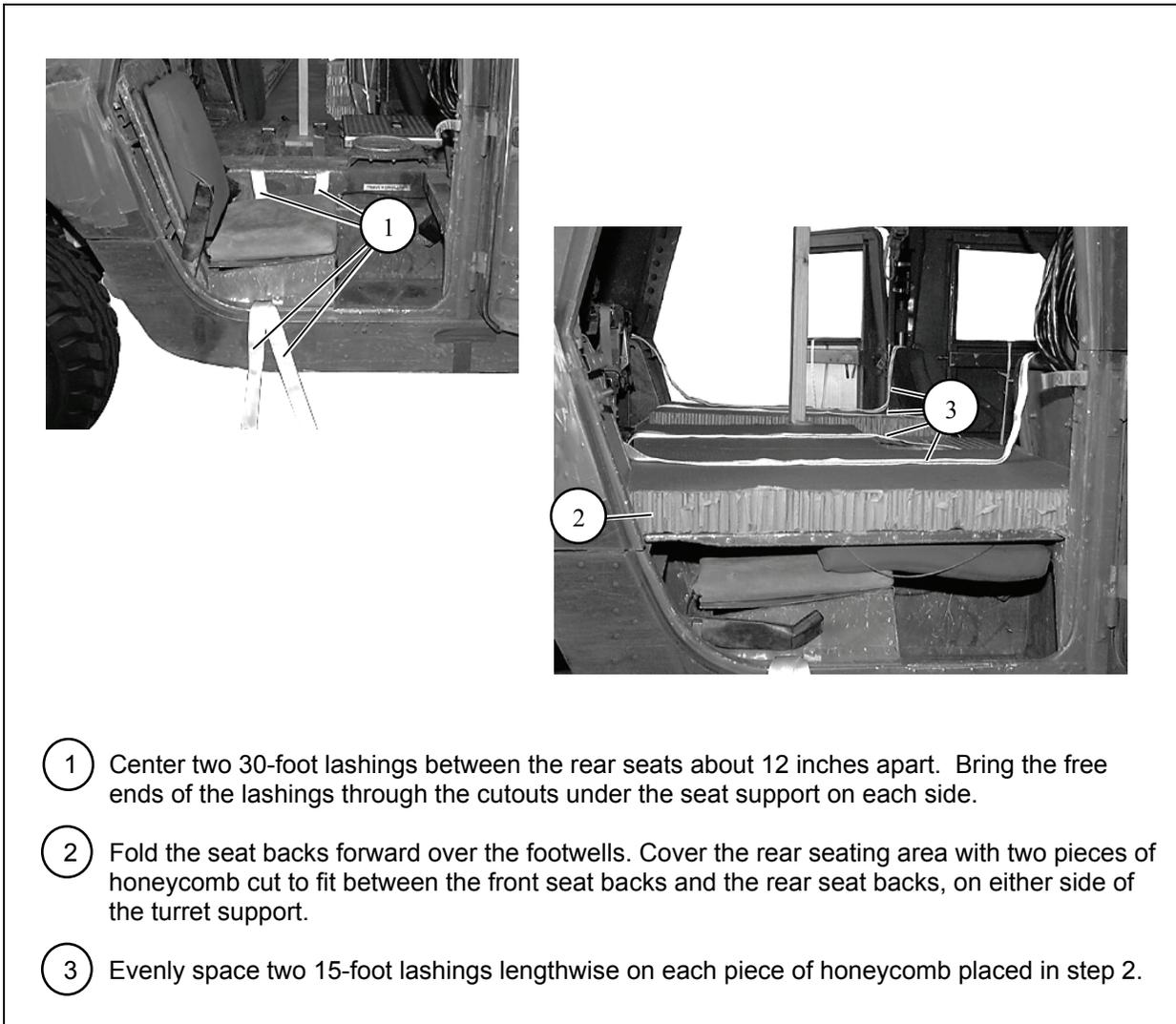


Figure 4-6. M1025 Accompanying Load Stowed (Continued)

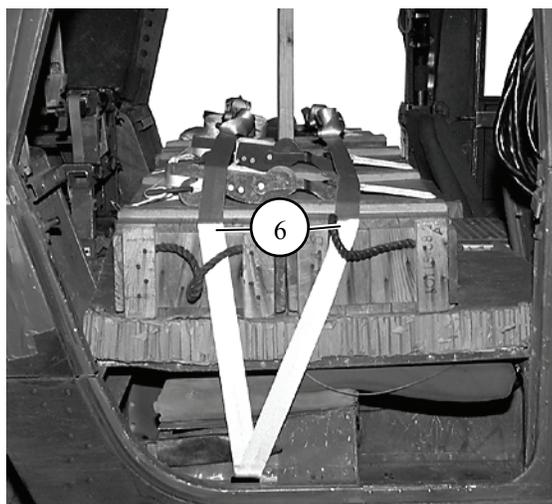
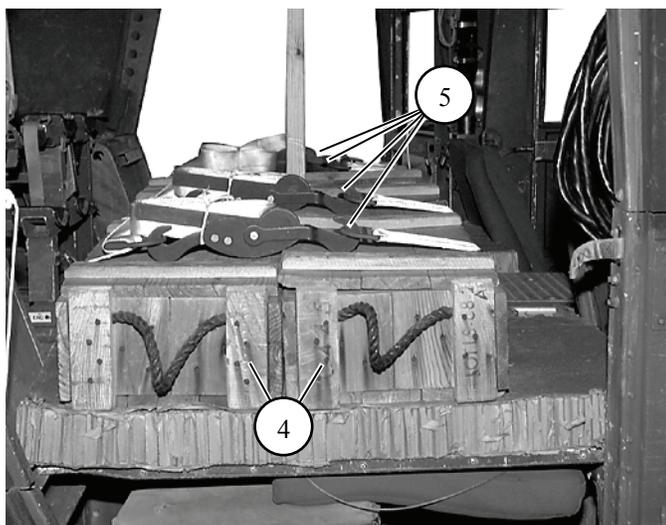
## STOWING ACCOMPANYING LOAD IN M1121 TOW CARRIER

4-7. Use the procedures shown in Figure 4-7 to stow mission and truck equipment weighing 800-2000 pounds. An 800-pound load is shown here.

- Notes.*
1. The accompanying load rigging procedures for the M1025 Armament Carrier are different from the M1121 procedures and are described in paragraph 4-6.
  2. The accompanying load may vary from the one shown. Ensure the load is properly secured and weighs between 800 and 2,000 pounds.

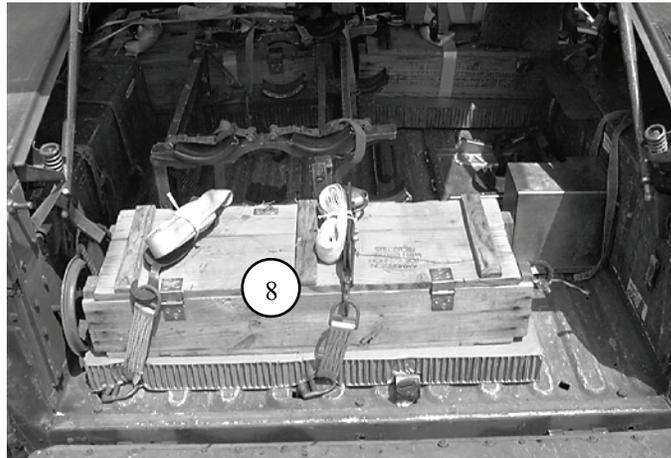
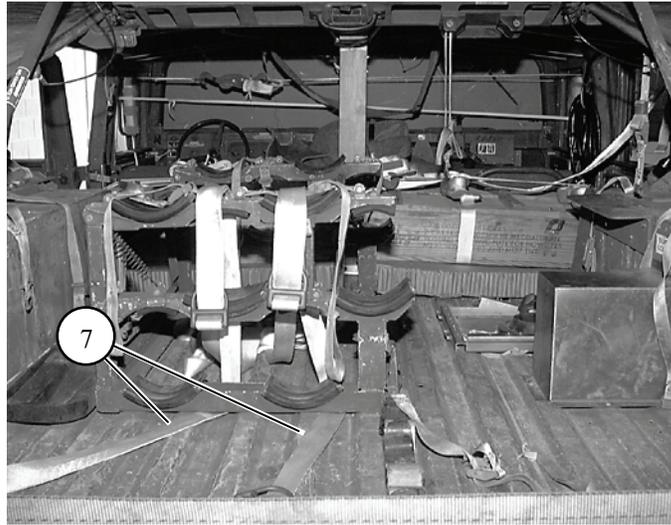


**Figure 4-7. M1121 TOW Carrier Accompanying Load Stowed**



- ④ Center two ammunition boxes across the width of each of the pieces of honeycomb placed in step 2.
- ⑤ Secure each of the four lashings placed in step 3 over the ammunition boxes.
- ⑥ Secure the lashings placed in step 1 to each other on top of the ammunition boxes.

**Figure 4-7. M1121 TOW Carrier Accompanying Load Stowed (Continued)**



- 7 Run two lashings through the two left rear cargo bed rings and under the TOW racks.
- 8 Place a piece of honeycomb cut to fit and one ammunition box over the lashings. Secure the lashings on top of the box.
- 9 Tie all windows open as shown in Figure 4-6, step 9.
- 10 Close and secure the tailgate as shown in Figure 4-6, step 8.

**Figure 4-7. M1121 TOW Carrier Accompanying Load Stowed (Continued)**

## PREPARING ROOF OF TOW CARRIERS

4-8. Prepare the roof of the M1025 and M1121 TOW carriers as shown in Figure 4-8.

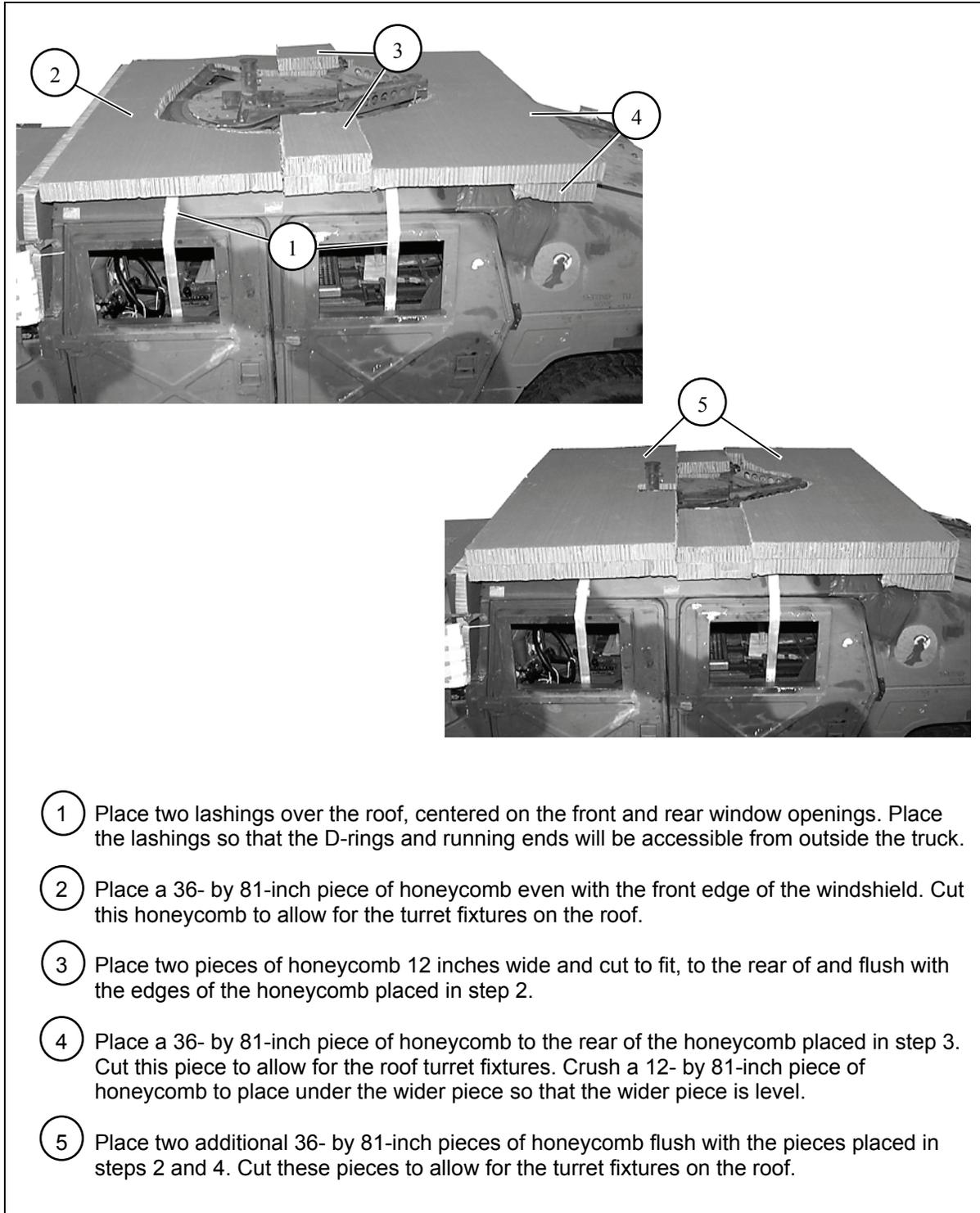
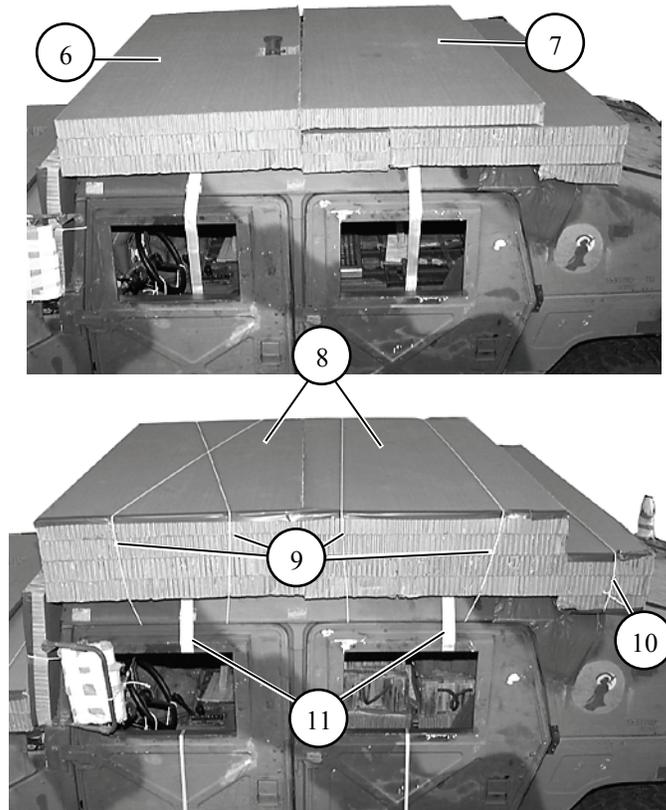


Figure 4-8. TOW Carrier Roof Prepared



- ⑥ Place a 36- by 81-inch piece of honeycomb flush with the pieces placed in steps 2 and 5. Cut this piece to allow for the roof turret fixtures.
- ⑦ Place a 36- by 81-inch piece of honeycomb aligned with the piece placed in step 6. A 12-inch ledge should result at the rear.
- ⑧ Place two 36- by 81-inch pieces of honeycomb flush with the pieces placed in steps 6 and 7. Crush this honeycomb, if necessary, to allow for the roof turret fixtures. Tape the upper outside edges of these pieces of honeycomb.
- ⑨ Open the truck doors and tie all four layers of honeycomb together through the door openings with Type III nylon cord.
- ⑩ Tape the lower outside edges of the 12-inch wedge piece of honeycomb placed in step 4. Tie this piece to the two layers above it with Type III nylon cord.
- ⑪ Close the doors, and secure them shut with the lashings placed in step 1.

**Figure 4-8. TOW Carrier Roof Prepared (Continued)**

## LIFTING AND POSITIONING TRUCK AND INSTALLING OPTIONAL DRIVE-OFF AIDS

4-9. Install the lifting slings and position the truck on the honeycomb stacks as shown in Figure 3-13. Attach the optional drive-off aids to the wheels of the truck as shown in Chapter 2 of this manual. Position the truck on the platform as shown in Figure 4-9.

## LASHING TRUCK

4-10. Lash the truck to the platform as shown in Figures 4-10 and 4-11.

## INSTALLING SUSPENSION SLINGS AND ATTITUDE CONTROL SYSTEM

4-11. Construct and inspect the Attitude Control System (ACS) according to Chapter 2. Position the ACS and suspension slings as shown in Figure 4-12. Secure the ACS according to Chapter 2 and as shown in Figures 4-13 and 4-14. Complete the suspension slings, pad the links, and safety tie the slings as shown in Figure 4-15.

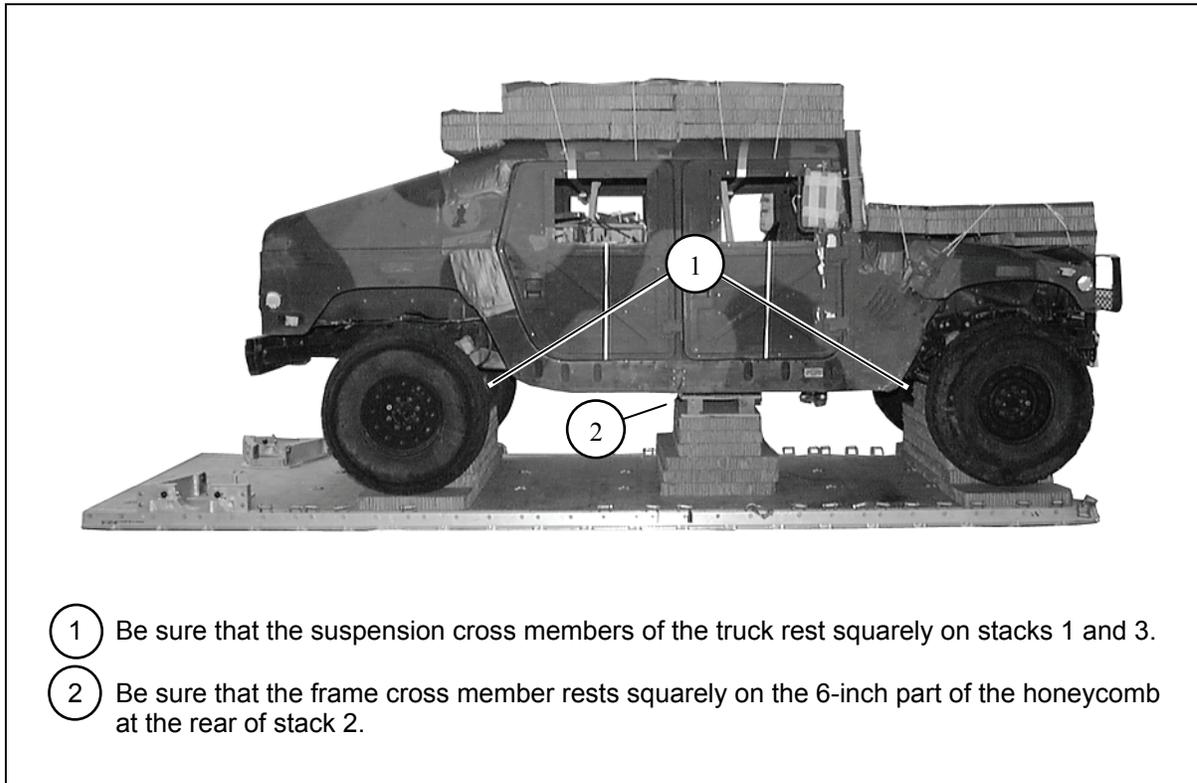
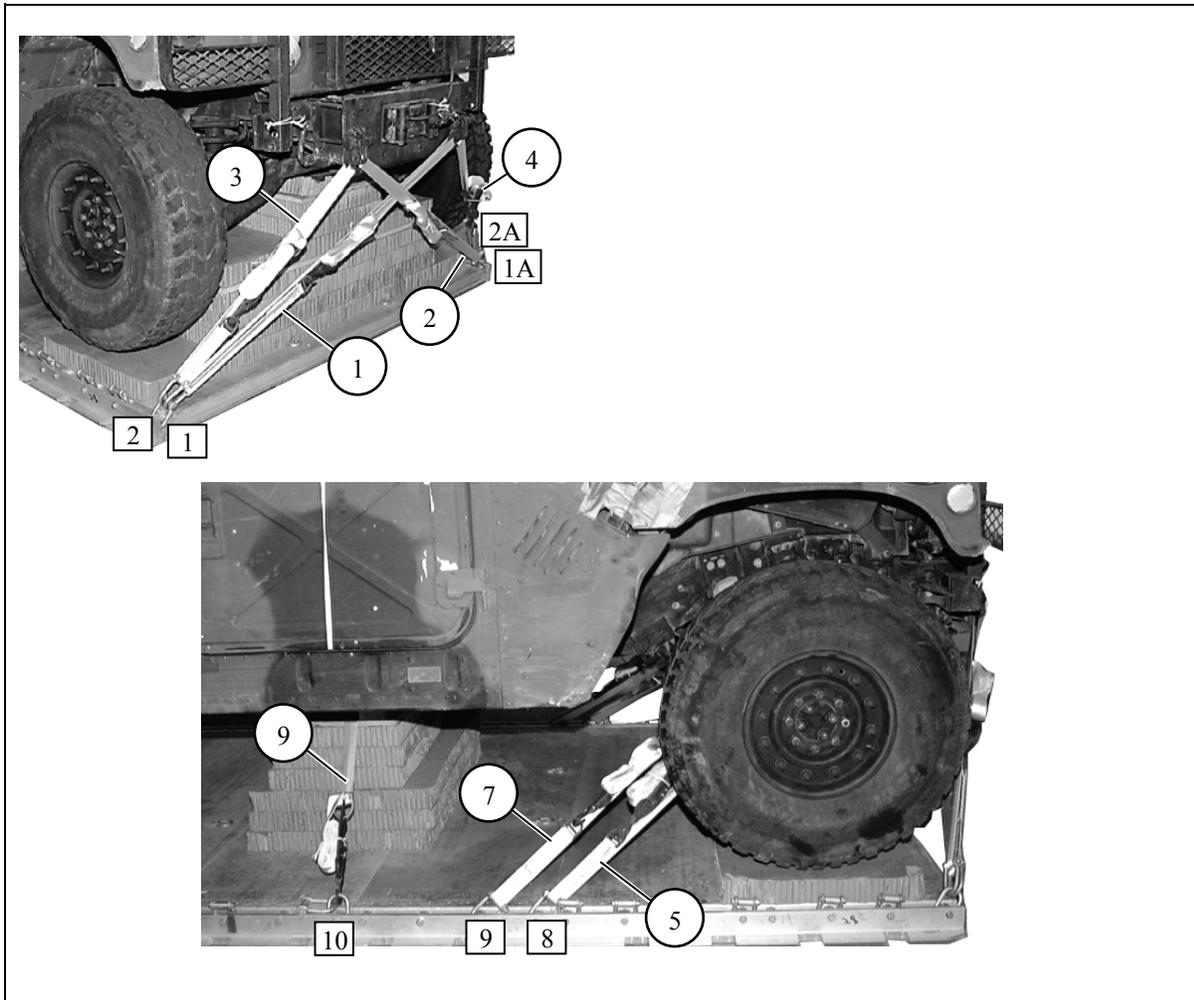
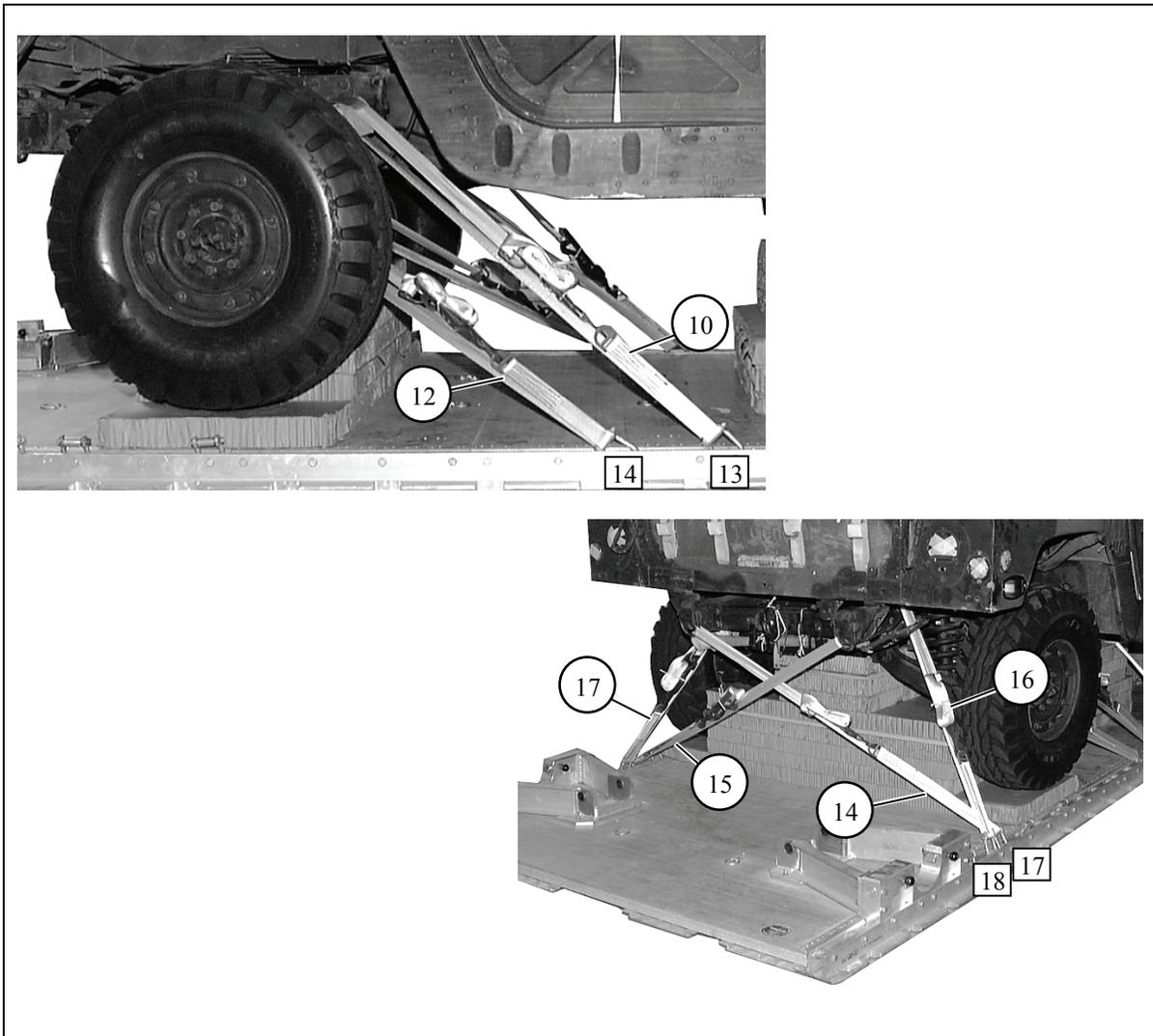


Figure 4-9. M1025 Armament Carrier Positioned on Platform



<b>Lashing Number</b>	<b>Tiedown Clevis Number</b>	<b>Instructions</b>
1	1	Pass lashing: Through left front tie-down provision.
2	1A	Through right front tie-down provision.
3	2	Through right front tie-down provision.
4	2A	Through left front tie-down provision.
5	8	Around right front lower control arm.
6	8A	Around left front lower control arm.
7	9	Through tiedown bracket behind right front coil spring.
8	9A	Through tiedown bracket behind left front coil spring.
9	10 and 10A	Pass a 15-foot lashing through clevis 10A and through its own D-ring. Pass the lashing through the holes in stack 2. Attach the lashing to clevis 10 with a load binder.

Figure 4-10. Lashings 1 Through 9 Installed

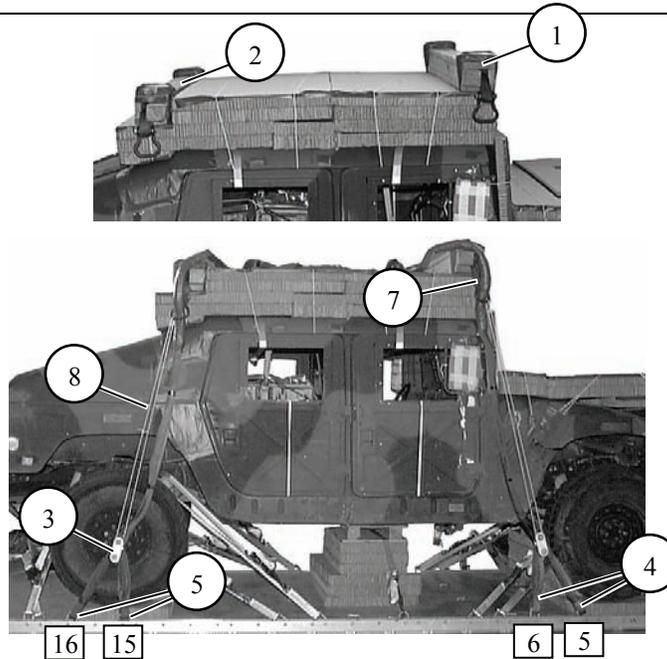


<i>Lashing Number</i>	<i>Tiedown Clevis Number</i>	<i>Instructions</i>
10	13	Pass lashing: Through tiedown bracket in front of right rear coil spring.
11	13A	Through tiedown bracket in front of left rear coil spring.
12	14	Around right rear lower control arm.
13	14A	Around left rear lower control arm.
14	17	Through left rear tiedown point.
15	17A	Through right rear tiedown point.
16	18	Through right rear tiedown point behind the coil spring.
17	18A	Through left rear tiedown point behind the coil spring.

Figure 4-11. Lashings 10 Through 17 Installed

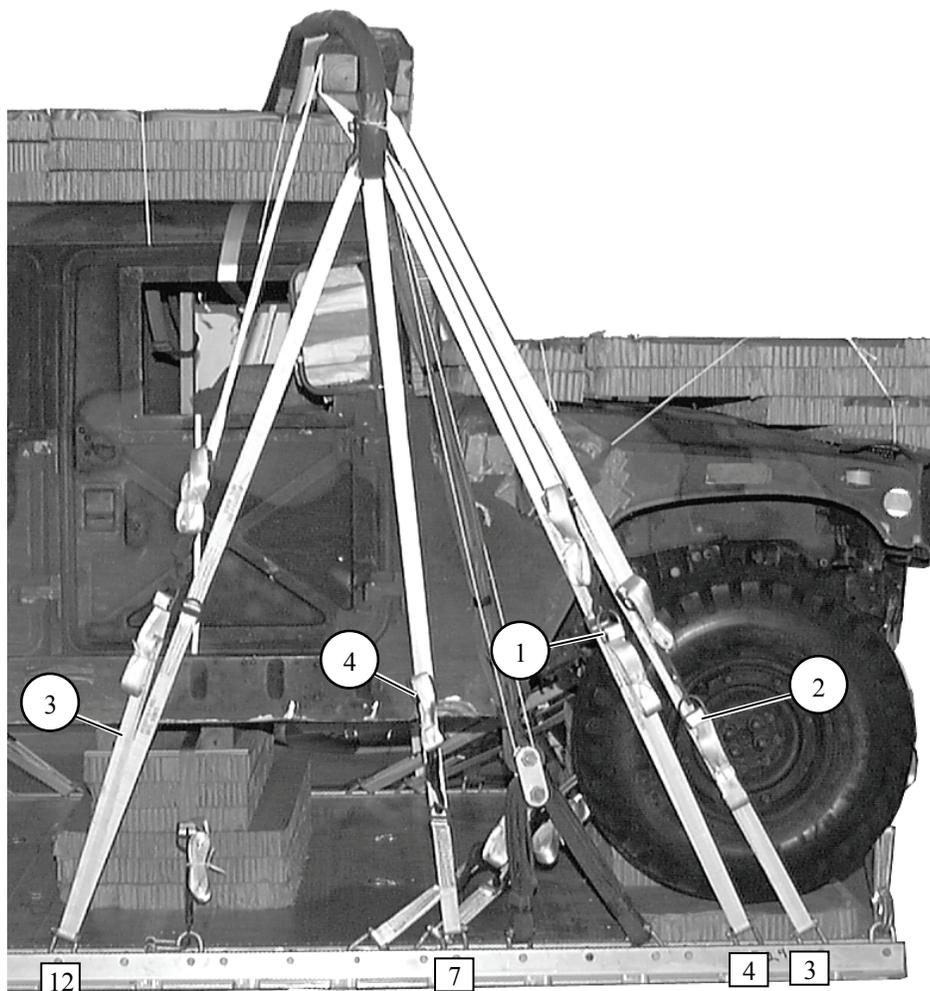
**CAUTION**

Center the ACS assemblies widthwise on the load.



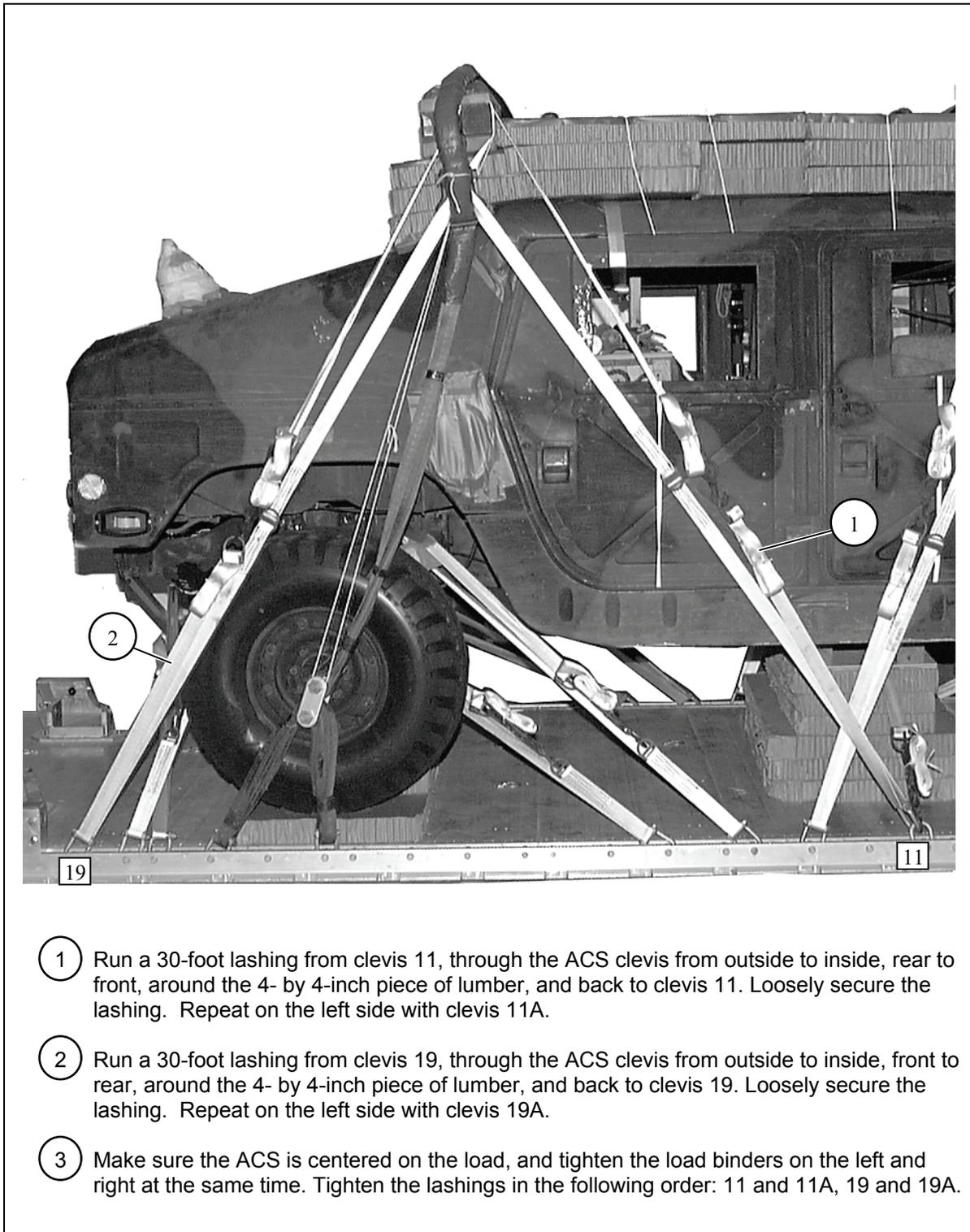
- 1 Center the front ACS on the roof protection honeycomb with the 4- by 4-inch piece of lumber facing the rear.
- 2 Center the rear ACS as far forward as possible on the ledge in the roof protection honeycomb. Face the 4- by 4-inch piece of lumber to the front.
- 3 Attach a 3 ¾-inch two-point link to an 11-foot (4-loop), Type XXVI nylon sling. Pass a 3-foot (4-loop), Type XXVI nylon sling through the two-point link. Repeat this procedure three times.
- 4 Attach the ends of a 3-foot sling placed in step 3 to clevises 5 and 6.
- 5 Attach the ends of another of the 3-foot slings placed in step 3 to clevises 15 and 16.
- 6 Repeat steps 4 and 5 for clevises 5A and 6A, and for 15A and 16A (not shown).
- 7 Pad the 11-foot slings with felt and tape 6 inches below the ACS clevis and extending to 6 inches above the top of the ACS. Pass each suspension sling through the closest ACS clevis.
- 8 Safety tie the two-point links to the ACS clevises with loops of Type III nylon cord.

**Figure 4-12. Front and Rear ACS Installed, and Suspension Slings Installed**



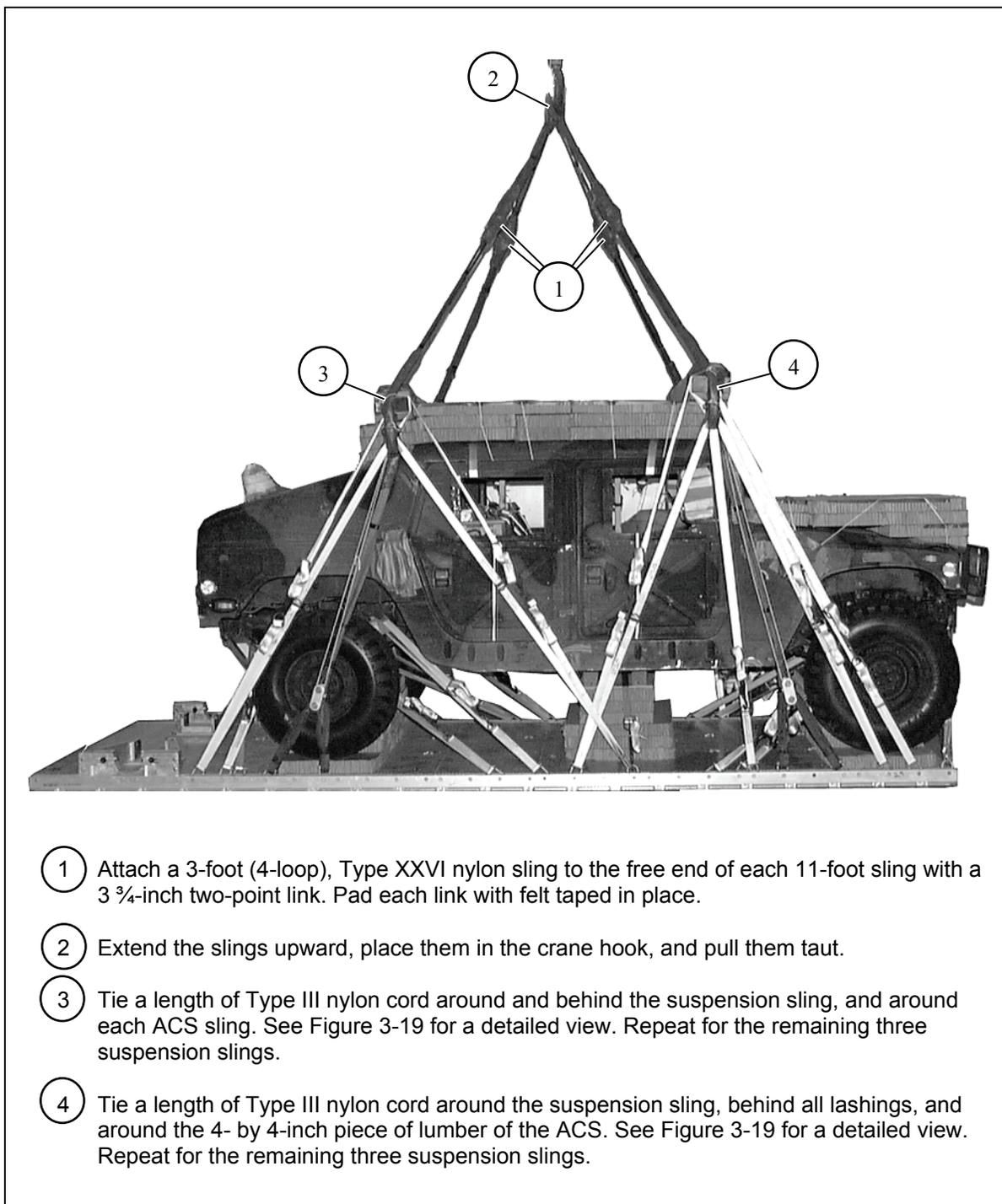
- ① Run a 30-foot lashing from clevis 4, through the ACS clevis from outside to inside, rear to front, around the 4- by 4-inch piece of lumber, and back to clevis 4. Loosely secure the lashing. Repeat on the left side with clevis 4A.
- ② Repeat step 1 using clevises 3 and 3A.
- ③ Run a 30-foot lashing from clevis 12, through the ACS clevis from outside to inside, front to rear, around the 4- by 4-inch piece of lumber, and back to clevis 12. Loosely secure the lashing. Repeat on the left side with clevis 12A.
- ④ Run a lashing from clevis 7, through the ACS clevis, and back to clevis 7. Loosely secure the lashing. Repeat on the left side with clevis 7A.
- ⑤ Make sure the ACS is centered on the load, and tighten the load binders on the left and right at the same time. Tighten the lashings in the following order: 4 and 4A, 3 and 3A, 12 and 12A, 7 and 7A.

Figure 4-13. Front ACS Secured



- 1 Run a 30-foot lashing from clevis 11, through the ACS clevis from outside to inside, rear to front, around the 4- by 4-inch piece of lumber, and back to clevis 11. Loosely secure the lashing. Repeat on the left side with clevis 11A.
- 2 Run a 30-foot lashing from clevis 19, through the ACS clevis from outside to inside, front to rear, around the 4- by 4-inch piece of lumber, and back to clevis 19. Loosely secure the lashing. Repeat on the left side with clevis 19A.
- 3 Make sure the ACS is centered on the load, and tighten the load binders on the left and right at the same time. Tighten the lashings in the following order: 11 and 11A, 19 and 19A.

**Figure 4-14. Rear ACS Secured**



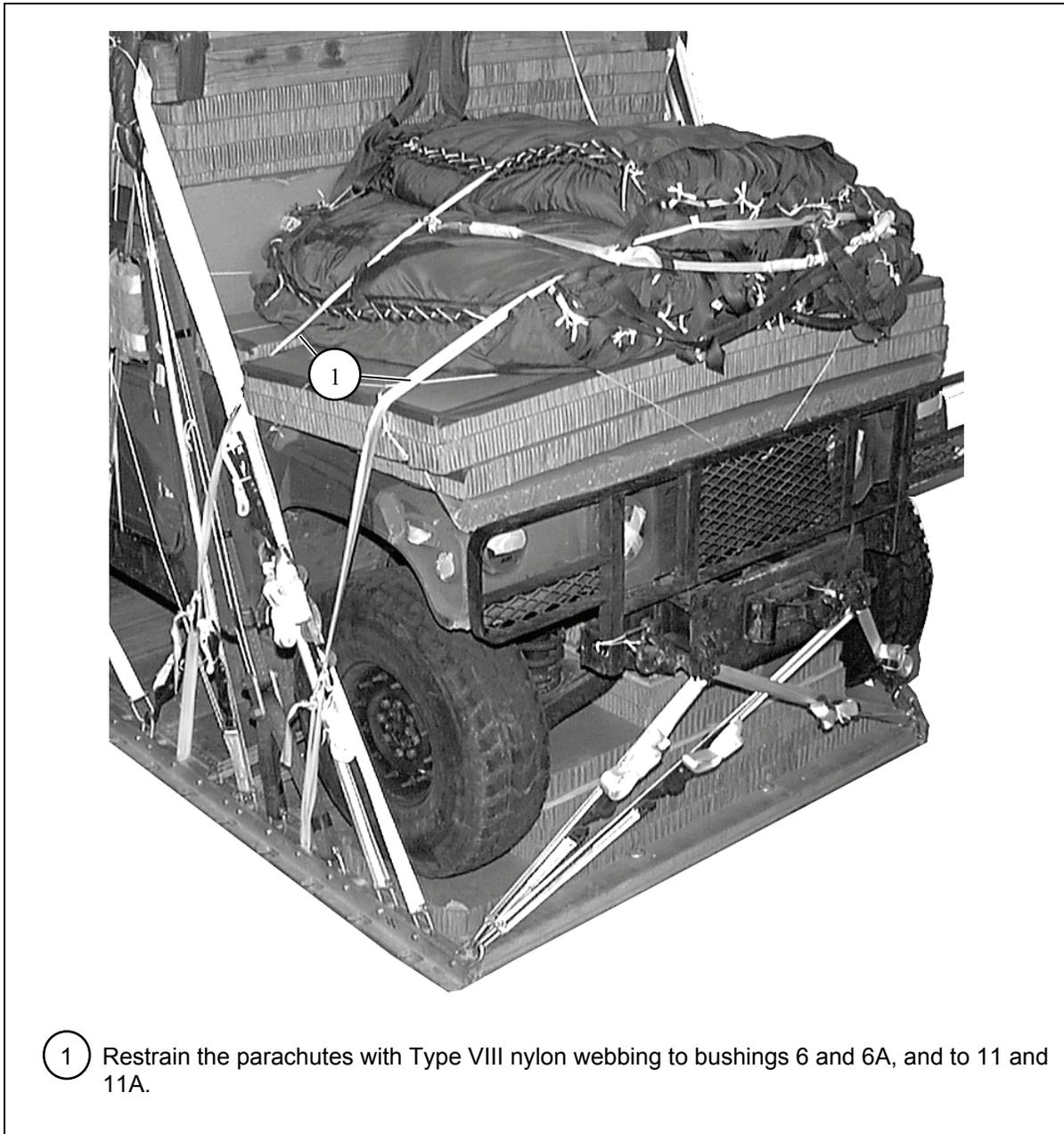
**Figure 4-15. Suspension Slings Completed, Raised, Padded, and Secured**

## INSTALLING OUTRIGGER ASSEMBLIES

4-12. Assemble, install, and safety tie the mast and foot assemblies on the DRAS platform as shown in Chapter 2, Figures 2-42 through 2-45, steps 1 through 3.

## STOWING CARGO PARACHUTES

4-13. Prepare, stow, and restrain three G-11D cargo parachutes on the hood of the truck as shown in Chapter 2 and in Figure 4-16.



**Figure 4-16. Cargo Parachutes Installed**

## STOWING DEPLOYMENT PARACHUTE

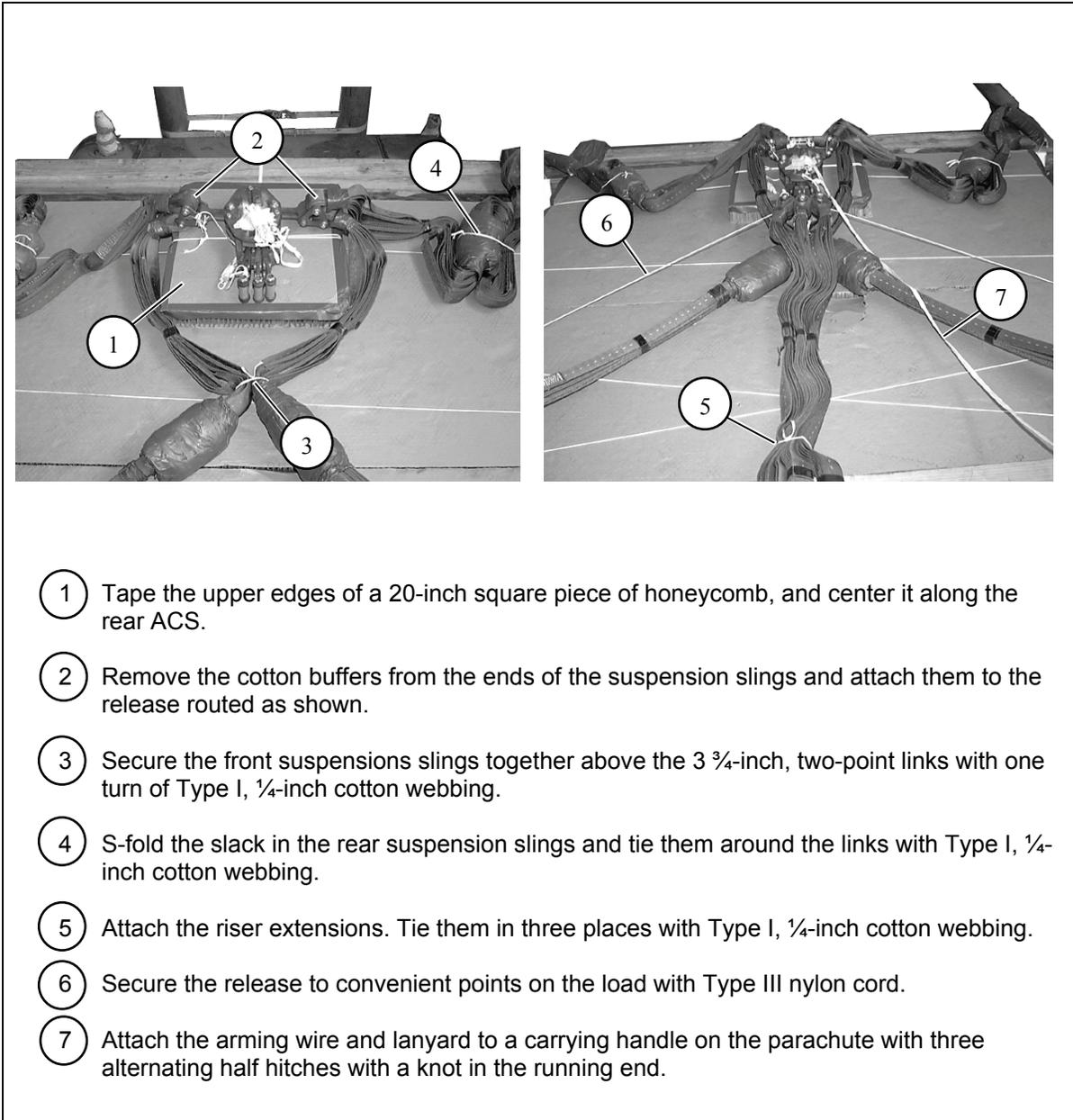
4-14. Prepare, stow, and install the deployment parachute according to Chapter 2, Figure 2-30, and as shown in Figure 4-17.



Figure 4-17. Deployment Parachute Installed

## INSTALLING M-1 RELEASE SYSTEM

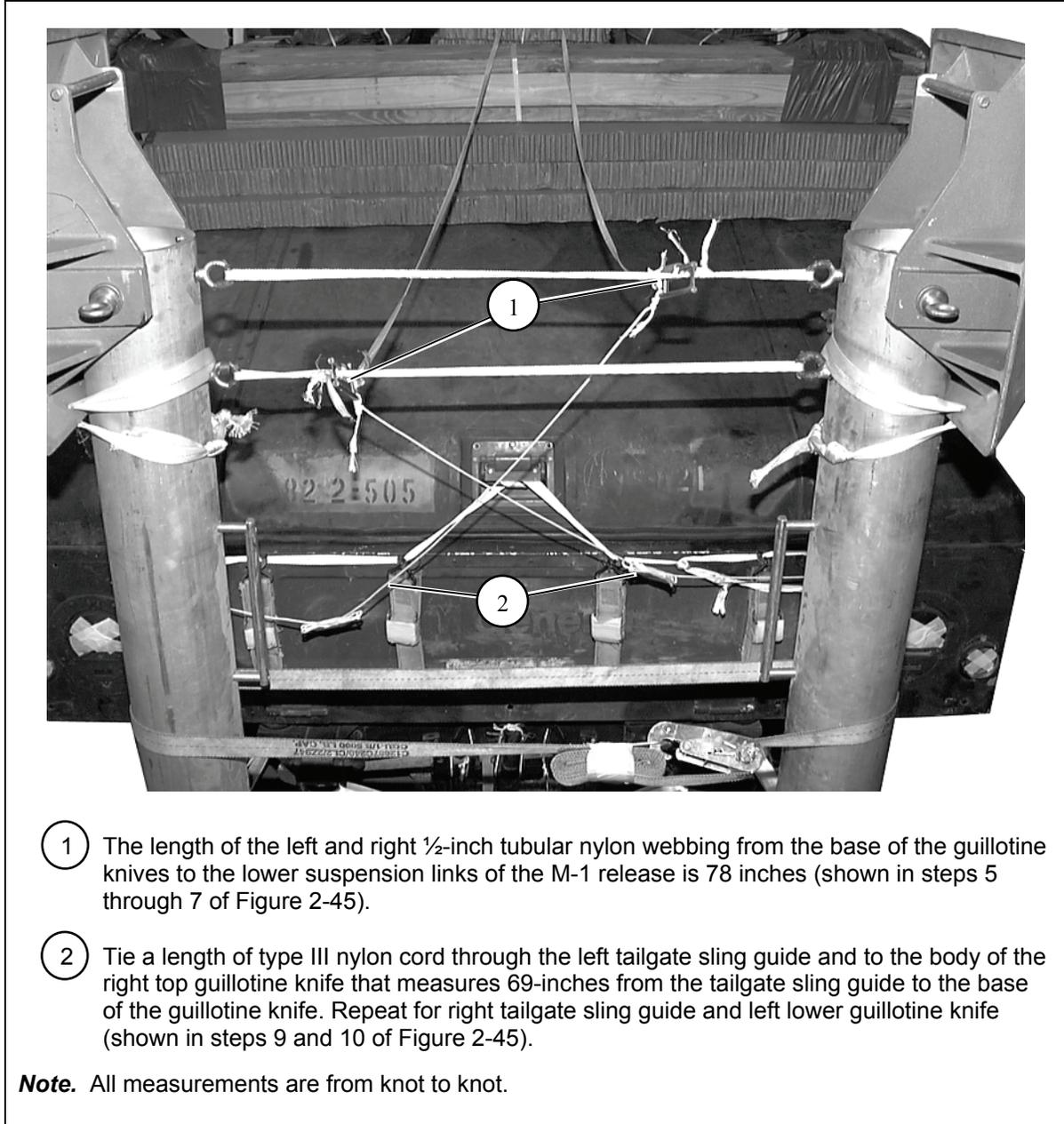
4-15. Prepare and install the M-1 parachute release system according to Chapter 2, and as shown in Figure 4-18.



**Figure 4-18. M-1 Cargo Parachute Release Installed**

## INSTALLING MAST RELEASE KNIVES

4-16. Install the mast release knives according to Chapter 2, Figure 2-45, steps 4 through 10 and as shown in Figure 4-19.



- ① The length of the left and right ½-inch tubular nylon webbing from the base of the guillotine knives to the lower suspension links of the M-1 release is 78 inches (shown in steps 5 through 7 of Figure 2-45).
- ② Tie a length of type III nylon cord through the left tailgate sling guide and to the body of the right top guillotine knife that measures 69-inches from the tailgate sling guide to the base of the guillotine knife. Repeat for right tailgate sling guide and left lower guillotine knife (shown in steps 9 and 10 of Figure 2-45).

**Note.** All measurements are from knot to knot.

**Figure 4-19. Mast Release Knives Installed**

## MARKING RIGGED LOAD

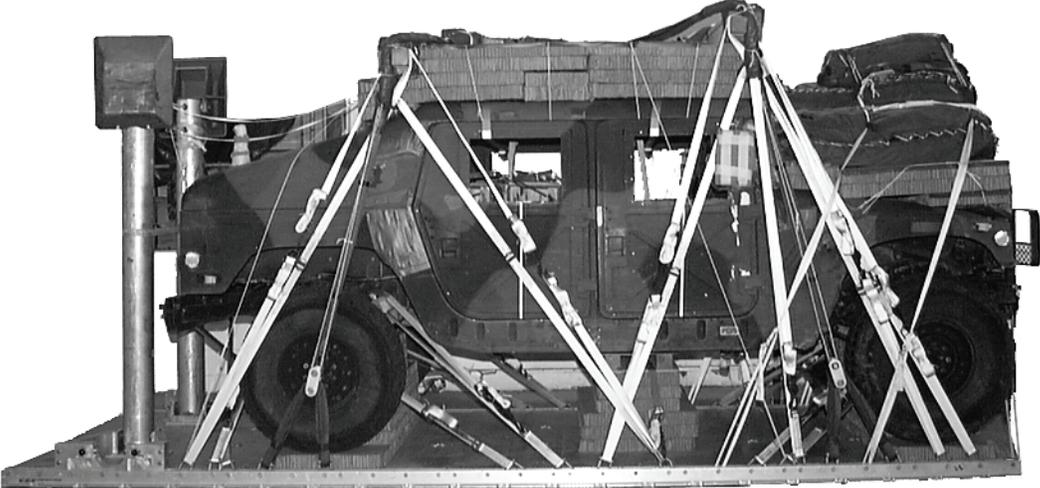
4-17. Mark the rigged load according to Chapter 2, Section IX and as shown in Figures 4-20 and 4-21. If the load varies from the one shown, the weight, height, CB, and parachute requirements must be recomputed.

## EQUIPMENT REQUIRED

4-18. The equipment required to rig this load is listed in Table 4-1.

**CAUTION**

Make the final rigger inspection required by Chapter 2, Section IX before the load leaves the rigging site.



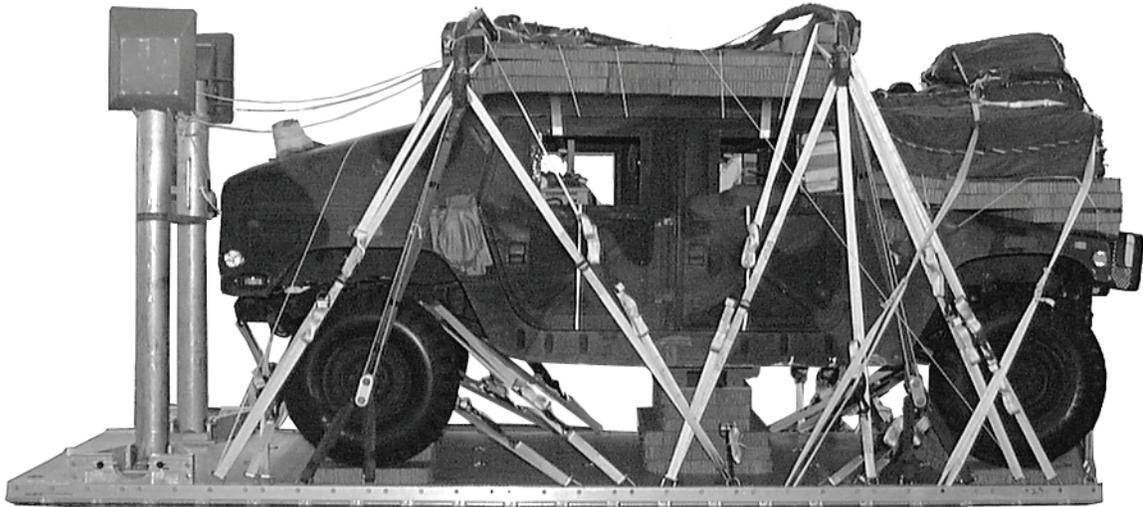
**RIGGED LOAD DATA**

Weight: Load shown .....	12,637 pounds
Maximum load allowed.....	12,750 pounds
Height (with three G-11D parachutes).....	98 inches
Width.....	94 inches
Overall Length .....	229 inches
Overhang: Front (brush guard).....	13 inches
Rear .....	0 inches
Center of Balance (from front edge of platform):.....	94 inches

**Figure 4-20. M1025 Armament Carrier Rigged on DRAS Platform**

**CAUTION**

Make the final rigger inspection required by Chapter 2, Section IX before the load leaves the rigging site.



**RIGGED LOAD DATA**

Weight: Load shown.....	10,455 pounds
Maximum load allowed .....	12,750 pounds
Height (with three G-11D parachutes) .....	98 inches
Width .....	94 inches
Overall Length.....	224 inches
Overhang: Front (brush guard) .....	8 inches
Rear .....	0 inches
Center of Balance (from front edge of platform): .....	86 inches

**Figure 4-21. M1121 TOW Carrier Rigged on DRAS Platform**

**Table 4-1. Equipment Required for Rigging M1025 Armament Carrier and M1121 TOW Carrier on DRAS Platform**

<i>National Stock Number</i>	<i>Item</i>	<i>Quantity</i>
8040-00-273-8713	Adhesive paste, 1-gallon	As required
4020-00-240-2146	Cord, nylon, type III, 550-pound	As required
	Clevis:	
4030-00-090-5354	Large	5
4030-00-678-8562	Medium	8
1670-00-360-0328	Cover, clevis, large	3
8135-00-664-6958	Cushioning material, packaging, cellulose wadding	As required
8305-00-191-1101	Felt, ½-inch	As required
1670-01-493-6418	Link assembly, two-point, 3 ¾-inch	9
	Lumber:	
5510-00-220-6146	2- by 4-inch	As required
5510-00-220-6148	2- by 6-inch	As required
5510-00-220-6274	4- by 4-inch	As required
5530-00-618-8073	Plywood, ¾-inch	5 sheets
	Nail, steel wire, common,	
5315-00-010-4659	8d	As required
5315-00-753-3883	10d	As required
1670-00-753-3928	Pad, energy dissipating, honeycomb	18 sheets
1670-01-487-5461	Static line assembly release away	1
	Parachute:	
	Cargo:	
1670-01-016-7841	G-11D	3
1670-00-040-8135	Cargo extraction: 28-foot (deployment parachute)	1
	Platform, dual row, 18-foot	
1670-01-485-1654	Rail, DRAS	2
1670-01-486-1342	Roller Pad, DRAS	4
1670-01-486-1656	Panel Assembly, Main	9
1670-01-162-2372	Clevis assembly	38
1670-01-097-8816	Release, cargo parachute, M-1	1
	Sling, cargo airdrop	
	For suspension:	
1670-01-062-6310	11-ft (4-loop), type XXVI nylon webbing	4
1670-01-062-6306	3-ft (4-loop), type XXVI nylon webbing	8
	For deployment:	
1670-01-062-6306	3-ft (4-loop), type XXVI nylon webbing	1
	For riser extension:	
1670-01-062-6313	60-ft (3-loop), type XXVI nylon webbing	3
	For ACS:	
1670-01-063-7761	16-ft (2-loop), type XXVI nylon webbing	2

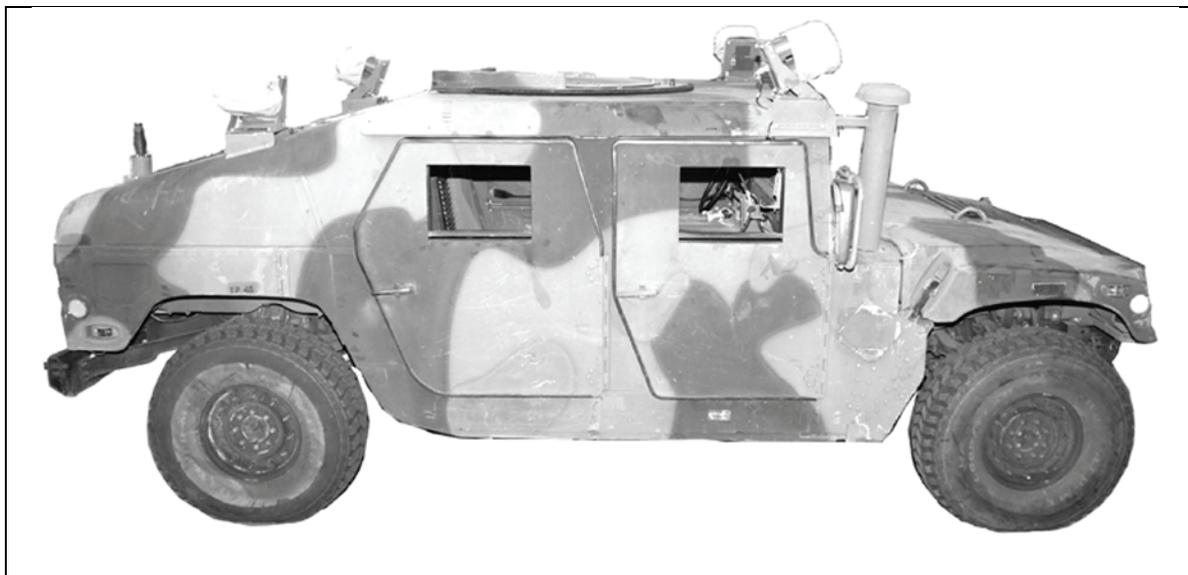
**Table 4-1. Equipment Required for Rigging M1025 Armament Carrier and M1121 TOW Carrier on DRAS Platform (Continued)**

<i>National Stock Number</i>	<i>Item</i>	<i>Quantity</i>
	For lifting:	
1670-01-062-6304	9-ft (2-loop), type XXVI nylon webbing	2
1670-01-062-6303	12-ft (2-loop), type XXVI nylon webbing	2
1670-00-040-8219	Strap, parachute release, multicut	2
1670-00-937-0271	Knife release, cargo (guillotine)	6
1670-01-487-5464	Outrigger assembly	1
7510-00-266-5016	Tape, adhesive, 2-in	As required
1670-00-937-0271	Tie-down assembly, 15-ft	51
1670-00-725-1437	Tie-down, cargo, aircraft, (CGU-1B)	5
	Webbing:	
8305-00-268-2411	Cotton, ¼-in, type I	As required
	Nylon:	
8305-00-082-5752	Tubular, ½-in	As required
8305-00-263-3591	Type VIII	As required

## SECTION II – RIGGING M1114 UP-ARMORED ARMAMENT CARRIER HMMWV

### DESCRIPTION OF LOAD

4-19. The M1114 HMMWV- series truck has a heavy-duty suspension and additional armor in the sides, door and floor. The truck is rigged on a Dual Row Airdrop System (DRAS) platform with four G-11D parachutes.



**Figure 4-22. M1114 Up-Armored Armament Carrier**

## PREPARING PLATFORM

4-20. Inspect, or assemble and inspect, a DRAS platform with outrigger assemblies, outrigger platform support weldments, and link assemblies according to TM 10-1670-268-20&P/TO 13C7-52-22 and as shown in Figure 4-23.

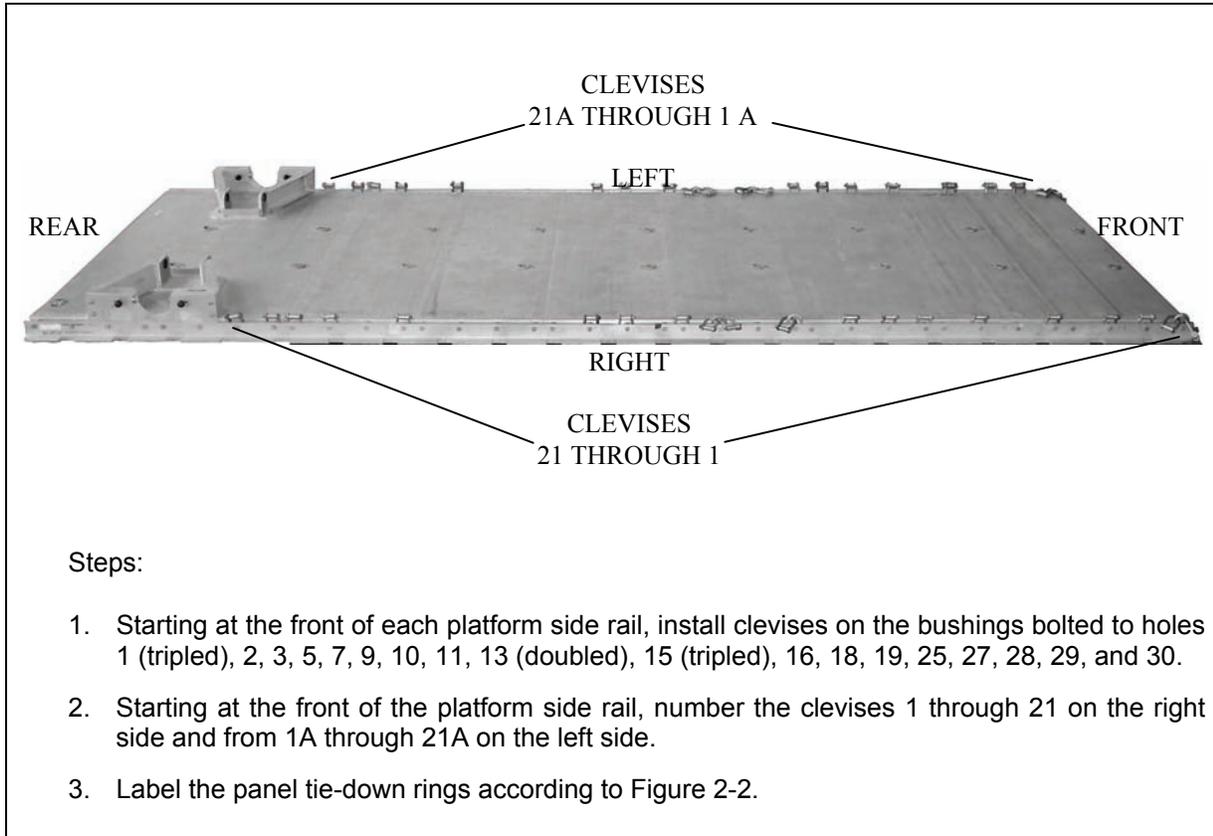
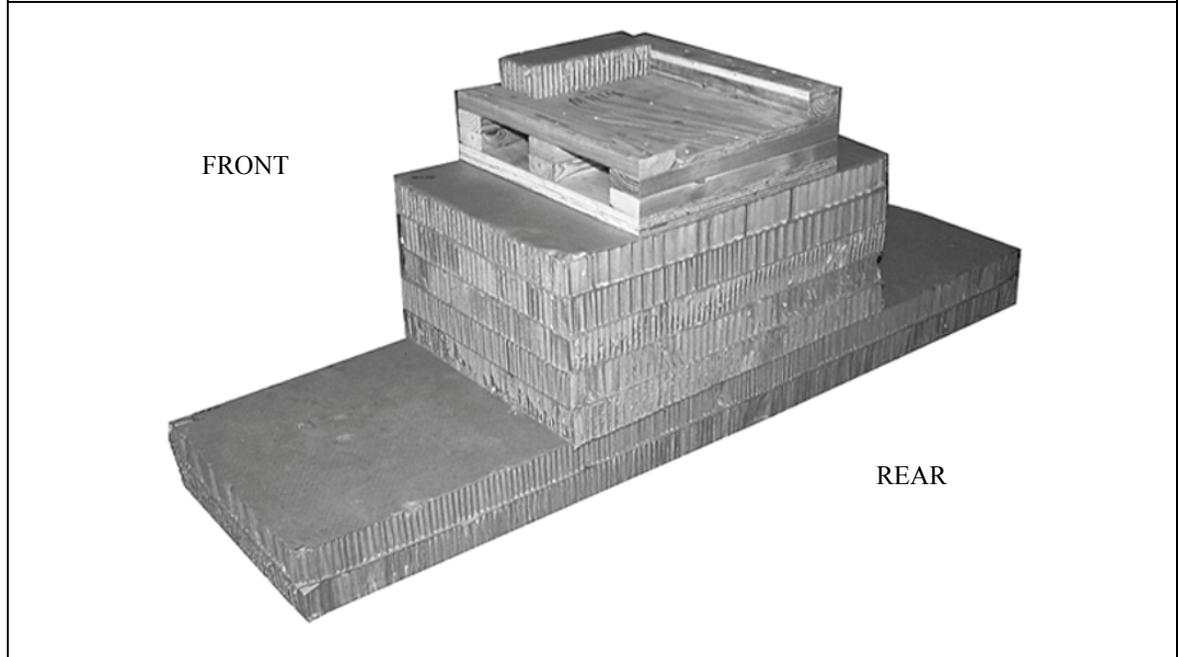


Figure 4-23. Platform Prepared

## BUILDING AND PLACING HONEYCOMB STACKS

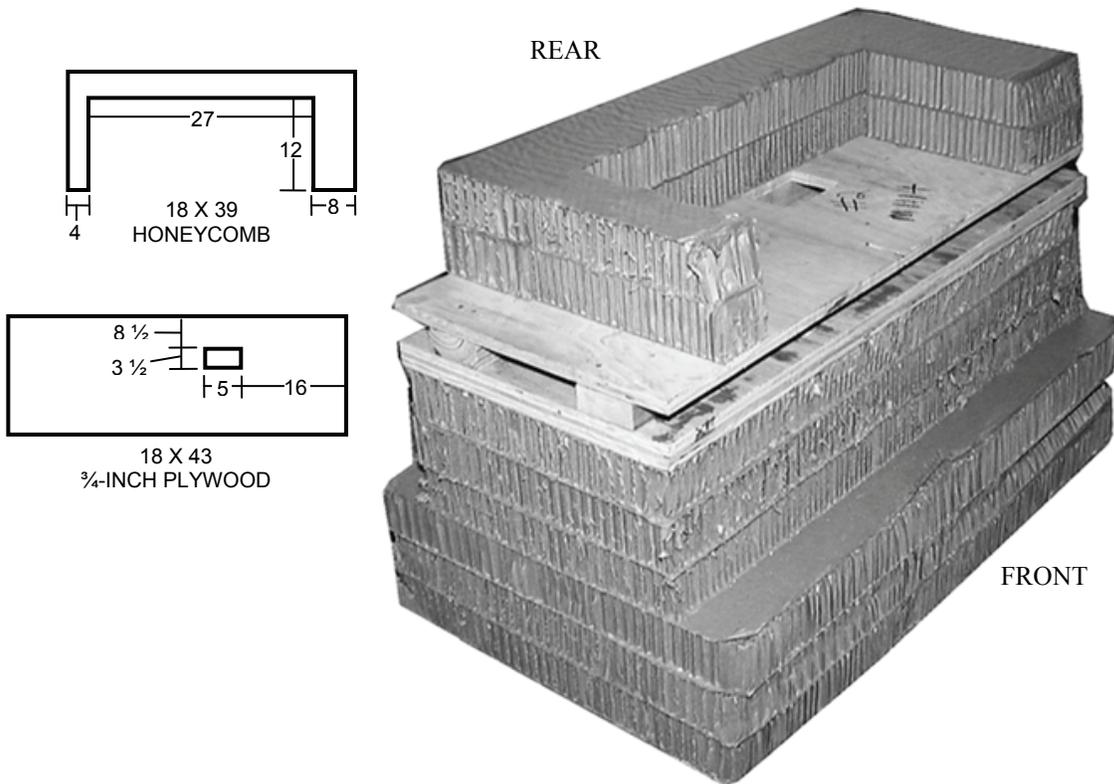
4-21. Build the honeycomb stacks as described in Figures 4-24 through 4-26. Position the stacks as shown in Figure 4-27.



<b>Stack Number</b>	<b>Pieces</b>	<b>Width (inches)</b>	<b>Length (inches)</b>	<b>Material</b>	<b>Instructions</b>
1	2	24	80	Honeycomb	Glue to form base.
	5	24	35	Honeycomb	Center and glue to base.
	2	24	21	¾-inch Plywood	Center and glue to top of 24-inch by 35-inch honeycomb.
	6		21	2 x 4 Lumber	Nail six pieces in stacks of two on the plywood. Position one stack flush along the front, center and rear edges.
	1		24	2 x 4 Lumber	Nail lumber flush along the left edge.
	1	24	17	¾-inch Plywood	Nail plywood flush with the right edge.
	1		24	2 x 4 Lumber	Nail lumber flush with the right edge of the plywood.
	1	24	3 ½	¾-inch Plywood	Nail plywood flush over the lumber placed above. Glue and center wood stack section on top of honeycomb base.
	1	5	13	Honeycomb	Glue honeycomb along the front edge of the honeycomb stack.

Figure 4-24. Honeycomb Stack 1 Prepared

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



Stack Number	Pieces	Width (inches)	Length (inches)	Material	Instructions
2	3	26	43	Honeycomb	Glue honeycomb together to form a base.
	3	18	43	Honeycomb	Center and glue honeycomb on the base.
	2	18	43	3/4-inch Plywood	Nail plywood flush together.
	2		43	2 x 4 Lumber	Nail lumber to plywood and 3 inches from each long edge.
	1	18	43	3/4-inch Plywood	Cut plywood as shown in diagram. Nail the plywood to the lumber and flush with the bottom layers of plywood. Glue the wood section of the stack flush on the honeycomb base.
	2	18	39	Honeycomb	Cut honeycomb as shown in diagram. Glue honeycomb flush with the left edge of the plywood, with the cutout facing the front of the stack.

Figure 4-25. Honeycomb Stack 2 Prepared

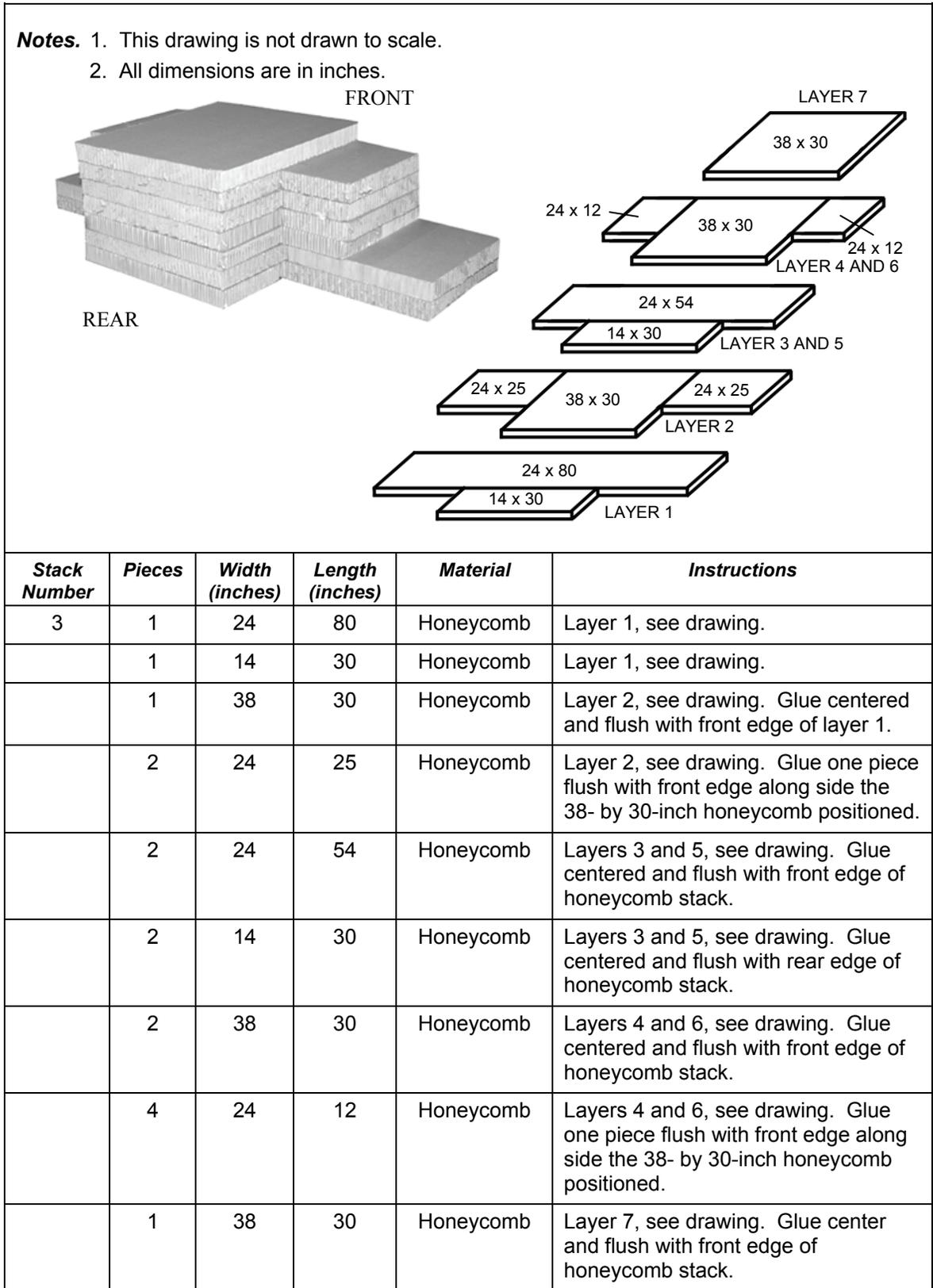
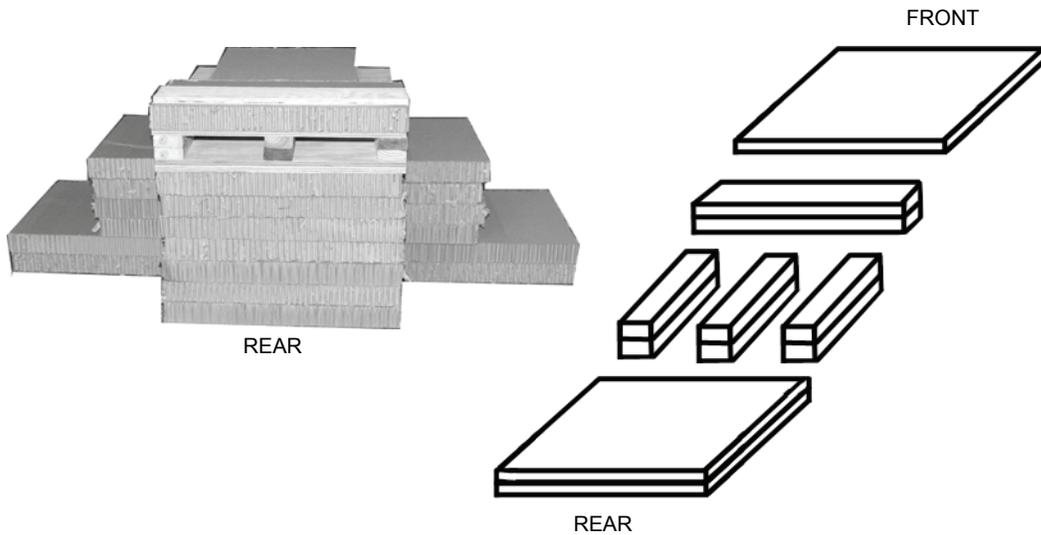


Figure 4-26. Honeycomb Stack 3 Prepared

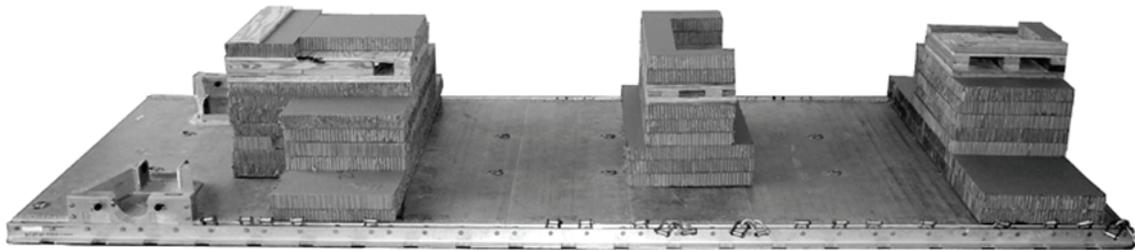
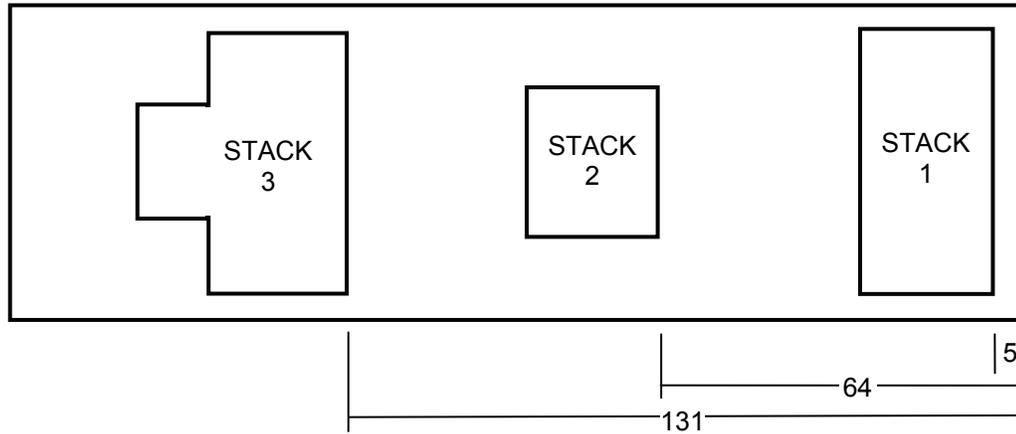
- Notes.** 1. All measurements are given in inches.  
 2. This drawing is not drawn to scale.



<b>Stack Number</b>	<b>Pieces</b>	<b>Width (inches)</b>	<b>Length (inches)</b>	<b>Material</b>	<b>Instructions</b>
3	2	30	38	¾-inch Plywood	Glue together to form wooden stack.
	8	30		2 x 4 Lumber	Nail in pairs of two. Nail one pair centered and one flush with left and right side of plywood. Nail one pair flush against front edge of plywood.
	1	30	38	¾-inch Plywood	Nail to 2 x 4 stacks of lumber.
					Center and glue wood stack to honeycomb base.
	1	30	14	Honeycomb	Center and glue flush along rear edge.
	1	24	20	Honeycomb	Center the 20-inch side along the front edge.
	1	6	20	¾-inch Plywood	Glue 1 inch from the rear edge of the stack.

**Figure 4-26. Honeycomb Stack 3 Prepared (Continued)**

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



<b>Stack Number</b>	<b>Position of Stack on Platform</b>
	Place stack:
1	Centered 5 inches from front edge of platform.
2	Centered 64 inches from front edge of platform.
3	Centered 131 inches from front edge of platform.

**Figure 4-27. Honeycomb Stacks Placed on Platform**

## PREPARING M1114 TRUCK

4-22. Prepare the M1114 truck as described below.

- Prepare the fuel tank as shown in Figures 3-5 and 3-6.

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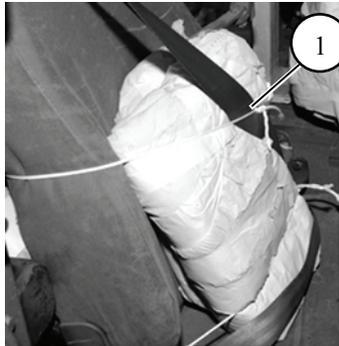
**Note.** Certain units may be authorized a waiver allowing 95% fuel. One way to verify the tank is 95% full is to fill the tank and withdraw 1 ¼ gallons with a hand pump.

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### CAUTION

A full tank does not allow for expansion, and is a danger to aircraft and air crew.

- Make sure the batteries and battery compartment comply with AFMAN 24-204(I)/TM 38-250.
- Prepare the cab of the truck as shown in Figures 4-2, 4-3 and 4-28.
- Prepare the body of the truck as shown in Figure 4-29.
- Prepare the underside of the truck as shown in Figure 4-30.
- Prepare the front of the truck as shown in Figure 4-31.
- Prepare the turret housing as shown in Figure 4-5.
- Prepare the light vehicle obscuration smoke system (LVOSS) units as shown in Figure 4-32.



- 1 Remove the side view mirrors and wrap with cellulose wadding and tape. Secure them to the front passenger seat with type III nylon cord. Fasten the seat belt around the padded mirrors.

**Figure 4-28. Inside of Cab Prepared**

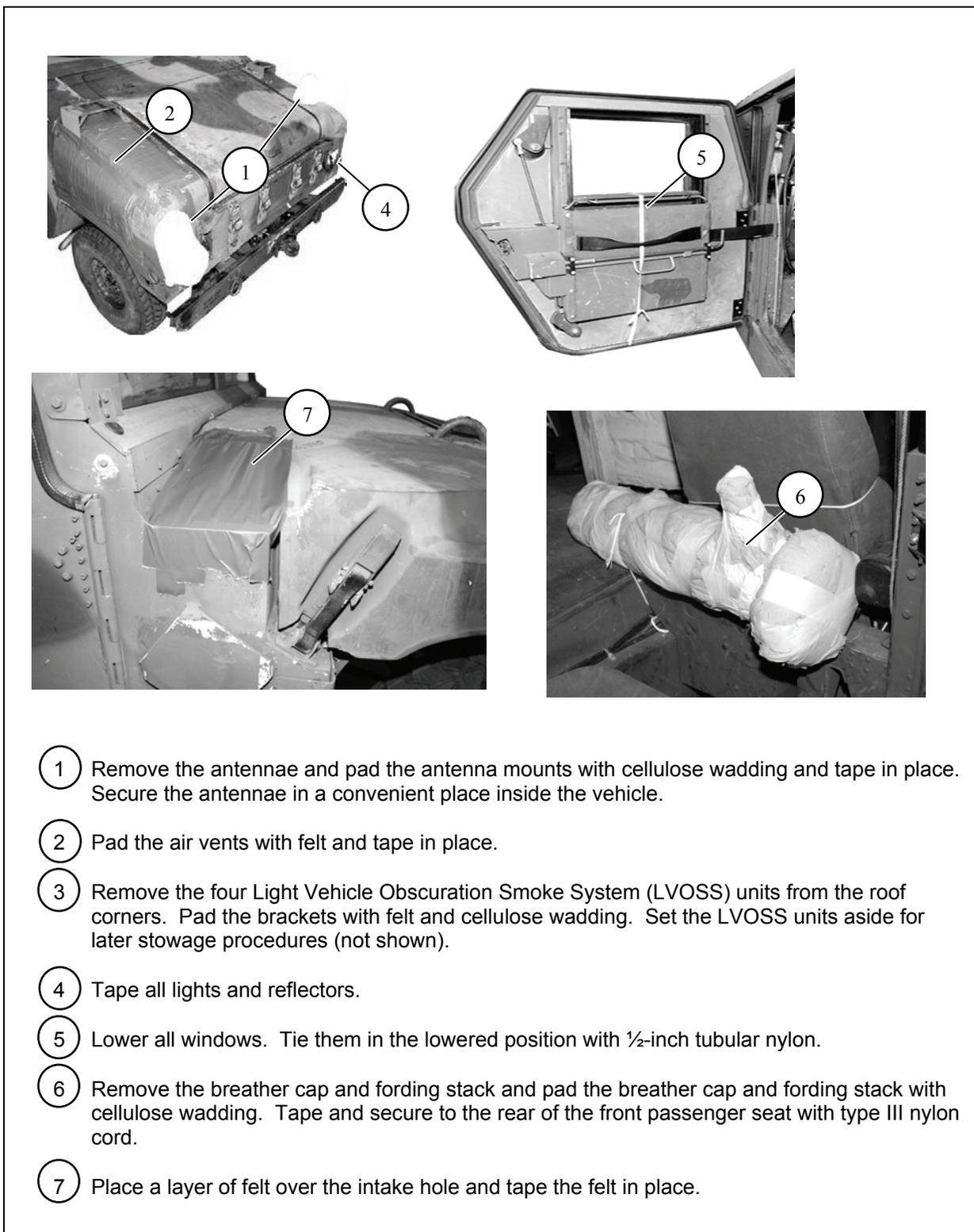
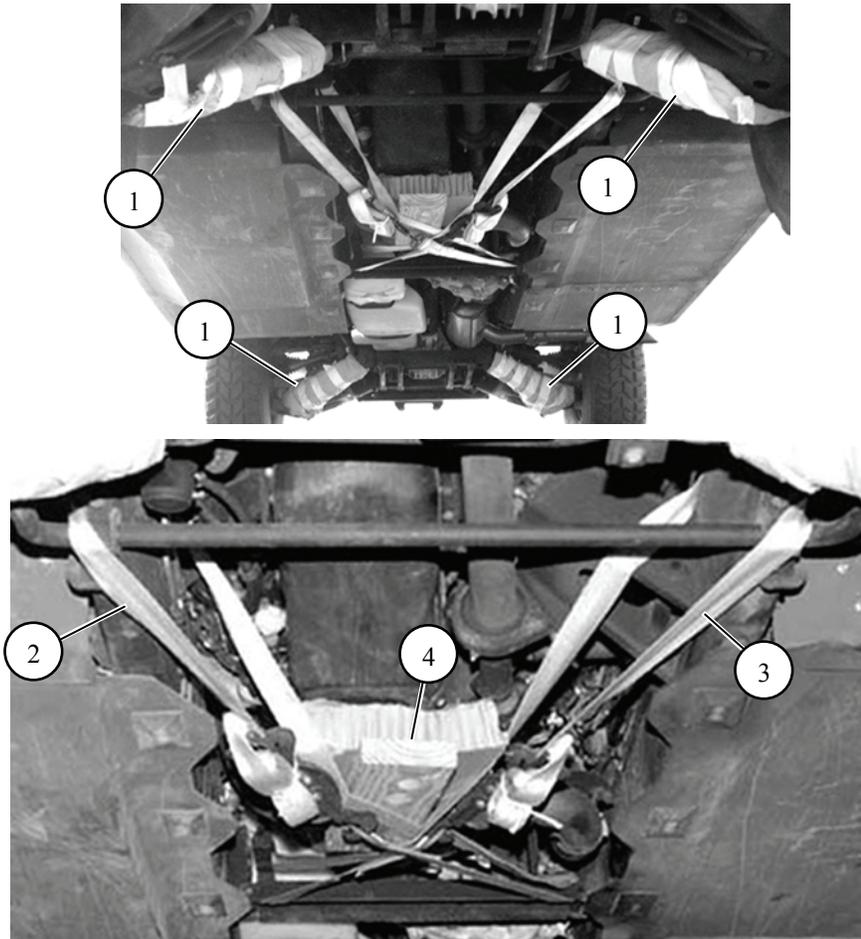


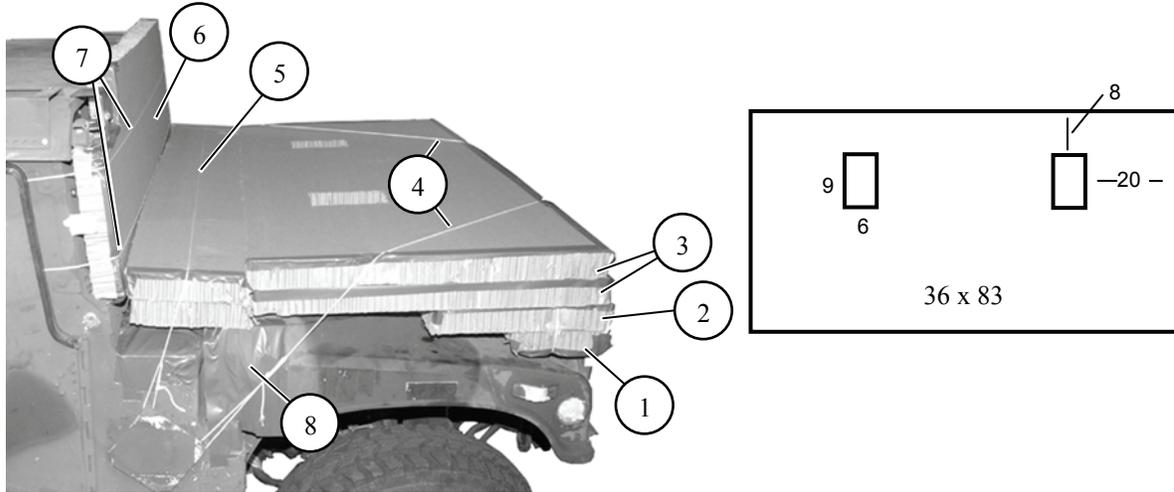
Figure 4-29. Body of Truck Prepared



- 1 Pad the lower control arms at the front and rear of the truck with cellulose wadding. Tape in place.
- 2 Route a 15-foot lashing around the right side frame member and to the front side of the stabilizer bar. Route the free end of the lashing around the radius rod on the left side of the cross member in front of the fuel tank. Do not tighten lashing at this time.
- 3 Route a second 15-foot lashing around the left side frame member to the front side of the stabilizer bar. Route the free end of the lashing around the radius rod on the right side of the cross member in front of the fuel tank. Do not tighten lashing at this time.
- 4 Cut a 12- by 12-inch piece of honeycomb and a 16 inch length of 2- by 6- inch lumber. Place the honeycomb and lumber under the oil pan. Tighten and secure both lashings over the honeycomb and lumber. Separate the load binders so they do not interfere with each other.

**Figure 4-30. Underside of Truck Prepared**

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



- 1 Cut a 10- by 80-inch piece of honeycomb. Tape the 10 inch side on the bottom of both ends. Place the honeycomb flush on the front end of the hood.
- 2 Cut an 18- by 80-inch piece of honeycomb. Position on top of and flush with the 10- by 80-inch piece of honeycomb. Tape the top of the 18 inch sides. Tie the two pieces of honeycomb together with a length of type III nylon cord around the 80 inch length.
- 3 Place two 36- by 83-inch pieces of honeycomb, with the cutouts as shown, on top of the previously positioned honeycomb and flush with the front. Tape the 36 inch sides on the top piece of honeycomb.
- 4 Secure the 36- by 83-inch pieces of honeycomb with type III nylon cord. Tie the type III nylon cord to the left hood latch and route it over the honeycomb, through the grill, over the honeycomb, and secure it to the right hood latch.
- 5 Cut two 12- by 83-inch pieces of honeycomb and position them behind the honeycomb positioned in step 5. Tape the top outside edges. Secure the honeycomb to the left and right vent protector.
- 6 Cut a 21- by 83-inch piece of honeycomb. Make a 6- by 12-inch cut out on the right front top of the honeycomb for the breather cap and fording stack brace. Tape the outside edges and position the honeycomb in front of the windshield.
- 7 Secure the honeycomb with two lengths of type III nylon cord around the honeycomb and inside the cab.
- 8 Tape the hood latches with 2-inch adhesive tape.

**Figure 4-31. Front of Truck Prepared**

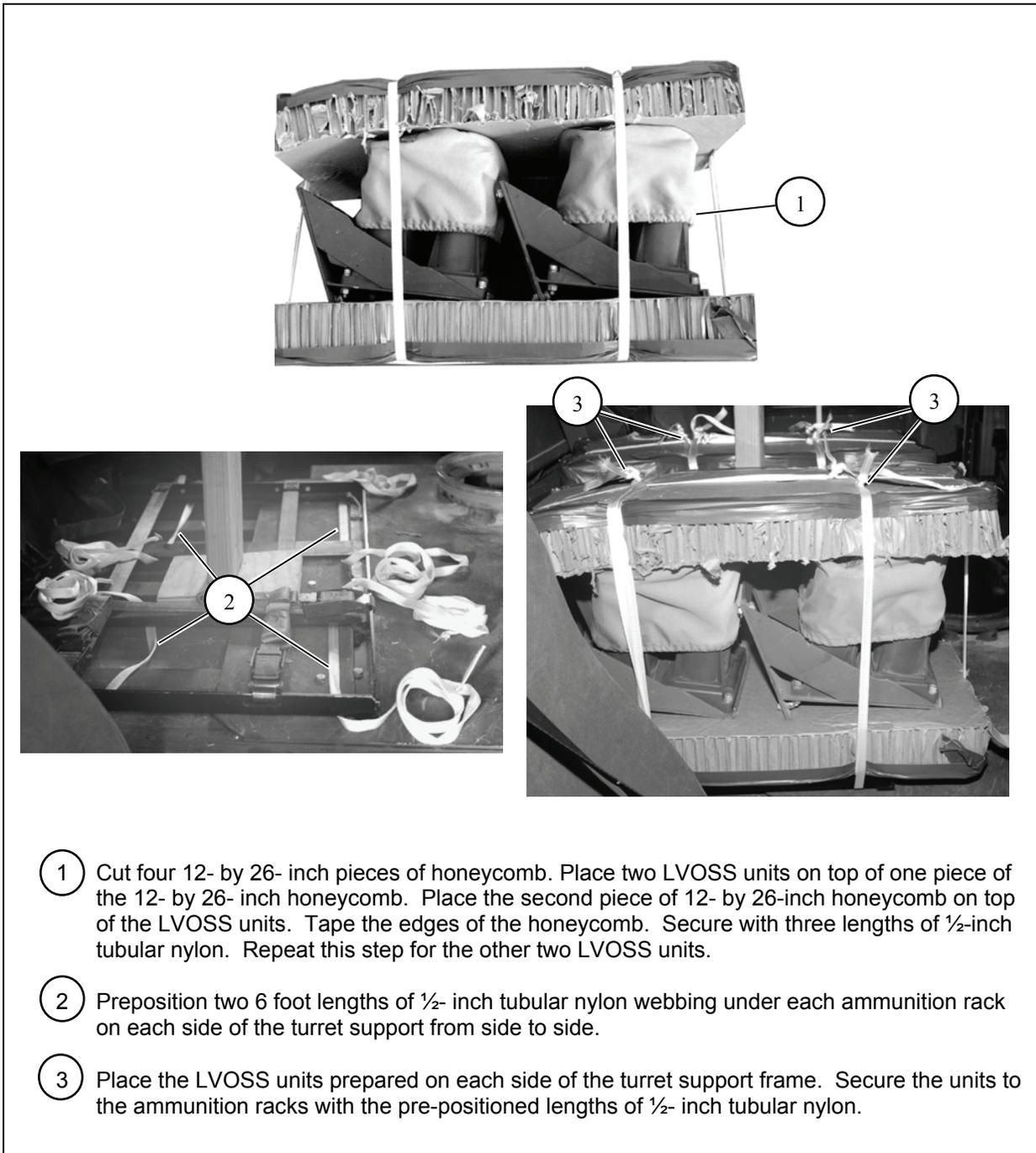


Figure 4-32. LVOSS Units Secured

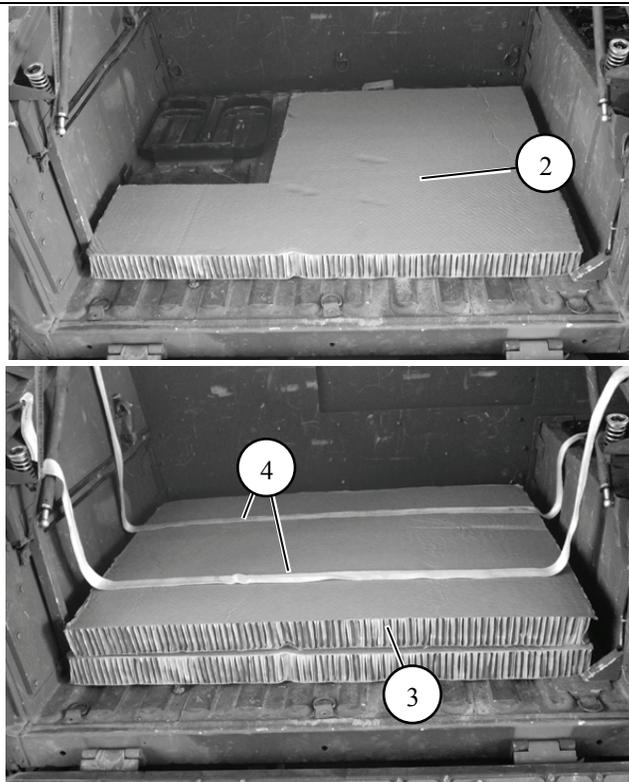
## STOWING THE ACCOMPANYING LOAD

4-23. Stow the accompanying load as shown in Figure 4-33.

*Note.* The accompanying load may vary from the one shown. Ensure the load is properly secured and weighs between 800 and 2,000 pounds.

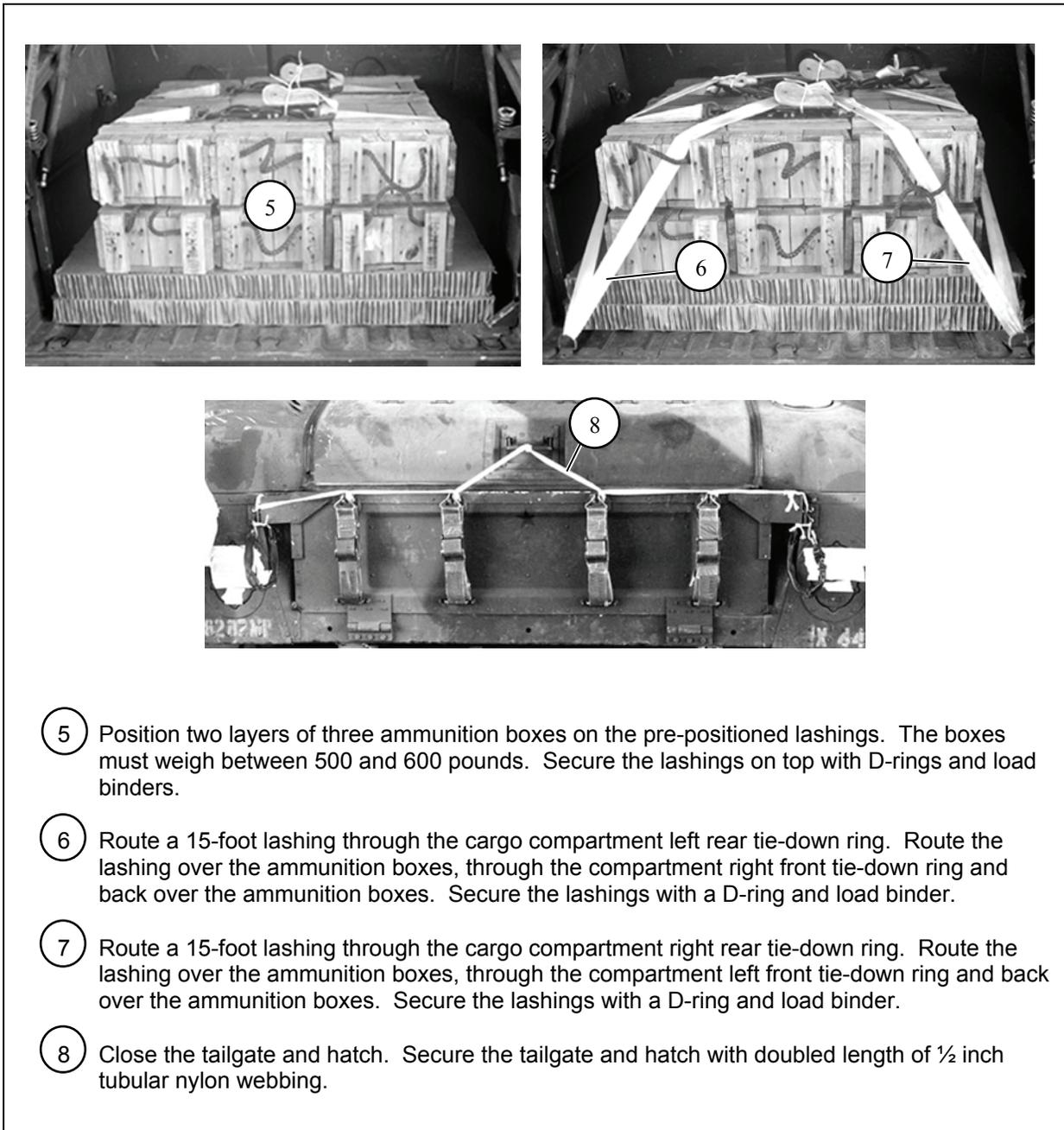
### CAUTION

Only ammunition listed in FM 4-20.153/MCRP 4-11.3B/TO 13C7-18-41 may be airdropped. Package, label and mark hazardous material according to AFMAN 24-204(I)/TM 38-250.



- ① Tighten all straps in the rear cargo compartment and secure with 2-inch adhesive tape (not shown).
- ② Cut a 36- by 47-inch piece of honeycomb. Make a 16- by 22-inch cut out to accommodate the fuel water can rack. Place it on the floor of the compartment.
- ③ Cut and place a 36- by 47-inch piece of honeycomb, and place it on top of the previously positioned piece of honeycomb in step 2.
- ④ Preposition two 15 foot lashings on top of the honeycomb in step 3. Place the first lashing 8 inches and the second lashing 25 inches from the rear of the honeycomb.

**Figure 4-33. Accompanying Load Stowed**



- 5 Position two layers of three ammunition boxes on the pre-positioned lashings. The boxes must weigh between 500 and 600 pounds. Secure the lashings on top with D-rings and load binders.
- 6 Route a 15-foot lashing through the cargo compartment left rear tie-down ring. Route the lashing over the ammunition boxes, through the compartment right front tie-down ring and back over the ammunition boxes. Secure the lashings with a D-ring and load binder.
- 7 Route a 15-foot lashing through the cargo compartment right rear tie-down ring. Route the lashing over the ammunition boxes, through the compartment left front tie-down ring and back over the ammunition boxes. Secure the lashings with a D-ring and load binder.
- 8 Close the tailgate and hatch. Secure the tailgate and hatch with doubled length of 1/2 inch tubular nylon webbing.

**Figure 4-33. Accompanying Load Stowed (Continued)**

## PREPARING ROOF

4-24. Prepare the roof of the M1114 as shown in Figure 4-34.

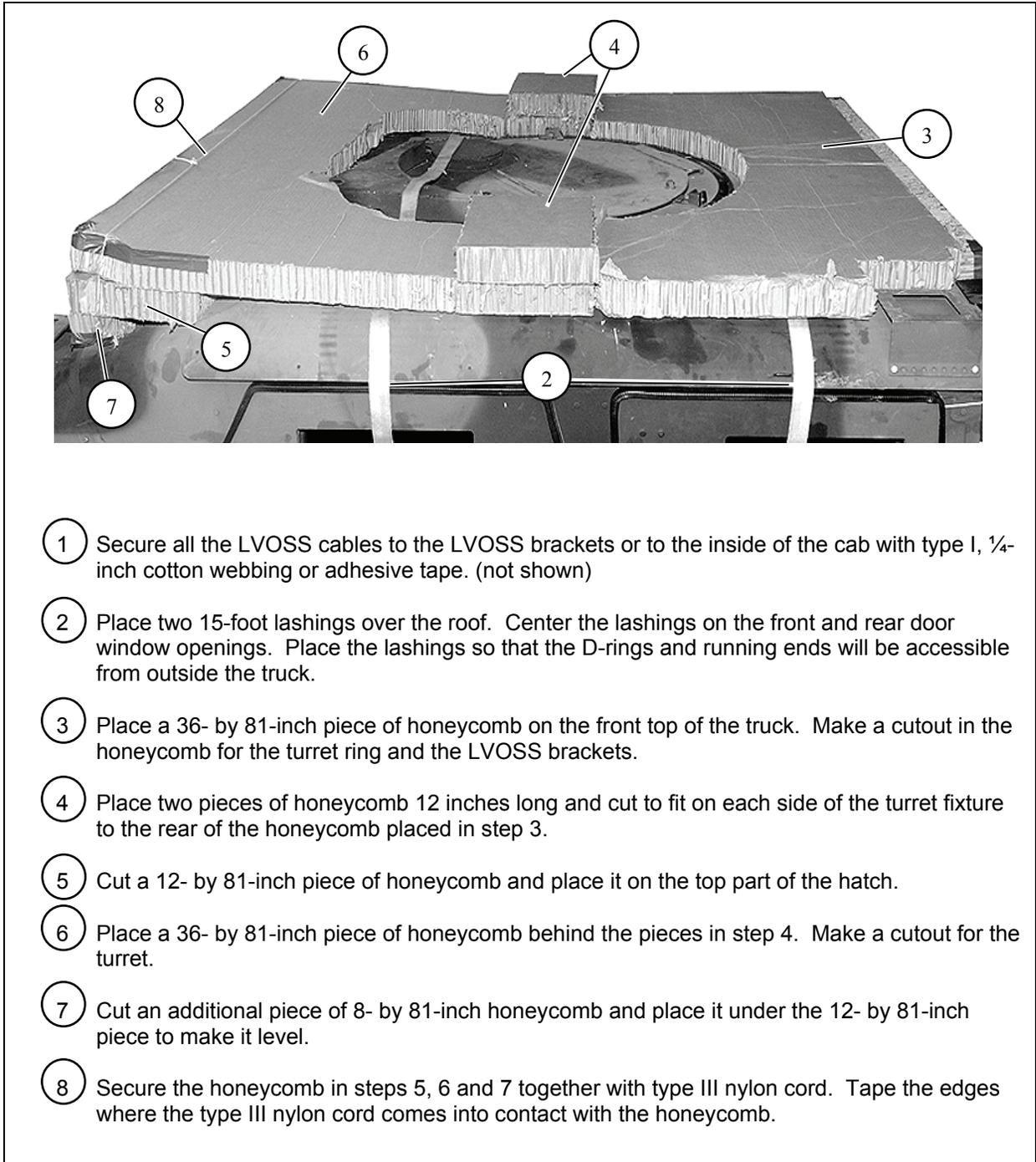
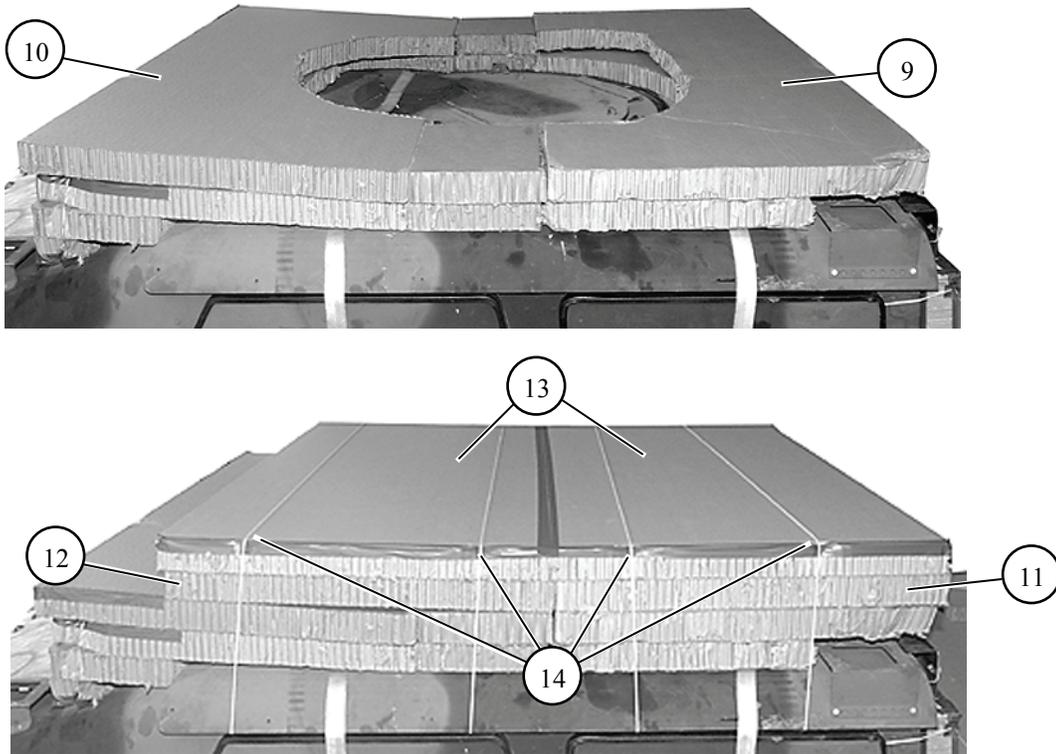


Figure 4-34. Roof Prepared



- 9 Place a second layer of 36- by 81-inch honeycomb on top of the front piece of honeycomb. Make a cutout for the turret ring.
- 10 Place a second layer of 36- by 81- inch honeycomb on top of the rear piece of honeycomb and flush against the piece of honeycomb placed in step 5. Make a cutout for the turret ring.
- 11 Place a 36- by 81-inch piece of honeycomb on top of the front pieces of honeycomb.
- 12 Place a 36- by 81-inch piece of honeycomb on top of the rear pieces of honeycomb and flush against the piece placed in step 11.
- 13 Place two 36- by 81-inch pieces of honeycomb on top of the honeycomb placed in steps 11 and 12.
- 14 Secure the pieces of honeycomb with four lengths of type III nylon cord over the top and inside the cab. Tape the edges of the honeycomb where the type III nylon cord contacts it.
- 15 Close the doors and secure them shut with the lashings provided in step 2 (not shown).

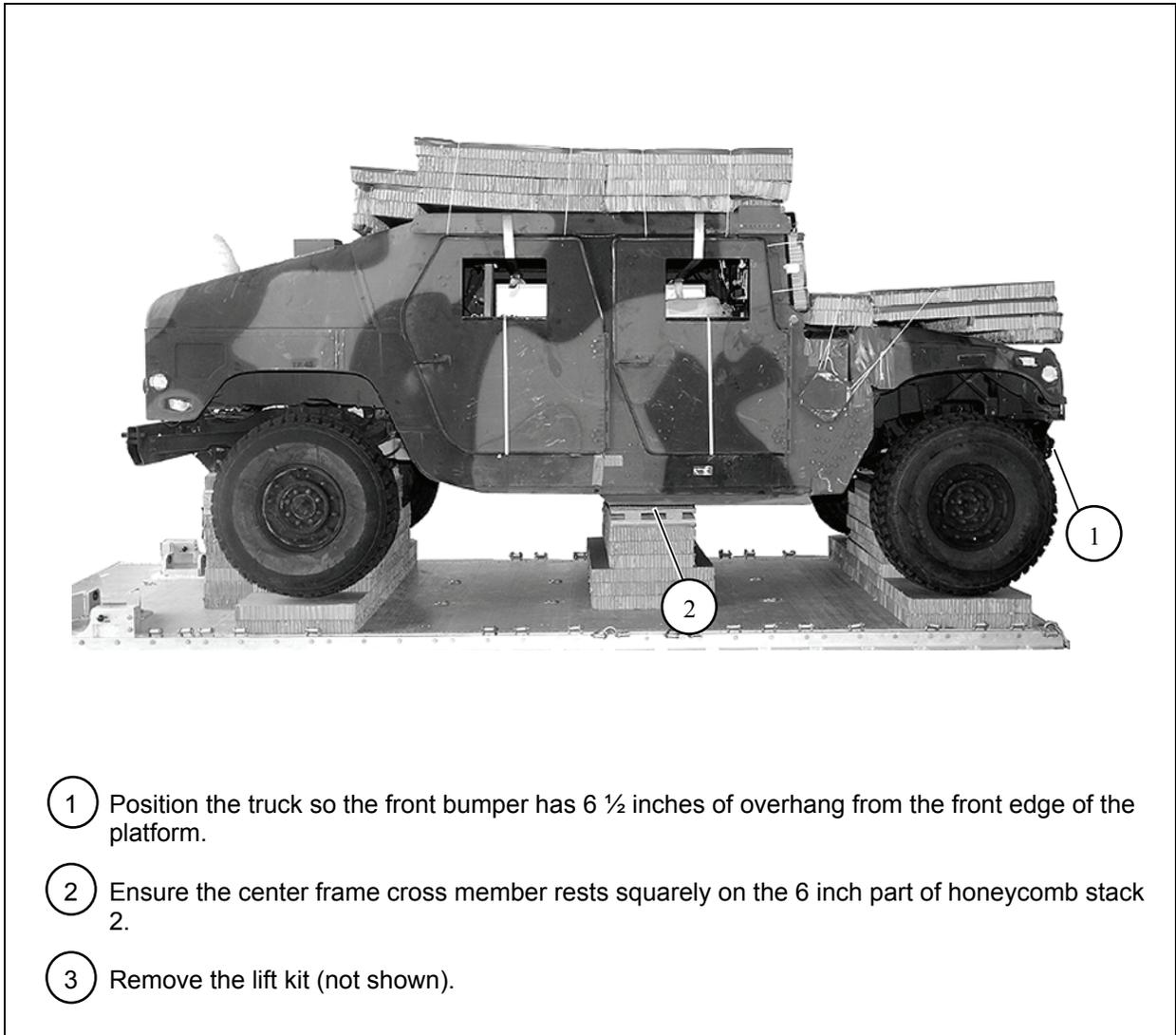
**Figure 4-34. Roof Prepared (Continued)**

## LIFTING AND POSITIONING TRUCK AND INSTALLING OPTIONAL DRIVE-OFF AIDS

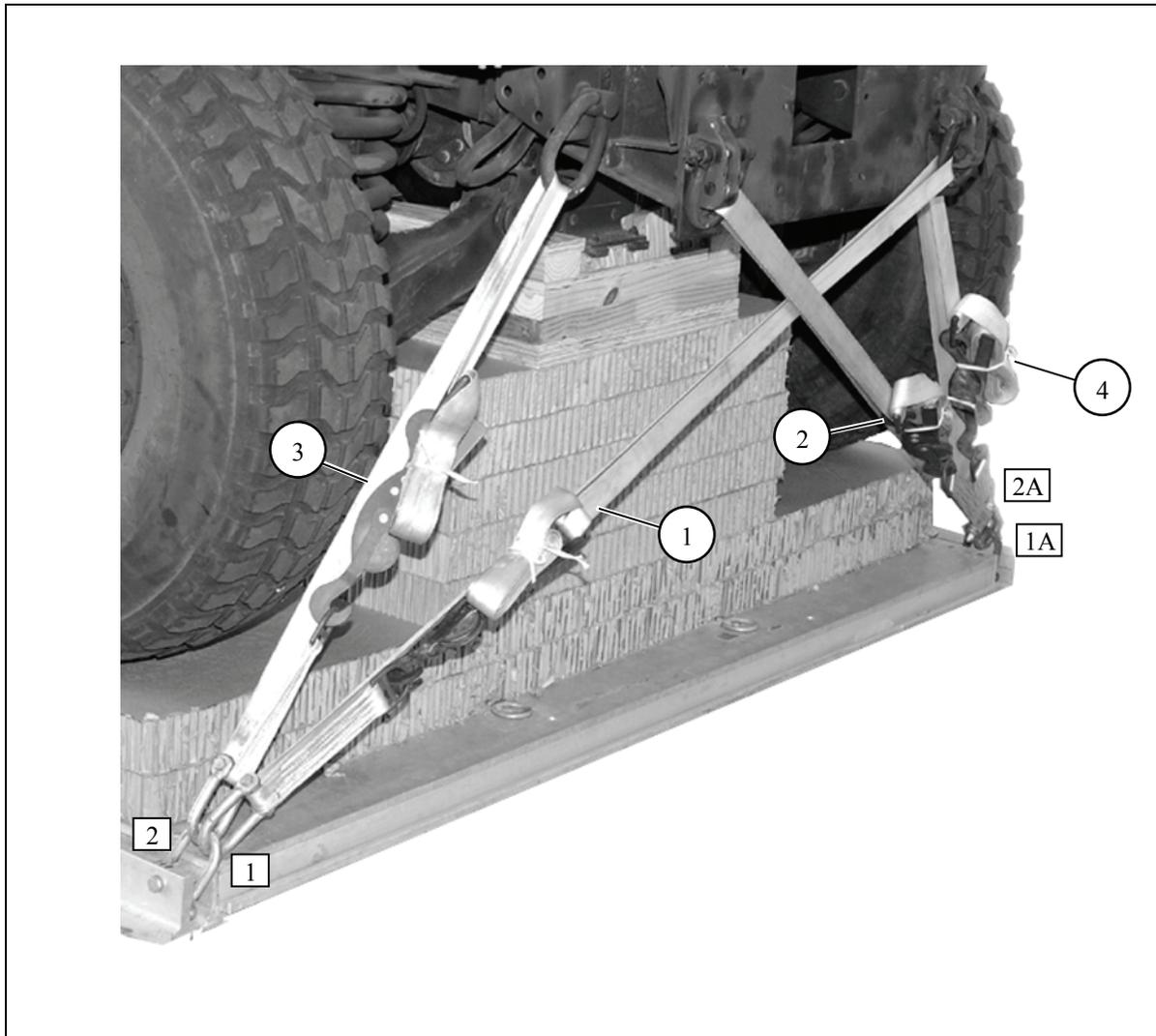
4-25. Install the lifting slings as shown in Figure 3-13. Attach the optional drive-off aids to the wheels of the truck as shown in Chapter 2 of this manual. Position the truck on the platform as shown in Figure 4-35.

## LASHING TRUCK

4-26. Lash the truck to the platform as shown in Figures 4-36 through 4-39.

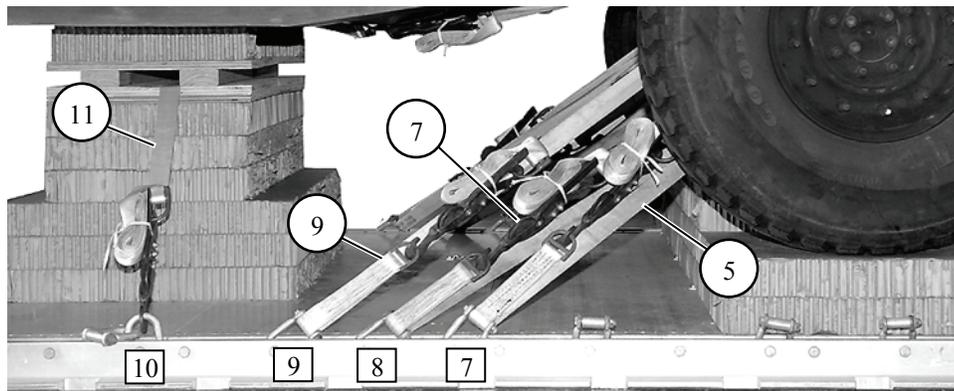


**Figure 4-35. Truck Positioned on Platform**



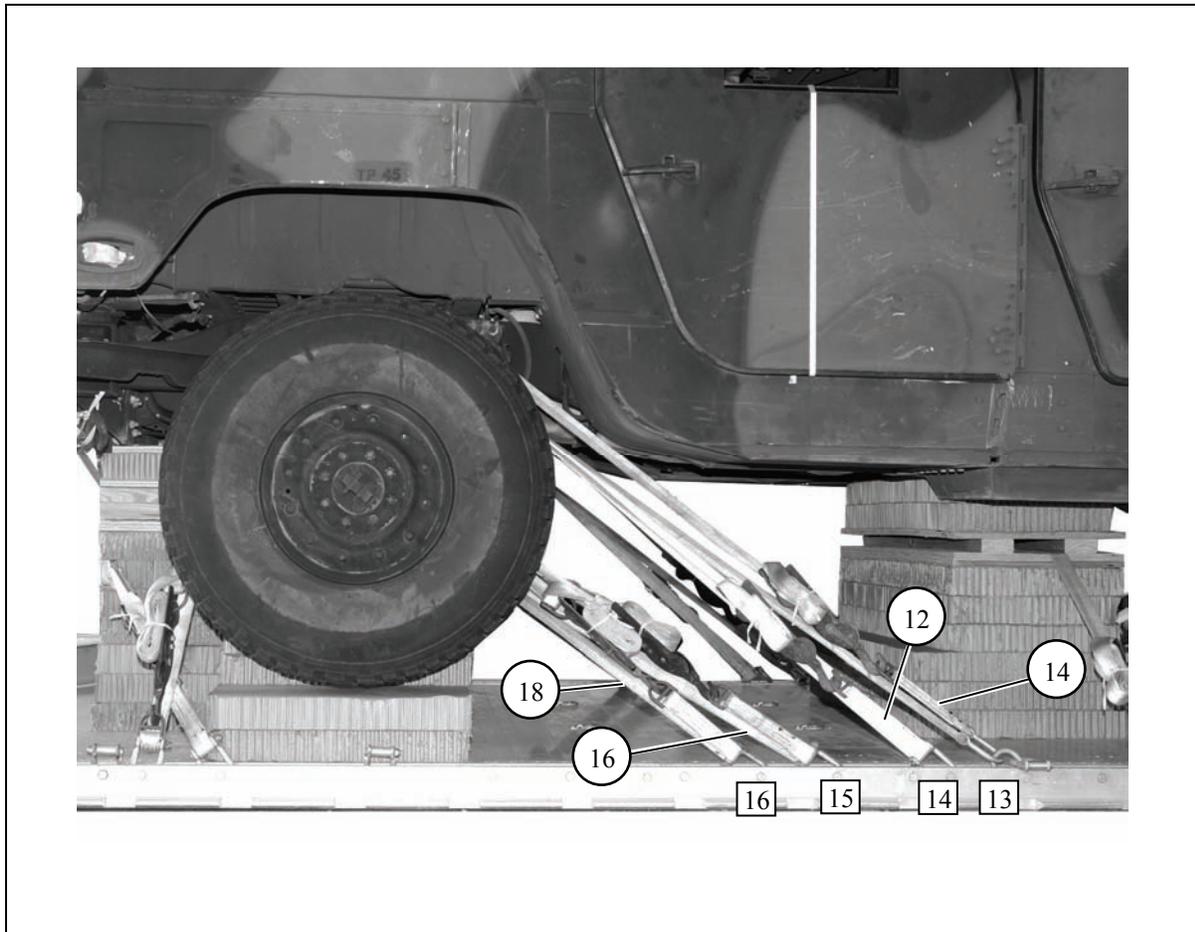
<i>Lashing Number</i>	<i>Tiedown Clevis Number</i>	<i>Instructions</i>
1	1	Pass lashing:
2	1A	Through left front tie-down provision.
3	2	Through right front tie-down provision.
4	2A	Through right front tie-down provision.

Figure 4-36. Lashings 1 Through 4 Installed



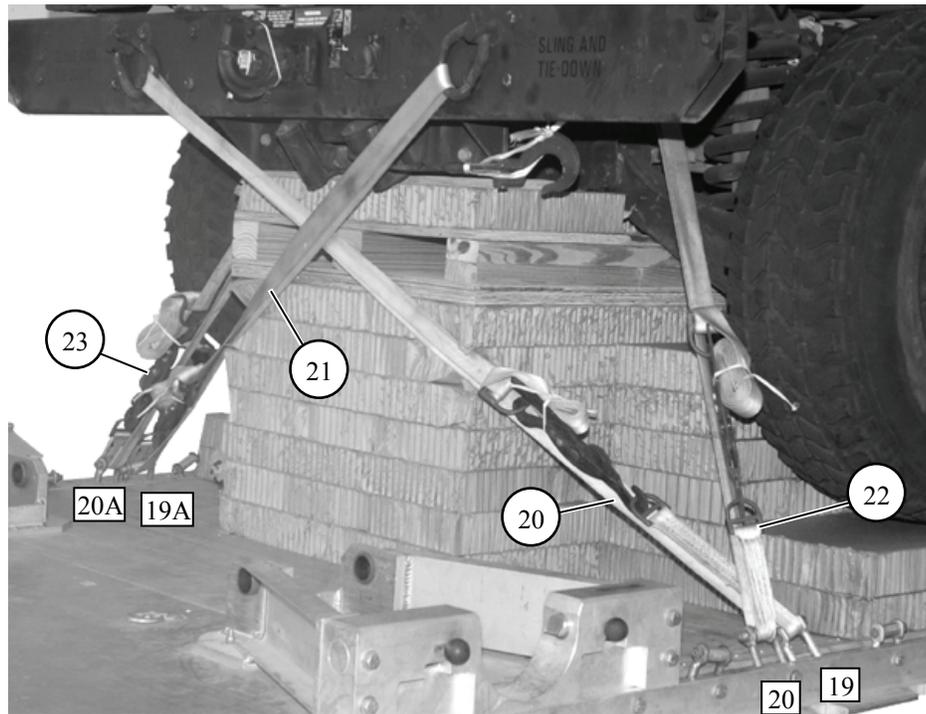
<b>Lashing Number</b>	<b>Tiedown Clevis Number</b>	<b>Instructions</b>
5	7	Pass lashing: Around right front lower control arm.
6	7A	Around left front lower control arm.
7	8	Around right front lower control arm.
8	8A	Around left front lower control arm.
9	9	Through the tiedown bracket behind the right front coil spring.
10	9A	Through the tiedown bracket behind the left front coil spring.
11	10 and 10A	Through clevis 10A and through its own D-ring. Pass the lashing through the holes in stack 2 and attach it a D-ring and load binder to clevis 10.

Figure 4-37. Lashings 5 Through 11 Installed



<i>Lashing Number</i>	<i>Tiedown Clevis Number</i>	<i>Instructions</i>
		Pass lashing:
12	14	Through tiedown bracket in front of right rear coil spring.
13	14A	Through tiedown bracket in front of left rear coil spring.
14	13	Through tiedown bracket in front of right rear coil spring.
15	13A	Through tiedown bracket in front of left rear coil spring.
16	15	Around right rear lower control arm.
17	15A	Around left rear lower control arm.
18	16	Around right rear lower control arm.
19	16A	Around left rear lower control arm.

**Figure 4-38. Lashings 12 Through 19 Installed**

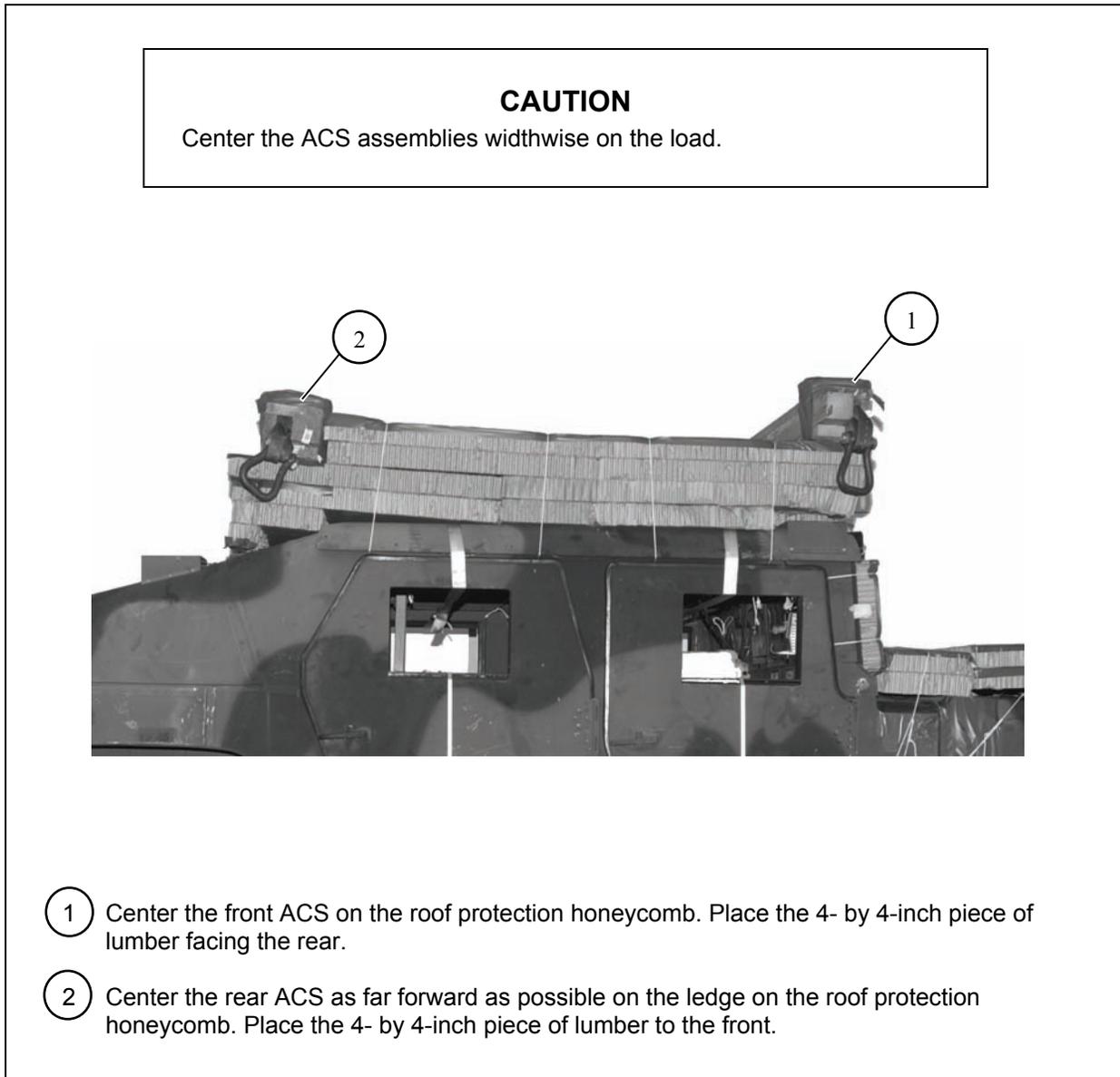


<i>Lashing Number</i>	<i>Tiedown Clevis Number</i>	<i>Instructions</i>
20	19	Pass lashing: Through left rear tiedown point.
21	19A	Through right rear tiedown point.
22	20	Through right rear tiedown point behind the coil spring.
23	20A	Through left rear tiedown point behind the coil spring.

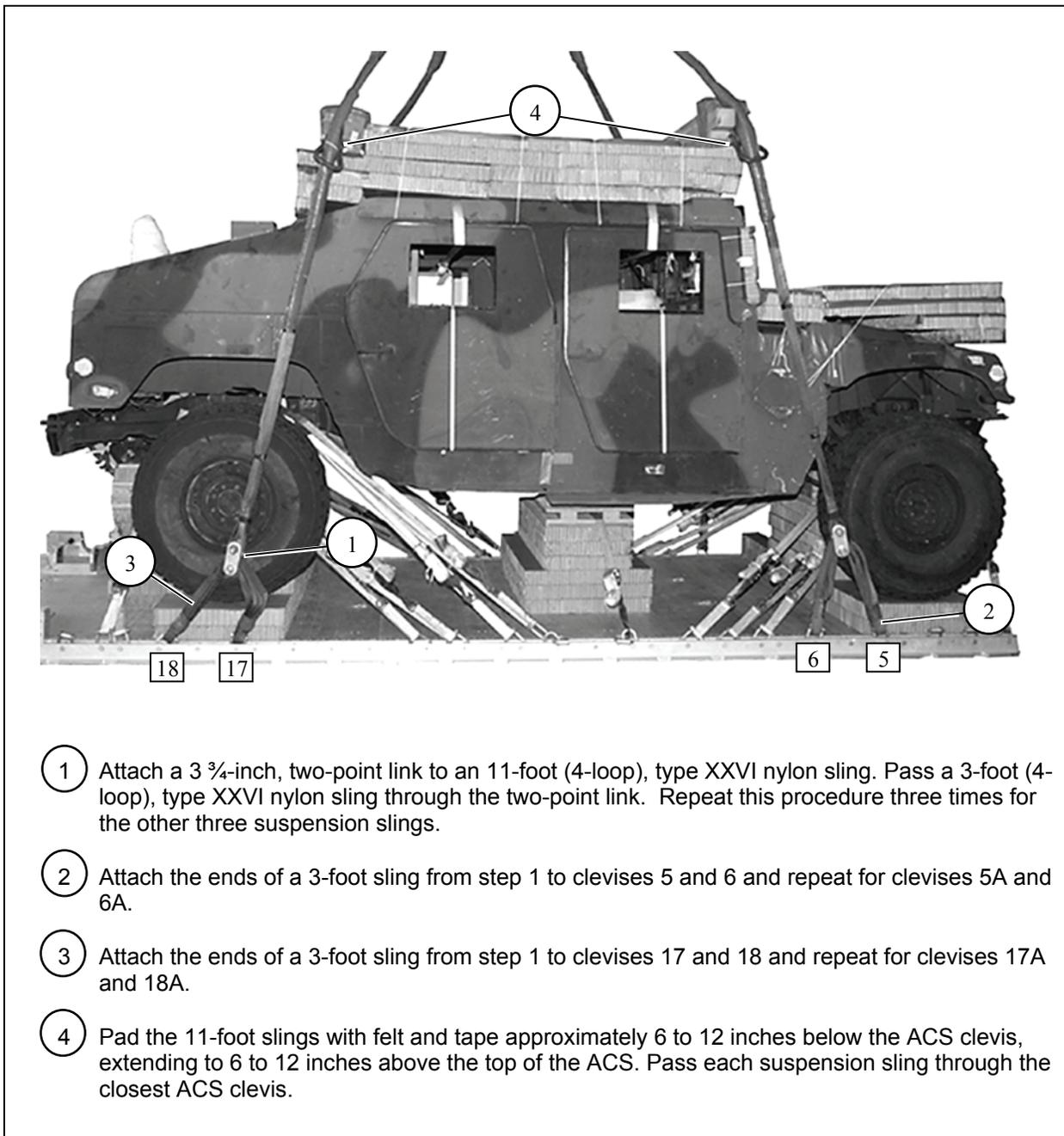
Figure 4-39. Lashings 20 Through 23 Installed

## INSTALLING ATTITUDE CONTROL SYSTEM AND SUSPENSION SLINGS

4-27. Construct and inspect the ACS according to Chapter 2. Install the ACS as shown in Figure 4-40. Install the suspension slings as shown in Figure 4-41. Secure the ACS according to Chapter 2 and as shown in Figure 4-42. Complete the installation of the suspension slings, pad the two-point links and safety tie and secure the slings as shown in Figure 4-43.

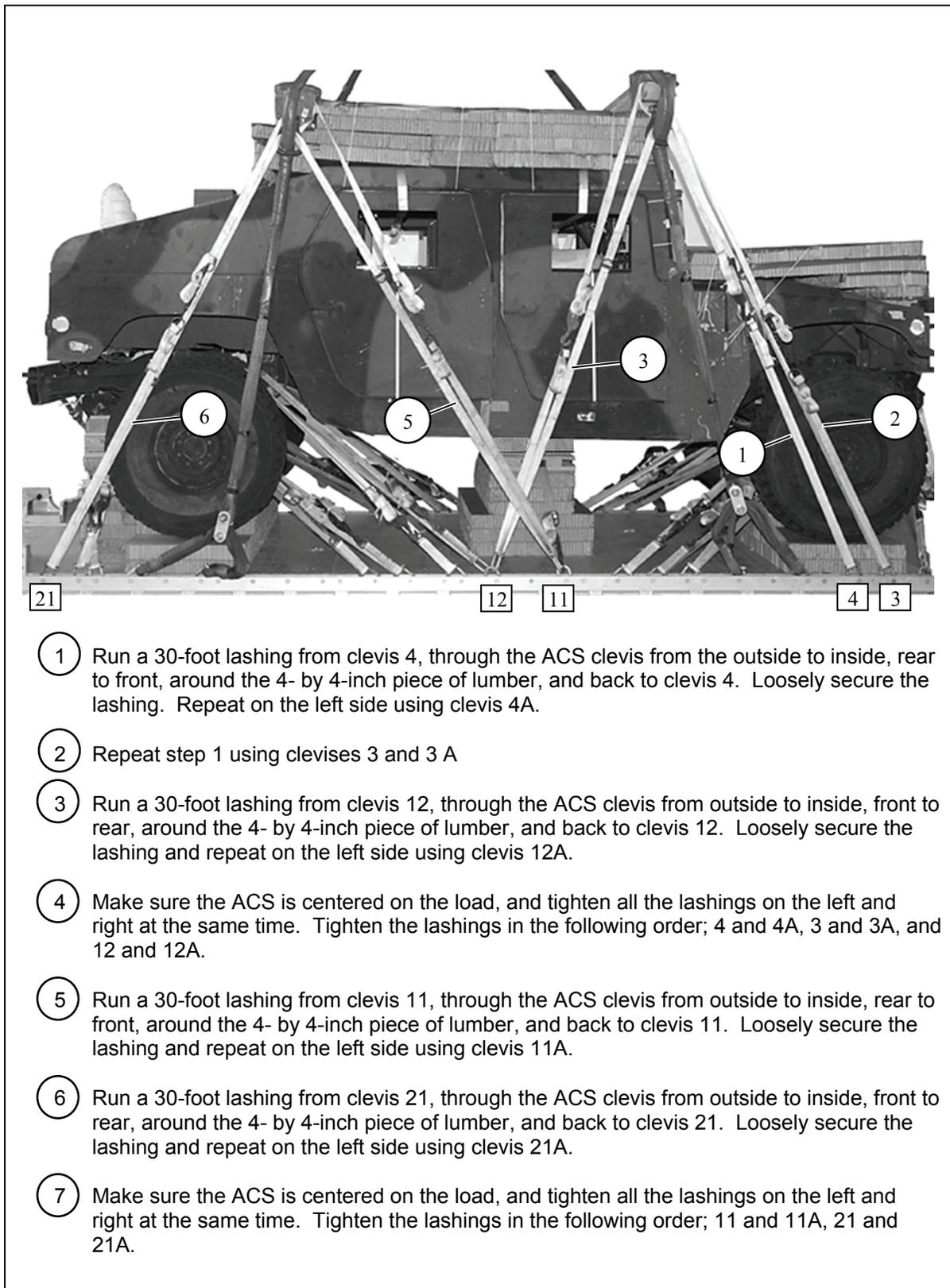


**Figure 4-40. ACS Installed**



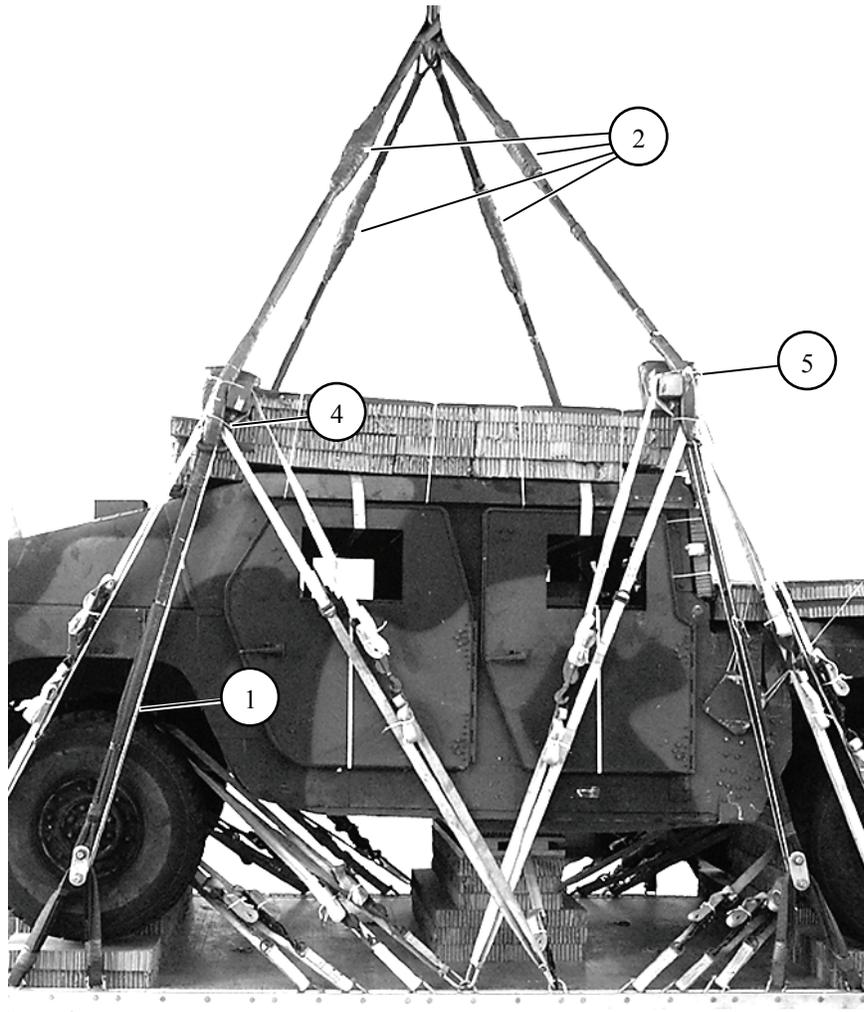
- ① Attach a 3 ¾-inch, two-point link to an 11-foot (4-loop), type XXVI nylon sling. Pass a 3-foot (4-loop), type XXVI nylon sling through the two-point link. Repeat this procedure three times for the other three suspension slings.
- ② Attach the ends of a 3-foot sling from step 1 to clevises 5 and 6 and repeat for clevises 5A and 6A.
- ③ Attach the ends of a 3-foot sling from step 1 to clevises 17 and 18 and repeat for clevises 17A and 18A.
- ④ Pad the 11-foot slings with felt and tape approximately 6 to 12 inches below the ACS clevis, extending to 6 to 12 inches above the top of the ACS. Pass each suspension sling through the closest ACS clevis.

**Figure 4-41. Suspension Slings Installed**



- 1 Run a 30-foot lashing from clevis 4, through the ACS clevis from the outside to inside, rear to front, around the 4- by 4-inch piece of lumber, and back to clevis 4. Loosely secure the lashing. Repeat on the left side using clevis 4A.
- 2 Repeat step 1 using clevises 3 and 3 A
- 3 Run a 30-foot lashing from clevis 12, through the ACS clevis from outside to inside, front to rear, around the 4- by 4-inch piece of lumber, and back to clevis 12. Loosely secure the lashing and repeat on the left side using clevis 12A.
- 4 Make sure the ACS is centered on the load, and tighten all the lashings on the left and right at the same time. Tighten the lashings in the following order; 4 and 4A, 3 and 3A, and 12 and 12A.
- 5 Run a 30-foot lashing from clevis 11, through the ACS clevis from outside to inside, rear to front, around the 4- by 4-inch piece of lumber, and back to clevis 11. Loosely secure the lashing and repeat on the left side using clevis 11A.
- 6 Run a 30-foot lashing from clevis 21, through the ACS clevis from outside to inside, front to rear, around the 4- by 4-inch piece of lumber, and back to clevis 21. Loosely secure the lashing and repeat on the left side using clevis 21A.
- 7 Make sure the ACS is centered on the load, and tighten all the lashings on the left and right at the same time. Tighten the lashings in the following order; 11 and 11A, 21 and 21A.

**Figure 4-42. ACS Secured**



- 1 Safety tie the two-point links to the ACS clevises with a loop of type III nylon cord.
- 2 Attach a 3-foot (4-loop), type XXVI nylon sling to the free end of each 11-foot, 4-loop with a 3 3/4-inch, two-point link. Pad each link with felt and tape in place.
- 3 Extend the slings upward with a lifting device until they are taut.
- 4 Tie a length of type III nylon cord around and behind the suspension sling, and around each ACS sling. See Figure 3-19 for a detailed view. Repeat for the remaining three suspension slings.
- 5 Tie a length of type III nylon cord around the suspension sling, behind all lashings and around the 4- by 4-inch piece of lumber of the ACS. See Figure 3-19 for a detailed view. Repeat for all suspension slings.

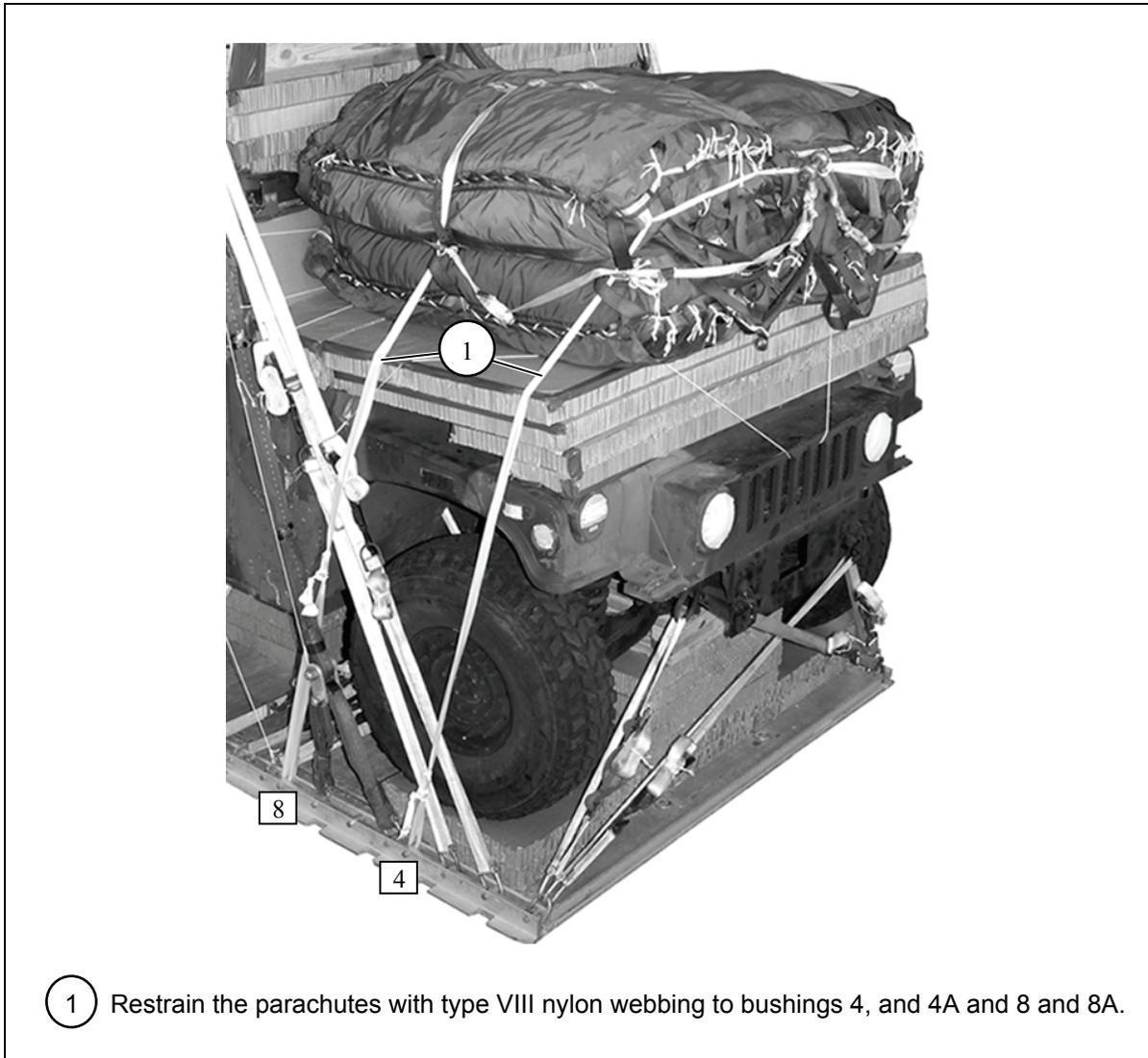
**Figure 4-43. Two-point Links and Suspension Slings Secured**

## INSTALLING OUTRIGGER ASSEMBLIES

4-28. Assemble, install, and safety tie the mast and foot assemblies on the DRAS platform as shown in Chapter 2, Figures 2-42 through 2-45, steps 1 through 3.

## STOWING CARGO PARACHUTES

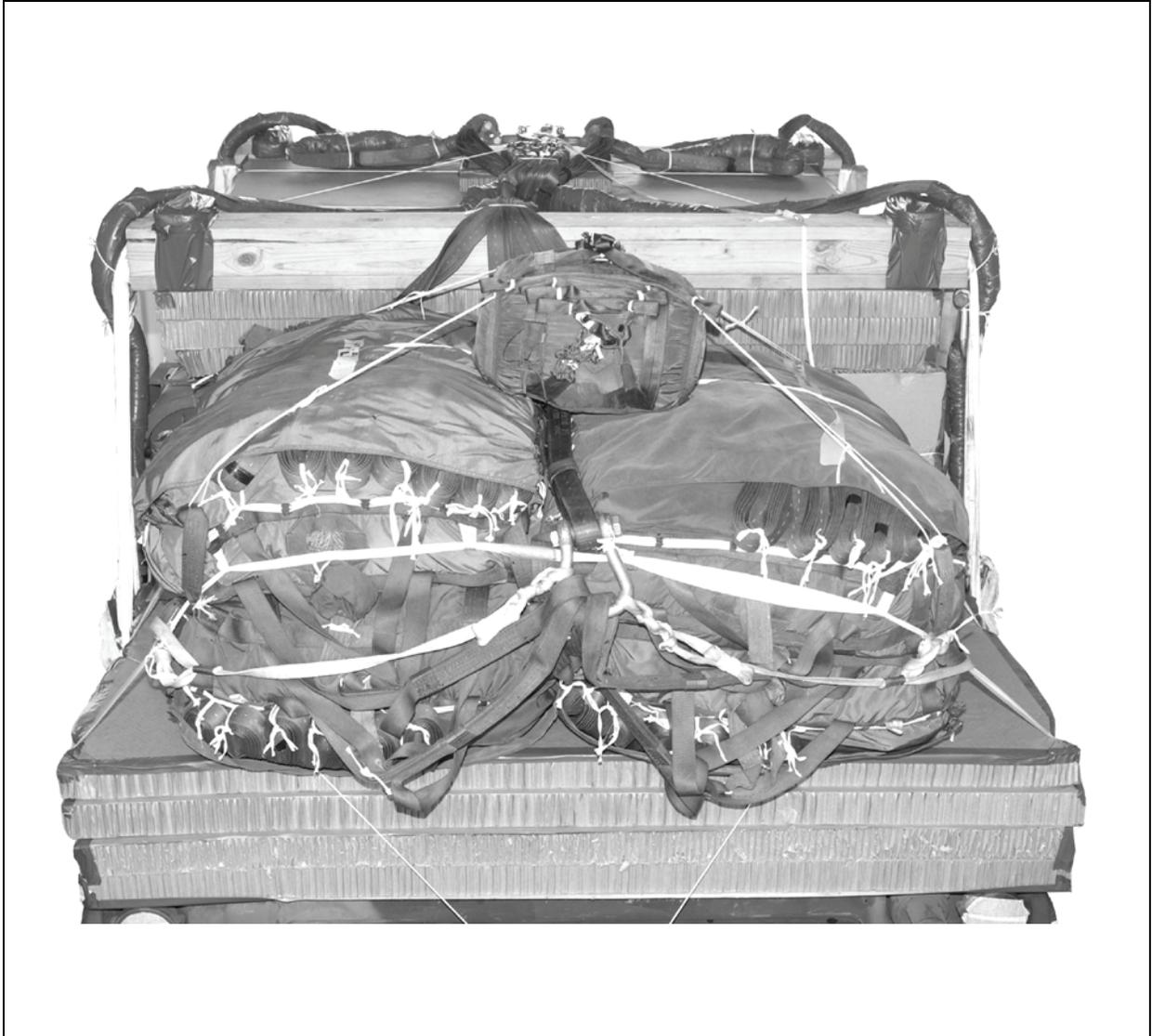
4-29. Prepare, stow and restrain four G-11D cargo parachutes on the hood of the truck as shown in Chapter 2 and Figure 4-44.



**Figure 4-44. Cargo Parachutes Installed and Restrained**

## **STOWING DEPLOYMENT PARACHUTE**

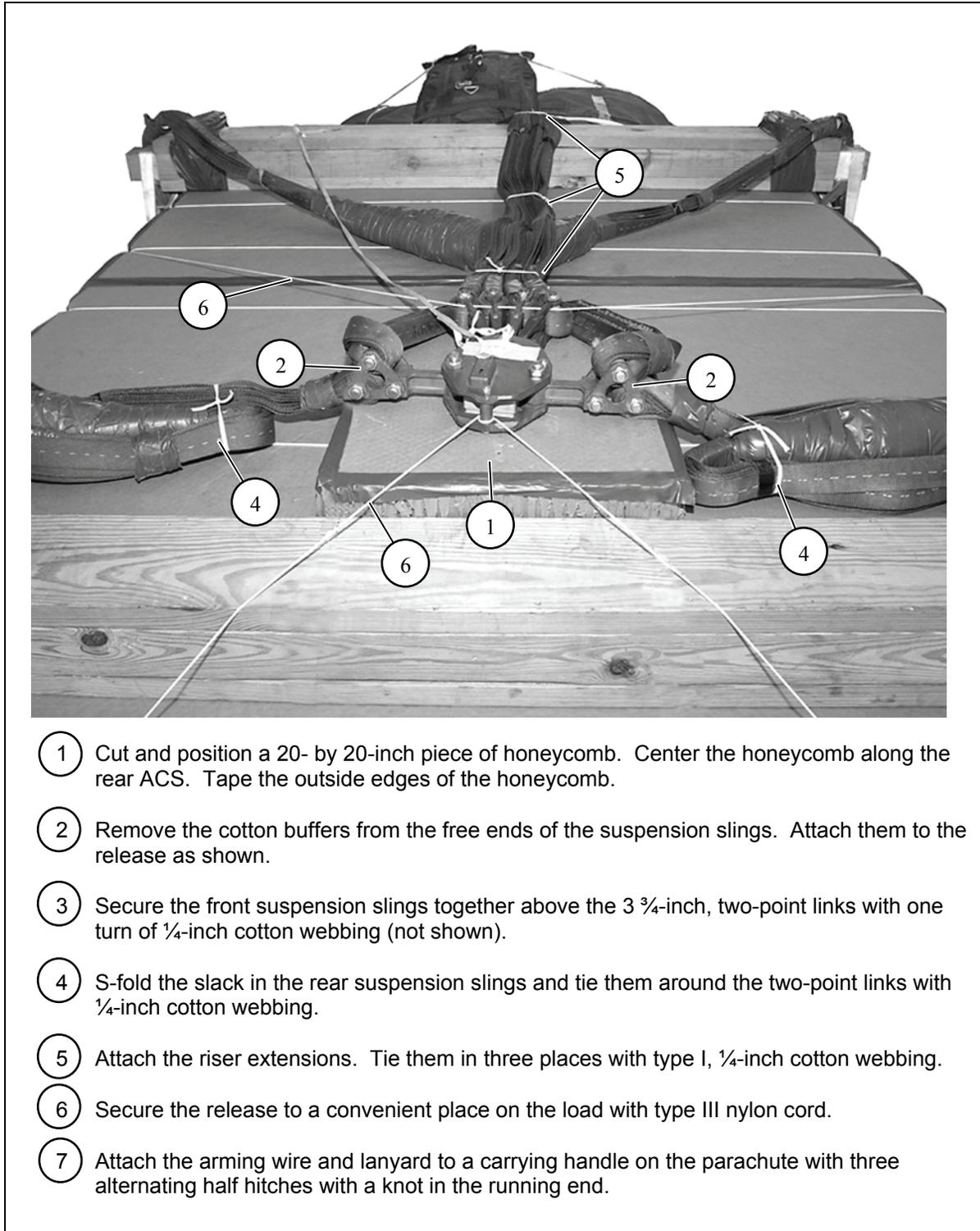
4-30. Prepare, stow and install the deployment parachute according to Chapter 2, Figures 2-30 and 4-45.



**Figure 4-45. Deployment Parachute Installed**

## INSTALLING M-1 PARACHUTE RELEASE SYSTEM

4-31. Prepare and install the M-1 parachute release system according to Chapter 2 and Figure 4-46.

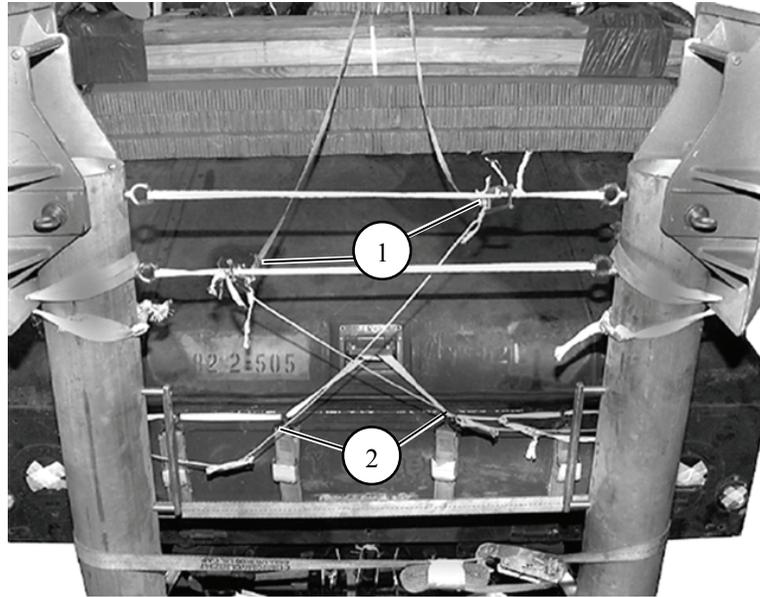


- ① Cut and position a 20- by 20-inch piece of honeycomb. Center the honeycomb along the rear ACS. Tape the outside edges of the honeycomb.
- ② Remove the cotton buffers from the free ends of the suspension slings. Attach them to the release as shown.
- ③ Secure the front suspension slings together above the 3 ¾-inch, two-point links with one turn of ¼-inch cotton webbing (not shown).
- ④ S-fold the slack in the rear suspension slings and tie them around the two-point links with ¼-inch cotton webbing.
- ⑤ Attach the riser extensions. Tie them in three places with type I, ¼-inch cotton webbing.
- ⑥ Secure the release to a convenient place on the load with type III nylon cord.
- ⑦ Attach the arming wire and lanyard to a carrying handle on the parachute with three alternating half hitches with a knot in the running end.

**Figure 4-46. M-1 Cargo Parachute Release Installed**

## INSTALLING MAST RELEASE KNIVES

4-32. Install the mast release knives as shown in Chapter 2 Figure 2-45 steps 4 through 10 and as shown in Figure 4-47.



- ① The length of the left and right ½-inch tubular nylon webbing from the base of the guillotine knives to the lower suspension links of the M-1 release is 78 inches (shown in steps 5 through 7 of Figure 2-45).
- ② Tie a length of type III nylon cord through the left tailgate sling guide and to the body of the right top guillotine knife that measures 69-inches from the tailgate sling guide to the base of the guillotine knife. Repeat for right tailgate sling guide and left lower guillotine knife (shown in steps 9 and 10 of Figure 2-45).

**Note.** All measurements are from knot to knot.

**Figure 4-47. Mast Release Knives Installed**

## MARKING RIGGED LOAD

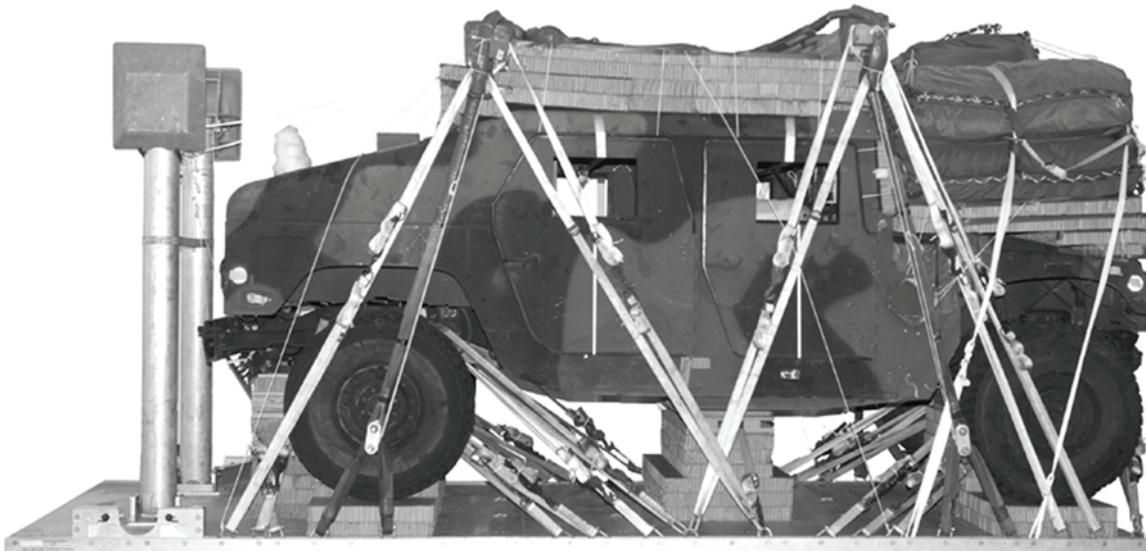
4-33. Mark the rigged load according to Chapter 2, Section IX and as shown in Figure 4-48. If the load varies from the one shown, the weight, height, CB, and parachute requirements must be recomputed.

## EQUIPMENT REQUIRED

4-34. The equipment required to rig this load is listed in Table 4-2.

### CAUTION

Make the final rigger inspection required by Chapter 2, Section IX before the load leaves the rigging site.



### RIGGED LOAD DATA

Weight: Load shown .....	14,400 pounds
Maximum load allowed .....	14,500 pounds
Height (with four G-11D parachutes) .....	106 inches
Width .....	94 inches
Overall Length .....	222 ½ inches
Overhang: Front (brush guard) .....	6 ½ inches
Rear .....	0 inches
Center of Balance (from front edge of platform) .....	94 inches

Figure 4-48. M1114 Up-Armored HMMWV Rigged on DRAS Platform

**Table 4-2. Equipment Required for Rigging M1114 Up-Armored HMMWV on DRAS Platform**

<i>National Stock Number</i>	<i>Item</i>	<i>Quantity</i>
8040-00-273-8713	Adhesive paste, 1-gallon	As required
4020-00-240-2146	Cord, nylon, type III, 550-pound	As required
	Clevis,	
4030-00-090-5354	Large	5
4030-00-678-8562	Medium	8
1670-00-360-0328	Cover, clevis, large	4
8135-00-664-6958	Cushioning material, packaging, cellulose wadding	As required
8305-00-191-1101	Felt, ½-inch	As required
1670-01-493-6418	Link assembly, two-point, 3 ¾-inch	9
	Lumber:	
5510-00-220-6146	2- by 4-inch	As required
5510-00-220-6148	2- by 6-inch	As required
5510-00-220-6274	4- by 4-inch	As required
5530-00-618-8073	Plywood, ¾-inch	5 sheets
	Nail, steel wire, common,	
5315-00-010-4659	8d	As required
5315-00-753-3883	10d	As required
1670-00-753-3928	Pad, energy dissipating, honeycomb	21 sheets
1670-01-487-5461	Static line assembly release away	1
	Parachute:	
	Cargo:	
1670-01-016-7841	G-11D	4
1670-00-040-8135	Cargo extraction: 28-foot (deployment parachute)	1
	Platform, dual row, 18-foot	
1670-01-485-1654	Rail, DRAS	2
1670-01-486-1342	Roller Pad, DRAS	4
1670-01-486-1656	Panel Assembly, Main	9
1670-01-162-2372	Clevis assembly	46
1670-01-097-8816	Release, cargo parachute, M-1	1
	Sling, cargo airdrop	
	For suspension:	
1670-01-062-6310	11-ft (4-loop), type XXVI nylon webbing	4
1670-01-062-6306	3-ft (4-loop), type XXVI nylon webbing	8
	For deployment:	
1670-01-062-6306	3-ft (4-loop), type XXVI nylon webbing	1
	For riser extension:	
1670-01-062-6313	60-ft (3-loop), type XXVI nylon webbing	4
	For ACS:	
1670-01-063-7761	16-ft (2-loop), type XXVI nylon webbing	2

**Table 4-2. Equipment Required for Rigging M1114 Up-Armored HMMWV on DRAS Platform  
(Continued)**

<i>National Stock Number</i>	<i>Item</i>	<i>Quantity</i>
	For lifting:	
1670-01-062-6304	9-ft (2-loop), type XXVI nylon webbing	2
1670-01-062-6303	12-ft (2-loop), type XXVI nylon webbing	2
1670-00-040-8219	Strap, parachute release, multicut	2
1670-00-937-0271	Knife release, cargo (guillotine)	6
1670-01-487-5464	Outrigger assembly	1
7510-00-266-5016	Tape, adhesive, 2-in	As required
1670-00-937-0271	Tie-down assembly, 15-ft	48
1670-00-725-1437	Tie-down, cargo, aircraft, (CGU-1B)	5
	Webbing:	
8305-00-268-2411	Cotton, ¼-in, type I	As required
	Nylon:	
8305-00-082-5752	Tubular, ½-in	As required
8305-00-263-3591	Type VIII	As required

## Chapter 5

# Rigging M119 105-Millimeter Howitzer and Accompanying Load on Dual Row Airdrop System Platform

### DESCRIPTION OF LOAD

4-35. The M119, 105-mm howitzer (Figure 5-1) weighs 4,190 pounds. The length is 240 inches, reducible to 192 inches. It is 70 inches wide. Its height is 94 inches reducible to 54 inches. The howitzer is rigged with 36 boxes of 105-mm ammunition and 6 boxes of fuses on a DRAS platform. The load is rigged with three G-11D cargo parachutes.

### PREPARING PLATFORM

4-36. Inspect, or assemble and inspect, a DRAS platform with outrigger assemblies and outrigger platform support weldments according to TM 10-1670-268-20&P/TO 13C7-52-22 and as shown in Figure 5-2.

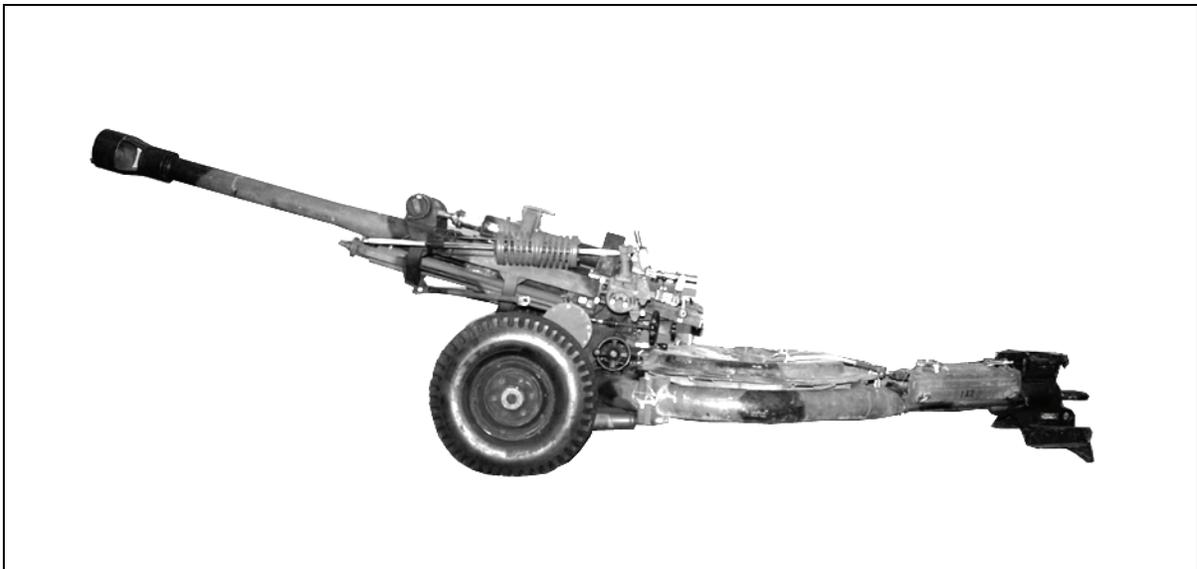
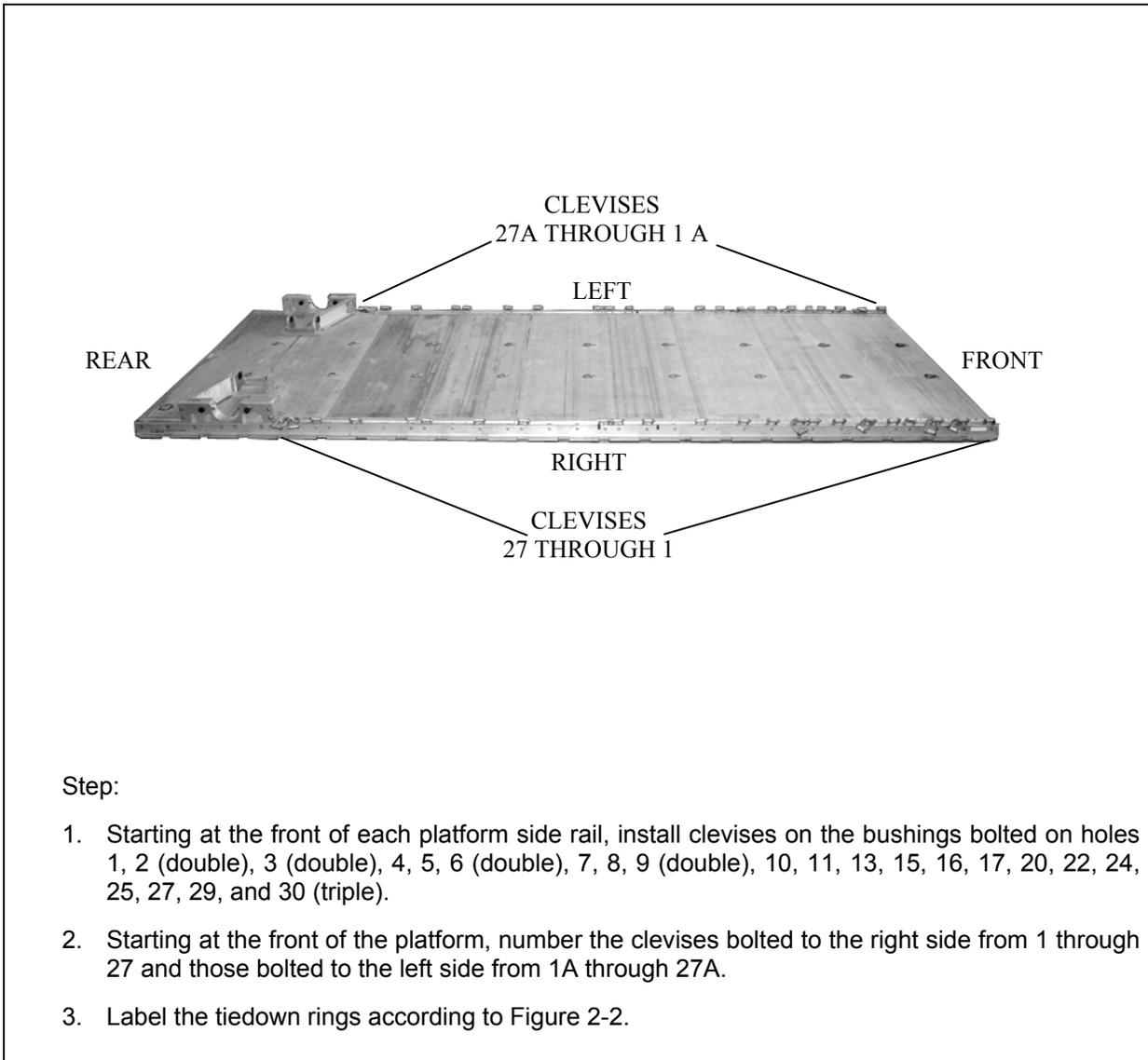


Figure 5-1. M119 105-Millimeter Howitzer



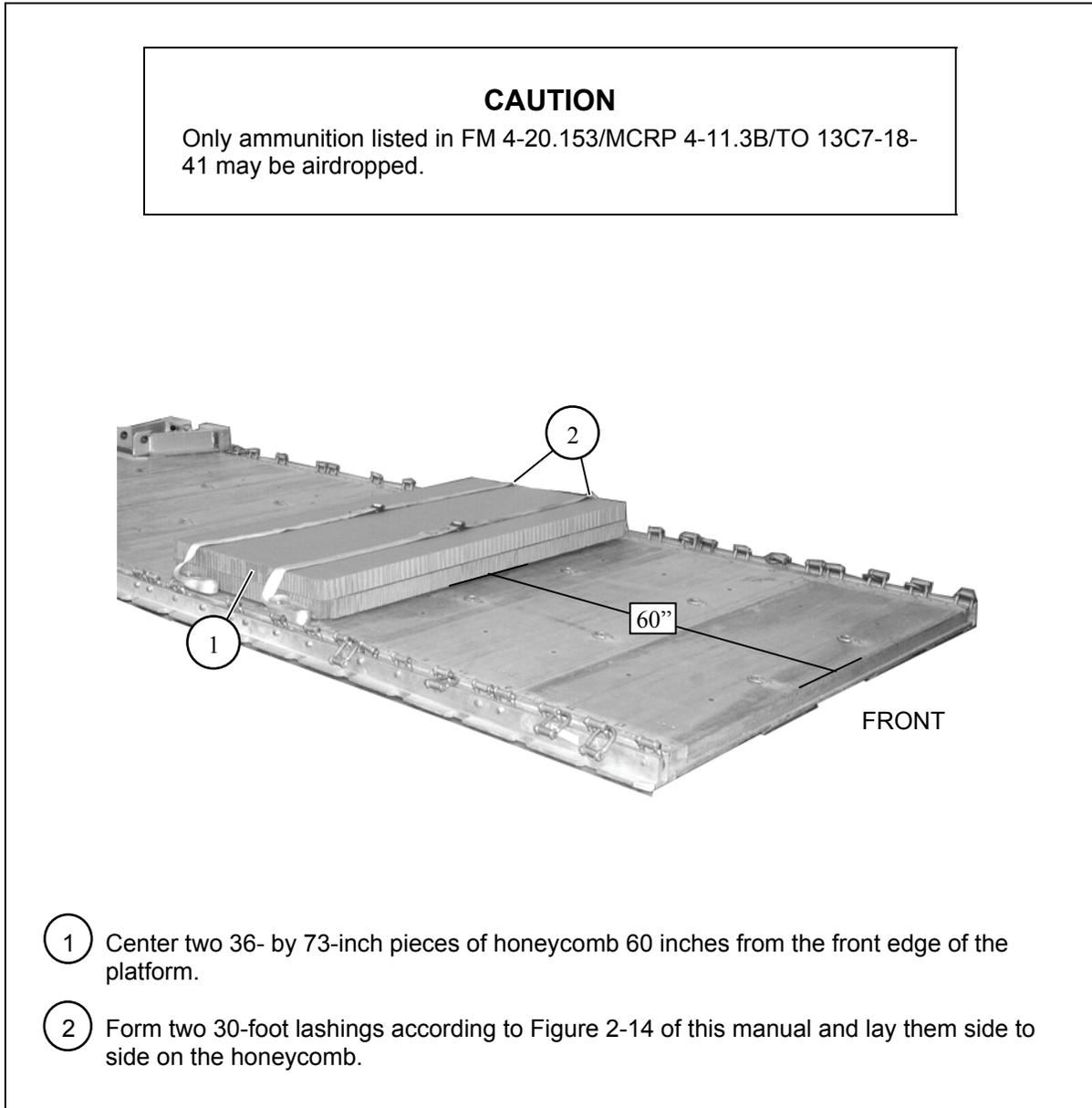
Step:

1. Starting at the front of each platform side rail, install clevises on the bushings bolted on holes 1, 2 (double), 3 (double), 4, 5, 6 (double), 7, 8, 9 (double), 10, 11, 13, 15, 16, 17, 20, 22, 24, 25, 27, 29, and 30 (triple).
2. Starting at the front of the platform, number the clevises bolted to the right side from 1 through 27 and those bolted to the left side from 1A through 27A.
3. Label the tiedown rings according to Figure 2-2.

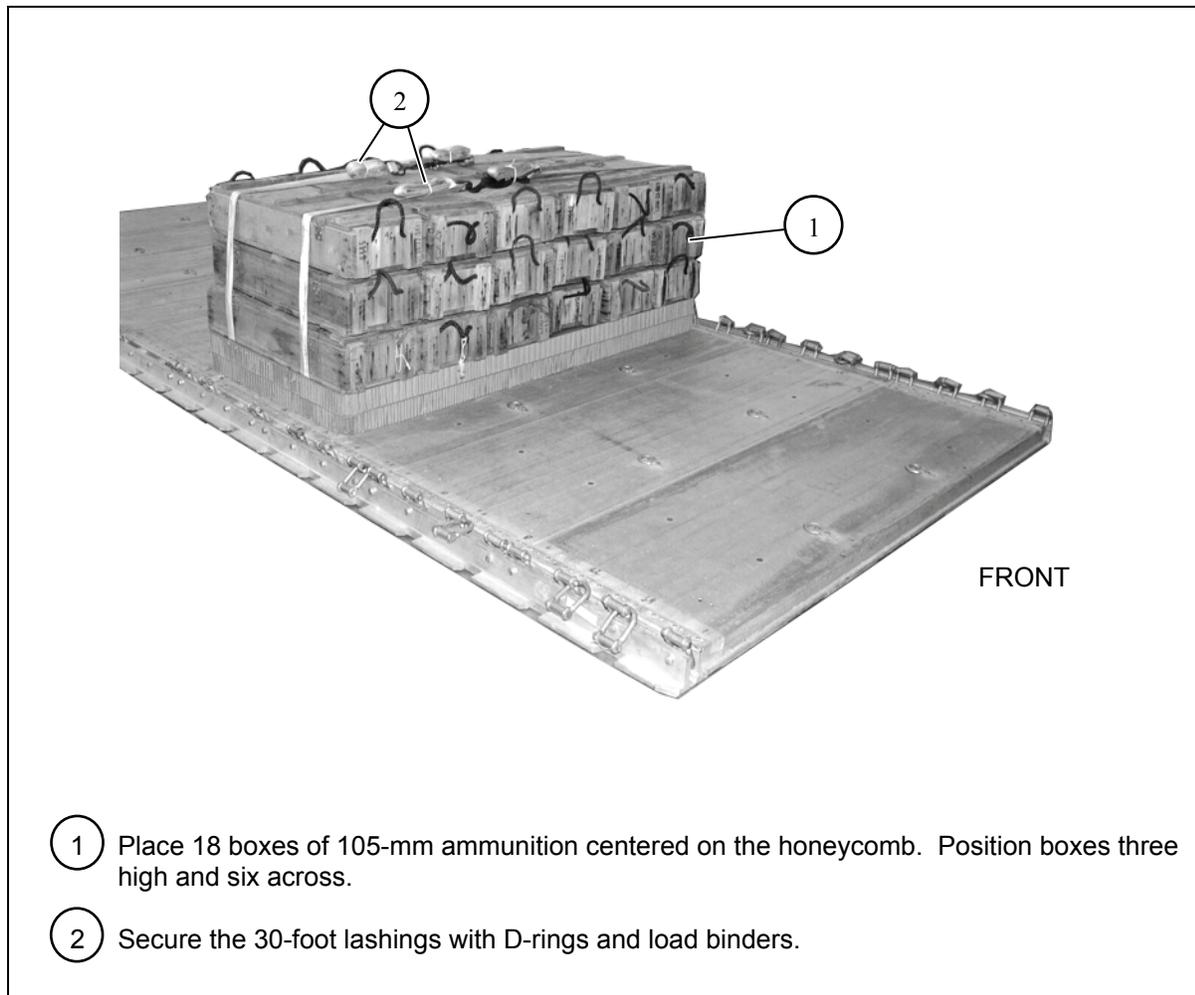
**Figure 5-2. Platform Prepared**

## STOWING ACCOMPANYING LOAD

4-37. Stow the accompanying load of 36 boxes of 105-mm ammunition as shown in Figures 5-3 through 5-5. Six boxes of fuses will be stowed after the gun is lashed to the platform. When hazardous materials are rigged as part of the load, they must be packaged, marked, and labeled according to AFMAN 24-204(I)/TM 38-250.

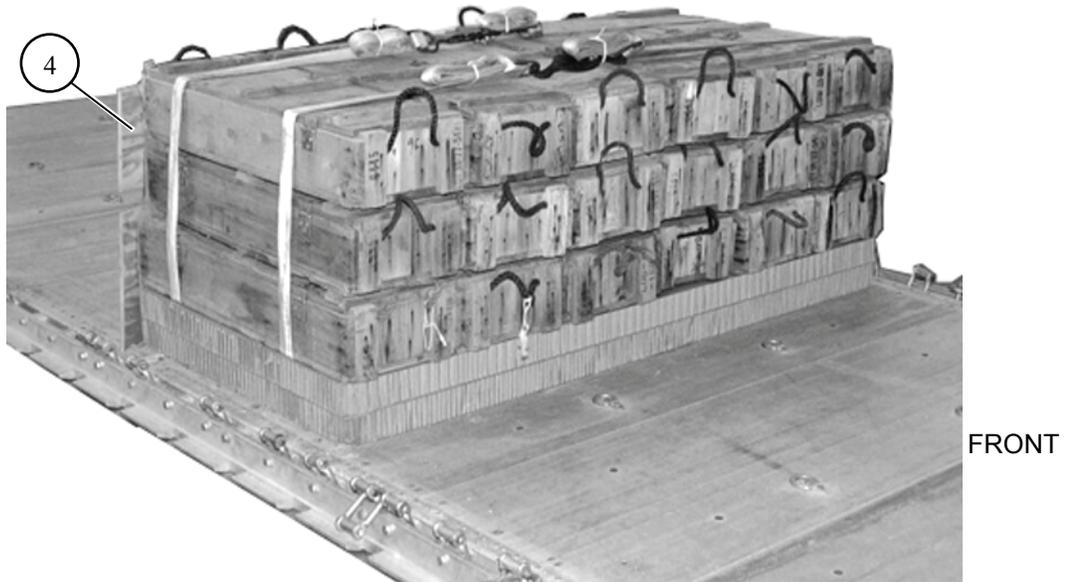
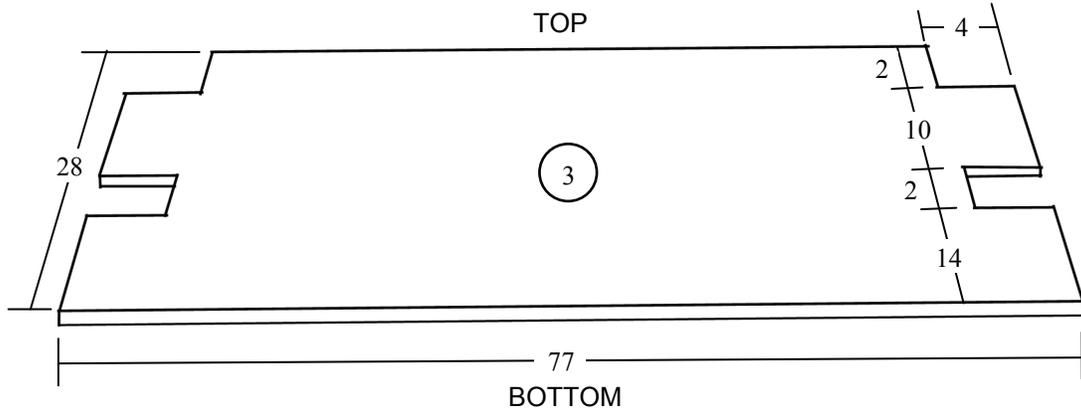


**Figure 5-3. First Stack of Honeycomb Positioned**



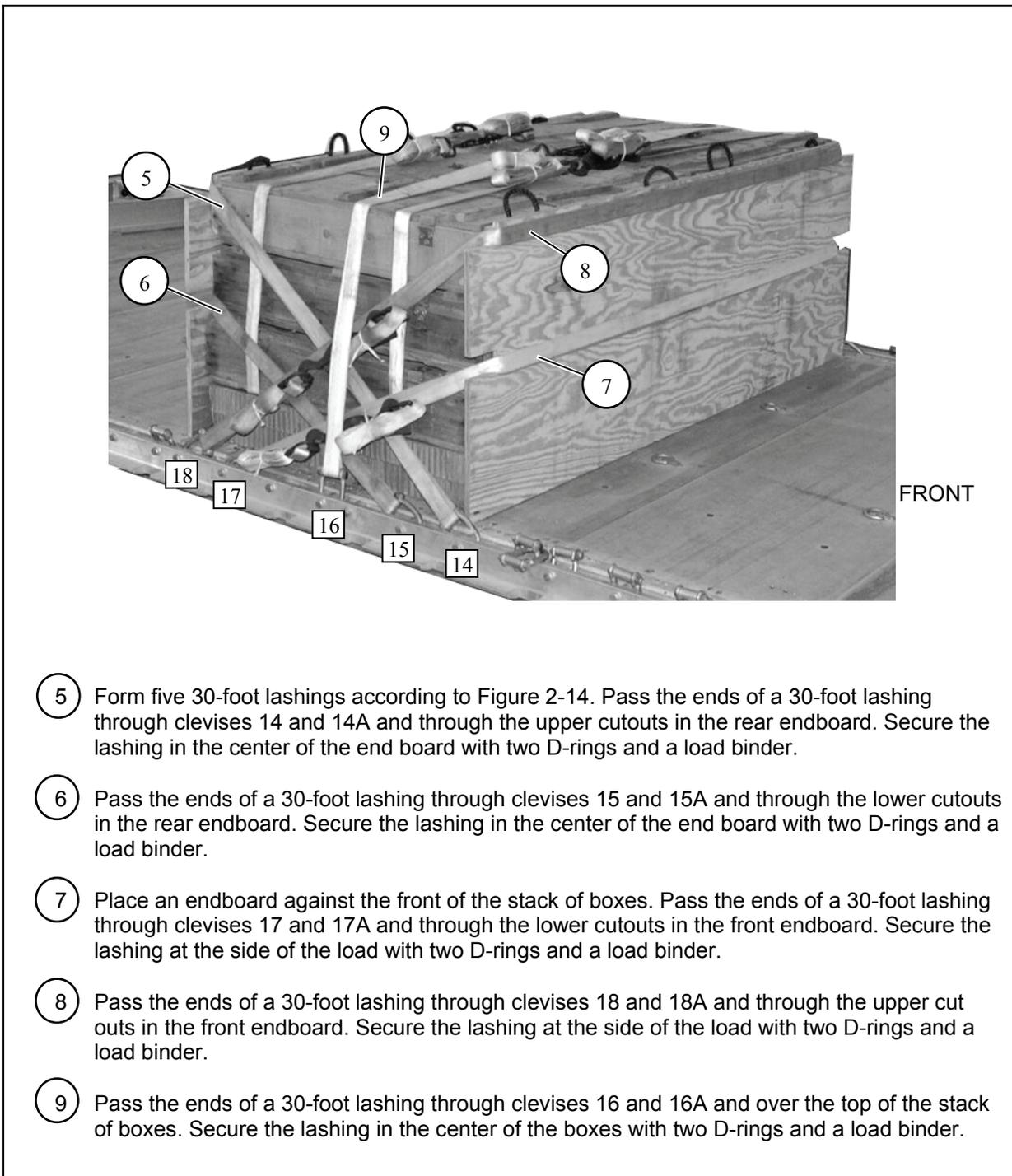
**Figure 5-4. First Stack of Ammunition Lashed**

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



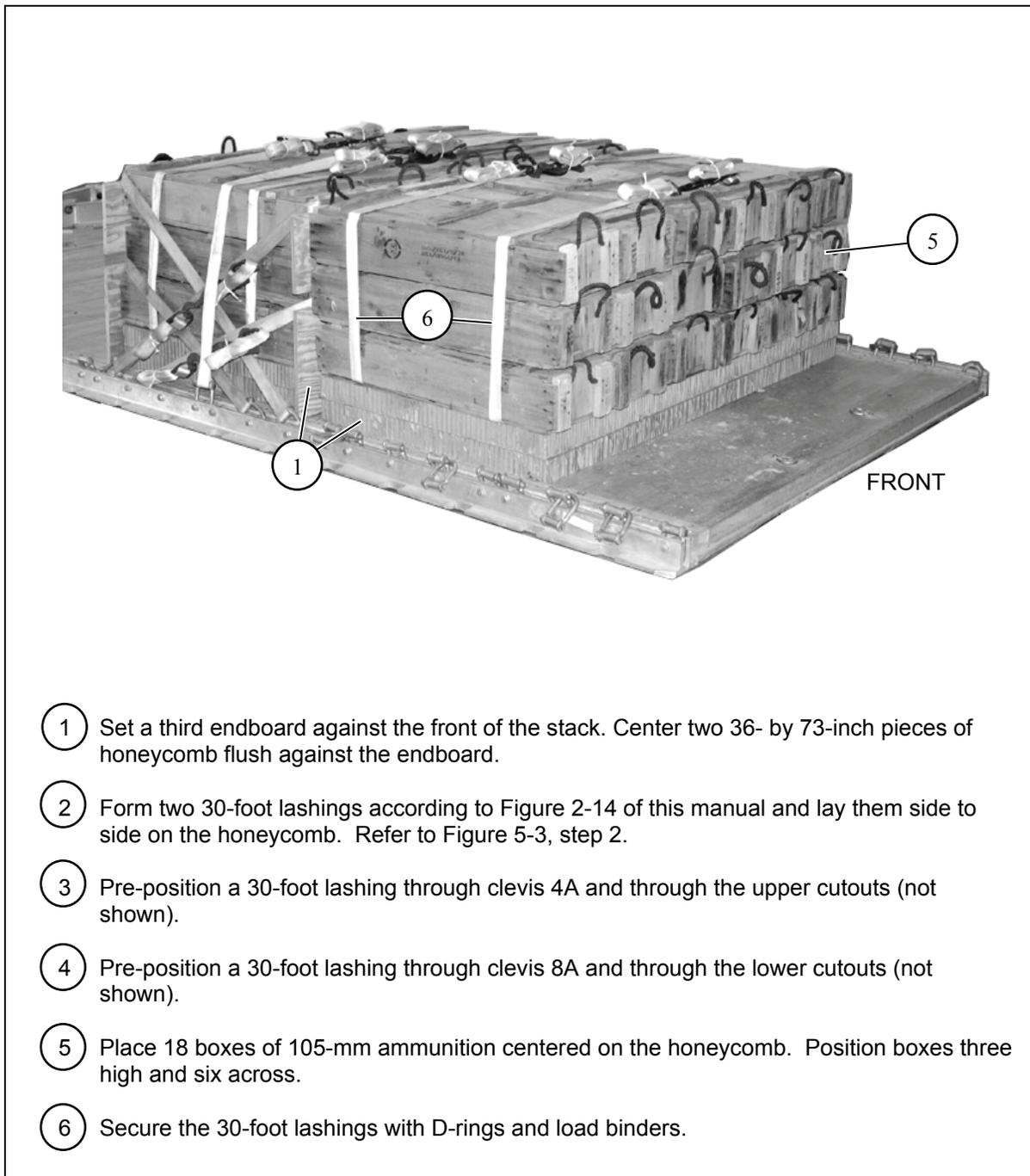
- ③ Cut four endboards as shown using  $\frac{3}{4}$ - by 28- by 77-inch pieces of plywood.  
④ Place one endboard against the rear of the stack of boxes.

**Figure 5-4. First Stack of Ammunition Lashed (Continued)**

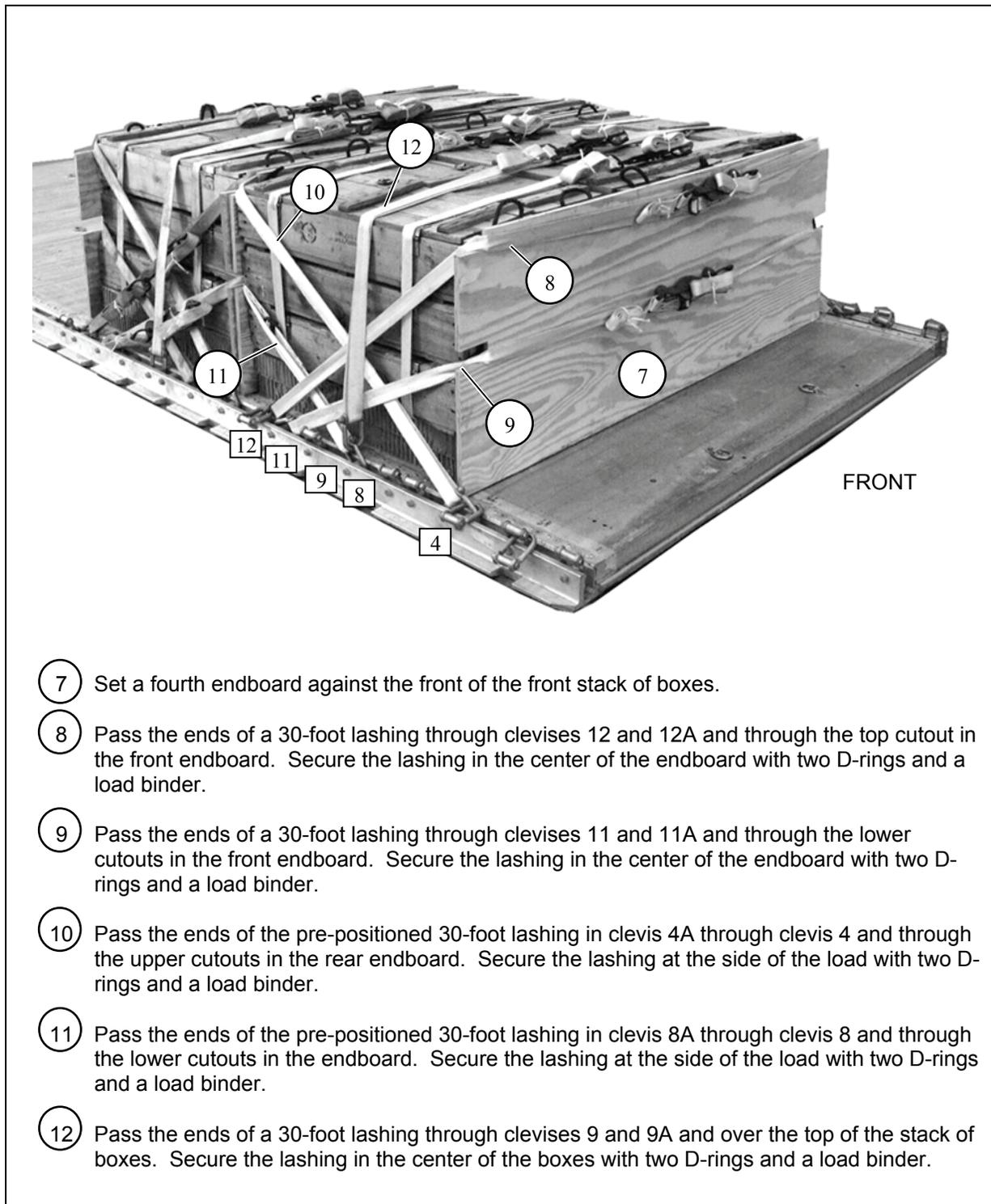


- 5 Form five 30-foot lashings according to Figure 2-14. Pass the ends of a 30-foot lashing through clevises 14 and 14A and through the upper cutouts in the rear endboard. Secure the lashing in the center of the end board with two D-rings and a load binder.
- 6 Pass the ends of a 30-foot lashing through clevises 15 and 15A and through the lower cutouts in the rear endboard. Secure the lashing in the center of the end board with two D-rings and a load binder.
- 7 Place an endboard against the front of the stack of boxes. Pass the ends of a 30-foot lashing through clevises 17 and 17A and through the lower cutouts in the front endboard. Secure the lashing at the side of the load with two D-rings and a load binder.
- 8 Pass the ends of a 30-foot lashing through clevises 18 and 18A and through the upper cutouts in the front endboard. Secure the lashing at the side of the load with two D-rings and a load binder.
- 9 Pass the ends of a 30-foot lashing through clevises 16 and 16A and over the top of the stack of boxes. Secure the lashing in the center of the boxes with two D-rings and a load binder.

**Figure 5-4. First Stack of Ammunition Lashed (Continued)**



**Figure 5-5. Second Stack of Ammunition Lashed**



- 7 Set a fourth endboard against the front of the front stack of boxes.
- 8 Pass the ends of a 30-foot lashing through clevises 12 and 12A and through the top cutout in the front endboard. Secure the lashing in the center of the endboard with two D-rings and a load binder.
- 9 Pass the ends of a 30-foot lashing through clevises 11 and 11A and through the lower cutouts in the front endboard. Secure the lashing in the center of the endboard with two D-rings and a load binder.
- 10 Pass the ends of the pre-positioned 30-foot lashing in clevis 4A through clevis 4 and through the upper cutouts in the rear endboard. Secure the lashing at the side of the load with two D-rings and a load binder.
- 11 Pass the ends of the pre-positioned 30-foot lashing in clevis 8A through clevis 8 and through the lower cutouts in the endboard. Secure the lashing at the side of the load with two D-rings and a load binder.
- 12 Pass the ends of a 30-foot lashing through clevises 9 and 9A and over the top of the stack of boxes. Secure the lashing in the center of the boxes with two D-rings and a load binder.

**Figure 5-5. Second Stack of Ammunition Lashed (Continued)**

## BUILDING AND PLACING HONEYCOMB STACKS

4-38. Build the honeycomb stacks as shown in Figures 5-6 through 5-8. Place them on the platform as shown in Figure 5-9.

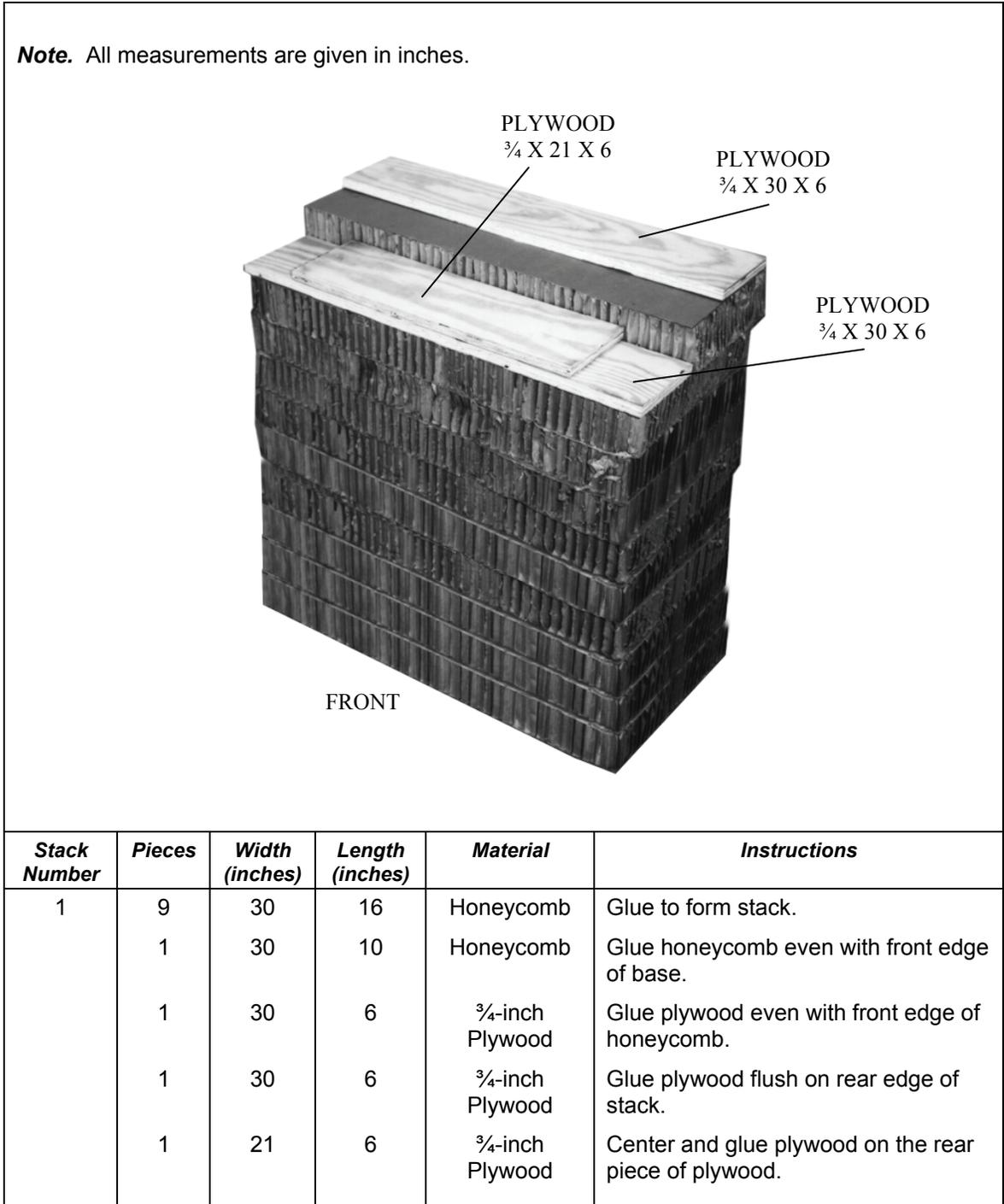
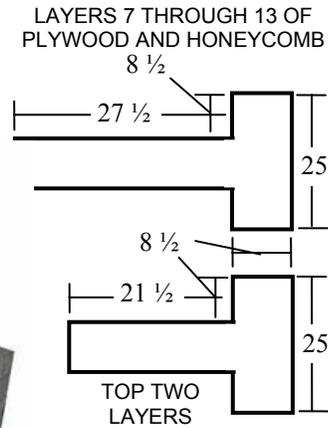
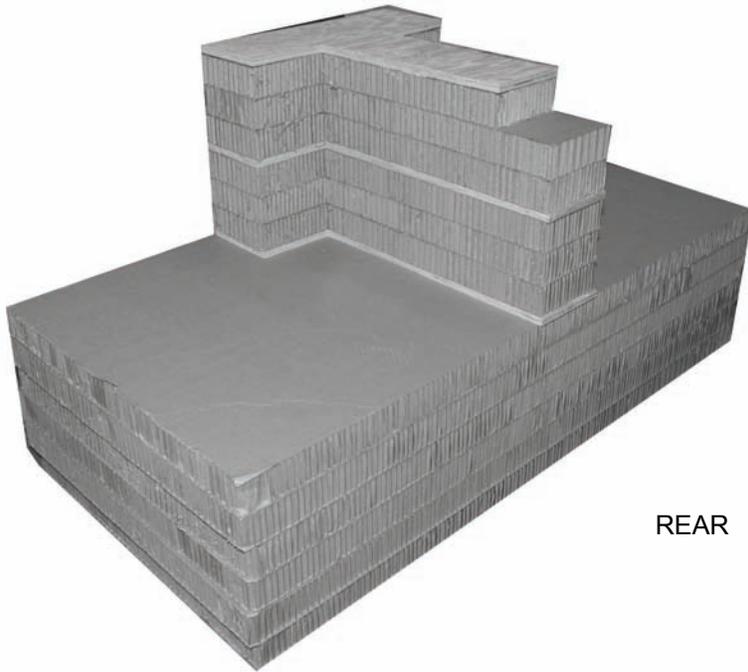


Figure 5-6. Honeycomb Stack 1 Prepared

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



REAR

Stack Number	Pieces	Width (inches)	Length (inches)	Material	Instructions
2	6	72	36	Honeycomb	Glue to form stack.
	1	25	36	3/4-inch Plywood	Make cutouts as shown.
	3	25	36	Honeycomb	Make cutouts as shown and place flush on the plywood.
	1	25	36	3/4-inch Plywood	Make cutouts as shown and place flush on honeycomb.
	2	25	36	Honeycomb	Make cutouts as shown and place flush on the stack.
	1	25	30	Honeycomb	Make cutouts as shown for the top layer and place flush on the stack.
	1	25	30	3/4-inch Plywood	Make cutouts as shown for the top layer and flush on the stack.

Figure 5-7. Honeycomb Stack 2 Prepared

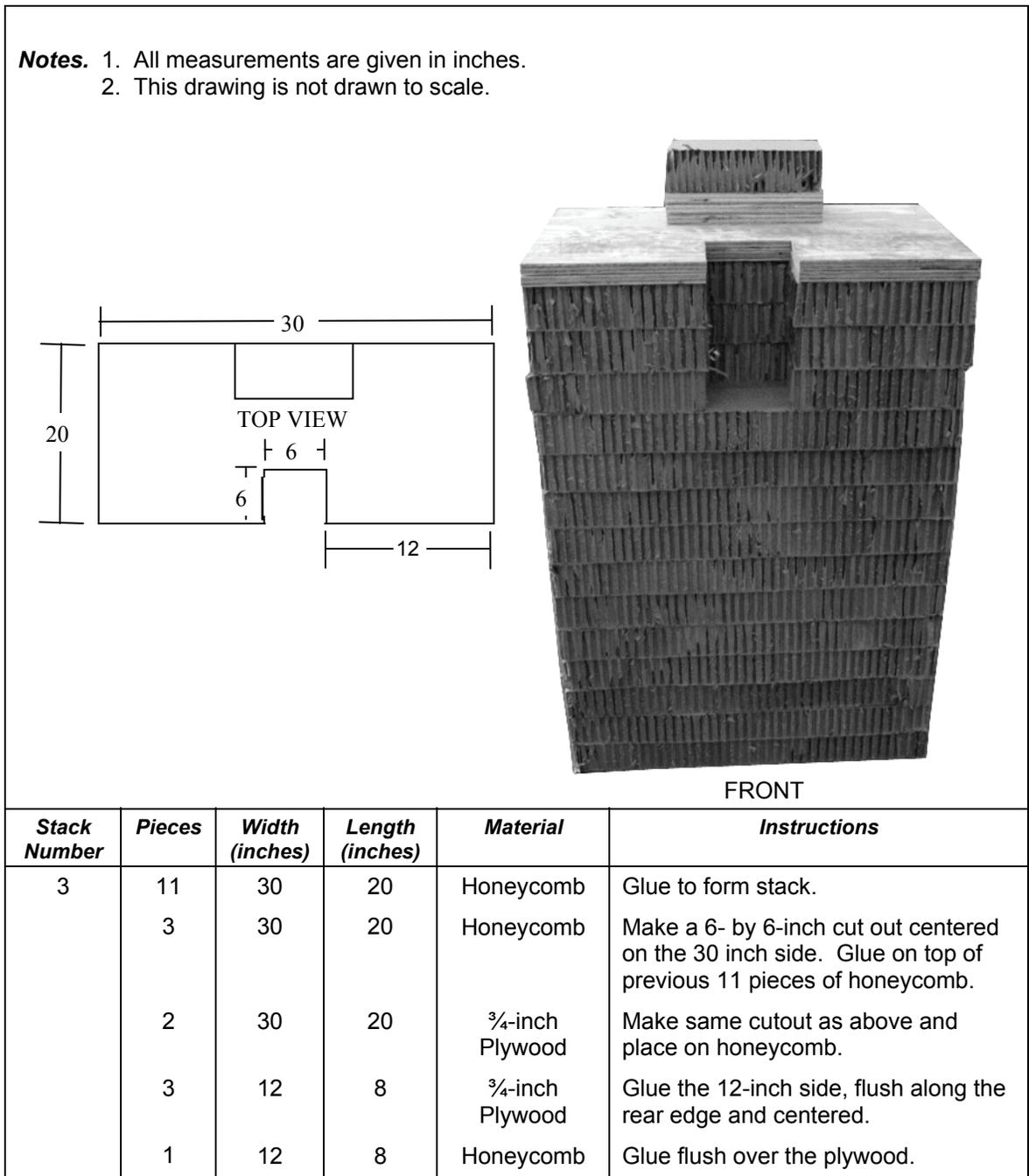
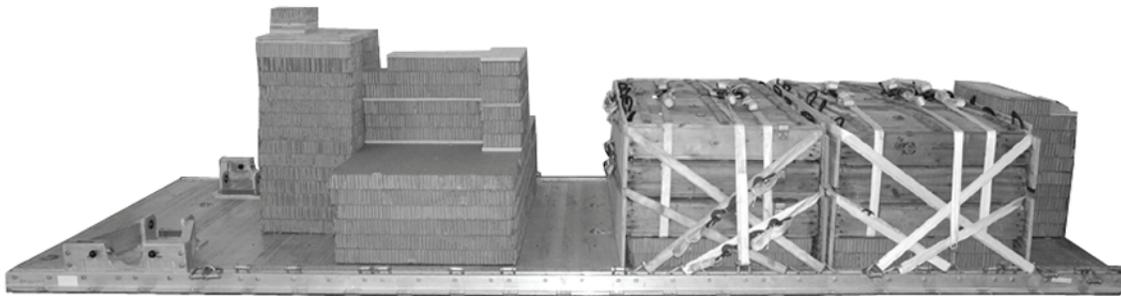
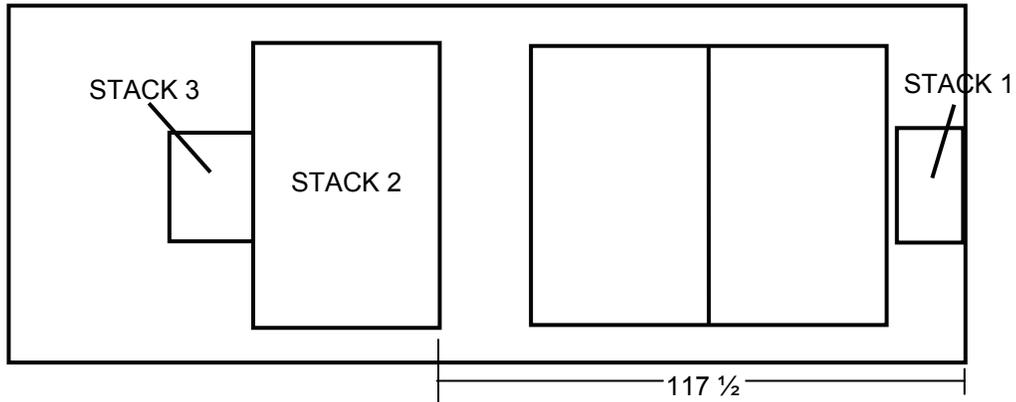


Figure 5-8. Honeycomb Stack 3 Prepared

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

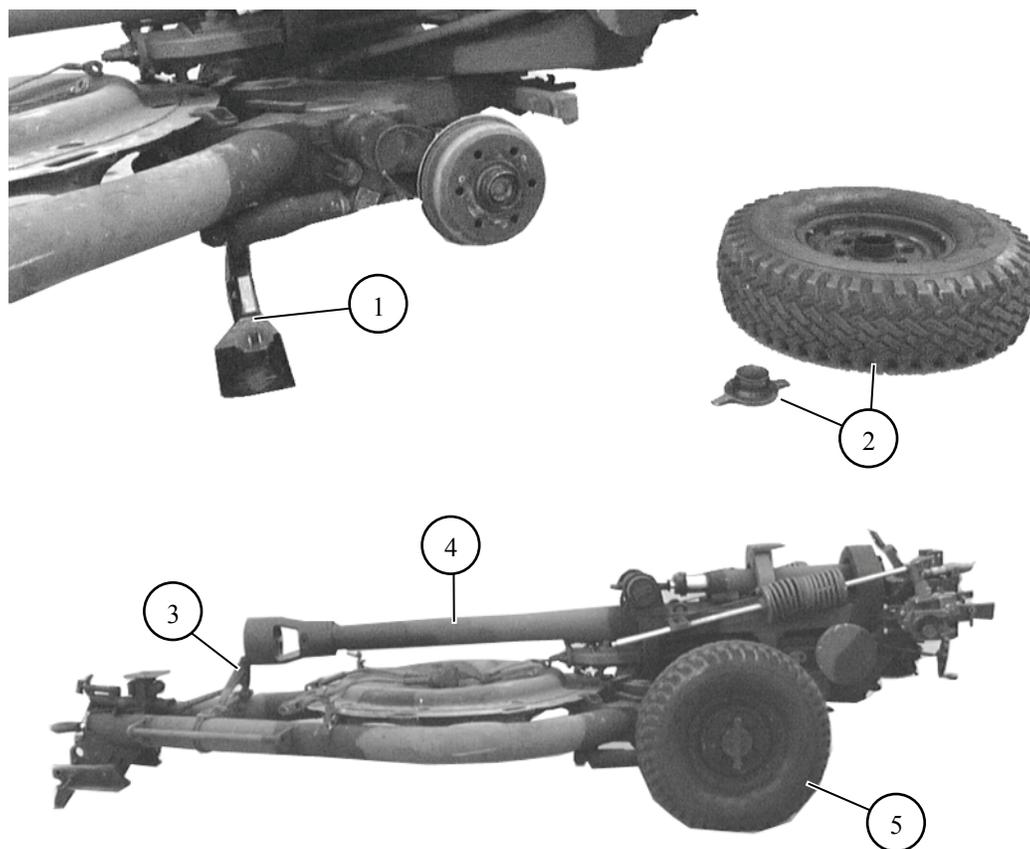


<b>Stack Number</b>	<b>Position of Stack on Platform</b>
	Place stack:
1	Centered flush with the front edge of the platform.
2	Centered 117 ½ inches from the front edge of the platform.
3	Centered flush against stack 2.

**Figure 5-9. Honeycomb Stacks Placed on Platform**

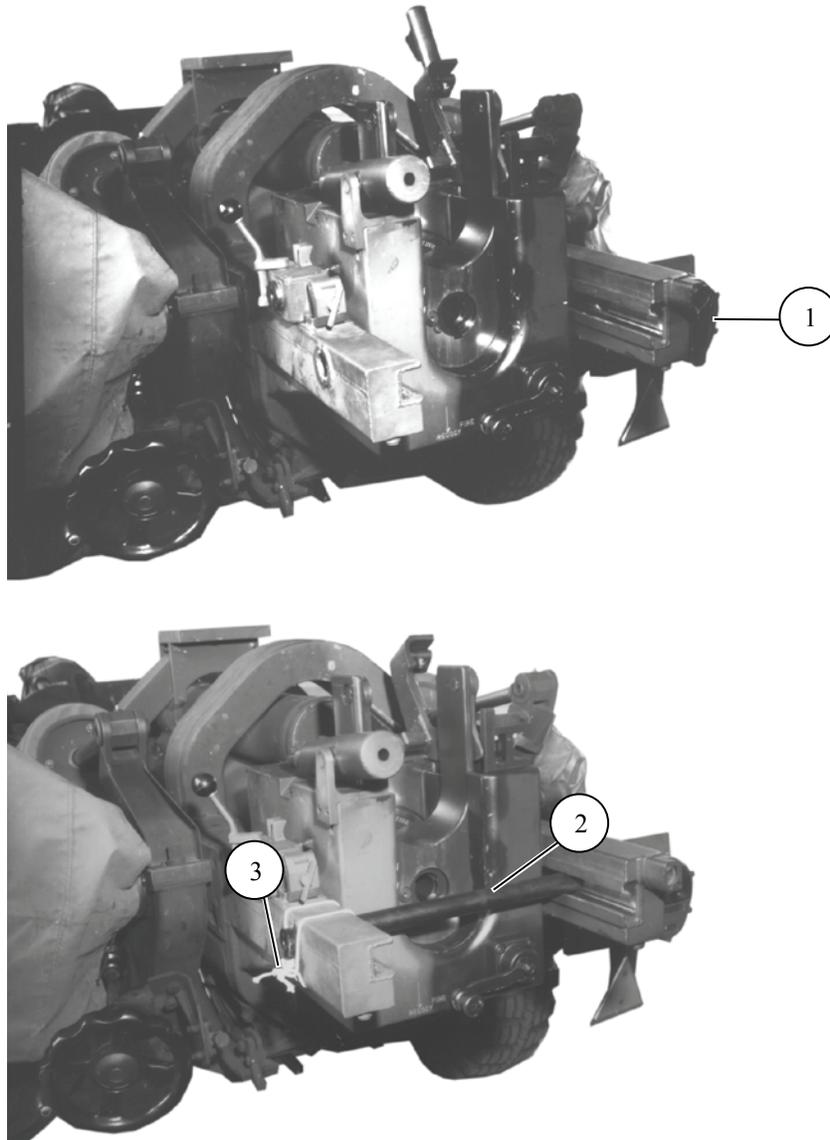
## PREPARING HOWITZER

4-39. Prepare the howitzer as shown in Figures 5-10 through 5-19.



- ① Install the jack.
- ② Use the mallet to remove the wheel hub and the right front wheel.
- ③ Place the traveling stay in its locking bracket.
- ④ Traverse the barrel to the rear until it is centered between the trails.
- ⑤ Replace the wheel and hub. Stow the jack and mallet in the bracket on the left side of the gun.

**Figure 5-10. Gun Placed in Travel Position**



- ① Remove the run back stop bar from its storage hole on the right rail. (Bar shown stowed.)
- ② Insert the bar from the left side into the holes provided in both rails.
- ③ Secure the left end of the bar to the left rail with type III nylon cord.

**Figure 5-11. Run Back Stop Bar Secured Across Breech**

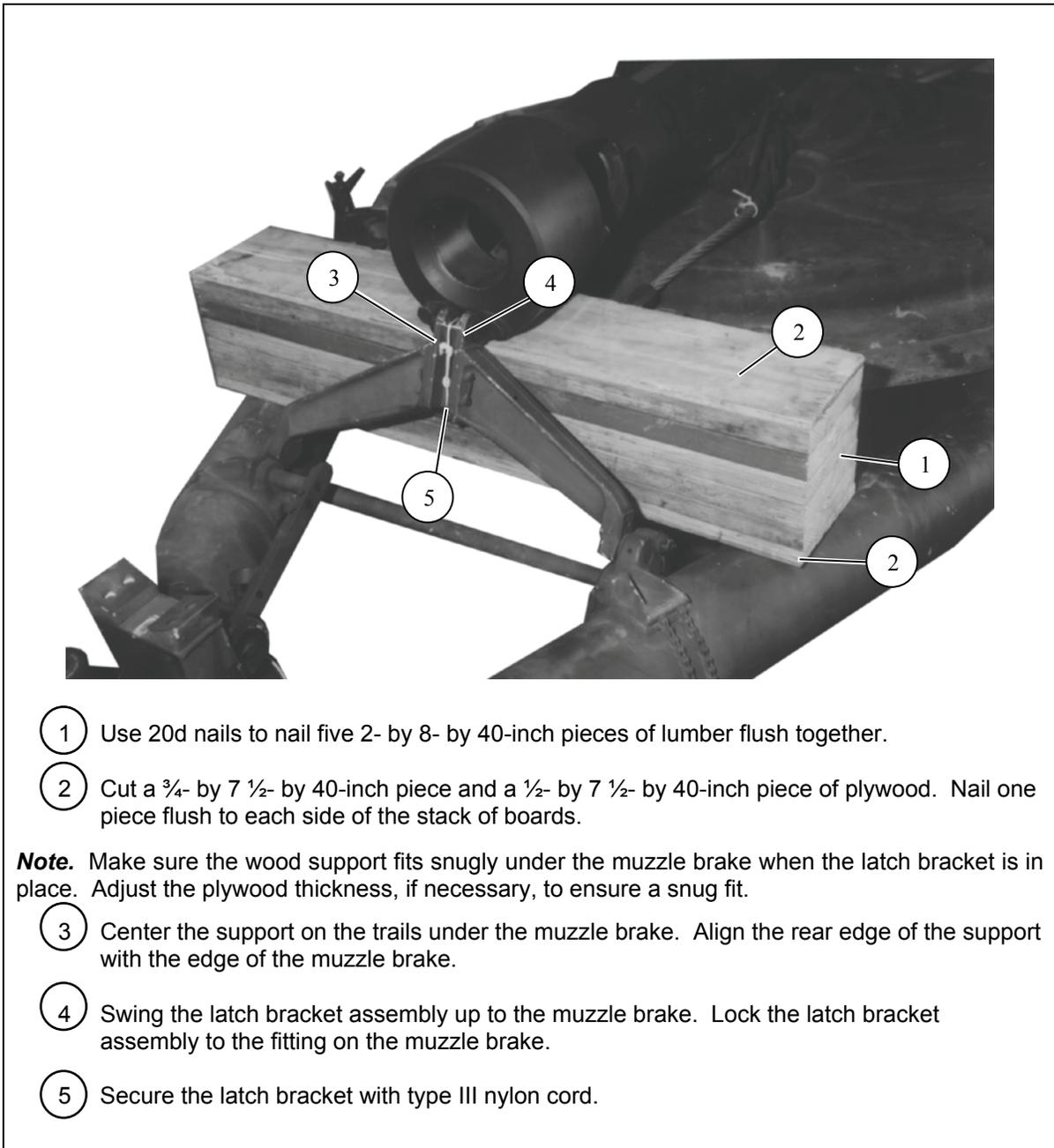
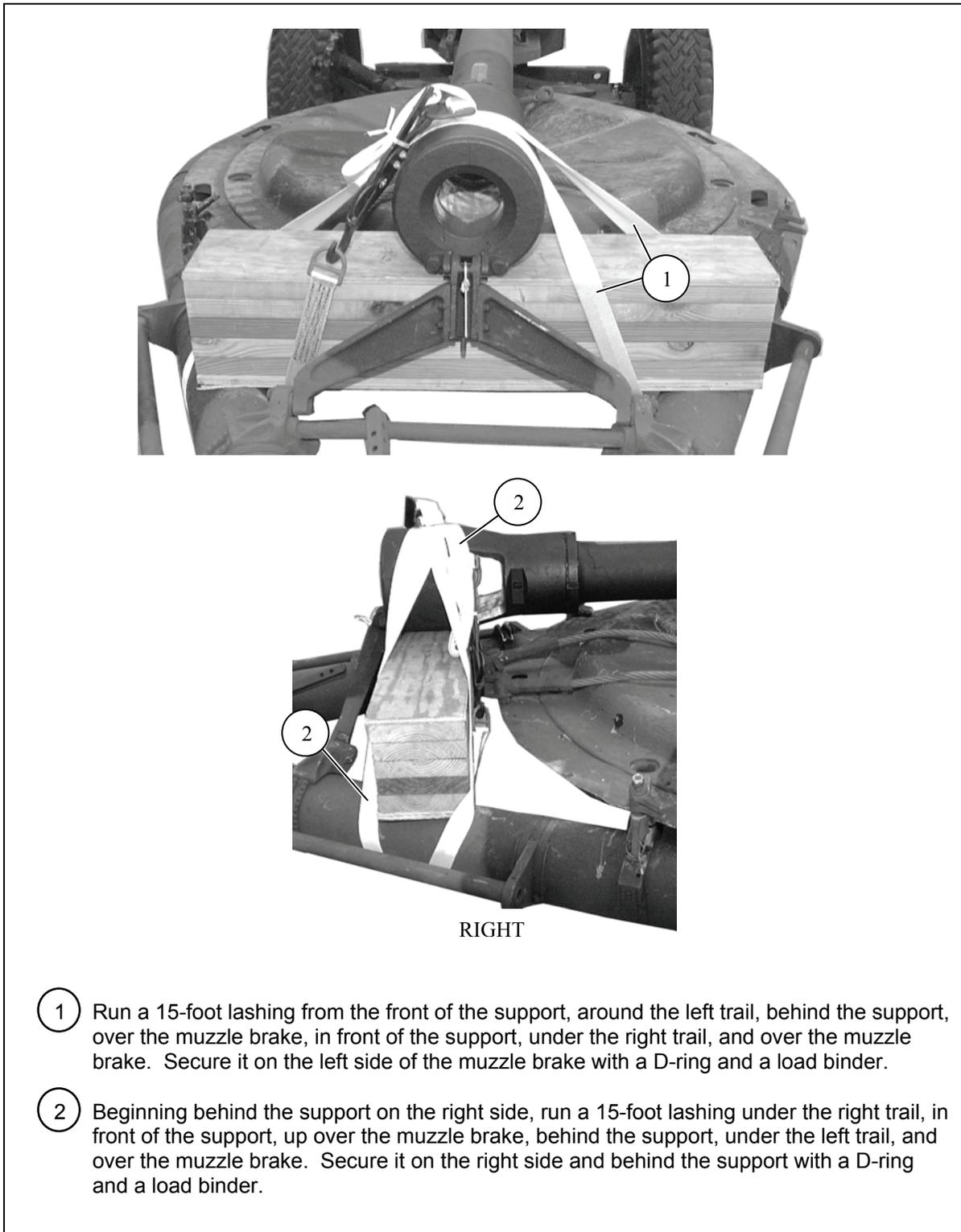
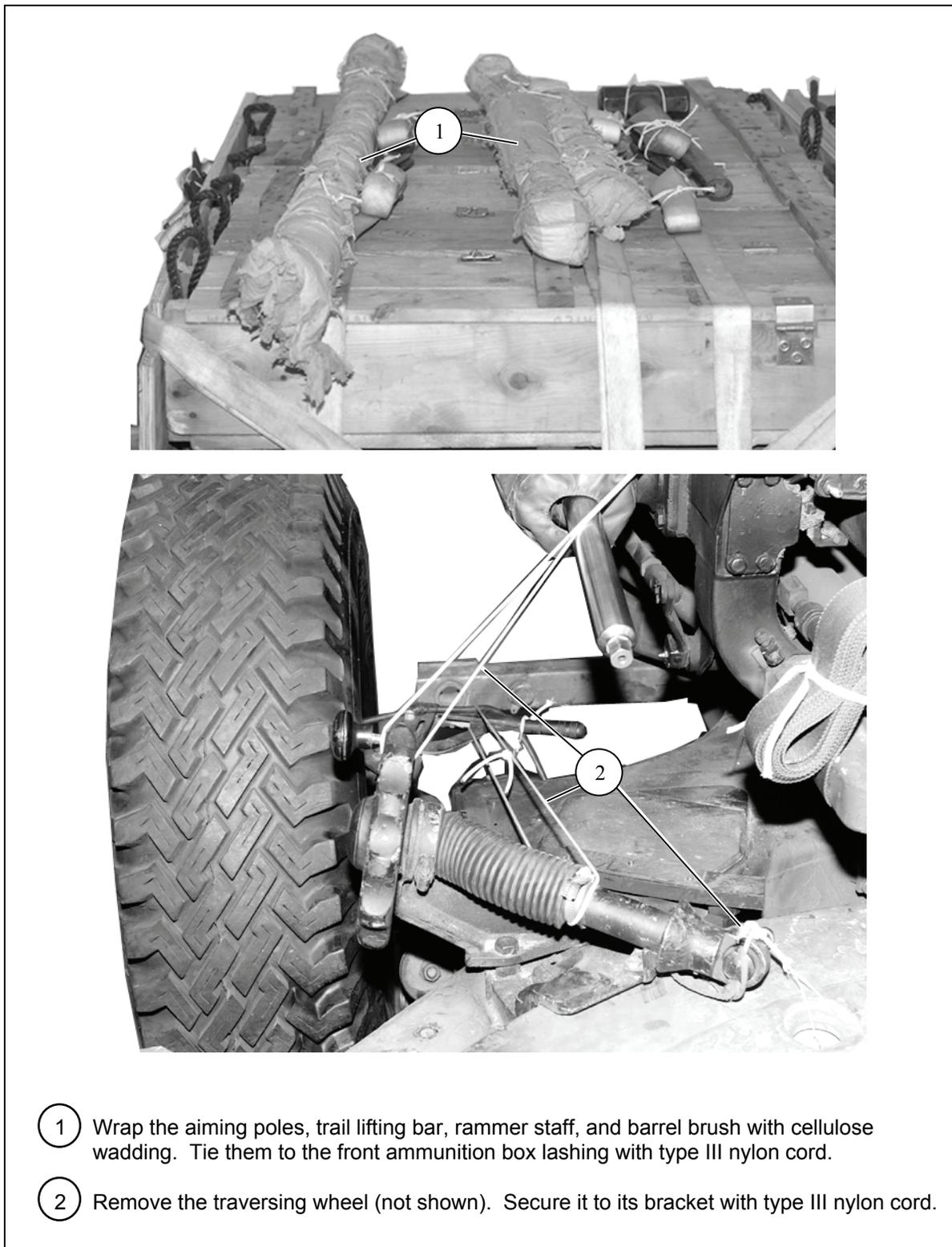


Figure 5-12. Muzzle Brake Support Constructed and Placed



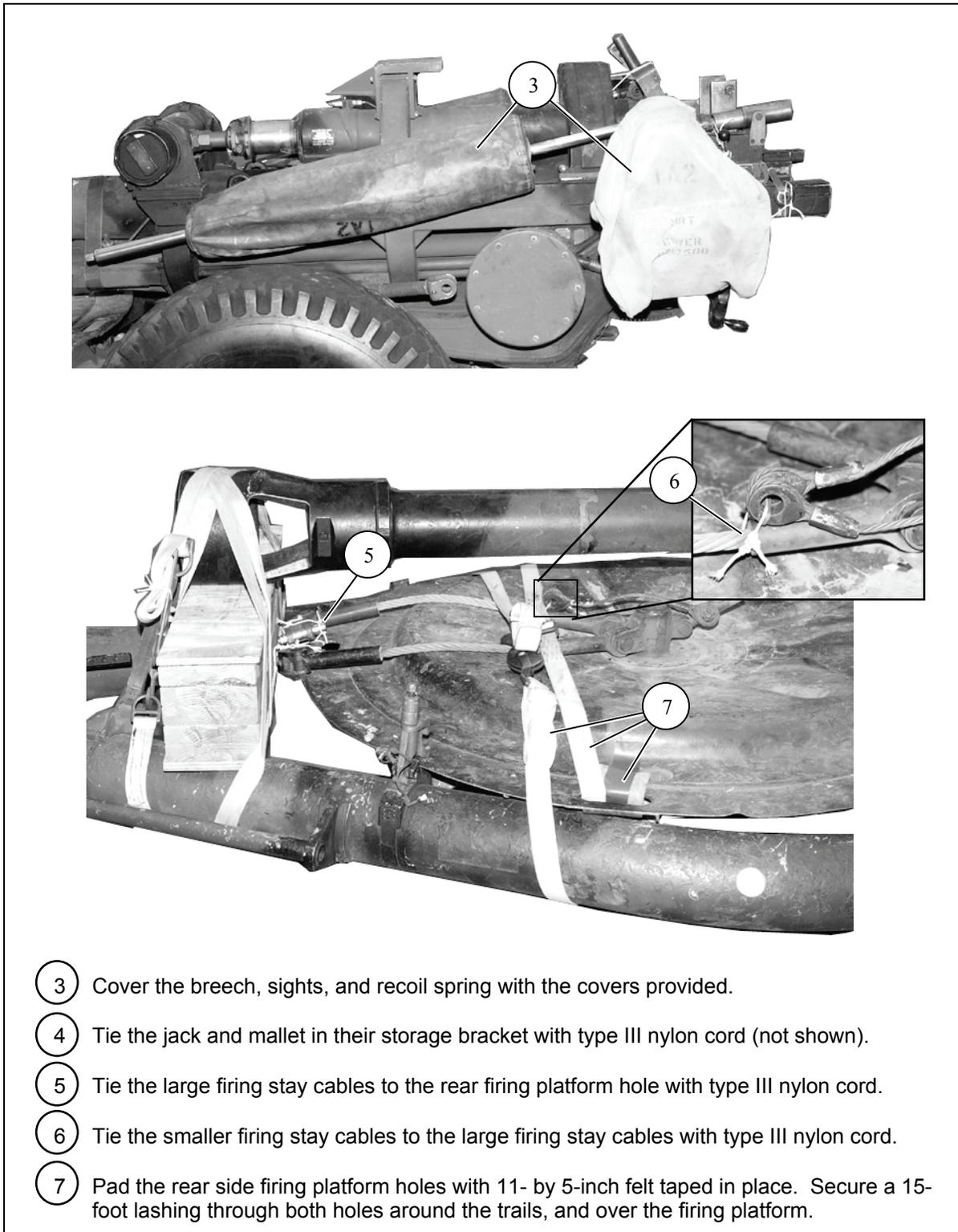
- ① Run a 15-foot lashing from the front of the support, around the left trail, behind the support, over the muzzle brake, in front of the support, under the right trail, and over the muzzle brake. Secure it on the left side of the muzzle brake with a D-ring and a load binder.
- ② Beginning behind the support on the right side, run a 15-foot lashing under the right trail, in front of the support, up over the muzzle brake, behind the support, under the left trail, and over the muzzle brake. Secure it on the right side and behind the support with a D-ring and a load binder.

**Figure 5-13. Muzzle Brake Support Secured**



- ① Wrap the aiming poles, trail lifting bar, rammer staff, and barrel brush with cellulose wadding. Tie them to the front ammunition box lashing with type III nylon cord.
- ② Remove the traversing wheel (not shown). Secure it to its bracket with type III nylon cord.

Figure 5-14. Gun Equipment Stowed



- ③ Cover the breech, sights, and recoil spring with the covers provided.
- ④ Tie the jack and mallet in their storage bracket with type III nylon cord (not shown).
- ⑤ Tie the large firing stay cables to the rear firing platform hole with type III nylon cord.
- ⑥ Tie the smaller firing stay cables to the large firing stay cables with type III nylon cord.
- ⑦ Pad the rear side firing platform holes with 11- by 5-inch felt taped in place. Secure a 15-foot lashing through both holes around the trails, and over the firing platform.

**Figure 5-14. Gun Equipment Stowed (Continued)**

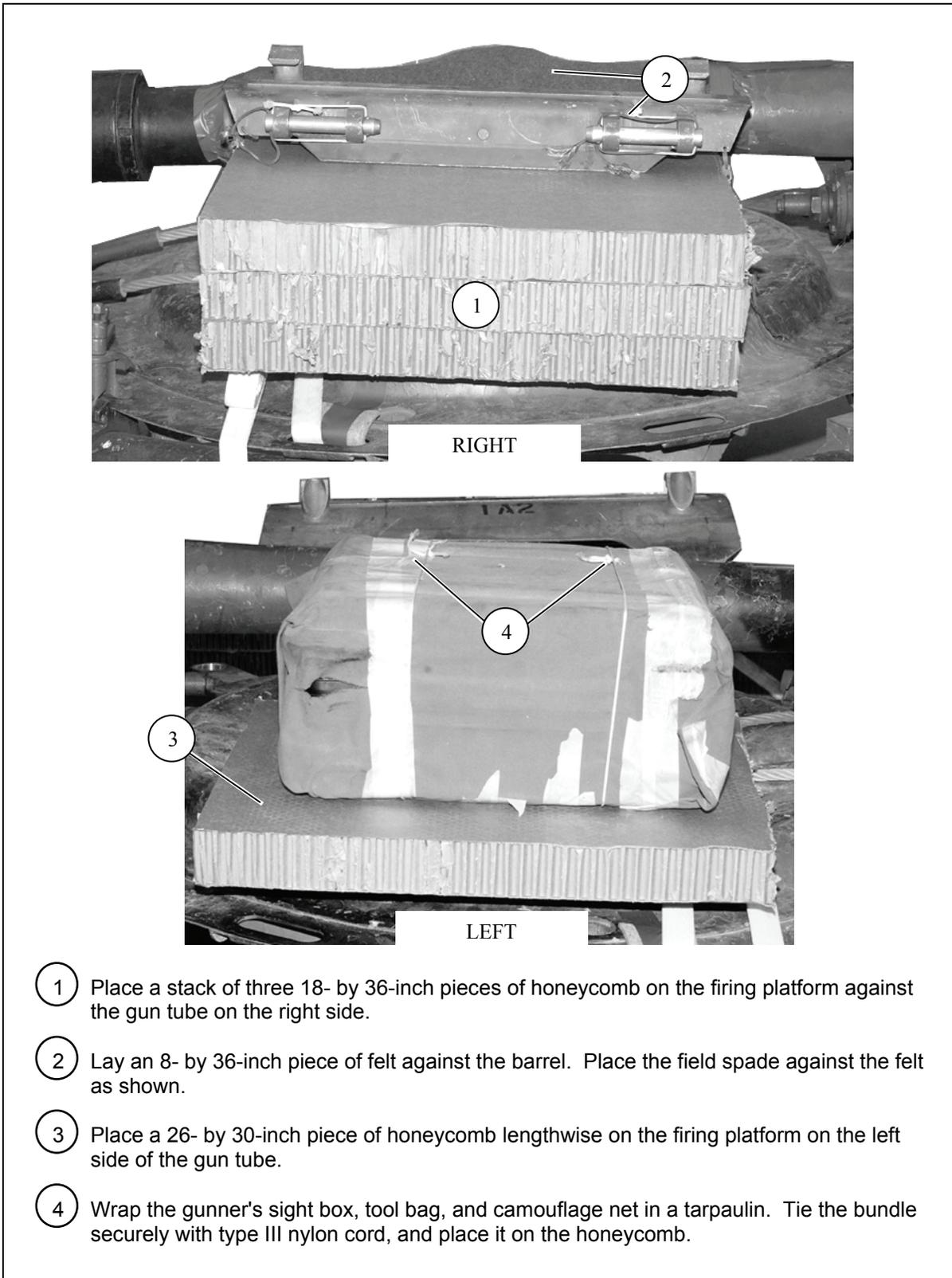
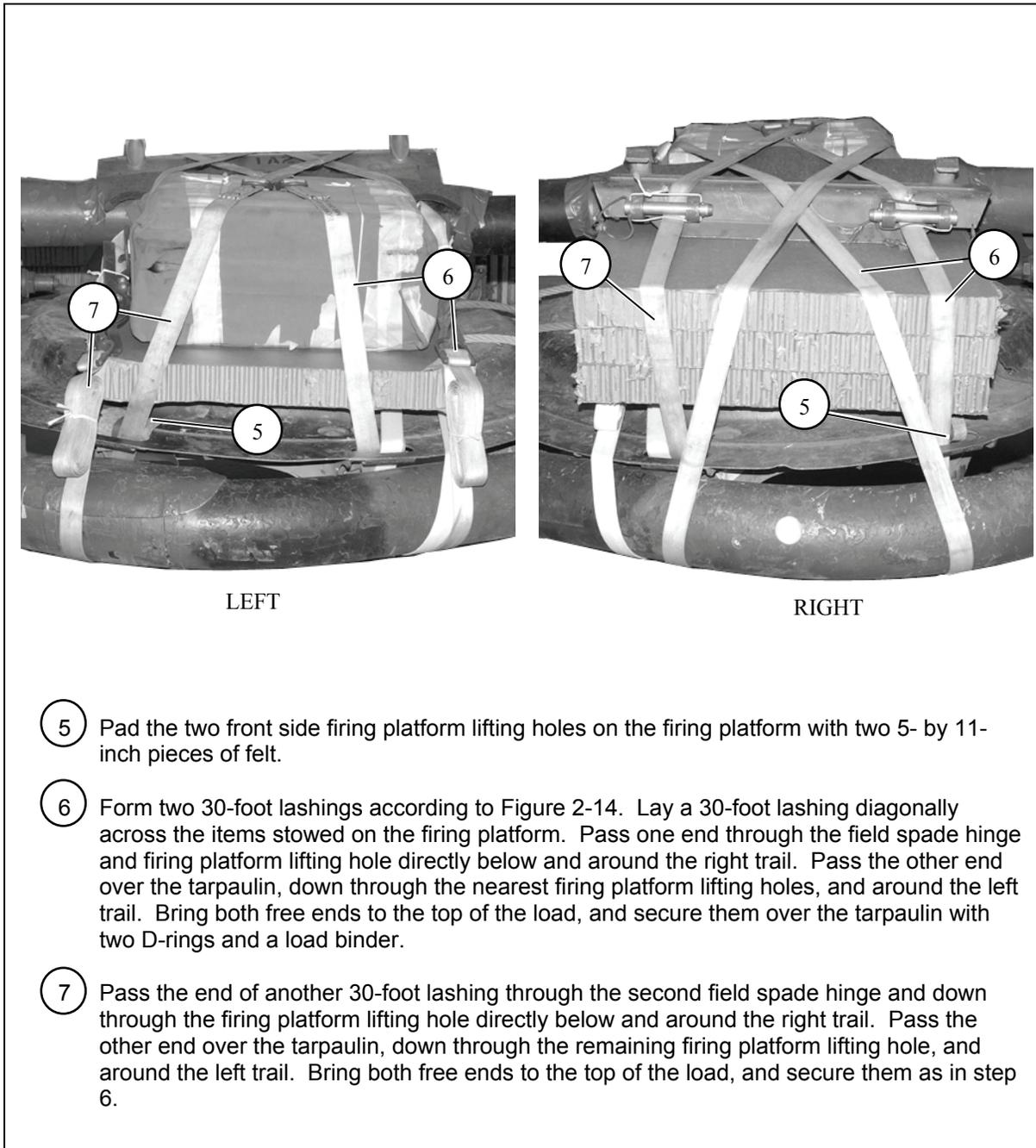
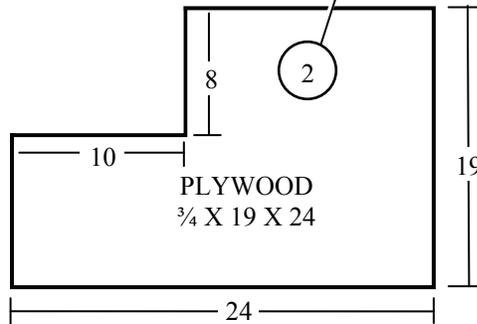
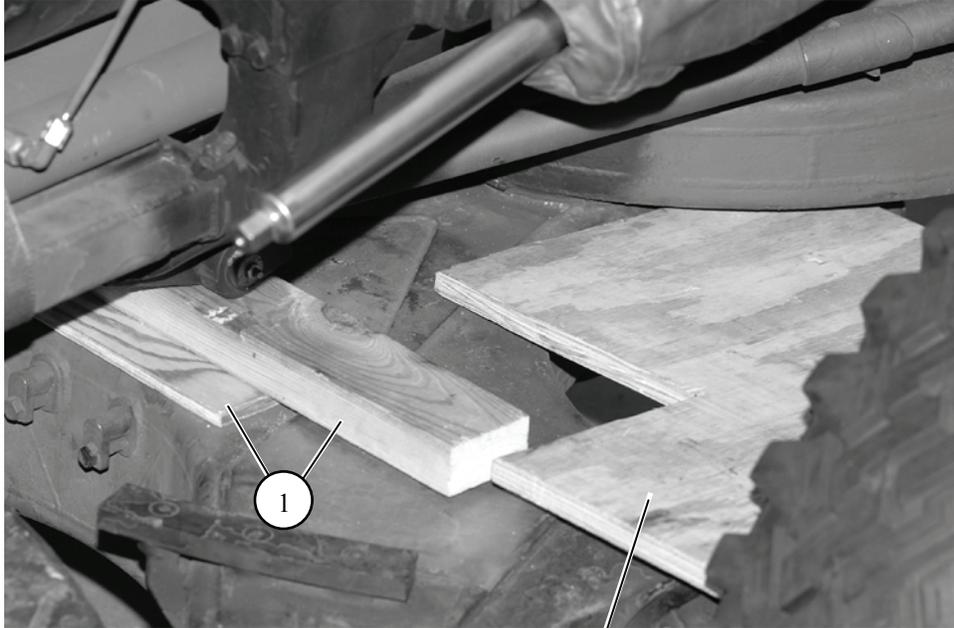


Figure 5-15. Howitzer Equipment Stowed on Firing Platform



**Figure 5-15. Howitzer Equipment Stowed on Firing Platform (Continued)**

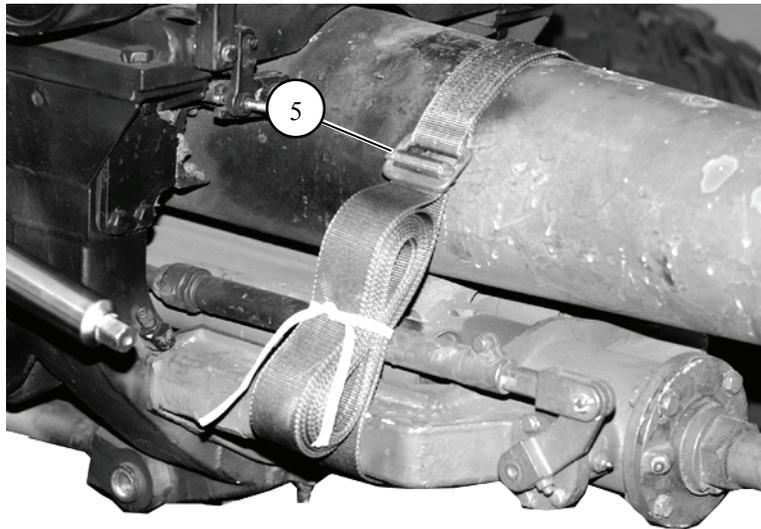
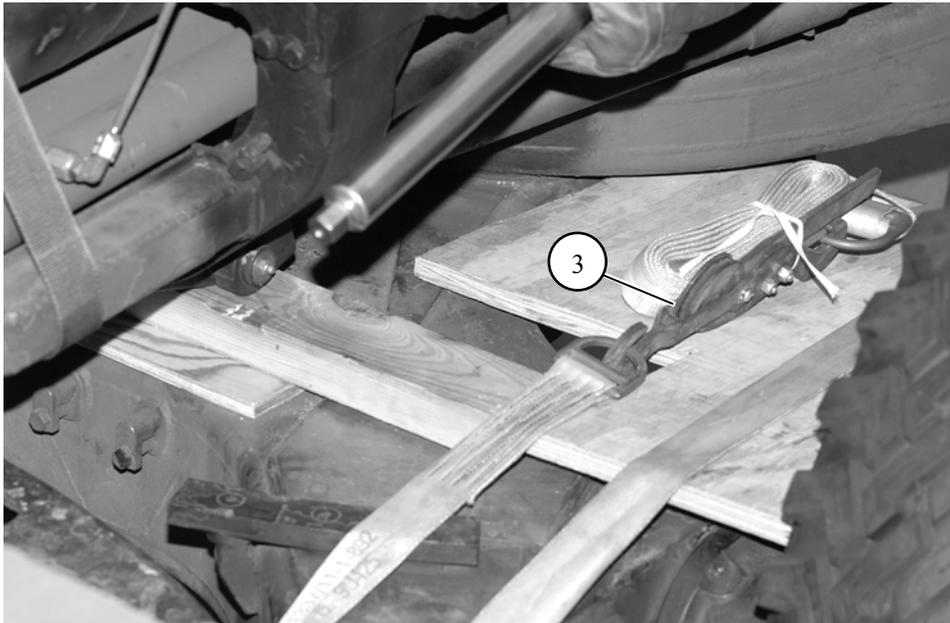
- Notes.** 1. All measurements are given in inches.  
2. This drawing is not drawn to scale.



- ① Center a 1/2- by 10 1/2- by 6-inch piece of plywood directly under the hinge of the traveling stay. Center a 2- by 4- by 24-inch piece of lumber over the plywood.
- ② Place a 3/4- by 19- by 24-inch piece of plywood with a 10- by 8-inch cutout on each side of the 2- by 4-inch piece of lumber. See the line drawing for details.

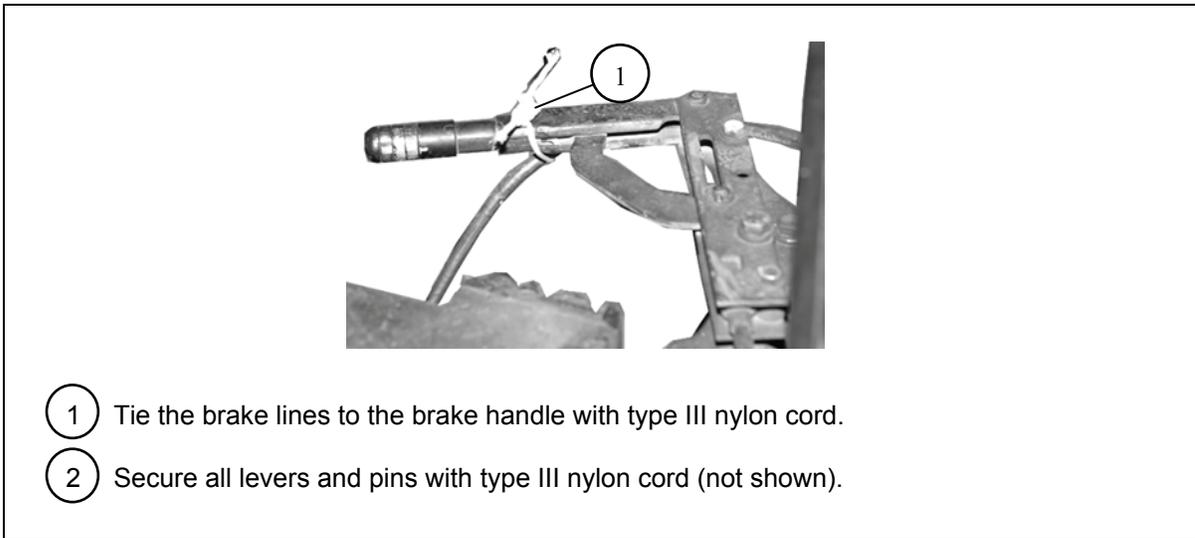
**Note.** Be sure that the wood support fits snugly between the traveling stay and the carriage. Adjust the plywood thickness, if necessary, to ensure a snug fit.

**Figure 5-16. Wood Under Buffer Assembly Secured**

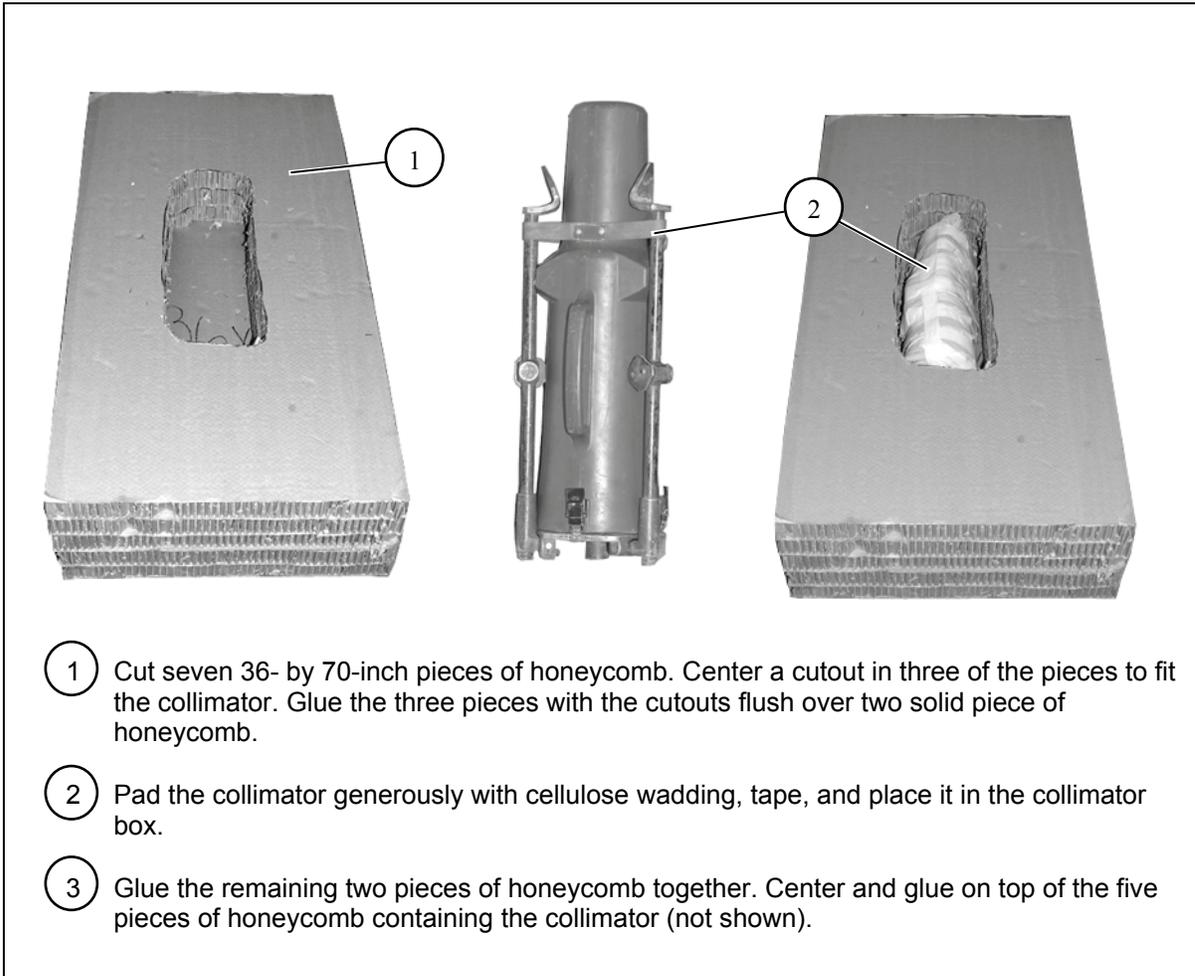


- 3 Pad the front firing platform hole with cellulose wadding. Pass a 15-foot lashing through the hole, over the lumber placed earlier, and around the brake light bar. Secure the lashing on top with a D-ring and a load binder.
- 4 Repeat steps 2 and 3 on the opposite side, using the same firing platform hole. (Not shown)
- 5 Pass an A7A cargo strap around the barrel and under the buffer assembly. Secure the strap with its friction adapter. Tie the excess strap with type I, 1/4-inch cotton webbing.

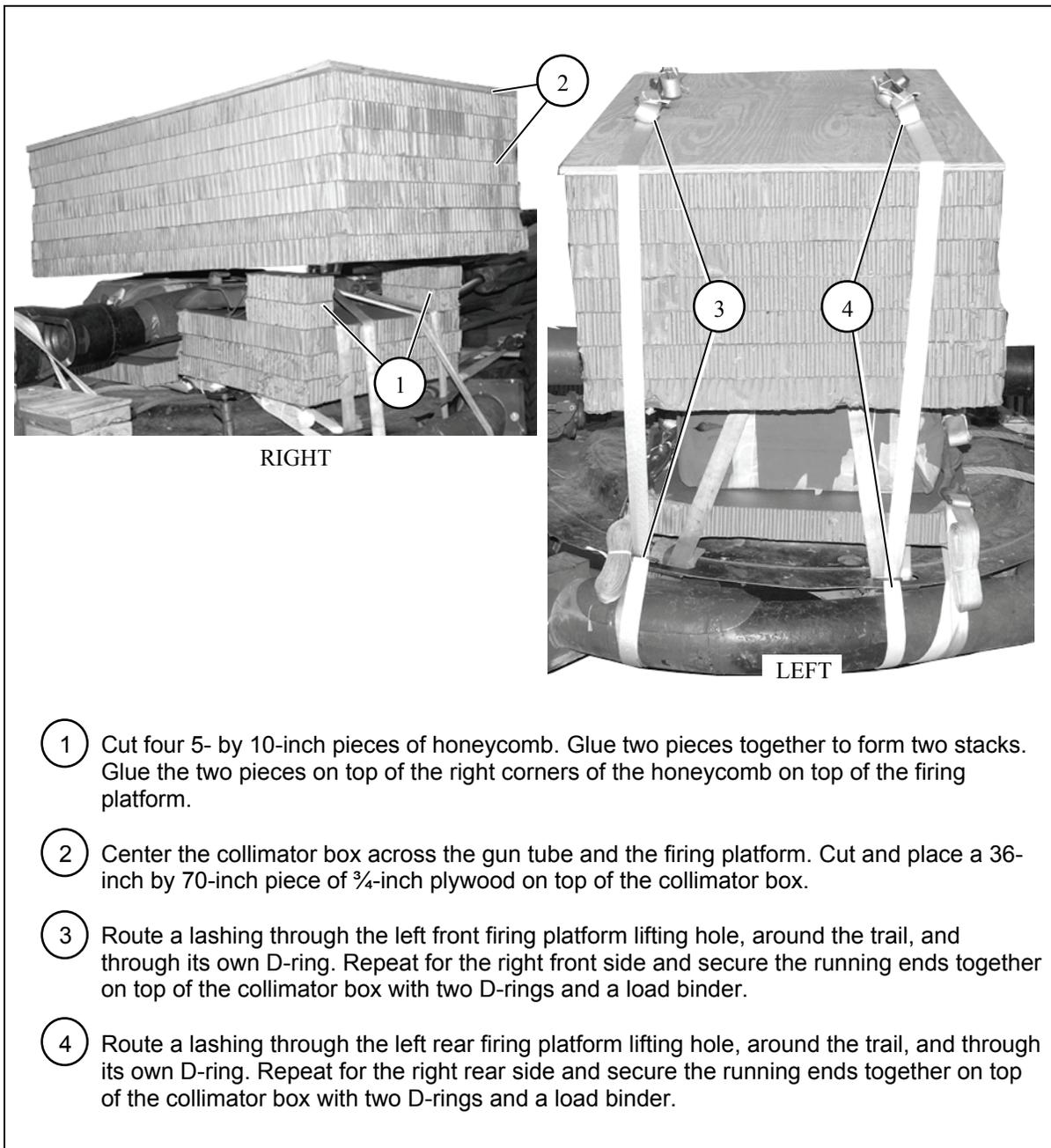
**Figure 5-16. Wood Under Buffer Assembly Secured (Continued)**



**Figure 5-17. Brake Lines Secured to Brake Handle**



**Figure 5-18. Collimator Stowed**

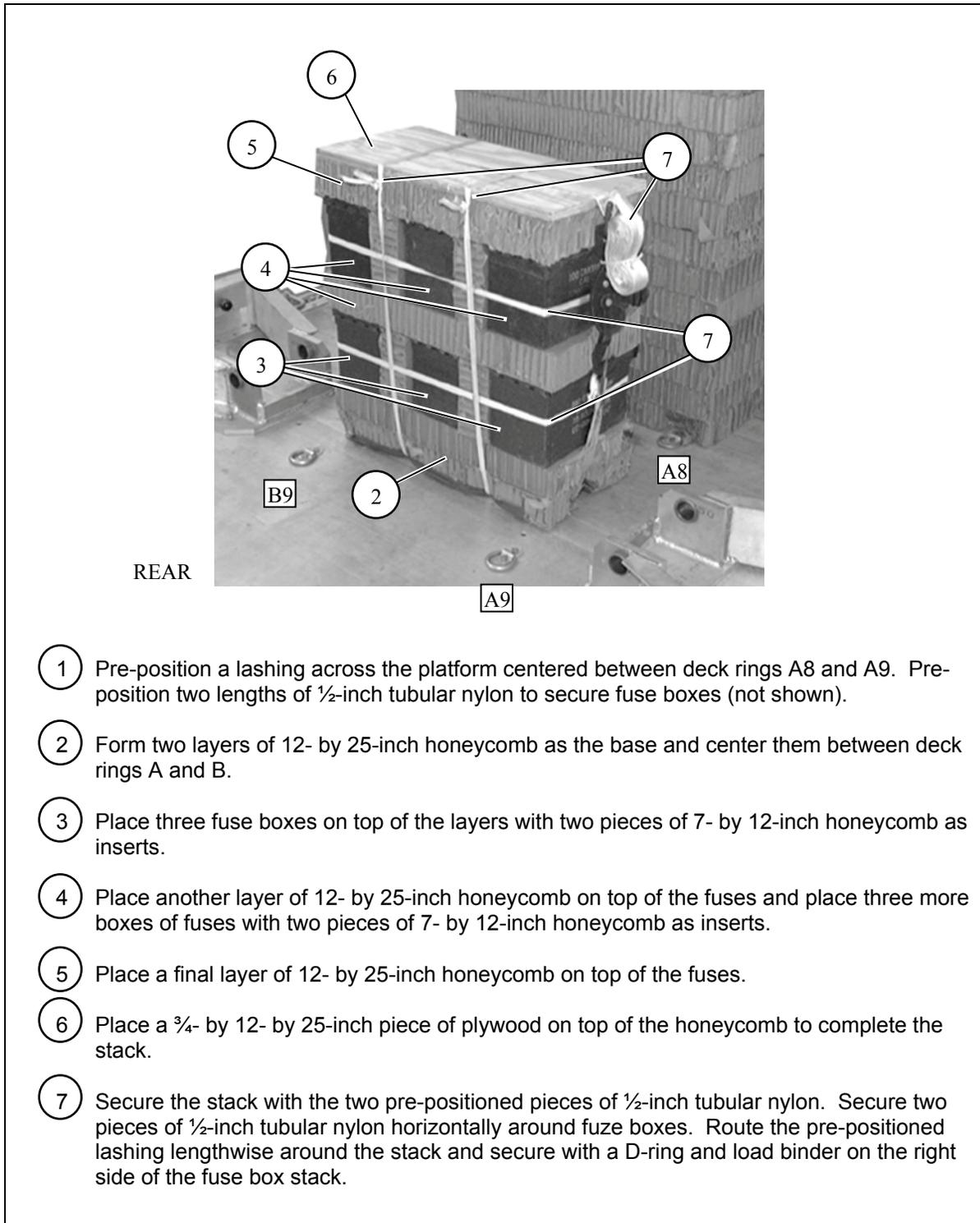


**Figure 5-19. Collimator Box Secured to Load**

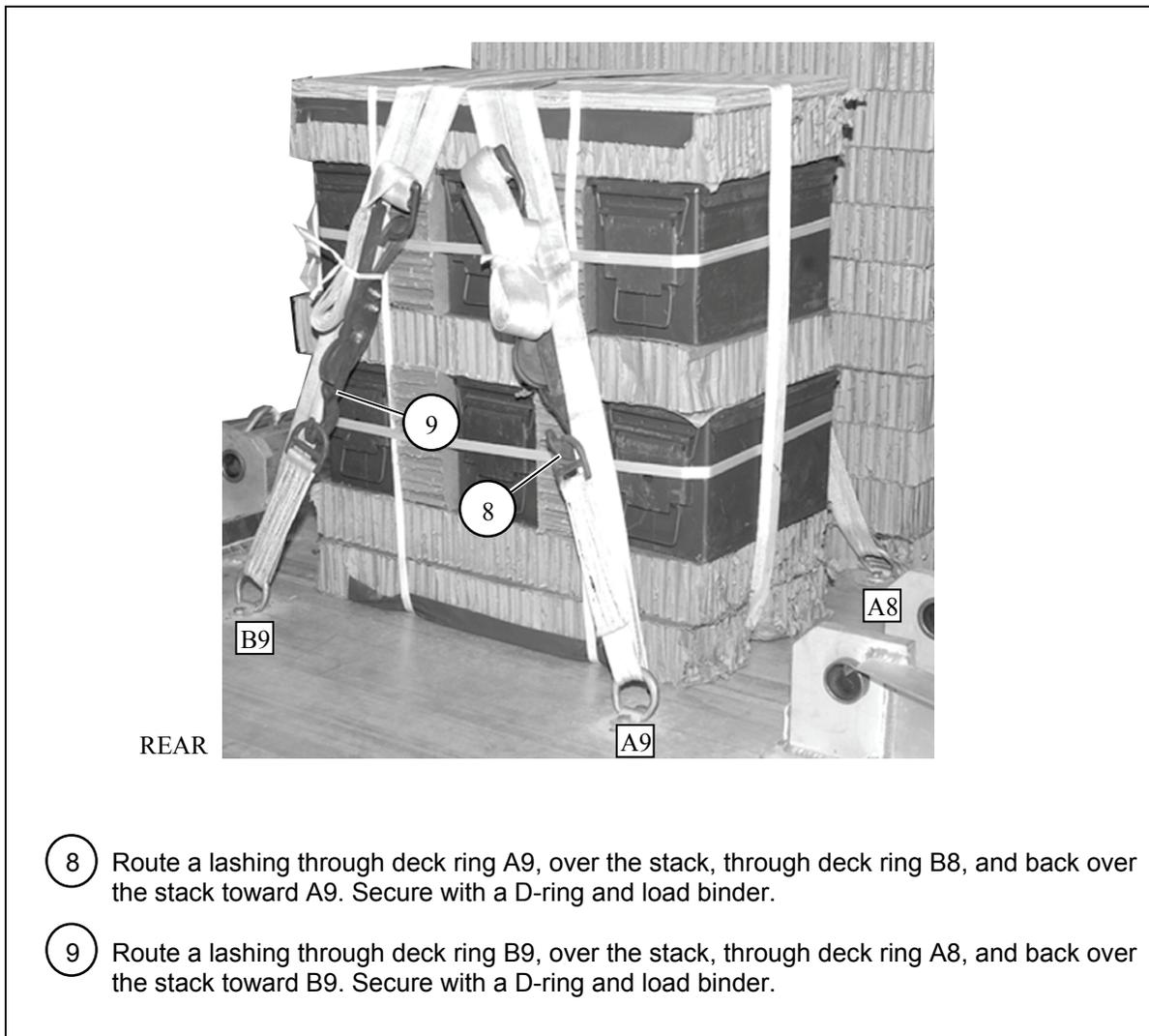


## STOWING FUSE BOXES

4-41. Stow six fuse boxes on the back of the platform as shown in Figure 5-21.



**Figure 5-21. Fuse Boxes Stowed**



**Figure 5-21. Fuse Boxes Stowed (Continued)**

## BUILDING AND PLACING THE ATTITUDE CONTROL SYSTEM (ACS) BRIDGE SUPPORT

4-42. Build the ACS bridge support as shown in Figure 5-22. Place the ACS bridge support on the load as shown in Figure 5-23.

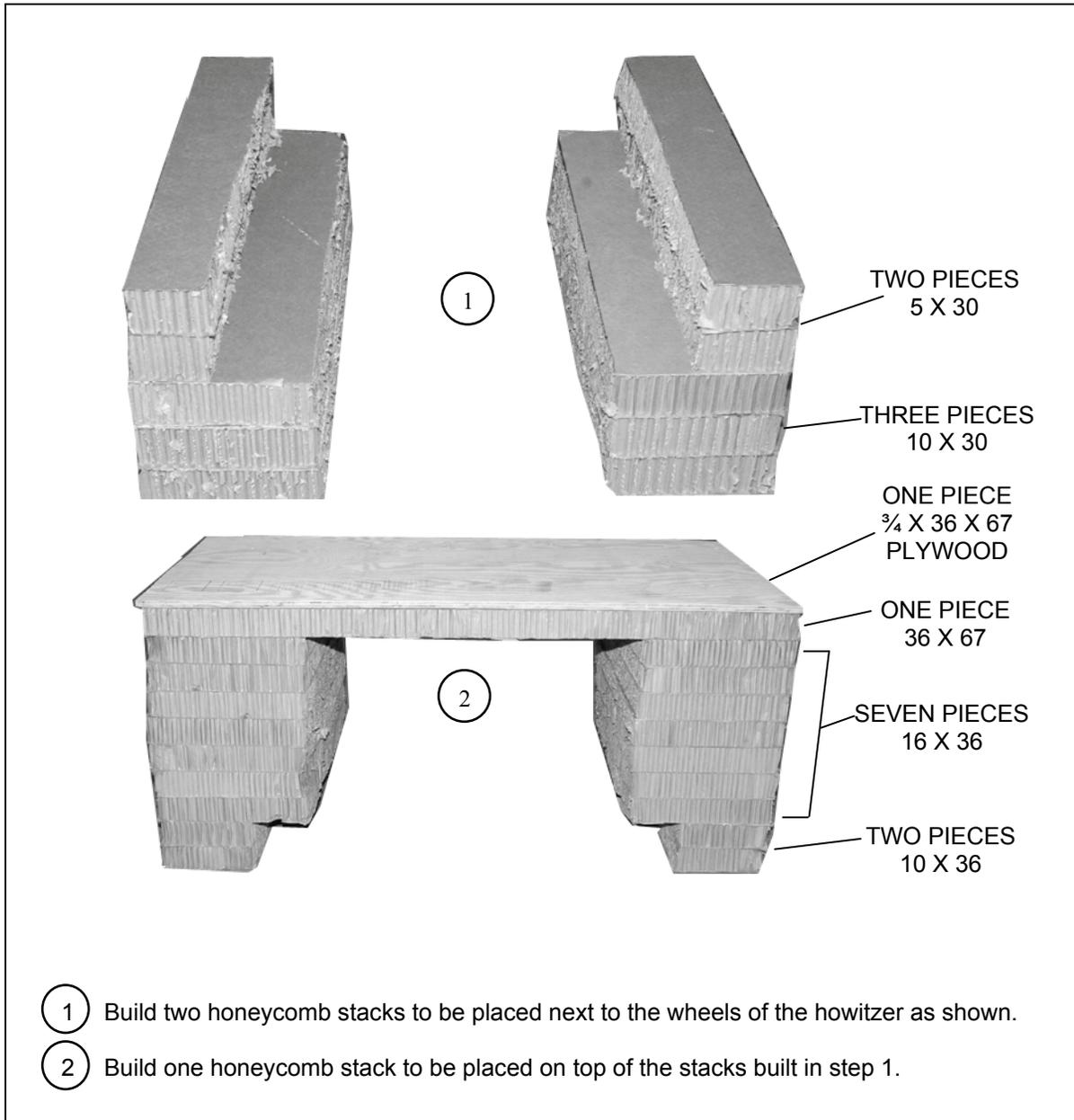
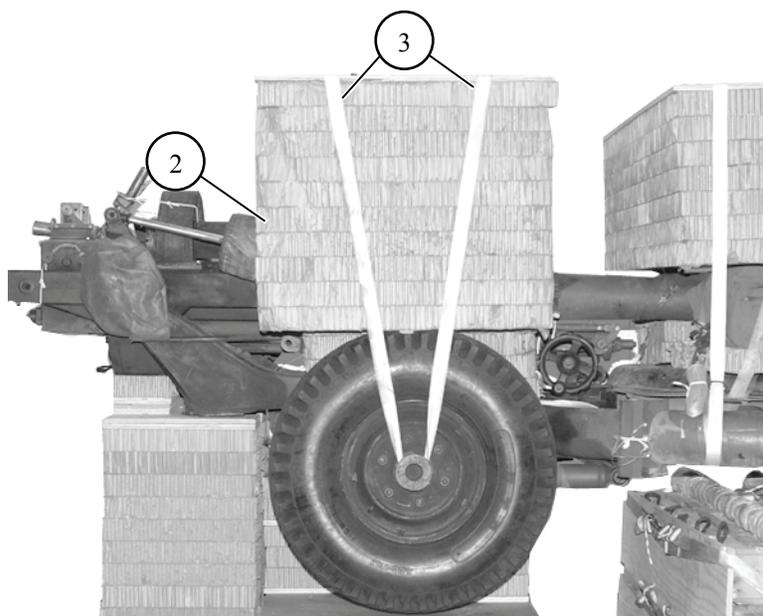


Figure 5-22. ACS Bridge Support Stacks Built

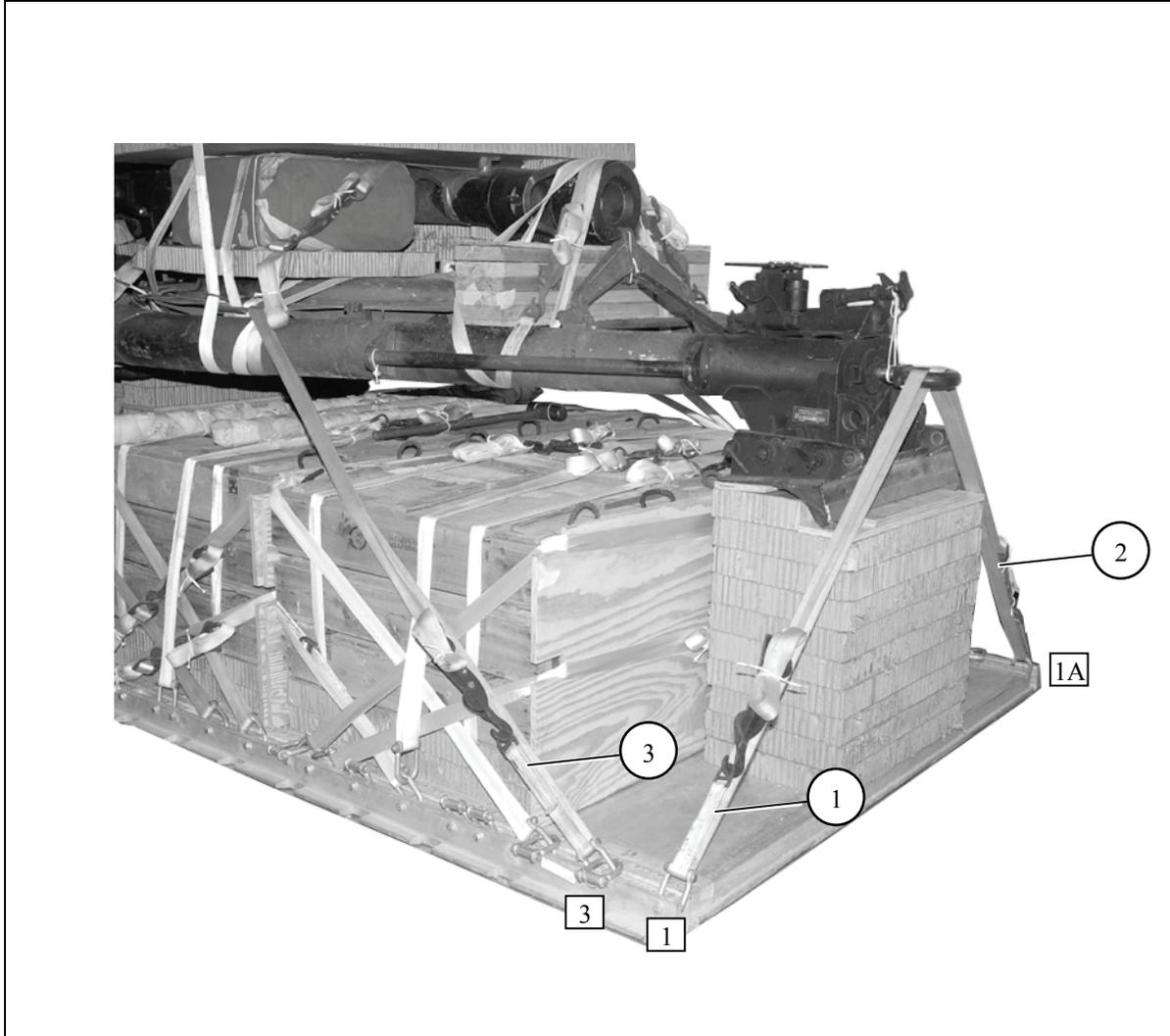


- ① Place the two smaller honeycomb stacks previously built next to the inside of each wheel.
- ② Place the larger stack on top of the stacks in step 1.
- ③ Form a 30-foot lashing and route the free ends around the wheel hubs and secure on top with two D-rings and a load binder.

**Figure 5-23. ACS Bridge Support Stacks Secured on Load**

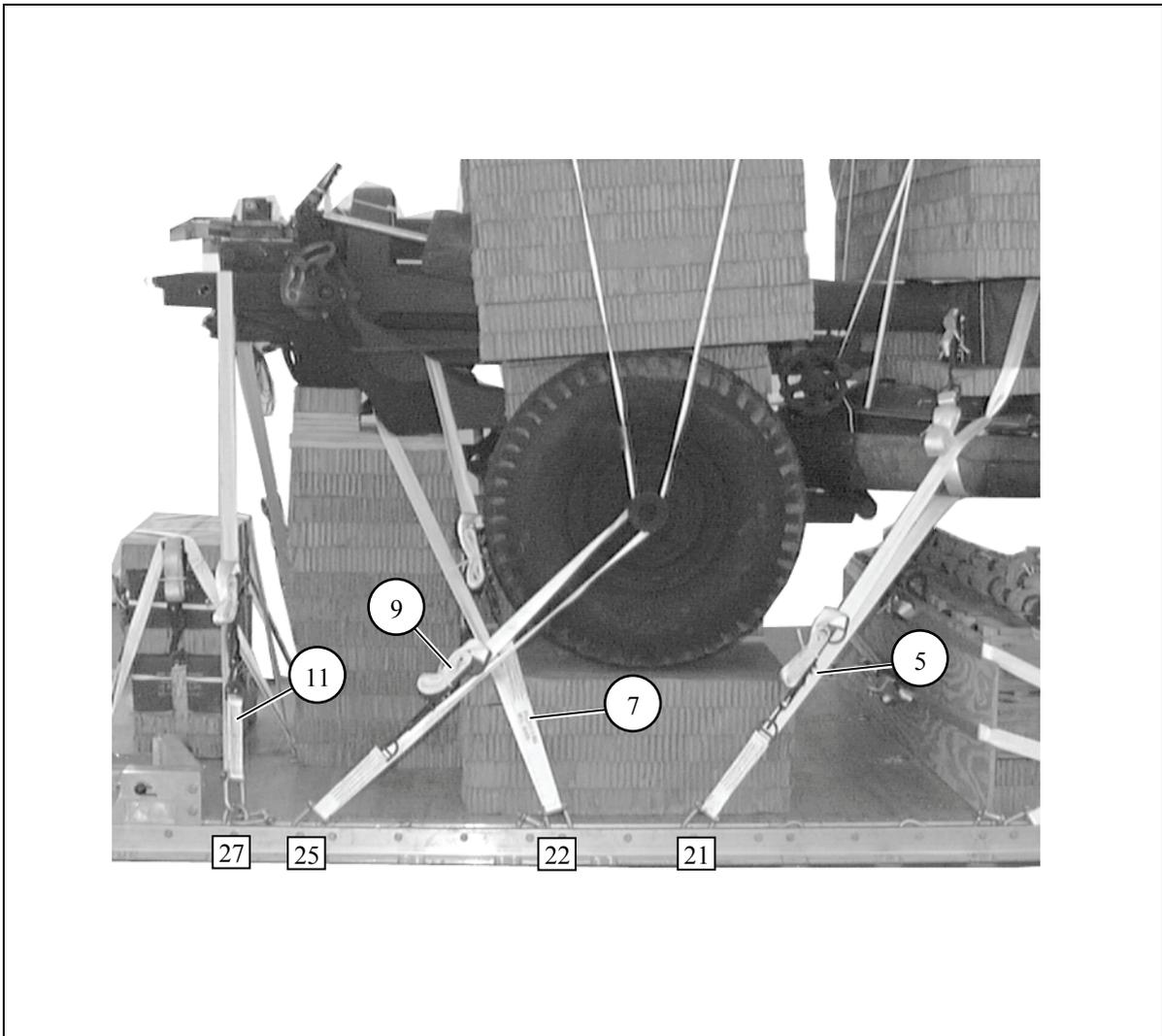
## LASHING HOWITZER

4-43. Lash the howitzer to the platform as shown in Figures 5-24 and 5-25. Install and safety the lashings according to Chapter 2 of this manual.



<i>Lashing Number</i>	<i>Tiedown Clevis Number</i>	<i>Instructions</i>
1	1	Pass lashing: Through lunette, right side.
2	1A	Through lunette, left side.
3	3	Through hole in firing platform and around trail, right side.
4	3A	Through hole in firing platform and around trail, left side.

**Figure 5-24. Lashings 1 Through 4 Installed**

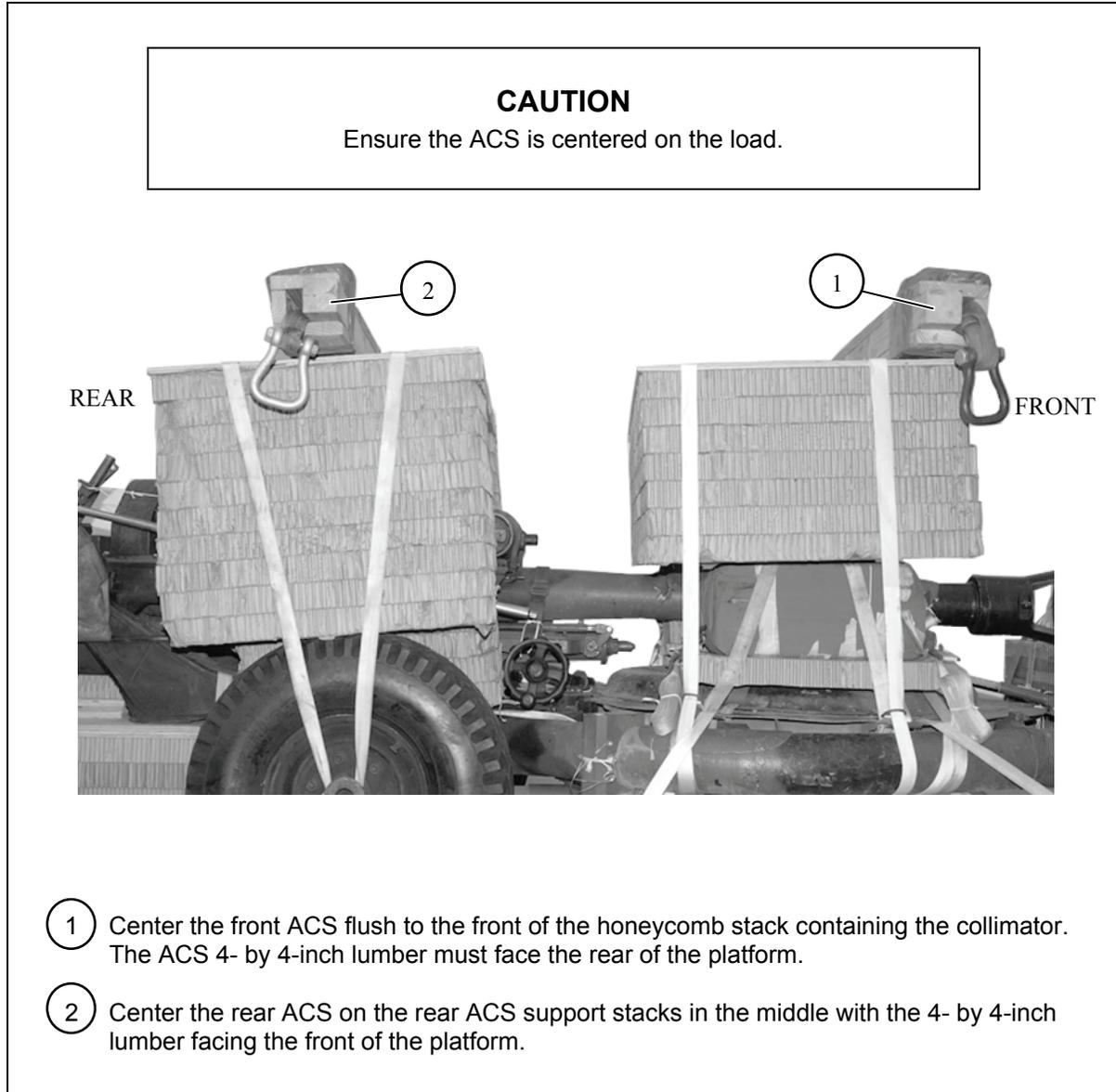


<i>Lashing Number</i>	<i>Tiedown Clevis Number</i>	<i>Instructions</i>
5	21	Pass lashing: Through hole in firing platform and around trail, right side.
6	21A	Through hole in firing platform and around trail, left side.
7	22	Around the arm, near the tire, right side.
8	22A	Around the arm, near the tire, left side.
9	25	Around the wheel hub, right side.
10	25A	Around the wheel hub, left side.
11	27	Around rail, right side.
12	27A	Around rail, left side.

**Figure 5-25. Lashings 5 Through 12 Installed**

## INSTALLING ACS AND SUSPENSION SLINGS

4-44. Construct, inspect, and position the ACS according to Chapter 2, and as shown in Figure 5-26. Install the suspension slings and secure ACS according to Chapter 2, and as shown in Figure 5-27.



**Figure 5-26. Attitude Control System Positioned**

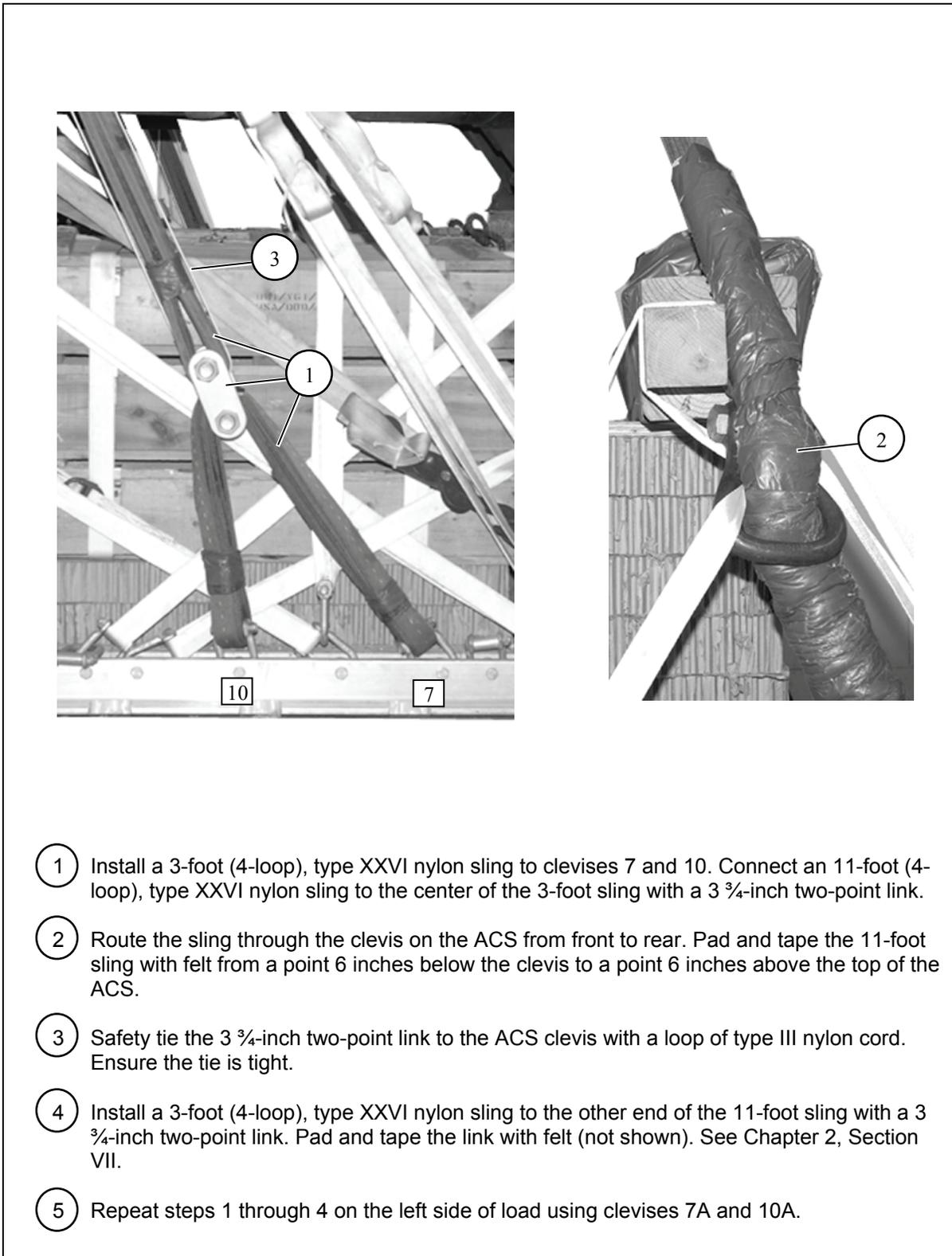
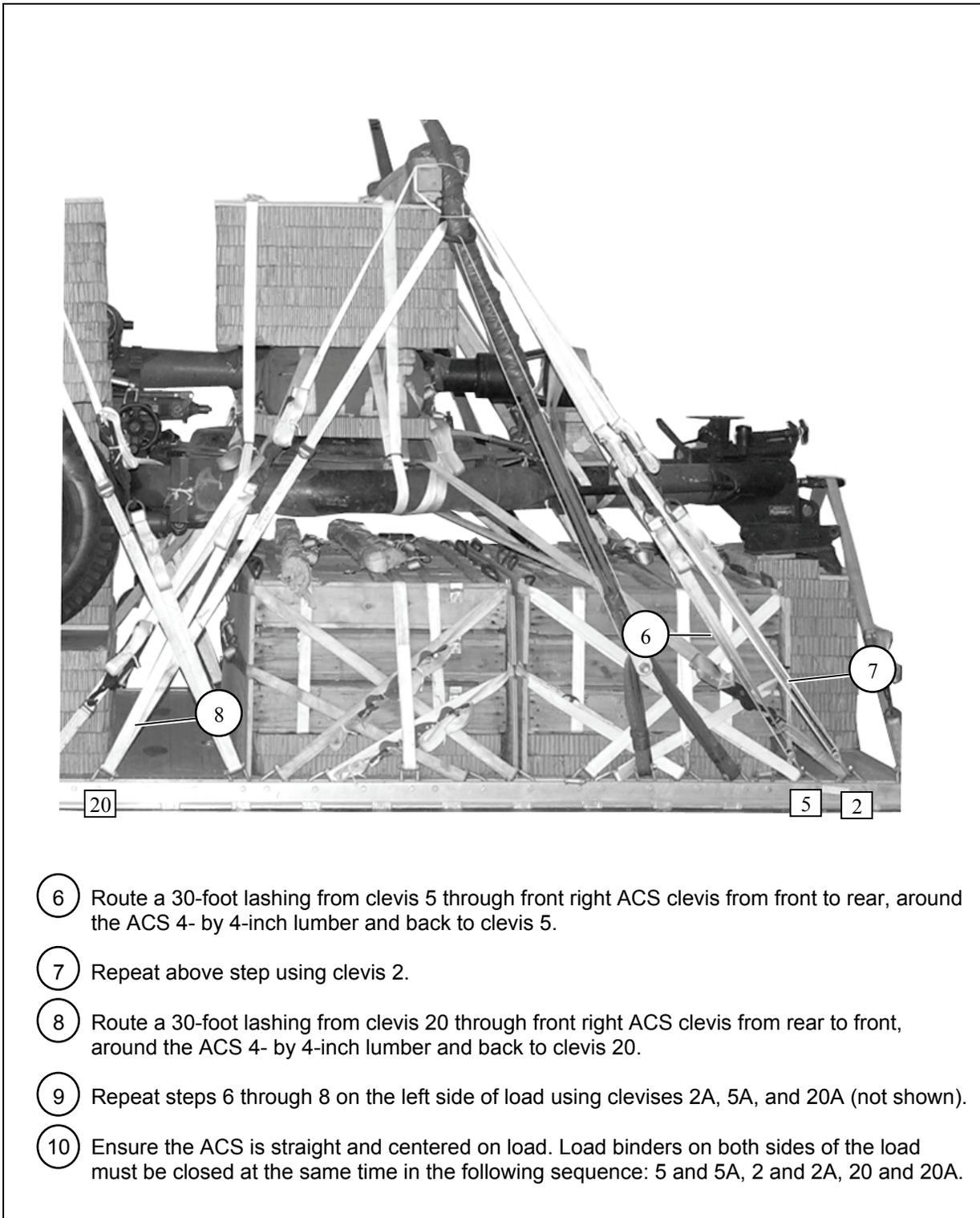
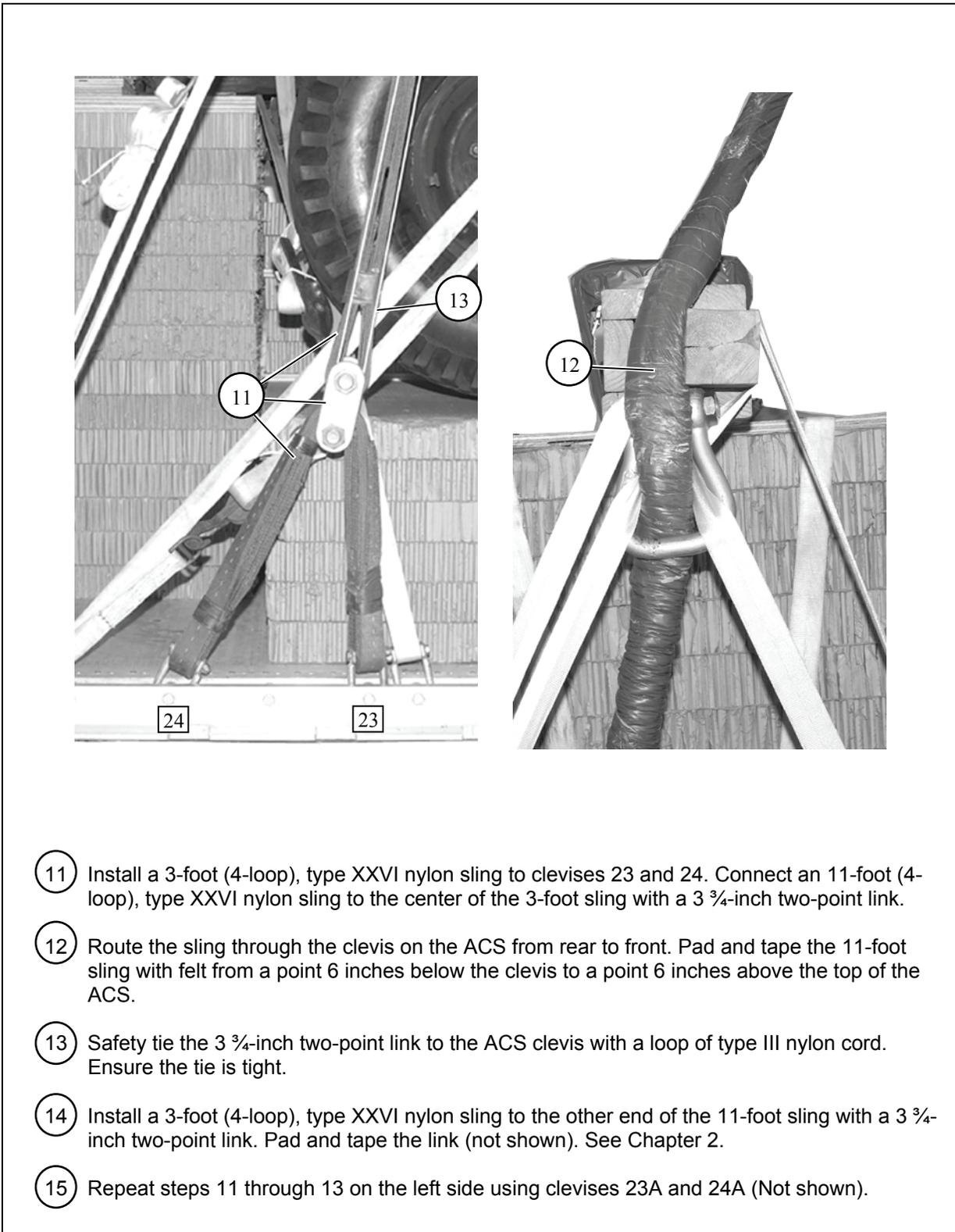


Figure 5-27. Slings Installed and ACS Secured



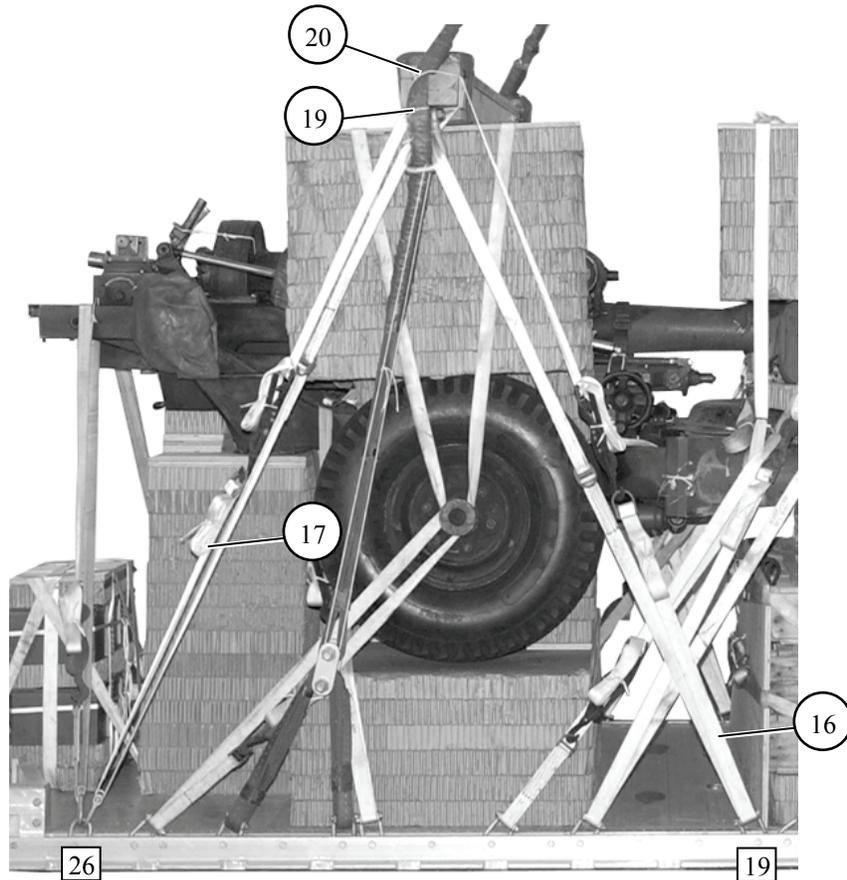
- ⑥ Route a 30-foot lashing from clevis 5 through front right ACS clevis from front to rear, around the ACS 4- by 4-inch lumber and back to clevis 5.
- ⑦ Repeat above step using clevis 2.
- ⑧ Route a 30-foot lashing from clevis 20 through front right ACS clevis from rear to front, around the ACS 4- by 4-inch lumber and back to clevis 20.
- ⑨ Repeat steps 6 through 8 on the left side of load using clevises 2A, 5A, and 20A (not shown).
- ⑩ Ensure the ACS is straight and centered on load. Load binders on both sides of the load must be closed at the same time in the following sequence: 5 and 5A, 2 and 2A, 20 and 20A.

**Figure 5-27. Slings Installed and ACS Secured (Continued)**



- 11 Install a 3-foot (4-loop), type XXVI nylon sling to clevises 23 and 24. Connect an 11-foot (4-loop), type XXVI nylon sling to the center of the 3-foot sling with a 3 3/4-inch two-point link.
- 12 Route the sling through the clevis on the ACS from rear to front. Pad and tape the 11-foot sling with felt from a point 6 inches below the clevis to a point 6 inches above the top of the ACS.
- 13 Safety tie the 3 3/4-inch two-point link to the ACS clevis with a loop of type III nylon cord. Ensure the tie is tight.
- 14 Install a 3-foot (4-loop), type XXVI nylon sling to the other end of the 11-foot sling with a 3 3/4-inch two-point link. Pad and tape the link (not shown). See Chapter 2.
- 15 Repeat steps 11 through 13 on the left side using clevises 23A and 24A (Not shown).

**Figure 5-27. Slings Installed and ACS Secured (Continued)**



- 16 Route a 30-foot lashing from clevis 19 through right rear ACS clevis from outside to inside, rear to front, around the ACS 4- by 4-inch lumber and back to clevis 19.
- 17 Route a lashing from clevis 26 through right rear ACS clevis from outside to inside, front to rear, around ACS 4- by 4-inch lumber and back to clevis 26.
- 18 Repeat steps 16 through 17 on the left side of the load (not shown).
- 19 Remove all slack from the slings. Tie a length of type III nylon cord around the 11-foot sling and the ACS sling. Refer to Chapter 2, Figure 2-7 for detailed view.
- 20 Tie a length of type III nylon cord around the 11-foot nylon sling, behind all lashings, and the 4- by 4-inch lumber of the ACS and tie the ends together. Refer to Chapter 2, Figure 2-7 for detailed view.
- 21 Repeat steps 19 and 20 on all slings (Not shown).

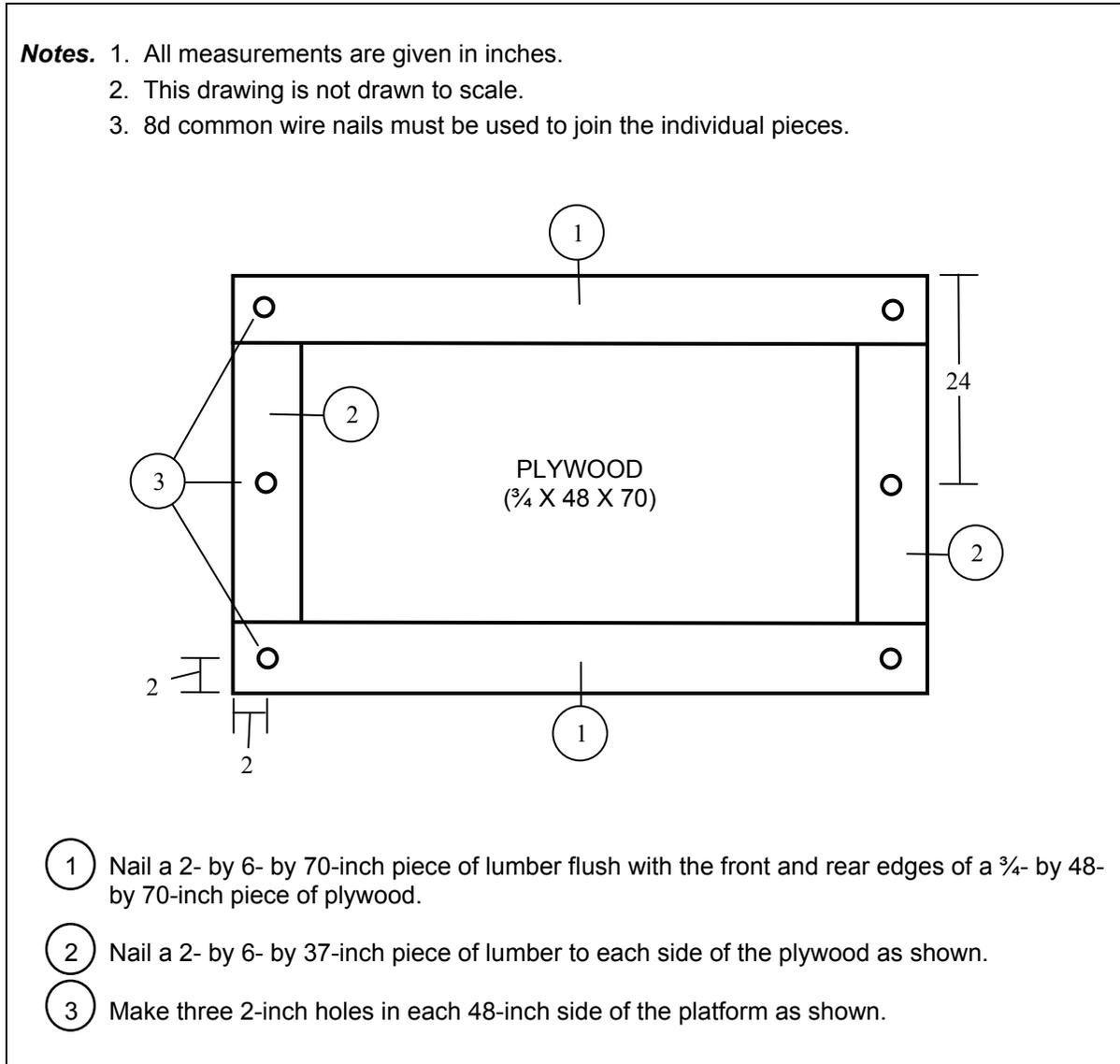
**Figure 5-27. Slings Installed and ACS Secured (Continued)**

## INSTALLING OUTRIGGER ASSEMBLIES

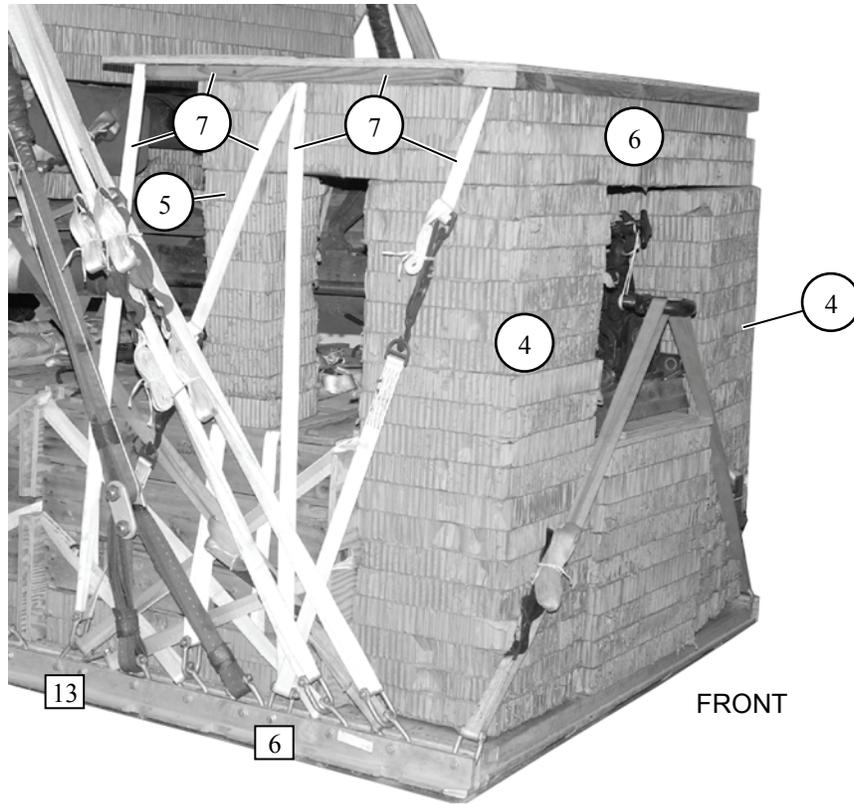
4-45. Assemble, install, and safety tie the mast and foot assemblies on the DRAS platform according to TM 10-1670-268-20&P/TO 13C7-52-22 and as shown in Chapter 2, Figures 2-42 through 2-44 and Figure 2-45 steps 1, 2, and 3.

## STOWING CARGO PARACHUTES

4-46. Prepare the parachute stowage platform, stow, and restrain three G-11D cargo parachutes on top of the stowage platform as shown in Chapter 2 and as shown in Figure 5-28.

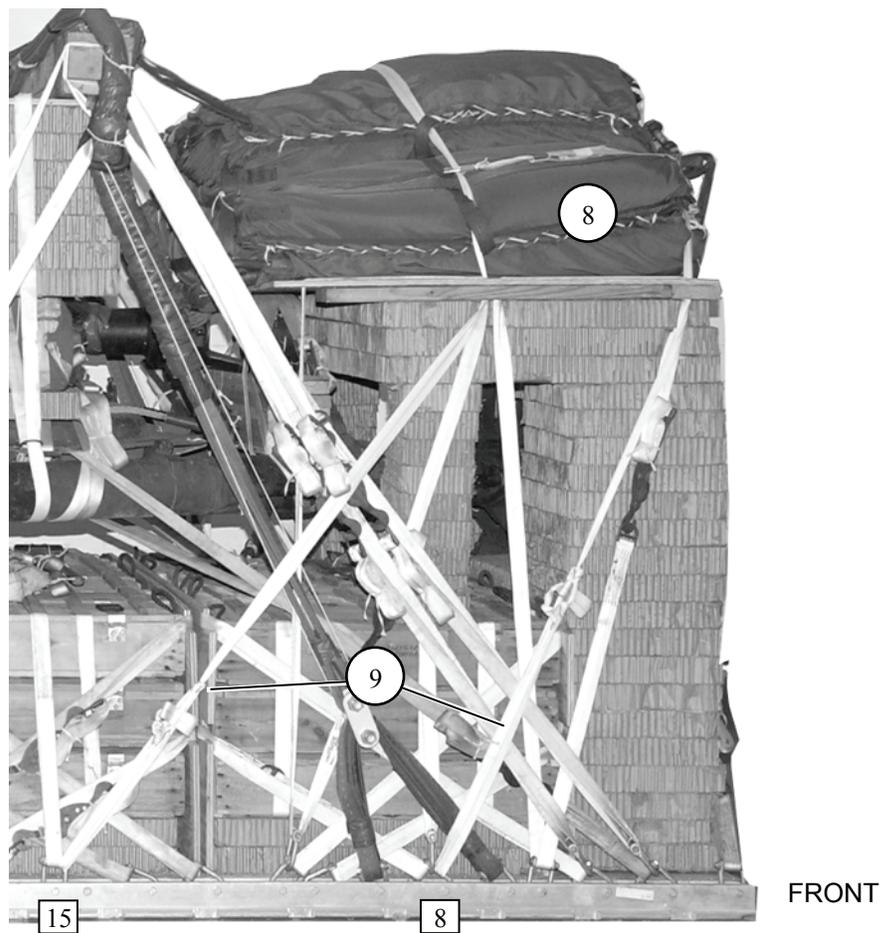


**Figure 5-28. Parachute Stowage Platform Constructed and Cargo Parachutes Stowed**



- ④ Set two stacks of 18 layers each of 17- by 20-inch honeycomb flush against each side of stack 1 and the front of the platform.
- ⑤ Set two stacks of 9 layers each of 10- by 10-inch honeycomb on top of the first stack of ammunition boxes.
- ⑥ Set three 70- by 36-inch pieces of honeycomb on top of the four stacks flush with the front and sides. Ensure that the 10- by 10-inch honeycomb stacks are flush with the rear and sides of the top three pieces.
- ⑦ Center the parachute stowage platform on the honeycomb stacks. Lash the parachute stowage platform to clevises 6 and 6A and clevises 13 and 13A.

**Figure 5-28. Parachute Stowage Platform Constructed and Cargo Parachutes Stowed (Continued)**

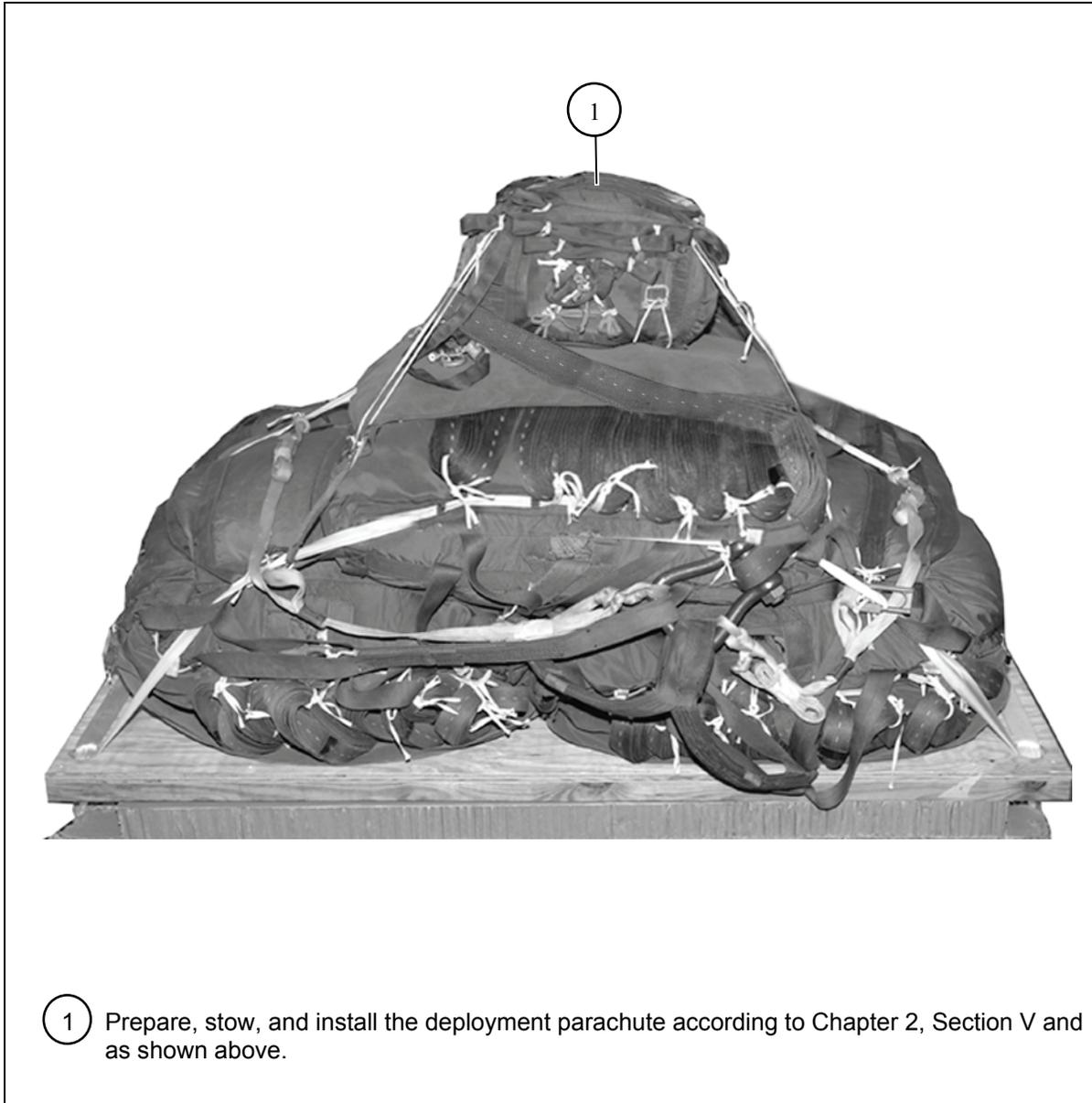


- ⑧ Prepare and install three G-11D cargo parachutes on top of the stowage platform as shown above and in Chapter 2.
- ⑨ Restrain the parachutes using type VIII nylon webbing tied to clevises 8, 8A, 15, and 15A.

**Figure 5-28. Parachute Stowage Platform Constructed and Cargo Parachutes Stowed (Continued)**

## STOWING DEPLOYMENT PARACHUTE

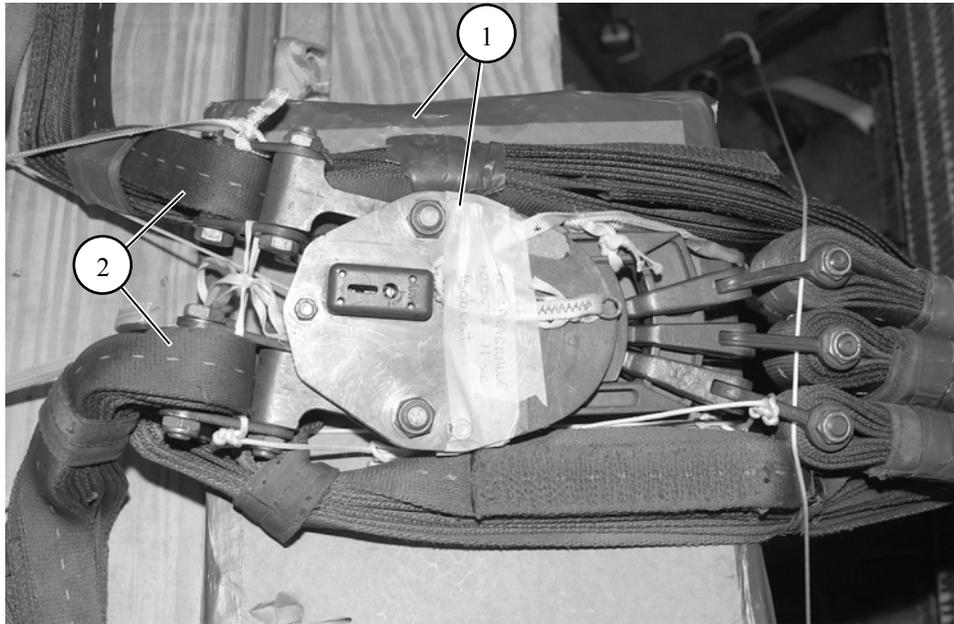
4-47. Prepare, stow, and install the deployment parachute according to Chapter 2, Section V and as shown in Figure 5-29.



**Figure 5-29. Deployment Parachute Installed**

## INSTALLING PARACHUTE RELEASE SYSTEM

4-48. Build an M-1 parachute release stack. Prepare and install an M-1 release system according to Chapter 2 and as shown in Figure 5-30.

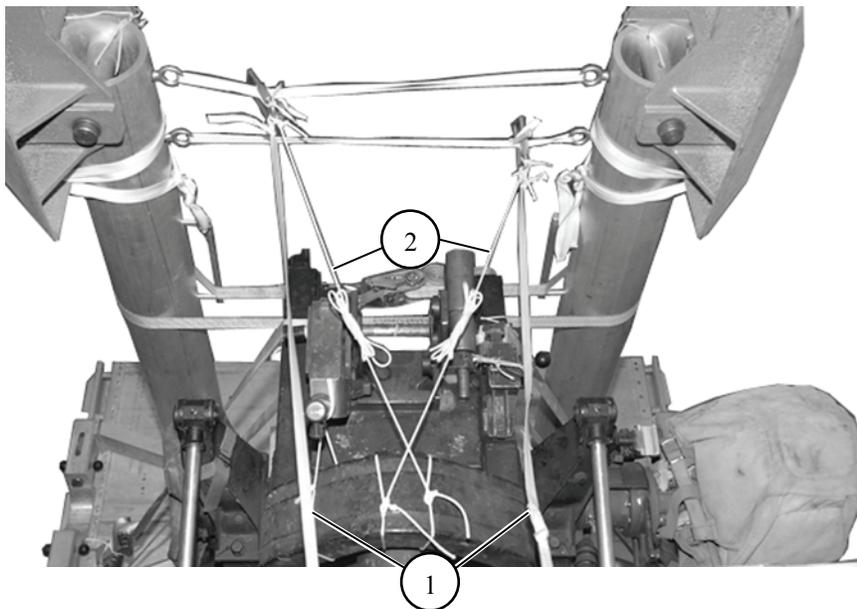


- ① Cut three 20- by 15-inch pieces of honeycomb and glue together to form the M-1 release parachute stack. Tape the top edges of the honeycomb. Center the stack against the front edge of the rear ACS and secure it with type III nylon cord. Place the M-1 release on the support stack.
  - ② Attach riser extensions and suspension slings to the M-1 release.
- Note.** Remove the buffers from the ends of the suspension slings that attach to the M-1 release.
- ③ Group the riser extensions together and tie, equally spaced, with type I, ¼-inch cotton webbing making three ties (not shown). S-fold the slack in the front and rear suspension slings on top of the front and rear ACS according to Chapter 2 of this manual.
  - ④ Attach the arming wire and lanyard to a carrying handle on the parachute with three alternating half hitches with a knot in the running end (not shown).

Figure 5-30. Parachute Release System Installed

## INSTALLING MAST RELEASE KNIVES

4-49. Install the mast release knives according to Chapter 2, Figure 2-45, Steps 4 through 10 and as shown in Figure 5-31.



- ① The lengths of the left and right ½-inch tubular nylon webbing from the base of the guillotine knives to the lower suspension links of the M-1 release is 59 inches as shown in steps 5 and 6 of Figure 2-45.
- ② Tie a length of type III nylon cord through the left part of the gun and to the body of the right top guillotine knife that measures 58 inches from the trunnion (hole) of the equilibrator arm to the base of the guillotine knife. Repeat for the right part of the gun and left lower guillotine knife as shown in steps 9 and 10 of Figure 2-45.

**Note.** All measurements are from knot to knot.

**Figure 5-31. Mast Release Knives Installed**

**MARKING RIGGED LOAD**

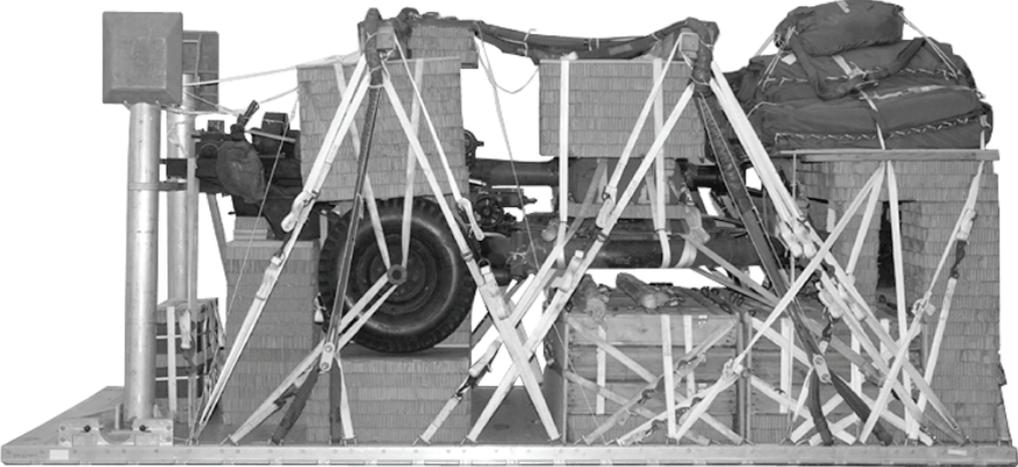
4-50. Mark the rigged load according to Chapter 2 and as shown in Figure 5-32. A Shipper’s Declaration for Dangerous Goods is required. If the load varies from the one shown, the weight, height, CB, and parachute requirements must be recomputed.

**EQUIPMENT REQUIRED**

4-51. The equipment required to rig this load is listed in Table 5-1.

**CAUTION**

Make the final rigger inspection required by Chapter 2 before the load leaves the rigging site.



**RIGGED LOAD DATA**

Weight: Load shown.....	11,200 pounds
Maximum load allowed .....	12,750 pounds
Height (with three G-11D parachutes) .....	98 inches
Width .....	94 inches
Overall Length .....	216 inches
Overhang: Front .....	0 inches
Rear .....	0 inches
Center of Balance (from front edge of platform): .....	94 inches

**Figure 5-32. M119 Howitzer and Accompanying Ammunition Rigged on DRAS Platform**

**Table 5-1. Equipment Required for Rigging M119 Howitzer and Accompanying Ammunition on DRAS Platform**

<i>National Stock Number</i>	<i>Item</i>	<i>Quantity</i>
8040-00-273-8713	Adhesive paste, 1-gallon	As required
4020-00-240-2146	Cord, nylon, type III, 550-pound	As required
	Clevis,	
4030-00-090-5354	Large	5
4030-00-678-8562	Medium	4
1670-00-360-0328	Cover, clevis, large	3
8135-00-664-6958	Cushioning material, packaging, cellulose wadding	As required
8305-00-191-1101	Felt, ½-inch	As required
1670-01-493-6418	Link assembly, two-point, 3 ¾-inch	9
	Lumber:	
5510-00-220-6146	2- by 4-inch	As required
5510-00-220-6148	2- by 6-inch	As required
5510-00-220-6274	4- by 4-inch	As required
	Plywood:	
5530-00-129-7777	½-inch	1 sheet
5530-00-618-8073	¾-inch	6 sheets
5315-00-010-4659	Nail, steel wire, common, 8d	As required
1670-00-753-3928	Pad, energy dissipating, honeycomb	26 sheets
1670-01-487-5461	Static line assembly release away	1
	Parachute:	
	Cargo:	
1670-01-016-7841	G-11D	3
1670-00-040-8135	Cargo extraction: 28-foot (deployment parachute)	1
	Platform, dual row, 18-foot	
1670-01-485-1654	Rail, DRAS	2
1670-01-486-1342	Roller Pad, DRAS	4
1670-01-486-1656	Panel Assembly, Main	9
1670-01-162-2372	Clevis assembly	56
1670-01-097-8816	Release, cargo parachute, M-1	1
	Sling, cargo airdrop	
	For suspension:	
1670-01-062-6310	11-foot (4-loop), type XXVI nylon webbing	4
1670-01-062-6306	3-foot (4-loop), type XXVI nylon webbing	8
	For deployment:	
1670-01-062-6306	3-foot (4-loop), type XXVI nylon webbing	1
	For riser extension:	
1670-01-062-6313	60-foot (3-loop), type XXVI nylon webbing	3
	For ACS:	
1670-01-063-7761	16-foot (2-loop), type XXVI nylon webbing	2

**Table 5-1. Equipment Required for Rigging M119 Howitzer and Accompanying Ammunition on DRAS Platform (Continued)**

<i>National Stock Number</i>	<i>Item</i>	<i>Quantity</i>
	For lifting:	
1670-01-062-6303	11-foot (2-loop), type XXVI nylon webbing	3
1670-00-251-1153	Sling cargo, aerial transport, (A7A)	1
1670-00-040-8219	Strap, parachute release, multicut	2
1670-00-937-0271	Knife release, cargo (guillotine)	6
1670-01-487-5464	Outrigger assembly	1
7510-00-266-5016	Tape, adhesive, 2-inch	As required
1670-00-937-0271	Tie-down assembly, 15-foot	58
1670-00-725-1437	Tie-down, cargo, aircraft, (CGU-1B)	5
	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	As required

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## Chapter 6

# Rigging M101A1 or M101A2, ¾-Ton Cargo Trailer with Accompanying Load on Dual Row Airdrop System Platform

## DESCRIPTION OF LOAD

6-1. The M101A1 or M101A2, ¾-ton cargo trailer (Figure 6-1) with accompanying loads is rigged on a DRAS airdrop platform.

- **M101A1 ¾-ton cargo trailer.** The M101A1 ¾-ton cargo trailer with accompanying loads, consisting of 30 boxes of 105-millimeter ammunition and weighing 3,210 pounds, is rigged with two G-11D cargo parachutes. The accompanying load consisting of 14 boxes of 105-millimeter ammunition and weighing 1,500 pounds is stowed in the trailer and 16 boxes of 105-millimeter ammunition are stowed on the platform. The unrigged trailer weighs 1,340 pounds. The M101A1 trailer is 147 inches long and 71 inches wide. The height of the trailer is 82 inches, reducible to 51 inches.
- **M101A2 ¾-ton cargo trailer.** The M101A2 ¾-ton cargo trailer with accompanying loads, consisting of 28 boxes of 105-millimeter ammunition and weighing 2,996 pounds, is rigged with two G-11D cargo parachutes. The accompanying load consisting of 14 boxes of 105-millimeter ammunition and weighing 1,500 pounds is stowed in the trailer and 14 boxes of 105-millimeter ammunition are stowed on the platform. The unrigged trailer weighs 1,375 pounds. The M101A2 trailer is 147 inches long and 71 inches wide. The height of the trailer is 82 inches, reducible to 51 inches.

## PREPARING PLATFORM

6-2. Inspect, or assemble and inspect, a DRAS platform with outrigger assemblies and outrigger platform support weldments according to TM 10-1670-268-20&P/TO 13C7-52-22 and as shown in Figure 6-2.

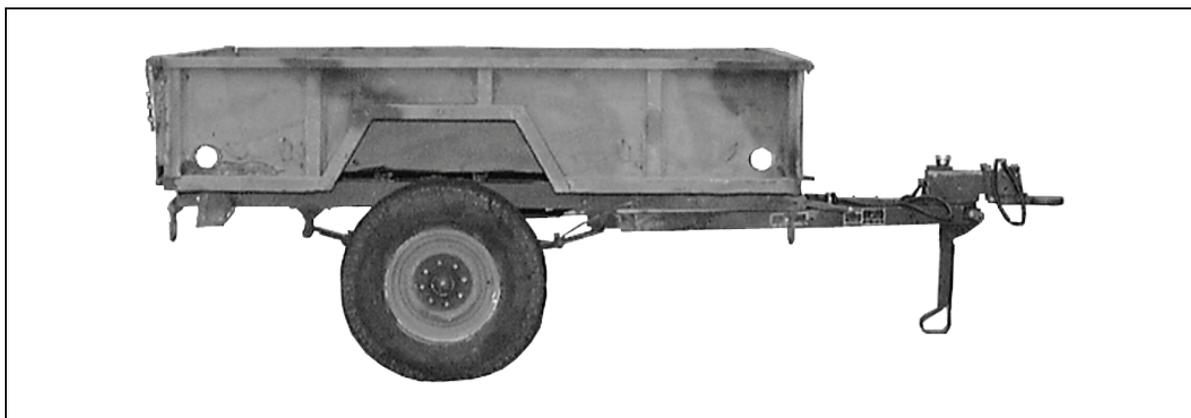
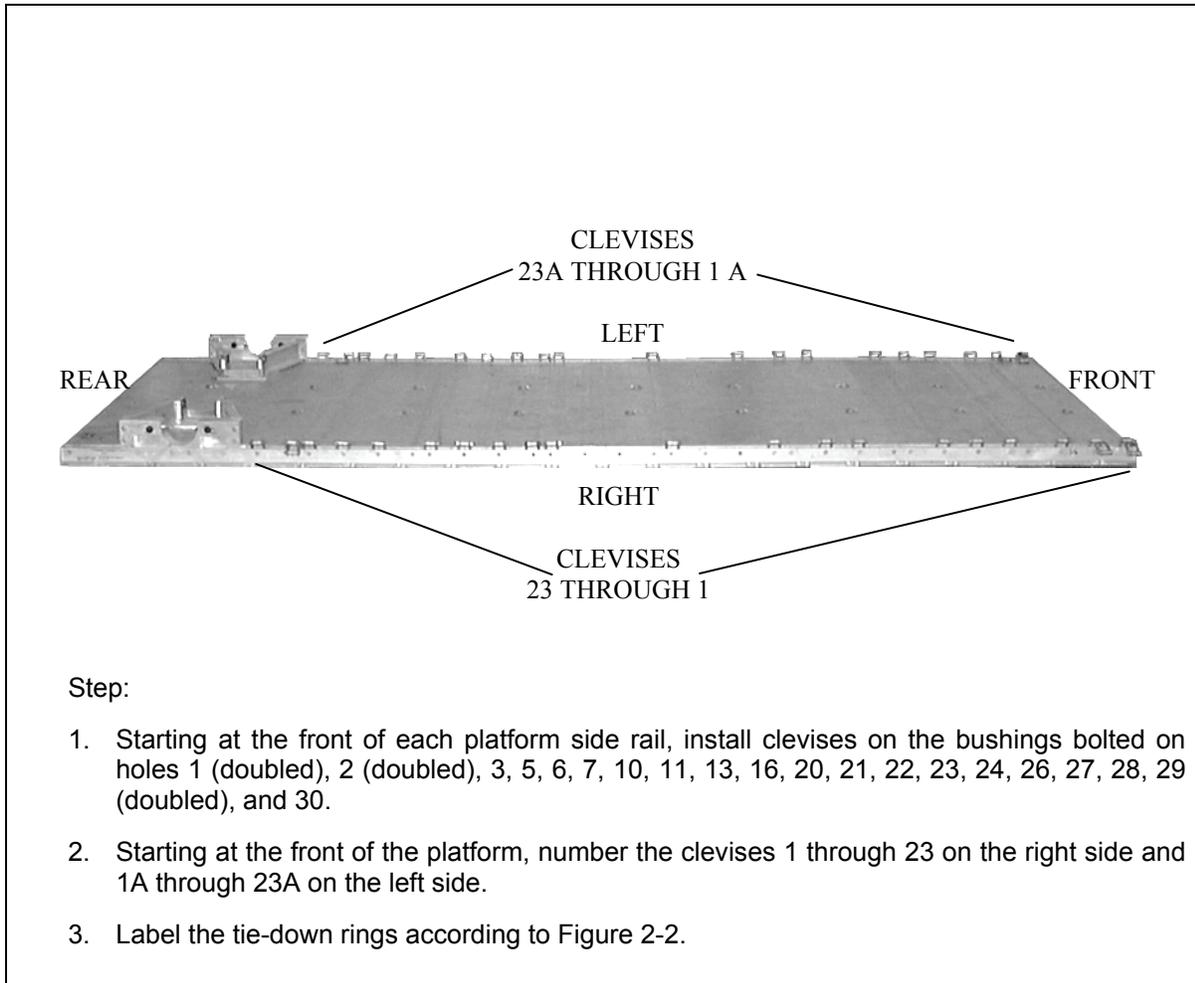


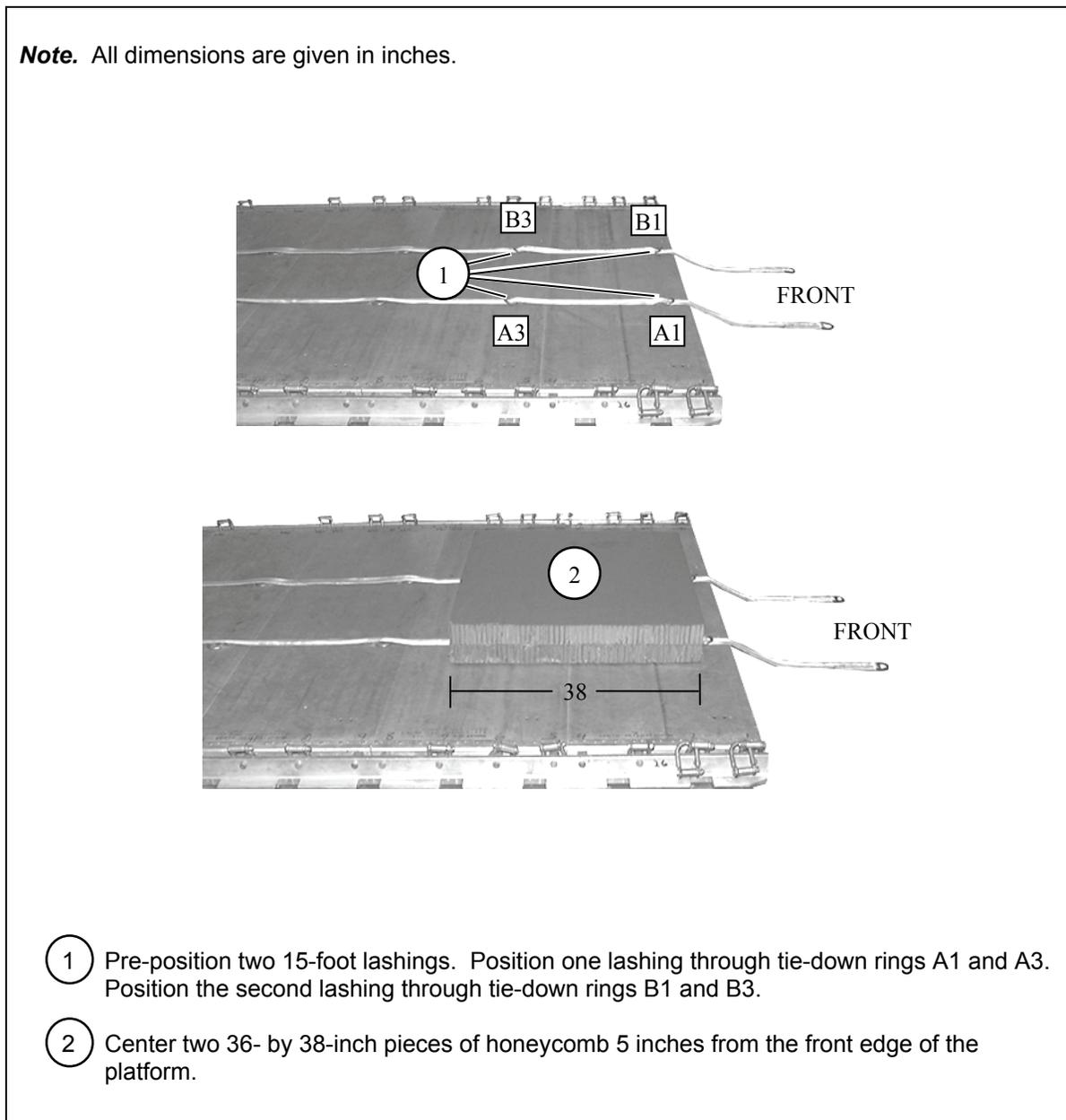
Figure 6-1. M101A1, ¾-Ton Cargo Trailer



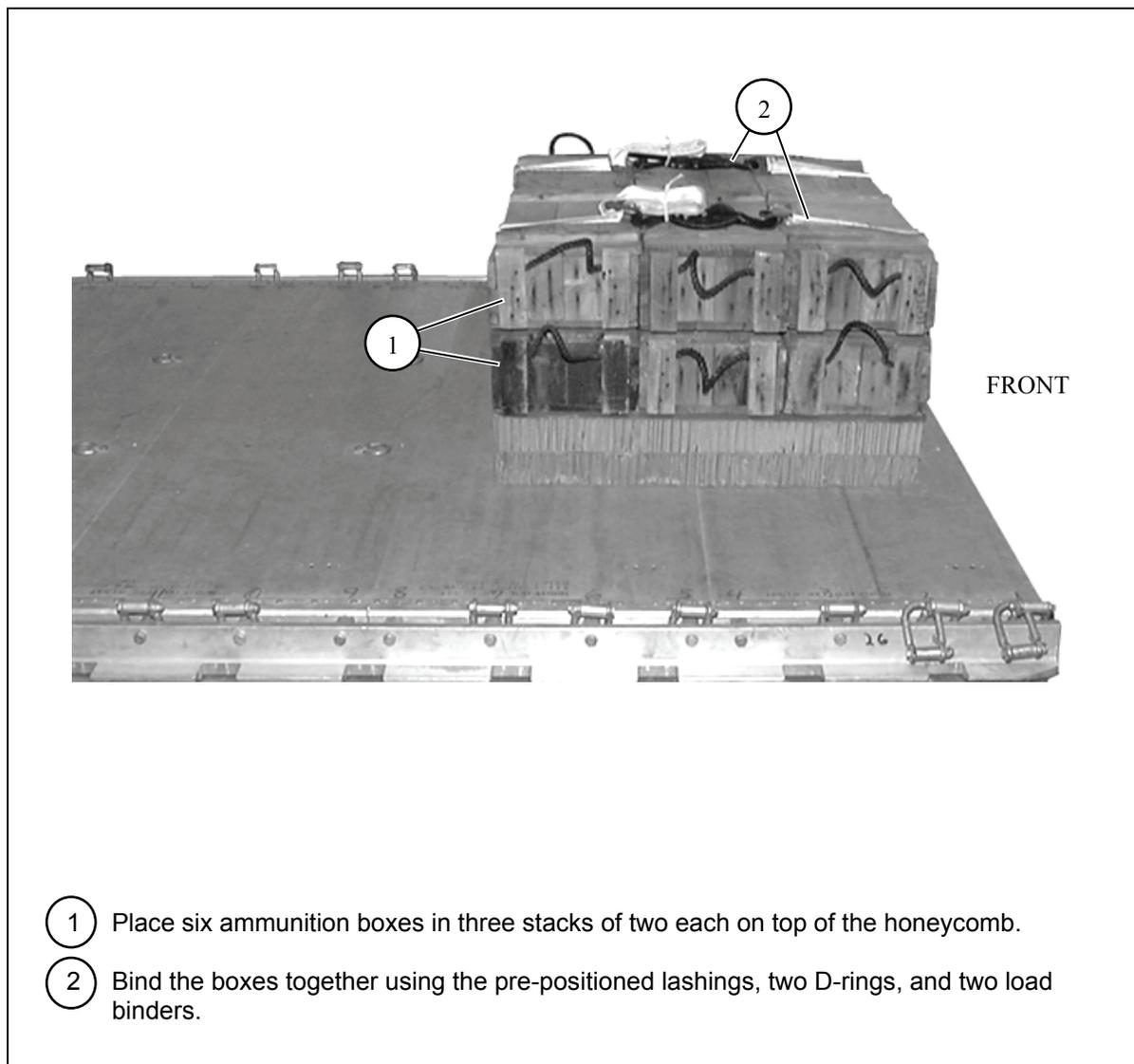
**Figure 6-2. Platform Prepared**

## POSITIONING AND LASHING ACCOMPANYING LOADS ON PLATFORM

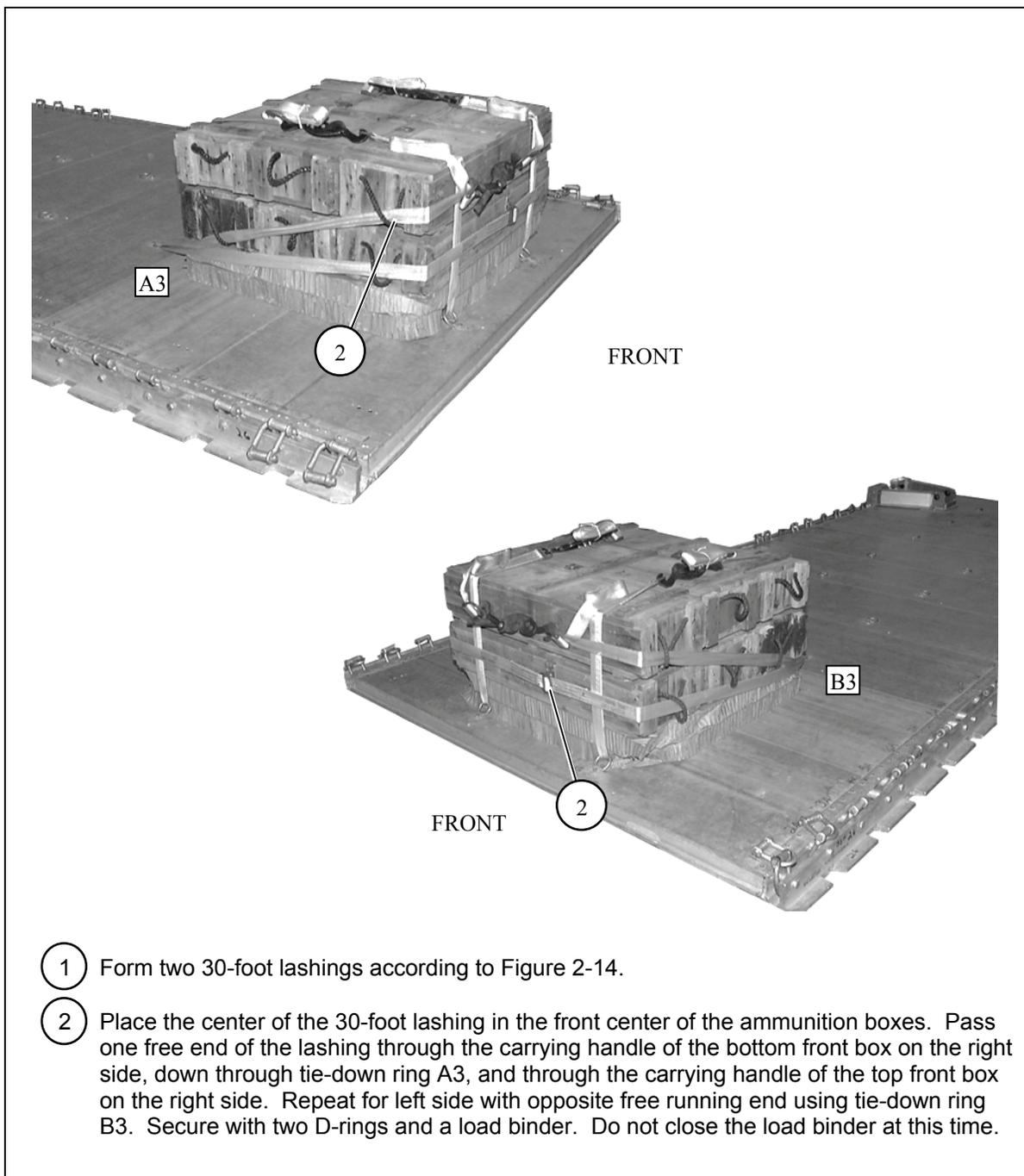
6-3. Position and lash the accompanying loads on the platform as shown in Figures 6-3 through 6-8.



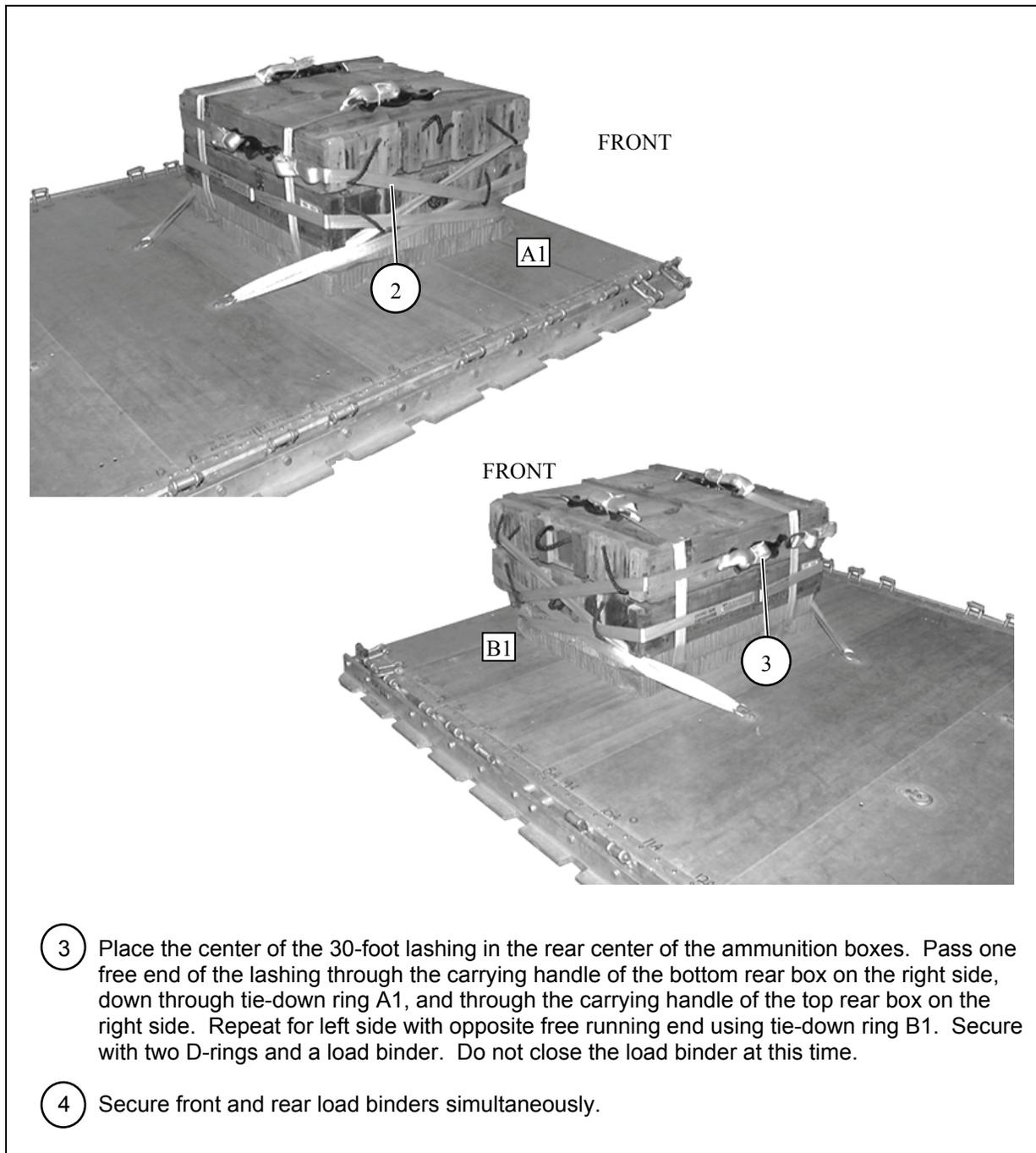
**Figure 6-3. Honeycomb and Lashings Positioned on the Front of Platform**



**Figure 6-4. Ammunition Boxes Positioned on the Front of the Platform**

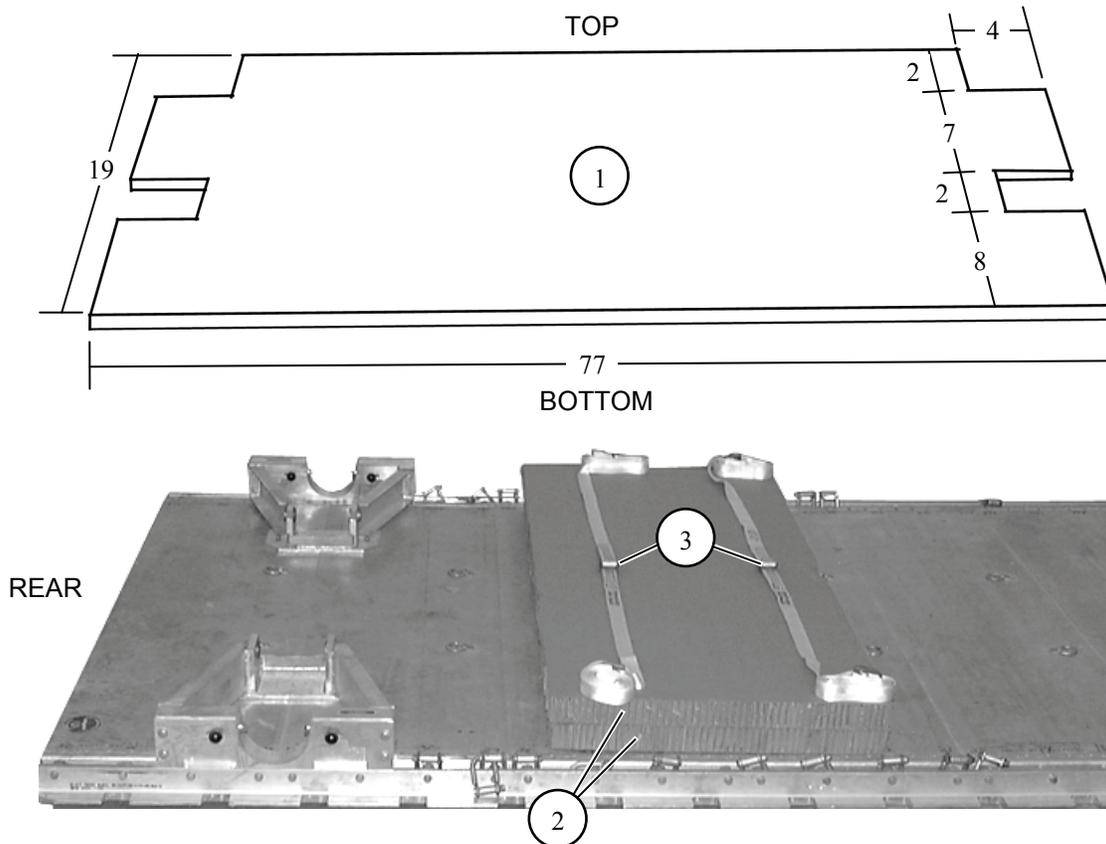


**Figure 6-5. Ammunition Boxes Lashed and Secured on the Front of the Platform**



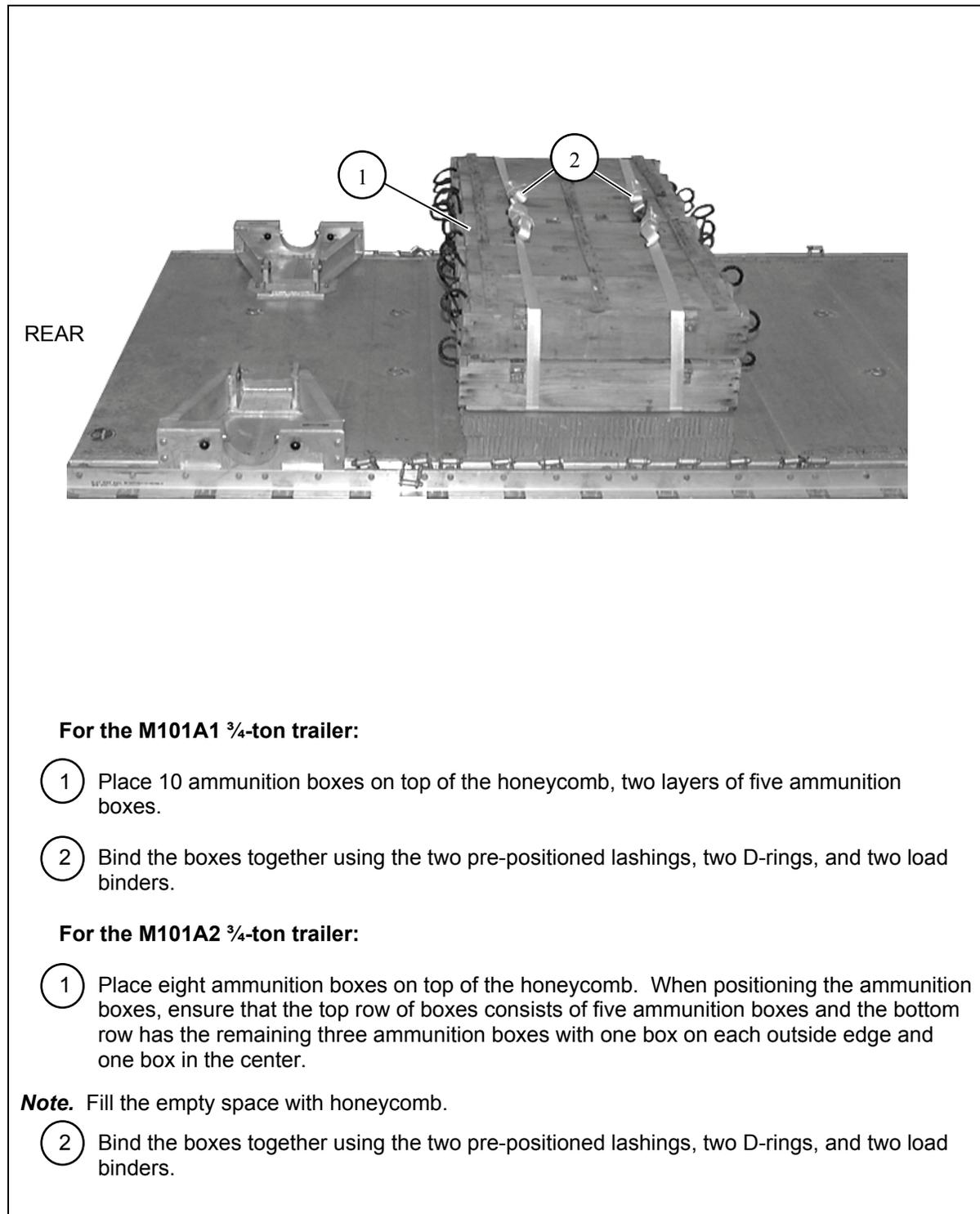
**Figure 6-5. Ammunition Boxes Lashed and Secured on the Front of the Platform (Continued)**

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

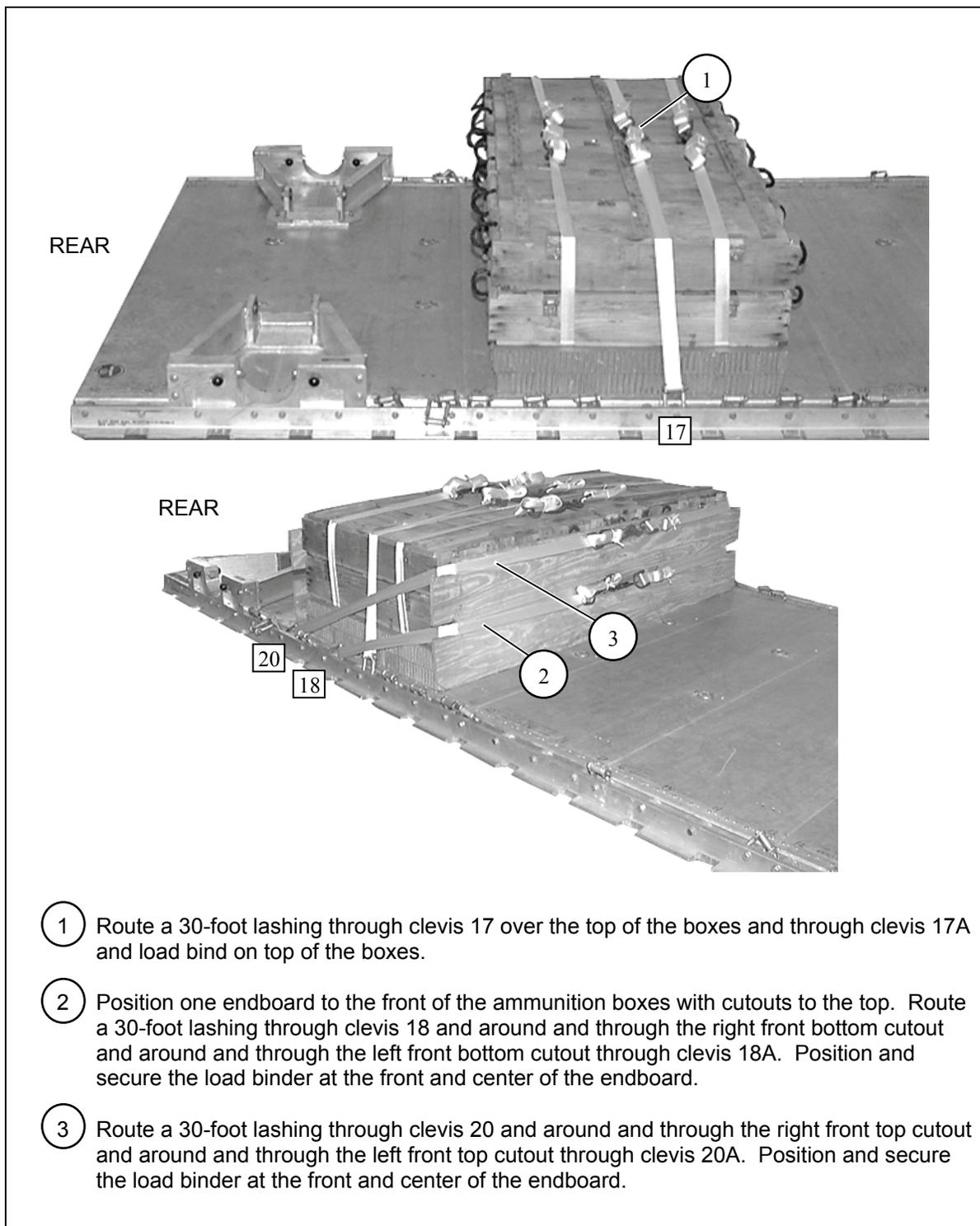


- ① Cut two endboards as shown above using two 3/4- by 19- by 77-inch pieces of plywood.
- ② Center two 36- by 76-inch pieces of honeycomb 128 inches from front edge of platform.
- ③ Center two 30-foot lashings laterally across the top piece of honeycomb.

**Figure 6-6. Honeycomb and Lashings Positioned on the Rear of Platform**



**Figure 6-7. Ammunition Boxes Positioned on the Rear of Platform**



**Figure 6-8. Ammunition Boxes Lashed and Secured on the Rear of the Platform**



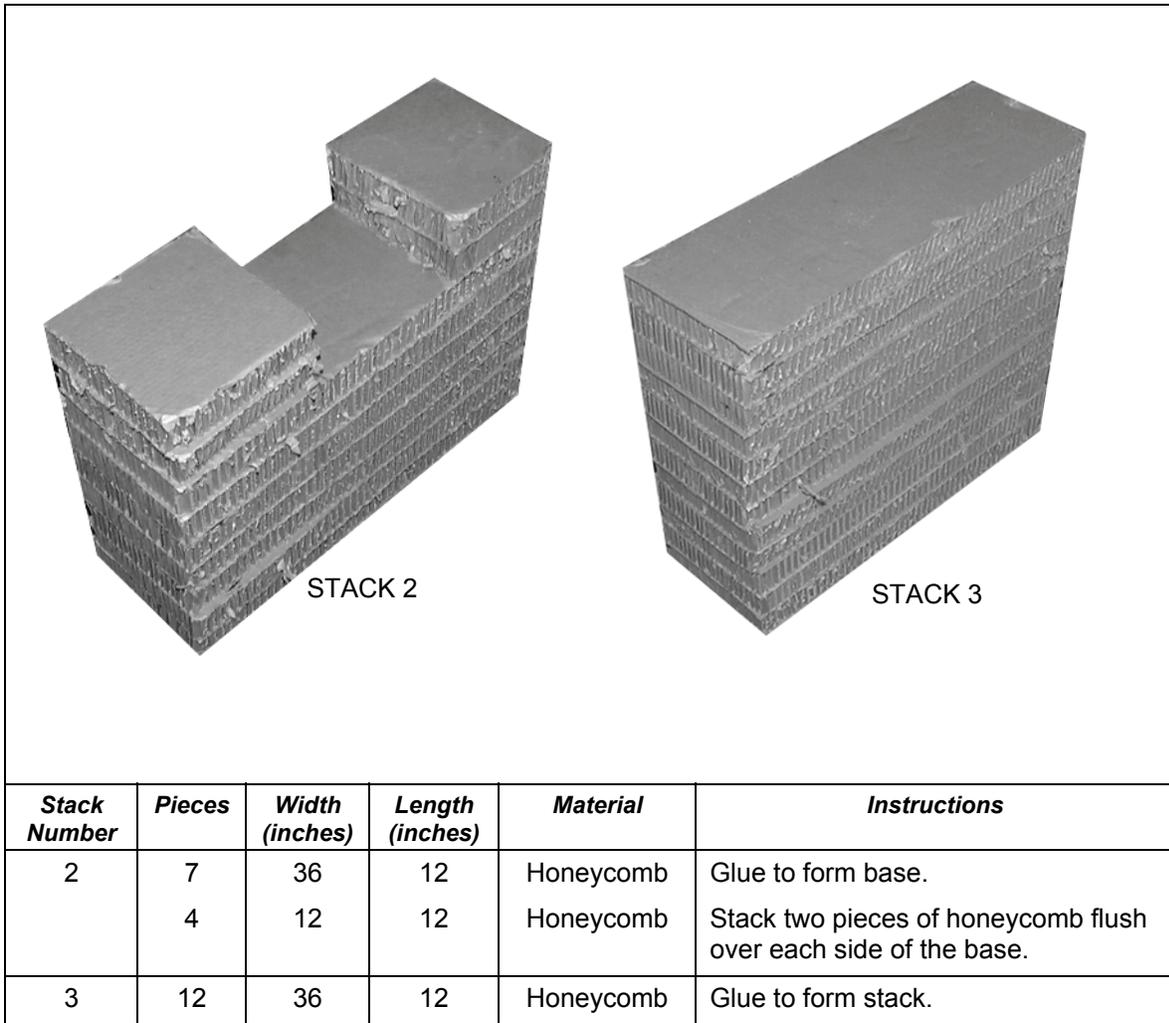
## BUILDING AND PLACING HONEYCOMB STACK

6-4. Prepare the honeycomb stacks as shown in Figures 6-9 and 6-10. Position the honeycomb stack as shown in Figure 6-11.

**Note.** All measurements are given in inches.

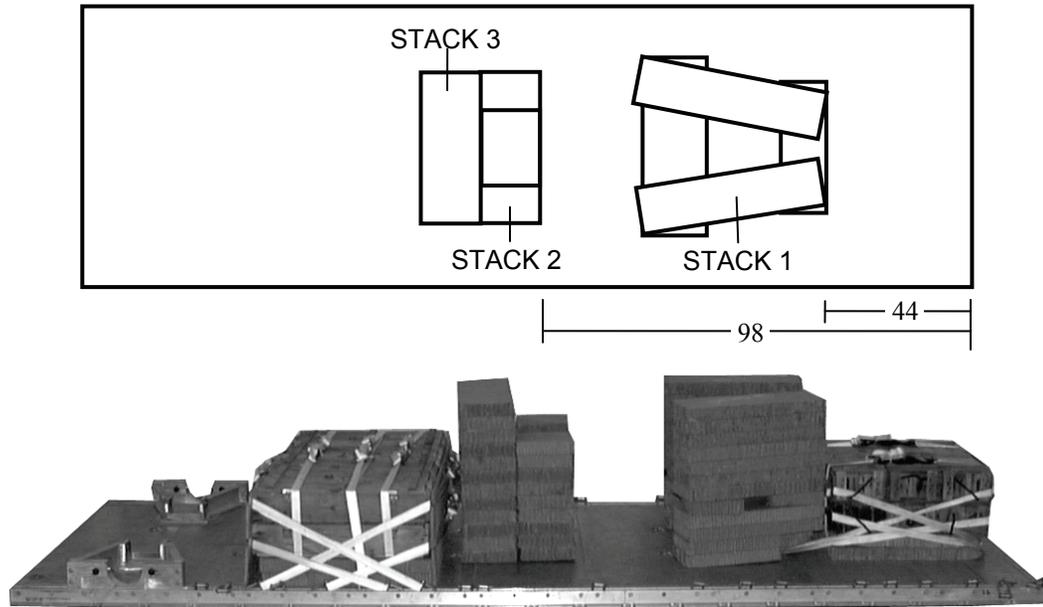
Stack Number	Pieces	Width (inches)	Length (inches)	Material	Instructions
1	8	12	32	Honeycomb	Form two base stacks of four layers each in a "V" shape. Cut a 10- by 6- inch cutout on the front outside of the bottom two layers. Place the stacks 25 inches apart in the rear and 11 inches apart in the front.
	1	36	12	Honeycomb	Place honeycomb over the front of the base stacks to form a bridge. Place the honeycomb so that the front edge of the bridge is aligned with the front outside corners of the base stacks.
	1	48	12	Honeycomb	Place honeycomb over the rear of the base stacks to form a bridge. Place the honeycomb so that the rear edge of the bridge is aligned with the rear outside corners of the base stacks.
	14	12	32	Honeycomb	Form two stacks of seven layers each. Place each stack on top of the bridge and align it with each base stack.

Figure 6-9. Honeycomb Stack 1 Prepared



**Figure 6-10. Honeycomb Stacks 2 and 3 Prepared**

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

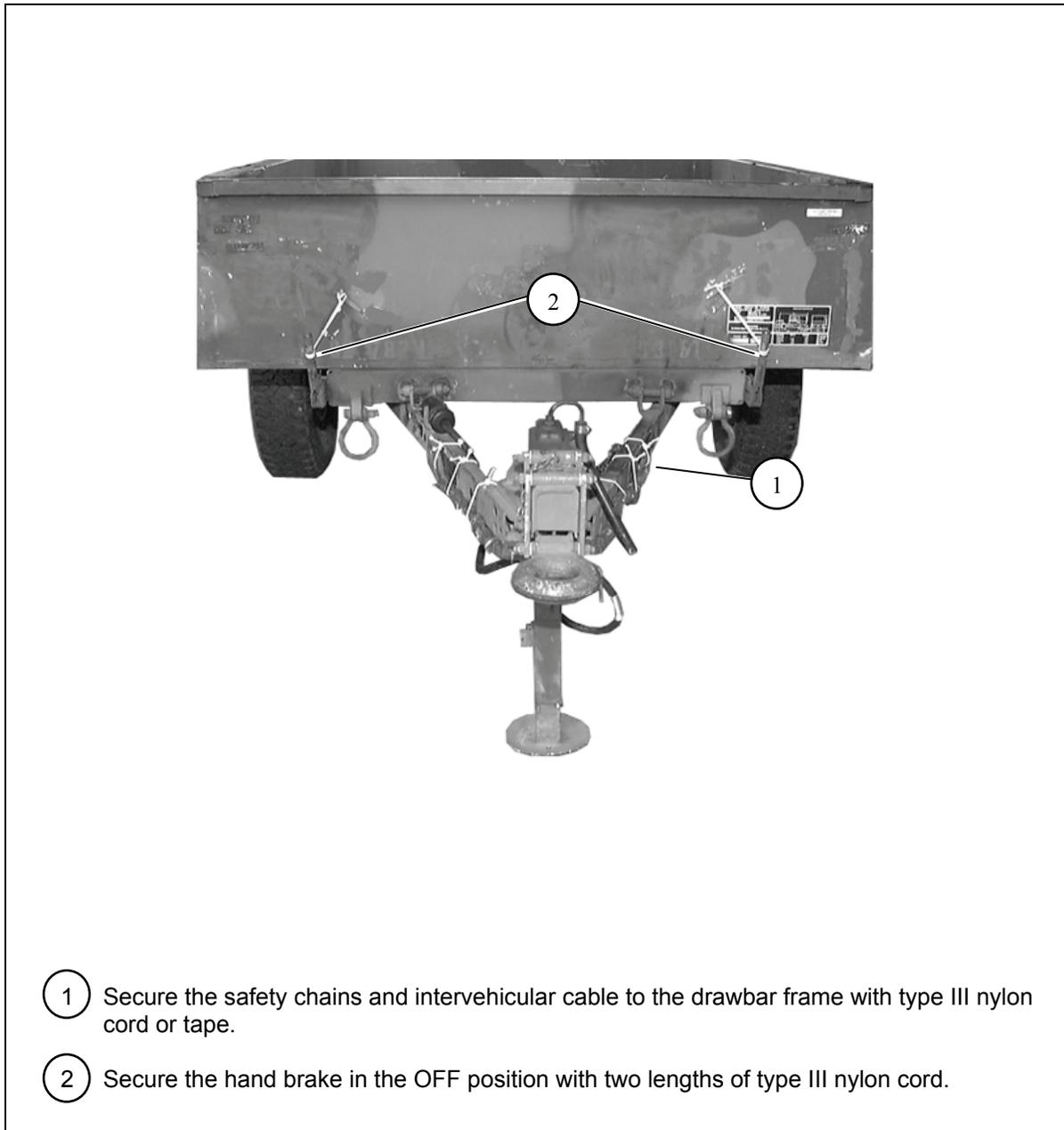


<i>Stack Number</i>	<i>Position of Stack on Platform</i>
	Place stack:
1	Centered 44 inches from the front edge of platform.
2	Centered 98 inches from the front edge of platform.
3	Center flush against the rear of stack 2.

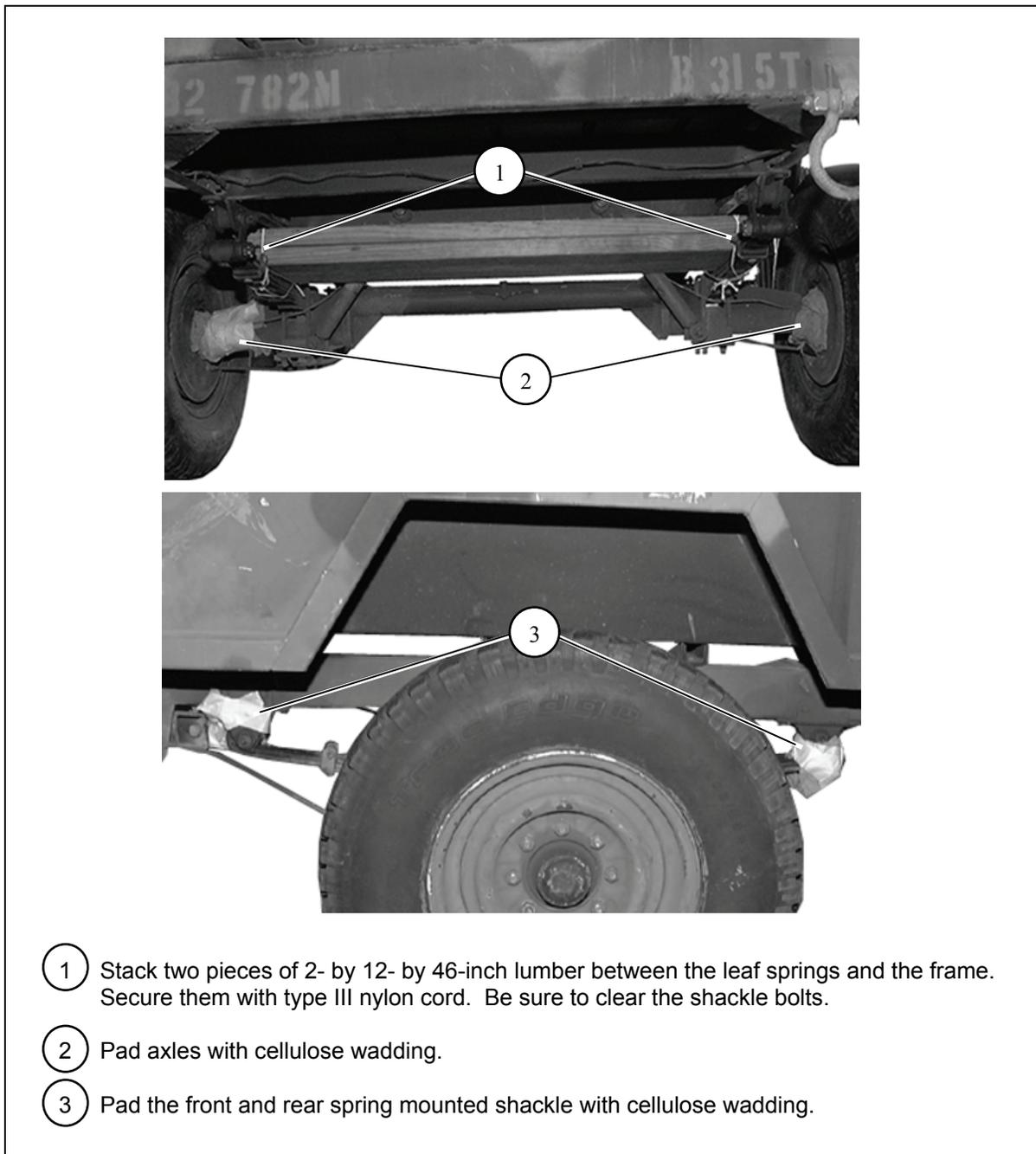
**Figure 6-11. Honeycomb Stacks Placed on Platform**

## PREPARING THE TRAILER

6-5. Prepare the trailer as shown in Figures 6-12 and 6-13. Remove the tarpaulin, bows, and side racks according to TM 9-2330-202-14&P.



**Figure 6-12. Front of Trailer Prepared**



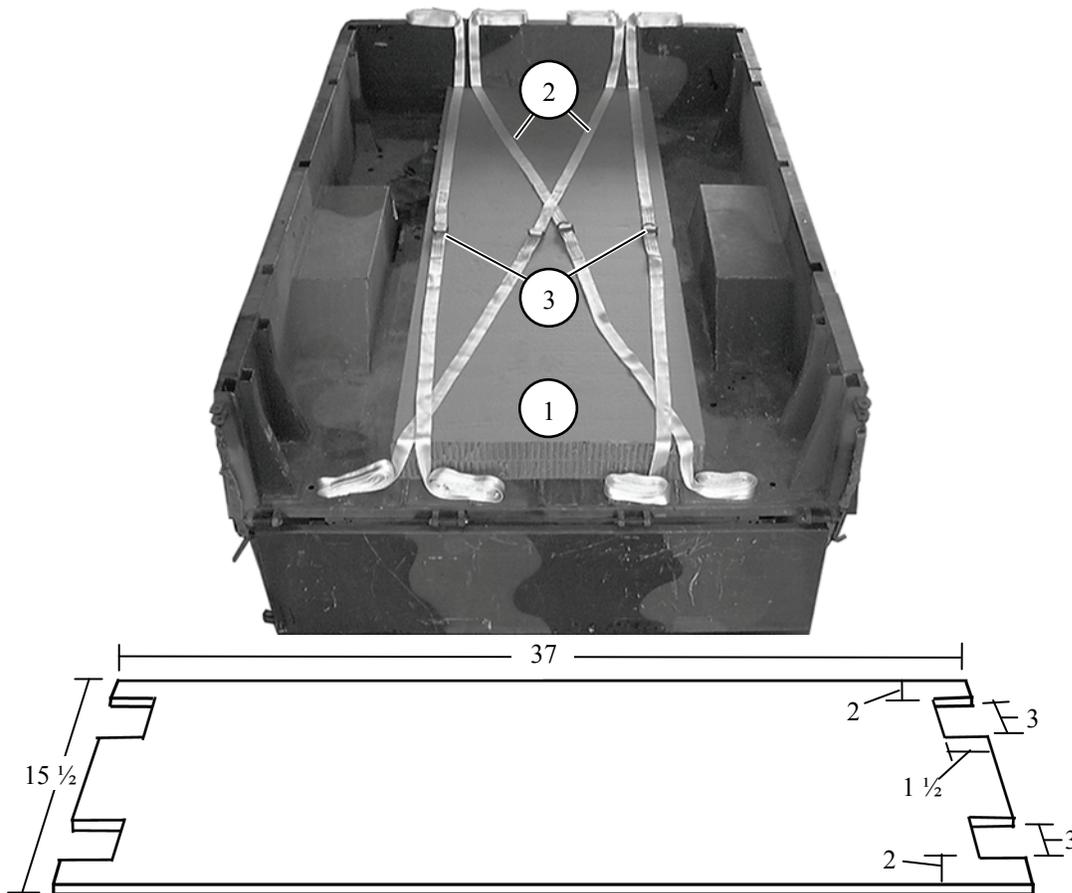
**Figure 6-13. Rear of Trailer Prepared**

## STOWING ACCOMPANYING LOAD AND TRAILER COMPONENTS IN TRAILER

6-6. Stow the accompanying load of 14 ammunition boxes in the trailer as shown in Figures 6-14 and 6-15. Stow the trailer components as shown in Figure 6-16.

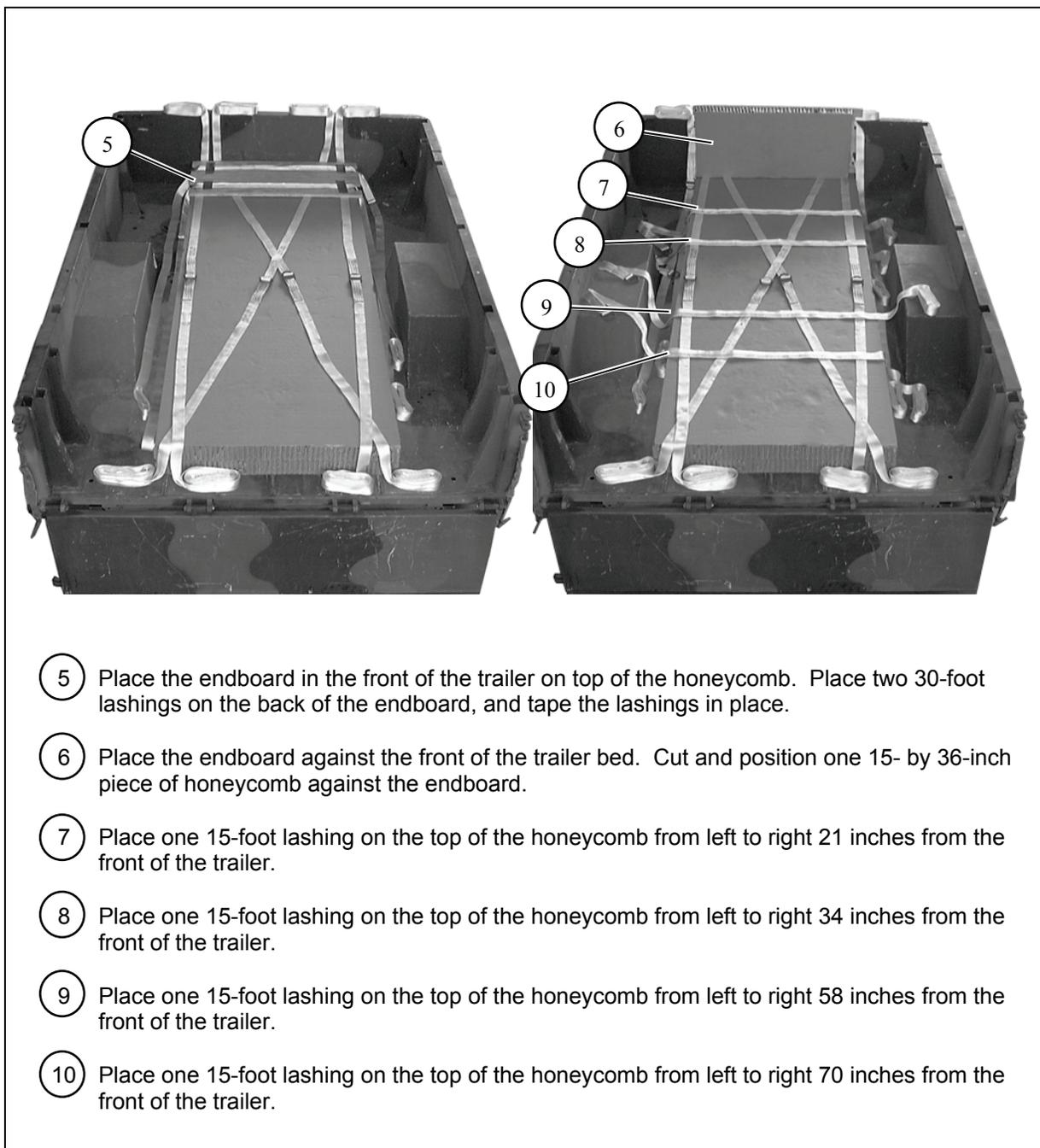
**Note.** The accompanying load may vary from the one shown. Ensure the load is properly secured and weight does not exceed 1,500 pounds.

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

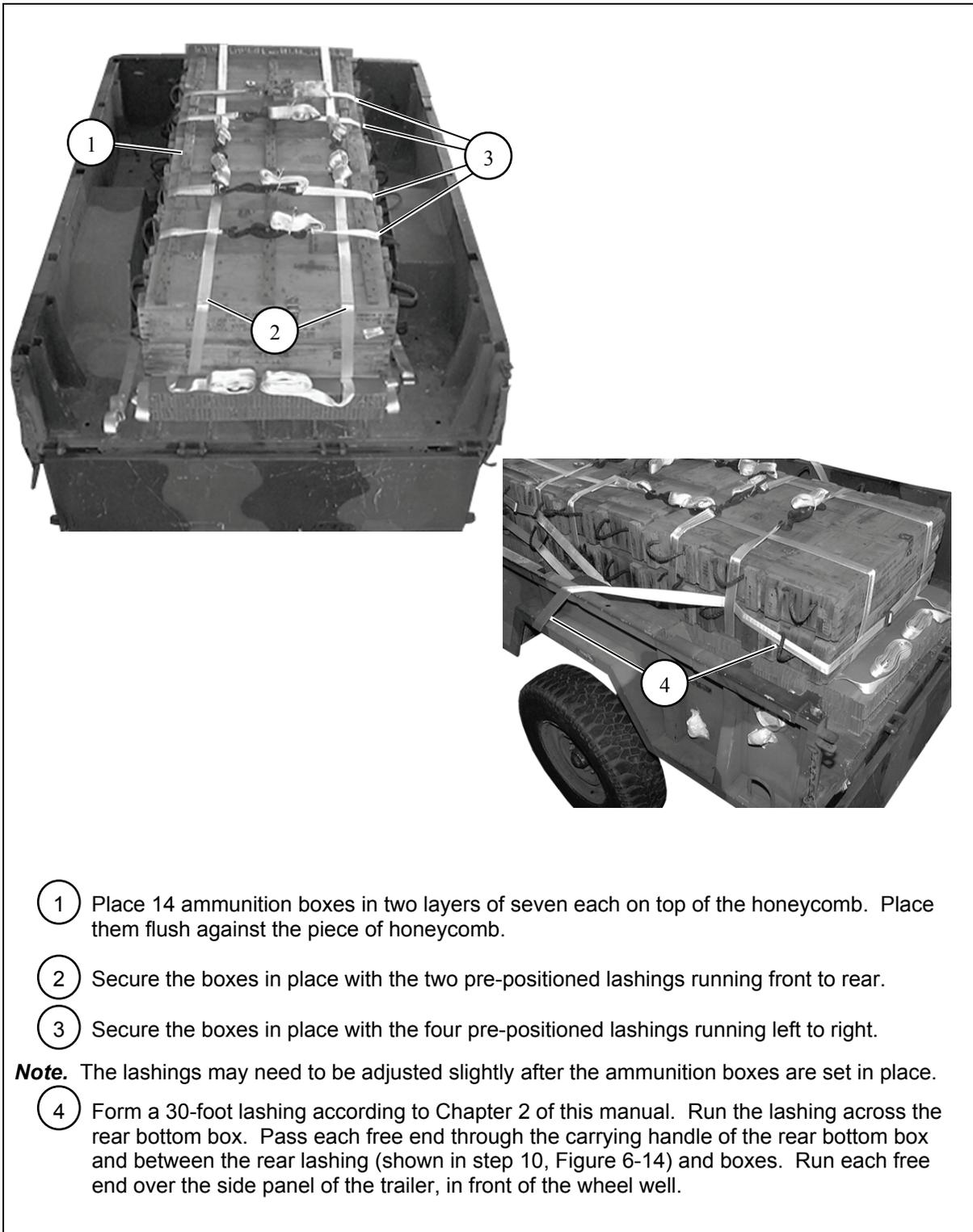


- 1 Center two 36- by 94-inch pieces of honeycomb in the trailer bed.
- 2 Form six 30-foot lashings according to Chapter 2. Place two 30-foot lashings on top of the honeycomb from front to rear crossing at the center.
- 3 Place two 30-foot lashings on top of the honeycomb from front to rear 22 inches apart.
- 4 Cut one endboard as shown above using one  $\frac{3}{4}$ - by 15  $\frac{1}{2}$ - by 37-inch piece of plywood.

**Figure 6-14. Honeycomb, Lashings and Endboards Positioned in the Trailer**



**Figure 6-14. Honeycomb, Lashings and Endboards Positioned in the Trailer (Continued)**

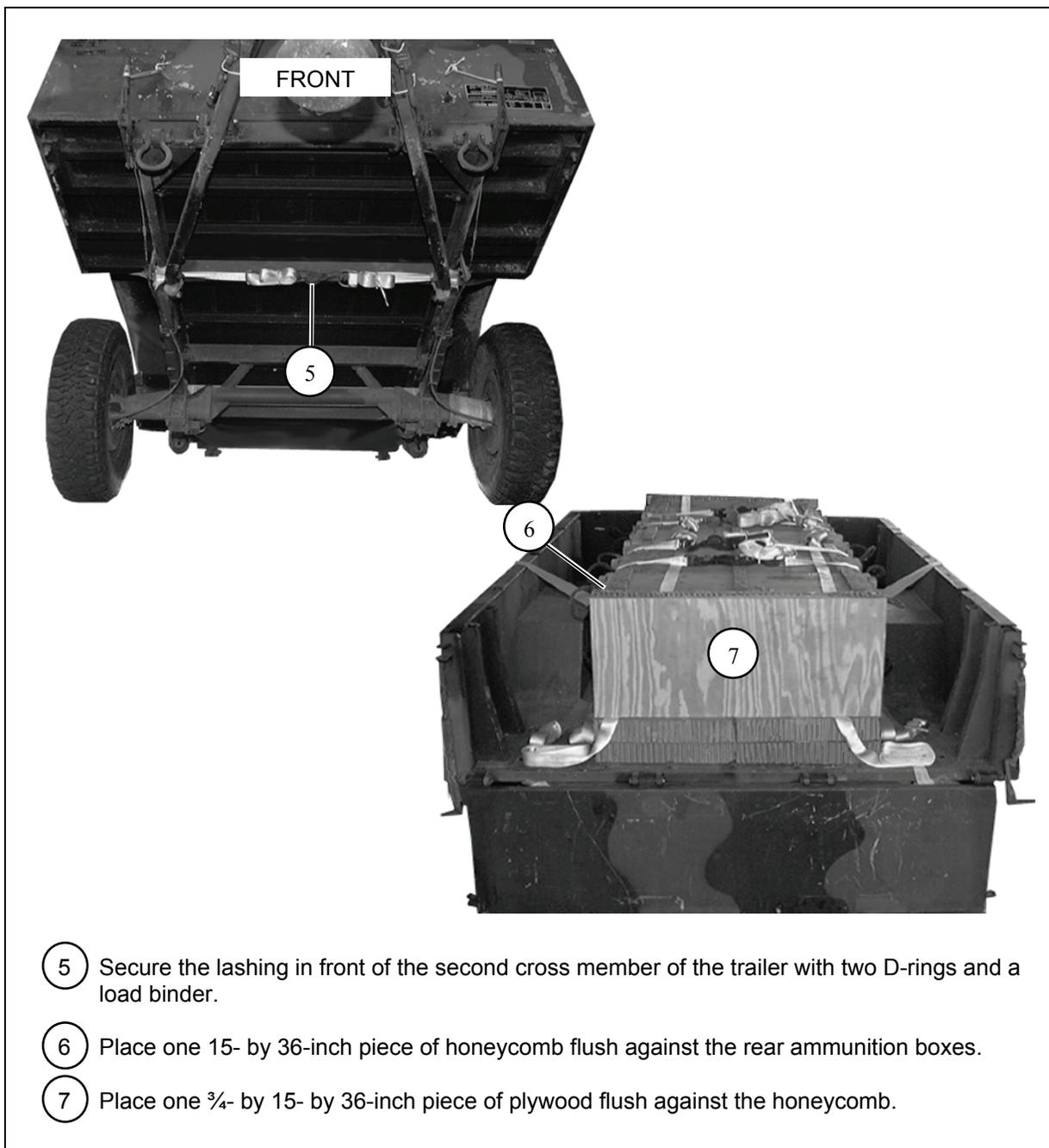


- ① Place 14 ammunition boxes in two layers of seven each on top of the honeycomb. Place them flush against the piece of honeycomb.
- ② Secure the boxes in place with the two pre-positioned lashings running front to rear.
- ③ Secure the boxes in place with the four pre-positioned lashings running left to right.

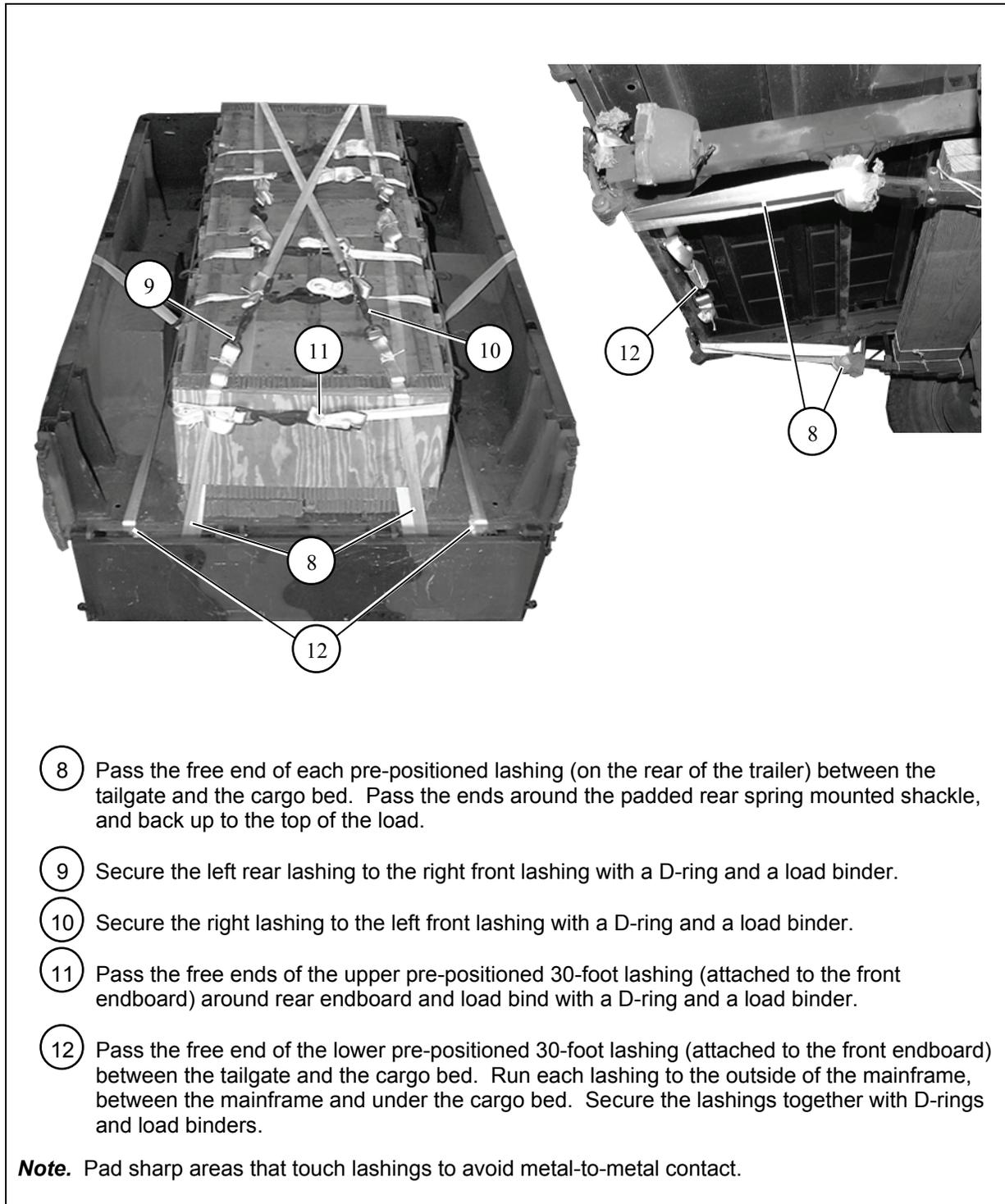
**Note.** The lashings may need to be adjusted slightly after the ammunition boxes are set in place.

- ④ Form a 30-foot lashing according to Chapter 2 of this manual. Run the lashing across the rear bottom box. Pass each free end through the carrying handle of the rear bottom box and between the rear lashing (shown in step 10, Figure 6-14) and boxes. Run each free end over the side panel of the trailer, in front of the wheel well.

**Figure 6-15. Ammunition Boxes Lashed and Secured in the Trailer**



**Figure 6-15. Ammunition Boxes Lashed and Secured in the Trailer (Continued)**



- 8 Pass the free end of each pre-positioned lashing (on the rear of the trailer) between the tailgate and the cargo bed. Pass the ends around the padded rear spring mounted shackle, and back up to the top of the load.
- 9 Secure the left rear lashing to the right front lashing with a D-ring and a load binder.
- 10 Secure the right lashing to the left front lashing with a D-ring and a load binder.
- 11 Pass the free ends of the upper pre-positioned 30-foot lashing (attached to the front endboard) around rear endboard and load bind with a D-ring and a load binder.
- 12 Pass the free end of the lower pre-positioned 30-foot lashing (attached to the front endboard) between the tailgate and the cargo bed. Run each lashing to the outside of the mainframe, between the mainframe and under the cargo bed. Secure the lashings together with D-rings and load binders.

**Note.** Pad sharp areas that touch lashings to avoid metal-to-metal contact.

**Figure 6-15. Ammunition Boxes Lashed and Secured in the Trailer (Continued)**

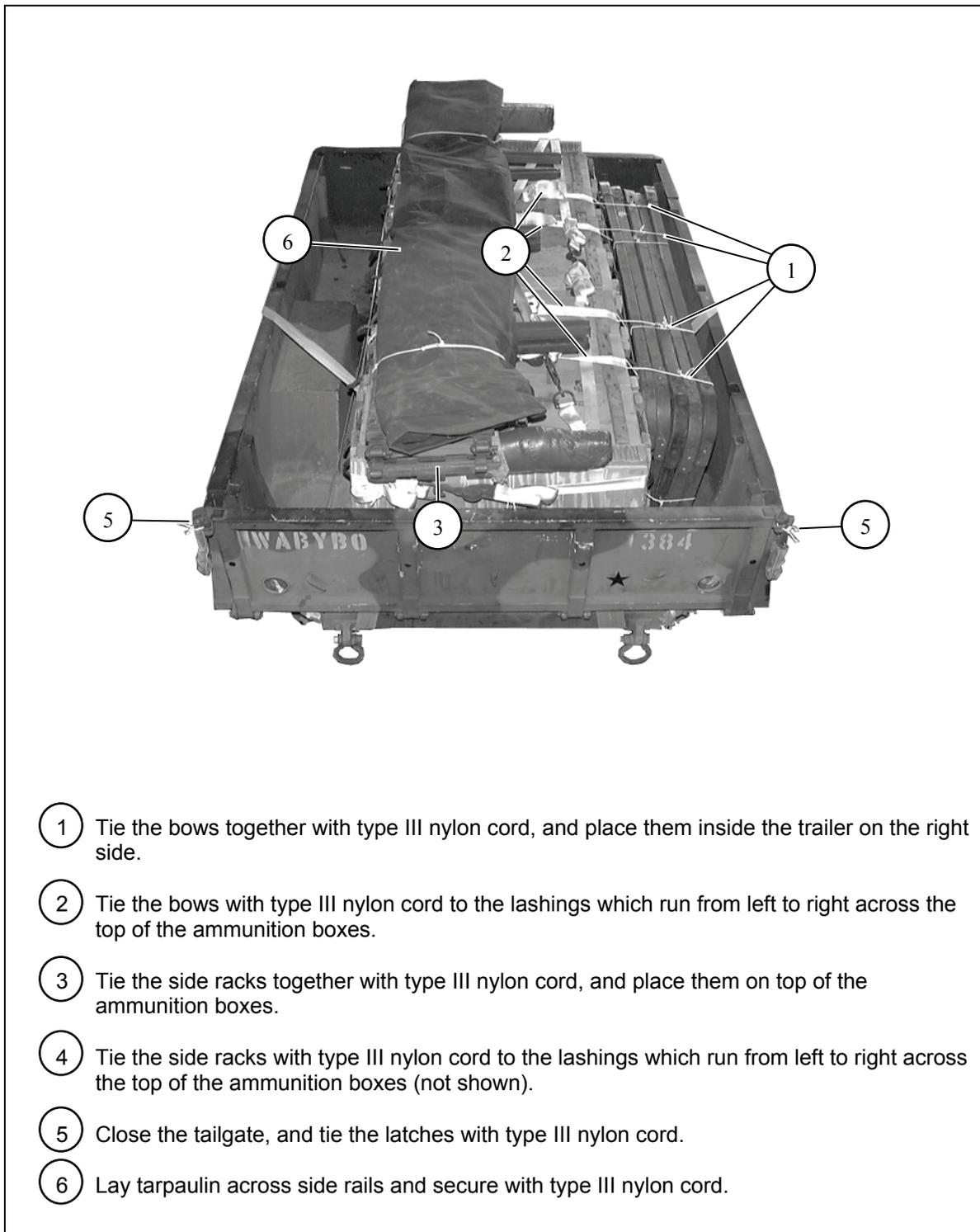
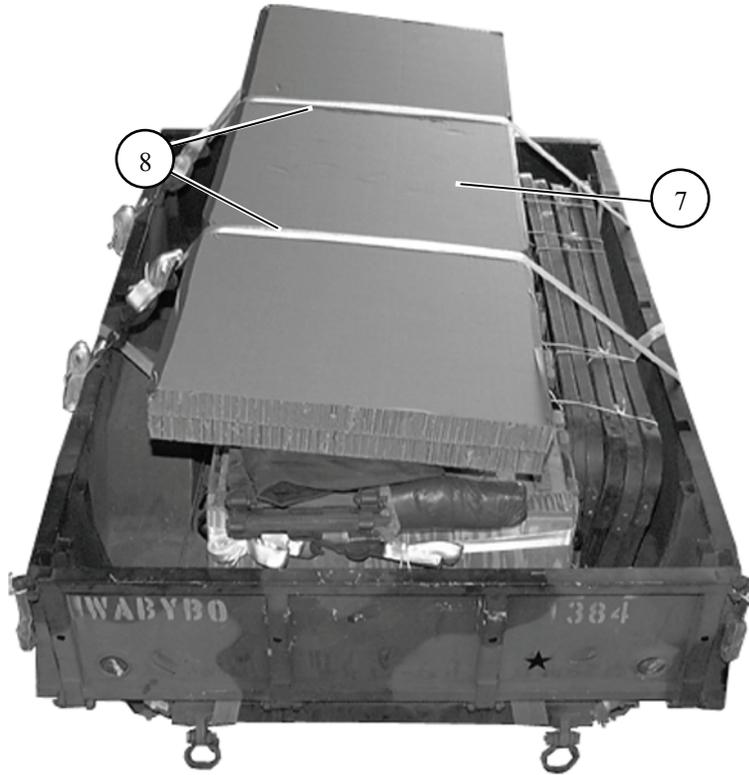


Figure 6-16. Trailer Components Stowed

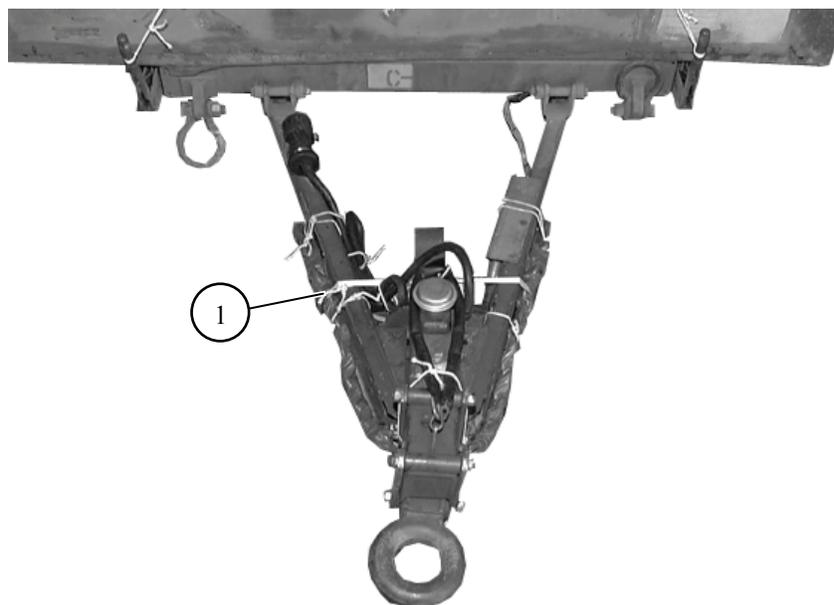


- ⑦ Place two 36- by 96-inch pieces of honeycomb on top of the tarpaulin. Tape the edges of the honeycomb where the lashings will touch.
- ⑧ Form two 30-foot lashings according to Figure 2-14. Position one lashing 32 inches from rear of trailer bed and second lashing 69 inches from the rear of trailer bed. Secure the load and trailer components by passing each lashing around the trailer body and frame. Position the load binders off the honeycomb and secure them.

**Figure 6-16. Trailer Components Stowed (Continued)**

## SECURING TRAILER SUPPORT STAND AND INSTALLING LIFTING SLINGS

6-7. Raise and secure the trailer support stand as shown in Figure 6-17. Use three 12-foot (2-loop), type XXVI nylon webbing slings; one 3-foot (2-loop), type XXVI nylon webbing sling; and three medium suspension clevises to lift the trailer.

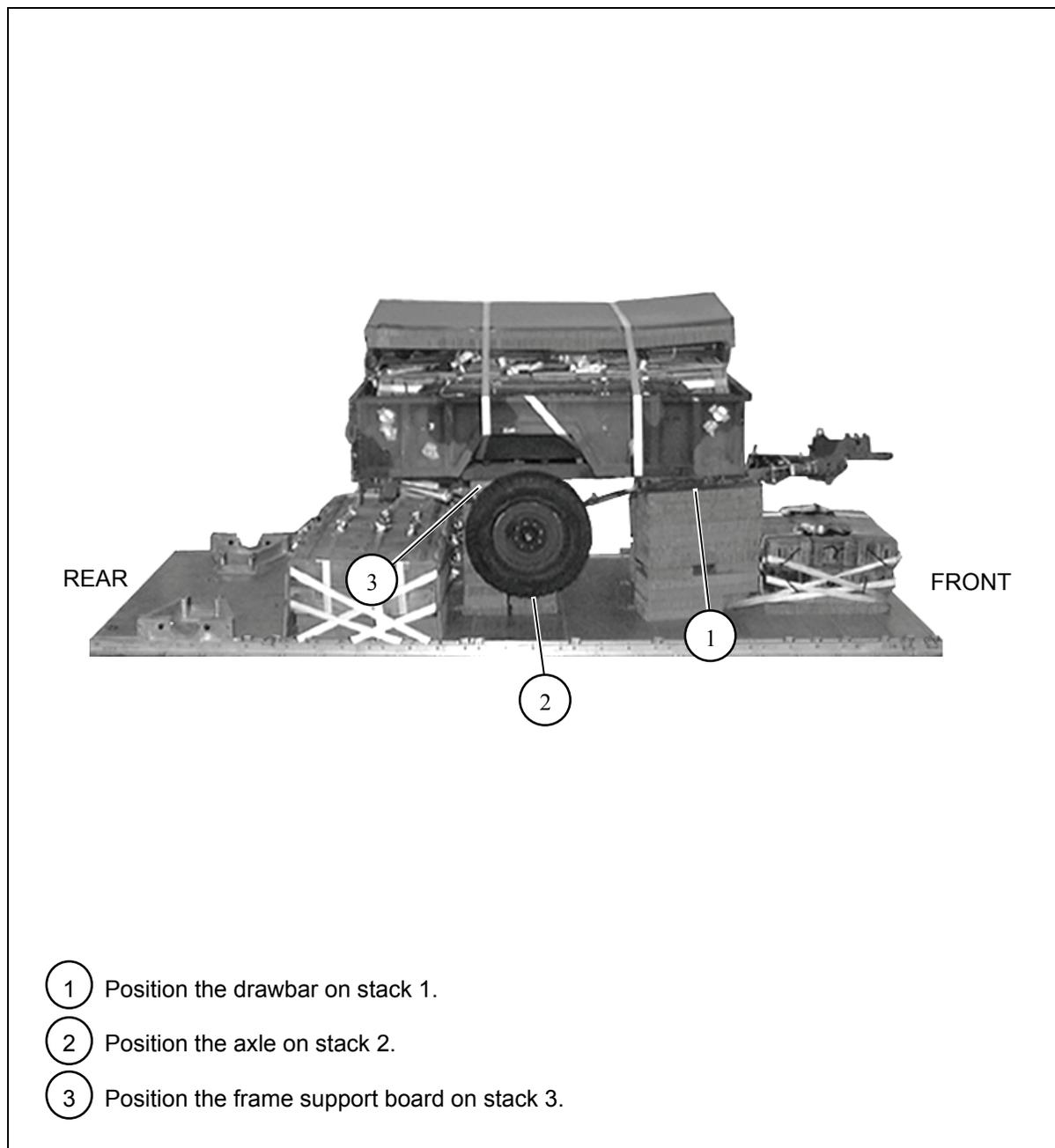


- ① Raise the support stand, and tie it with 1/2-inch tubular nylon webbing.
- ② Place the bell portion of each clevis in the end loop of each 12-foot sling (not shown).
- ③ Attach the two rear lifting slings to the tie-down provisions on the rear of the trailer (not shown).
- ④ Pass a 3-foot sling through the lunette on the trailer. Attach the 3-foot sling to the medium suspension clevis (not shown).

**Figure 6-17. Trailer Support Stand Raised and Secured**

## POSITIONING TRAILER

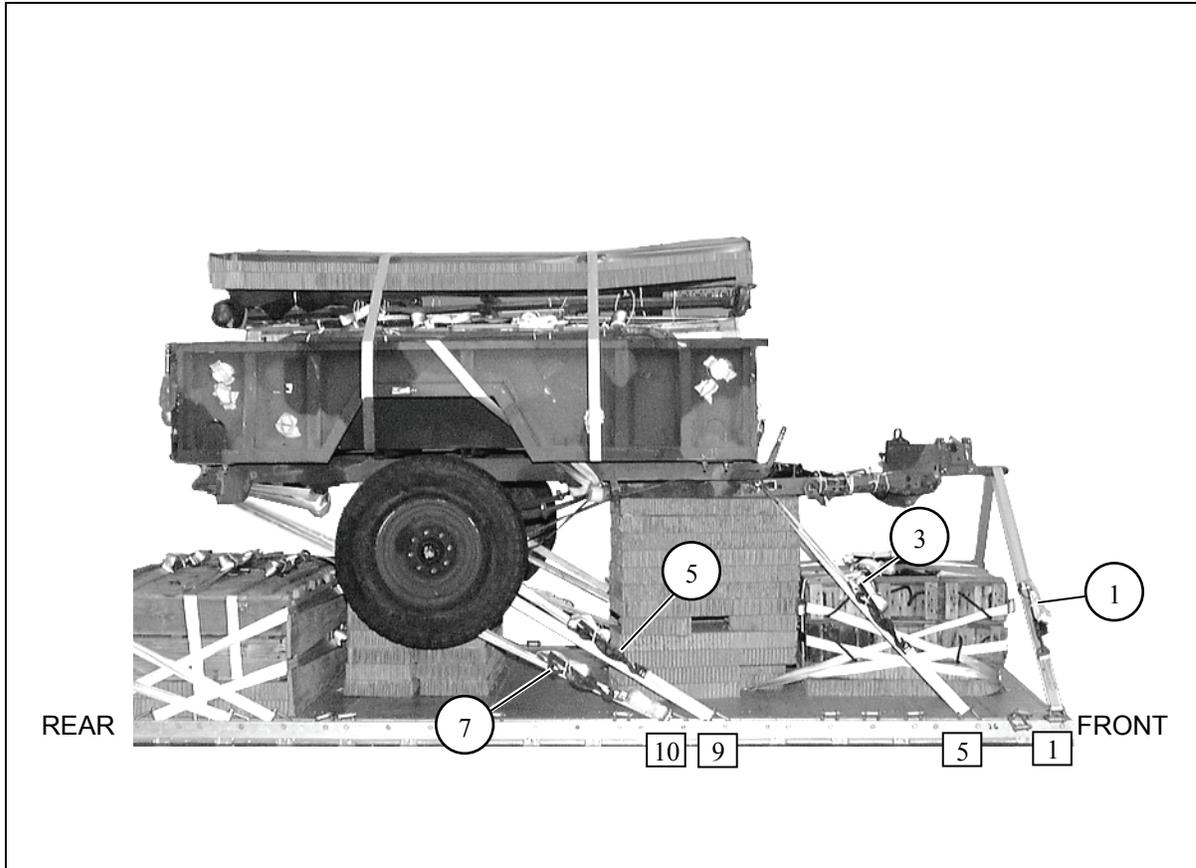
6-8. Position the trailer on the honeycomb stacks according to Figure 6-18.



**Figure 6-18. Trailer Positioned**

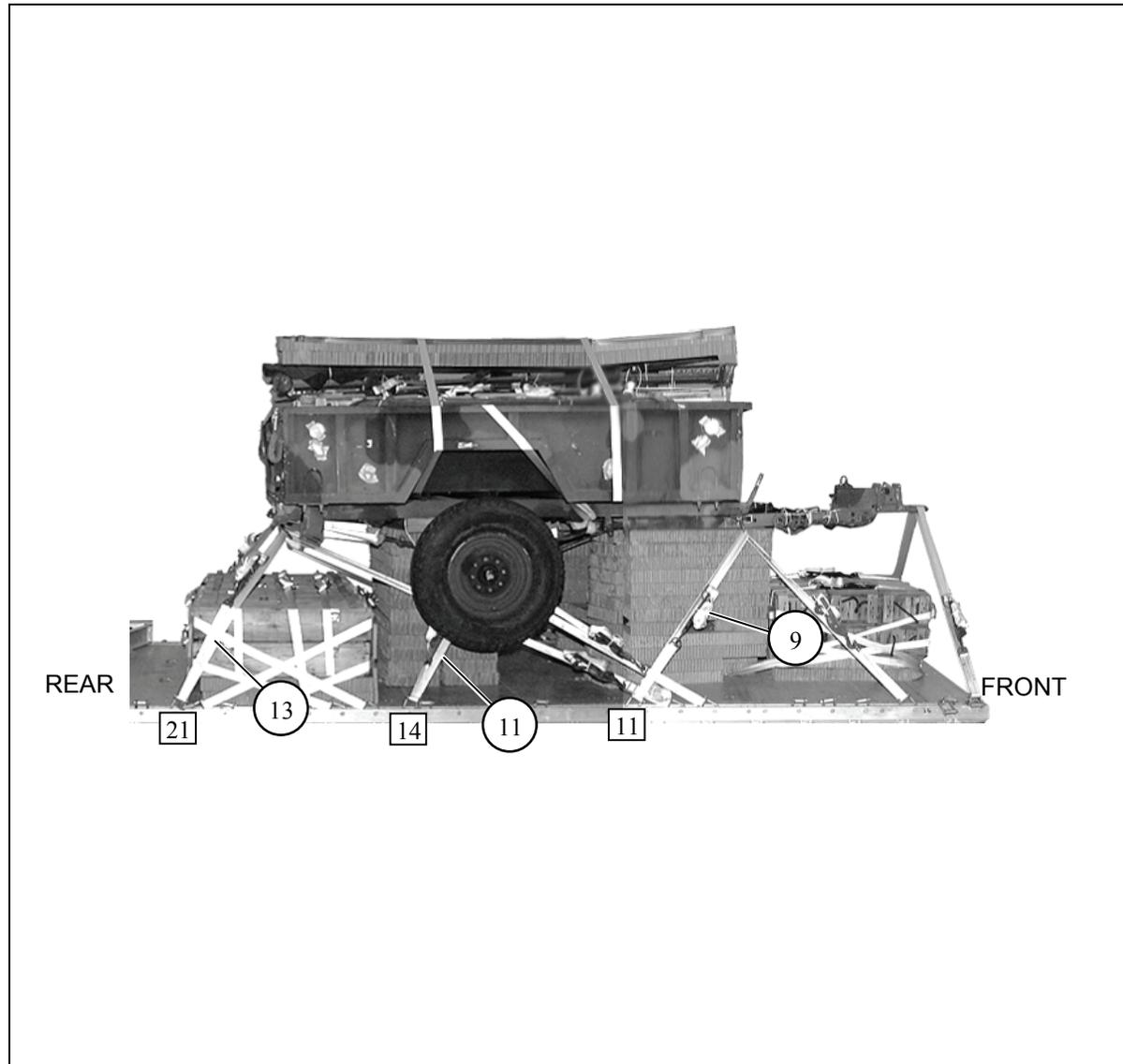
## LASHING TRAILER

6-9. Lash the trailer to the platform according to Chapter 2 of this manual and as shown Figures 6-19 and 6-20.



<i>Lashing Number</i>	<i>Tiedown Clevis Number</i>	<i>Instructions</i>
		Pass lashing:
1	1	Through the lunette.
2	1A	Through the lunette.
3	5	Through the right front lifting shackle.
4	5A	Through the left front lifting shackle.
5	9	Around the right side of the axle.
6	9A	Around the left side of the axle.
7	10	Through the right rear lifting shackle using a 30-foot lashing.
8	10A	Through the left rear lifting shackle using a 30-foot lashing.

Figure 6-19. Lashings 1 Through 8 Installed



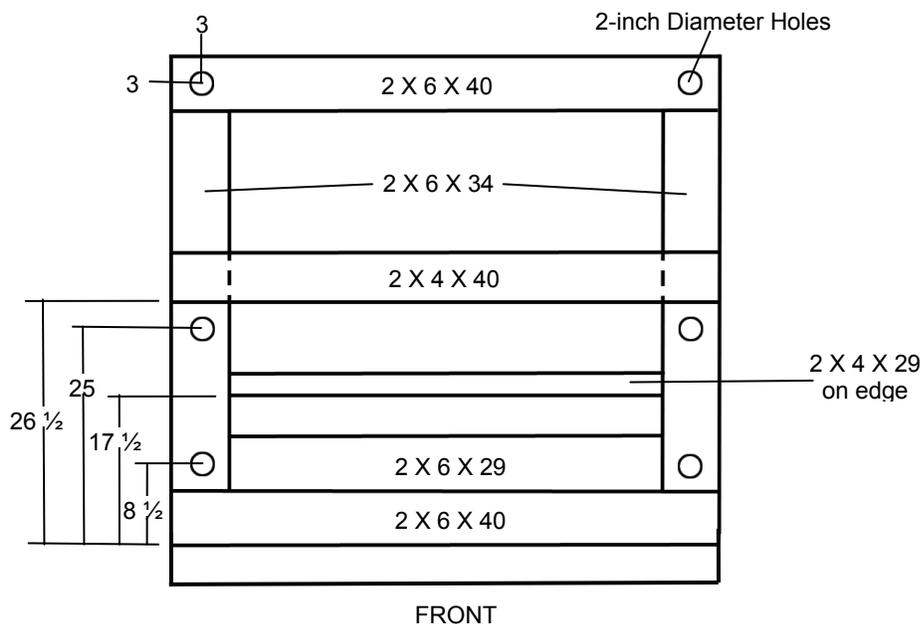
<i>Lashing Number</i>	<i>Tiedown Clevis Number</i>	<i>Instructions</i>
9	11	Pass lashing: Through the right front lifting shackle.
10	11A	Through the left front lifting shackle.
11	14	Around the right side of axle.
12	14A	Around the left side of axle.
13	21	Through the right rear lifting shackle.
14	21A	Through the left rear lifting shackle.

**Figure 6-20. Lashings 9 Through 14 Installed**

## BUILDING AND INSTALLING PARACHUTE STOWAGE PLATFORM

6-10. Build the parachute stowage platform as shown in Figure 6-21. Install the parachute stowage platform using four 15-foot tie-down assemblies as shown in Figure 6-22.

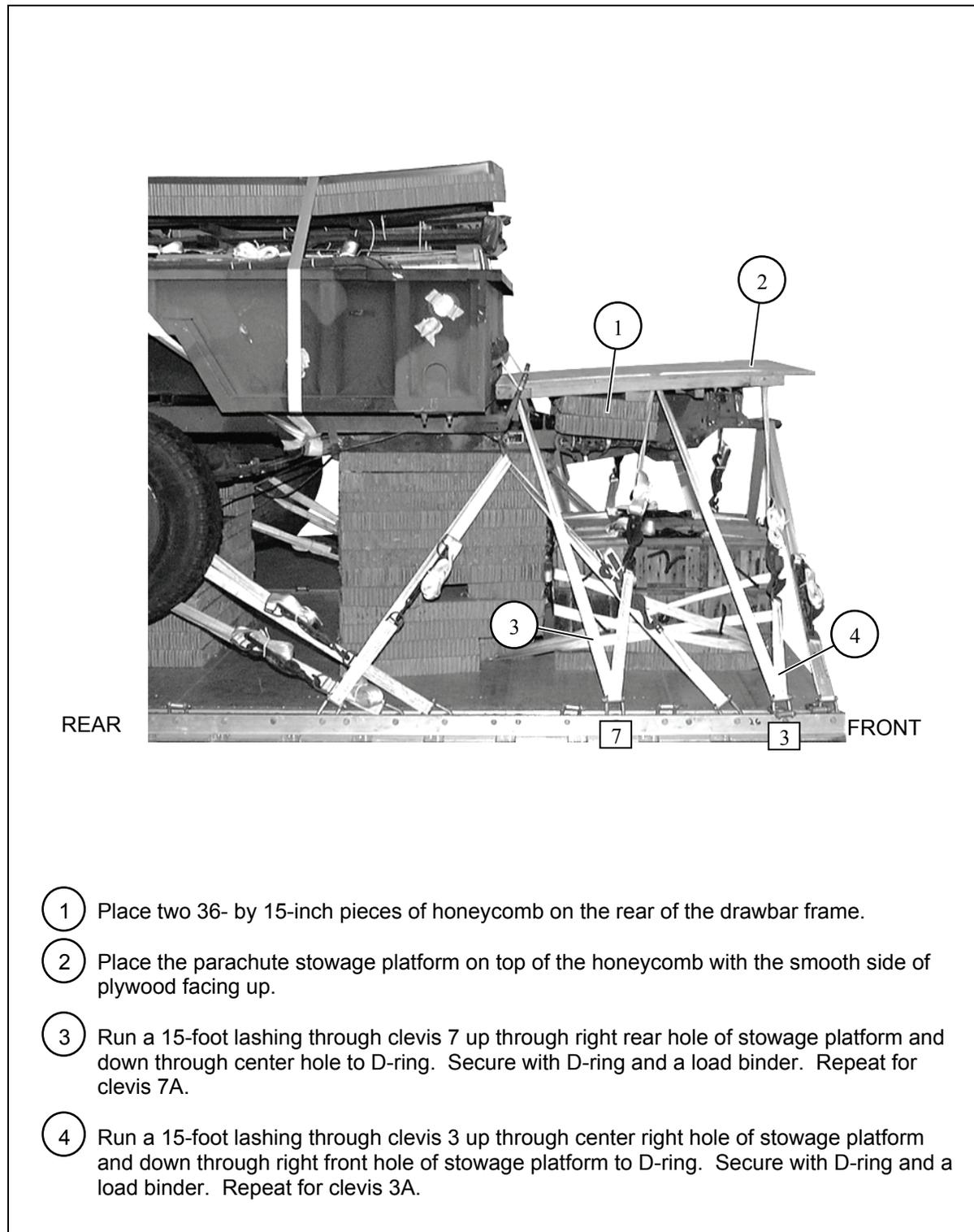
- Notes.** 1. All measurements are given in inches.  
2. This drawing is not drawn to scale.



**Step:**

1. Cut a 3/4- by 40- by 50-inch piece of plywood.
2. Nail a 2- by 6- by 40-inch piece of lumber 5 inches from the front edge of the plywood. Nail a second 2- by 6- by 40-inch piece of lumber flush with the rear edge of the plywood.
3. Nail a 2- by 6- by 34-inch piece of lumber to each side of the plywood as shown.
4. Nail a 2- by 6- by 29-inch piece of lumber on top of the 2- by 6- by 40-inch lumber that is positioned on the front of the plywood.
5. Nail a 2- by 4- by 29-inch piece of lumber standing on edge 17 1/2 inches from the front edge of the plywood.
6. Nail a 2- by 4- by 40-inch piece of lumber 26 1/2 inches from the front edge of the plywood.
7. Drill six 2-inch holes in the lumber as shown.

**Figure 6-21. Parachute Stowage Platform Built**



- ① Place two 36- by 15-inch pieces of honeycomb on the rear of the drawbar frame.
- ② Place the parachute stowage platform on top of the honeycomb with the smooth side of plywood facing up.
- ③ Run a 15-foot lashing through clevis 7 up through right rear hole of stowage platform and down through center hole to D-ring. Secure with D-ring and a load binder. Repeat for clevis 7A.
- ④ Run a 15-foot lashing through clevis 3 up through center right hole of stowage platform and down through right front hole of stowage platform to D-ring. Secure with D-ring and a load binder. Repeat for clevis 3A.

**Figure 6-22. Parachute Stowage Platform Installed**

## BUILDING AND POSITIONING ATTITUDE CONTROL SYSTEM (ACS) STACKS

6-11. Build the ACS stacks as shown in Figure 6-23. Position the ACS stacks as shown in Figure 6-24.

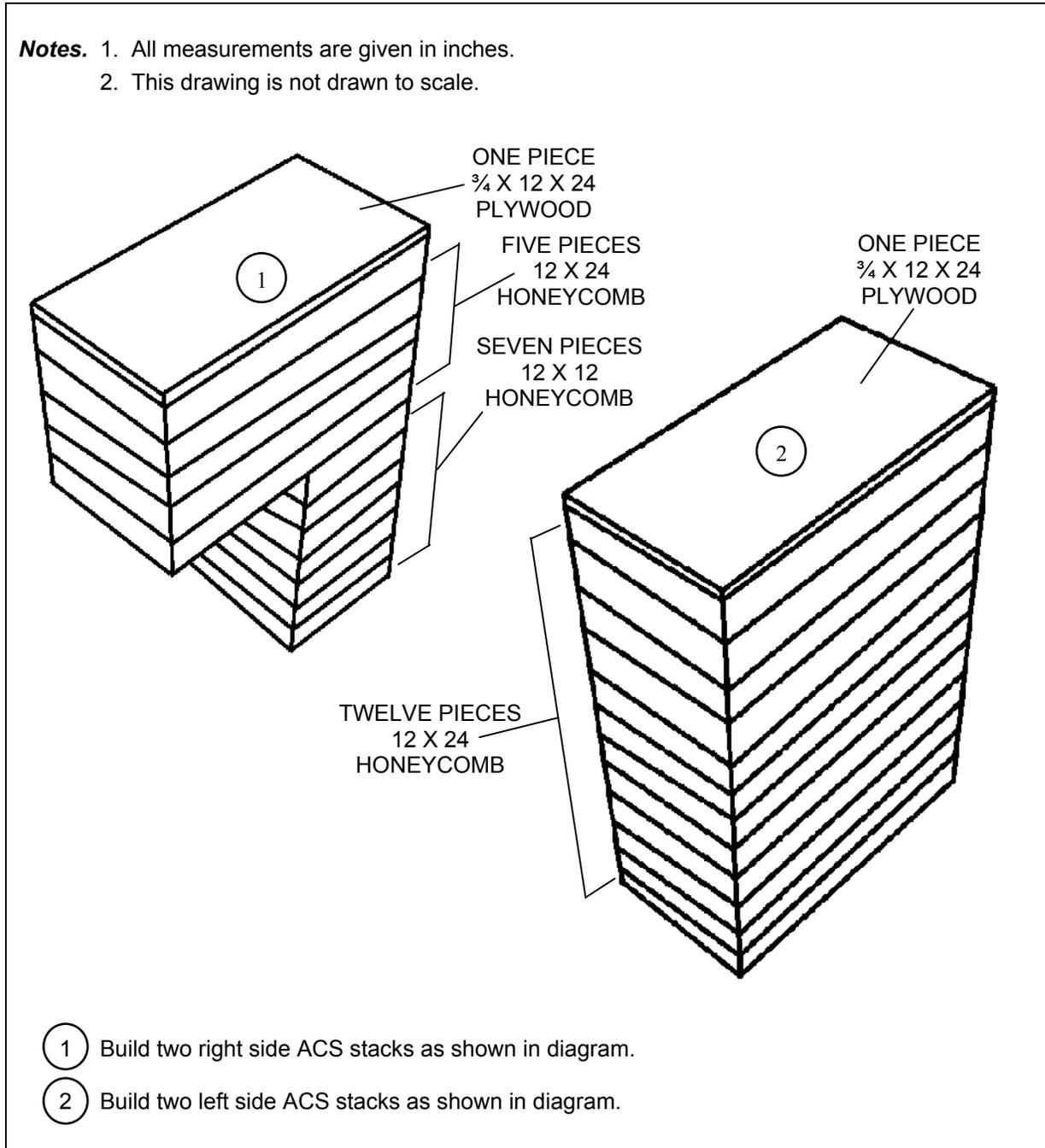


Figure 6-23. ACS Stacks Built

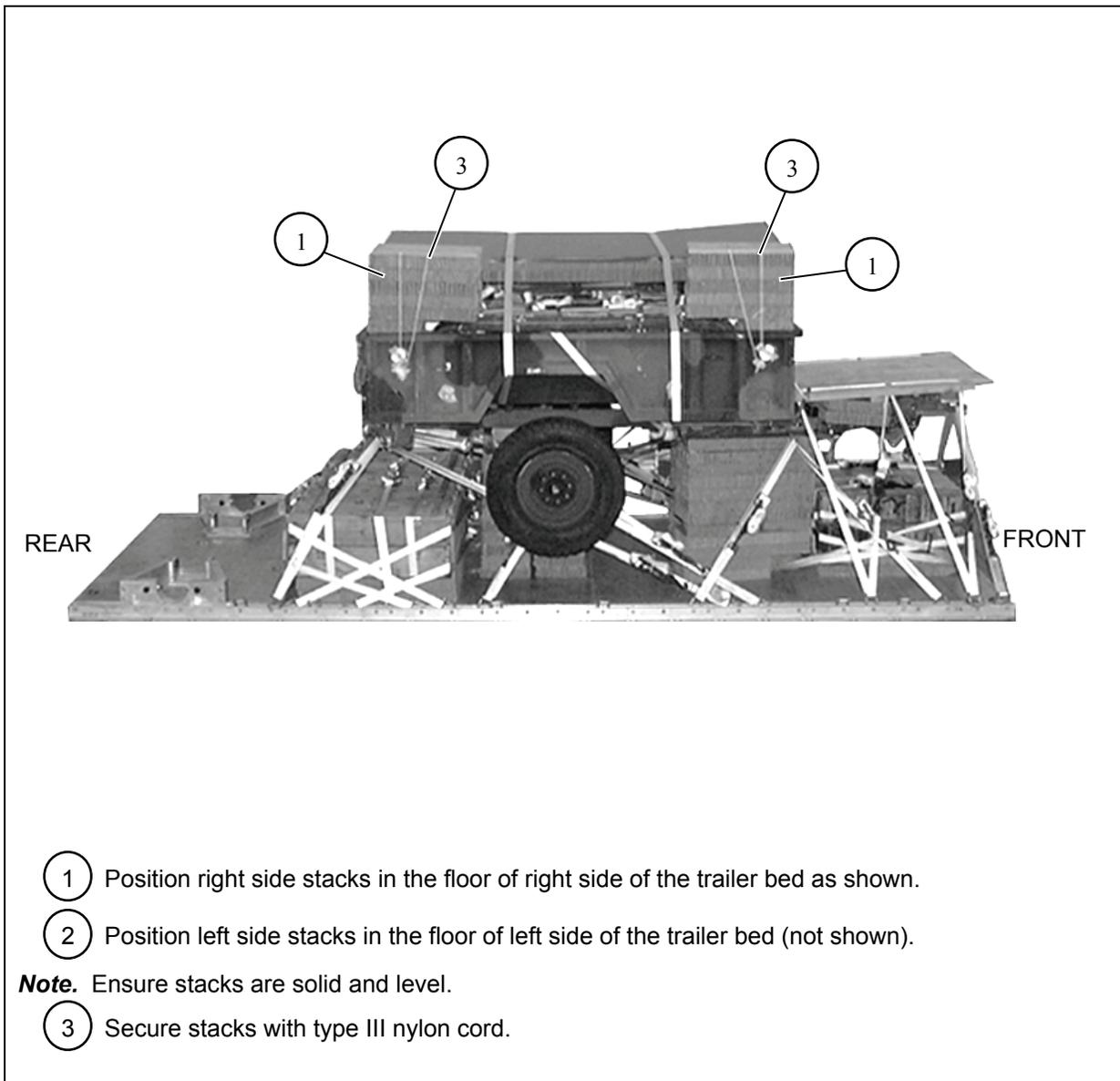
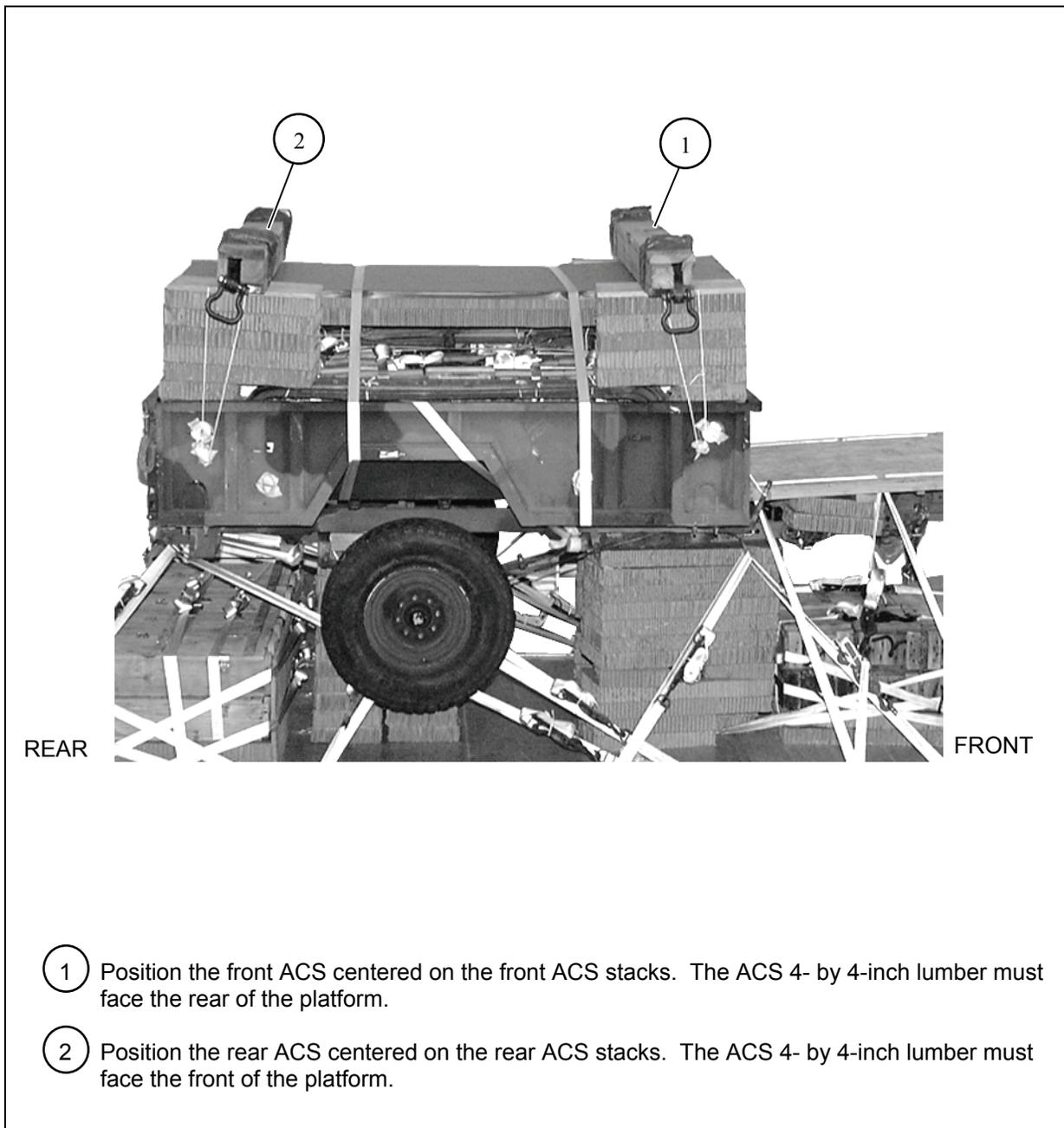


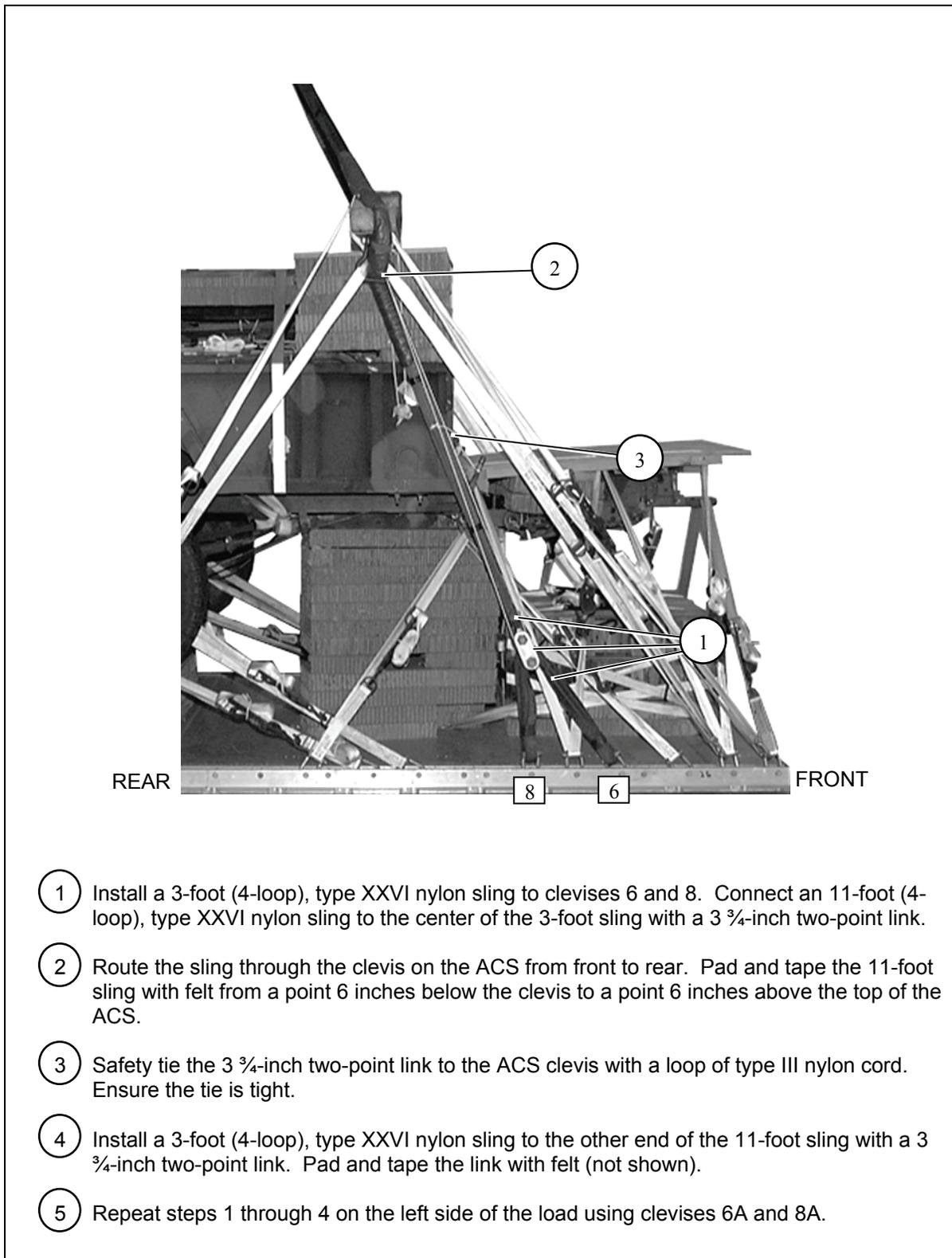
Figure 6-24. ACS Stacks Positioned

## INSTALLING SUSPENSION SLINGS AND ATTITUDE CONTROL SYSTEM (ACS)

6-12. Construct, inspect, and position the ACS according to Chapter 2 of this manual and as shown in Figure 6-25. Install the suspension slings and secure ACS according to Chapter 2, and as shown in Figure 6-26.



**Figure 6-25. ACS Positioned**



- ① Install a 3-foot (4-loop), type XXVI nylon sling to clevises 6 and 8. Connect an 11-foot (4-loop), type XXVI nylon sling to the center of the 3-foot sling with a 3 ¾-inch two-point link.
- ② Route the sling through the clevis on the ACS from front to rear. Pad and tape the 11-foot sling with felt from a point 6 inches below the clevis to a point 6 inches above the top of the ACS.
- ③ Safety tie the 3 ¾-inch two-point link to the ACS clevis with a loop of type III nylon cord. Ensure the tie is tight.
- ④ Install a 3-foot (4-loop), type XXVI nylon sling to the other end of the 11-foot sling with a 3 ¾-inch two-point link. Pad and tape the link with felt (not shown).
- ⑤ Repeat steps 1 through 4 on the left side of the load using clevises 6A and 8A.

**Figure 6-26. Slings Installed and ACS Secured**

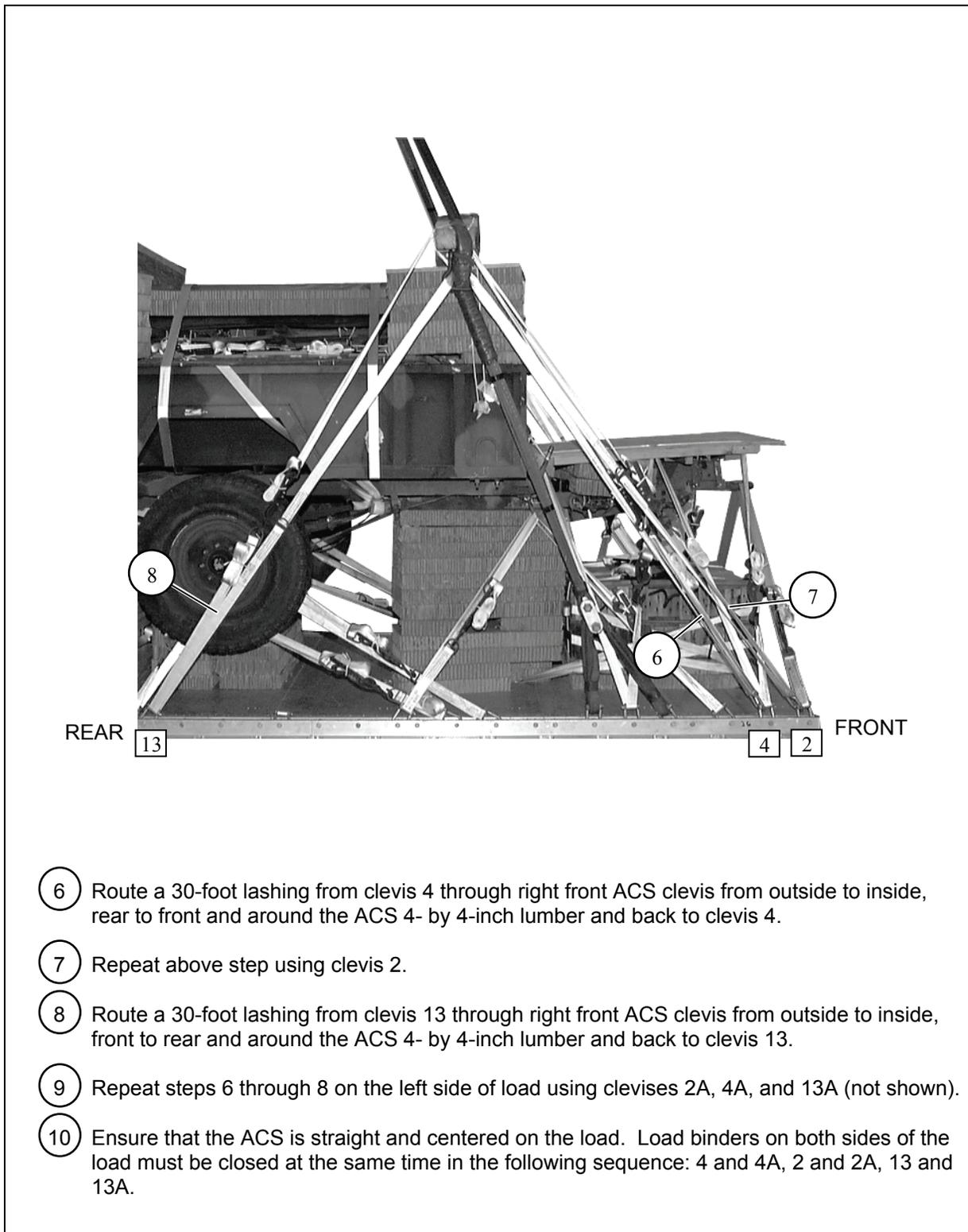
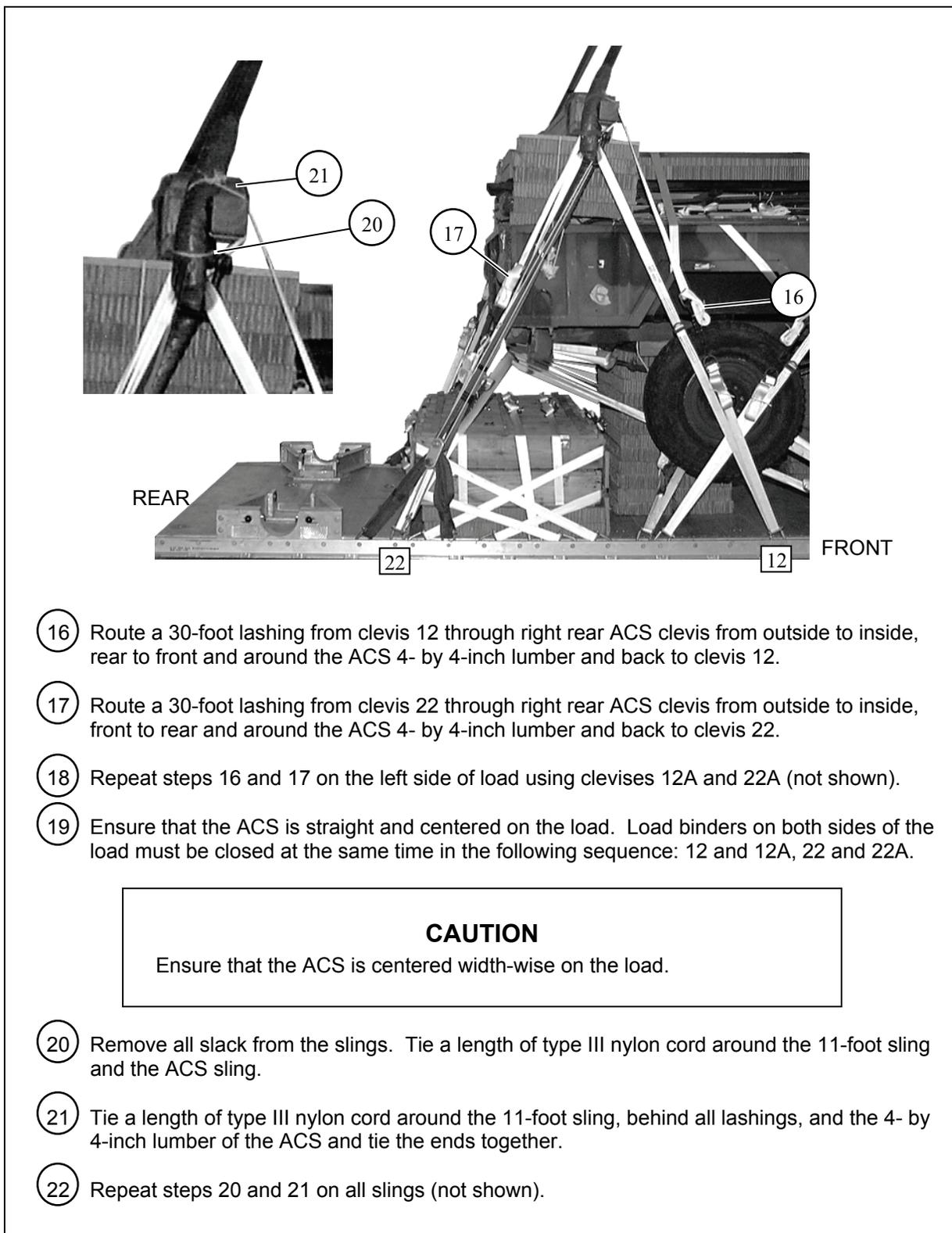


Figure 6-26. Slings Installed and ACS Secured (Continued)





- ①⑥ Route a 30-foot lashing from clevis 12 through right rear ACS clevis from outside to inside, rear to front and around the ACS 4- by 4-inch lumber and back to clevis 12.
- ①⑦ Route a 30-foot lashing from clevis 22 through right rear ACS clevis from outside to inside, front to rear and around the ACS 4- by 4-inch lumber and back to clevis 22.
- ①⑧ Repeat steps 16 and 17 on the left side of load using clevises 12A and 22A (not shown).
- ①⑨ Ensure that the ACS is straight and centered on the load. Load binders on both sides of the load must be closed at the same time in the following sequence: 12 and 12A, 22 and 22A.

### CAUTION

Ensure that the ACS is centered width-wise on the load.

- ②⑩ Remove all slack from the slings. Tie a length of type III nylon cord around the 11-foot sling and the ACS sling.
- ②⑪ Tie a length of type III nylon cord around the 11-foot sling, behind all lashings, and the 4- by 4-inch lumber of the ACS and tie the ends together.
- ②⑫ Repeat steps 20 and 21 on all slings (not shown).

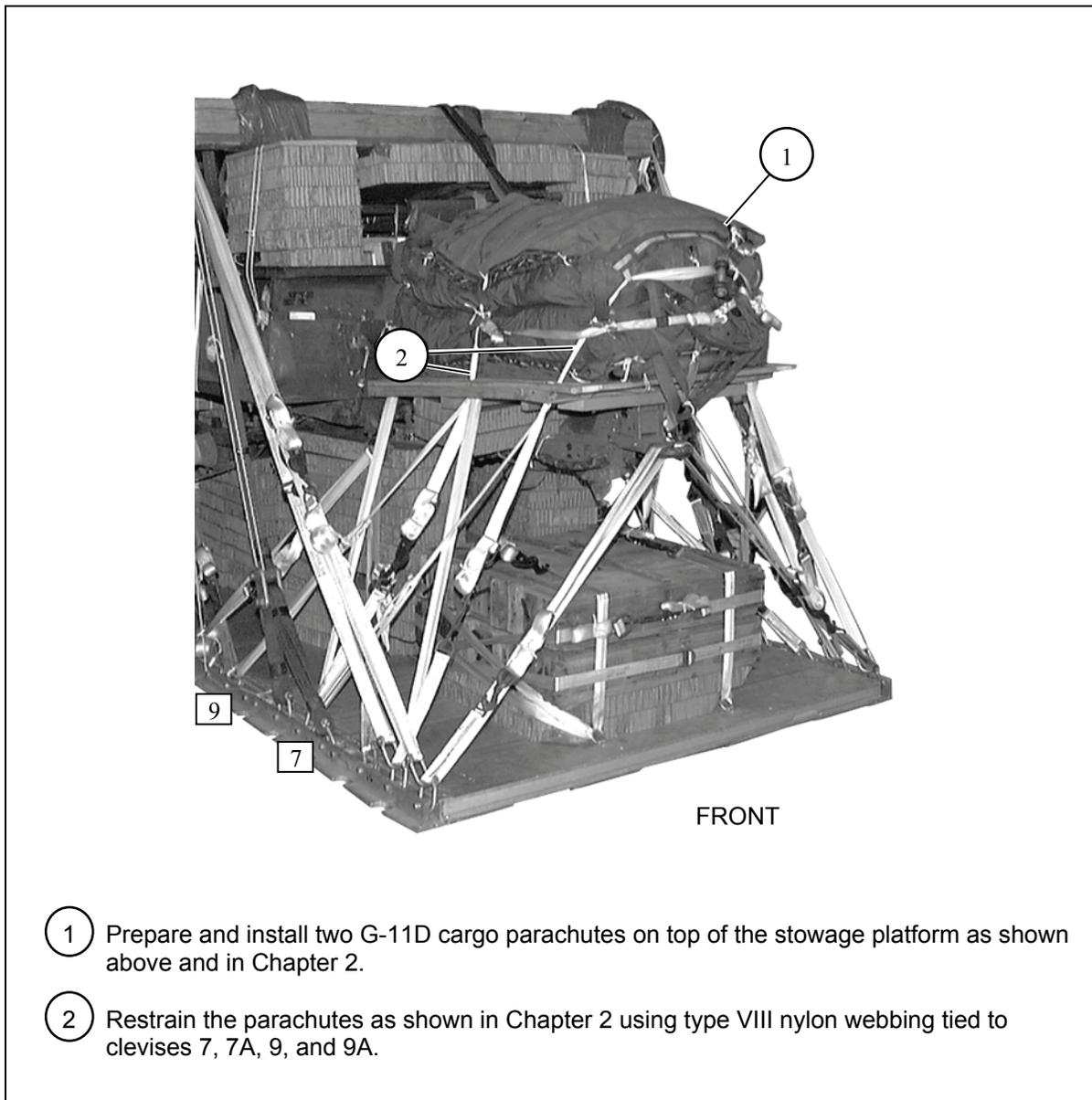
Figure 6-26. Slings Installed and ACS Secured (Continued)

## INSTALLING OUTRIGGER ASSEMBLIES

6-13. Assemble, install, and safety tie the mast and foot assemblies on the DRAS platform according to TM 10-1670-268-20&P/TO 13C7-52-22 and as shown in Chapter 2, Figures 2-42 through 2-44 and Figure 2-45 steps 1, 2, and 3.

## STOWING CARGO PARACHUTES

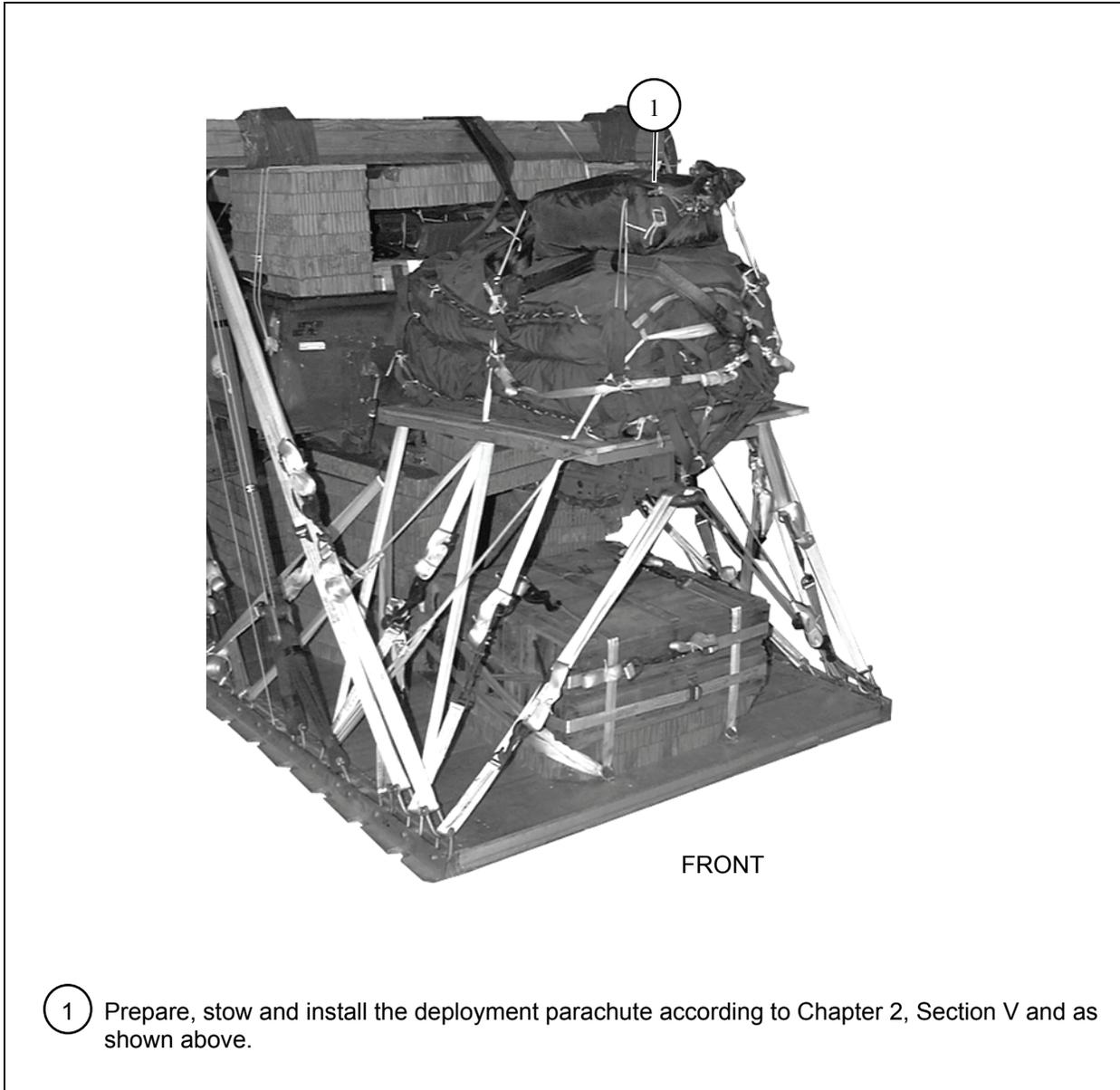
6-14. Stow and restrain two G-11D cargo parachutes on top of the stowage platform as shown in Chapter 2 and as shown in Figure 6-27.



**Figure 6-27. Cargo Parachutes Stowed**

## STOWING DEPLOYMENT PARACHUTE

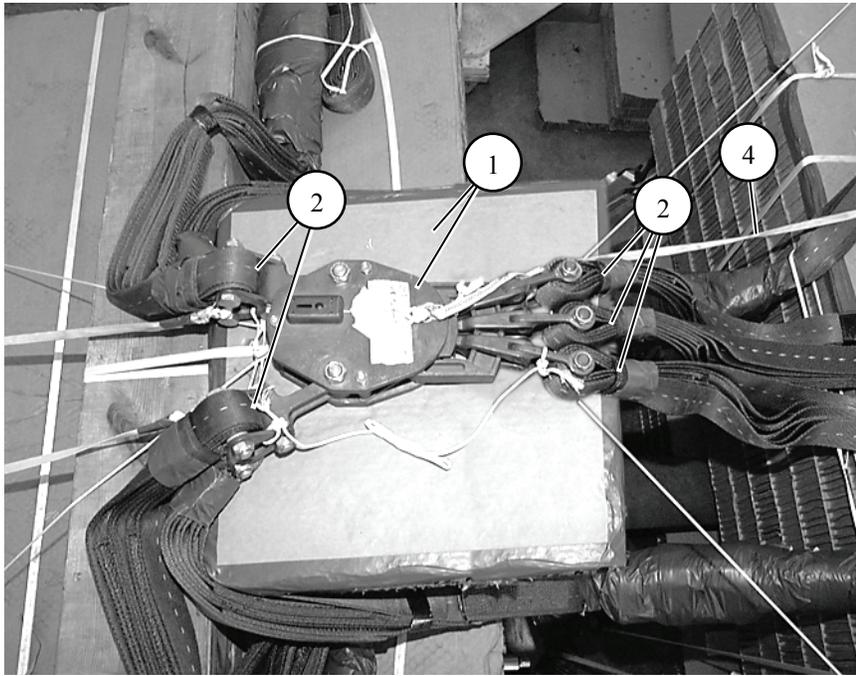
6-15. Prepare, stow and install the deployment parachute according to Chapter 2, Section V and as shown in Figure 6-28.



**Figure 6-28. Deployment Parachute Installed**

## INSTALLING PARACHUTE RELEASE SYSTEM

6-16. Build an M-1 parachute release stack, and prepare and install an M-1 release system according to Chapter 2, Section VI and as shown in Figure 6-29.



① Cut three 20- by 20-inch pieces of honeycomb and glue together to form the M-1 release parachute stack. Tape the top edges of the honeycomb. Center the stack and the M-1 release on the support stack against the rear ACS.

② Attach riser extensions and suspension slings to the M-1 release.

**Note.** Remove the buffers from the ends of the suspension slings that attach to the M-1 release.

③ Group the riser extensions together and tie with type I, ¼-inch cotton webbing. Make three ties. S-fold the slack in the front and rear suspension slings on top of front and rear ACS according to Chapter 2 of this manual. Secure with type I, ¼-inch cotton webbing (not shown).

④ Attach the arming wire and lanyard to a carrying handle on the parachute with three alternating half hitches with a knot in the running end.

**Figure 6-29. Parachute Release System Installed**



## MARKING RIGGED LOAD

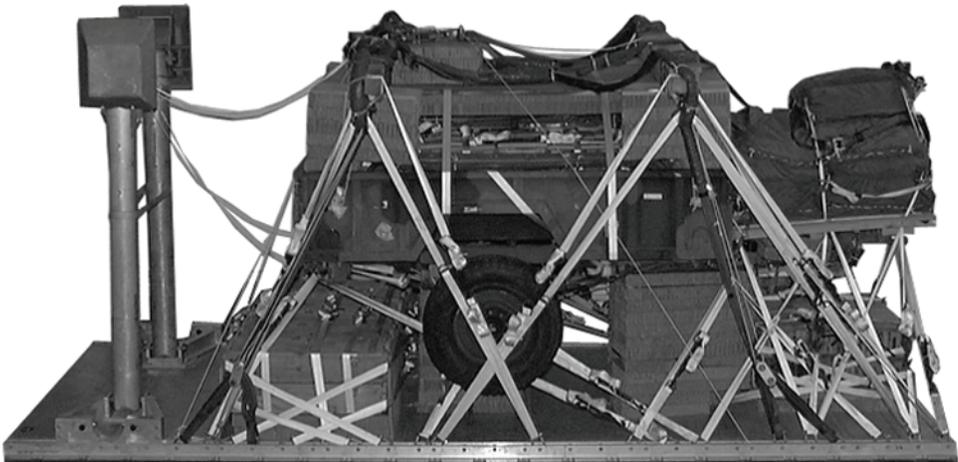
6-18. Mark the rigged load according to Chapter 2, Section IX of this manual and as shown in Figure 6-31. A Shipper's Declaration for Dangerous Goods is required. If the load varies from the one shown, the weight, height, CB, and parachute requirements must be recomputed.

## EQUIPMENT REQUIRED

6-19. The equipment required to rig this load is listed in Table 6-1.

**CAUTION**

Make the final rigger inspection required by Chapter 2, Section IX before the load leaves the rigging site.



**RIGGED LOAD DATA**

Weight: Load shown .....	8,062 pounds
M101A2 .....	7,860 pounds
Maximum load allowed .....	8,999 pounds
Height .....	98 inches
Width .....	94 inches
Overall Length .....	216 inches
Overhang: Front .....	0 inches
Rear .....	0 inches
Center of Balance: M101A1 (from front edge of platform): .....	98 inches
M101A2 .....	99 inches

**Figure 6-31. M101A1, 3/4-Ton Trailer and Accompanying Load Rigged on DRAS Platform**

**Table 6-1. Equipment Required for Rigging M101A1, ¾-Ton Trailer and Accompanying Load on DRAS Platform**

<i>National Stock Number</i>	<i>Item</i>	<i>Quantity</i>
8040-00-273-8713	Adhesive paste, 1-gallon	As required
4020-00-240-2146	Cord, nylon, type III, 550-pound	As required
	Clevis:	
4030-00-090-5354	Large	5
4030-00-678-8562	Medium	4
1670-00-360-0328	Cover, clevis, large	2
8135-00-664-6958	Cushioning material, packaging, cellulose wadding	As required
8305-00-191-1101	Felt, ½-inch	As required
1670-01-493-6418	Link assembly, two-point, 3 ¾-inch	9
	Lumber:	
5510-00-220-6146	2- by 4-inch	As required
5510-00-220-6148	2- by 6-inch	As required
5510-00-220-6274	4- by 4-inch	As required
5530-00-618-8073	Plywood, ¾-inch	2 sheets
5315-00-010-4659	Nail, steel wire, common, 8d	As required
1670-00-753-3928	Pad, energy dissipating, honeycomb	20 sheets
1670-01-487-5461	Static line assembly release away	1
	Parachute:	
	Cargo:	
1670-01-016-7841	G-11D	2
1670-00-040-8135	Cargo extraction: 28-foot (deployment parachute)	1
	Platform, dual row, 18-foot	
1670-01-485-1654	Rail, DRAS	2
1670-01-486-1342	Roller Pad, DRAS	4
1670-01-486-1656	Panel Assembly, Main	9
1670-01-162-2372	Clevis assembly	46
1670-01-097-8816	Release, cargo parachute, M-1	1
	Sling, cargo airdrop	
	For suspension:	
1670-01-062-6310	11-foot (4-loop), type XXVI nylon webbing	4
1670-01-062-6306	3-foot (4-loop), type XXVI nylon webbing	8
	For deployment:	
1670-01-062-6306	3-foot (4-loop), type XXVI nylon webbing	1
	For riser extension:	
1670-01-062-6313	60-foot (3-loop), type XXVI nylon webbing	2
	For ACS:	
1670-01-063-7761	16-foot (2-loop), type XXVI nylon webbing	2
	For lifting:	
1670-01-062-6301	3-foot (2-loop), type XXVI nylon webbing	1
1670-01-062-6303	12-foot (2-loop), type XXVI nylon webbing	3

**Table 6-1. Equipment Required for Rigging M101A1, 3/4-Ton Trailer and Accompanying Load on DRAS Platform (Continued)**

<i>National Stock Number</i>	<i>Item</i>	<i>Quantity</i>
1670-00-040-8219	Strap, parachute release, multicut	2
1670-00-937-0271	Knife release, cargo (guillotine)	6
1670-01-487-5464	Outrigger assembly	1
7510-00-266-5016	Tape, adhesive, 2-inch	As required
1670-00-937-0271	Tie-down assembly, 15-foot	60
1670-00-725-1437	Tie-down, cargo, aircraft, (CGU-1B)	5
	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	As required

## Chapter 7

# Rigging T200 Bobcat Compact Track Loader on Dual Row Airdrop System Platform

## SECTION I - T200 BOBCAT COMPACT TRACK LOADER

### DESCRIPTION OF LOAD

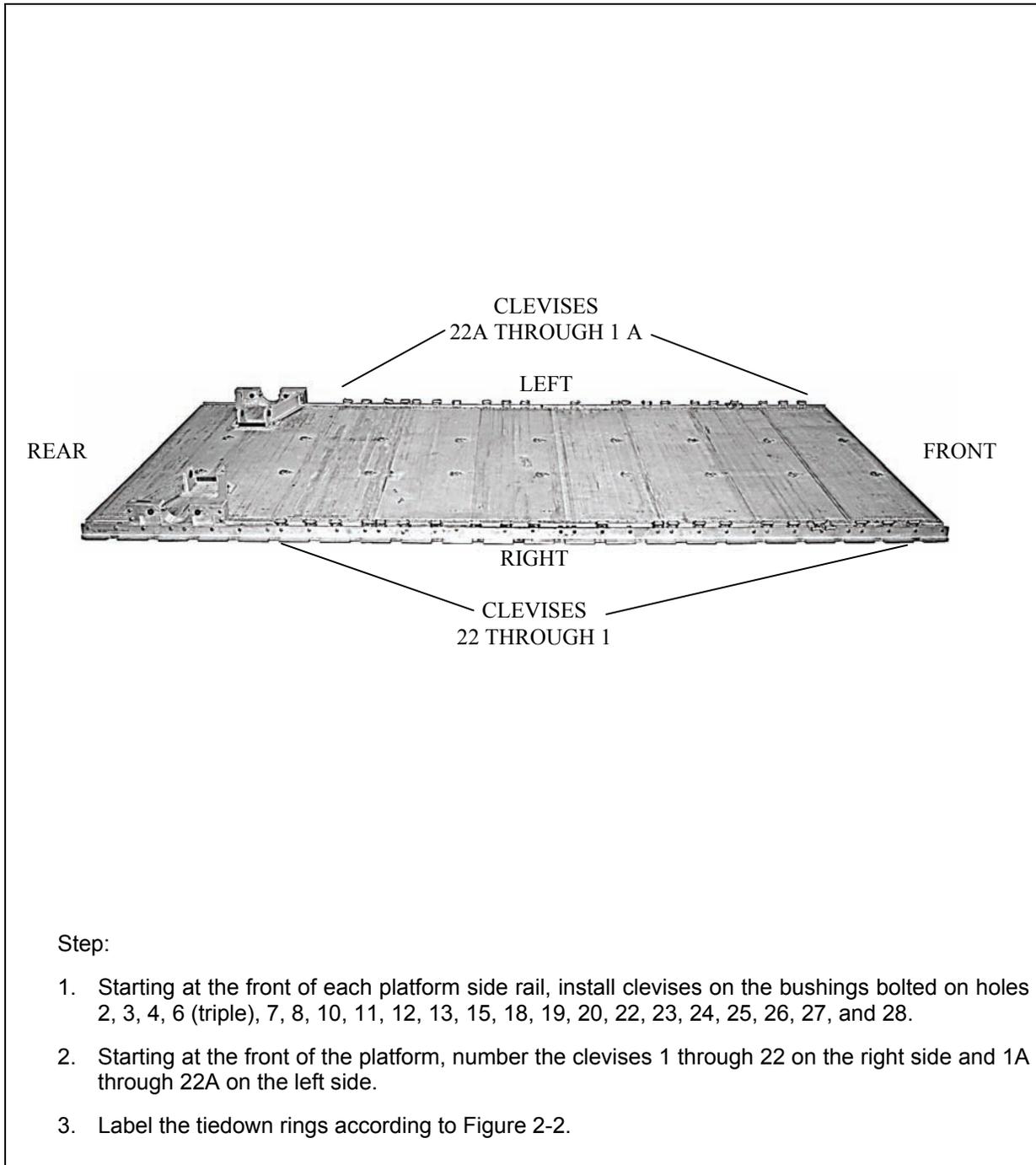
7-1. The T200 Bobcat Compact Track Loader, (Figure 7-1) with vibratory roller and construction/industrial bucket is rigged on a DRAS airdrop platform. The T200 Bobcat Compact Track Loader weighs 7,860 pounds. The vibratory roller weighs 1,880 pounds and the construction/industrial bucket weighs 580 pounds. The T200 Bobcat Compact Track Loader is 106 inches long and 77 inches wide. The height of the T200 Bobcat Compact Track Loader is 79 inches. The load, as shown, is rigged with four G-11D cargo parachutes.

### PREPARING PLATFORM

7-2. Inspect, or assemble and inspect, a DRAS platform with outrigger assemblies and outrigger platform support weldments according to TM 10-1670-268-20&P and as shown in Figure 7-2.



Figure 7-1. T200 Bobcat Compact Loader



**Figure 7-2. Platform Prepared**

## BUILDING AND PLACING HONEYCOMB STACK

7-3. Prepare the honeycomb stacks for the loader as shown in Figure 7-3. Position the honeycomb stacks as shown in Figure 7-4.

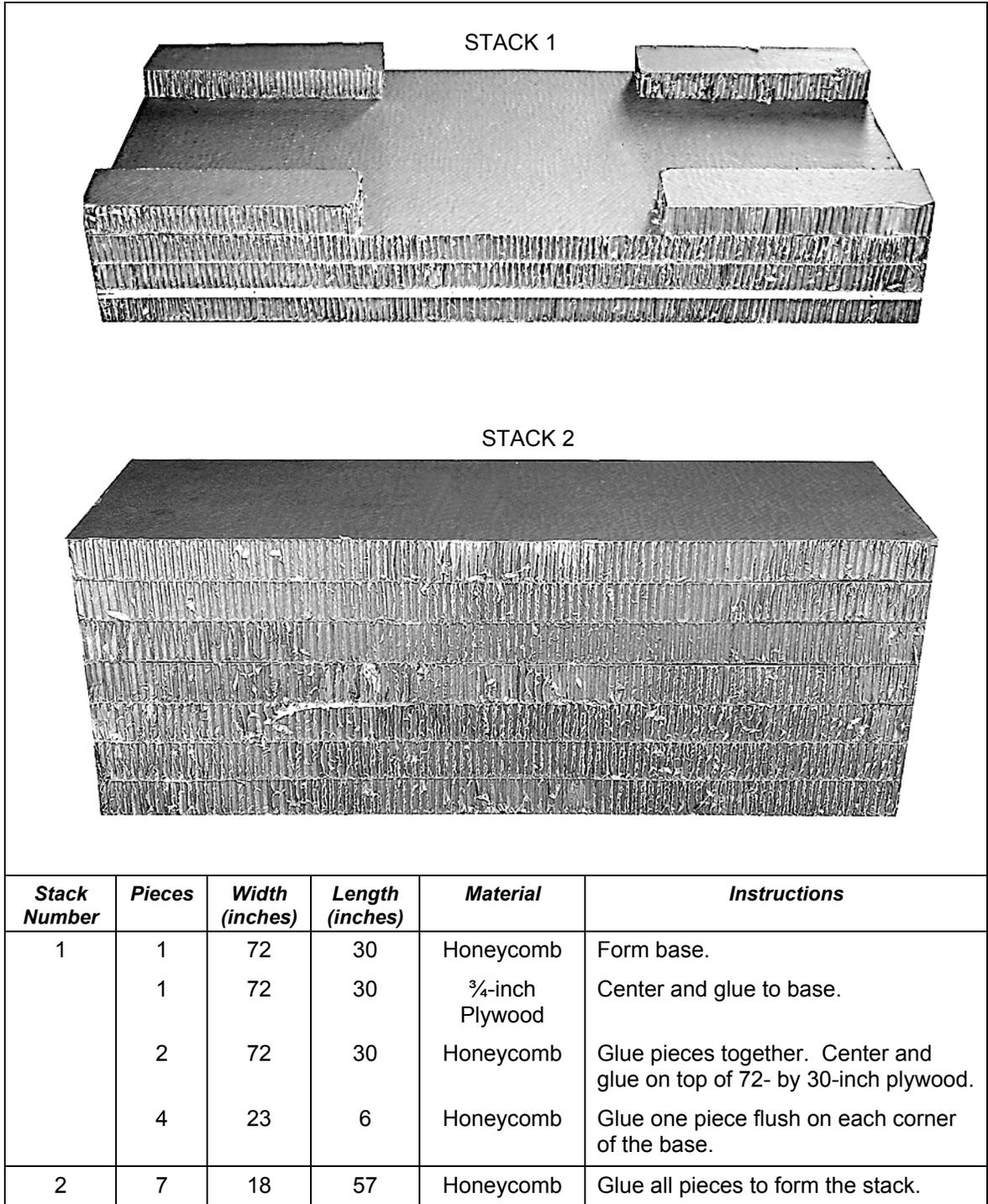
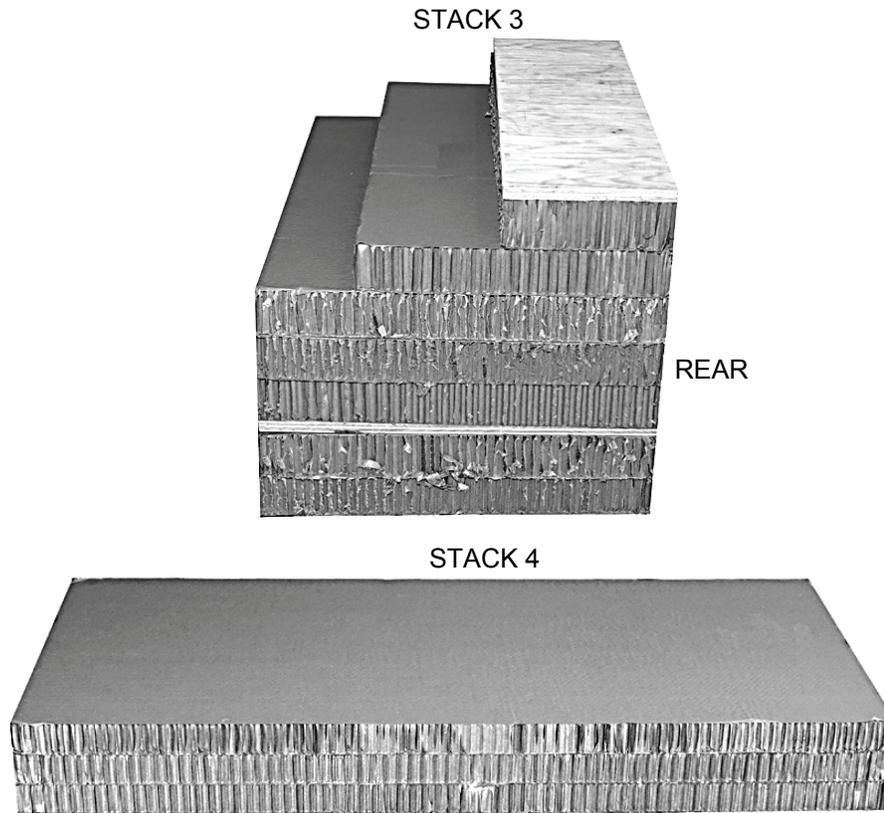


Figure 7-3. Honeycomb Stacks Prepared

**Note.** An additional 10- by 32- by 3/4-inch piece of plywood may be needed on stack 3 during positioning.



Stack Number	Pieces	Width (inches)	Length (inches)	Material	Instructions
3	2	32	24	Honeycomb	Glue to form base.
	1	32	24	3/4-inch Plywood	Center and glue to base.
	3	32	24	Honeycomb	Glue pieces together. Center and glue on top of 32- by 24-inch plywood.
	1	32	18	Honeycomb	Glue piece flush on the rear of base.
		32	10	Honeycomb	Glue piece flush on the rear of base.
		32	10	3/4-inch Plywood	Glue piece flush on the rear of base
4	3	77	34	Honeycomb	Glue all pieces together to form stack.

Figure 7-3. Honeycomb Stacks Prepared (Continued)

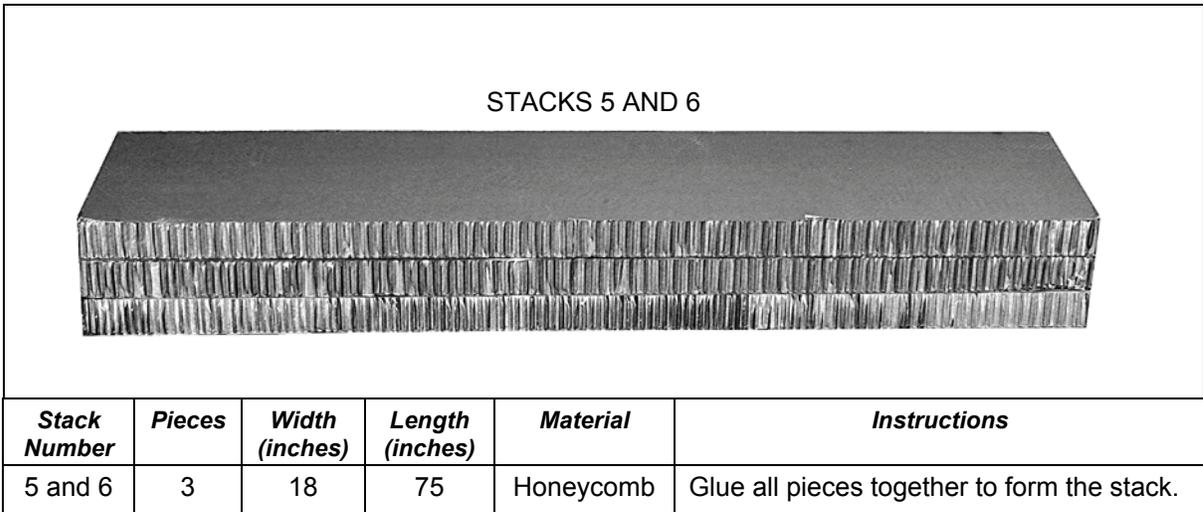


Figure 7-3. Honeycomb Stacks Prepared (Continued)

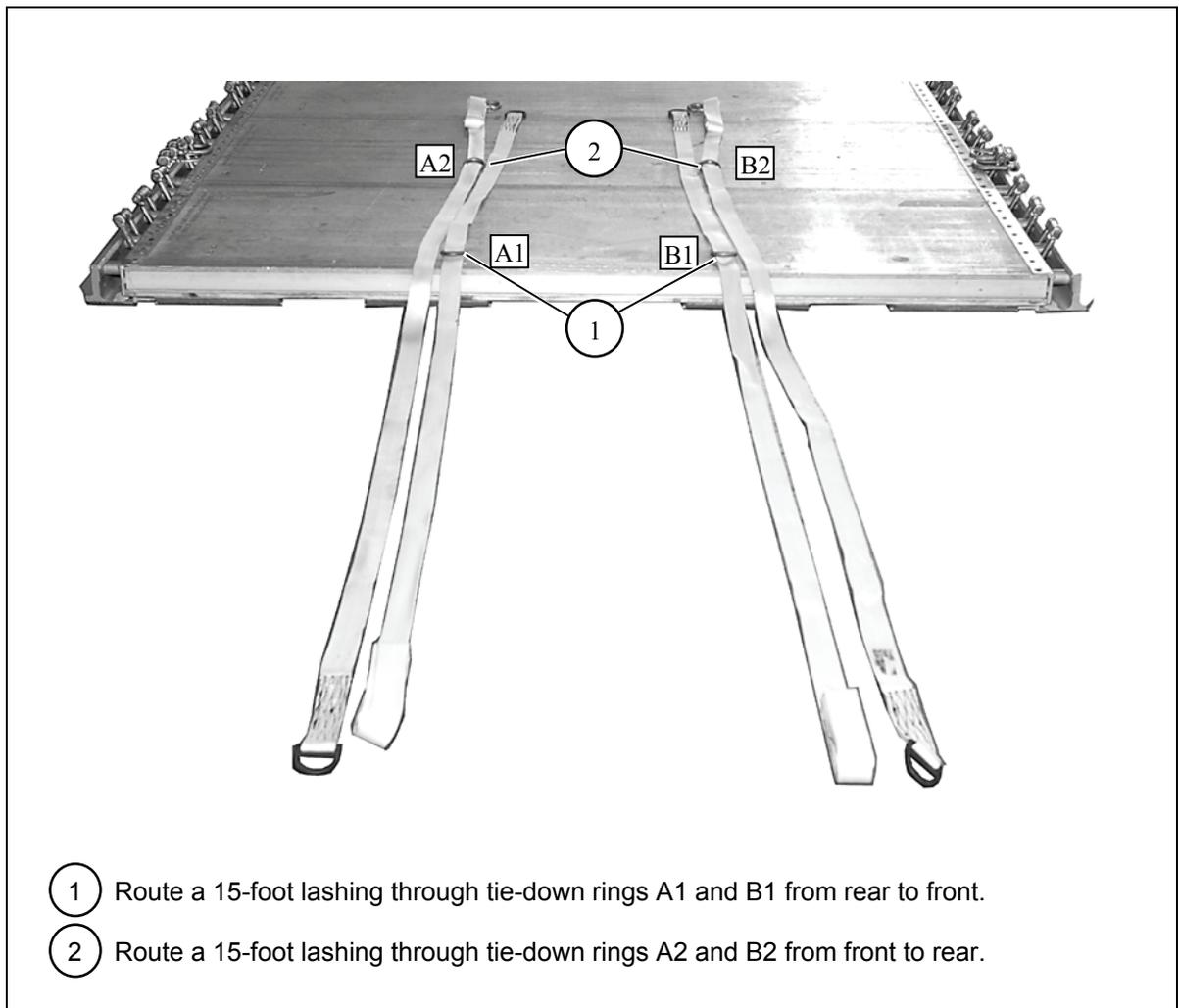
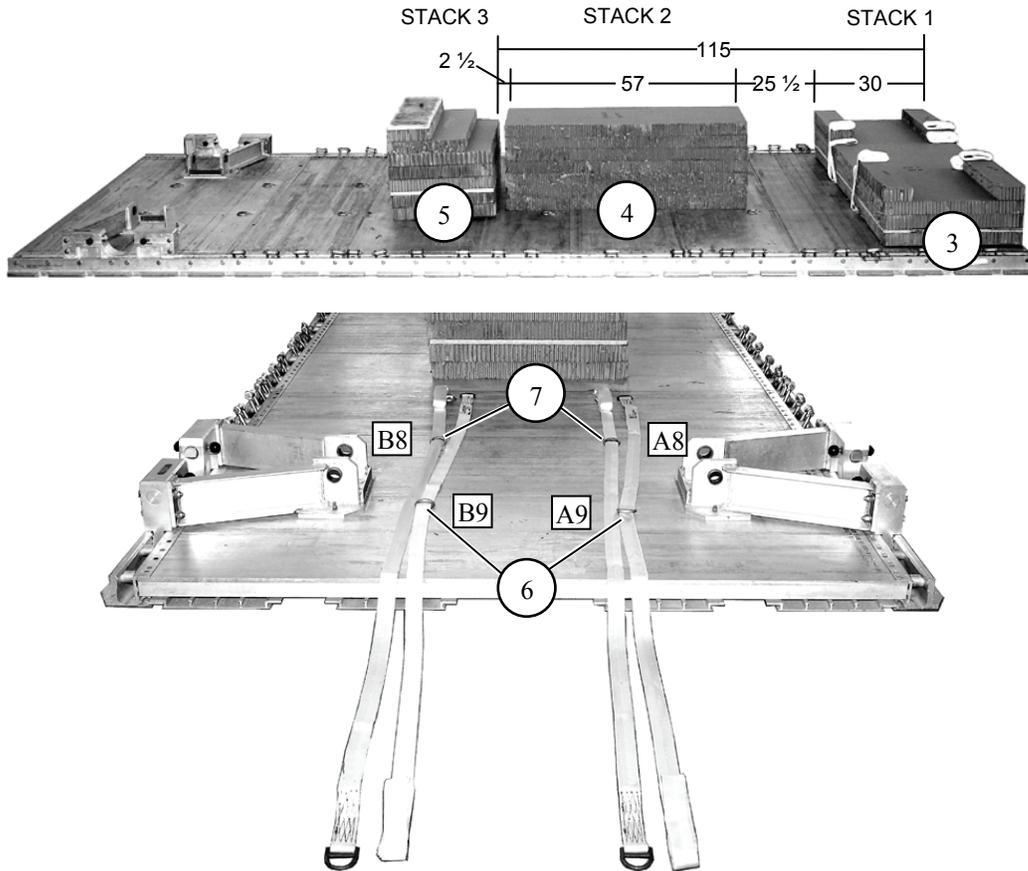


Figure 7-4. Lashings and Honeycomb Stacks Positioned

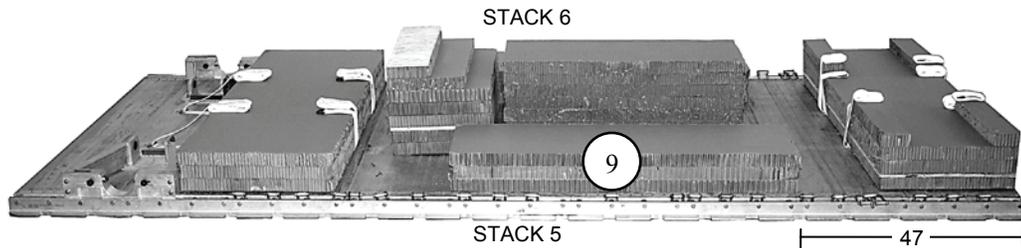
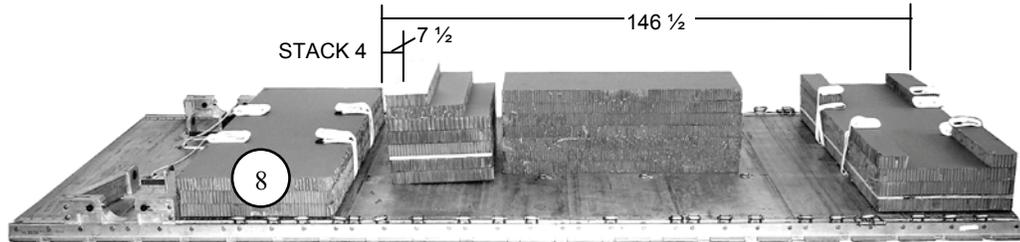
**Note.** All dimensions are given in inches.



- ③ Center stack 1 on top of the lashings and flush with the front of the platform. Roll the excess lashings and place on top of stack 1.
- ④ Center stack 2, 25 1/2 inches from the rear of stack 1 (55 1/2 inches from the front of the platform).
- ⑤ Center stack 3, 2 1/2 inches from the rear of stack 2 (115 inches from the front of the platform).
- ⑥ Route a 15-foot lashing through tie-down rings A9 and B9 from front to rear.
- ⑦ Route a 15-foot lashing through tie-down rings A8 and B8 from rear to front.

**Figure 7-4. Lashings and Honeycomb Stacks Positioned (Continued)**

**Note.** All dimensions are given in inches.



- ⑧ Center stack 4 on top of the lashings  $7 \frac{1}{2}$  inches from the rear of stack 3 (147 inches from the front of the platform). Roll the excess lashings and place on top of stack 4.
- ⑨ Place stack 5 flush against the right side rail, 47 inches from the front of the platform.
- ⑩ Place stack 6 flush against the left side rail, 47 inches from the front of the platform (not shown).

**Figure 7-4. Lashings and Honeycomb Stacks Positioned (Continued)**

## POSITIONING AND SECURING THE ROLLER AND BUCKET

7-4. Position and secure the roller as shown in Figure 7-5. Position and secure the bucket as shown in Figure 7-6.

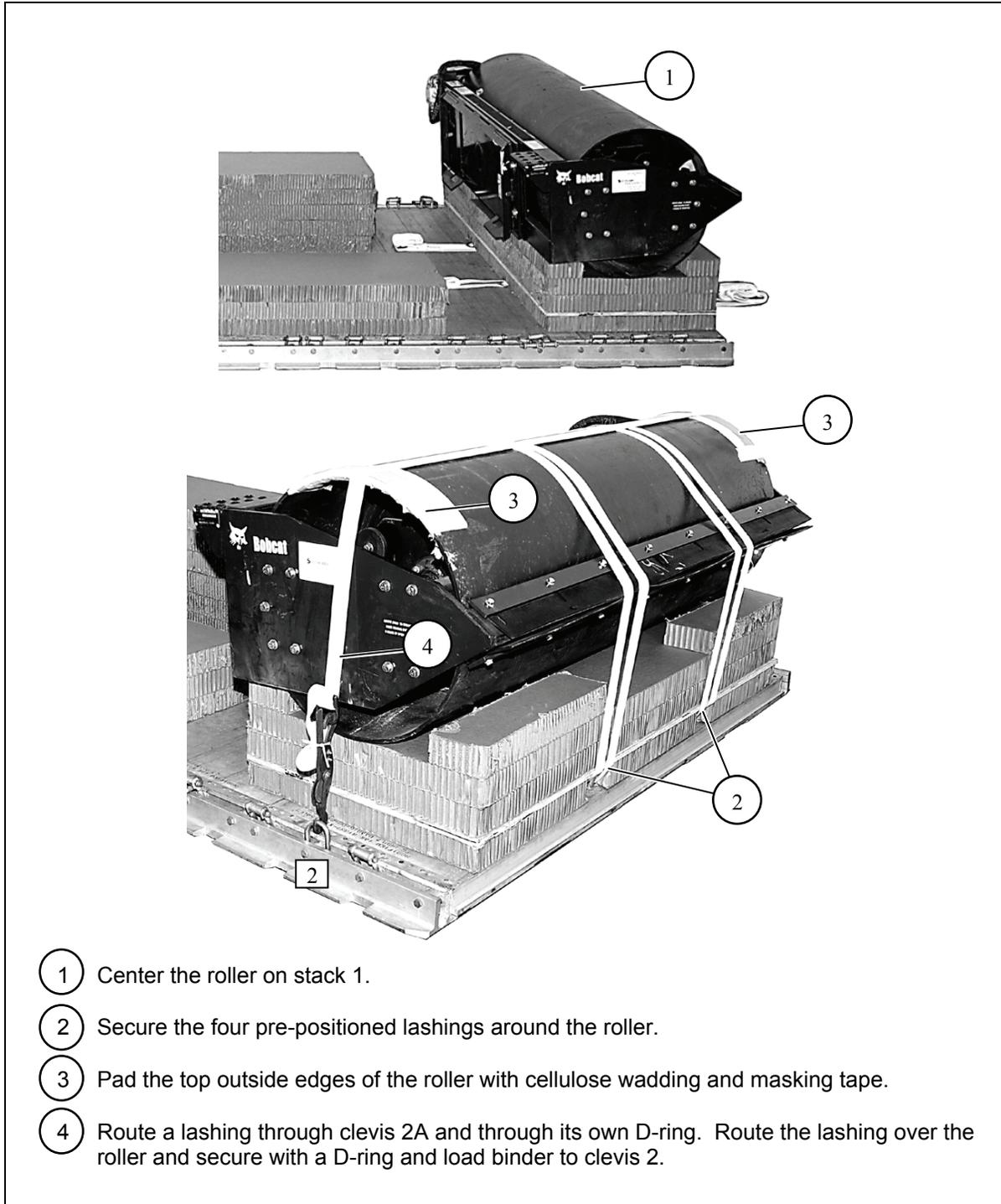
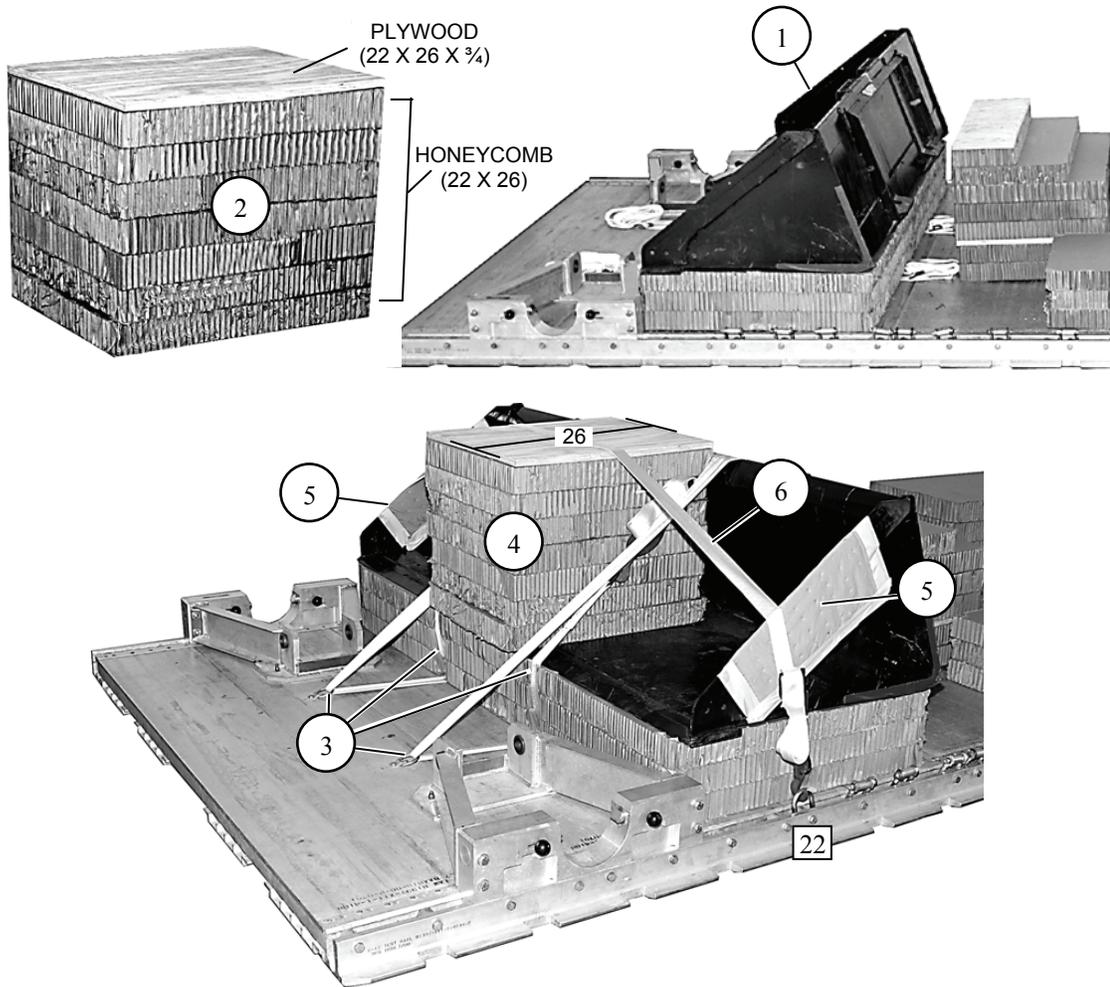


Figure 7-5. Roller Positioned and Secured

**Note.** All dimensions are given in inches.



- 1 Center the bucket on stack 4.
- 2 Cut seven pieces of honeycomb and one piece of  $\frac{3}{4}$ -inch plywood 22- by 26-inches. Glue the honeycomb together and glue the plywood on top of the honeycomb to form a stack as shown above.
- 3 Secure the four pre-positioned lashings around the bucket.
- 4 Position the stack formed in step 2 between the lashings in the bucket.
- 5 Pad the side edges of the bucket with cellulose wadding and masking tape.
- 6 Route a lashing through clevis 22A and through its own D-ring. Route the lashing over the bucket and the stack. Secure with a D-ring and load binder to clevis 22.

**Figure 7-6. Bucket Positioned and Secured**

## PREPARING THE LOADER

7-5. Prepare the loader as shown in Figure 7-7.

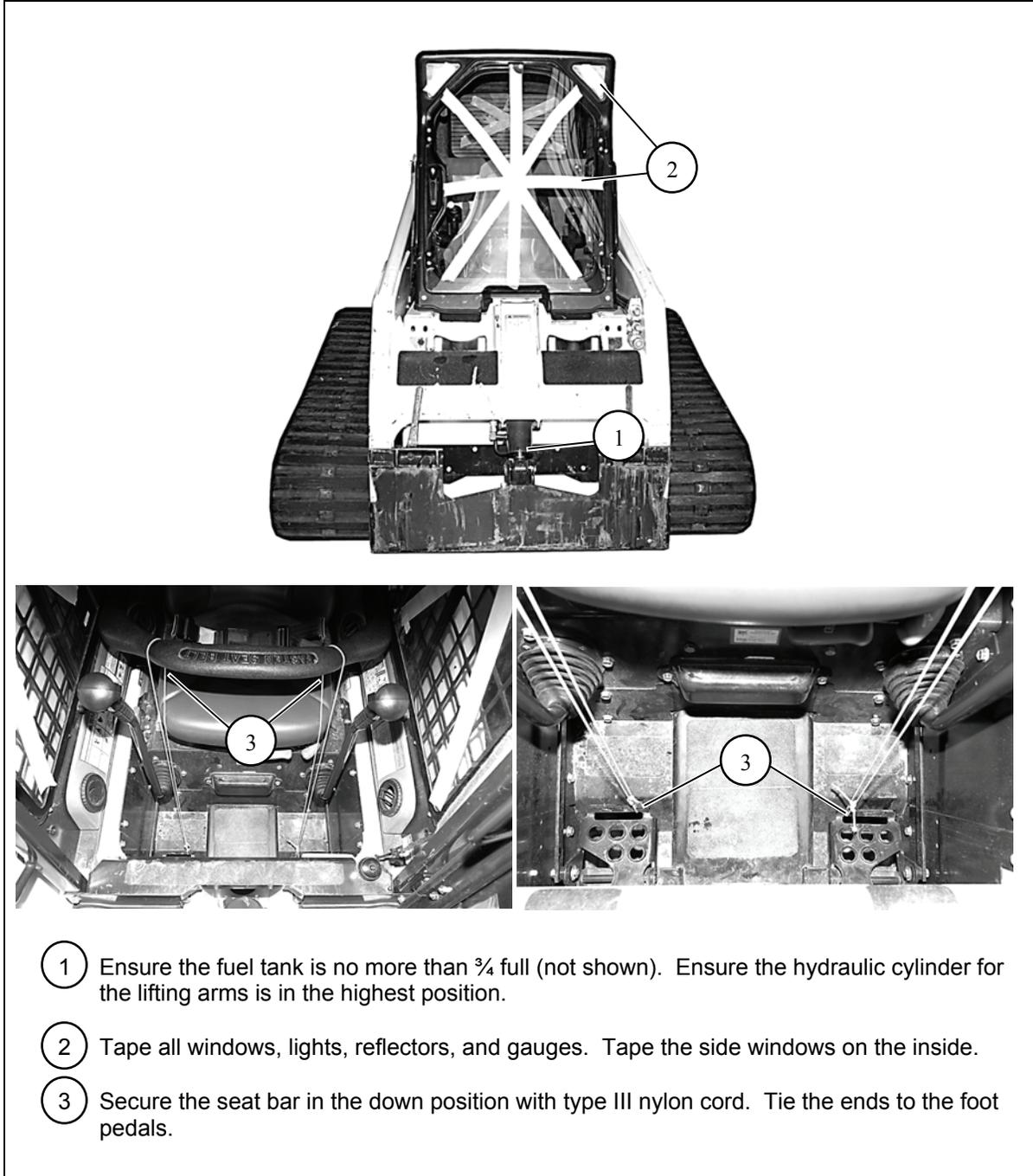


Figure 7-7. Loader Prepared

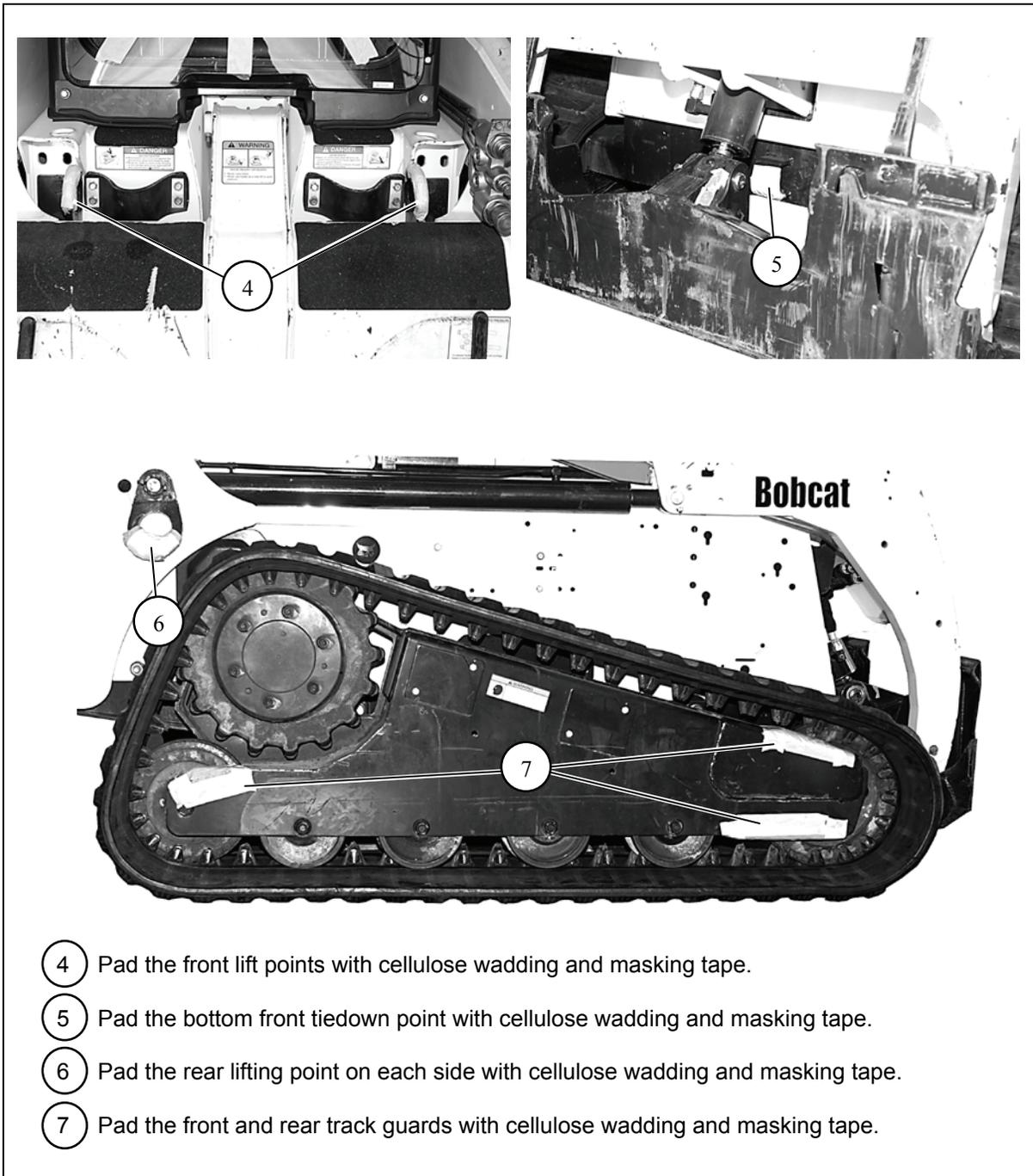


Figure 7-7. Loader Prepared (Continued)

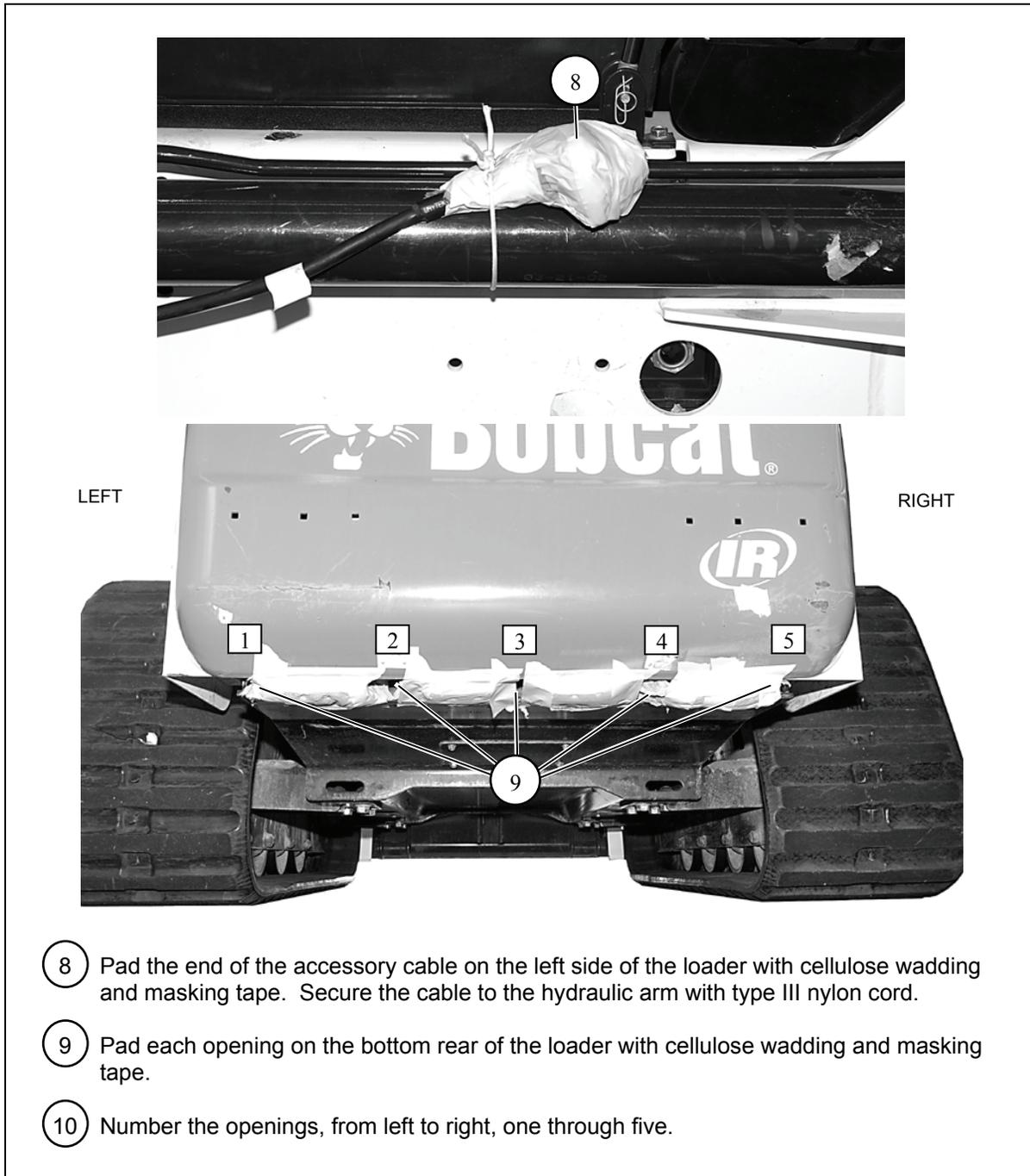
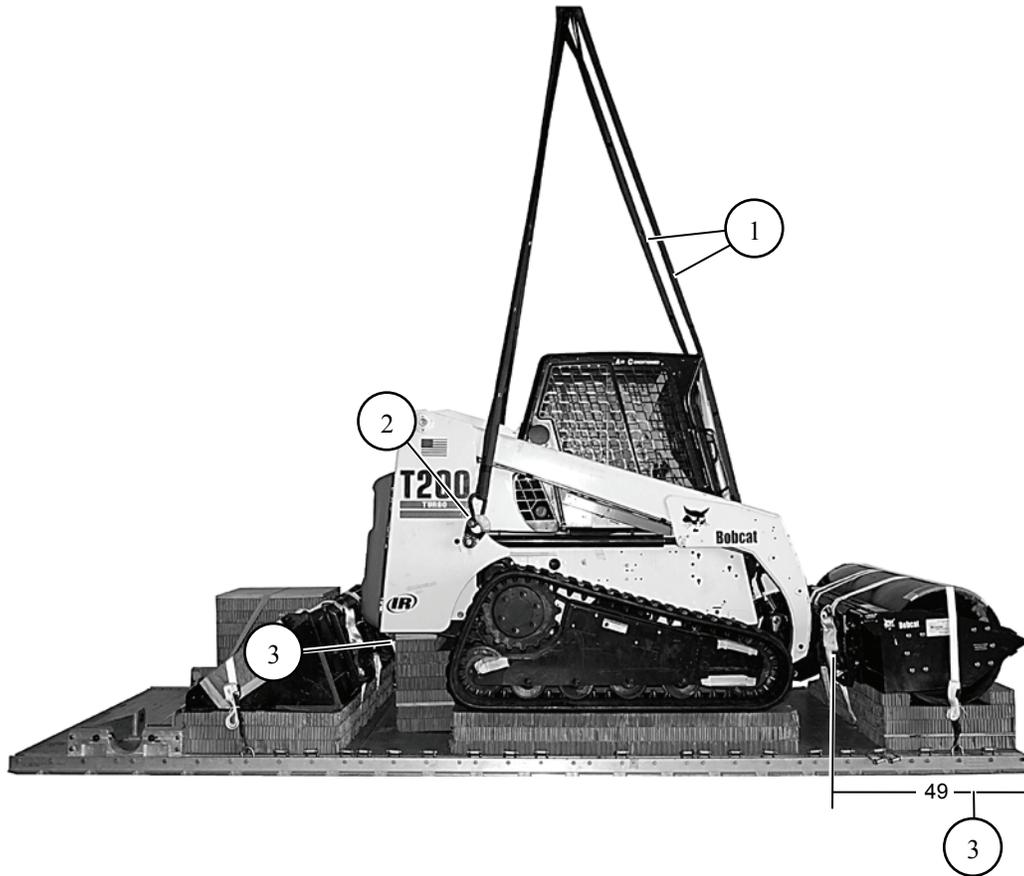


Figure 7-7. Loader Prepared (Continued)

## LIFTING AND POSITIONING THE LOADER

7-6. Install the lifting slings and position the loader as shown in Figure 7-8.

**Note.** All dimensions are given in inches.



- ① Attach a 12-foot (4-loop), type XXVI nylon sling to each front lifting point with a large clevis.
- ② Attach an 11-foot (4-loop), type XXVI nylon sling to each rear lifting point with a large clevis.
- ③ Position the loader 49 inches from the front edge of the platform. Ensure the front edge of the under carriage rests squarely and flush with the front edge of stack 2 (not shown) and the openings on the bottom rear of the loader are to the rear of stack 3.
- ④ Remove the slings and clevises installed in steps 1 and 2 (not shown).

**Figure 7-8. Loader Positioned**

## LASHING THE LOADER

7-7. Lash the loader as shown in Figures 7-9 through 7-14.

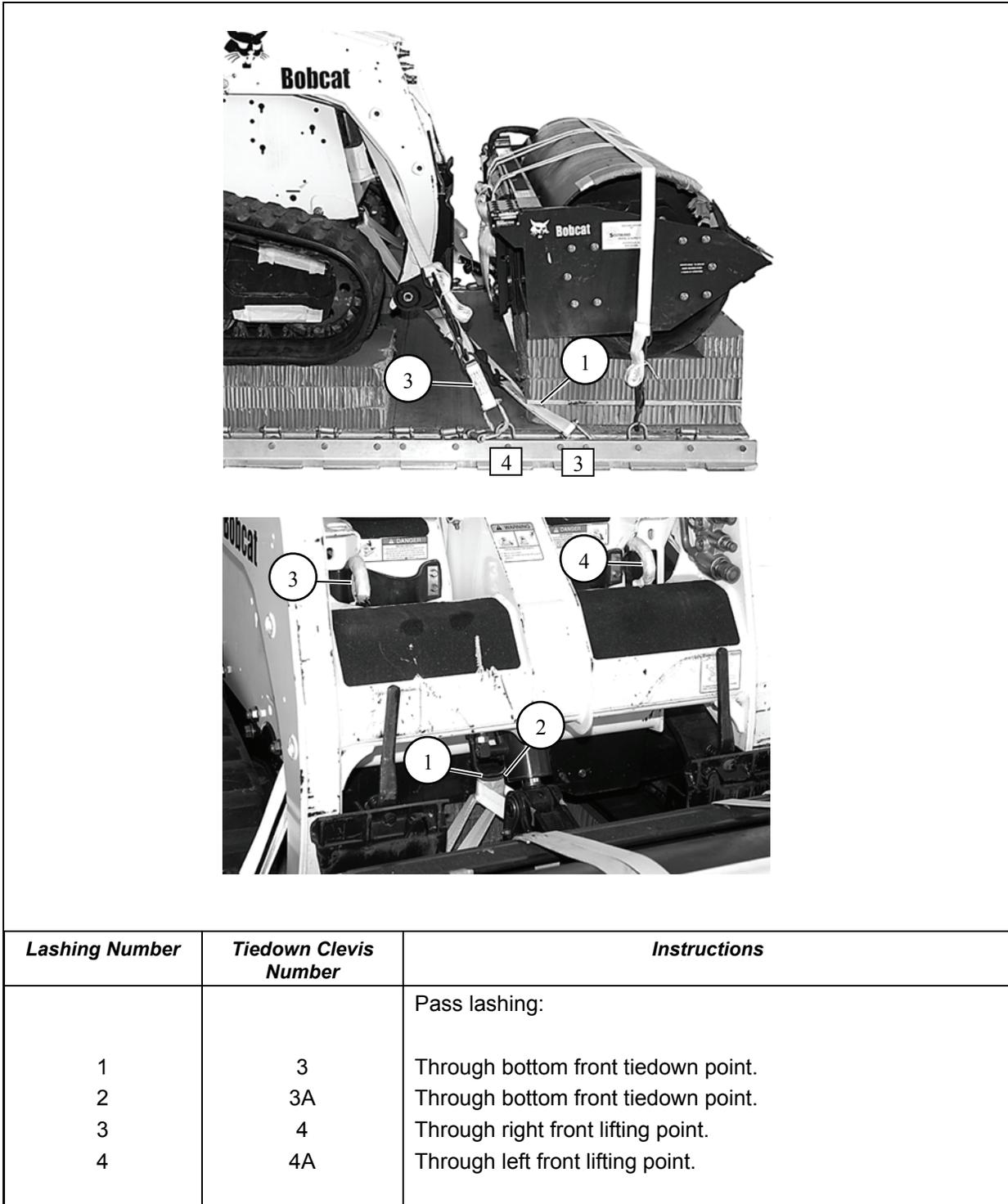
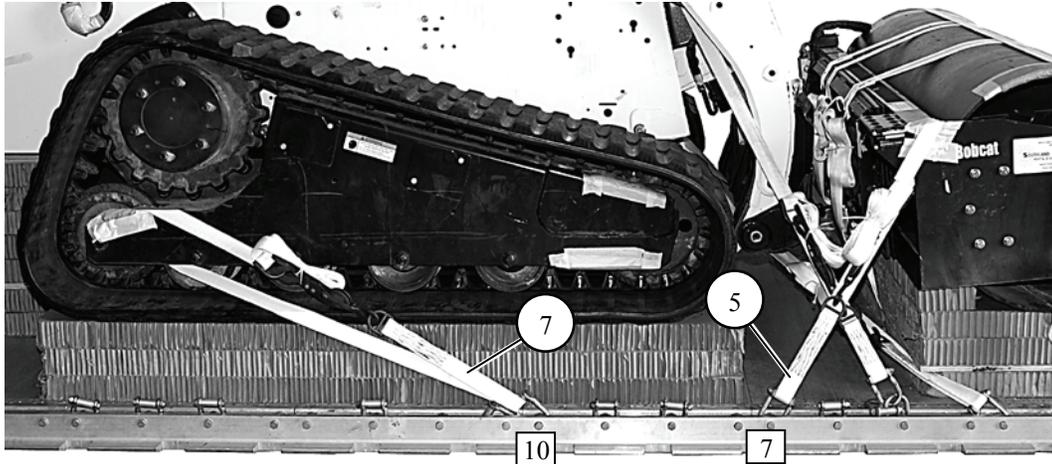
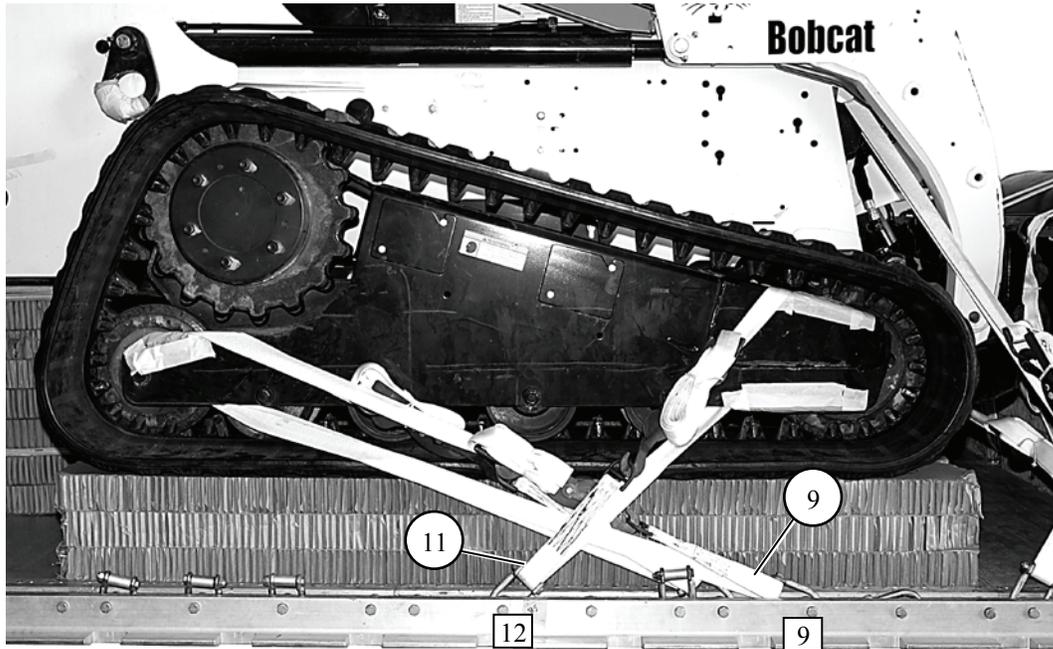


Figure 7-9. Lashings 1 Through 4 Installed



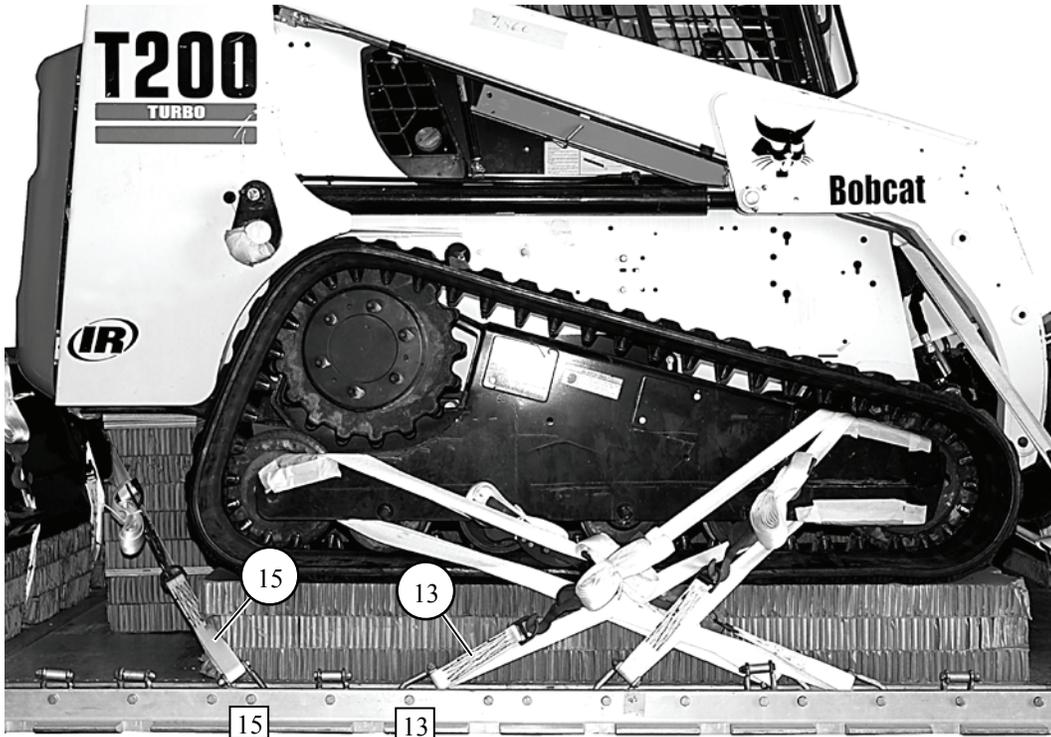
<i>Lashing Number</i>	<i>Tiedown Clevis Number</i>	<i>Instructions</i>
5	7	Pass lashing: Through right rear roller brace. Pad the brace with cellulose wadding and masking tape.
6	7A	Through left rear roller brace. Pad the brace with cellulose wadding and masking tape.
7	10	Through right rear track guard.
8	10A	Through left rear track guard.

**Figure 7-10. Lashings 5 Through 8 Installed**



<i>Lashing Number</i>	<i>Tiedown Clevis Number</i>	<i>Instructions</i>
9	9	Pass lashing: Through right rear track guard.
10	9A	Through left rear track guard.
11	12	Through right front track guard.
12	12A	Through left front track guard.

**Figure 7-11. Lashings 9 Through 12 Installed**



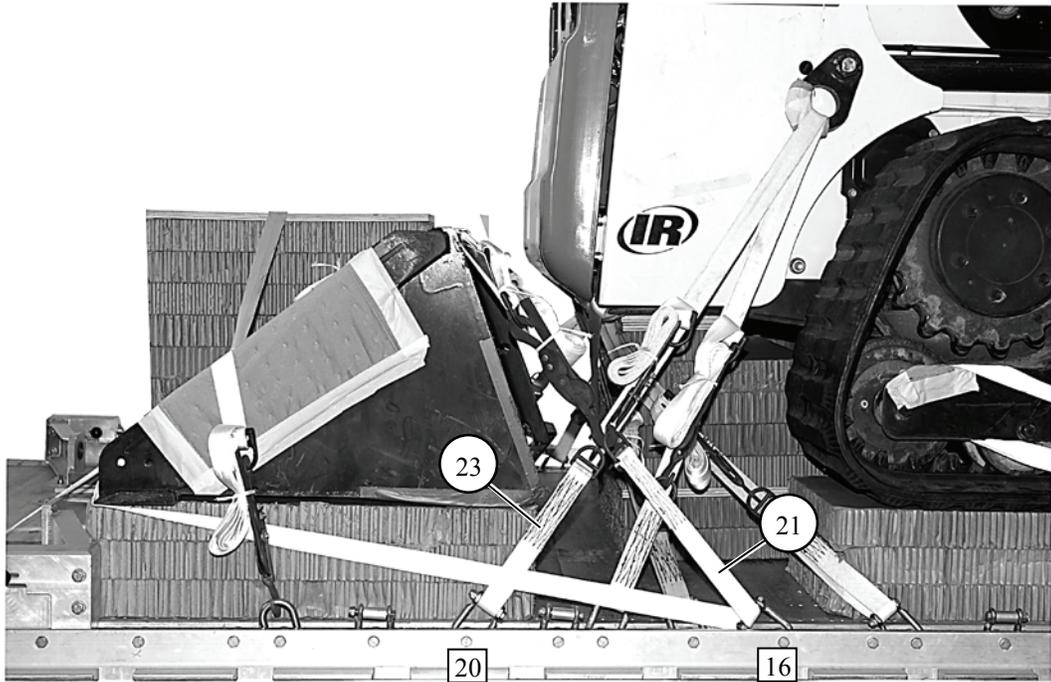
<i>Lashing Number</i>	<i>Tiedown Clevis Number</i>	<i>Instructions</i>
		Pass lashing:
13	13	Through right front track guard.
14	13A	Through left front track guard.
15	15	Through rear bottom hole number 3 and out rear hole number 2 (step 10, Figure 7-7).
16	15A	Through rear bottom hole number 3 and out rear hole number 4 (step 10, Figure 7-7).

**Figure 7-12. Lashings 13 Through 16 Installed**



<i>Lashing Number</i>	<i>Tiedown Clevis Number</i>	<i>Instructions</i>
17	17	Pass lashing: Through rear bottom hole number 2 and out rear hole number 1 (step 10, Figure 7-7).
18	17A	Through rear bottom hole number 4 and out rear hole number 5 (step 10, Figure 7-7).
19	18	Through right rear lifting point.
20	18A	Through left rear lifting point.

**Figure 7-13. Lashings 17 Through 20 Installed**



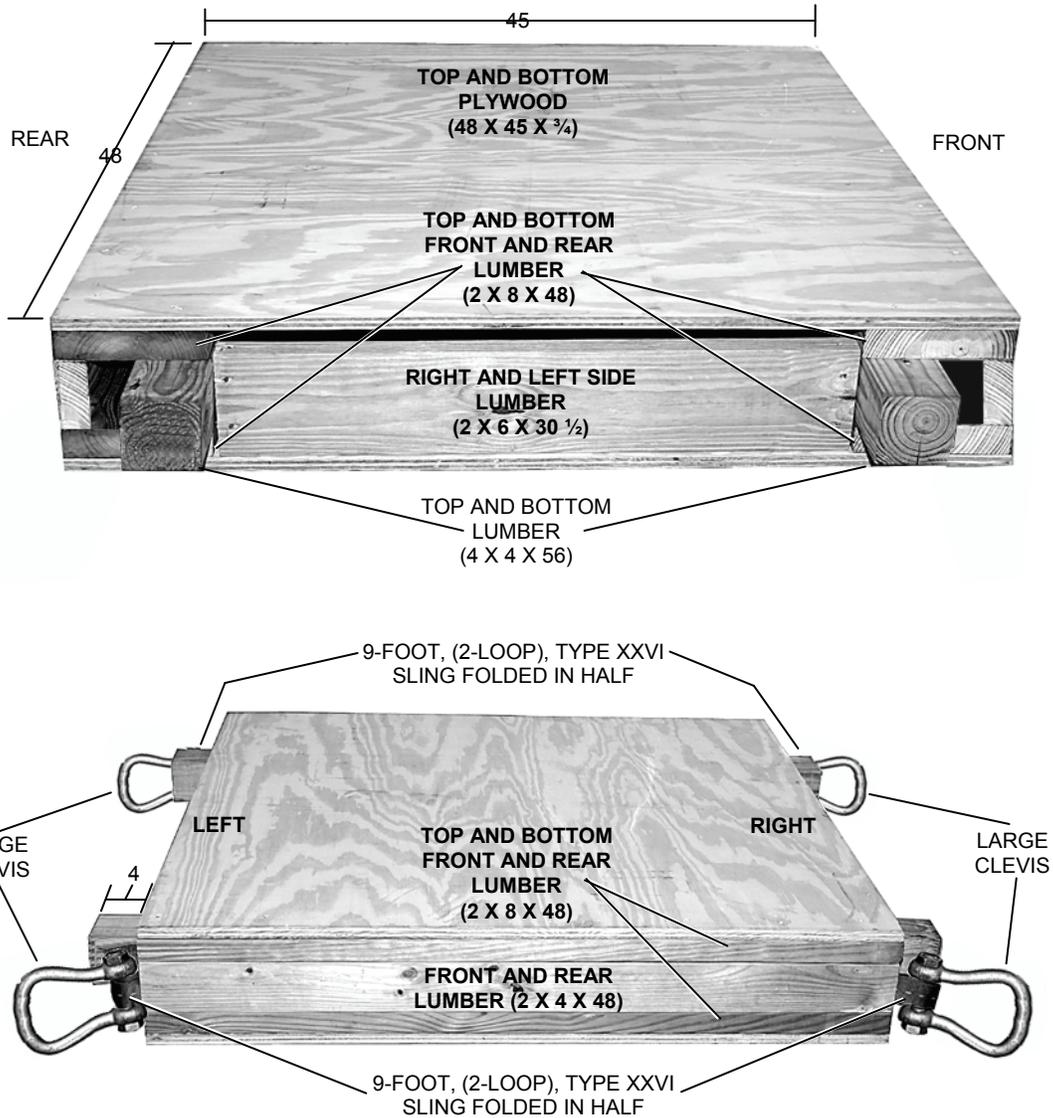
<i>Lashing Number</i>	<i>Tiedown Clevis Number</i>	<i>Instructions</i>
21	16	Pass lashing: Under the bucket and over the top of the bucket.
22	16A	Under the bucket and over the top of the bucket.
23	20	Through right rear lifting point.
24	20A	Through left rear lifting point.

**Figure 7-14. Lashings 21 Through 24 Installed**

## INSTALLING SUSPENSION SLINGS AND ATTITUDE CONTROL SYSTEM (ACS)

7-8. Construct the ACS as shown in Figure 7-15. Install the ACS and suspension slings as shown in Figures 7-16 through 7-18.

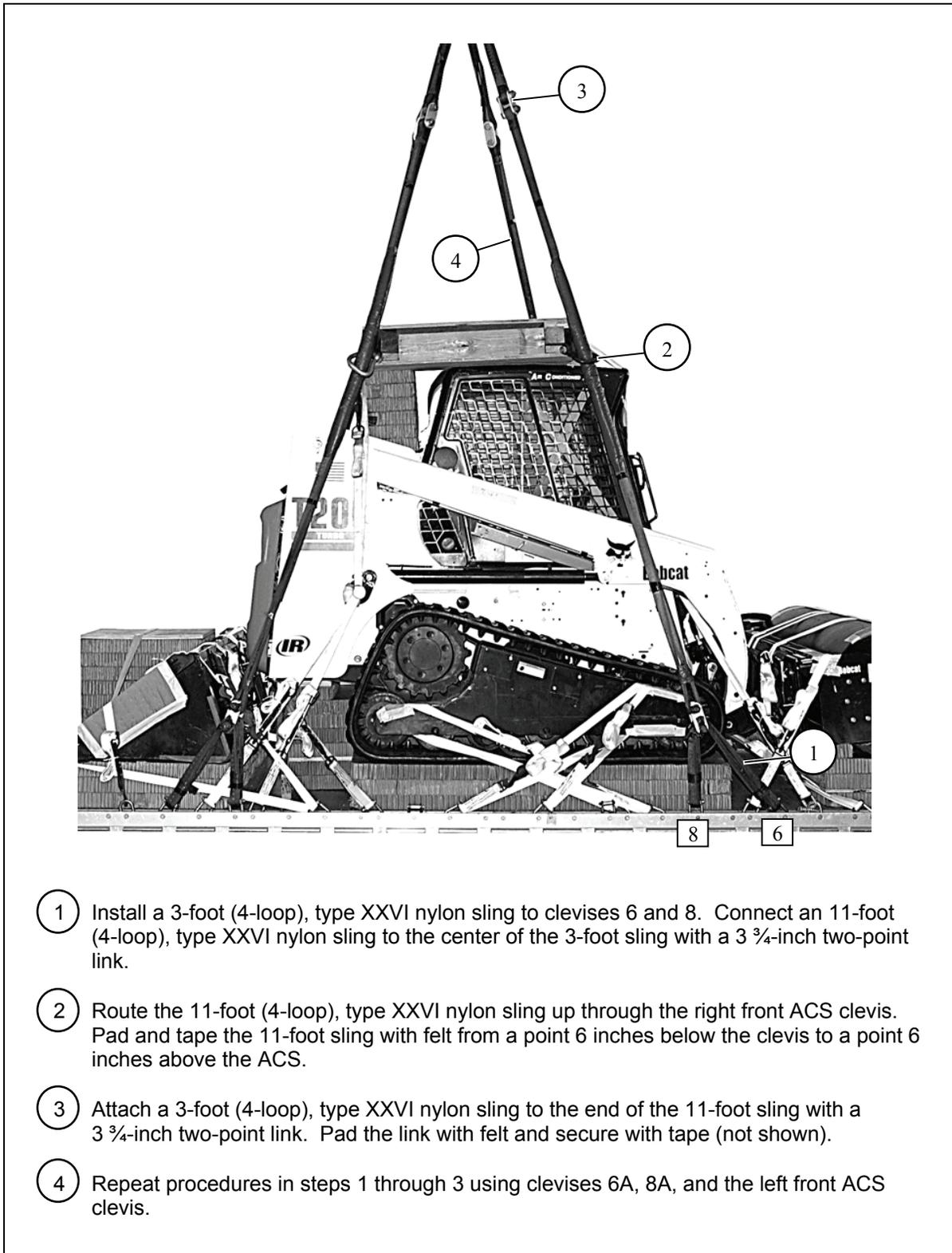
**Note.** All dimensions are given in inches.



- 1 Nail all lumber together with 16d nails. Nail the plywood to the lumber with 8d nails.

**Figure 7-15. ACS Built**

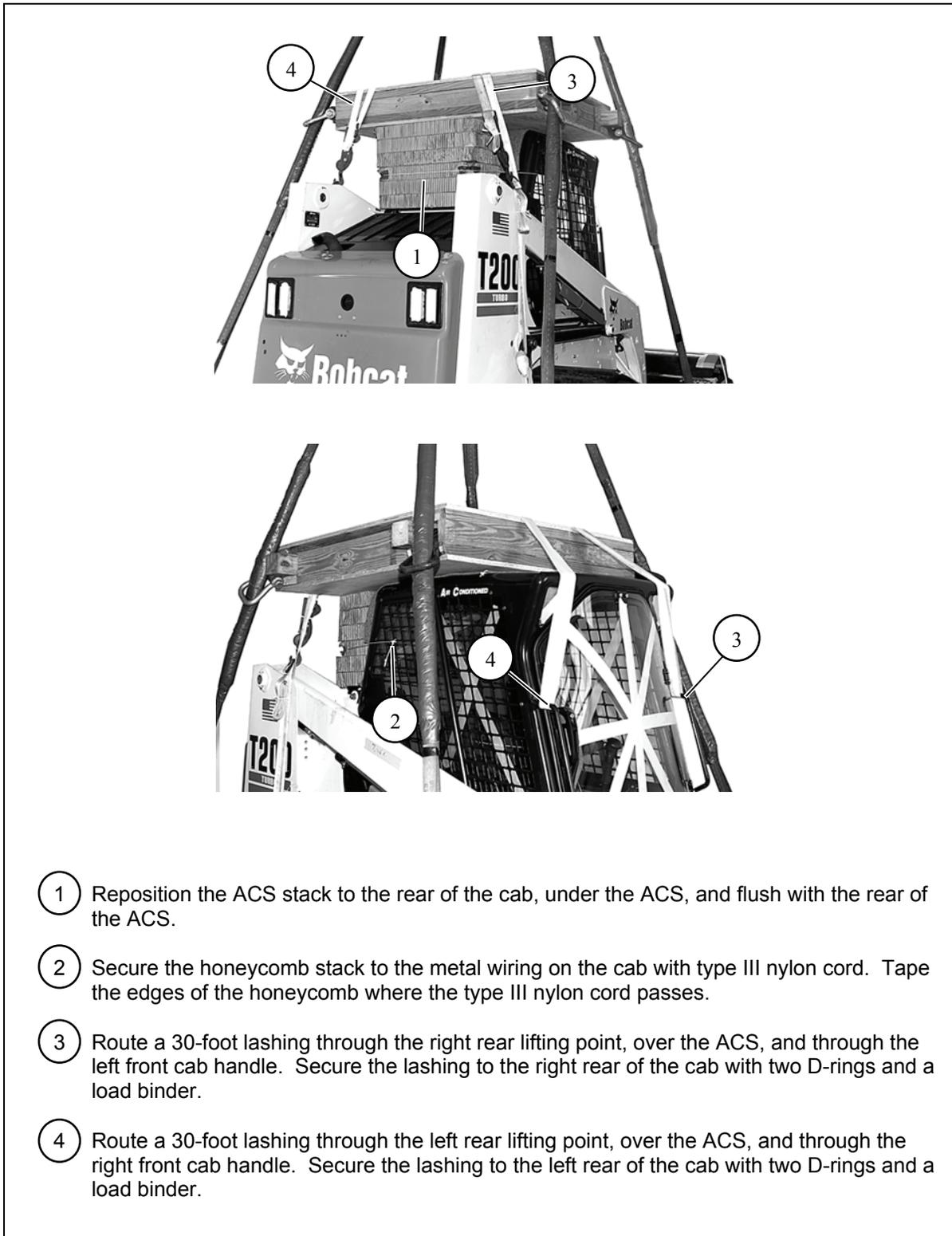




- 1 Install a 3-foot (4-loop), type XXVI nylon sling to clevises 6 and 8. Connect an 11-foot (4-loop), type XXVI nylon sling to the center of the 3-foot sling with a 3 ¾-inch two-point link.
- 2 Route the 11-foot (4-loop), type XXVI nylon sling up through the right front ACS clevis. Pad and tape the 11-foot sling with felt from a point 6 inches below the clevis to a point 6 inches above the ACS.
- 3 Attach a 3-foot (4-loop), type XXVI nylon sling to the end of the 11-foot sling with a 3 ¾-inch two-point link. Pad the link with felt and secure with tape (not shown).
- 4 Repeat procedures in steps 1 through 3 using clevises 6A, 8A, and the left front ACS clevis.

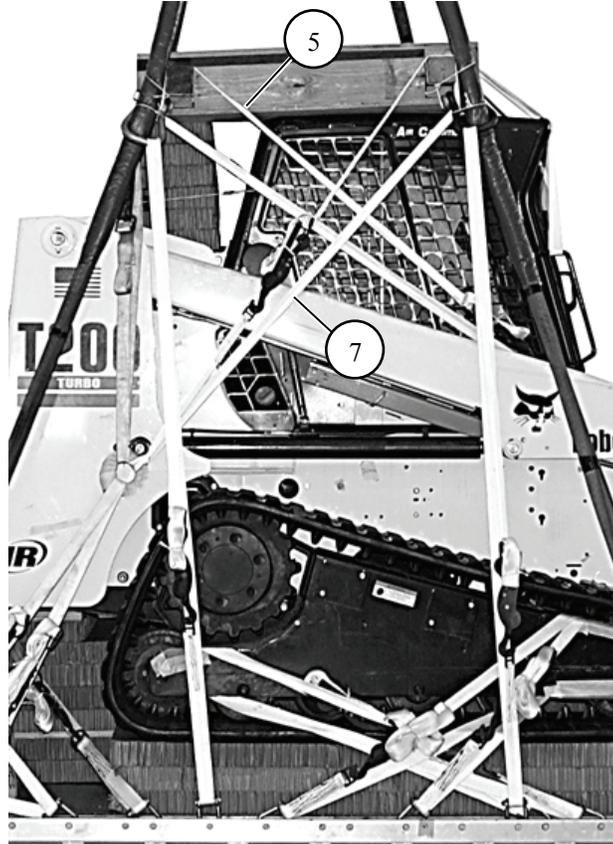
**Figure 7-17. Suspension Slings Installed**





- 1 Reposition the ACS stack to the rear of the cab, under the ACS, and flush with the rear of the ACS.
- 2 Secure the honeycomb stack to the metal wiring on the cab with type III nylon cord. Tape the edges of the honeycomb where the type III nylon cord passes.
- 3 Route a 30-foot lashing through the right rear lifting point, over the ACS, and through the left front cab handle. Secure the lashing to the right rear of the cab with two D-rings and a load binder.
- 4 Route a 30-foot lashing through the left rear lifting point, over the ACS, and through the right front cab handle. Secure the lashing to the left rear of the cab with two D-rings and a load binder.

Figure 7-18. ACS Secured



- 5 Route a lashing through the right front lifting point, to the bottom of the right rear ACS 4- by 4-inch lumber, over the top of the 4- by 4-inch lumber and secure with D-ring and load binder.

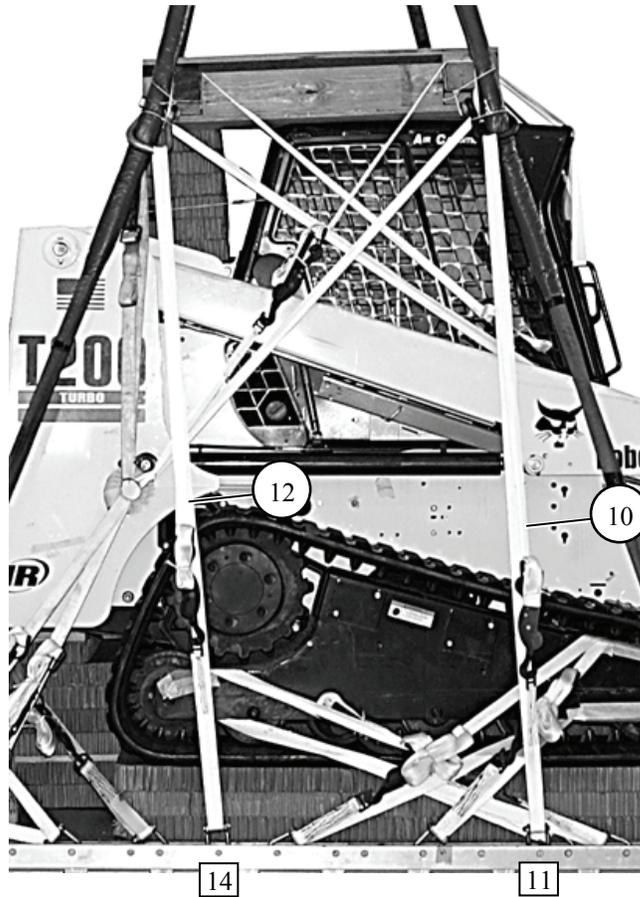
**Note.** Do not tighten or close the load binder at this time.

- 6 Repeat step 5 using the left front lifting point and the left rear ACS 4- by 4-inch lumber.
- 7 Route a lashing through the right rear lifting point, to the bottom of the right front ACS 4- by 4-inch lumber, over the top of the 4- by 4-inch lumber and secure with D-ring and load binder.

**Note.** Do not tighten or close the load binder at this time.

- 8 Repeat step 7 using the left rear lifting point and the left front ACS 4- by 4-inch lumber.
- 9 Tighten and close all four load binders in steps 5 through 8 simultaneously.

**Figure 7-18. ACS Secured (Continued)**



- ⑩ Route a lashing through clevis 11, through the right front ACS clevis from inside to outside and secure with a D-ring and load binder.

**Note.** Do not tighten or close the load binder at this time.

- ⑪ Repeat step 10 using clevis 11A and the left front ACS clevis.

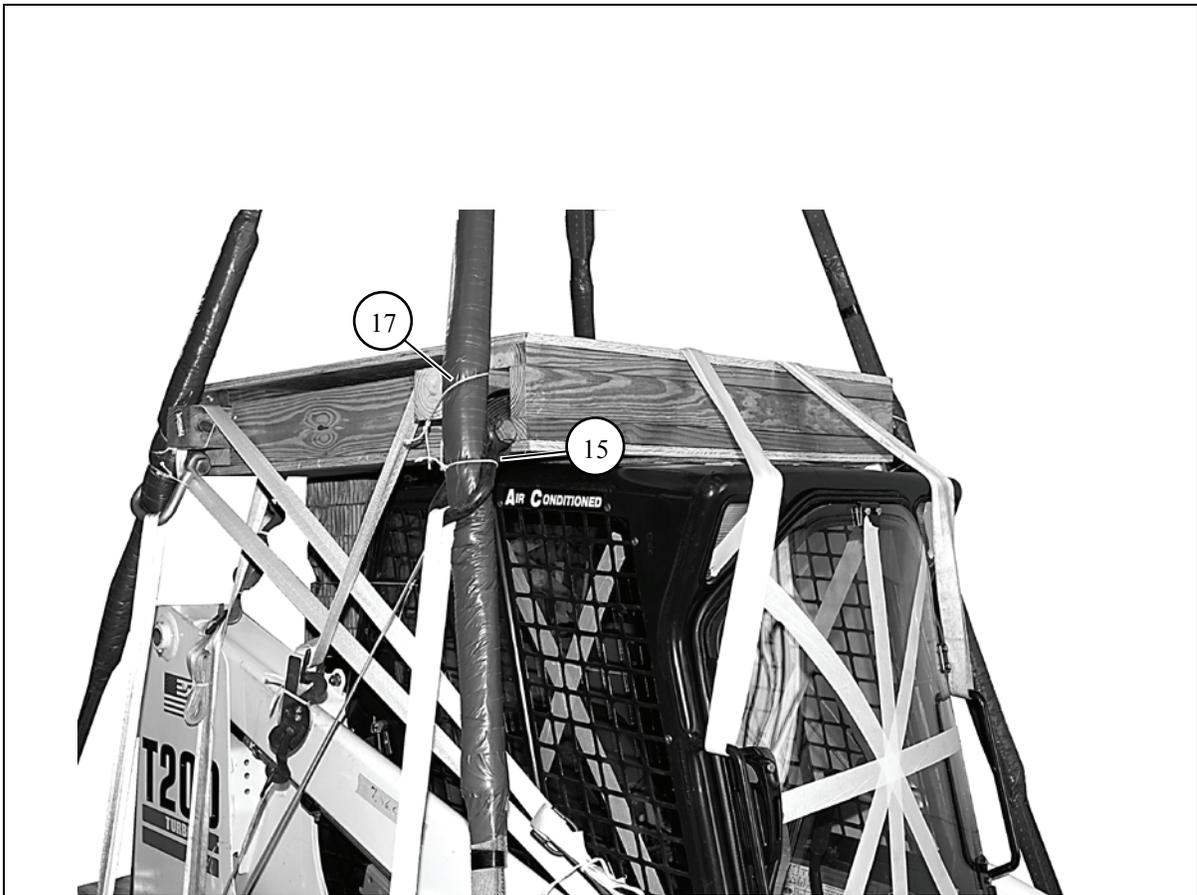
- ⑫ Route a lashing through clevis 14, through the left rear ACS clevis from inside to outside and secure with a D-ring and load binder.

**Note.** Do not tighten or close the load binder at this time.

- ⑬ Repeat step 12 using clevis 14A and the left rear ACS clevis.

- ⑭ Tighten and close all four load binders in steps 10 through 13 simultaneously.

**Figure 7-18. ACS Secured (Continued)**



- 15 Tie a length of type III nylon cord around suspension sling and the ACS clevis.
- 16 Repeat step 15 on all remaining suspension slings and ACS clevises.
- 17 Tie a length of type III nylon cord around and behind the suspension sling, behind all lashings, and around the ACS 4- by 4-inch lumber.
- 18 Repeat step 17 on all remaining suspension slings and ACS 4- by 4-inch lumber.
- 19 Tie a length of type III nylon cord from each rear lower 3 ¾-inch link to the side lifting point (not shown).

**Note.** The front 3 ¾-inch links will be safety tied after the parachute stowage platform is installed.

**Figure 7-18. ACS Secured (Continued)**

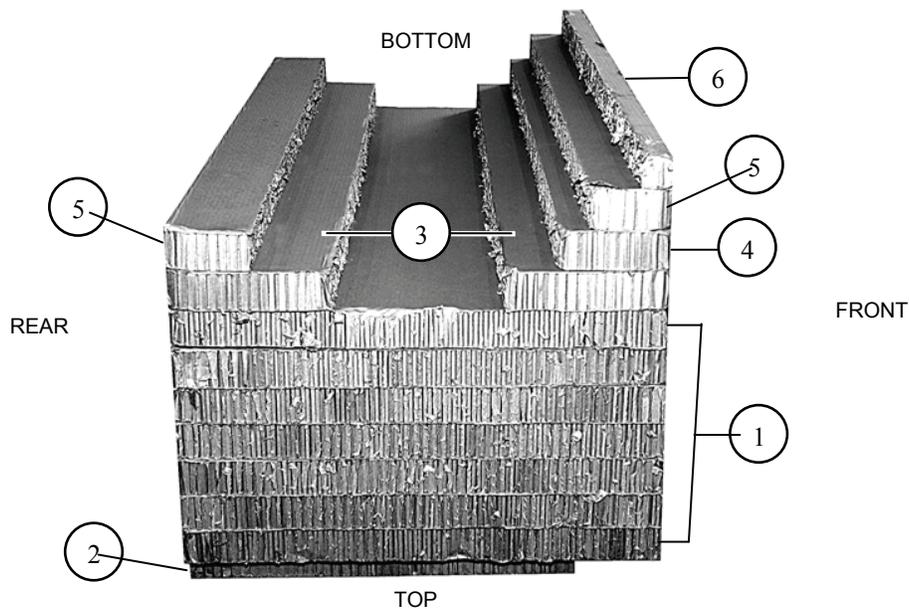
## INSTALLING OUTRIGGER ASSEMBLIES

7-9. Assemble, install, and safety tie the mast and foot assemblies on the DRAS platform as shown in Chapter 2, Figures 2-42 through 2-44 and 2-45, steps 1 through 3.

## STOWING CARGO PARACHUTES

7-10. Construct the parachute support stack and stowage platform as shown in Figure 7-19. Prepare, stow, and restrain four G-11D cargo parachutes according to Chapter 2 and as shown in Figures 7-20 and 7-21.

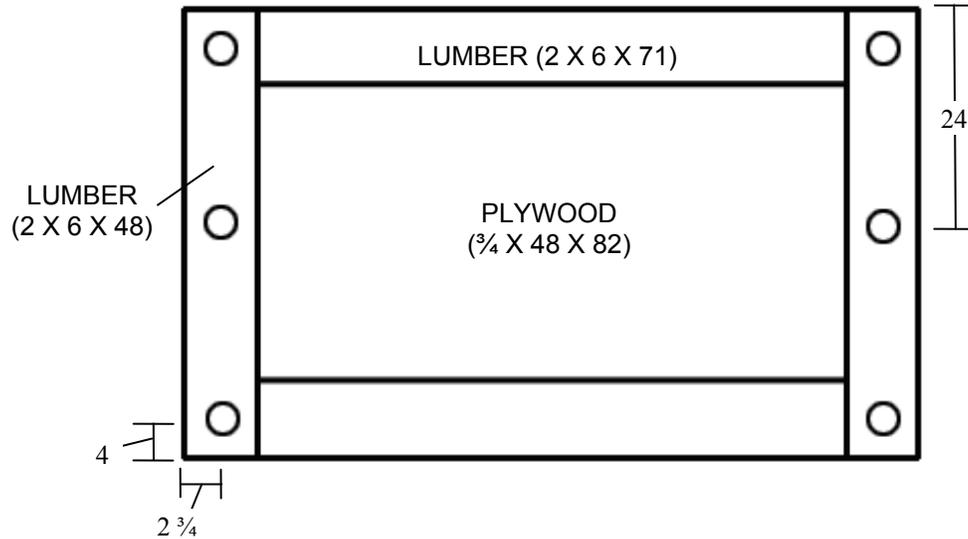
**Note.** The parachute support stack is pictured upside down.



- ① Cut and glue seven 35- by 74 ½-inches pieces of honeycomb.
- ② Center and glue a 29- by 70-inch piece of honeycomb flush with the rear of the stack. This is the top of the stack.
- ③ Invert the stack. Cut two 12- by 74 ½-inch pieces of honeycomb. Glue one piece flush with the front of the stack and one piece flush with the rear of the stack.
- ④ Cut and glue an 8- by 74 ½-inch piece of honeycomb flush with the front of the stack.
- ⑤ Cut two 6- by 74 ½-inch pieces of honeycomb. Glue one piece flush with the front of the stack and one piece flush with the rear of the stack.
- ⑥ Cut and glue a 2- by 74 ½-inch piece of honeycomb flush with the front of the stack. Turn the stack right side up.

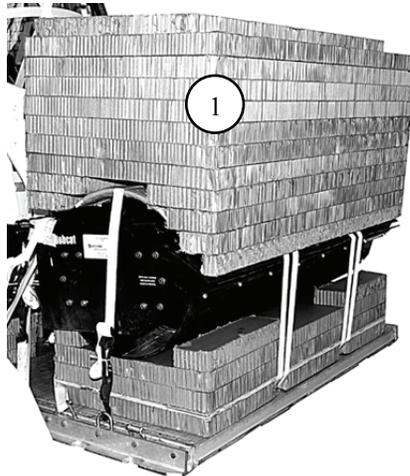
**Figure 7-19. Parachute Support Stack and Stowage Platform Built**

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



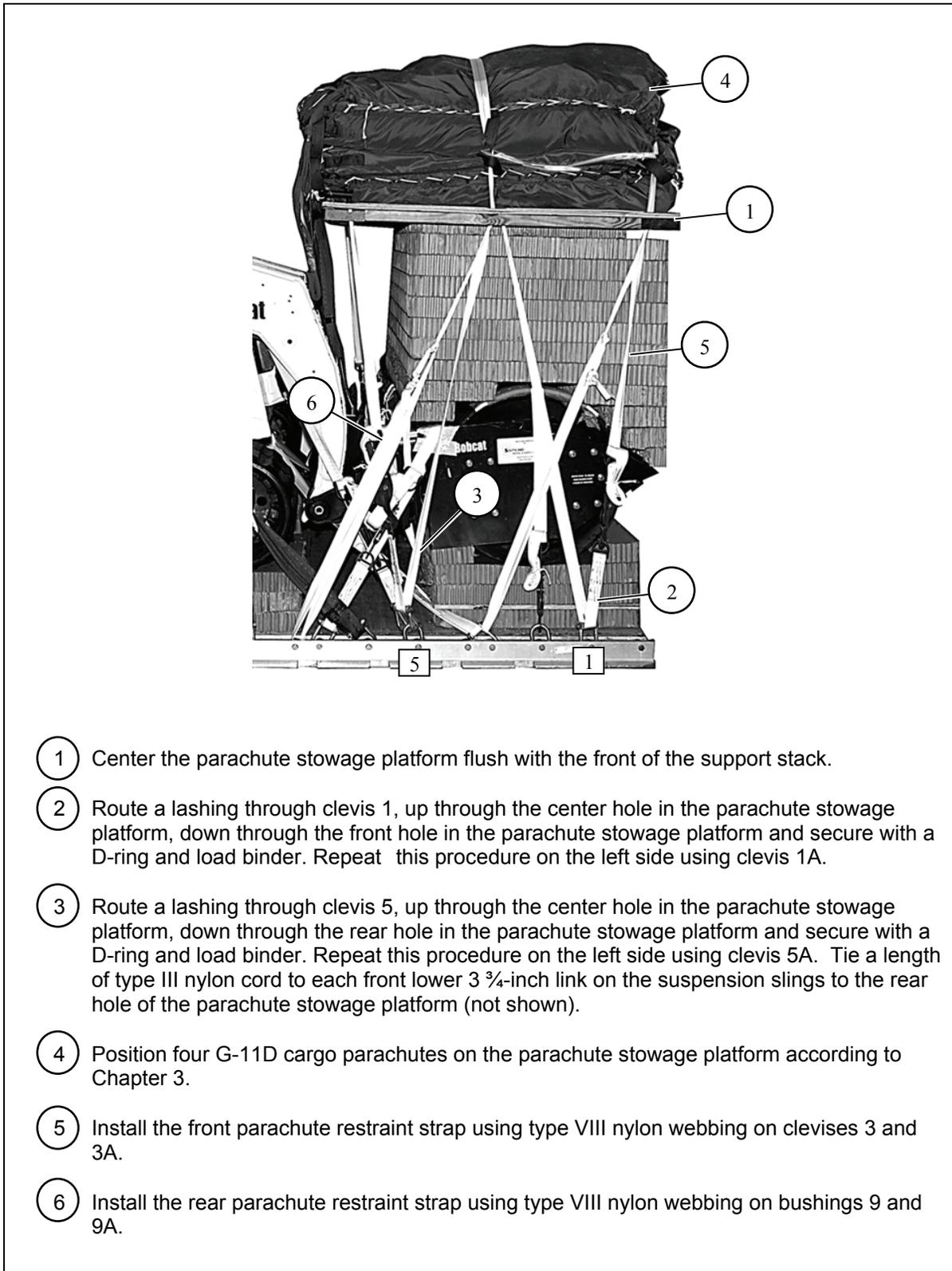
- 7 Build the parachute stowage platform as shown above and nail the plywood to the lumber with 8d nails.

Figure 7-19. Parachute Support Stack and Stowage Platform Built (Continued)



- 1 Center the parachute support stack on the roller.

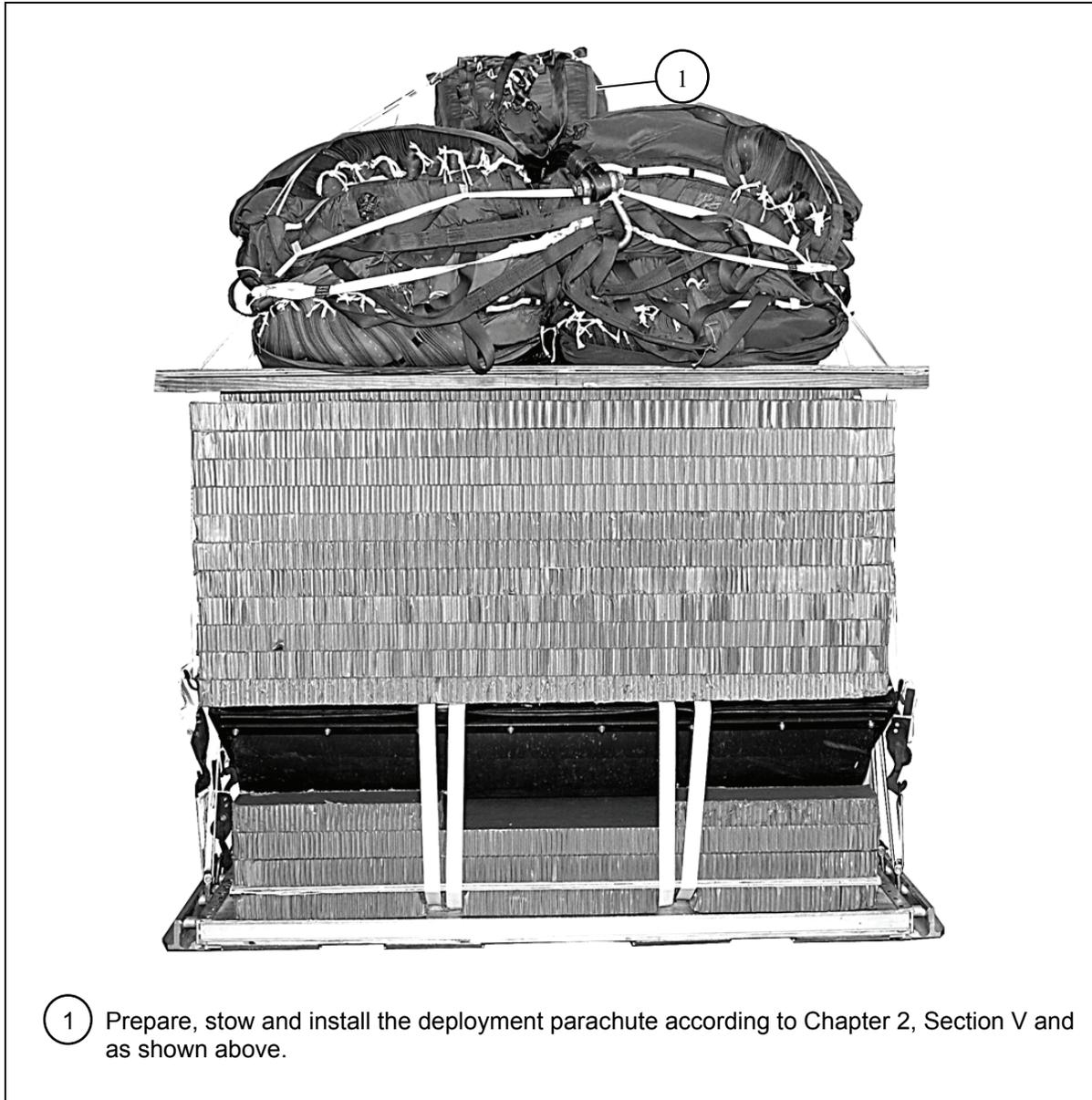
Figure 7-20. Parachute Support Stack Positioned



**Figure 7-21. Cargo Parachutes Positioned and Restrained**

## STOWING DEPLOYMENT PARACHUTE

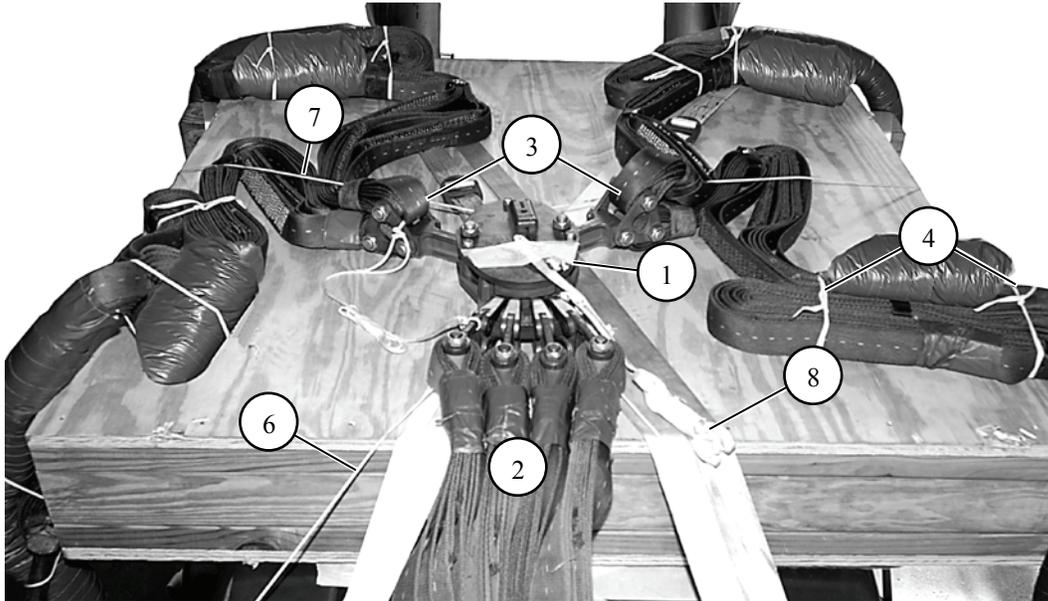
7-11. Prepare, stow, and install the deployment parachute according to Chapter 2, Section V and as shown in Figure 7-22.



**Figure 7-22. Deployment Parachute Installed**

## INSTALLING PARACHUTE RELEASE SYSTEM

7-12. Prepare and install an M-1 parachute release system according to Chapter 2, Section VI and as shown in Figure 7-23.



- 1 Position the M-1 release on top of the ACS with the parachute release connectors near the front edge of the ACS.
- 2 Attach the parachute riser extensions to the parachute release connectors.
- 3 Attach the suspension slings to the lower suspension links.

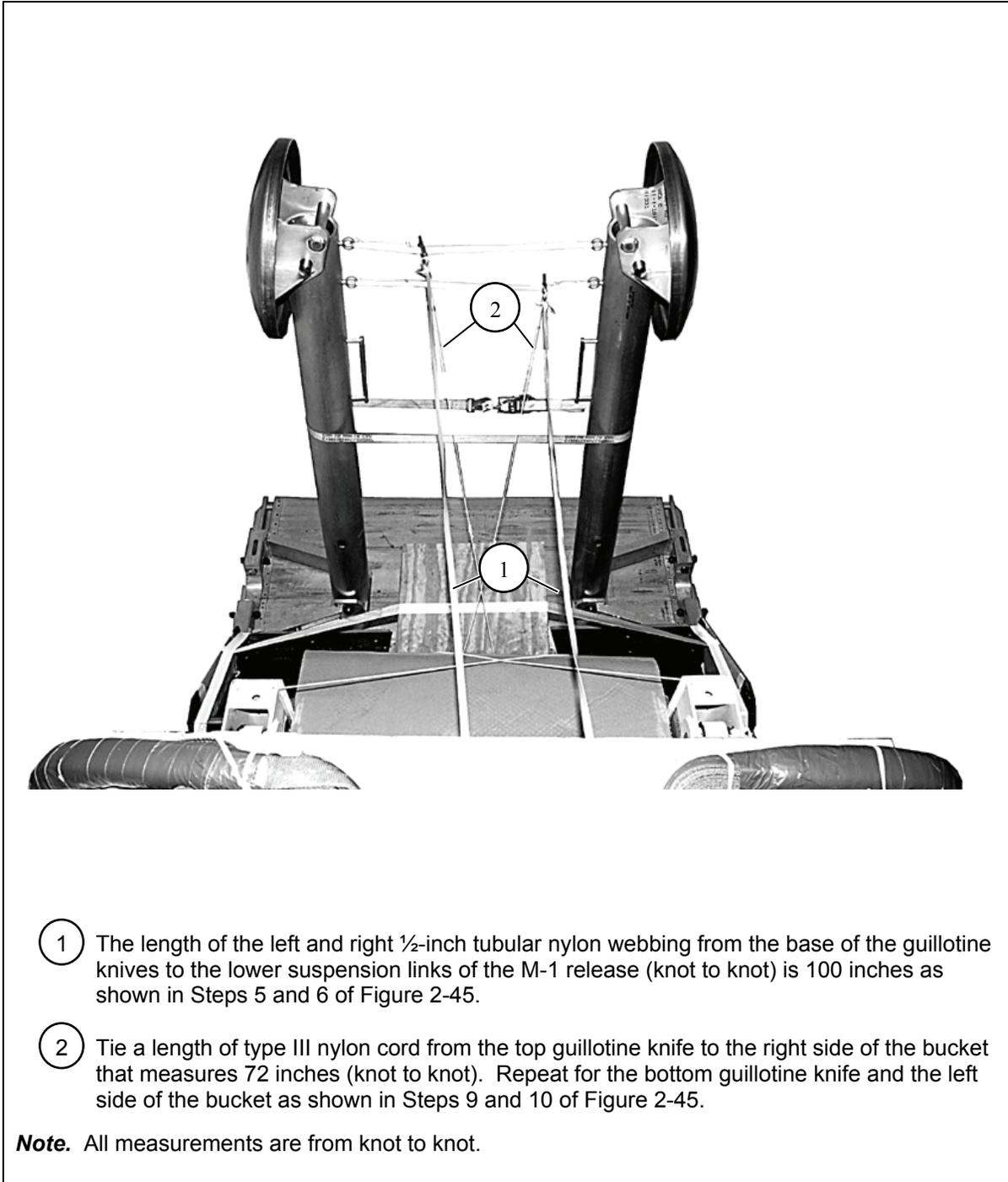
**Note.** Remove the buffers from the ends of the suspension slings that attach to the M-1 release.

- 4 S-fold the suspension slings on top of the ACS and safety tie at or near the 3 ¾-inch link with type I, ¼-inch cotton webbing. Make two ties on each sling.
- 5 Group the riser extensions together and safety tie with type I, ¼-inch cotton webbing half way between the M-1 release and the parachutes (not shown).
- 6 Tie the front M-1 parachute release safety tie to convenient points on the load with type III nylon cord.
- 7 Tie the rear M-1 parachute release safety tie to convenient points on the load with type III nylon cord.
- 8 Attach the arming wire and lanyard to a carrying handle on the parachute with three alternating half hitches with a knot in the running end.

Figure 7-23. M-1 Parachute Release Installed

## INSTALLING MAST RELEASE KNIVES

7-13. Install the mast release knives according to Chapter 2, Figure 2-45, Steps 4 through 10 and as shown in Figure 7-24.



**Figure 7-24. Mast Release Knives Installed**

## INSTALLING VEHICLE BODY PROTECTION

7-14. Install vehicle body protection as shown in Figure 7-25.



- 1 Contour a full sheet of honeycomb around the rear of the loader and secure to convenient points on the load with type III nylon cord. Tape the edges of the honeycomb where the type III nylon cord crosses the honeycomb.

**Figure 7-25. Vehicle Body Protected**

## MARKING RIGGED LOAD

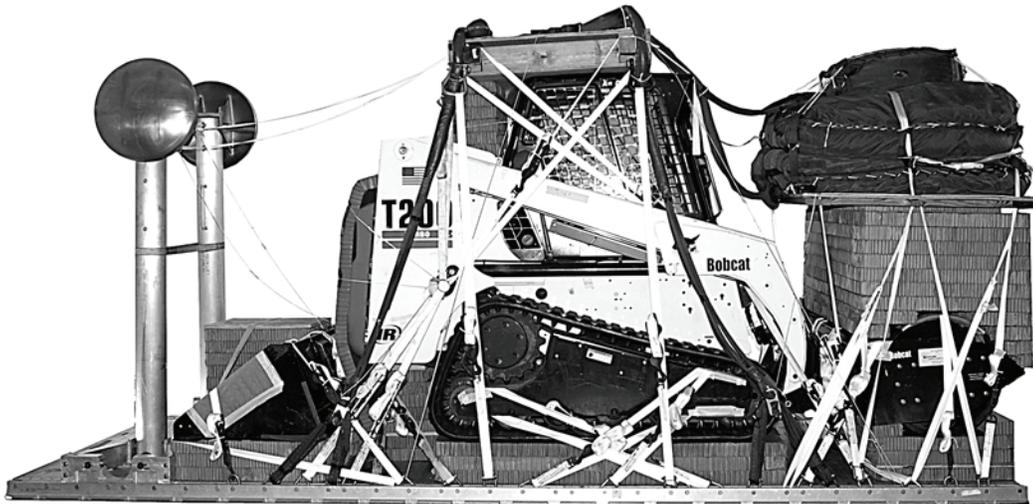
7-15. Mark the rigged load according to Chapter 2, Section IX of this manual and as shown in Figure 7-26. A Shipper's Declaration for Dangerous Goods is required.

## EQUIPMENT REQUIRED

7-16. The equipment required to rig this load is listed in Table 7-1.

### CAUTION

Make the final rigger inspection required by Chapter 2, Section IX before the load leaves the rigging site.



### RIGGED LOAD DATA

Weight: Load shown.....	14,240 pounds
Maximum load allowed .....	14,500 pounds
Height.....	105 inches
Width .....	88 inches
Overall Length.....	216 inches
Overhang: Front.....	0 inches
Rear .....	0 inches
Center of Balance: (from front edge of platform): .....	86 inches

Figure 7-26. T200 Bobcat Compact Track Loader Rigged on DRAS Platform

**Table 7-1. Equipment Required for Rigging T200 Bobcat Compact Track Loader on DRAS Platform**

<i>National Stock Number</i>	<i>Item</i>	<i>Quantity</i>
8040-00-273-8713	Adhesive paste, 1-gallon	As required
4020-00-240-2146	Cord, nylon, type III, 550-pound	As required
	Clevis:	
4030-00-090-5354	Large	5
4030-00-678-8562	Medium	4
1670-00-360-0328	Cover, clevis, large	4
8135-00-664-6958	Cushioning material, packaging, cellulose wadding	As required
8305-00-191-1101	Felt, ½-inch	As required
1670-01-493-6418	Link assembly, two-point, 3 ¾-inch	9
	Lumber:	
5510-00-220-6146	2- by 4-inch	As required
5510-00-220-6148	2- by 6-inch	As required
5510-00-220-6274	4- by 4-inch	As required
5530-00-618-8073	Plywood, ¾-inch	4 sheets
	Nail, steel wire, common:	
5315-00-010-4659	8d	As required
5315-00-753-3885	16d	As required
1670-00-753-3928	Pad, energy dissipating, honeycomb	22 sheets
1670-01-487-5461	Static line assembly release away	1
	Parachute:	
	Cargo:	
1670-01-016-7841	G-11D	4
1670-00-040-8135	Cargo extraction: 28-foot (deployment parachute)	1
	Platform, dual row, 18-foot	
1670-01-485-1654	Rail, DRAS	2
1670-01-486-1342	Roller Pad, DRAS	4
1670-01-486-1656	Panel Assembly, Main	9
1670-01-162-2372	Clevis assembly	46
1670-01-097-8816	Release, cargo parachute, M-1	1
	Sling, cargo airdrop	
	For suspension:	
1670-01-062-6310	11-foot (4-loop), type XXVI nylon webbing	4
1670-01-062-6306	3-foot (4-loop), type XXVI nylon webbing	8
	For deployment:	
1670-01-062-6306	3-foot (4-loop), type XXVI nylon webbing	1
	For riser extension:	
1670-01-062-6313	60-foot (3-loop), type XXVI nylon webbing	4
	For ACS:	
1670-01-062-6304	9-foot (2-loop), type XXVI nylon webbing	2

**Table 7-1. Equipment Required for Rigging T200 Bobcat Compact Track Loader on DRAS Platform (Continued)**

<i>National Stock Number</i>	<i>Item</i>	<i>Quantity</i>
	For lifting:	
1670-01-063-7760	11-foot (2-loop), type XXVI nylon webbing	2
1670-01-062-6303	12-foot (2-loop), type XXVI nylon webbing	2
1670-00-040-8219	Strap, parachute release, multicut	2
1670-00-937-0271	Knife release, cargo (guillotine)	6
1670-01-487-5464	Outrigger assembly	1
7510-00-266-5016	Tape, adhesive, 2-inch	As required
1670-00-937-0271	Tie-down assembly, 15-foot	48
1670-00-725-1437	Tie-down, cargo, aircraft, (CGU-1B)	1
	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	As required

**SECTION II – T200 BOBCAT COMPACT TRACK LOADER ACCESSORY LOAD**

**DESCRIPTION OF LOAD**

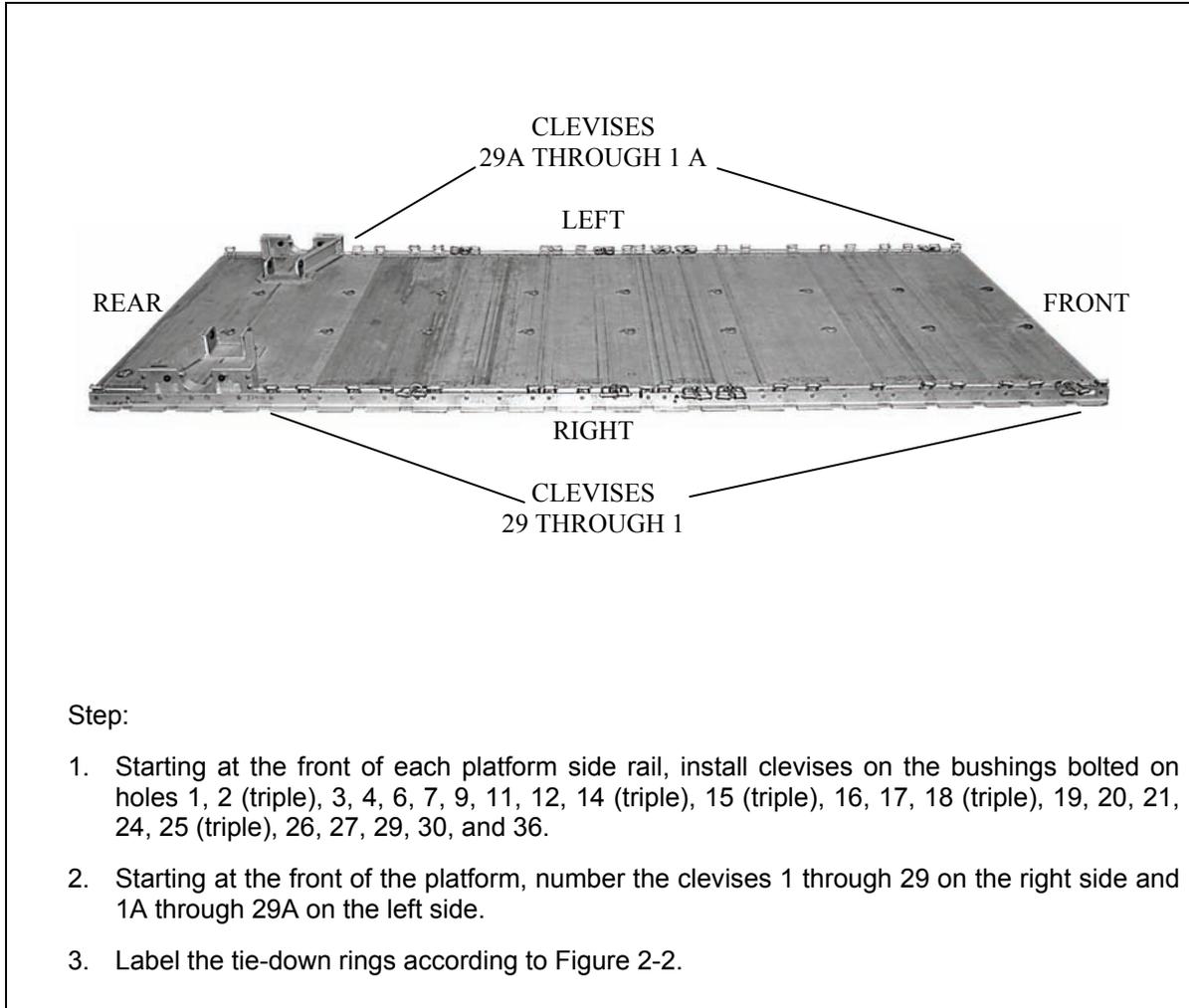
7-17. The T200 Bobcat compact track loader accessory load, consisting of an auger/jackhammer, a concrete mixer, a sweeper, a 500-gallon water drum, and forty 60-pound bags of concrete, is rigged on a DRAS airdrop platform. The auger/jackhammer weighs 670 pounds. The mixer weighs 320 pounds. The sweeper weighs 940 pounds. The total weight of the concrete is 2,400 pounds and the water drum with approximately 350 gallons of water weighs 3,140 pounds. The load, as shown, is rigged with three G-11D cargo parachutes.

**CAUTION**

There must be no more than 350 gallons of water in the water drum. Do not pressurize the drum with air.

## PREPARING PLATFORM

7-18. Inspect, or assemble and inspect, a DRAS platform with outrigger assemblies and outrigger platform support weldments according to TM 10-1670-268-20&P and as shown in Figure 7-27.



Step:

1. Starting at the front of each platform side rail, install clevises on the bushings bolted on holes 1, 2 (triple), 3, 4, 6, 7, 9, 11, 12, 14 (triple), 15 (triple), 16, 17, 18 (triple), 19, 20, 21, 24, 25 (triple), 26, 27, 29, 30, and 36.
2. Starting at the front of the platform, number the clevises 1 through 29 on the right side and 1A through 29A on the left side.
3. Label the tie-down rings according to Figure 2-2.

**Figure 7-27. Platform Prepared**

## BUILDING, PLACING, AND PACKING THE ACCESSORY BOX

7-19. Build the accessory boxes shown in Figure 7-28. Position the accessory boxes as shown in Figure 7-29. Pack the accessory box as shown in Figure 7-30.

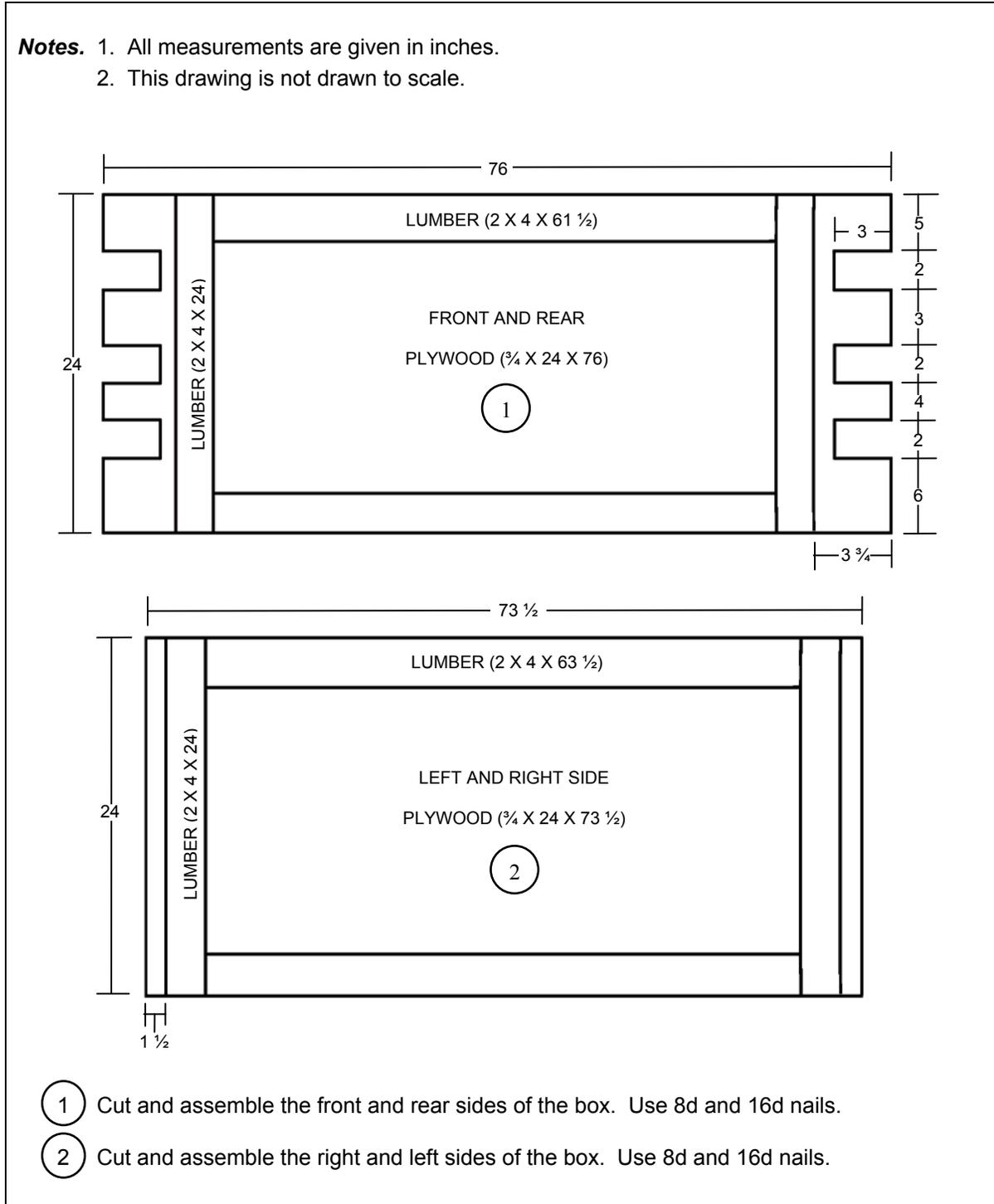
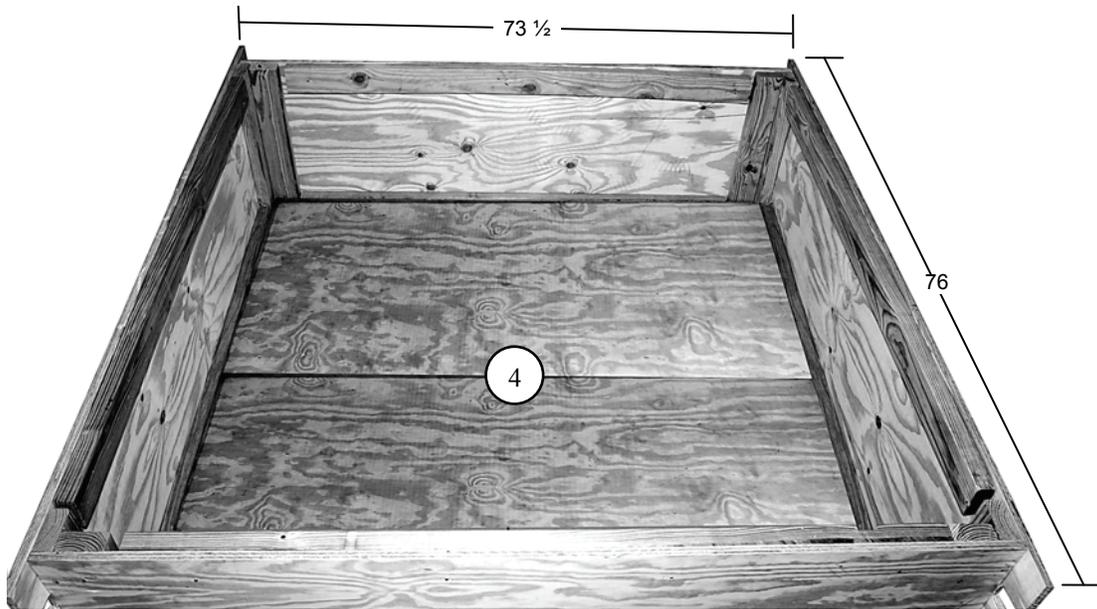
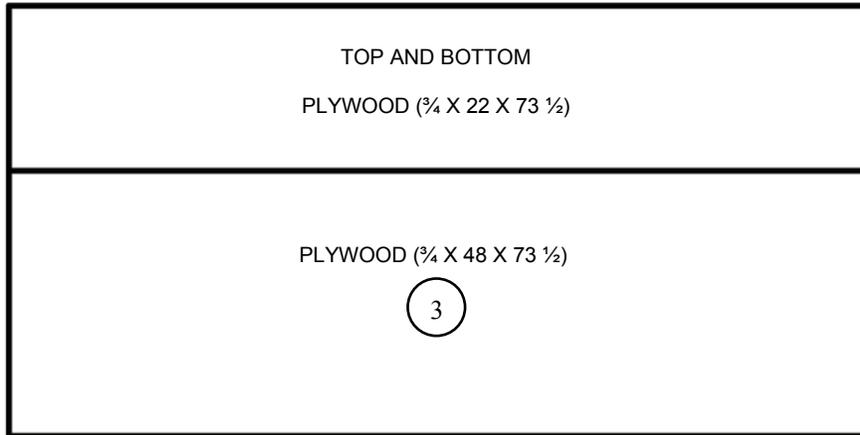


Figure 7-28. Accessory Box Built

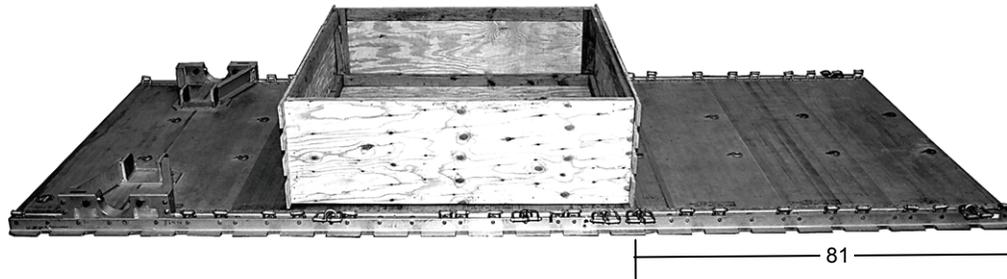
- Notes.** 1. The top is placed on the box in a later step.  
2. All dimensions are given in inches.



- 3 Cut the top and bottom of the box.
- 4 Nail the sides and bottom of box together with 8d nails.

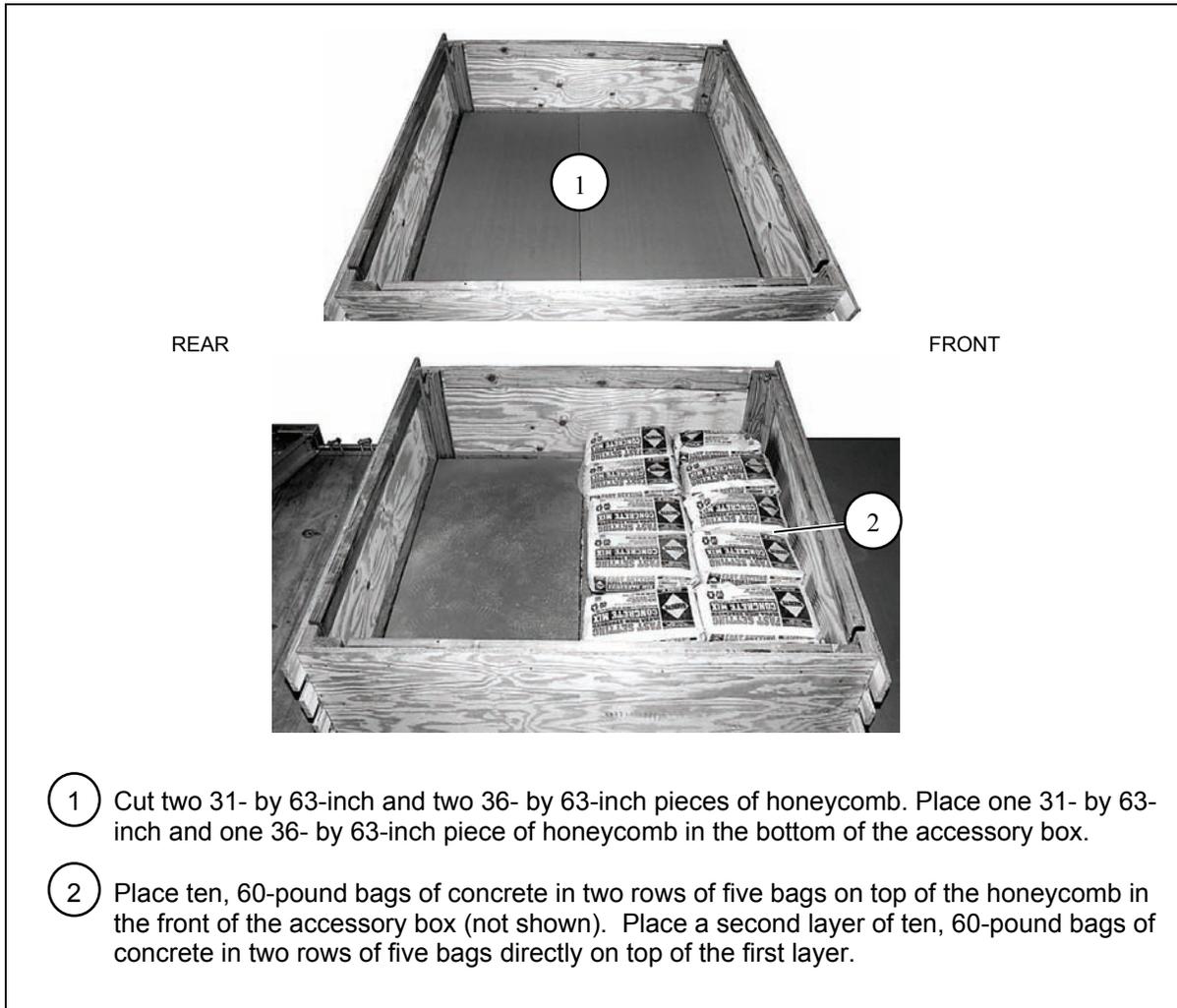
**Figure 7-28. Accessory Box Built (Continued)**

**Note.** All dimensions are given in inches.



- 1 Center the accessory box 81 inches from the front of the platform.

**Figure 7-29. Accessory Box Placed**



- 1 Cut two 31- by 63-inch and two 36- by 63-inch pieces of honeycomb. Place one 31- by 63-inch and one 36- by 63-inch piece of honeycomb in the bottom of the accessory box.
- 2 Place ten, 60-pound bags of concrete in two rows of five bags on top of the honeycomb in the front of the accessory box (not shown). Place a second layer of ten, 60-pound bags of concrete in two rows of five bags directly on top of the first layer.

**Figure 7-30. Accessory Box Packed**

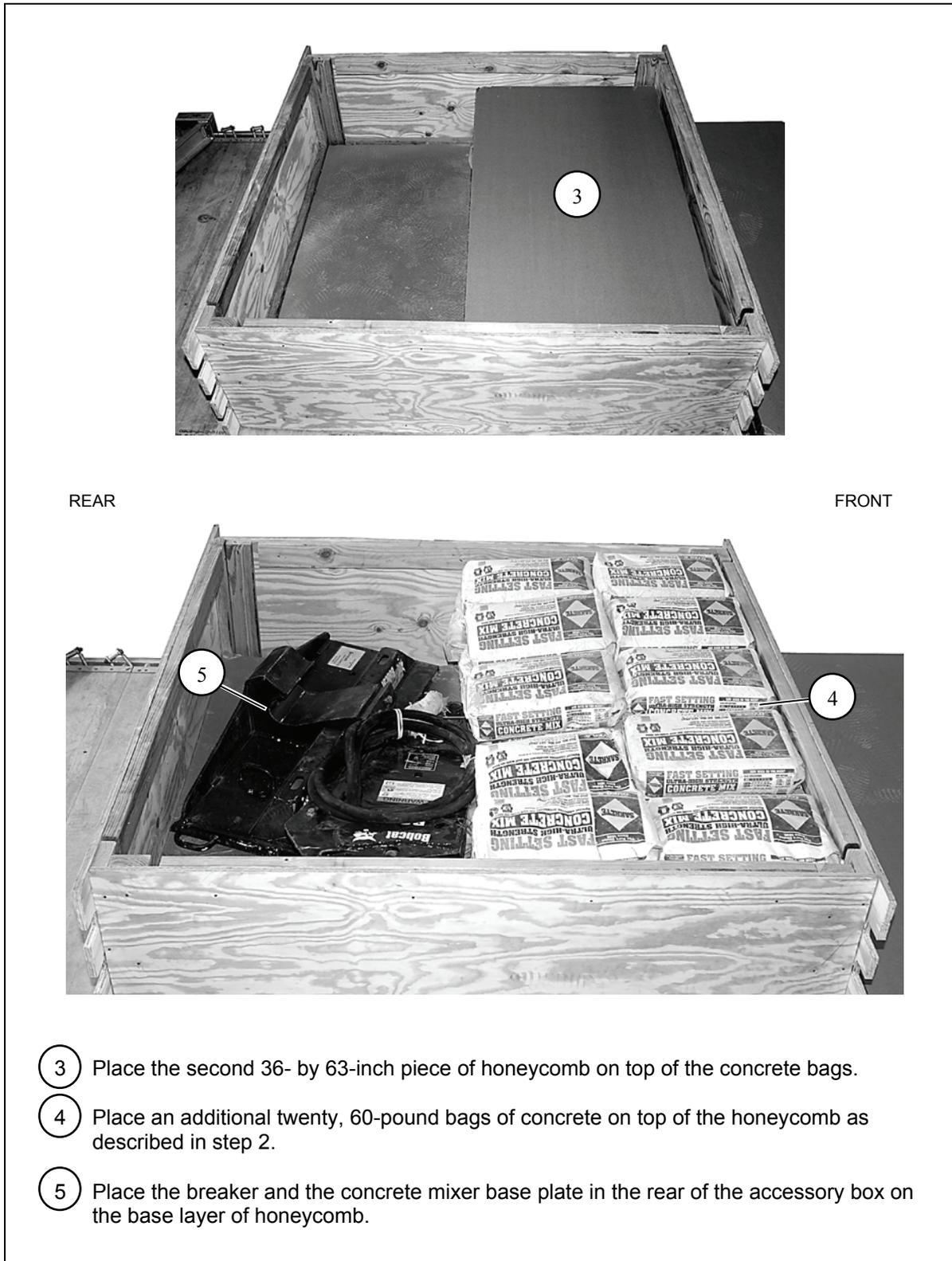


Figure 7-30. Accessory Box Packed (Continued)

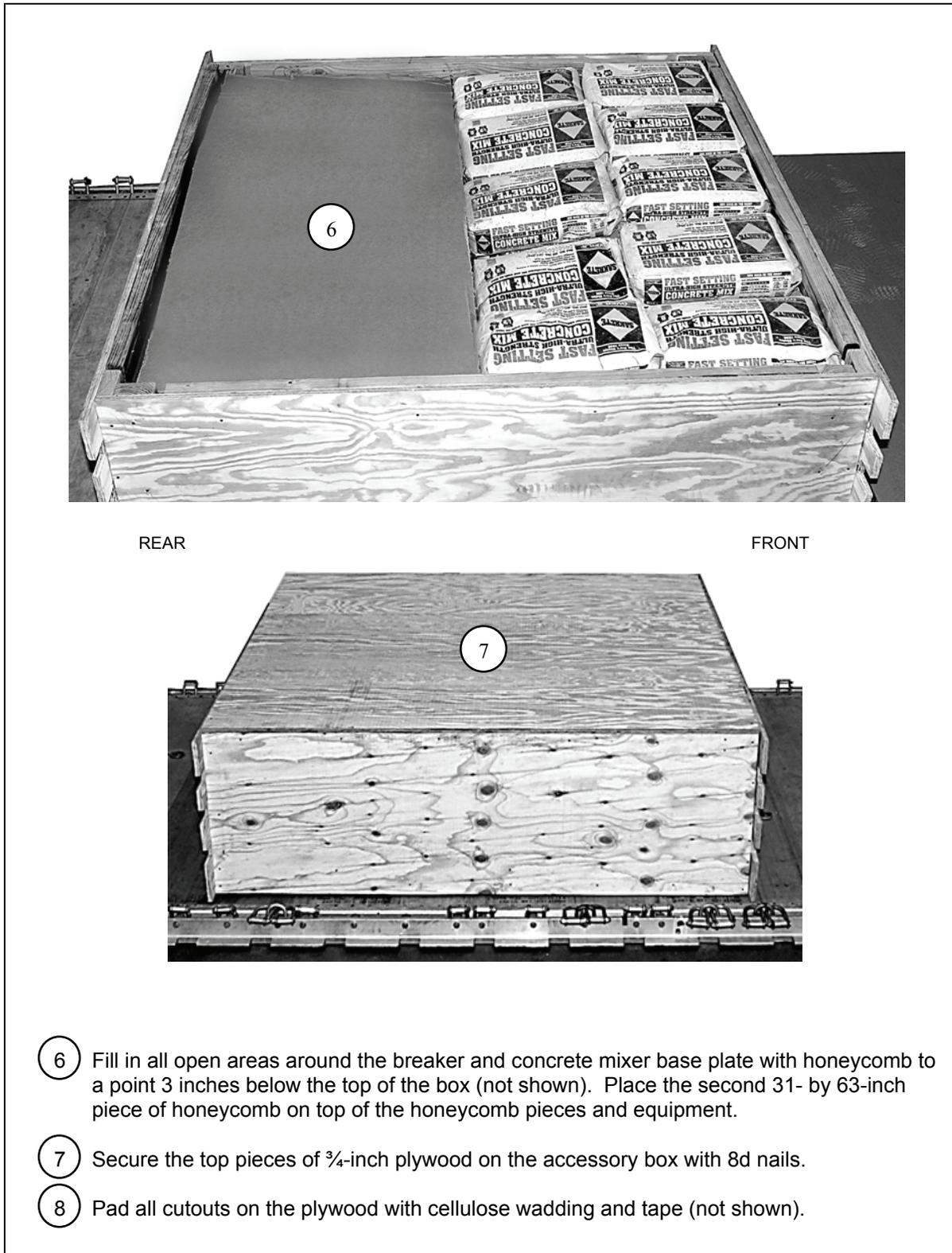
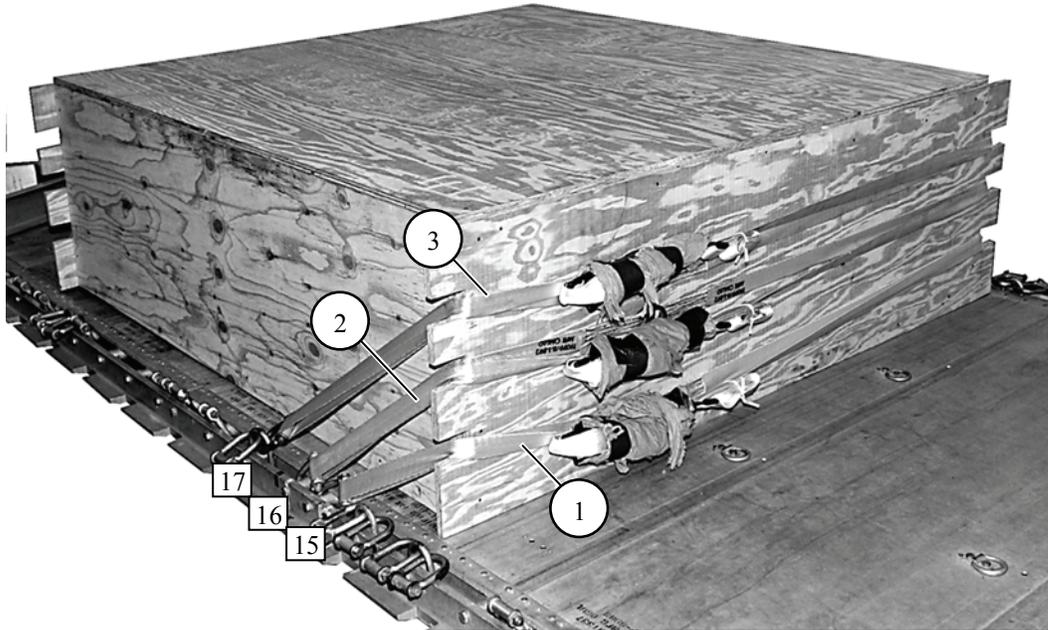


Figure 7-30. Accessory Box Packed (Continued)

## LASHING THE ACCESSORY BOX

7-20. Lash the accessory box according to Chapter 2 and as shown in Figures 7-31 through 7-33.

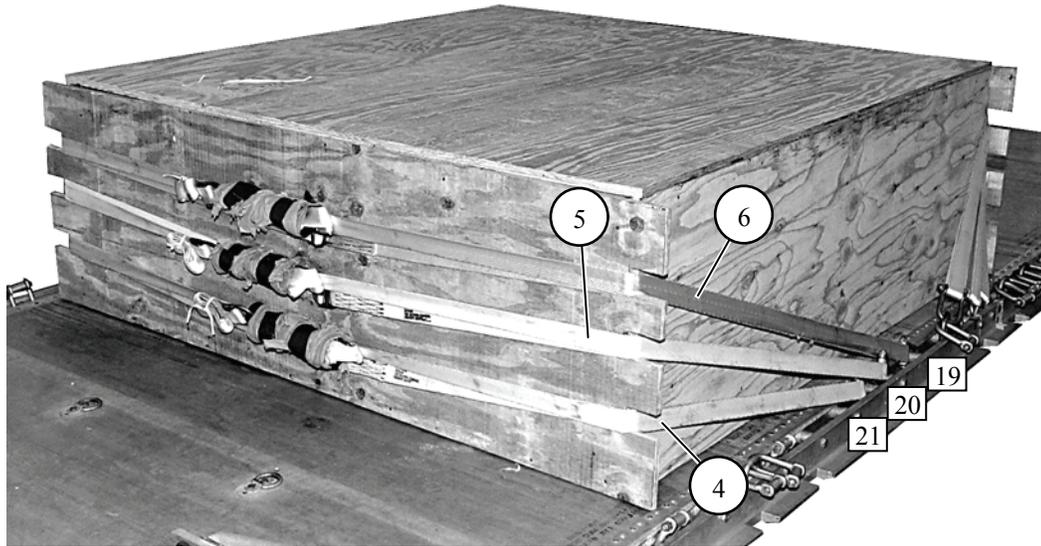
**Note.** Pad the front load binders with cellulose wadding and tape.



<i>Lashing Number</i>	<i>Tiedown Clevis Number</i>	<i>Instructions</i>
1	15 and 15A	Pass one end of a 30-foot lashing through clevis 15 and the other end through clevis 15A. Route the lashing through the bottom front cutouts and secure with two D-rings and a load binder on the front of the box.
2	16 and 16A	Pass one end of a 30-foot lashing through clevis 16 and the other end through clevis 16A. Route the lashing through the middle front cutouts and secure with two D-rings and a load binder on the front of the box.
3	17 and 17A	Pass one end of a 30-foot lashing through clevis 17 and the other end through clevis 17A. Route the lashing through the top front cutouts and secure with two D-rings and a load binder on the front of the box .

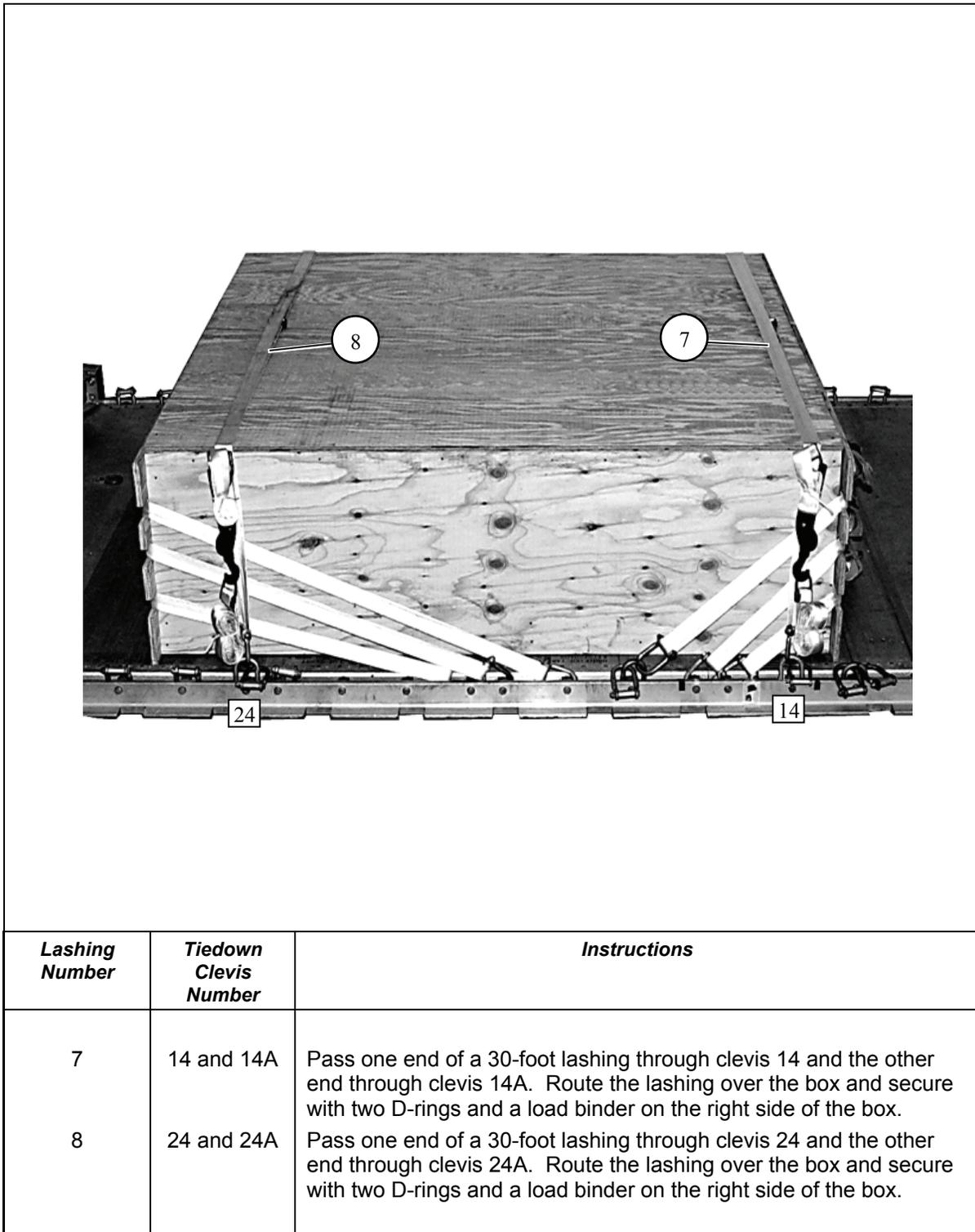
**Figure 7-31. Accessory Box Lashings 1 Through 3 Installed**

**Note.** Pad the rear load binders with cellulose wadding and tape.



<i>Lashing Number</i>	<i>Tiedown Clevis Number</i>	<i>Instructions</i>
4	21 and 21A	Pass one end of a 30-foot lashing through clevis 21 and the other end through clevis 21A. Route the lashing through the bottom rear cutouts and secure with two D-rings and a load binder on the rear of the box.
5	20 and 20A	Pass one end of a 30-foot lashing through clevis 20 and the other end through clevis 20A. Route the lashing through the middle rear cutouts and secure with two D-rings and a load binder on the rear of the box.
6	19 and 19A	Pass one end of a 30-foot lashing through clevis 19 and the other end through clevis 19A. Route the lashing through the top rear cutouts and secure with two D-rings and a load binder on the rear of the box.

**Figure 7-32. Accessory Box Lashings 4 Through 6 Installed**



<i>Lashing Number</i>	<i>Tiedown Clevis Number</i>	<i>Instructions</i>
7	14 and 14A	Pass one end of a 30-foot lashing through clevis 14 and the other end through clevis 14A. Route the lashing over the box and secure with two D-rings and a load binder on the right side of the box.
8	24 and 24A	Pass one end of a 30-foot lashing through clevis 24 and the other end through clevis 24A. Route the lashing over the box and secure with two D-rings and a load binder on the right side of the box.

**Figure 7-33. Accessory Box Lashings 7 and 8 Installed**

## POSITIONING AND LASHING THE 500-GALLON WATER DRUM

7-21. Position the 500-gallon water drum as shown in Figure 7-34. Lash the 500-gallon water drum according to Chapter 2 and as shown in Figure 7-35.

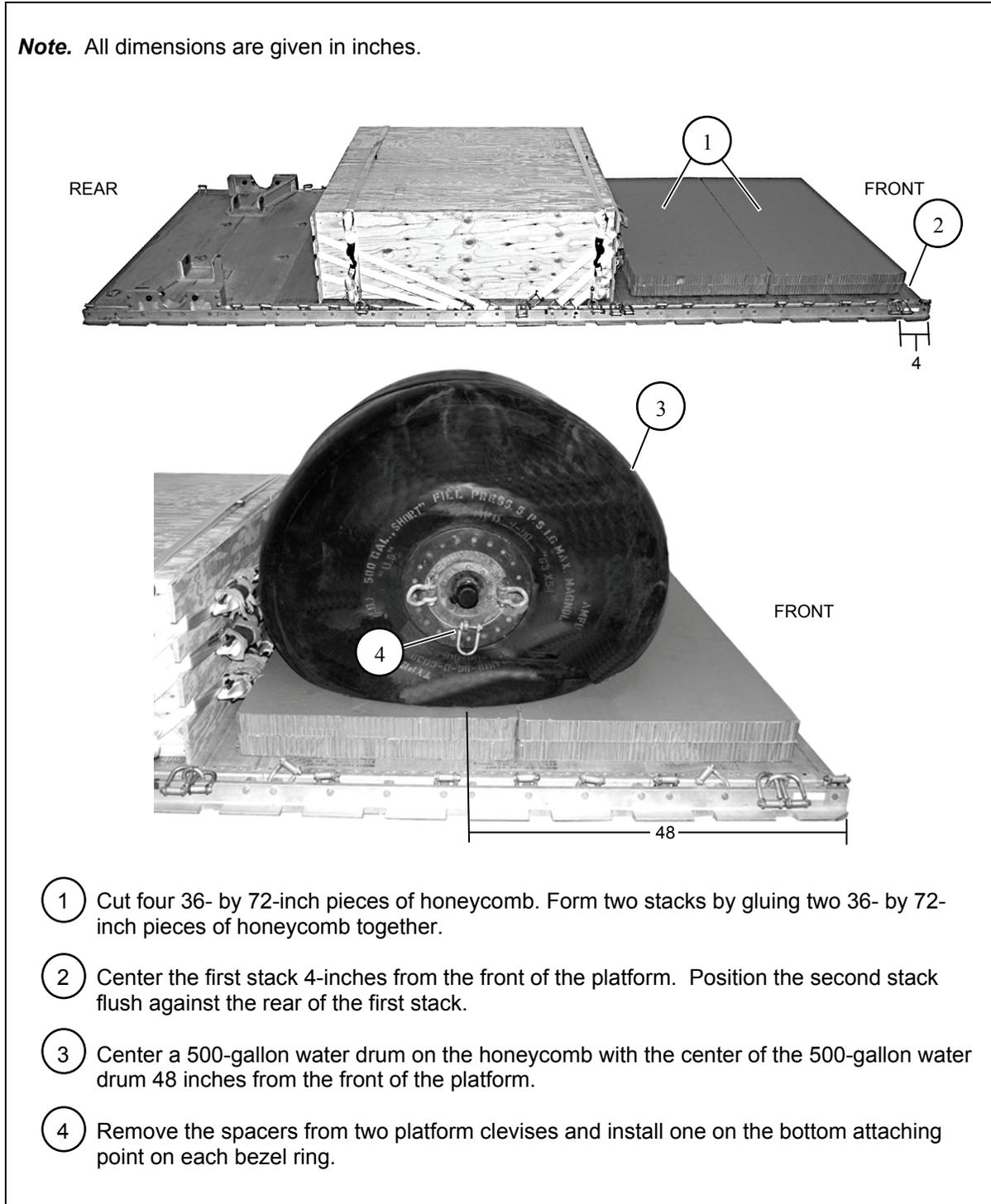
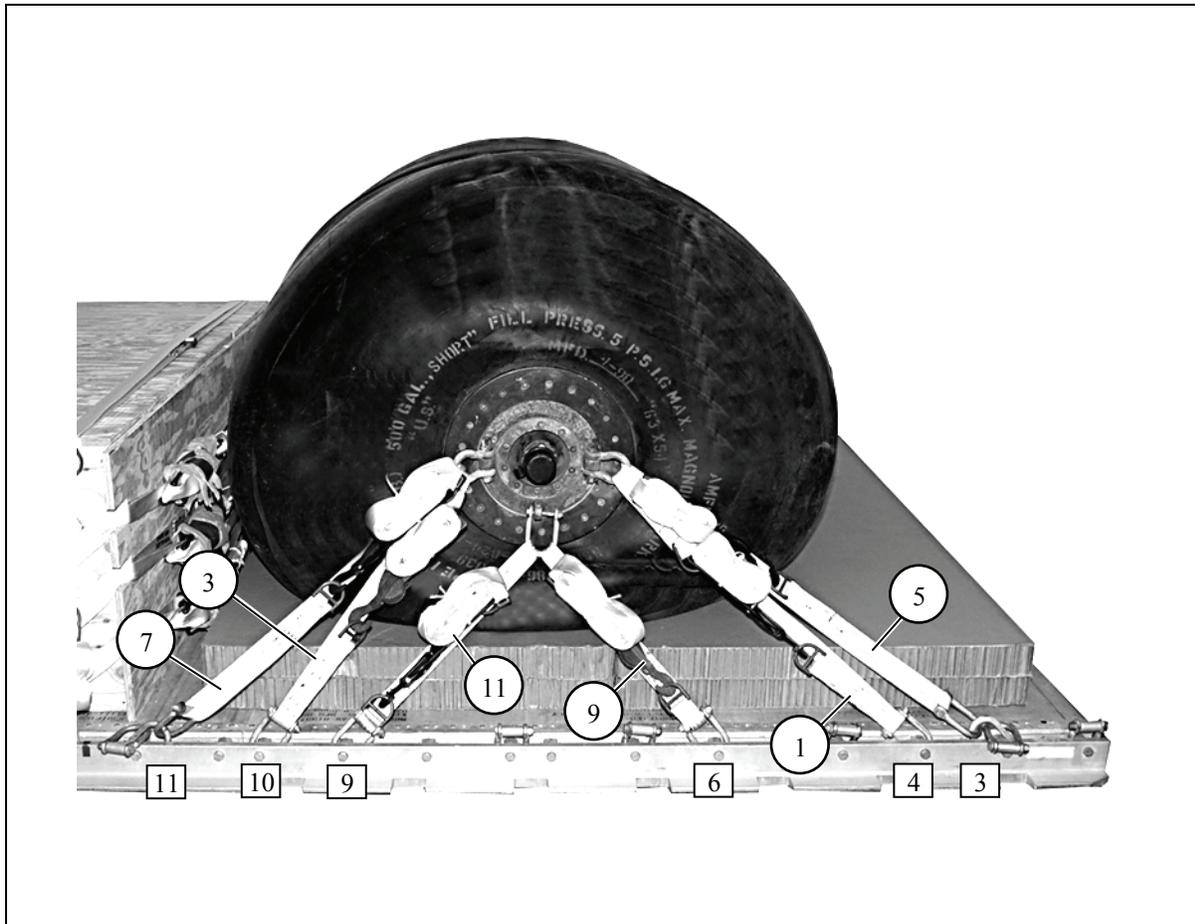


Figure 7-34. 500-Gallon Water Drum Positioned

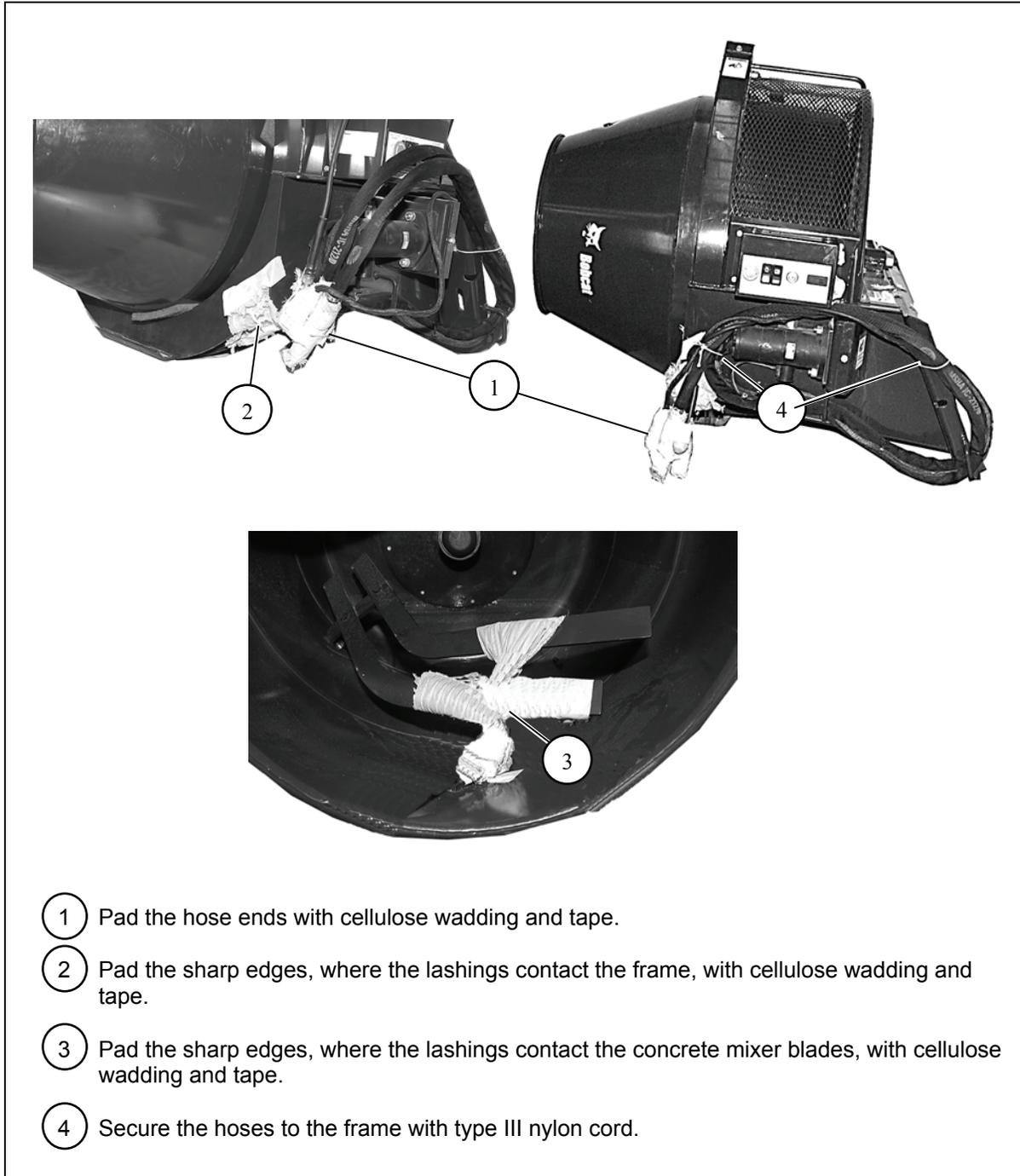


<b>Lashing Number</b>	<b>Tiedown Clevis Number</b>	<b>Instructions</b>
		Pass lashing:
1	4	Through right front bezel ring clevis.
2	4A	Through left front bezel ring clevis.
3	10	Through right rear bezel ring clevis.
4	10A	Through left rear bezel ring clevis.
5	3	Through right front bezel ring clevis.
6	3A	Through left front bezel ring clevis.
7	11	Through right rear bezel ring clevis.
8	11A	Through left rear bezel ring clevis.
9	6	Through right bottom bezel ring clevis.
10	6A	Through left bottom bezel ring clevis.
11	9	Through right bottom bezel ring clevis.
12	9	Through left bottom bezel ring clevis.

Figure 7-35. 500-Gallon Water Drum Lashed

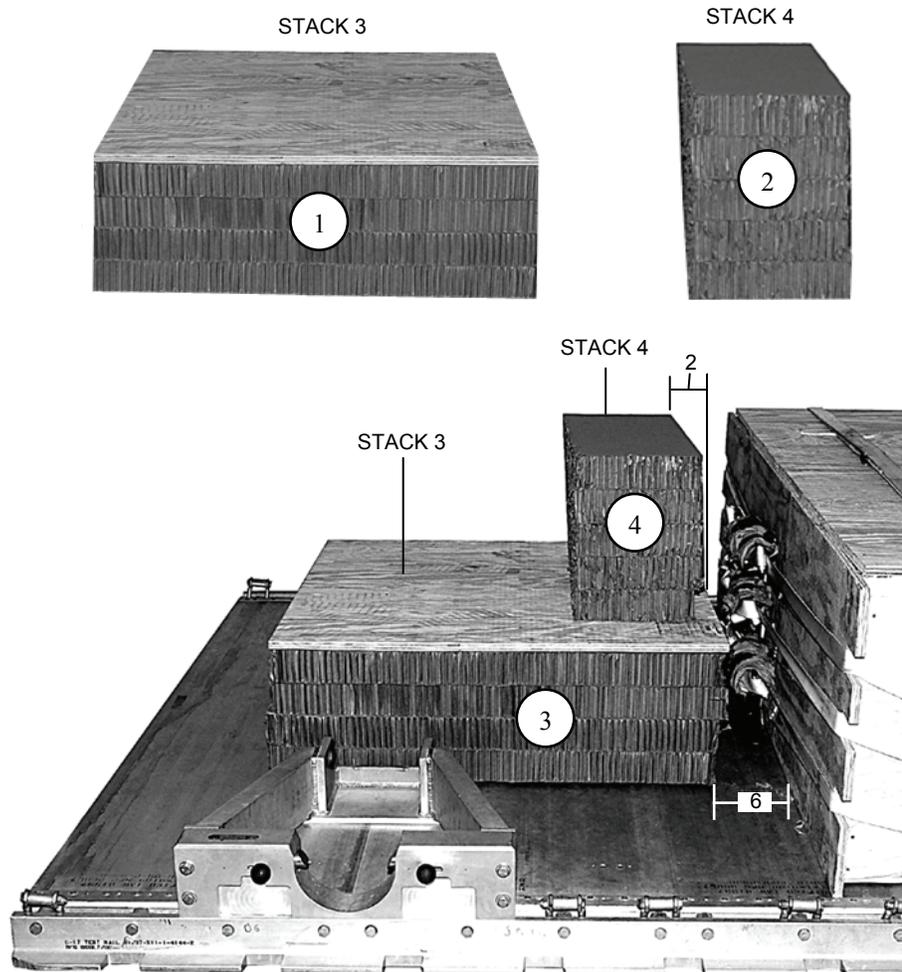
## PREPARING, POSITIONING AND LASHING THE CONCRETE MIXER

7-22. Prepare the concrete mixer as shown in Figure 7-36. Position the concrete mixer as shown in Figure 7-37. Lash the concrete mixer according to Chapter 2 and as shown in Figure 7-38.



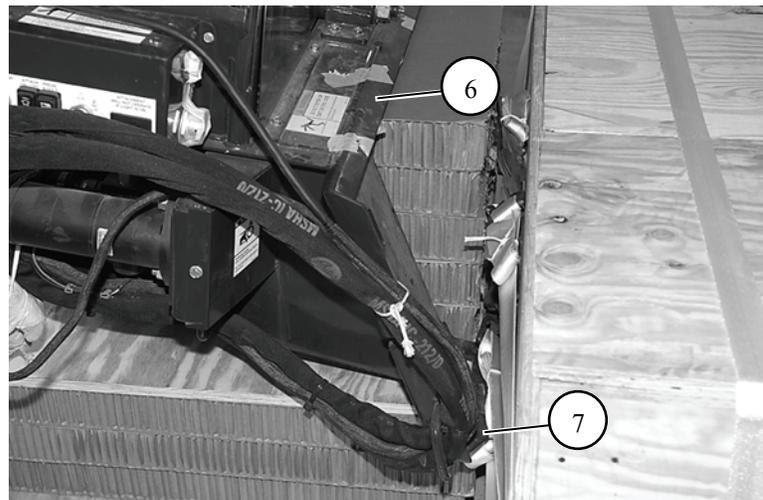
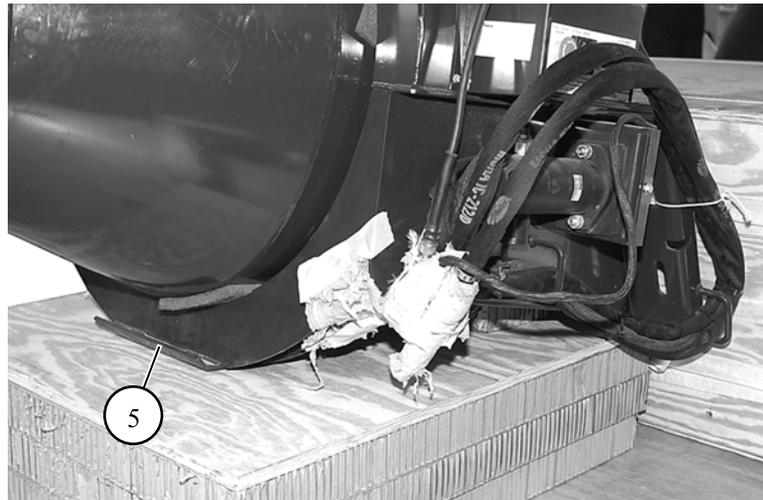
**Figure 7-36. Concrete Mixer Prepared**

- Notes.** 1. All dimensions are given in inches.  
 2. Do not glue stack 4 to stack 3.



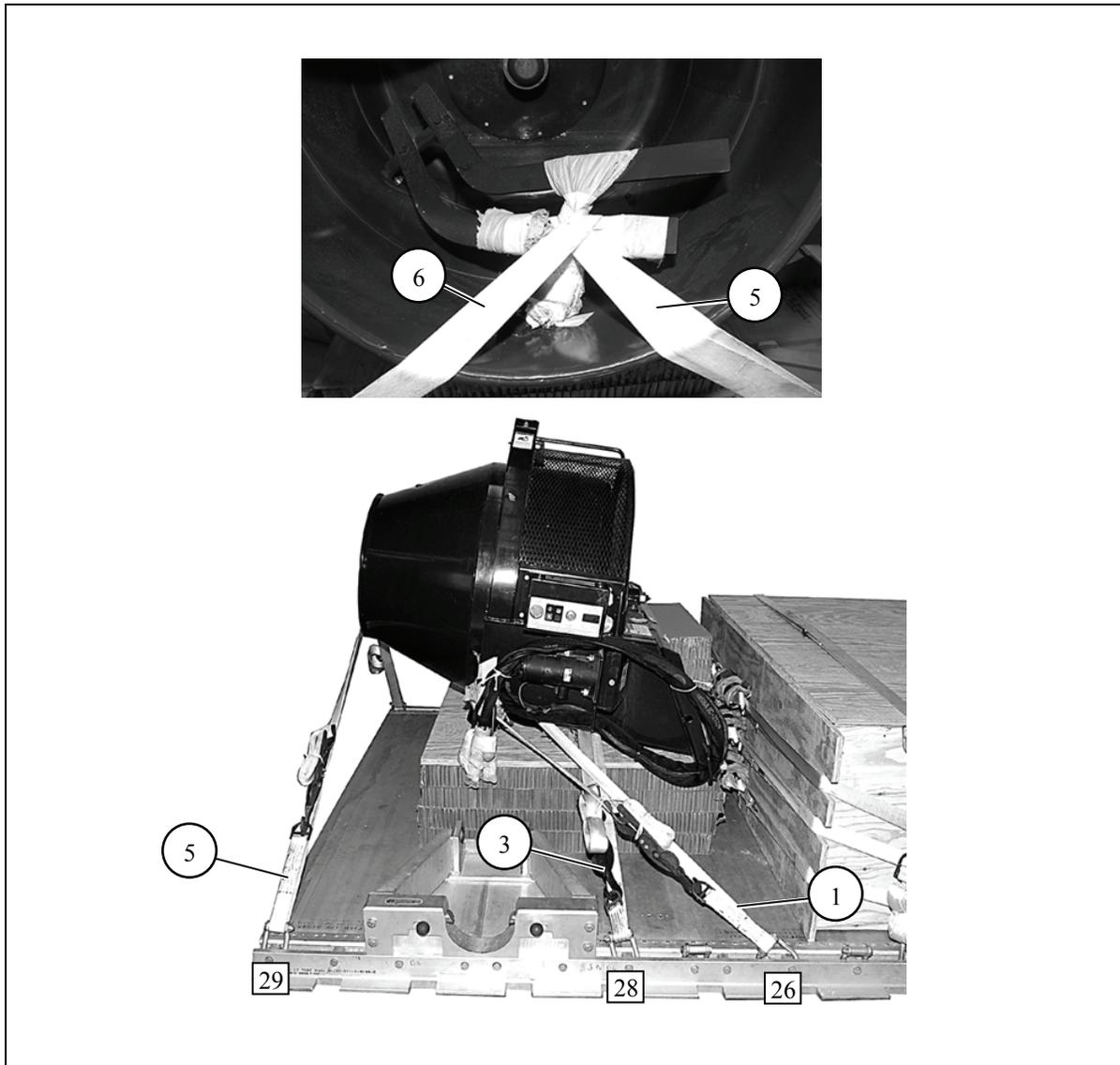
- ① Cut four 36- by 39-inch pieces of honeycomb and one  $\frac{3}{4}$ - by 36- by 39-inch piece of plywood. Glue the honeycomb together and glue the plywood on top of the honeycomb to form stack 3.
- ② Cut five 23- by 11-inch pieces of honeycomb and glue together to form stack 4.
- ③ Center stack 3 six inches from the rear of the accessory box.
- ④ Center stack 4 two inches from the front edge of stack 3.

**Figure 7-37. Concrete Mixer Positioned**



- 5 Place the concrete mixer on stack 3 with the opening of the concrete mixer facing the rear of the platform.
- 6 Place the attaching plate on top of stack 4.
- 7 The bottom of the attaching plate will be flush with the front of stack 3.

**Figure 7-37. Concrete Mixer Positioned (Continued)**



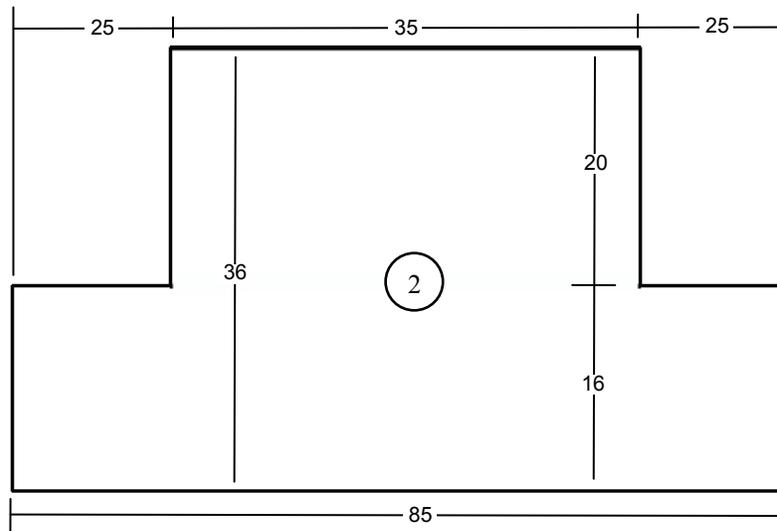
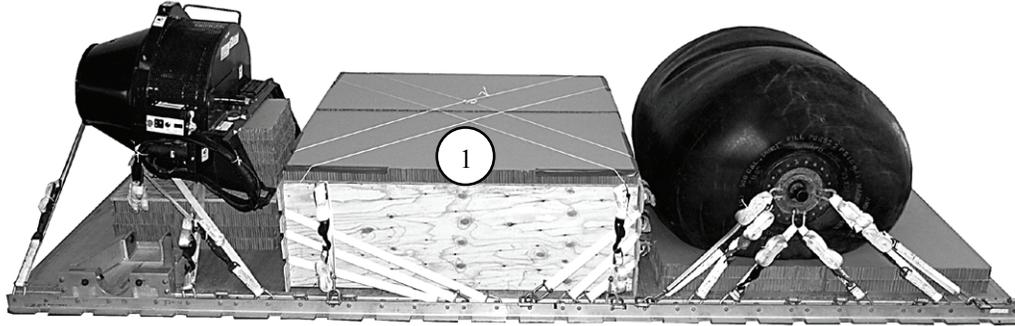
<b>Lashing Number</b>	<b>Tiedown Clevis Number</b>	<b>Instructions</b>
1	26	Pass lashing: Around front right side of concrete mixer frame.
2	26A	Around front left side of concrete mixer frame.
3	28	Through and around the support bar under the concrete mixer.
4	28A	Through and around the support bar under the concrete mixer.
5	29	Around mixer blade inside the concrete mixer.
6	29A	Around mixer blade inside the concrete mixer.

**Figure 7-38. Concrete Mixer Lashed**

## PREPARING, POSITIONING AND LASHING THE SWEEPER

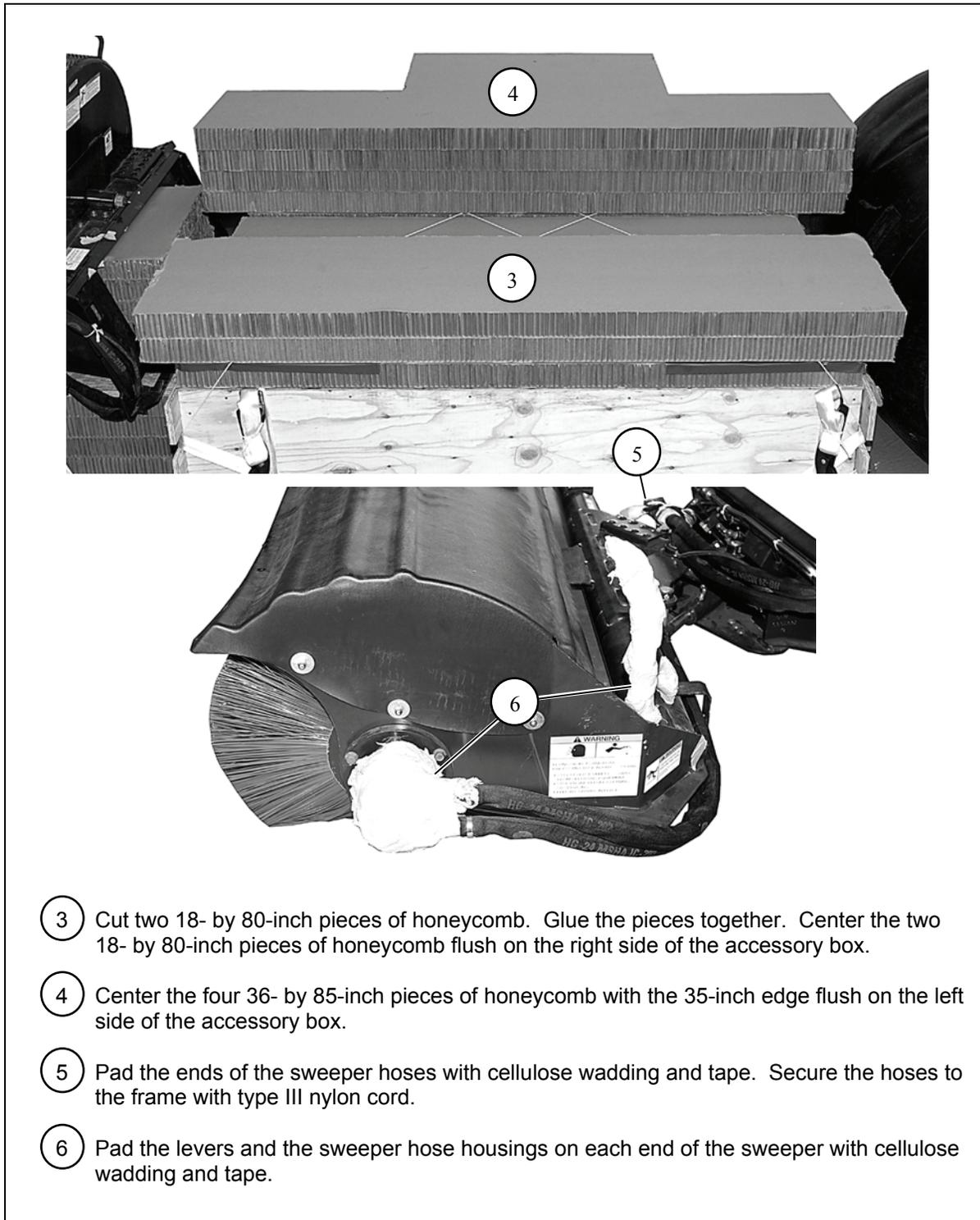
7-23. Prepare the sweeper as shown in Figure 7-39. Position the sweeper as shown in Figure 7-40. Lash the sweeper according to Chapter 2 and as shown in Figure 7-41.

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



- ① Cut one 36- by 73-inch piece of honeycomb and one 34- by 73-inch piece of honeycomb. Place the honeycomb lengthwise on top of the accessory box. Tape the outside corners of the honeycomb and secure the honeycomb diagonally with type III nylon cord to the top notches on the front and rear corners of the accessory box.
- ② Cut four 36- by 85-inch pieces of honeycomb. Cut each piece of honeycomb as shown above. Glue the four pieces together.

**Figure 7-39. Sweeper Prepared**



- 3 Cut two 18- by 80-inch pieces of honeycomb. Glue the pieces together. Center the two 18- by 80-inch pieces of honeycomb flush on the right side of the accessory box.
- 4 Center the four 36- by 85-inch pieces of honeycomb with the 35-inch edge flush on the left side of the accessory box.
- 5 Pad the ends of the sweeper hoses with cellulose wadding and tape. Secure the hoses to the frame with type III nylon cord.
- 6 Pad the levers and the sweeper hose housings on each end of the sweeper with cellulose wadding and tape.

**Figure 7-39. Sweeper Prepared (Continued)**

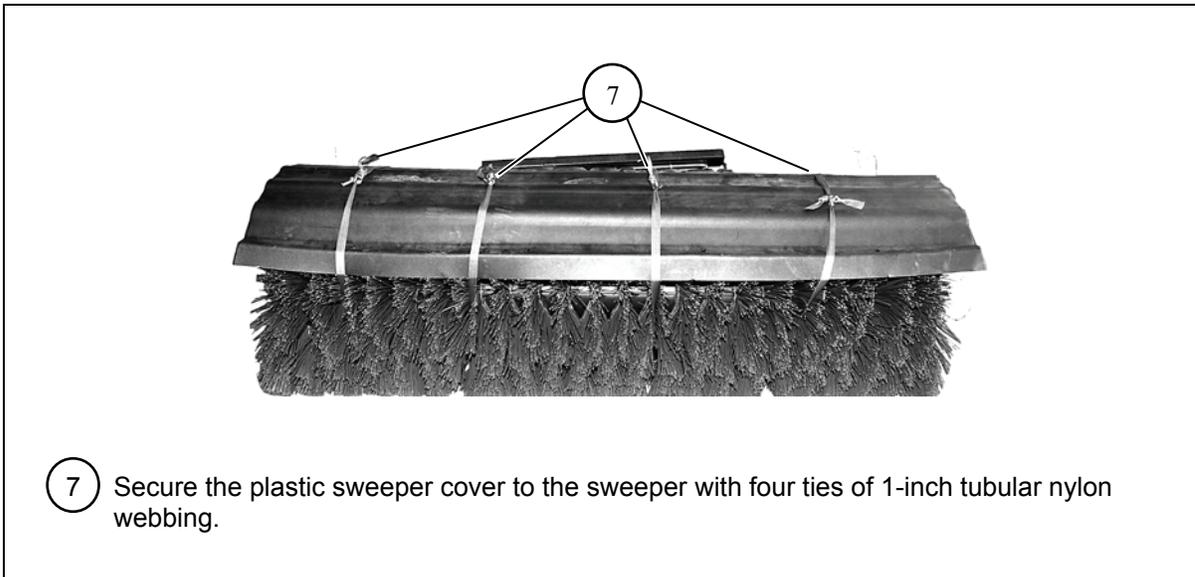


Figure 7-39. Sweeper Prepared (Continued)

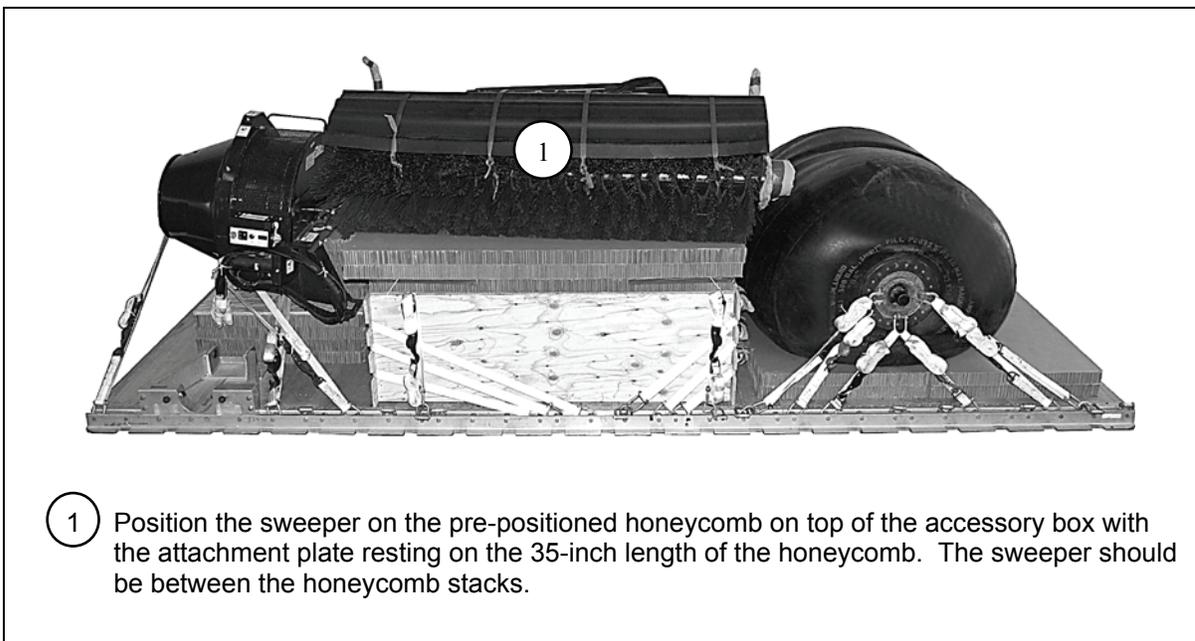
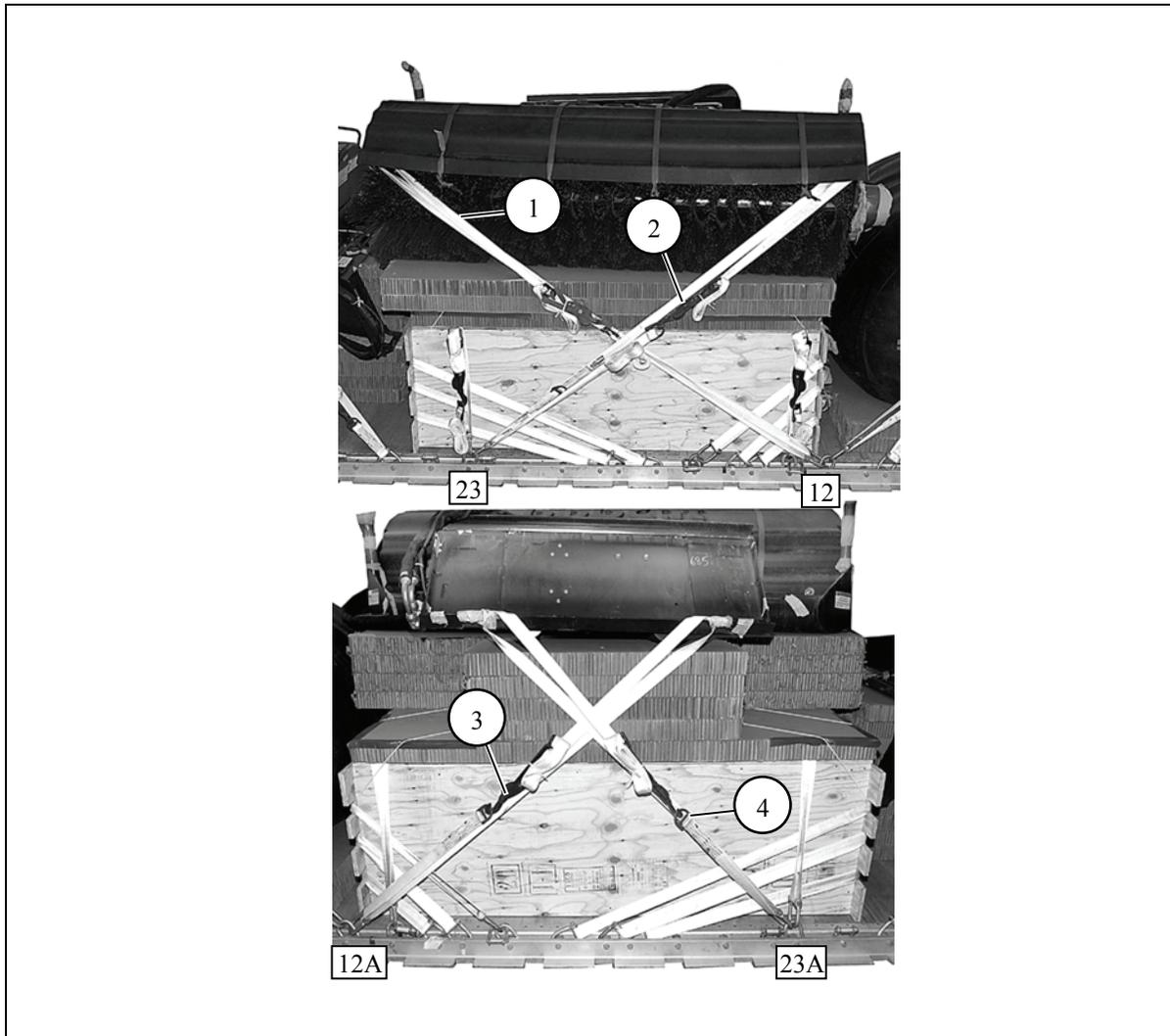


Figure 7-40. Sweeper Positioned

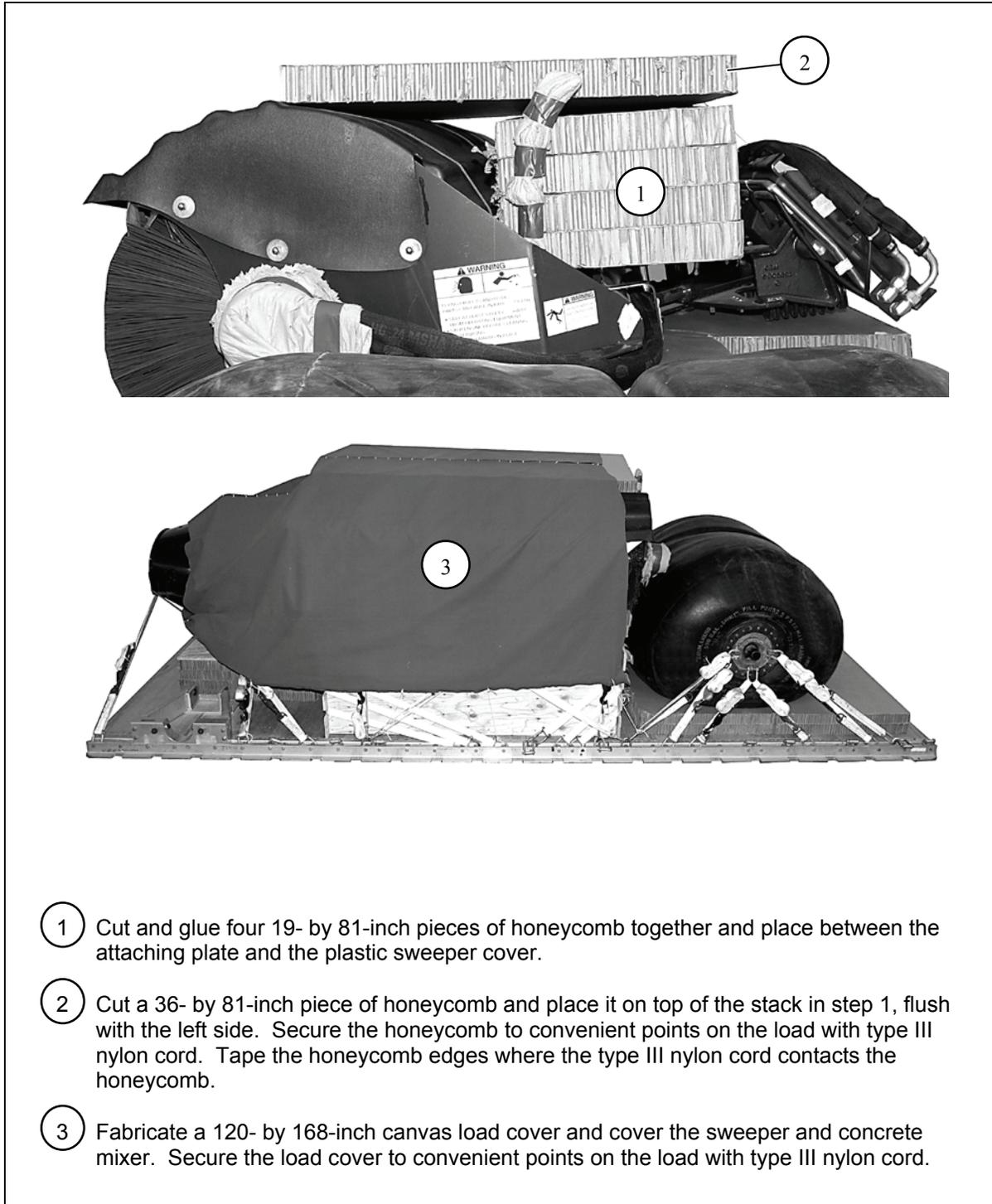


<b>Lashing Number</b>	<b>Tiedown Clevis Number</b>	<b>Instructions</b>
1	12	Route a 30-foot lashing through clevis 12, under the plastic sweeper cover, around the right rear sweeper frame, and secure with two D-rings and a load binder.
2	23	Route a 30-foot lashing through clevis 23, under the plastic sweeper cover, around the right front sweeper frame, and secure with two D-rings and a load binder.
3	12A	Route a lashing through clevis 12A, around the lower left rear part of the attaching plate, and secure with a D-ring and a load binder.
4	23A	Route a lashing through clevis 23A, around the lower left front part of the attaching plate, and secure with a D-ring and a load binder.

**Figure 7-41. Sweeper Lashed to Platform**

## COVERING THE LOAD

7-24. Cover the load as shown in Figure 7-42.



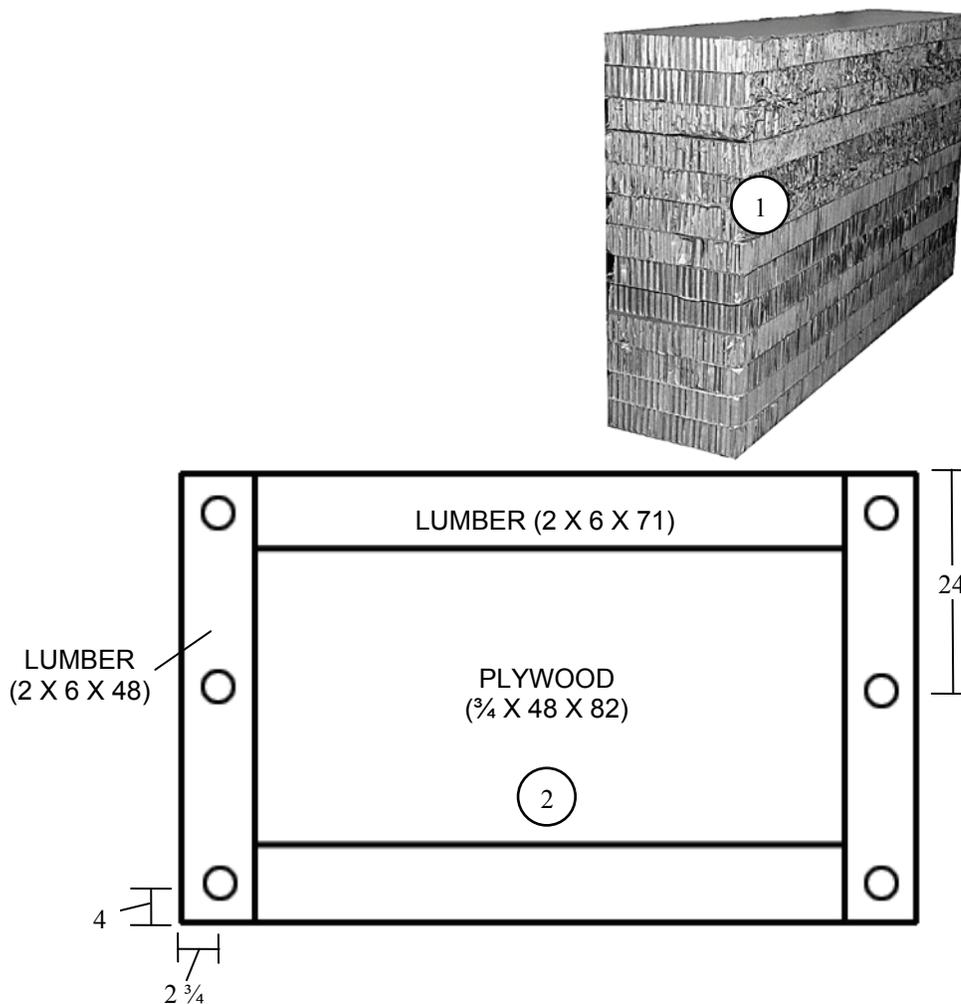
- ① Cut and glue four 19- by 81-inch pieces of honeycomb together and place between the attaching plate and the plastic sweeper cover.
- ② Cut a 36- by 81-inch piece of honeycomb and place it on top of the stack in step 1, flush with the left side. Secure the honeycomb to convenient points on the load with type III nylon cord. Tape the honeycomb edges where the type III nylon cord contacts the honeycomb.
- ③ Fabricate a 120- by 168-inch canvas load cover and cover the sweeper and concrete mixer. Secure the load cover to convenient points on the load with type III nylon cord.

Figure 7-42. Load Covered

## BUILDING AND POSITIONING THE PARACHUTE STOWAGE PLATFORM

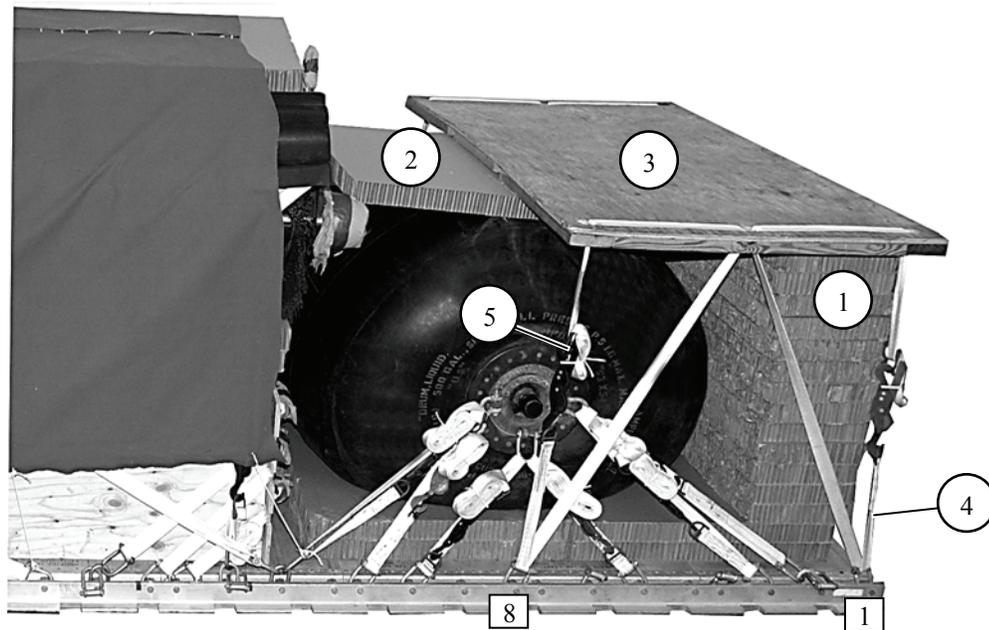
7-25. Construct the parachute stowage platform support stack and stowage platform as shown in Figure 7-43. Position the parachute support stack and stowage platform as shown in Figure 7-44.

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



- ① Cut and glue thirteen 15- by 73-inch pieces of honeycomb together.  
② Build the parachute stowage platform as shown above and nail the plywood to the lumber with 6d nails.

**Figure 7-43. Parachute Support Stack and Stowage Platform Built**



- ① Center the honeycomb stack on the platform with the front of the stack 2-inches from the front of the platform.
- ② Center a 36- by 66-inch piece of honeycomb lengthwise on top of the water drum with the rear of the honeycomb against the sweeper.
- ③ Center the parachute stowage platform on top of the honeycomb with the front edge of the 36- by 66-inch honeycomb against the inside edge of the front 2- by 6-inch piece of lumber on the parachute stowage platform.
- ④ Route a lashing through clevis 1, up through the center hole in the platform, down through the front hole in the platform and secure with a D-ring and load binder. Repeat this procedure on the left side using clevis 1A.
- ⑤ Route a lashing through clevis 8, up through the center hole in the platform, down through the rear hole in the platform and secure with a D-ring and load binder. Repeat this procedure on the left side using clevis 8A.

**Figure 7-44. Parachute Support Stack and Stowage Platform Positioned**

## INSTALLING SUSPENSION SLINGS AND ATTITUDE CONTROL SYSTEM (ACS)

7-26. Construct and inspect the attitude control system (ACS) according to Chapter 2. Position the ACS as shown in Figure 7-45. Install the suspension slings as shown in Figure 7-46. Secure the ACS and safety tie the suspension slings according to Chapter 2 and as shown in Figures 7-47 and 7-48.

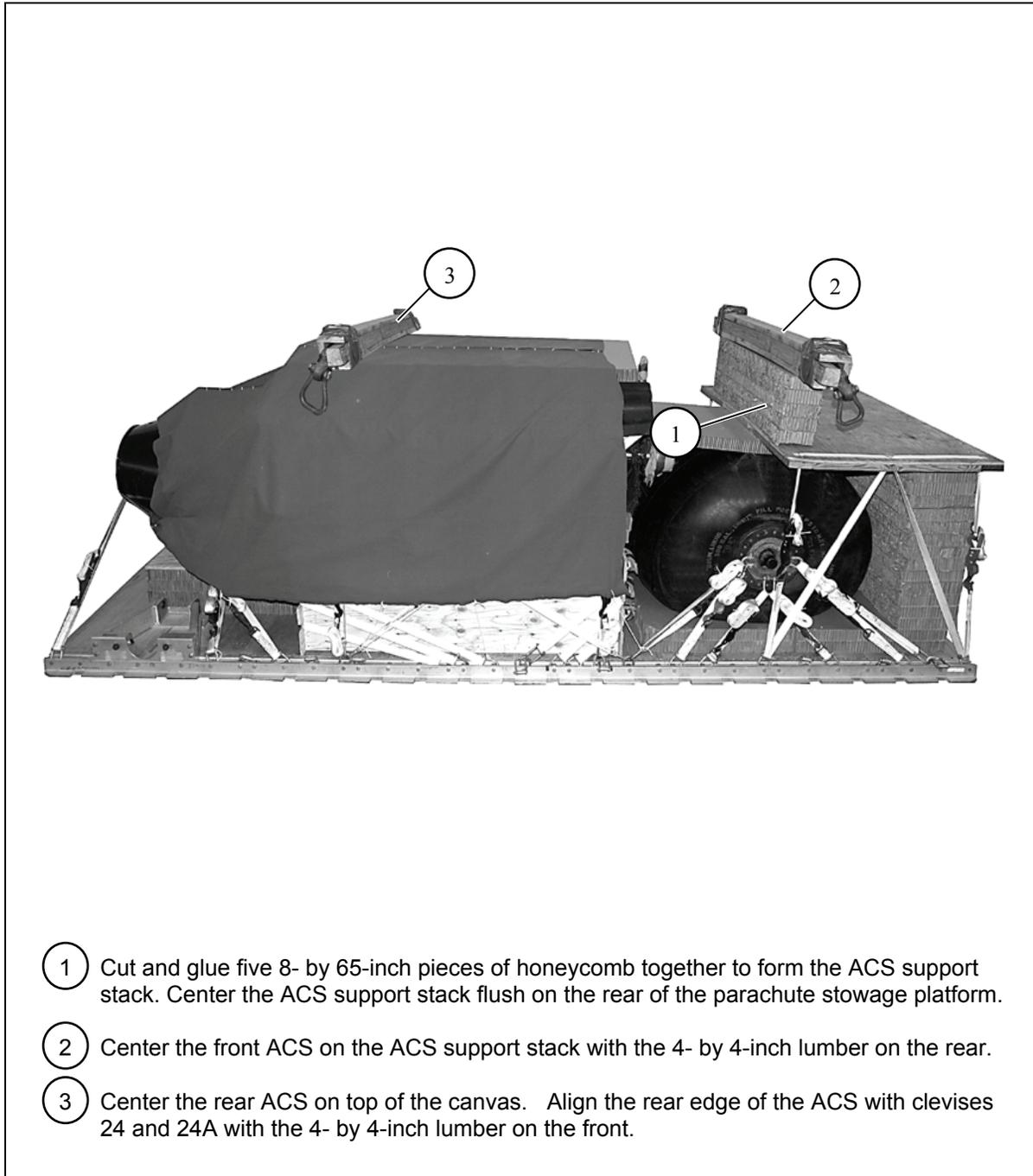
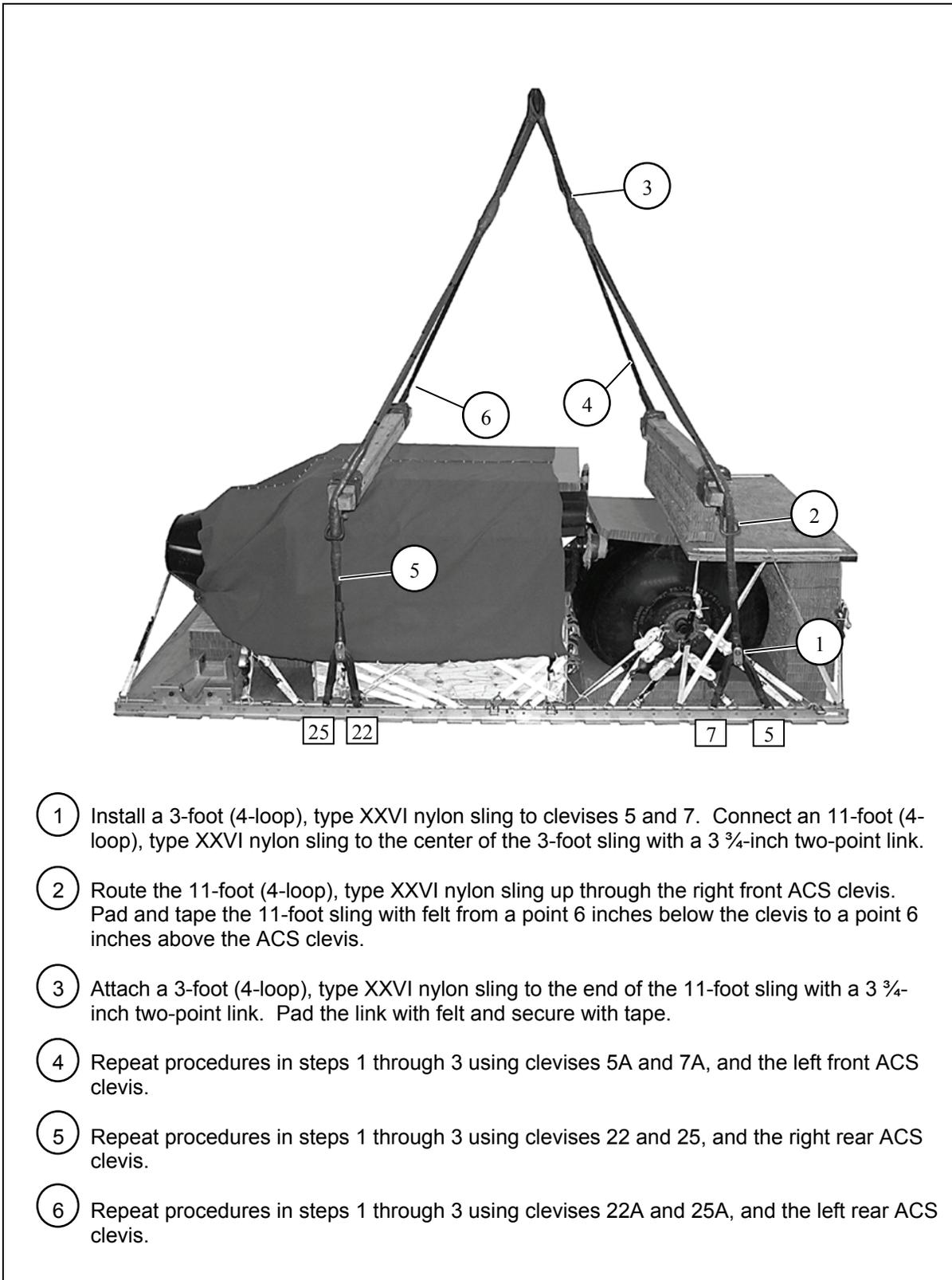
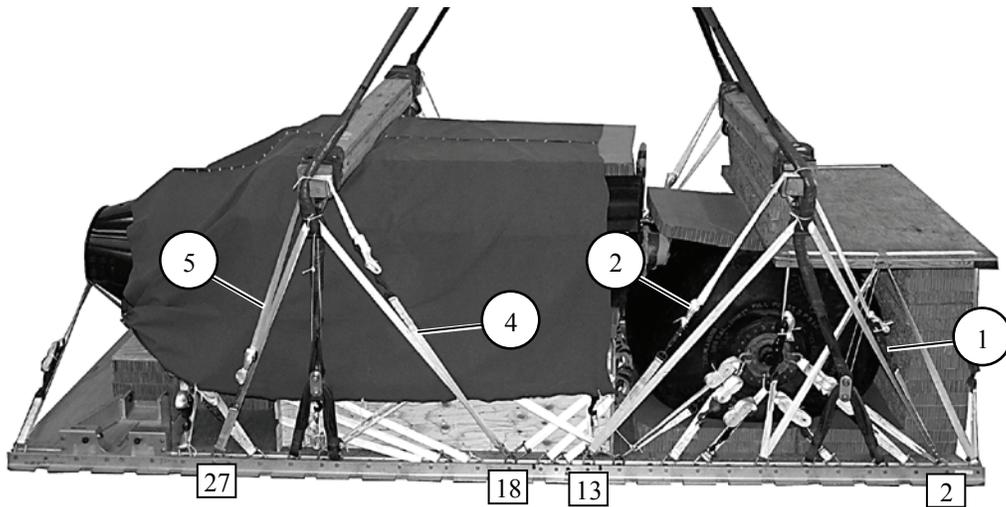


Figure 7-45. Front and Rear ACS Positioned



- ① Install a 3-foot (4-loop), type XXVI nylon sling to clevises 5 and 7. Connect an 11-foot (4-loop), type XXVI nylon sling to the center of the 3-foot sling with a 3 ¾-inch two-point link.
- ② Route the 11-foot (4-loop), type XXVI nylon sling up through the right front ACS clevis. Pad and tape the 11-foot sling with felt from a point 6 inches below the clevis to a point 6 inches above the ACS clevis.
- ③ Attach a 3-foot (4-loop), type XXVI nylon sling to the end of the 11-foot sling with a 3 ¾-inch two-point link. Pad the link with felt and secure with tape.
- ④ Repeat procedures in steps 1 through 3 using clevises 5A and 7A, and the left front ACS clevis.
- ⑤ Repeat procedures in steps 1 through 3 using clevises 22 and 25, and the right rear ACS clevis.
- ⑥ Repeat procedures in steps 1 through 3 using clevises 22A and 25A, and the left rear ACS clevis.

**Figure 7-46. Suspension Slings Installed**

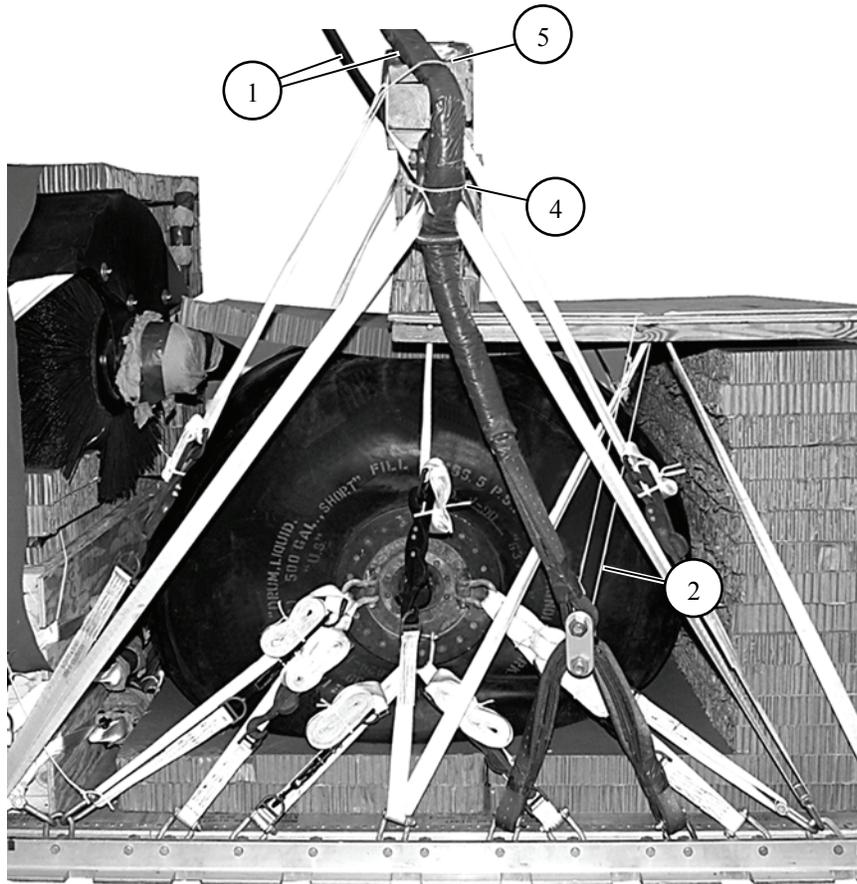


### CAUTION

Center the ACS assemblies widthwise on the load.

- 1 Run a 15-foot lashing from clevis 2, through the right front ACS clevis from the outside to the inside, rear to front, around the 4- by 4-inch lumber, and back to clevis 2. Loosely secure the lashing. Repeat on the left side using clevis 2A and the left front ACS clevis.
- 2 Run a 15-foot lashing from clevis 13, through the right front ACS clevis from the outside to the inside, front to rear, around the 4- by 4-inch lumber, and back to clevis 13. Loosely secure the lashing. Repeat on the left side using clevis 13A and the left front ACS clevis.
- 3 Ensure the ACS is centered on the load and tighten the load binders on the left and right at the same time. Tighten the lashings in the following order: 2 and 2A, 13 and 13A.
- 4 Run a 15-foot lashing from clevis 18, through the right rear ACS clevis from the outside to the inside, rear to front, around the 4- by 4-inch lumber, and back to clevis 18. Loosely secure the lashing. Repeat on the left side using clevis 18A and the left rear ACS clevis.
- 5 Run a 15-foot lashing from clevis 27, through the right rear ACS clevis from the outside to the inside, front to rear around the 4- by 4-inch lumber, and back to clevis 27. Loosely secure the lashing. Repeat on the left side using clevis 27A and the left rear ACS clevis.
- 6 Ensure the ACS is centered on the load and tighten the load binders on the left and right at the same time. Tighten the lashings in the following order: 18 and 18A, 27 and 27A.

Figure 7-47. ACS Secured

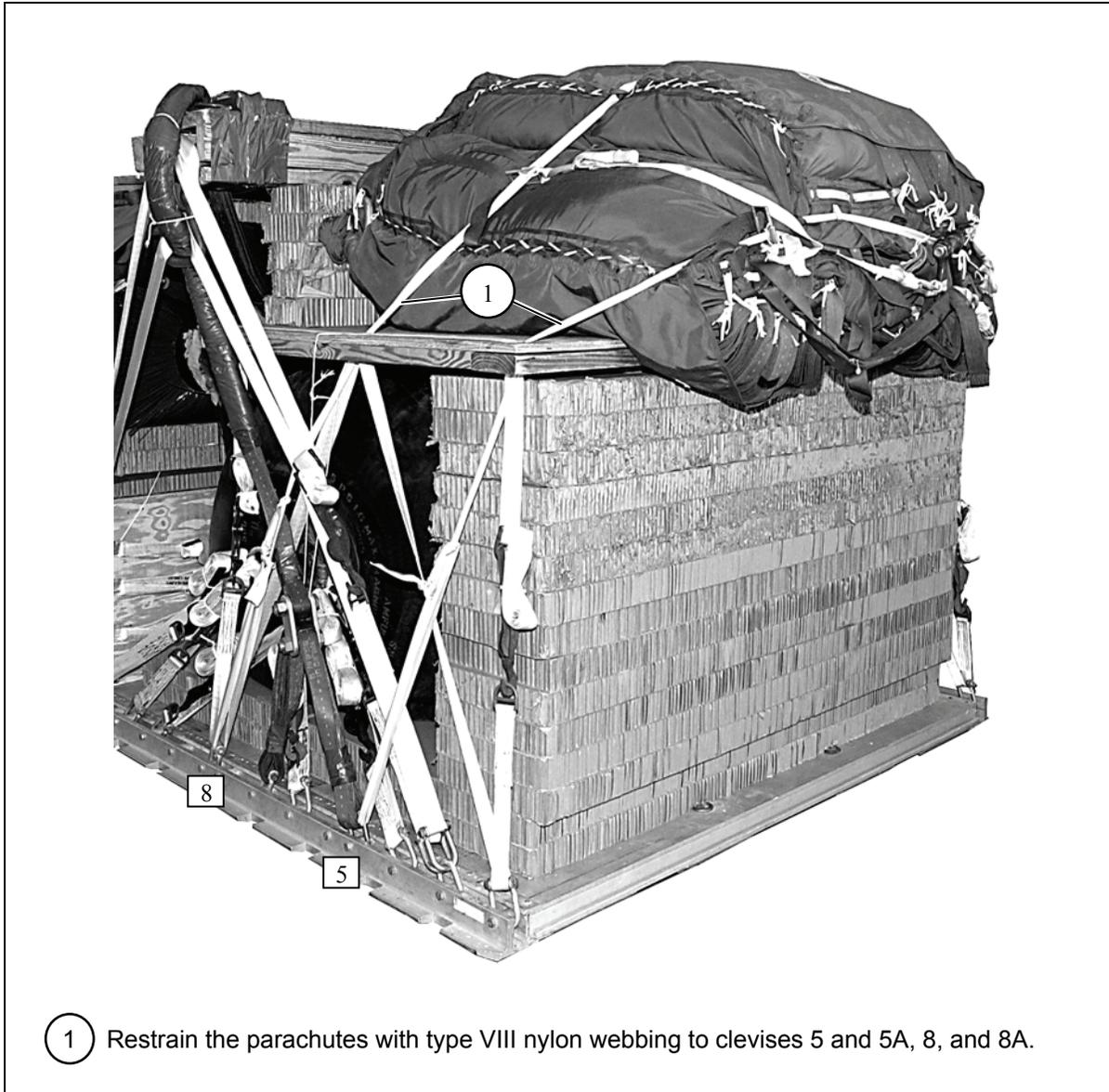


- ① Extend the suspension slings upward until taut.
- ② Safety tie each front, 3 3/4-inch, two-point link with a loop of type III nylon cord to the center hole in the parachute stowage platform.
- ③ Safety tie each rear, 3 3/4-inch, two-point link with a loop of type III nylon cord to the rear ACS clevis (not shown).
- ④ Tie a length of type III nylon cord around and behind the suspension sling, and around each ACS sling. Repeat for the remaining three suspension slings.
- ⑤ Tie a length of type III nylon cord around the suspension sling, behind all lashings, and around the 4- by 4-inch piece of lumber of the ACS. Repeat for the remaining three suspension slings.

**Figure 7-48. Suspension Slings Safety Tied**

## STOWING CARGO PARACHUTES

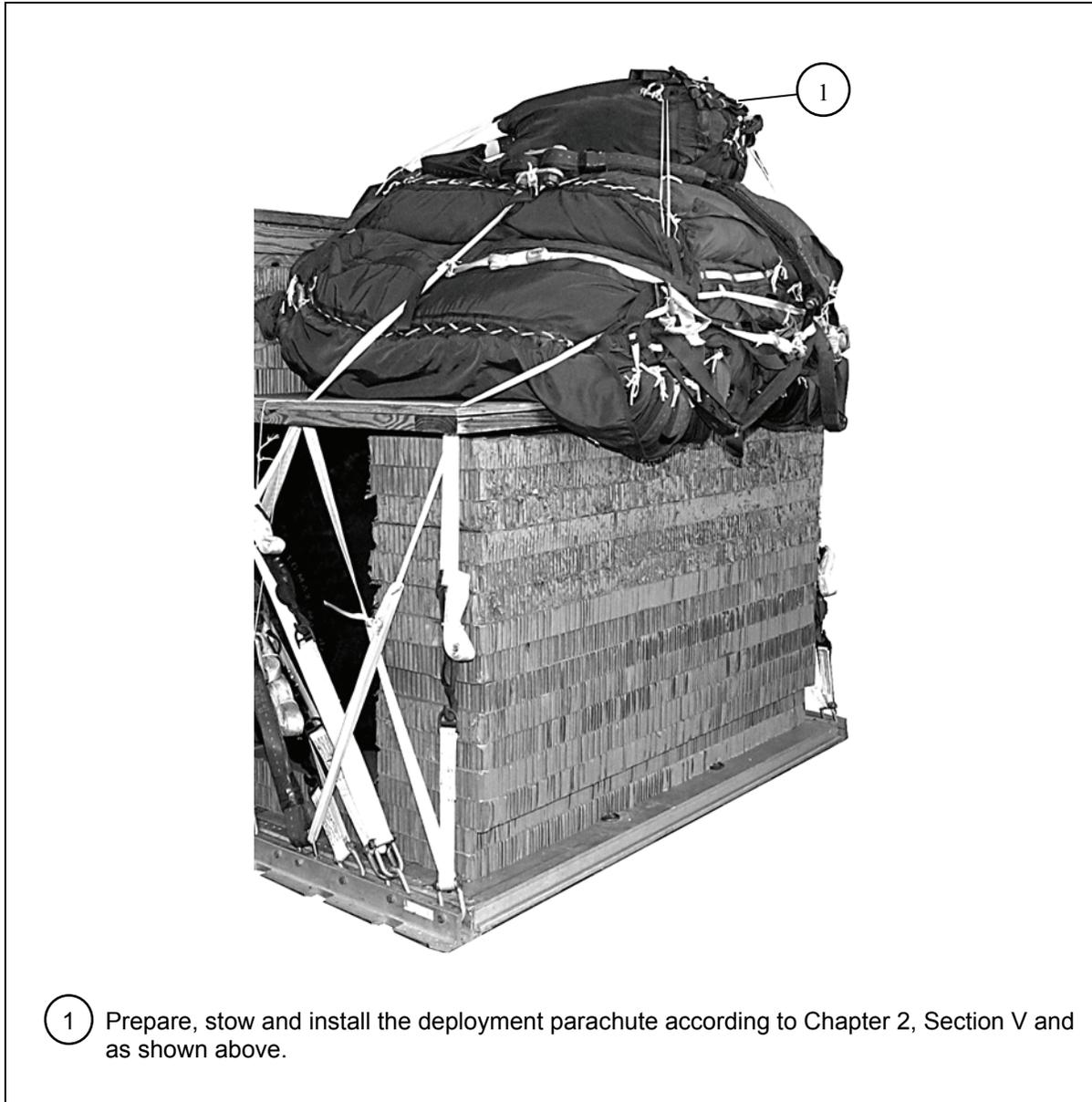
7-27. Prepare, stow, and restrain three G-11D cargo parachutes on the parachute stowage platform according to Chapter 2 and as shown in Figure 7-49.



**Figure 7-49. Cargo Parachutes Installed**

## STOWING DEPLOYMENT PARACHUTE

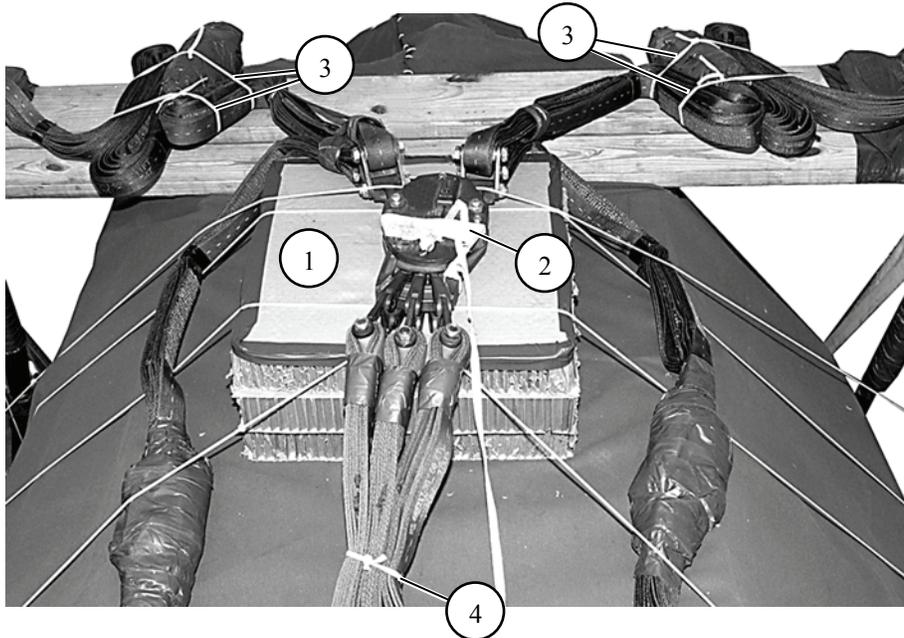
7-28. Prepare, stow, and install the deployment parachute according to Chapter 2, Section V and as shown in Figure 7-50.



**Figure 7-50. Deployment Parachute Installed**

## INSTALLING PARACHUTE RELEASE SYSTEM

7-29. Prepare and install the M-1 parachute release system according to Chapter 2, Section VI and as shown in Figure 7-51.



- 1 Cut and glue three 20- by 20-inch pieces of honeycomb to form the parachute release stack. Tape the top outside edges of the honeycomb. Center the stack in front of the rear ACS. Secure the parachute release stack with two lengths of type III nylon cord tied to convenient points on the load.
- 2 Position the M-1 release on top of the parachute release stack with the parachute release connectors toward the front edge.
- 3 Attach the suspension slings to the lower suspension links. S-fold the suspension slings on top of the rear ACS and safety tie at or near the 3 <sup>3</sup>/<sub>4</sub>-inch link with type I, <sup>1</sup>/<sub>4</sub>-inch cotton webbing. Make two ties on each sling.
- 4 Attach the parachute riser extensions to the parachute release connectors. Group the riser extensions together and safety tie with type I, <sup>1</sup>/<sub>4</sub>-inch cotton. Make the ties at 3-foot intervals.
- 5 Attach the arming wire and lanyard to a carrying handle on the parachute with three alternating half hitches with a knot in the running end.

**Figure 7-51. M-1 Parachute Release Installed**

## INSTALLING OUTRIGGER ASSEMBLIES

7-30. Assemble, install, and safety tie the mast and foot assemblies on the DRAS platform according to Chapter 2, Figures 2-42 through 2-44 and 2-45, Steps 1 through 3.

## INSTALLING MAST RELEASE KNIVES

7-31. Install the mast release knives according to Chapter 2, Figure 2-45, Steps 4 through 10 and as shown in Figure 7-52.

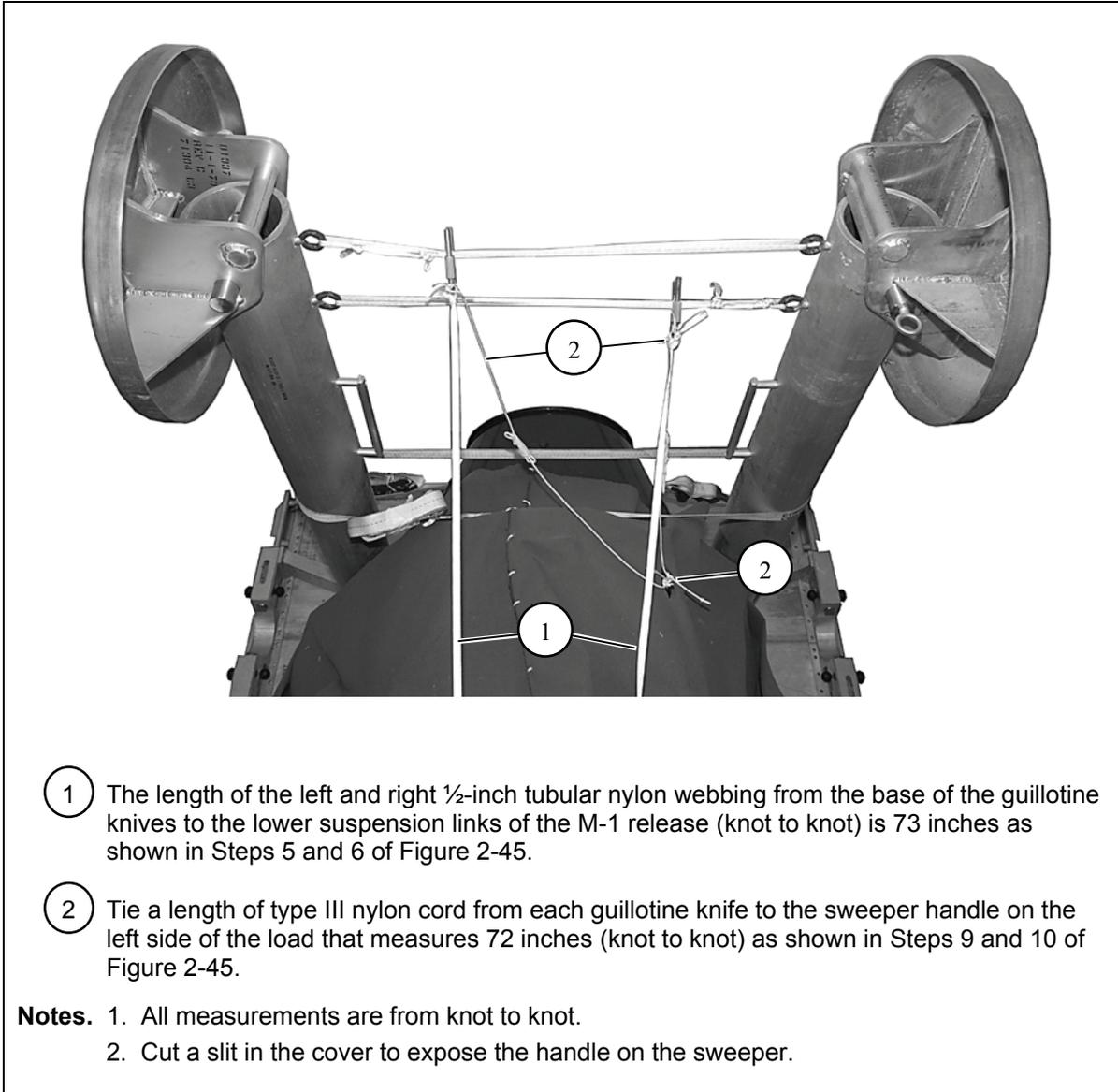


Figure 7-52. Mast Release Knives Installed

## MARKING RIGGED LOAD

7-32. Mark the rigged load according to Chapter 2, Section IX of this manual and as shown in Figure 7-53. A Shipper's Declaration for Dangerous Goods is required.

## EQUIPMENT REQUIRED

7-33. The equipment required to rig this load is listed in Table 7-2.

**CAUTION**

Make the final rigger inspection required by Chapter 2, Section IX before the load leaves the rigging site.



**RIGGED LOAD DATA**

Weight: Load shown .....	12,309 pounds
Maximum load allowed.....	12,750 pounds
Height .....	98 ½ inches
Width.....	94 inches
Overall Length .....	226 inches
Overhang: Front (Parachutes).....	10 inches
Rear .....	0 inches
Center of Balance: (from front edge of platform):.....	.88 inches

**Figure 7-53. T200 Bobcat Compact Track Loader Accessory Load Rigged on DRAS Platform**

**Table 7-2. Equipment Required for Rigging T200 Bobcat Compact Track Loader Accessory Load on DRAS Platform**

<i>National Stock Number</i>	<i>Item</i>	<i>Quantity</i>
8040-00-273-8713	Adhesive paste, 1-gallon	As required
4020-00-240-2146	Cord, nylon, type III, 550-pound	As required
	Clevis:	
4030-00-090-5354	Large	5
4030-00-678-8562	Medium	4
1670-00-360-0328	Cover, clevis, large	3
8135-00-664-6958	Cushioning material, packaging, cellulose wadding	As required
8305-00-191-1101	Felt, ½-inch	As required
1670-01-493-6418	Link assembly, two-point, 3 ¾-inch	9
	Lumber:	
5510-00-220-6146	2- by 4-inch	As required
5510-00-220-6148	2- by 6-inch	As required
5510-00-220-6246	2- by 8-inch	As required
5510-00-220-6274	4- by 4-inch	As required
5530-00-618-8073	Plywood, ¾-inch	7 sheets
	Nail, steel wire, common:	
5315-00-010-4659	8d	As required
5315-00-753-3885	16d	As required
1670-00-753-3928	Pad, energy dissipating, honeycomb	35 sheets
1670-01-487-5461	Static line assembly release away	1
	Parachute:	
	Cargo:	
1670-01-016-7841	G-11D	3
1670-00-040-8135	Cargo extraction: 28-foot (deployment parachute)	1
	Platform, dual row, 18-foot	
1670-01-485-1654	Rail, DRAS	2
1670-01-486-1342	Roller Pad, DRAS	4
1670-01-486-1656	Panel Assembly, Main	9
1670-01-162-2372	Clevis assembly	62
1670-01-097-8816	Release, cargo parachute, M-1	1
	Sling, cargo airdrop	
	For suspension:	
1670-01-062-6310	11-foot (4-loop), type XXVI nylon webbing	4
1670-01-062-6306	3-foot (4-loop), type XXVI nylon webbing	8
	For deployment:	
1670-01-062-6306	3-foot (4-loop), type XXVI nylon webbing	1
	For riser extension:	
1670-01-062-6313	60-foot (3-loop), type XXVI nylon webbing	3
	For ACS:	
1670-01-063-7761	16-foot (2-loop), type XXVI nylon webbing	2

**Table 7-2. Equipment Required for Rigging T200 Bobcat Compact Track Loader Accessory Load on DRAS Platform (Continued)**

<i>National Stock Number</i>	<i>Item</i>	<i>Quantity</i>
1670-00-040-8219	Strap, parachute release, multicut	2
1670-00-937-0271	Knife release, cargo (guillotine)	6
1670-01-487-5464	Outrigger assembly	1
7510-00-266-5016	Tape, adhesive, 2-inch	As required
1670-00-937-0271	Tie-down assembly, 15-foot	48
1670-00-725-1437	Tie-down, cargo, aircraft, (CGU-1B)	5
	Webbing:	
8305-00-268-2411	Cotton, ¼-inch, type I	As required
	Nylon:	
8305-00-268-2455	Tubular, 1-inch	As required
8305-00-082-5752	Tubular, ½-inch	As required
8305-00-263-3591	Type VIII	As required

## Chapter 8

# Rigging Guided Missile, Surface, Attack Javelin Container on Dual Row Airdrop System Platform

## SECTION I – RIGGING JAVELIN (METAL) CONTAINERS

### DESCRIPTION OF LOAD

8-1. The guided missile, surface, attack Javelin (metal) container is rigged on an 18-foot dual row platform. The rigged weight is 11,140 pounds. Each individual missile container weighs approximately 39 pounds. The load is rigged with 30 Javelin containers. The load has a supply box that has a load capacity weight limit of 2,000 pounds minimum and 4,000 pounds maximum. The height of the load is 110 inches and the width is 94 inches. The load is rigged with three G-11D cargo parachutes.

### PREPARING PLATFORM

8-2. Inspect, or assemble and inspect, a DRAS platform with outrigger assemblies and outrigger platform support weldments according to TM 10-1670-268-23&P and as shown in Figure 8-1.

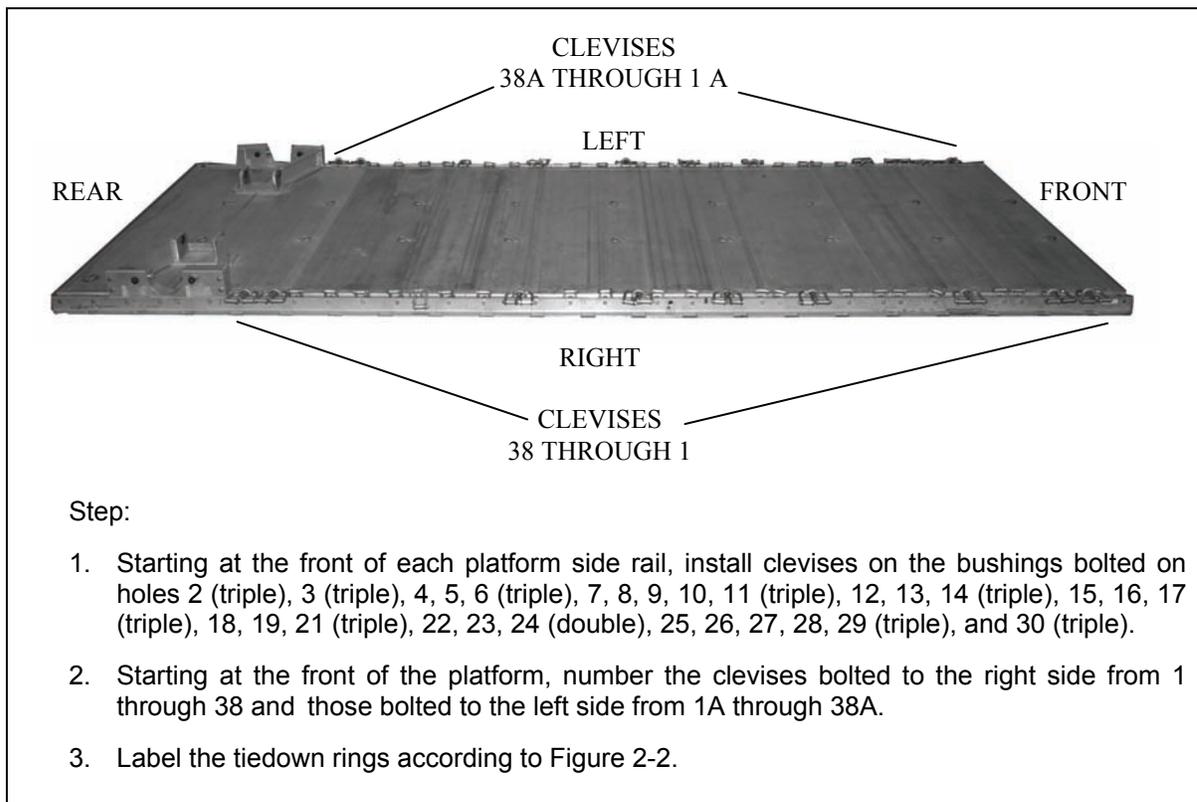
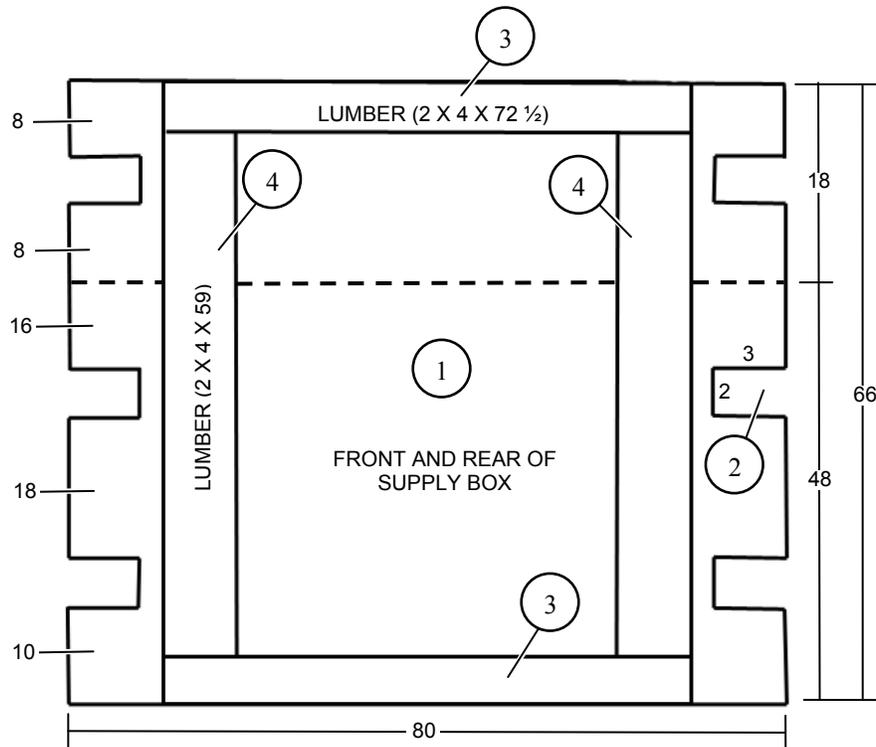


Figure 8-1. Platform Prepared

## CONSTRUCTING SUPPLY BOX

8-3. Construct the supply box as shown in Figure 8-2.

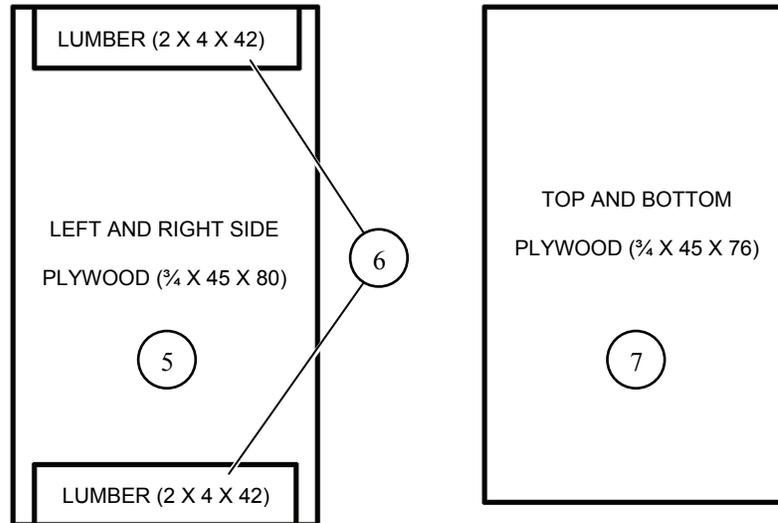
- Notes.**
1. This drawing is not to scale.
  2. All dimensions are in inches.
  3. Use 8d nails.



- 1 Cut two  $\frac{3}{4}$ - by 18- by 80-inch pieces of plywood and two  $\frac{3}{4}$ - by 48- by 80-inch pieces of plywood. Use this to form two 80- by 66-inch pieces of plywood which will be the front and rear of the box.
- 2 Make 2- by 3-inch cutouts as shown in each of the four sides.
- 3 Cut and nail a 2- by 4- by 72  $\frac{1}{2}$ -inch piece of lumber centered on the edge along the top and bottom interior edges of each of the four sides with 8d nails.
- 4 Cut and nail two pieces 2- by 4- by 59-inch lumber along the left and right side aligned with each edge of the 2- by 4- by 72  $\frac{1}{2}$ -inch pieces of lumber with 8d nails to form a square.

**Figure 8-2. Supply Box Constructed**

- Notes.** 1. This drawing is not to scale.  
2. All dimensions are in inches.  
3. Use 8d nails.



- 5 Cut two 3/4- by 45- by 80-inch pieces of plywood to form the right and left side of the box.
- 6 Cut and nail a 2- by 4- by 42-inch piece of lumber along the top and bottom interior edges flush and centered with each of the sides with 8d nails.
- 7 Cut two 3/4- by 45- by 76-inch pieces of plywood to form the top and bottom of the box.
- 8 Nail the four sides of the box to the base with the notched sides forming the front and rear (Not shown).

**Figure 8-2. Supply Box Constructed (Continued)**

## POSITIONING SUPPLY BOX

8-4. Position the supply box as shown in Figure 8-3.

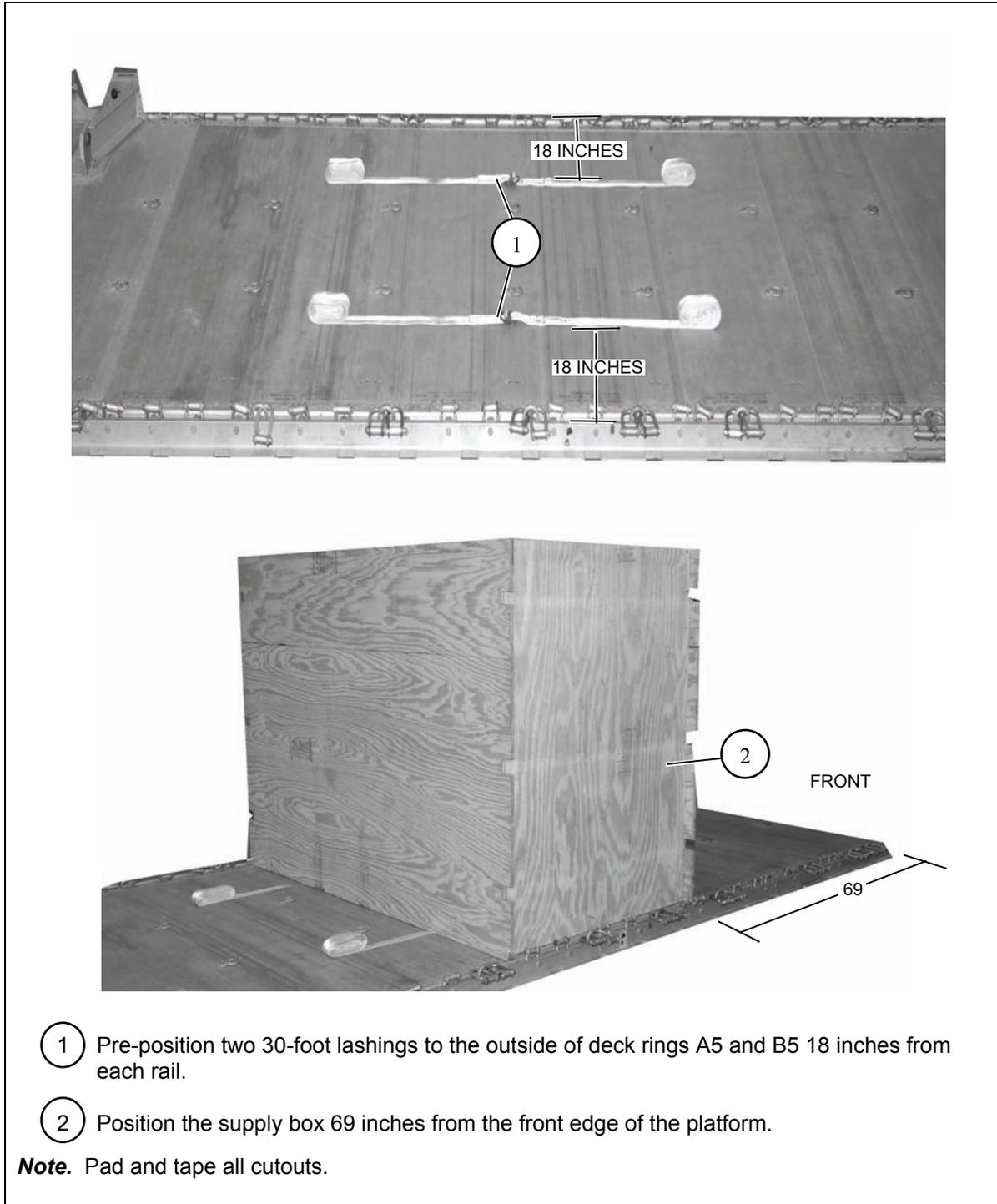
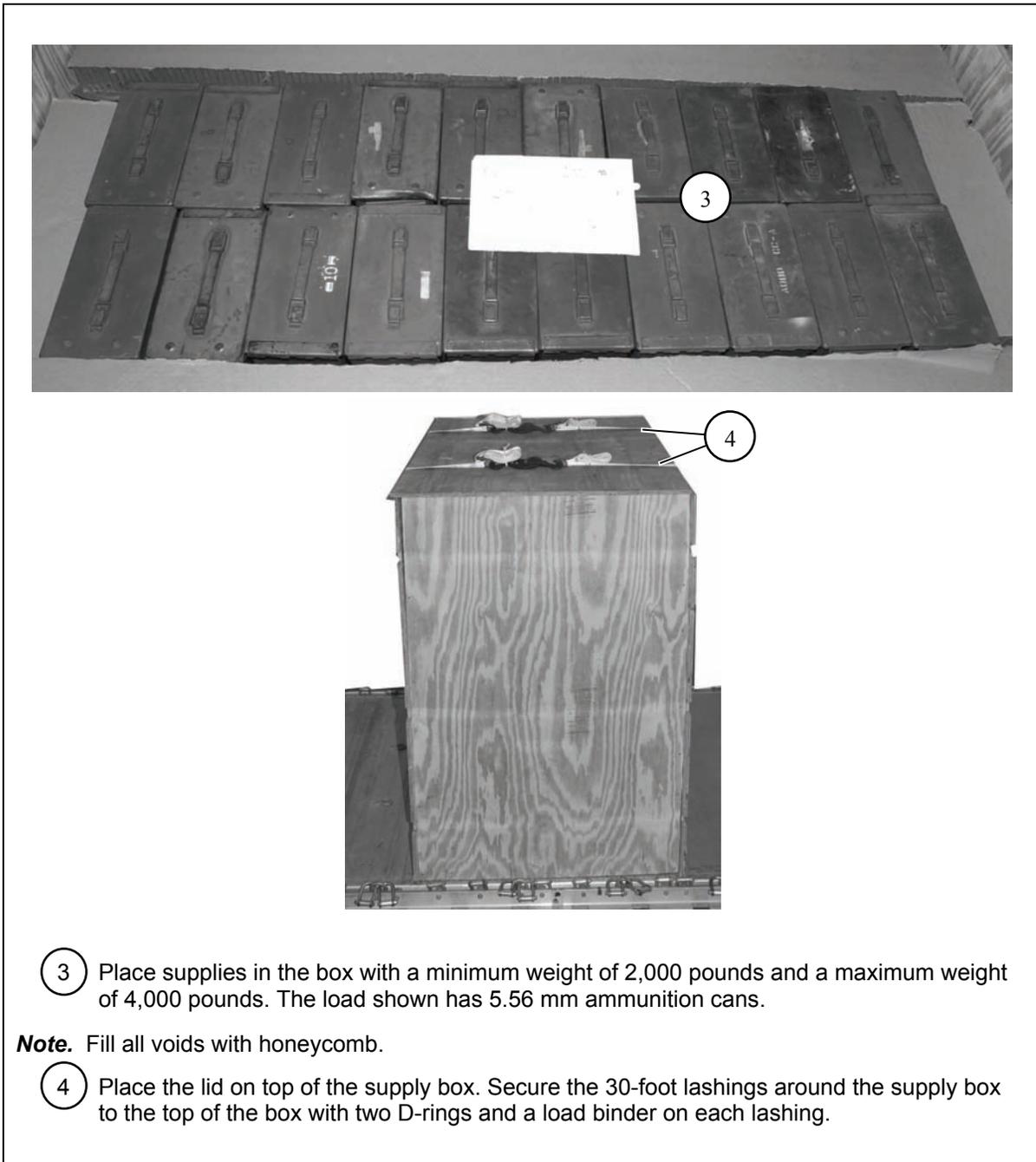


Figure 8-3. Supply Box Positioned

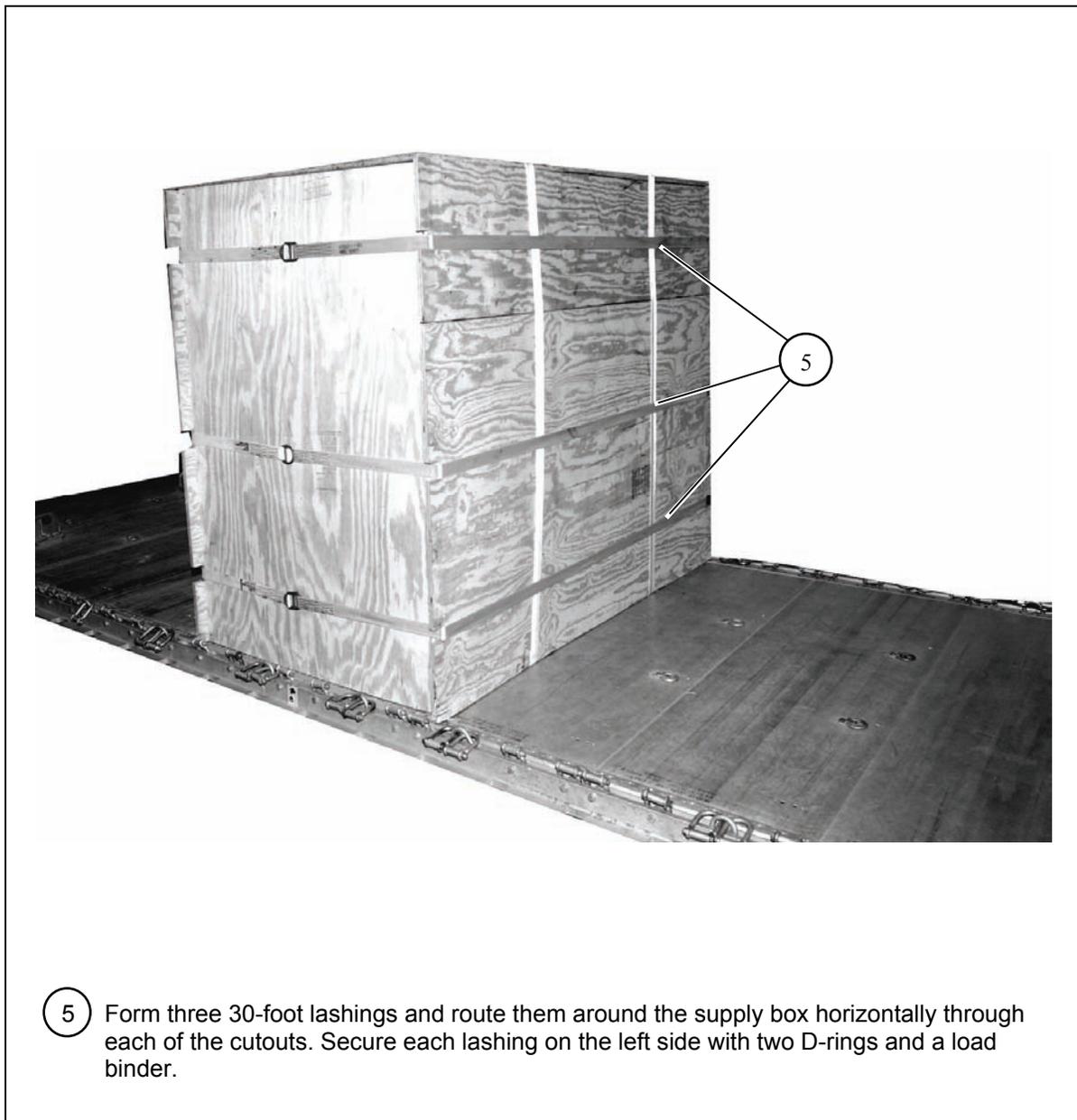


- ③ Place supplies in the box with a minimum weight of 2,000 pounds and a maximum weight of 4,000 pounds. The load shown has 5.56 mm ammunition cans.

**Note.** Fill all voids with honeycomb.

- ④ Place the lid on top of the supply box. Secure the 30-foot lashings around the supply box to the top of the box with two D-rings and a load binder on each lashing.

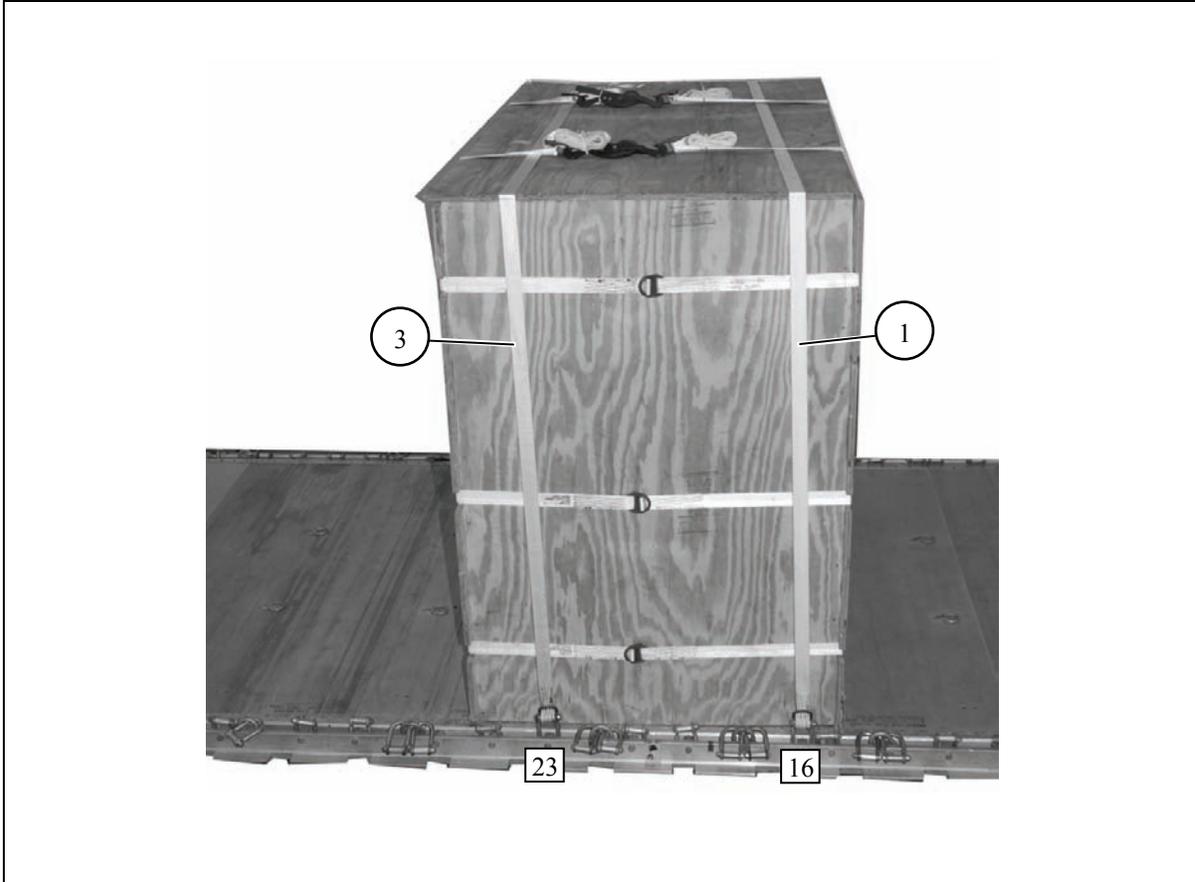
Figure 8-3. Supply Box Positioned (Continued)



**Figure 8-3. Supply Box Positioned (Continued)**

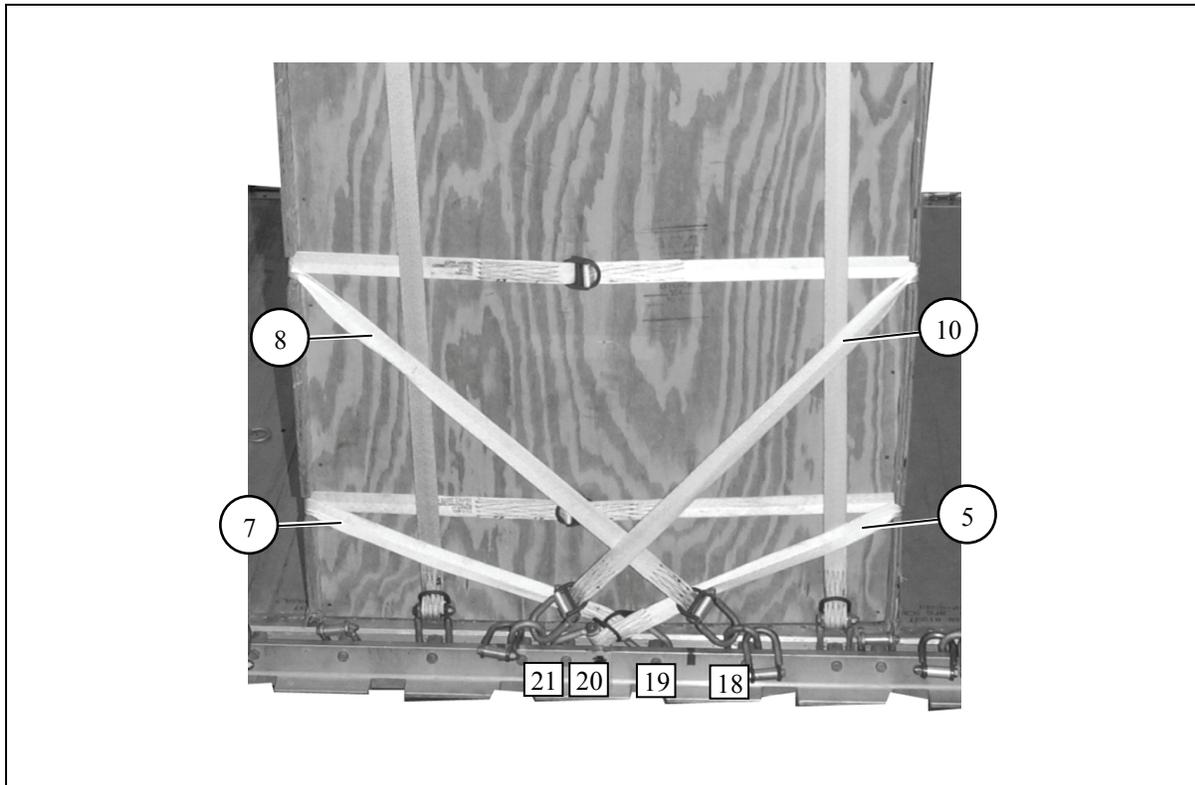
## LASHING SUPPLY BOX

8-5. Lash the supply box as shown in Figure 8-4.



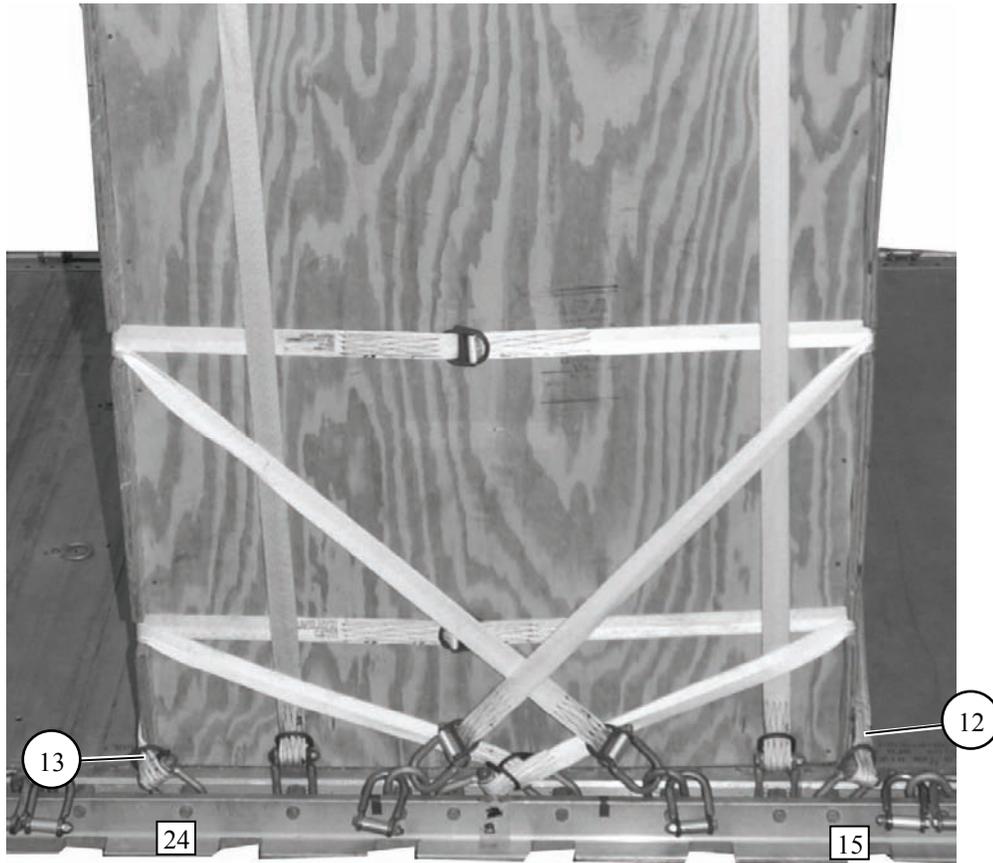
<i>Lashing Number</i>	<i>Tiedown Clevis Number</i>	<i>Instructions</i>
1	16	Route a 15-foot lashing through clevis 16 and through its own D-ring. Route the lashing over the top of the supply box.
2	16A	Route a 15-foot lashing through clevis 16A and through its own D-ring. Secure the lashing to the lashing from clevis 16 on the left side with two D-rings and a load binder.
3	23	Route a 15-foot lashing through clevis 23 and through its own D-ring. Route the lashing over the top of the supply box.
4	23A	Route a 15-foot lashing through clevis 23A and through its own D-ring. Secure the lashing to the lashing from clevis 23 on the left side with two D-rings and a load binder

**Figure 8-4. Supply Box Lashed**



<b>Lashing Number</b>	<b>Tiedown Clevis Number</b>	<b>Instructions</b>
5	20	Route a 15-foot lashing through clevis 20 and through its own D-ring. Route the lashing through the front bottom cutouts of the supply box.
6	20A	Route a 15-foot lashing through clevis 20A and through its own D-ring. Secure the lashing to the lashing from clevis 20 on the left side with two D-rings and a load binder.
7	19 and 19A	Route a 15-foot lashing through clevis 19 and through its own D-ring. Route the lashing through the rear bottom cutouts of the supply box. Secure the lashing with a load binder to clevis 19A.
8	18	Route a 15-foot lashing through clevis 18 and through its own D-ring. Route the lashing through the rear middle cutouts of the supply box.
9	18A	Route a 15-foot lashing through clevis 18A and through its own D-ring. Secure the lashing to the lashing from clevis 18 on the left side with two D-rings and a load binder.
10	21	Route a 15-foot lashing through clevis 21 and through its own D-ring. Route the lashing through the front middle cutouts of the supply box.
11	21A	Route a 15-foot lashing through clevis 21A and through its own D-ring. Secure the lashing to the lashing from clevis 21 on the left side with two D-rings and a load binder.

Figure 8-4. Supply Box Lashed (Continued)



<i>Lashing Number</i>	<i>Tiedown Clevis Number</i>	<i>Instructions</i>
12	15	Route a 15-foot lashing through clevis 15 and through its own D-ring. Route the lashing to the upper left front cutout of the supply box.
13	24	Route a 15-foot lashing through clevis 24 and through its own D-ring. Route the lashing to the upper left rear cutout of the supply box. Secure the lashing to the lashing from clevis 15 on the left side with two D-rings and a load binder.
14	15A	Route a 15-foot lashing through clevis 15A and through its own D-ring. Route the lashing to the upper right front cutout of the supply box.
15	24A	Route a 15-foot lashing through clevis 24A and through its own D-ring. Route the lashing to the upper right rear cutout of the supply box. Secure the lashing to the lashing from clevis 15A on the right side with two D-rings and a load binder.

**Figure 8-4. Supply Box Lashed (Continued)**

## PREPARING HONEYCOMB STACKS

8-6. Prepare honeycomb stacks 1 and 2 as shown in Figure 8-5.

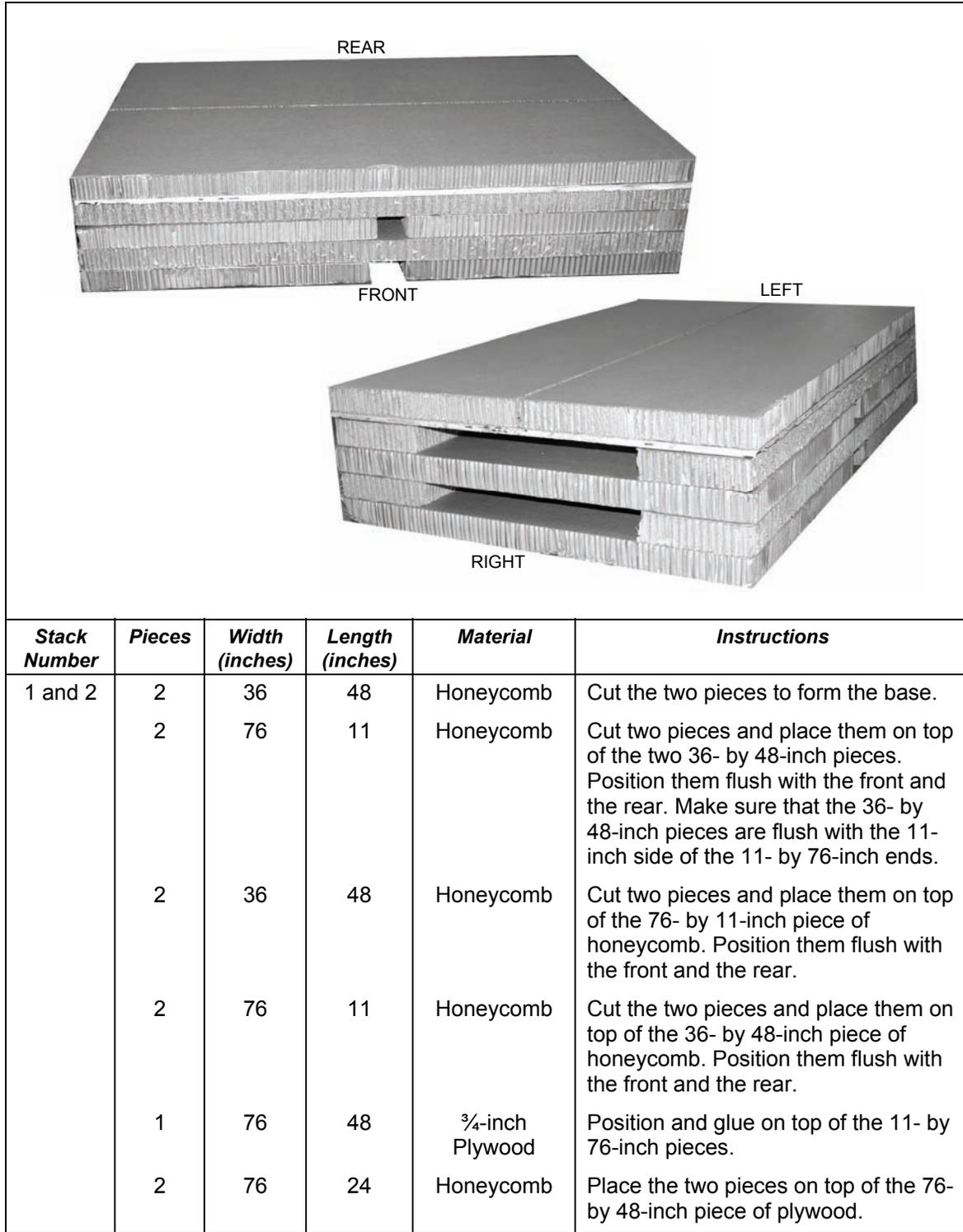
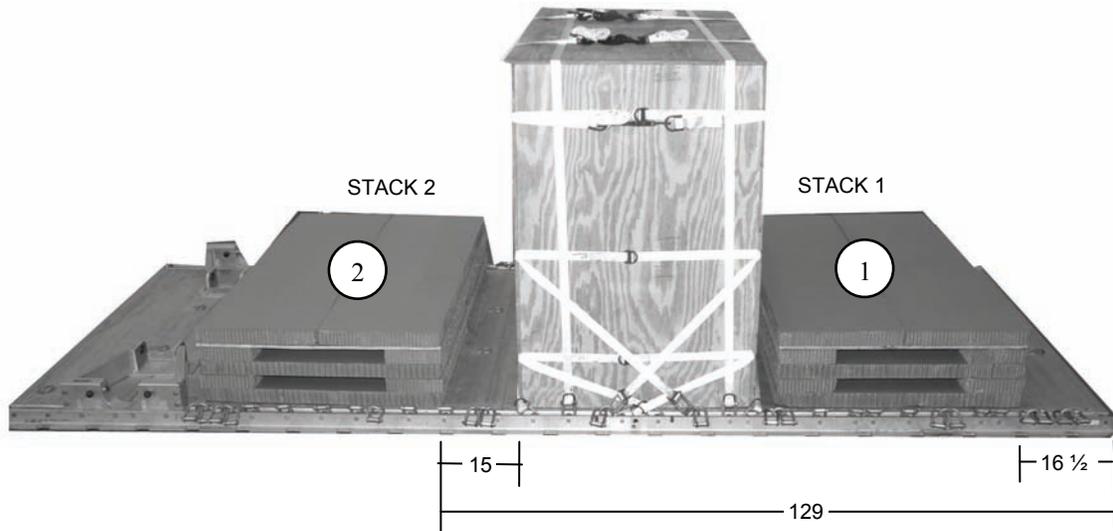


Figure 8-5. Honeycomb Stacks 1 and 2 Prepared

## POSITIONING HONEYCOMB STACKS

8-7. Position honeycomb stacks 1 and 2 as shown in Figure 8-6.

**Note.** All dimensions are in inches.



- ① Position stack 1, 16 ½ inches centered from the front edge of the platform.
- ② Position stack 2, 15 inches centered from the supply box and 129 inches centered from the front edge of the platform.

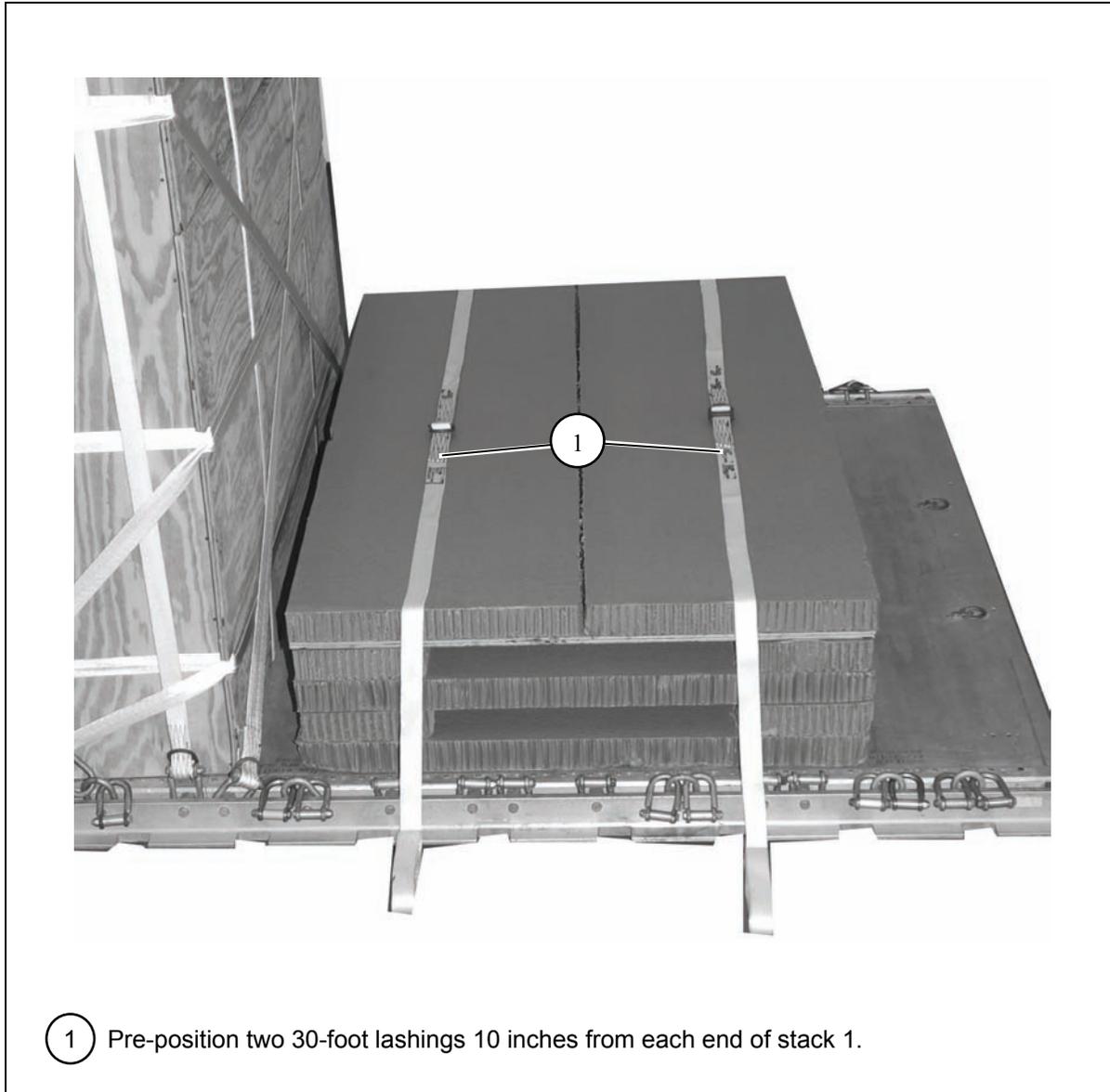
**Figure 8-6. Honeycomb Stacks 1 and 2 Positioned**

## POSITIONING AND SECURING JAVELINS ON STACK 1

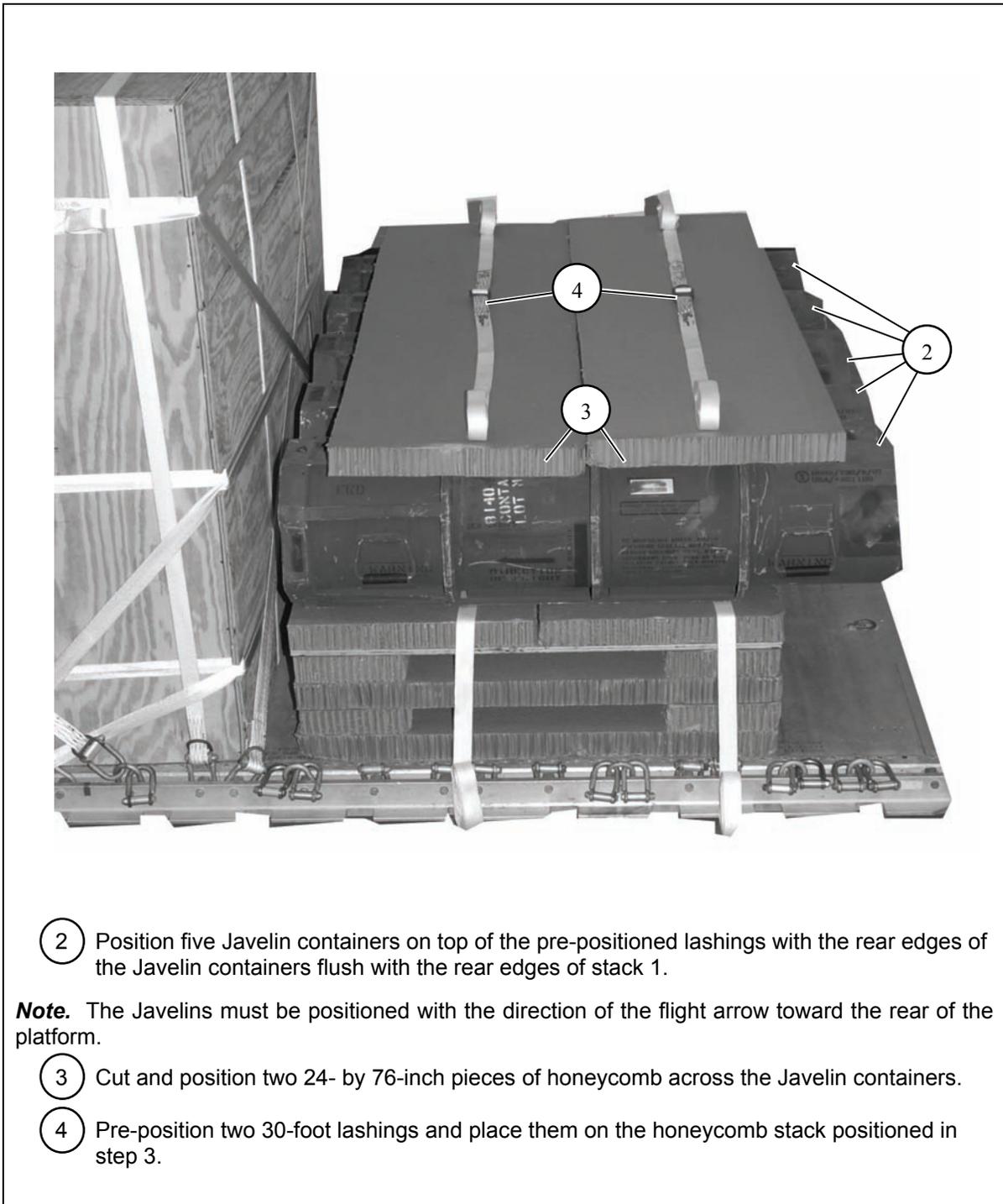
8-8. Position and secure the Javelins on stack 1 as shown in Figure 8-7.

### CAUTION

The Javelins must be positioned with the direction of the flight arrow toward the rear of the platform.



**Figure 8-7. Javelins Positioned and Secured on Stack 1**

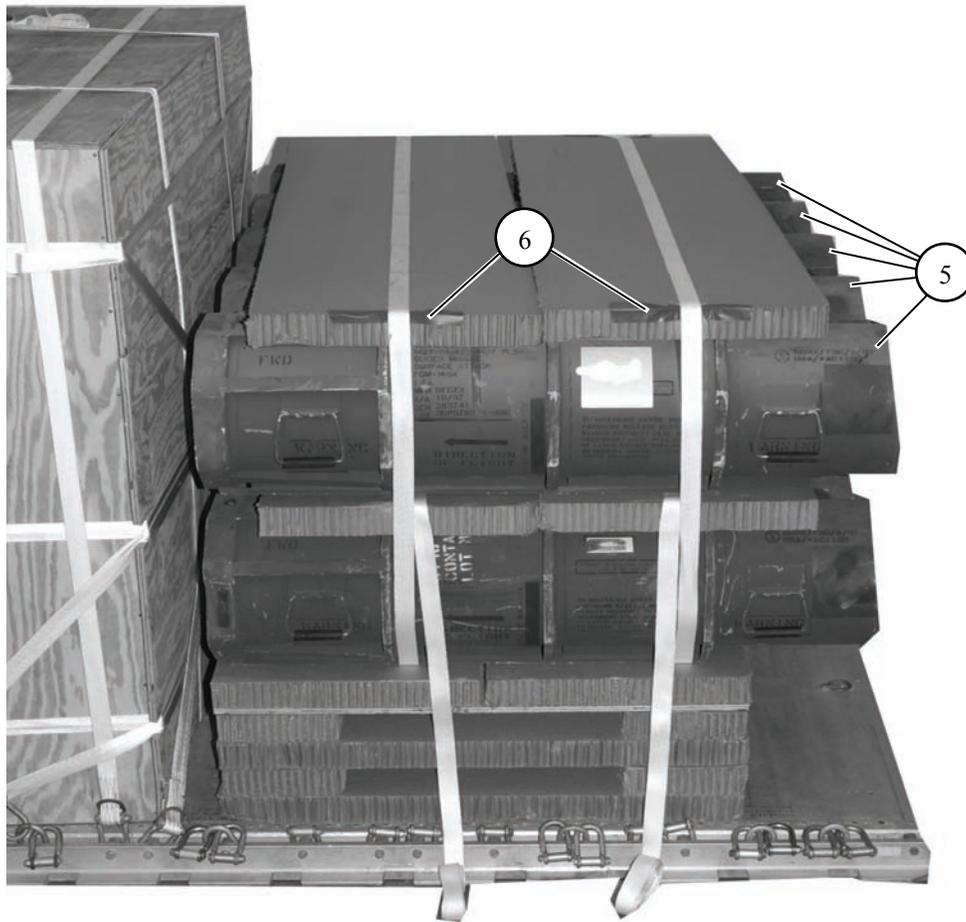


- 2 Position five Javelin containers on top of the pre-positioned lashings with the rear edges of the Javelin containers flush with the rear edges of stack 1.

**Note.** The Javelins must be positioned with the direction of the flight arrow toward the rear of the platform.

- 3 Cut and position two 24- by 76-inch pieces of honeycomb across the Javelin containers.
- 4 Pre-position two 30-foot lashings and place them on the honeycomb stack positioned in step 3.

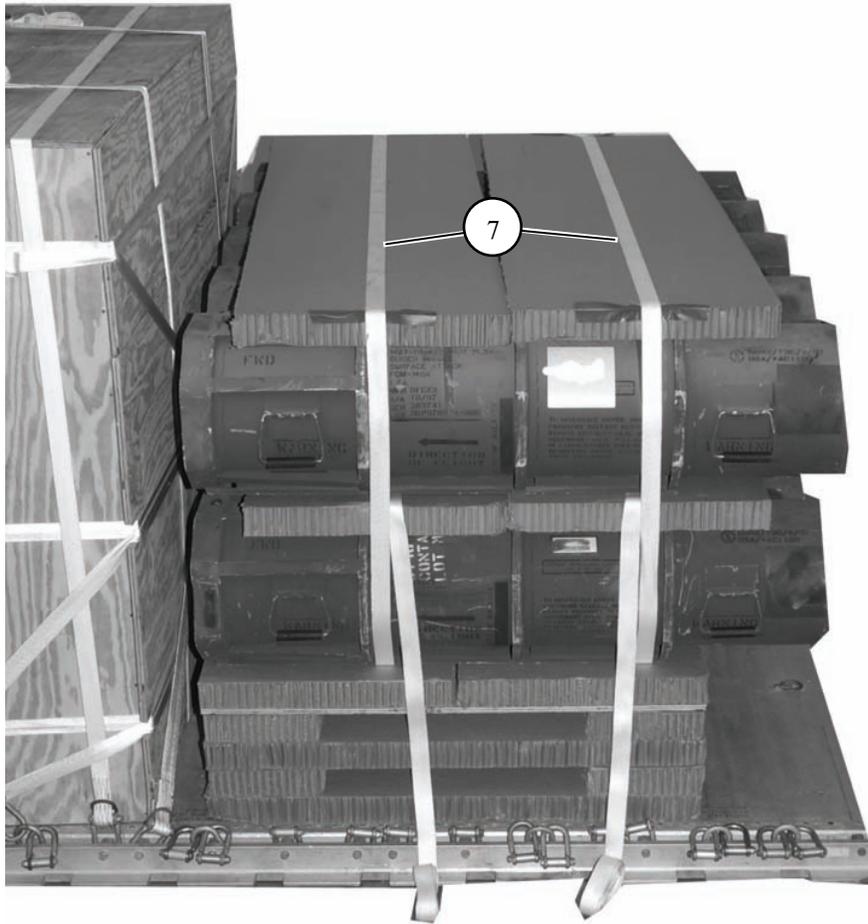
**Figure 8-7. Javelins Positioned and Secured on Stack 1 (Continued)**



- 5 Position five Javelin containers on top of the pre-positioned lashings with the rear edges of the Javelin containers flush with the rear edges of stack 1.
- 6 Cut and position two 24- by 76-inch pieces of honeycomb across the Javelin containers. Tape the edges of the honeycomb where the lashings will touch when secured.

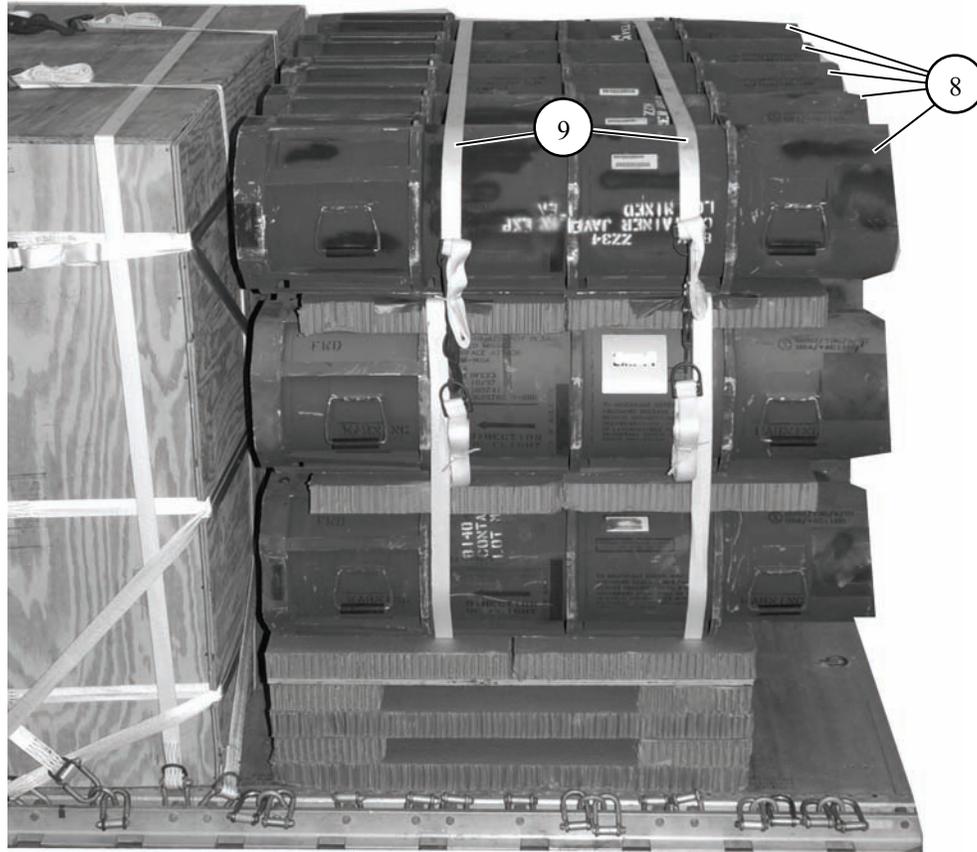
**Note.** Place the lashings toward the inside so the first set of lashings are not touching when secured.

**Figure 8-7. Javelins Positioned and Secured on Stack 1 (Continued)**



- ⑦ Secure the first and second layers with the pre-positioned lashings on the bottom of the left side with two D-rings and a load binder.

**Figure 8-7. Javelins Positioned and Secured on Stack 1 (Continued)**



- ⑧ Position five Javelin containers on top of the honeycomb with the rear edges of the Javelin containers flush with the rear edges of stack 1.
- ⑨ Secure the second and third layers with the pre-positioned lashings, that were placed on the second layer, on the right side of the platform with two D-rings and a load binder.

**Figure 8-7. Javelins Positioned and Secured on Stack 1 (Continued)**

## POSITIONING AND SECURING JAVELINS ON STACK 2

8-9. Position and secure the Javelins on stack 2 as shown in Figure 8-8. The same procedures and dimensions used in stack 1 will be duplicated for stack 2.

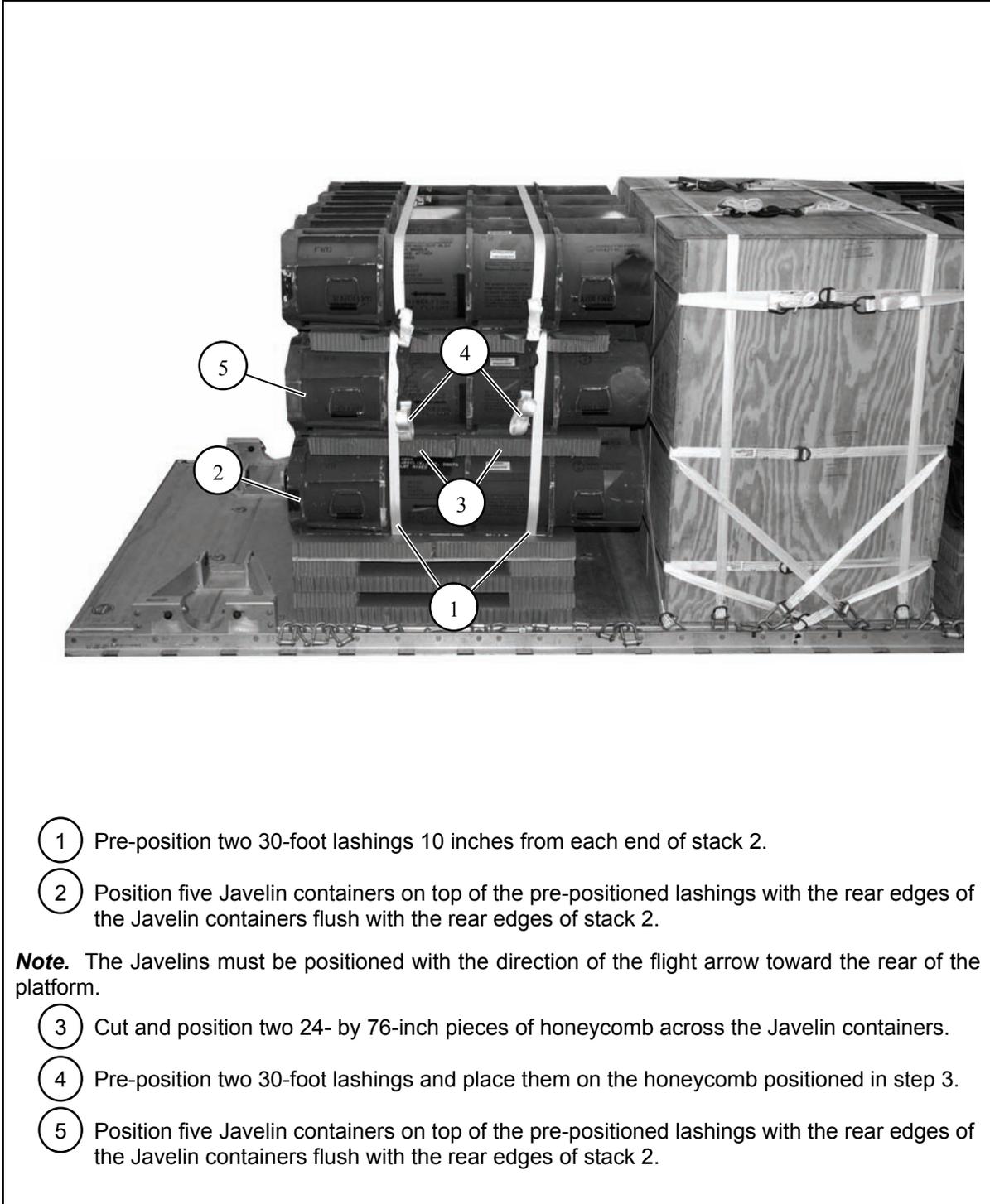
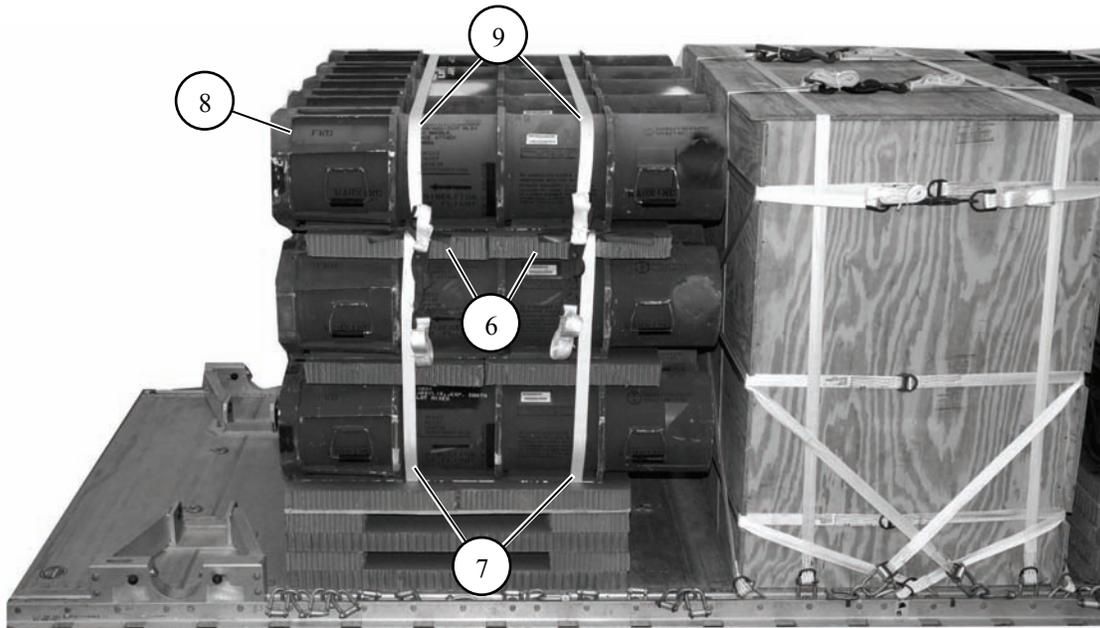


Figure 8-8. Javelins Positioned and Secured on Stack 2



- ⑥ Cut and position two 24- by 76-inch pieces of honeycomb across the Javelin containers. Tape the edges of the honeycomb where the lashings will touch when secured.

**Note.** Place the lashings toward the inside so as not to touch the first set of lashings are not touching when secured.

- ⑦ Secure the first and second layers with the pre-positioned lashings on the bottom on the left side with two D-rings and a load binder.
- ⑧ Position five Javelin containers on top of the honeycomb with the rear edges of the Javelin containers flush with the rear edges of stack 2.
- ⑨ Secure the second and third layers with the pre-positioned lashings, that were placed on the second layer, on the right side of the platform with two D-rings and a load binder.

**Figure 8-8. Javelins Positioned and Secured on Stack 2 (Continued)**

## CONSTRUCTING ENDBOARDS

8-10. Construct four endboards as shown in Figure 8-9.

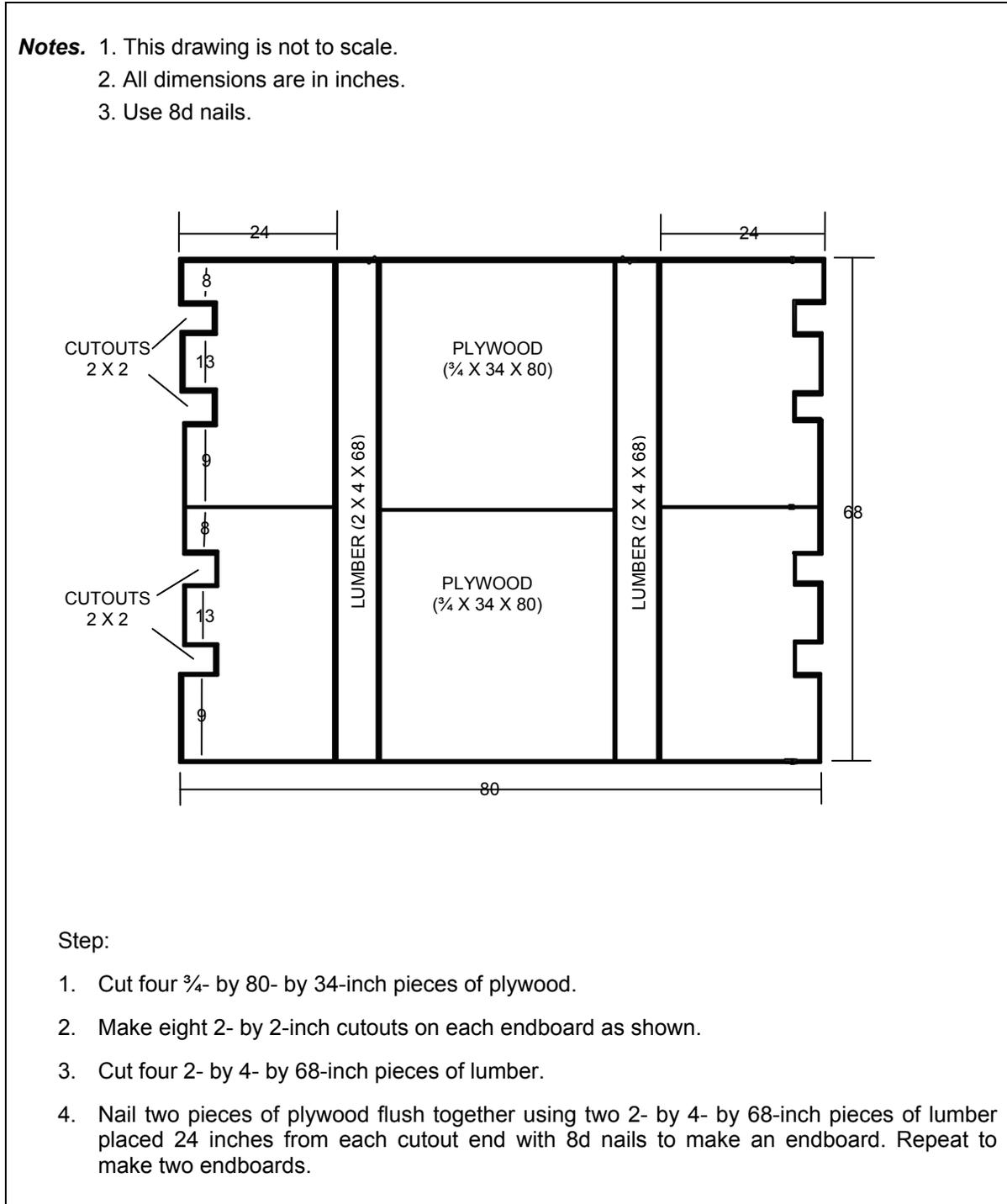
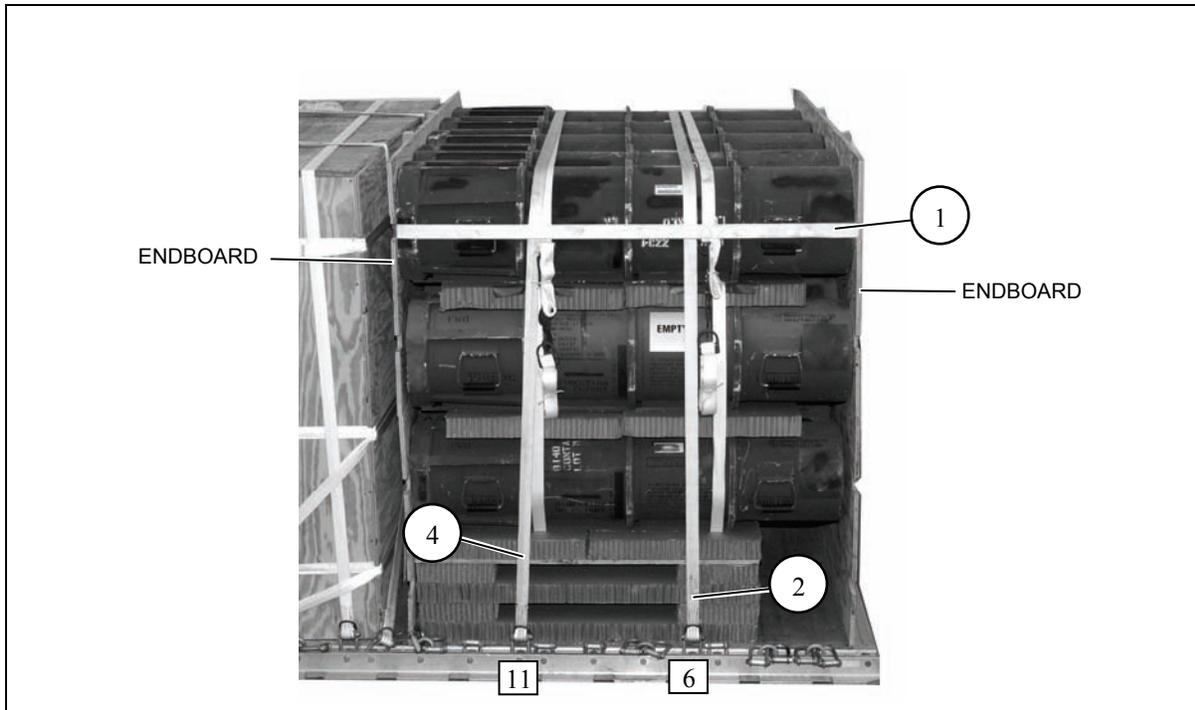


Figure 8-9. Endboards Constructed

## LASHING ENDBOARDS AND LOAD FOR STACK 1

8-11. Lash the endboards and the load for stack 1 as shown in Figure 8-10.

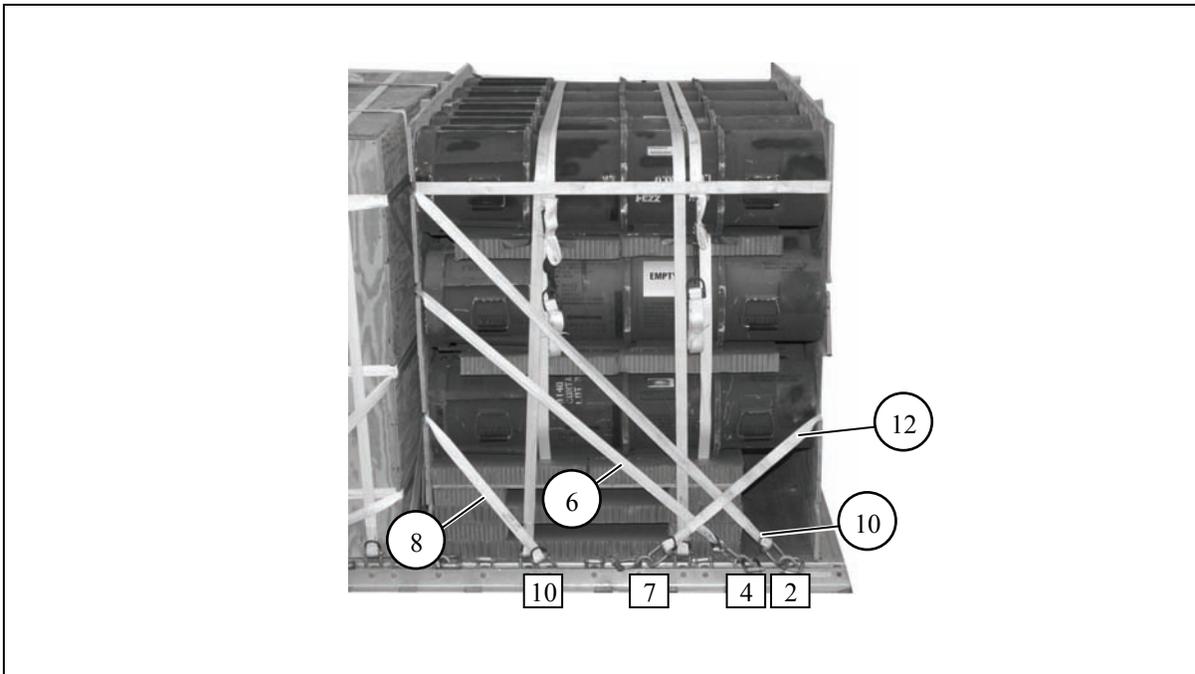


Step:

1. Position an endboard on each side of stack 1 with the 2- by 4-inch piece of lumber side placed to the outside.

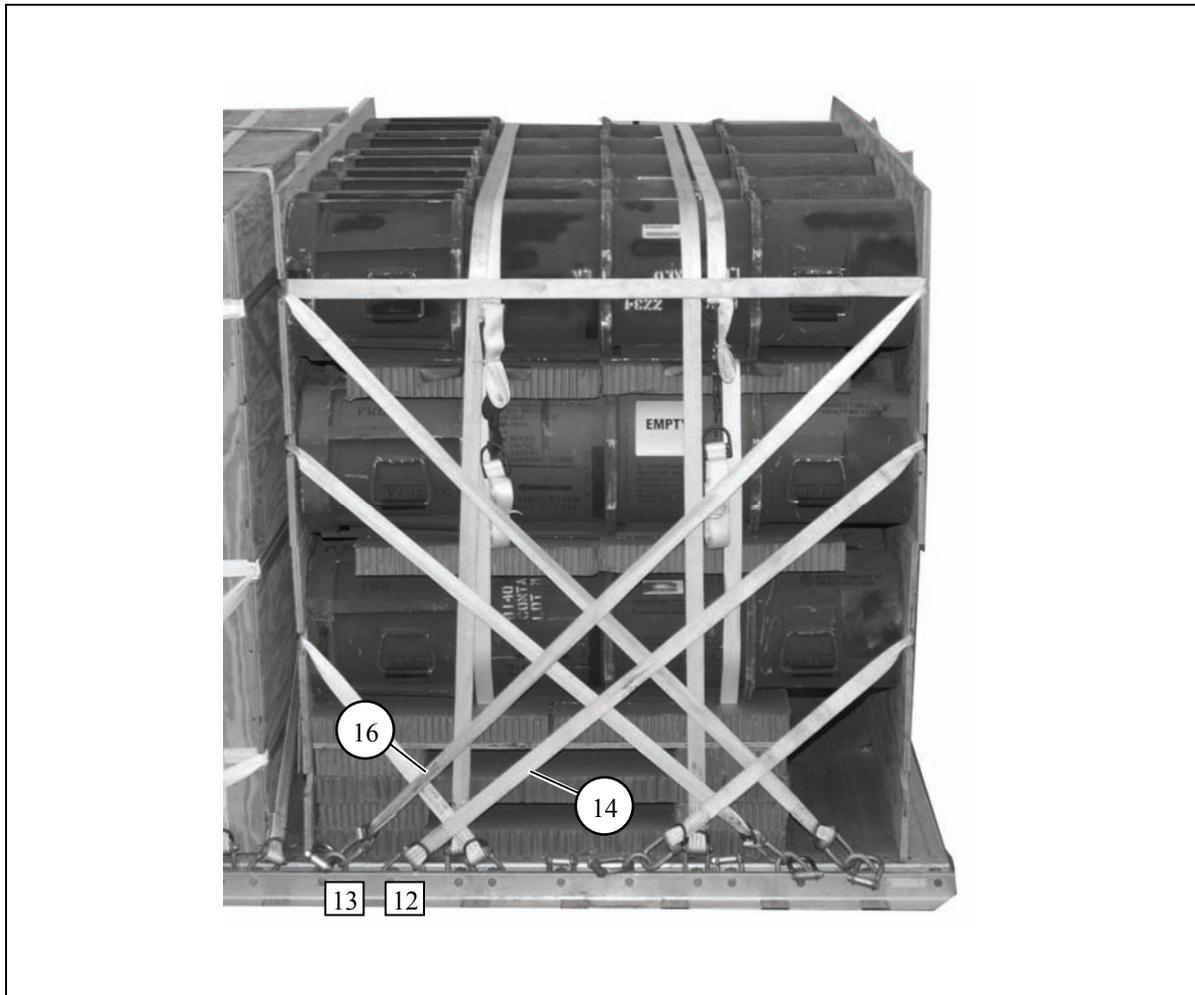
<i>Lashing Number</i>	<i>Tiedown Clevis Number</i>	<i>Instructions</i>
1		Form a 30-foot lashing and route it through the top cutouts of stack 1 and secure centered on the front endboard of stack 1 with two D-rings and a load binder.
2	6	Route a 15-foot lashing through clevis 6 and through its own D-ring. Route the lashing over the top of stack 1.
3	6A	Route a 15-foot lashing through clevis 6A and through its own D-ring. Secure the lashing to the lashing from clevis 6 on the left side with two D-rings and a load binder.
4	11	Route a 15-foot lashing through clevis 11 and through its own D-ring. Route the lashing over the top of stack 1.
5	11A	Route a 15-foot lashing through clevis 11A and through its own D-ring. Secure the lashing to the lashing from clevis 11 on the left side with two D-rings and a load binder.

**Figure 8-10. Endboards and Load for Stack 1 Lashed**



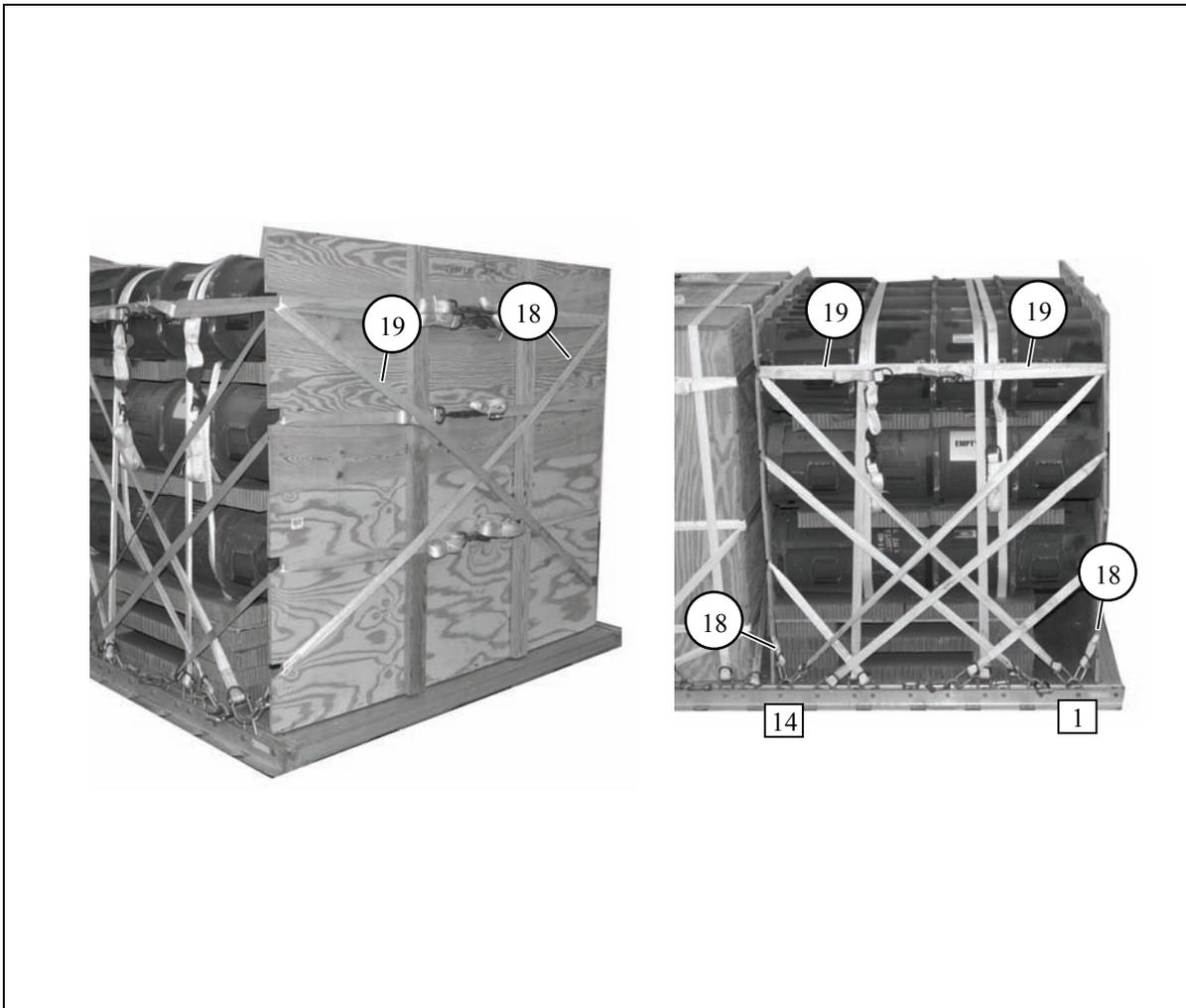
<b>Lashing Number</b>	<b>Tiedown Clevis Number</b>	<b>Instructions</b>
6	4	Route a 15-foot lashing through clevis 4 and through its own D-ring. Route the lashing through the top middle cutouts of the rear endboard.
7	4A	Route a 15-foot lashing through clevis 4A and through its own D-ring. Secure the lashing to the lashing from clevis 4 on the left side with two D-rings and a load binder.
8	10	Route a 15-foot lashing through clevis 10 and through its own D-ring. Route the lashing through the bottom middle cutouts of the rear endboard.
9	10A	Route a 15-foot lashing through clevis 10A and through its own D-ring. Secure the lashing to the lashing from clevis 10 on the left side with two D-rings and a load binder.
10	2	Route a 15-foot lashing through clevis 2 and through its own D-ring. Route the lashing through the top cutouts of the rear endboard.
11	2A	Route a 15-foot lashing through clevis 2A and through its own D-ring. Secure the lashing to the lashing from clevis 2 on the left side with two D-rings and a load binder.
12	7	Route a 15-foot lashing through clevis 7 and through its own D-ring. Route the lashing through the bottom middle cutout of the front endboard.
13	7A	Route a 15-foot lashing through clevis 7A and through its own D-ring. Secure the lashing to the lashing from clevis 7 on the front endboard center with two D-rings and a load binder.

Figure 8-10. Endboards and Load for Stack 1 Lashed (Continued)



<b>Lashing Number</b>	<b>Tiedown Clevis Number</b>	<b>Instructions</b>
14	12	Route a 15-foot lashing through clevis 12 and through its own D-ring. Route the lashing through the top middle cutout of the front endboard.
15	12A	Route a 15-foot lashing through clevis 12A and through its own D-ring. Route the lashing through the top middle cutout of the front endboard. Secure the lashing to the lashing from clevis 12 on the front endboard centered with two D-rings and a load binder.
16	13	Route a 15-foot lashing through clevis 13 and through its own D-ring. Route the lashing through the top cutout of the front endboard.
17	13A	Route a 15-foot lashing through clevis 13A and through its own D-ring. Route the lashing through the top cutout of the front endboard. Secure the lashing to the lashing from clevis 13 on the front endboard centered with two D-rings and a load binder.

**Figure 8-10. Endboards and Load for Stack 1 Lashed (Continued)**

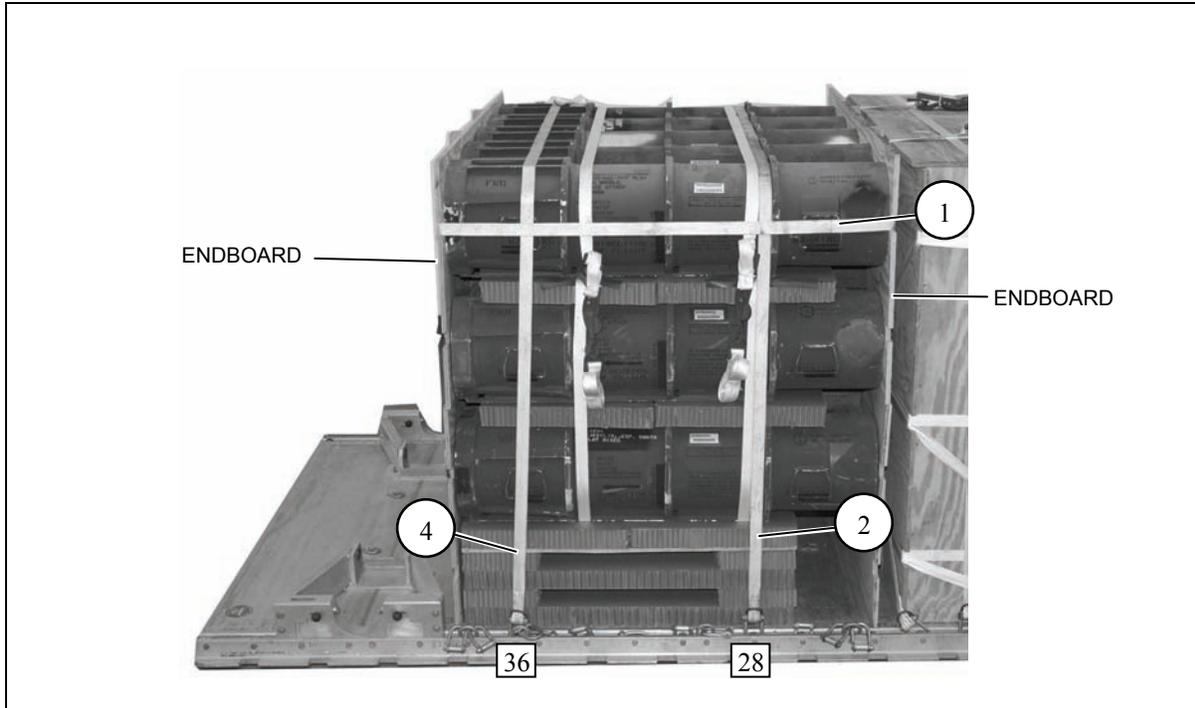


<i>Lashing Number</i>	<i>Tiedown Clevis Number</i>	<i>Instructions</i>
18	1 and 14	Route a 15-foot lashing through clevis 1 and through its own D-ring. Route the lashing through the bottom cutout to the top cutout of the front endboard. Route a 15-foot lashing through clevis 14 and through its own D-ring and through the bottom cutout to the top cutout of the rear endboard. Secure the lashing from clevises 1 and 14 together on the left side with two D-rings and a load binder.
19	1A and 14A	Route a 15-foot lashing through clevis 1A and through its own D-ring. Route the lashing through the bottom cutout to the top cutout of the front endboard. Route a 15-foot lashing through clevis 14A and through its own D-ring and through the bottom cutout to the top cutout of the rear endboard. Secure the lashing from clevises 1A and 14A together on the right side with two D-rings and a load binder.

Figure 8-10. Endboards and Load for Stack 1 Lashed (Continued)

## LASHING ENDBOARDS AND LOAD FOR STACK 2

8-12. Lash the endboards and the load for stack 2 as shown in Figure 8-11.

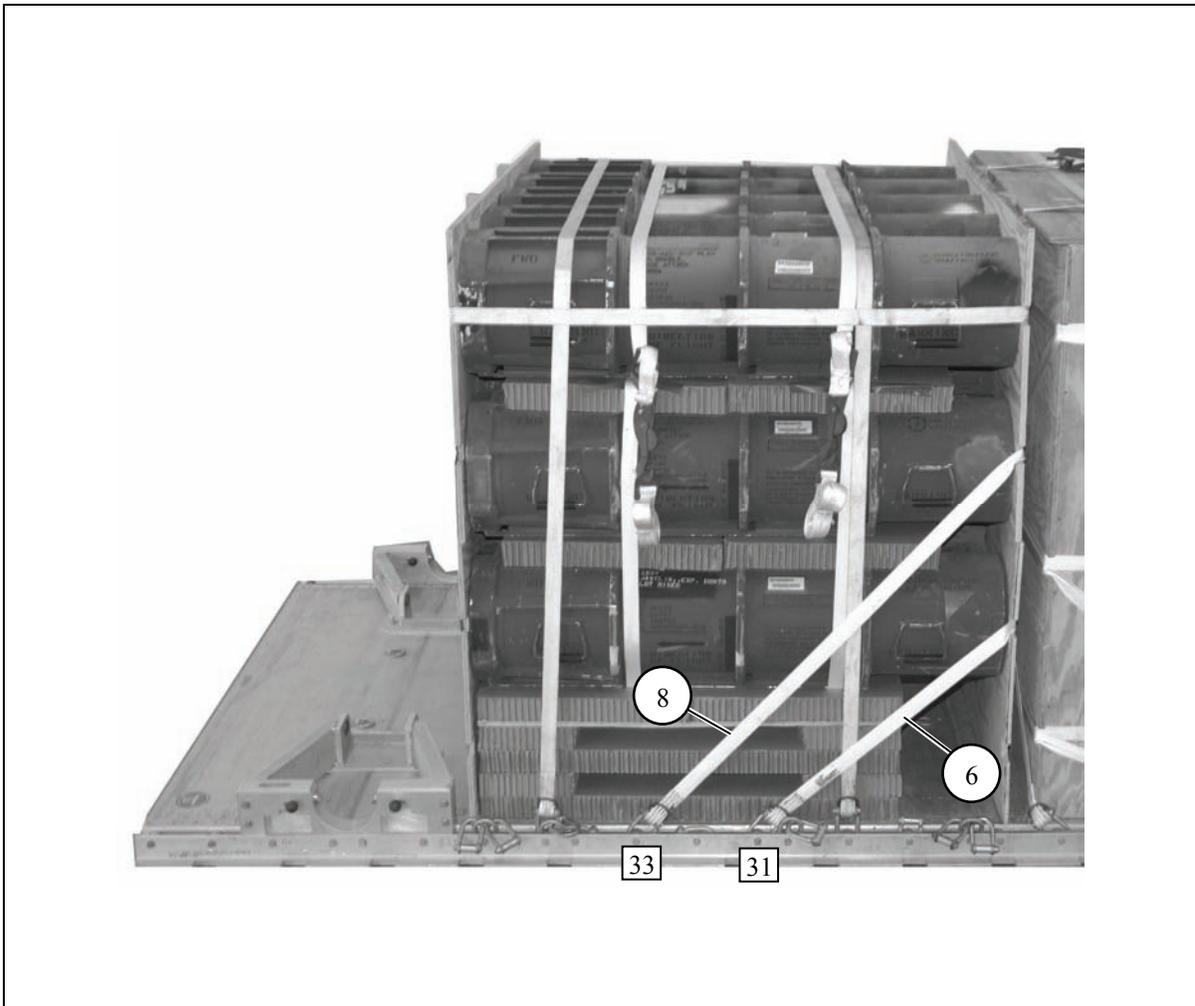


Step:

1. Position an endboard on each side of stack 2 with the side of the 2- by 4-inch pieces of lumber placed to the outside.

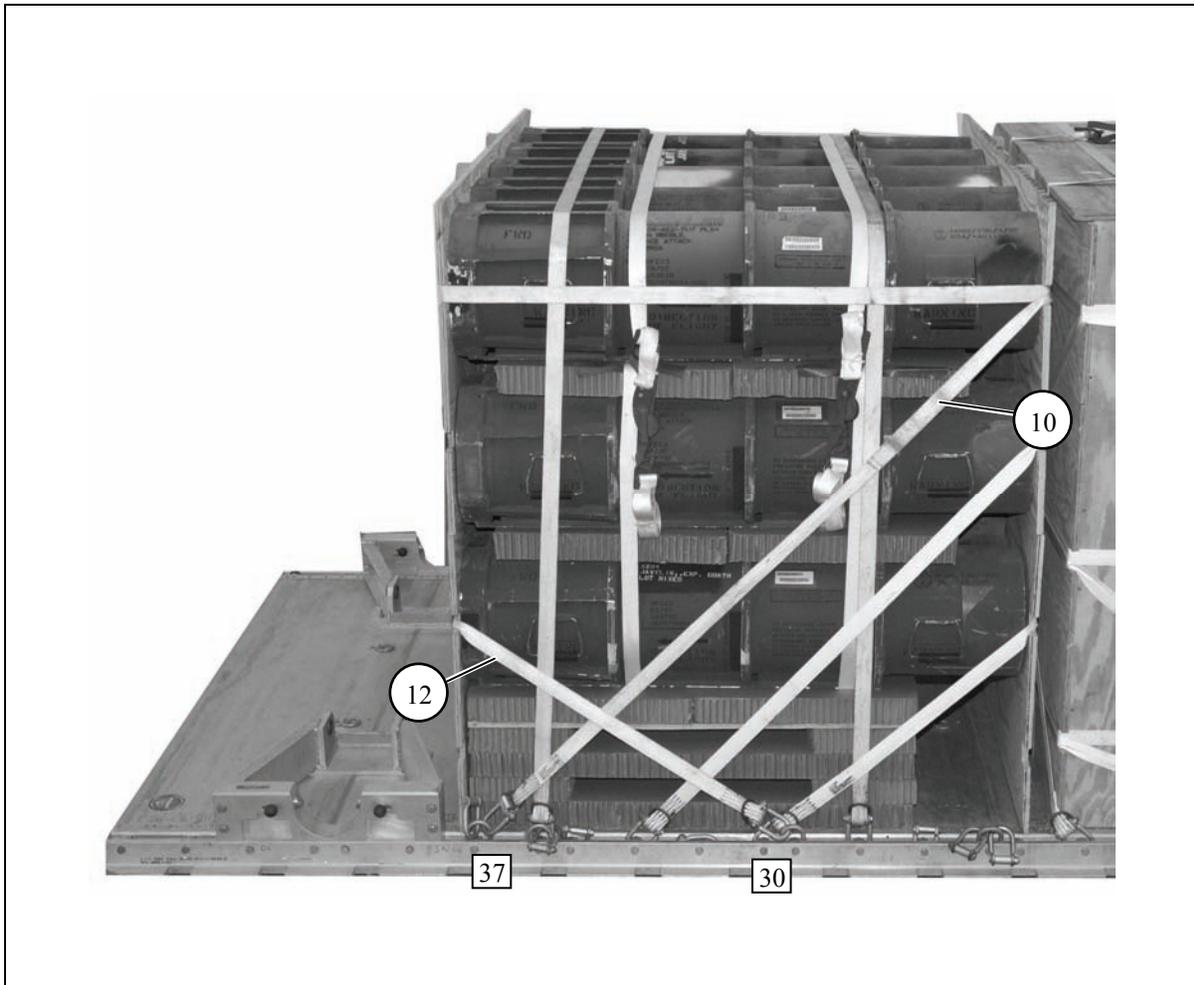
<i>Lashing Number</i>	<i>Tiedown Clevis Number</i>	<i>Instructions</i>
1		Form a 30-foot lashing and route it through the top cutouts of stack 2 and secure centered on the front endboard of stack 2 with two D-rings and a load binder.
2	28	Route a 15-foot lashing through clevis 28 and through its own D-ring. Route the lashing over the top of stack 2.
3	28A	Route a 15-foot lashing through clevis 28A and through its own D-ring. Secure the lashing to the lashing from clevis 28 on the left side with two D-rings and a load binder.
4	36	Route a 15-foot lashing through clevis 36 and through its own D-ring. Route the lashing over the top of stack 2.
5	36A	Route a 15-foot lashing through clevis 36A and through its own D-ring. Secure the lashing to the lashing from clevis 36 on the left side with two D-rings and a load binder.

**Figure 8-11. Endboards and Load for Stack 2 Lashed**



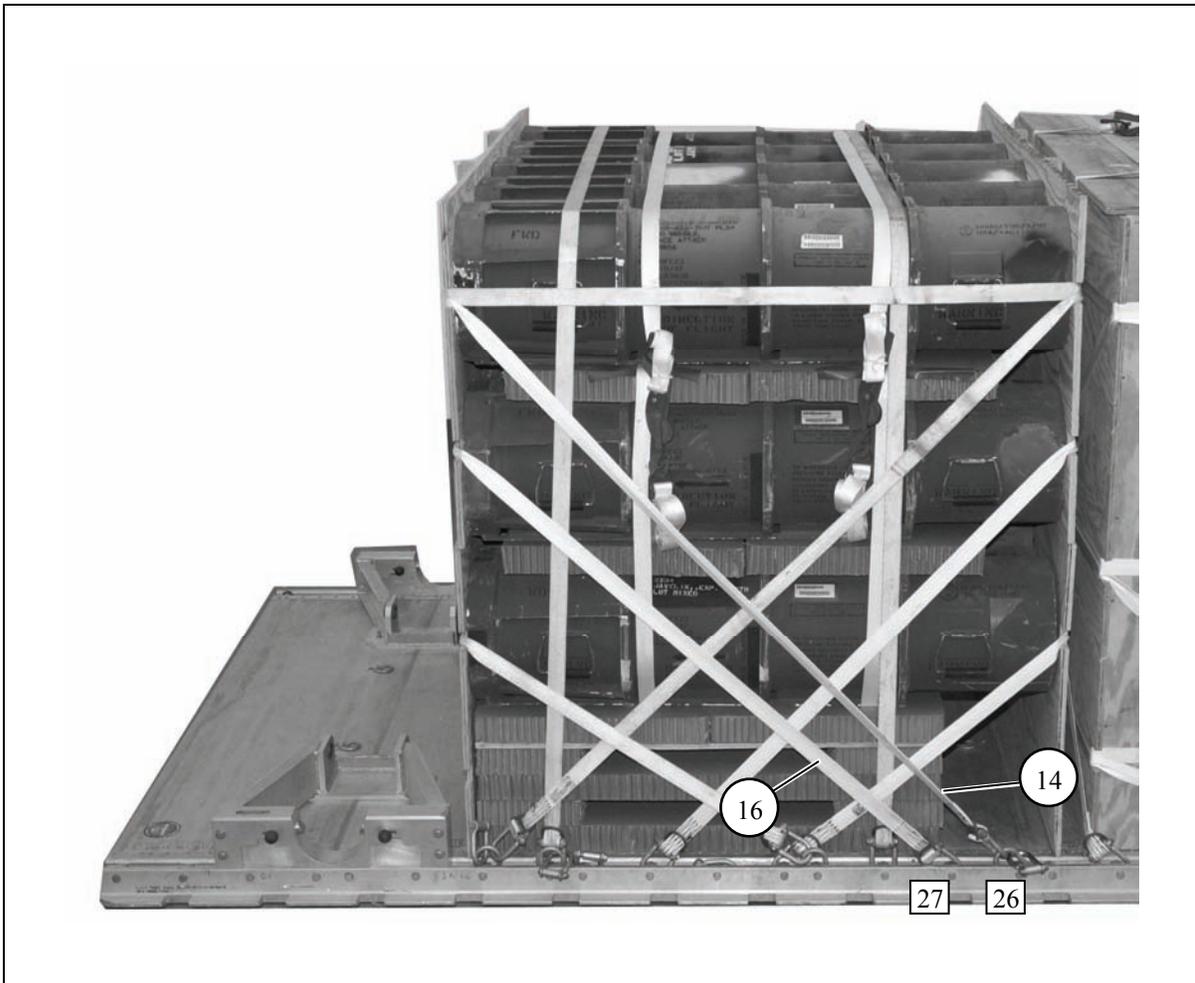
<b>Lashing Number</b>	<b>Tiedown Clevis Number</b>	<b>Instructions</b>
6	31	Route a 15-foot lashing through clevis 31 and through its own D-ring. Route the lashing through the bottom middle cutouts of the front endboard.
7	31A	Route a 15-foot lashing through clevis 31A and through its own D-ring. Secure the lashing to the lashing from clevis 31 on the left side with two D-rings and a load binder
8	33	Route a 15-foot lashing through clevis 33 and through its own D-ring. Route the lashing through the top middle cutouts of the front endboard.
9	33A	Route a 15-foot lashing through clevis 33A and through its own D-ring. Secure the lashing to the lashing from clevis 33 on the left side with two D-rings and a load binder.

Figure 8-11. Endboards and Load for Stack 2 Lashed (Continued)



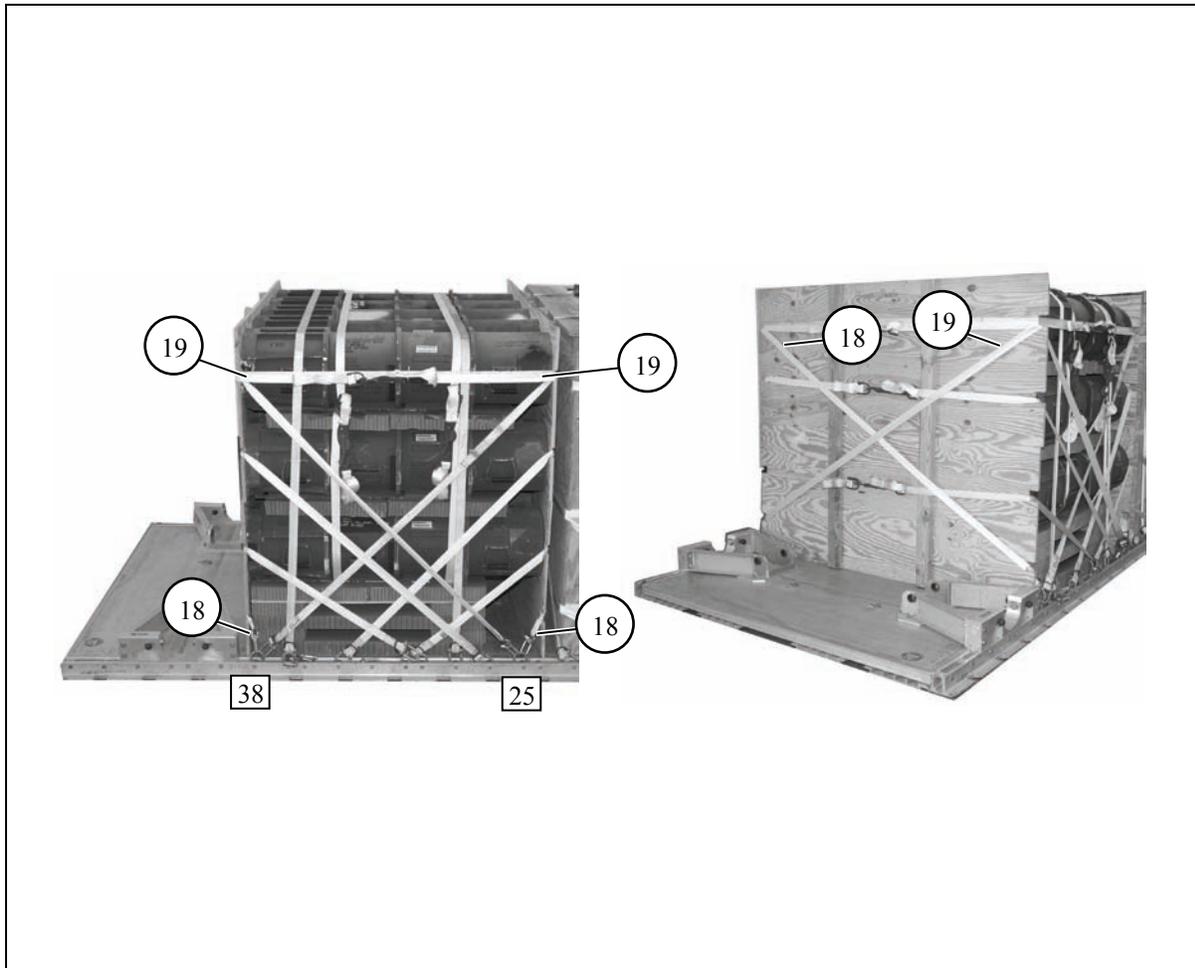
<b>Lashing Number</b>	<b>Tiedown Clevis Number</b>	<b>Instructions</b>
10	37	Route a 15-foot lashing through clevis 37 and through its own D-ring. Route the lashing through the top cutouts of the front endboard.
11	37A	Route a 15-foot lashing through clevis 37A and through its own D-ring. Secure the lashing to the lashing from clevis 37 on the left side with two D-rings and a load binder.
12	30	Route a 15-foot lashing through clevis 30 and through its own D-ring. Route the lashing through the bottom middle cutout of the rear endboard.
13	30A	Route a 15-foot lashing through clevis 30A and through its own D-ring. Secure the lashing to the lashing from clevis 30 on the rear endboard center with two D-rings and a load binder.

**Figure 8-11. Endboards and Load for Stack 2 Lashed (Continued)**



<i>Lashing Number</i>	<i>Tiedown Clevis Number</i>	<i>Instructions</i>
14	26	Route a 15-foot lashing through clevis 26 and through its own D-ring. Route the lashing through the top cutout of the rear endboard on the right side.
15	26A	Route a 15-foot lashing through clevis 26A and through its own D-ring. Route the lashing to the top cutout of the rear endboard. Secure the lashing to the lashing from clevis 26 on the rear endboard centered with two D-rings and a load binder.
16	27	Route a 15-foot lashing through clevis 27 and through its own D-ring. Route the lashing through the top middle cutout of the rear endboard on the right side.
17	27A	Route a 15-foot lashing through clevis 27A and through its own D-ring. Route the lashing to the top middle cutout of the rear endboard. Secure the lashing to the lashing from clevis 27 on the rear endboard centered with two D-rings and a load binder.

Figure 8-11. Endboards and Load for Stack 2 Lashed (Continued)



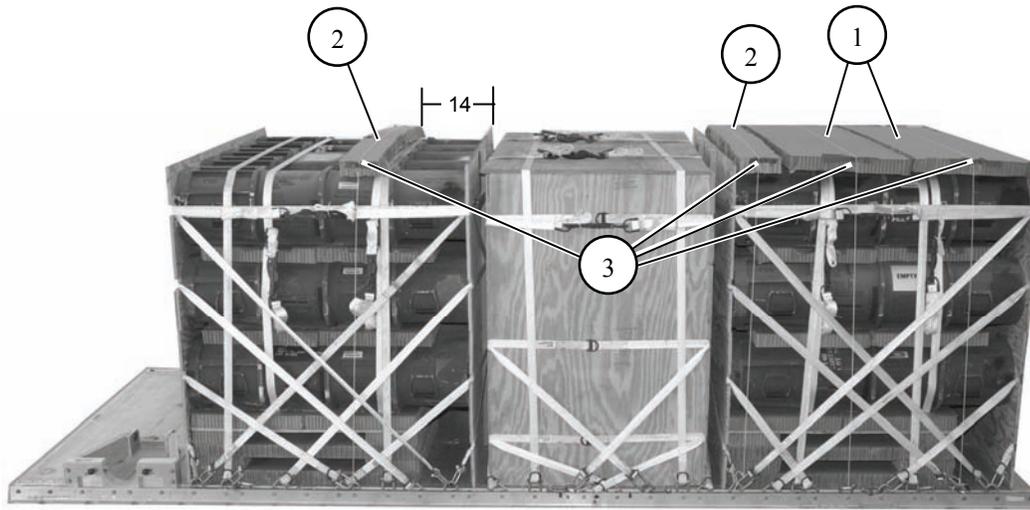
<b>Lashing Number</b>	<b>Tiedown Clevis Number</b>	<b>Instructions</b>
18	25 and 38	Route a 15-foot lashing through clevis 25 and through its own D-ring. Route the lashing through the bottom cutout to the top cutout of the front endboard. Route a 15-foot lashing through clevis 38 and through its own D-ring and through the bottom cutout to the top cutout of the rear endboard. Secure the lashings from clevises 25 and 38 together on the left side with two D-rings and a load binder.
19	25A and 38A	Route a 15-foot lashing through clevis 25A and through its own D-ring. Route the lashing through the bottom cutout to the top cutout of the front endboard. Route a 15-foot lashing through clevis 38A and through its own D-ring and through the bottom cutout to the top cutout of the rear endboard. Secure the lashings from 25A and 38A together on the right side with two D-rings and a load binder.

**Figure 8-11. Endboards and Load for Stack 2 Lashed (Continued)**

## POSITIONING ATTITUDE CONTROL SYSTEM (ACS) AND INSTALLING SUSPENSION SLINGS

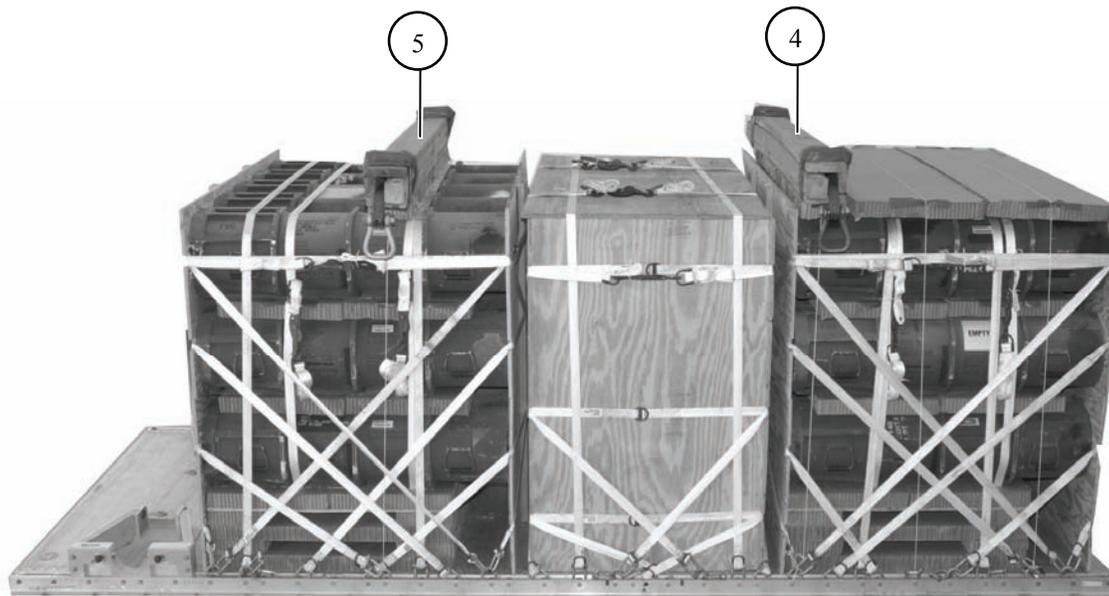
8-13. Construct the ACS according to Chapter 2. Position the ACS and install suspension slings as shown in Figure 8-12.

**Note.** All dimensions are in inches.



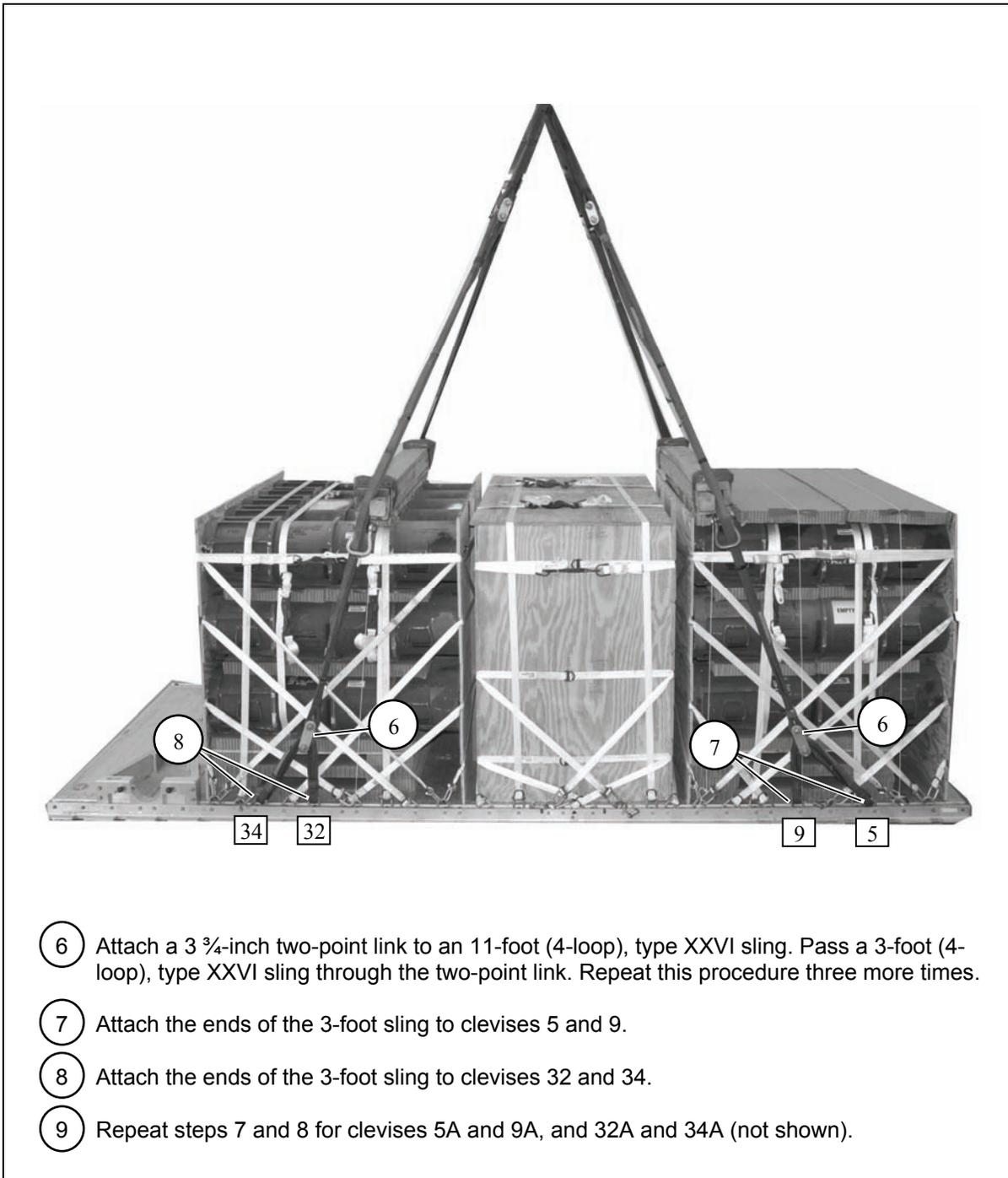
- ① Cut two 24- by 76-inch pieces of honeycomb. Position one piece on the front of stack 1 and the second piece flush against the first piece.
- ② Cut two 8- by 76-inch pieces of honeycomb. Position the first piece against the rear endboard of stack 1. Position the second piece 14 inches from the front endboard of stack 2.
- ③ Secure the pieces in place with type III nylon cord to convenient points on the platform, taping the edges of the honeycomb where the type III nylon cord will make contact.

**Figure 8-12. ACS Positioned and Suspension Slings Installed**

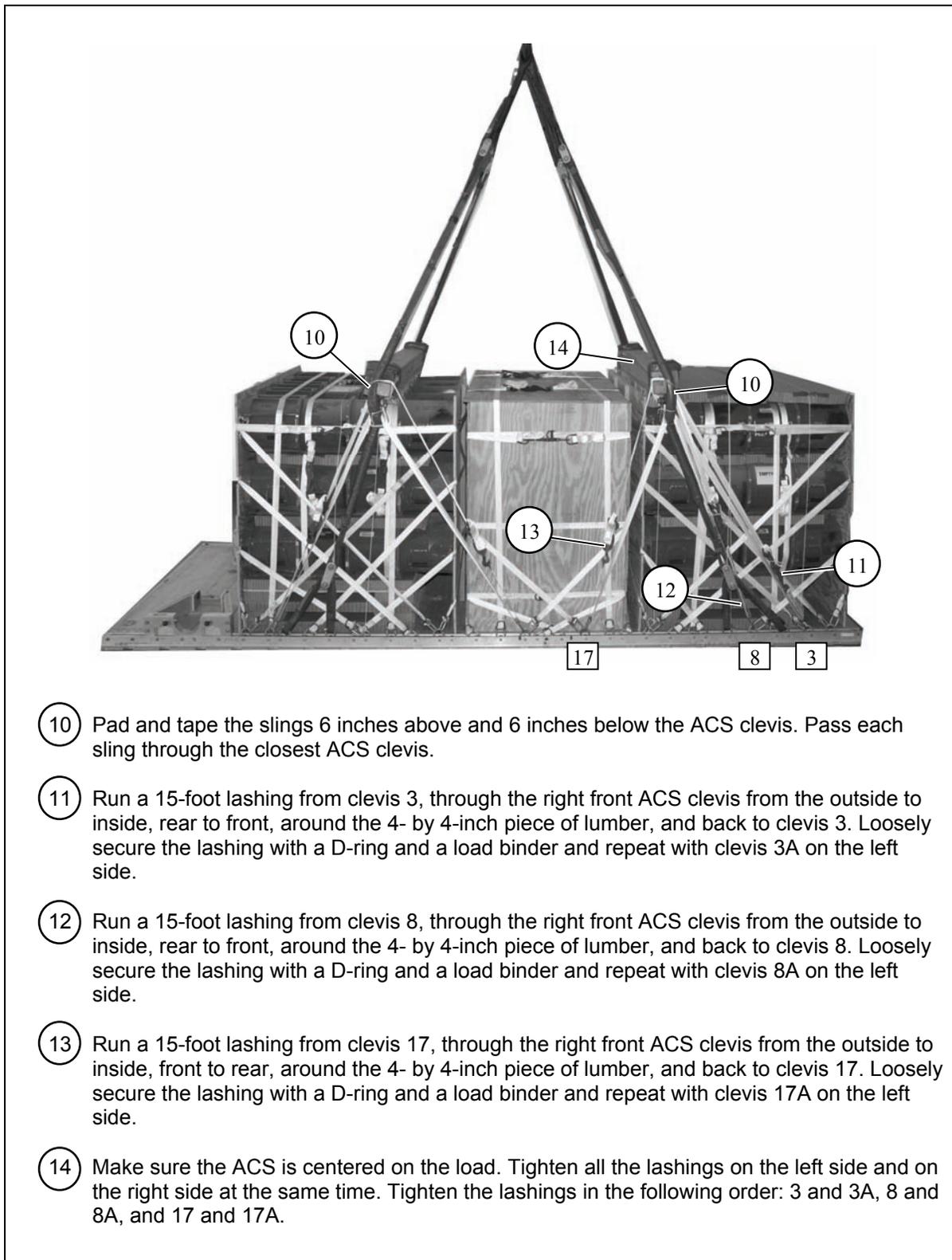


- ④ Position the front ACS on top of the 8- by- 76-inch piece of honeycomb on top of stack 1 with the 4- by- 4-inch piece of lumber to the rear.
- ⑤ Position the rear ACS on top of the 8- by- 76-inch piece of honeycomb on top of stack 2 with the 4- by- 4-inch piece of lumber to the front.

**Figure 8-12. ACS Positioned and Suspension Slings Installed (Continued)**



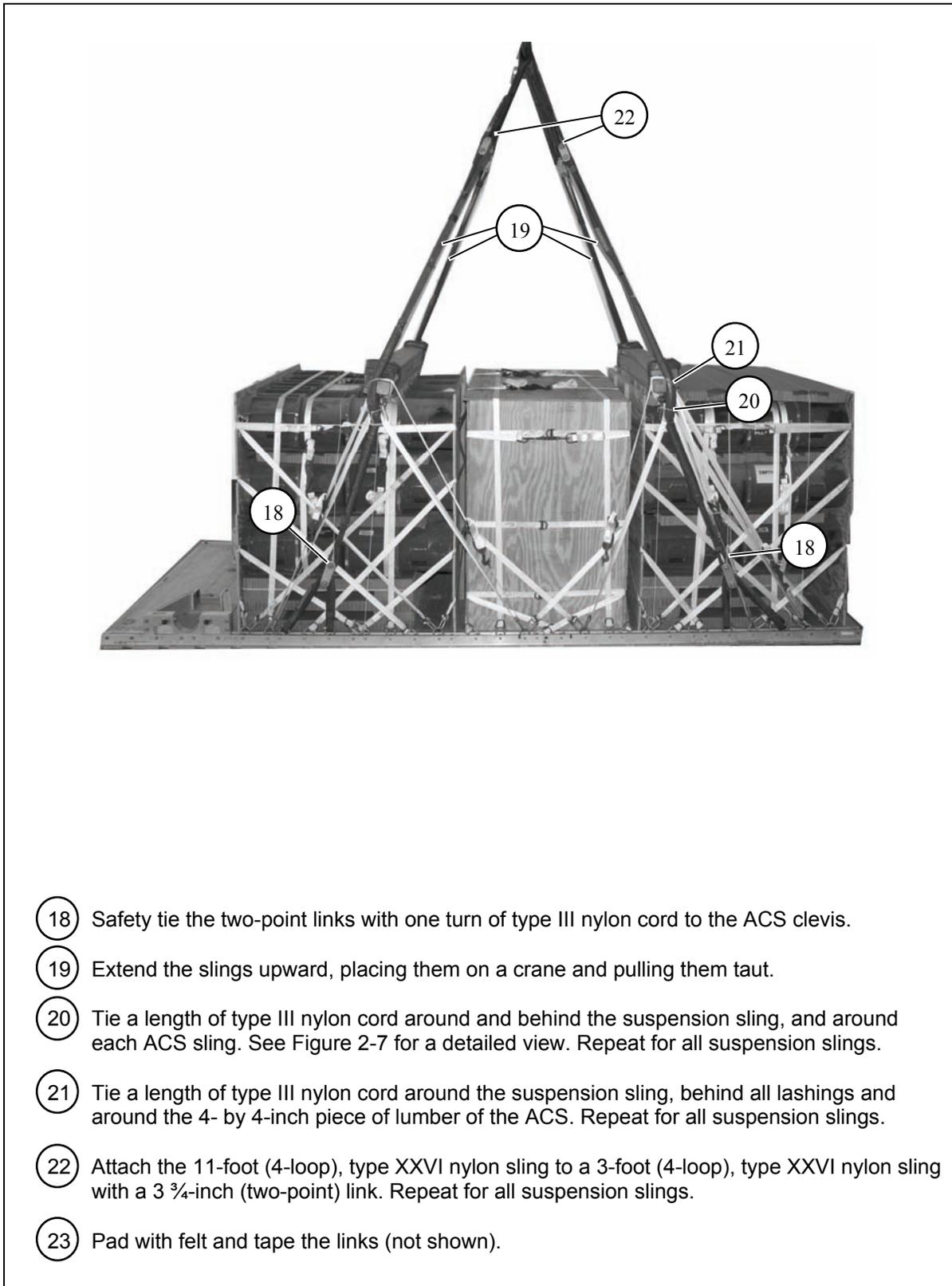
**Figure 8-12. ACS Positioned and Suspension Slings Installed (Continued)**



- ⑩ Pad and tape the slings 6 inches above and 6 inches below the ACS clevis. Pass each sling through the closest ACS clevis.
- ⑪ Run a 15-foot lashing from clevis 3, through the right front ACS clevis from the outside to inside, rear to front, around the 4- by 4-inch piece of lumber, and back to clevis 3. Loosely secure the lashing with a D-ring and a load binder and repeat with clevis 3A on the left side.
- ⑫ Run a 15-foot lashing from clevis 8, through the right front ACS clevis from the outside to inside, rear to front, around the 4- by 4-inch piece of lumber, and back to clevis 8. Loosely secure the lashing with a D-ring and a load binder and repeat with clevis 8A on the left side.
- ⑬ Run a 15-foot lashing from clevis 17, through the right front ACS clevis from the outside to inside, front to rear, around the 4- by 4-inch piece of lumber, and back to clevis 17. Loosely secure the lashing with a D-ring and a load binder and repeat with clevis 17A on the left side.
- ⑭ Make sure the ACS is centered on the load. Tighten all the lashings on the left side and on the right side at the same time. Tighten the lashings in the following order: 3 and 3A, 8 and 8A, and 17 and 17A.

**Figure 8-12. ACS Positioned and Suspension Slings Installed (Continued)**





- ⑱ Safety tie the two-point links with one turn of type III nylon cord to the ACS clevis.
- ⑲ Extend the slings upward, placing them on a crane and pulling them taut.
- ⑳ Tie a length of type III nylon cord around and behind the suspension sling, and around each ACS sling. See Figure 2-7 for a detailed view. Repeat for all suspension slings.
- ㉑ Tie a length of type III nylon cord around the suspension sling, behind all lashings and around the 4- by 4-inch piece of lumber of the ACS. Repeat for all suspension slings.
- ㉒ Attach the 11-foot (4-loop), type XXVI nylon sling to a 3-foot (4-loop), type XXVI nylon sling with a 3 ¾-inch (two-point) link. Repeat for all suspension slings.
- ㉓ Pad with felt and tape the links (not shown).

**Figure 8-12. ACS Positioned and Suspension Slings Installed (Continued)**

## INSTALLING OUTRIGGER ASSEMBLIES

8-14. Assemble, install, and safety tie the mast and foot assemblies on the DRAS platform according to TM 10-1670-268-20&P/TO 13C7-52-22 and as shown in Chapter 2, Figures 2-42 through 2-44 and Figure 2-45, Steps 1, 2, and 3.

## STOWING CARGO PARACHUTES

8-15. Prepare, stow, and restrain three G-11D cargo parachutes as shown in Chapter 2 and as shown on top of the honeycomb on stack 1 in Figure 8-13.

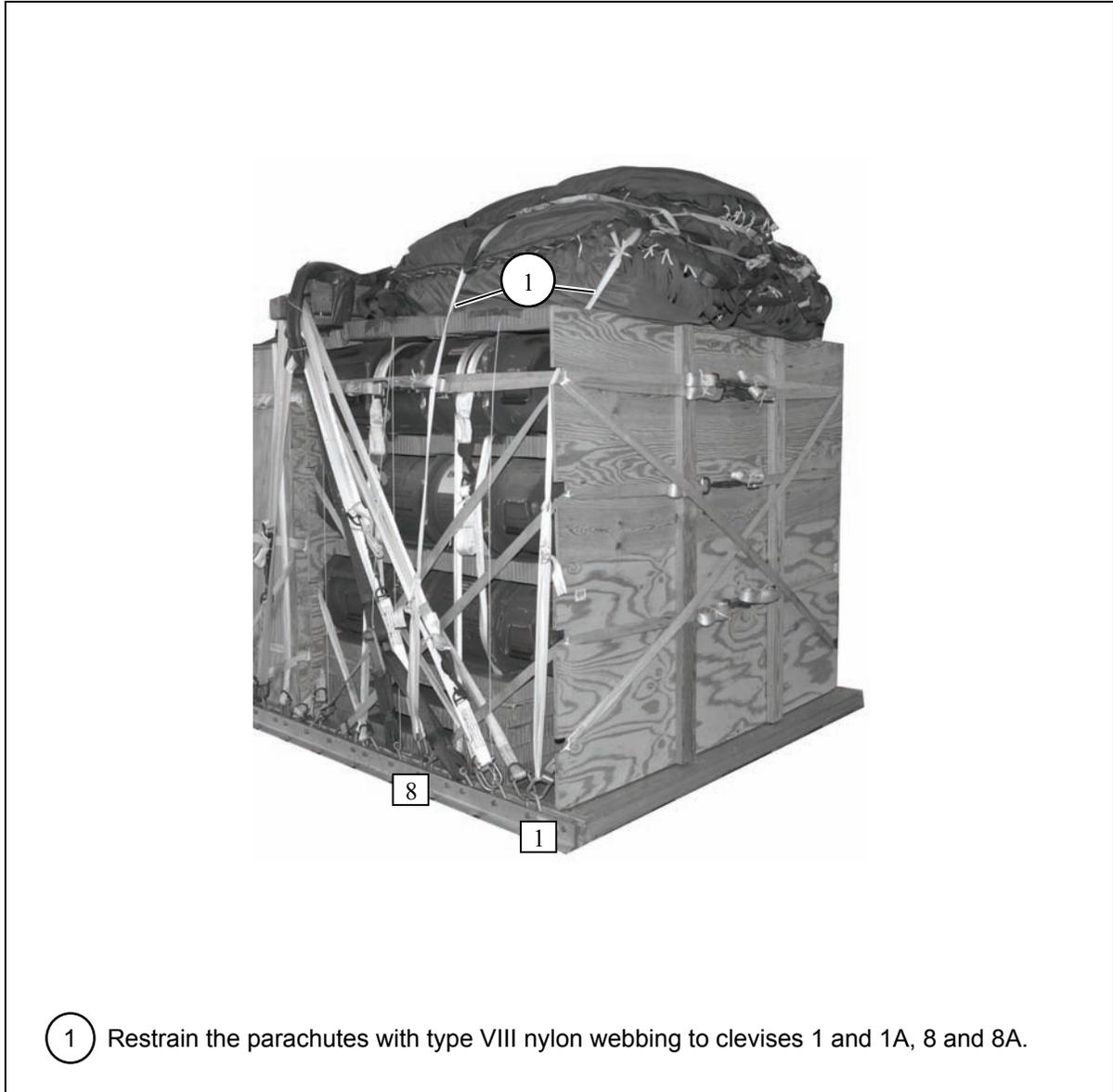
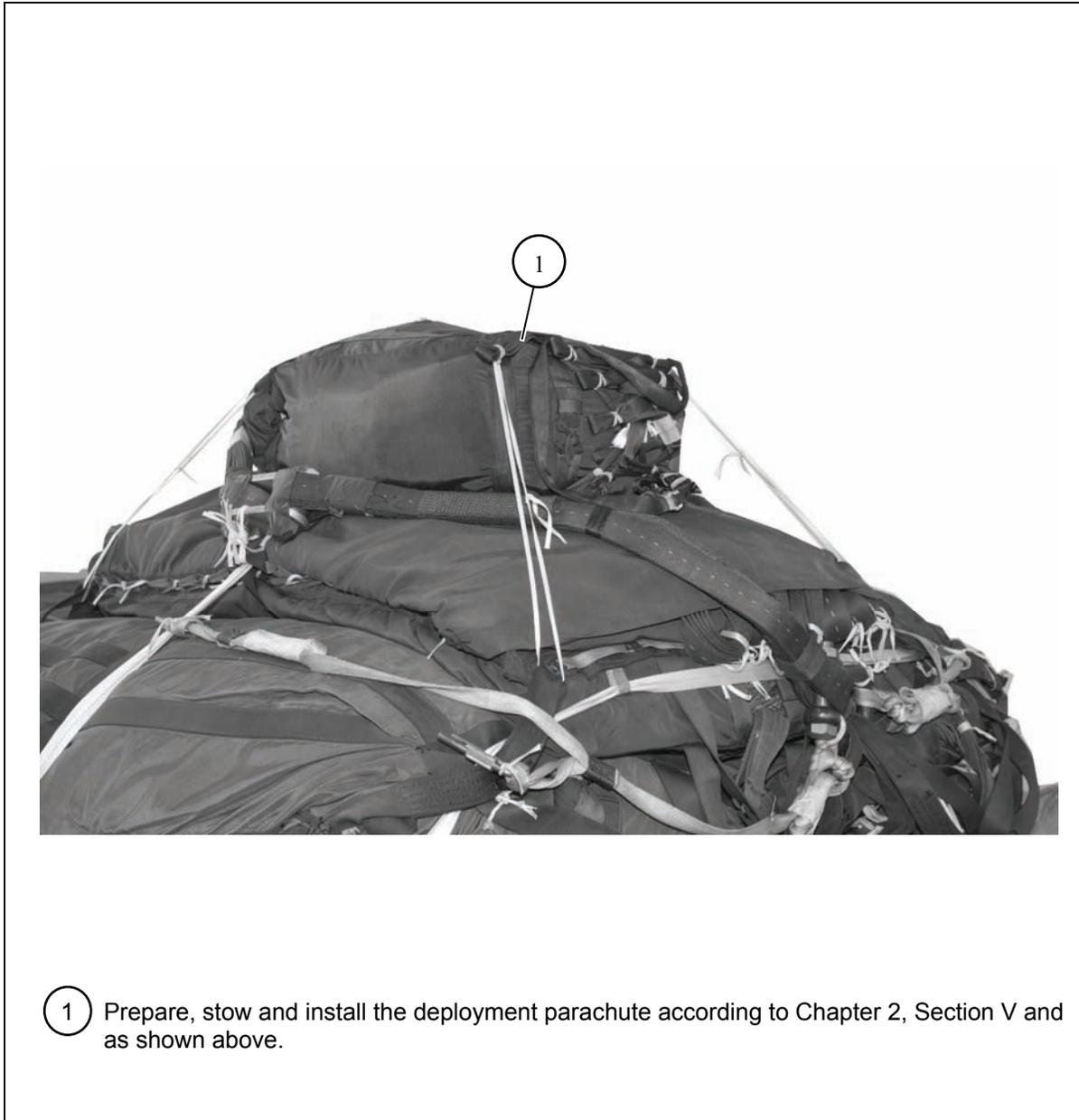


Figure 8-13. Cargo Parachutes Installed and Restrained

## STOWING DEPLOYMENT PARACHUTE

8-16. Prepare, stow, and install the deployment parachute according to Chapter 2, Section V and as shown in Figure 8-14.

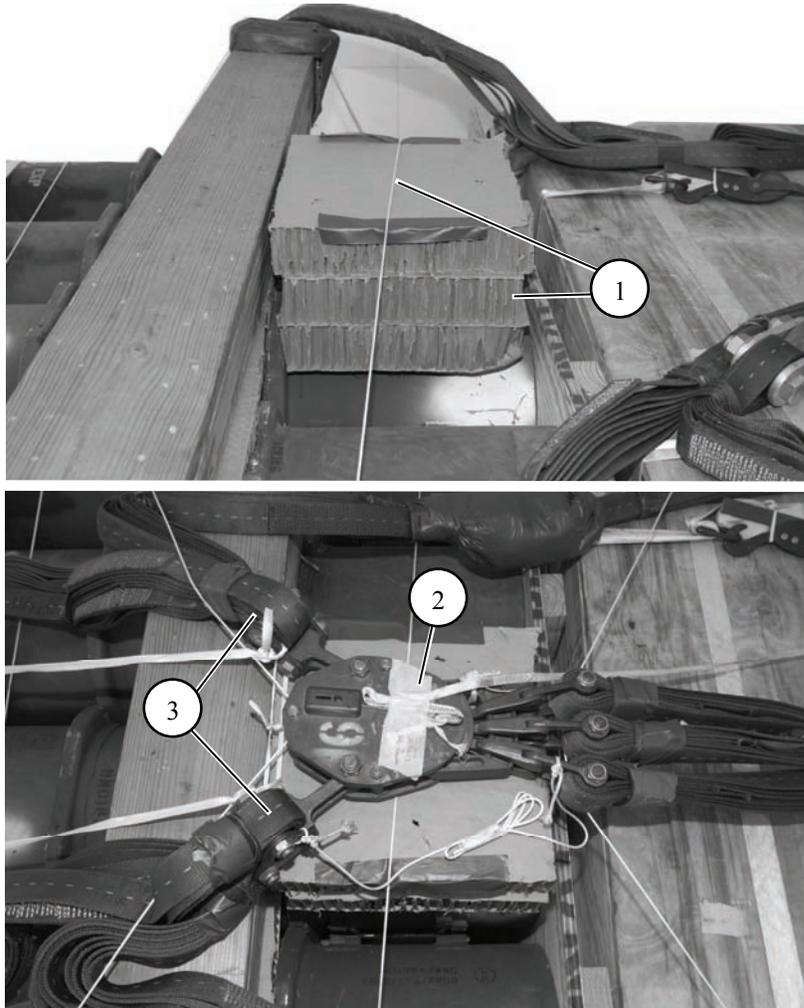


1 Prepare, stow and install the deployment parachute according to Chapter 2, Section V and as shown above.

**Figure 8-14. Deployment Parachute Installed**

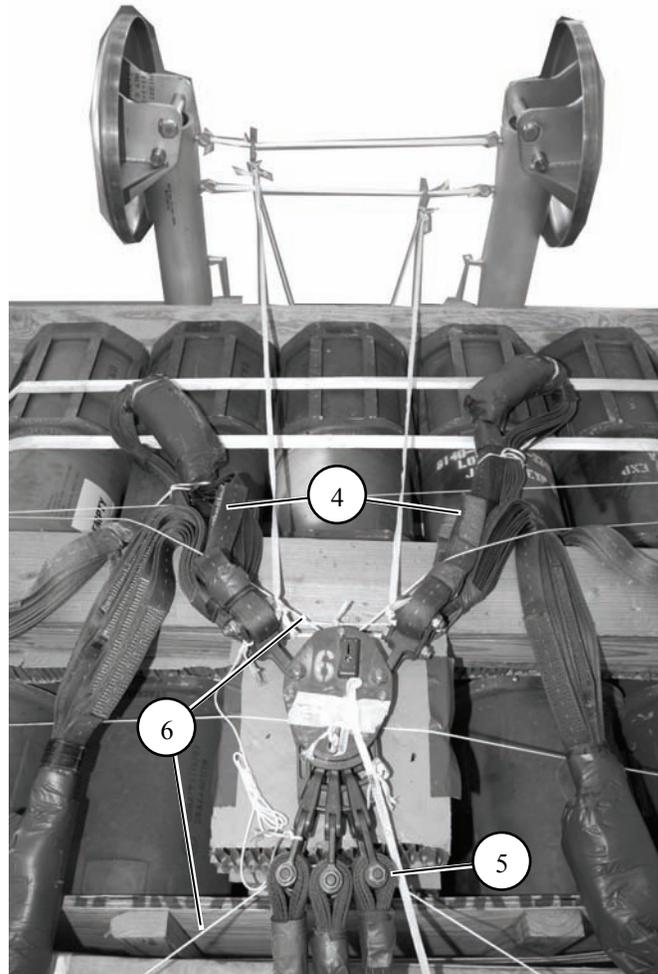
## INSTALLING PARACHUTE RELEASE SYSTEM

8-17. Build an M-1 parachute release stack. Prepare and install an M-1 release system according to Chapter 2, Section VI and as shown in Figure 8-15.



- ① Cut three 14- by 14-inch pieces of honeycomb and glue together to form the M-1 release stack. Tape the top edges of the honeycomb. Center the stack in front of the ACS on stack 2 and secure it with type III nylon cord.
- ② Position the M-1 release on top of the release stack.
- ③ Remove the buffers from the free ends of the suspension slings and attach them to the release.

Figure 8-15. Parachute Release System Installed

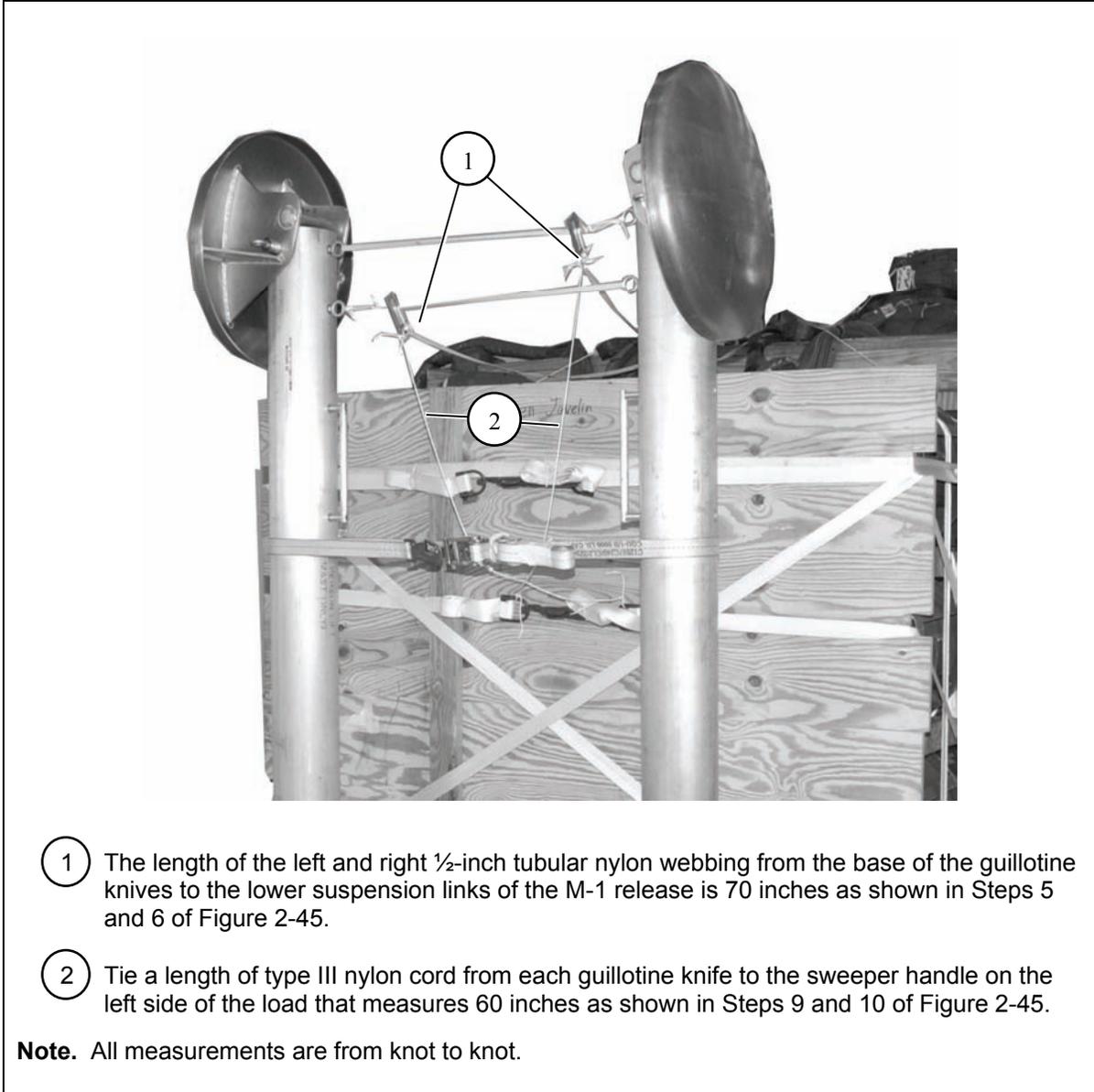


- ④ S-fold the slack in the suspension slings and tie them around the links with type I, 1/4-inch cotton webbing.
- ⑤ Attach the riser extensions to the parachute connectors. Secure the riser extensions together with type I, 1/4-inch cotton webbing.
- ⑥ Restrain the release through the parachute release connectors to convenient points on the platform. Secure the bottom of the release to convenient points on the platform.

**Figure 8-15. Parachute Release System Installed (Continued)**

## INSTALLING MAST RELEASE KNIVES

8-18. Install the mast release knives according to Chapter 2, Figure 2-45, Steps 4 through 10 and as shown in Figure 8-16.



**Figure 8-16. Mast Release Knives Installed**

## MARKING RIGGED LOAD

8-19. Mark the rigged load according to Chapter 2, Section IX and as shown in Figure 8-17. A Shipper's Declaration for Dangerous Goods is required.

## EQUIPMENT REQUIRED

8-20. The equipment required to rig this load is listed in Table 8-1.

### CAUTION

Make the final rigger inspection required by Chapter 2, Section IX before the load leaves the rigging site.



### RIGGED LOAD DATA

Weight: Load shown .....	11,140 pounds
Maximum load allowed.....	13,500 pounds
Height .....	110 inches
Width.....	94 inches
Overall Length .....	216 inches
Overhang: Front.....	0 inches
Rear.....	0 inches
Center of Balance: (from front edge of platform):.....	93 inches

Figure 8.17. Javelin (Metal) Containers Rigged on DRAS Platform

**Table 8-1. Equipment Required for Rigging Javelin (Metal) Containers on DRAS Platform**

<i>National Stock Number</i>	<i>Item</i>	<i>Quantity</i>
8040-00-273-8713	Adhesive paste, 1-gallon	As required
4020-00-240-2146	Cord, nylon, type III, 550-pound	As required
	Clevis:	
4030-00-090-5354	Large	5
4030-00-678-8562	Medium	4
1670-00-360-0328	Cover, clevis, large	3
8135-00-664-6958	Cushioning material, cellulose wadding	As required
8305-00-191-1101	Felt, ½-inch	As required
1670-01-493-6418	Link assembly, two-point, 3 ¾-inch	9
	Lumber:	
5510-00-220-6146	2- by 4-inch	As required
5510-00-220-6148	2- by 6-inch	As required
5510-00-220-6274	4- by 4-inch	As required
5530-00-618-8073	Plywood, ¾-inch	13 sheets
	Nail, steel wire, common:	
5315-00-010-4659	8d	As required
5315-00-010-4662	12d	As required
5315-00-753-3885	16d	As required
1670-00-753-3928	Pad, energy dissipating, honeycomb	33 sheets
1670-01-487-5461	Static line assembly release away	1
	Parachute:	
	Cargo:	
1670-01-016-7841	G-11D	3
1670-00-040-8135	Cargo extraction: 28-foot (deployment parachute)	1
	Platform, dual row, 18-foot	
1670-01-485-1654	Rail, DRAS	2
1670-01-486-1342	Roller Pad, DRAS	4
1670-01-486-1656	Panel Assembly, Main	9
1670-01-162-2372	Clevis assembly	94
1670-01-097-8816	Release, cargo parachute, M-1	1
	Sling, cargo airdrop	
	For suspension:	
1670-01-062-6310	11-foot (4-loop), type XXVI nylon webbing	4
1670-01-062-6306	3-foot (4-loop), type XXVI nylon webbing	8
	For deployment:	
1670-01-062-6306	3-foot (4-loop), type XXVI nylon webbing	1
	For riser extension:	
1670-01-062-6313	60-foot (3-loop), type XXVI nylon webbing	3
	For ACS:	
1670-01-063-7761	16-foot (2-loop), type XXVI nylon webbing	2

**Table 8-1. Equipment Required for Rigging Javelin (Metal) Containers on DRAS Platform (Continued)**

<i>National Stock Number</i>	<i>Item</i>	<i>Quantity</i>
1670-00-040-8219	Strap, parachute release, multicut	2
1670-00-937-0271	Knife release, cargo (guillotine)	6
1670-01-487-5464	Outrigger assembly	1
7510-00-266-5016	Tape, adhesive, 2-inch	As required
1670-00-937-0271	Tie-down assembly, 15-foot	89
1670-00-725-1437	Tie-down, cargo, aircraft, (CGU-1B)	5
	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	As required

## SECTION II – RIGGING JAVELIN (PLASTIC) CONTAINERS

### DESCRIPTION OF LOAD

8-21. The guided missile, surface, attack Javelin (plastic) container is rigged on an 18-foot dual row platform. The rigged weight is 8,920 pounds. Each individual missile container weighs approximately 96 pounds. The load is rigged with 50 Javelin containers. The height of the load is 98 inches and the width is 94 inches. The load is rigged with two G-11D cargo parachutes.

### PREPARING PLATFORM

8-22. Inspect, or assemble and inspect, a DRAS platform with outrigger assemblies and outrigger platform support weldments according to TM 10-1670-268-23&P and as shown in Figure 8-18.

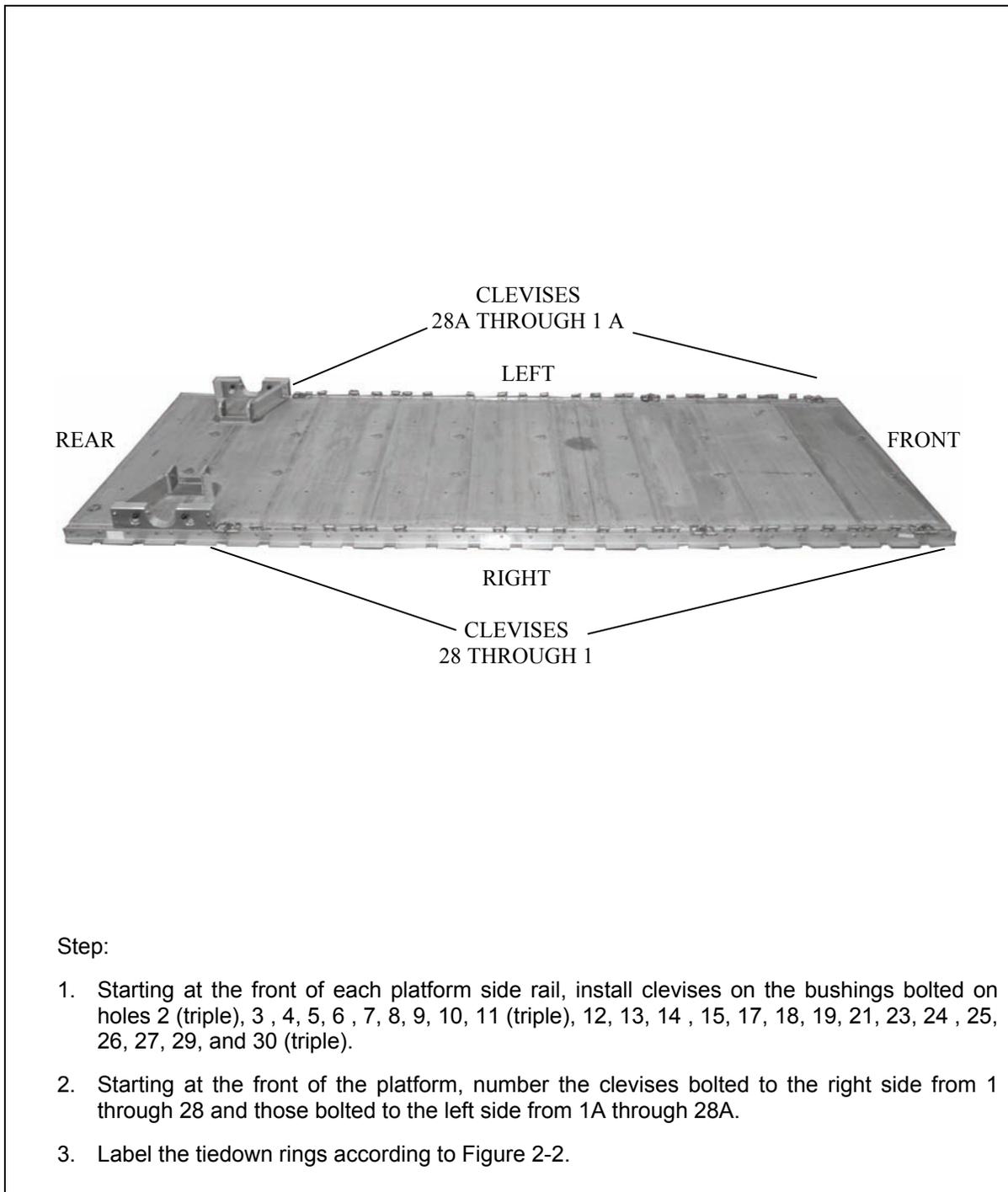


Figure 8-18. Platform Prepared

## PREPARING HONEYCOMB STACKS

8-23. Prepare honeycomb stacks 1, 2, and 3 as shown in Figure 8-19.

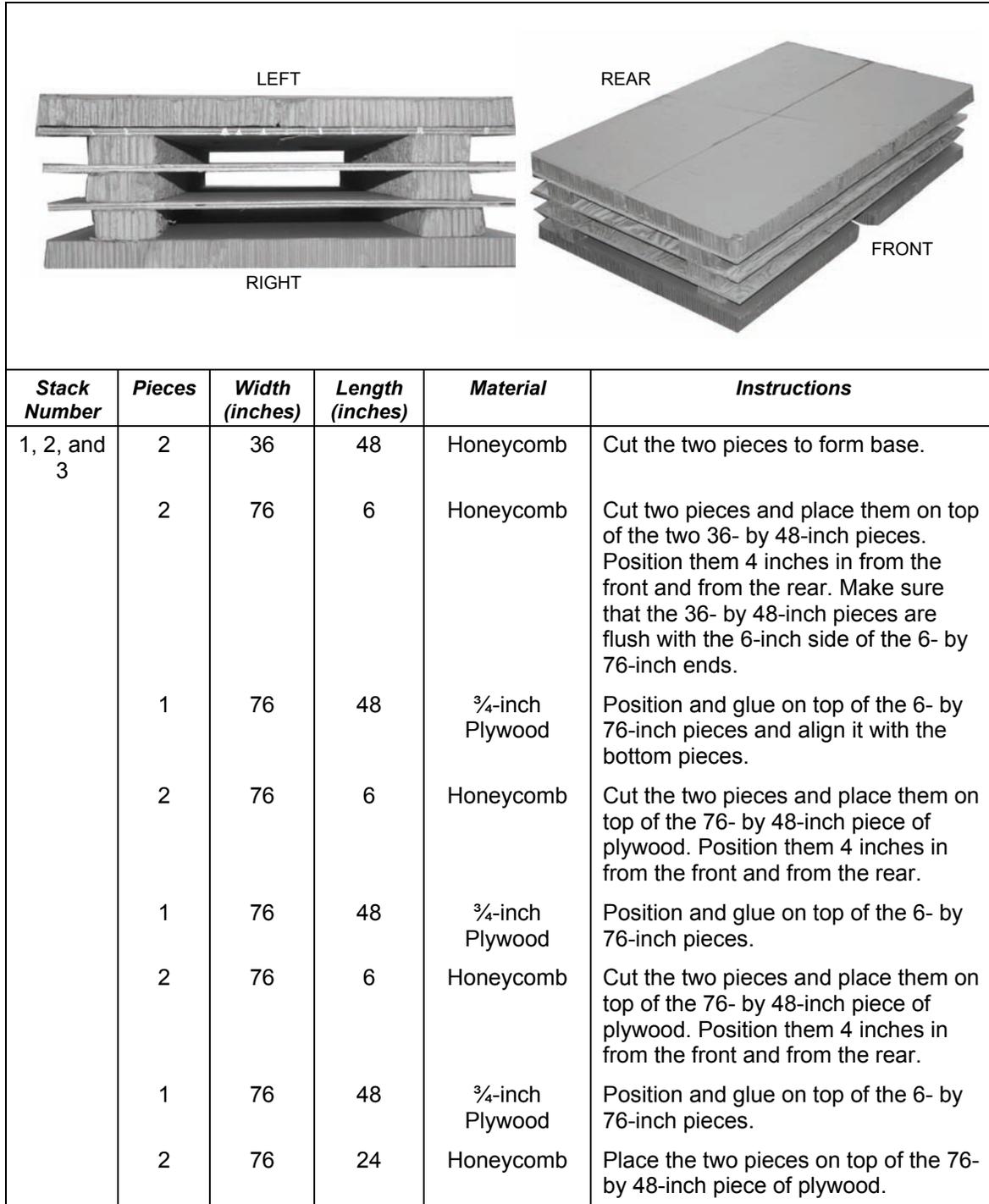
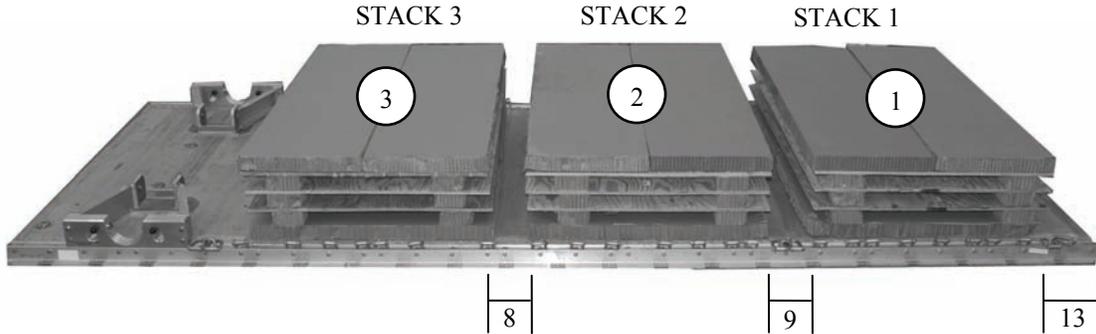


Figure 8-19. Honeycomb Stacks 1, 2, and 3 Prepared

## POSITIONING HONEYCOMB STACKS

8-24. Position honeycomb stacks 1, 2, and 3 as shown in Figure 8-20.

**Note.** All dimensions are in inches.

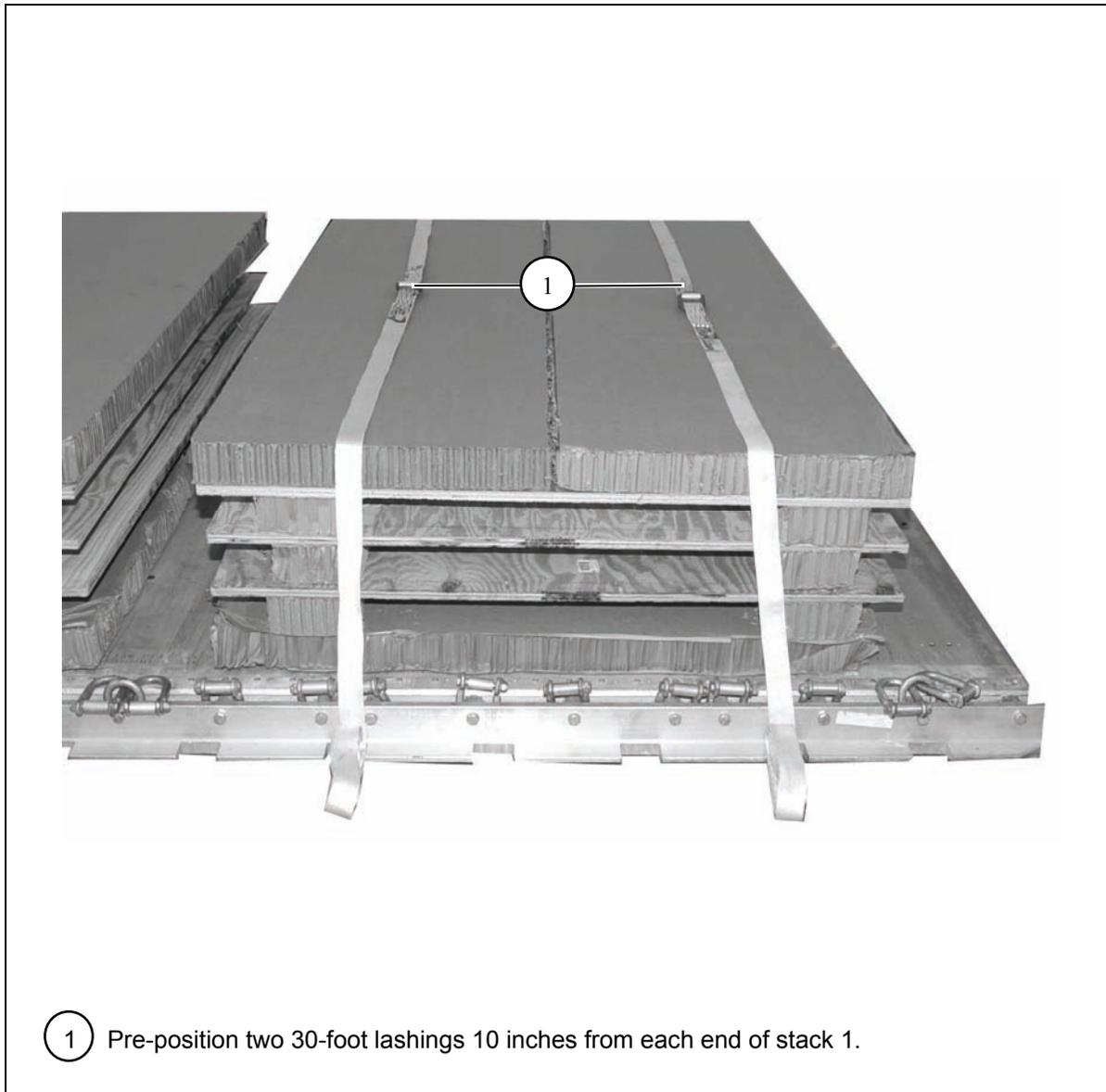


- ① Position stack 1, 13 inches centered from the front edge of the platform.
- ② Position stack 2, 9 inches centered from stack 1.
- ③ Position stack 3, 8 inches centered from stack 2.

**Figure 8-20. Honeycomb Stacks 1, 2, and 3 Positioned**

## POSITIONING AND SECURING JAVELINS ON STACK 1

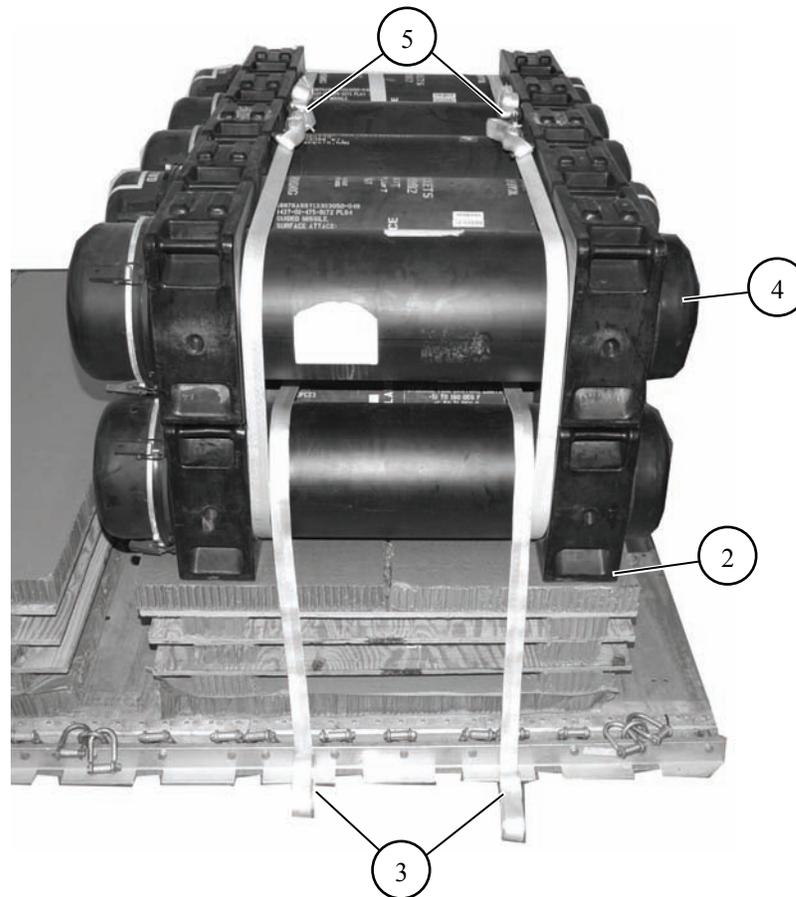
8-25. Position and secure the Javelins on stack 1 as shown in Figure 8-21.



**Figure 8-21. Javelins Positioned and Secured on Stack 1**

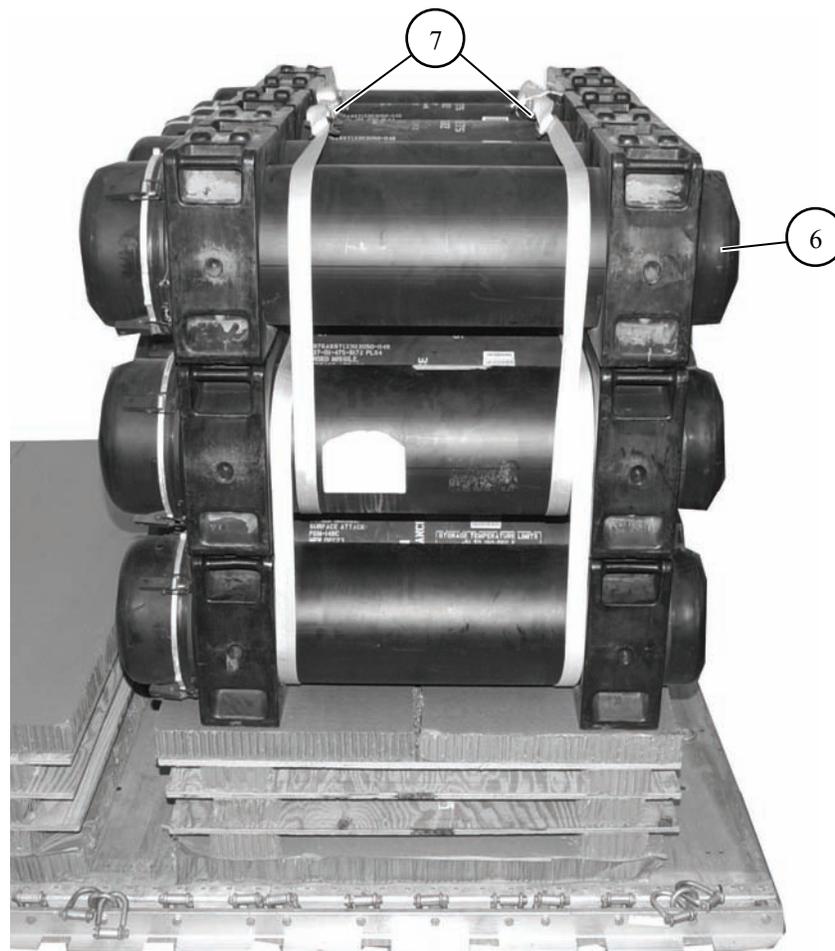
**CAUTION**

The Javelins must be positioned with the direction of the flight arrow toward the rear of the platform.



- ② Position five Javelin containers on top of the pre-positioned lashings with the stacking brackets centered over the 6 inch pieces of honeycomb of stack 1.
- ③ Pre-position two 30-foot lashings on top of the Javelins to the inside of the first pre-positioned lashings in step 1.
- ④ Position five Javelin containers on top of the pre-positioned lashings in step 3.
- ⑤ Secure the first and second layer with the pre-positioned lashings on the bottom with two D-rings and a load binder on top of the Javelin containers.

**Figure 8-21. Javelins Positioned and Secured on Stack 1 (Continued)**



- ⑥ Position five Javelin containers on top of the last layer of missiles.
- ⑦ Secure the pre-positioned lashings under the middle layer together to secure the second and third layers.

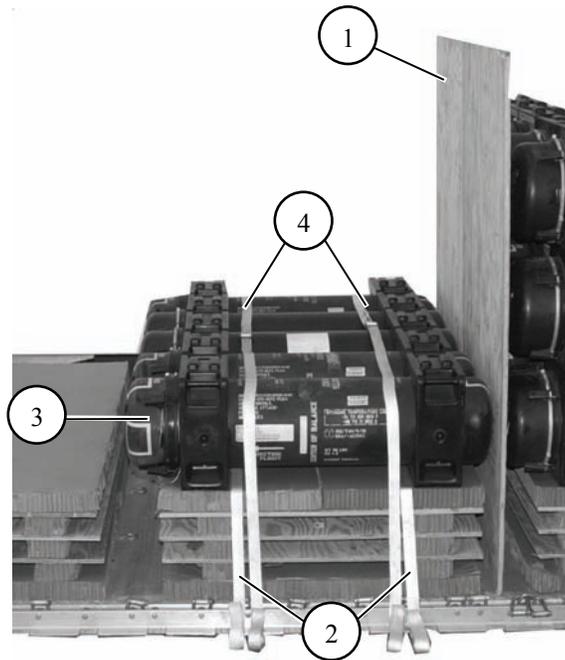
**Figure 8-21. Javelins Positioned and Secured on Stack 1 (Continued)**

## POSITIONING AND SECURING JAVELINS ON STACK 2

8-26. Position and secure the Javelins on stack 2 as shown in Figure 8-22.

### CAUTION

The Javelins must be positioned with the direction of the flight arrow toward the rear of the platform.



① Position two 38- by- 80-inch pieces of  $\frac{3}{4}$ -inch plywood to the rear of Javelin stack 1.

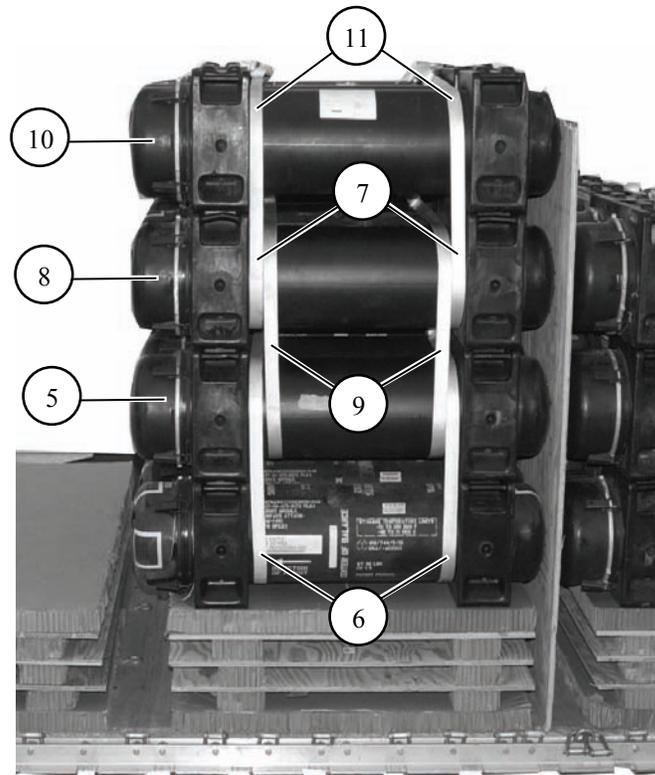
② Pre-position two 30-foot lashings 10 inches from each end of stack 2.

**Note.** Position all Javelins on stack 2 against the plywood.

③ Position five Javelin containers on top and centered on the pre-positioned lashings, flush against the plywood.

④ Pre-position two 30-foot lashings to the inside of the first pre-positioned lashings on top of the Javelins.

Figure 8-22. Javelins Positioned and Secured on Stack 2



- 5 Position five Javelin containers on top of the pre-positioned lashings.
- 6 Secure the pre-positioned lashings together to secure the first and second layers.
- 7 Pre-position two 30-foot lashings to the outside of the second pre-positioned lashings on top of the Javelin containers.
- 8 Position five Javelin containers on top of the last layer of missiles.
- 9 Secure the second set of pre-positioned lashings together to secure the second and third layers.
- 10 Position five Javelin containers on top of the last layer of missiles.
- 11 Secure the third set of pre-positioned lashings together to secure the third and fourth layers.

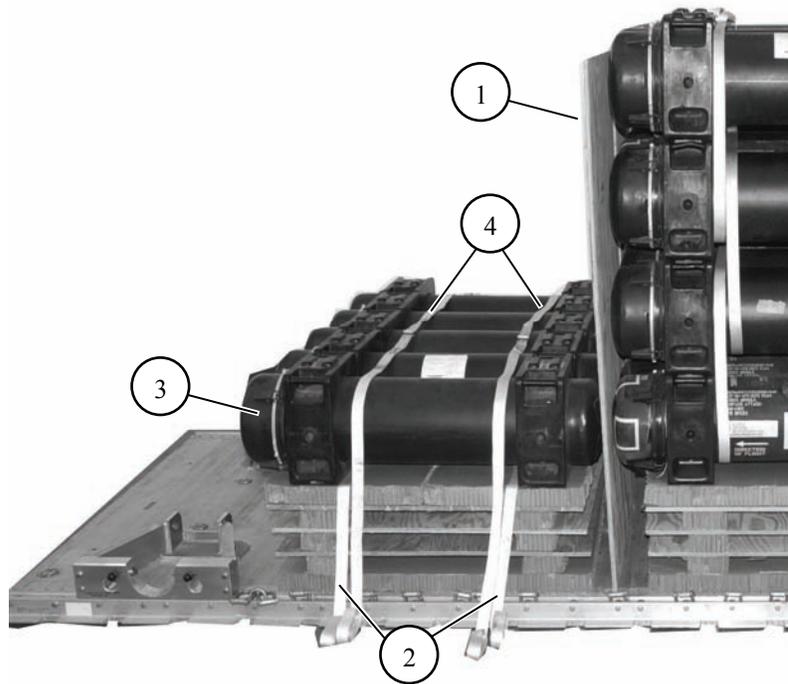
**Figure 8-22. Javelins Positioned and Secured on Stack 2 (Continued)**

### POSITIONING AND SECURING JAVELINS ON STACK 3

8-27. Position and secure the Javelins on stack 3 as shown in Figure 8-23.

#### CAUTION

The Javelins must be positioned with the direction of the flight arrow toward the rear of the platform.



① Position two 38- by- 80-inch pieces of  $\frac{3}{4}$ -inch plywood to the rear of stack 2.

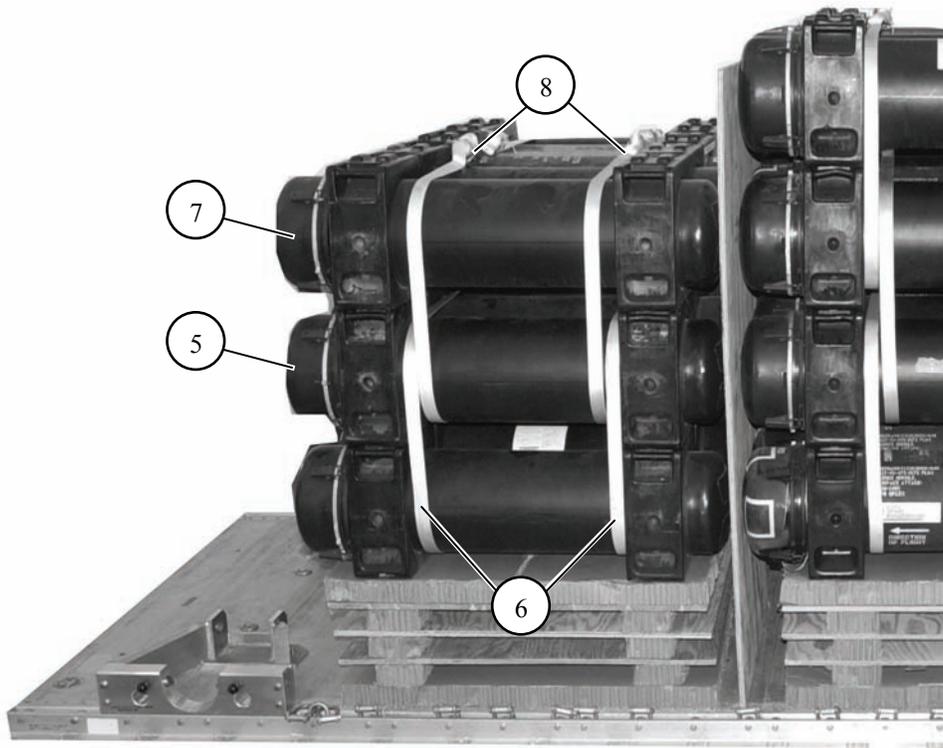
② Pre-position two 30-foot lashings 10 inches from each end of stack 3.

**Note.** Position all Javelins on stack 3 against the plywood.

③ Position five Javelin containers on top and centered on the pre-positioned lashings, flush against the plywood.

④ Pre-position two 30-foot lashings to the inside of the first pre-positioned lashings on top of the Javelins.

Figure 8-23. Javelins Positioned and Secured on Stack 3



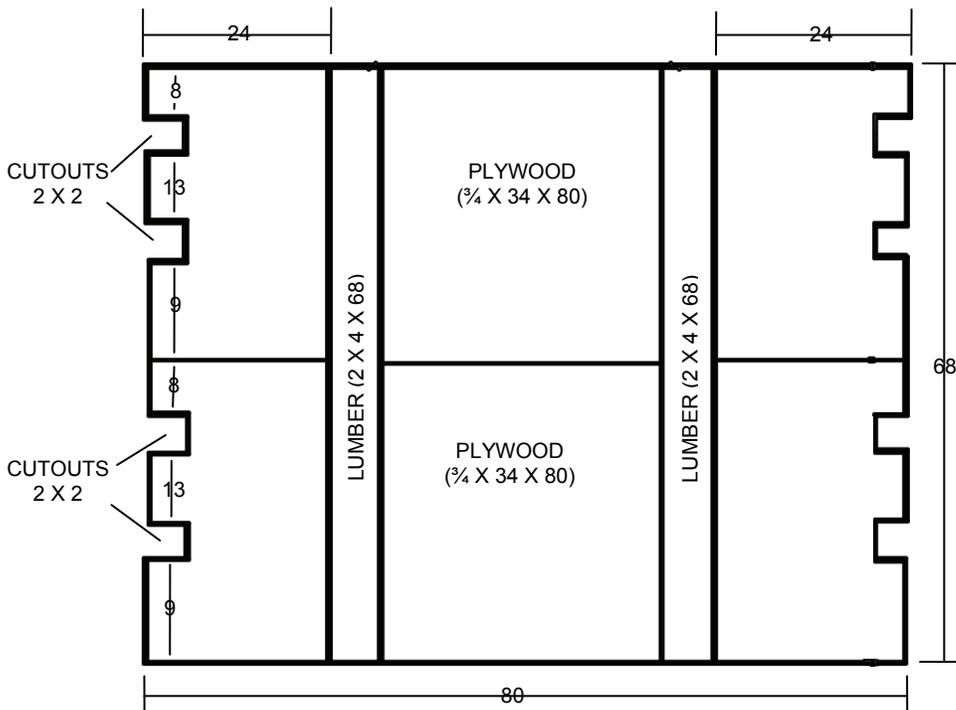
- ⑤ Position five Javelin containers on top of the pre-positioned lashings.
- ⑥ Secure the pre-positioned lashings on the bottom together to secure the first and second layers.
- ⑦ Position five Javelin containers on top of the last layer of missiles.
- ⑧ Secure the pre-positioned lashings under the middle layer together to secure the second and third layers.

**Figure 8-23. Javelins Positioned and Secured on Stack 3 (Continued)**

## CONSTRUCTING ENDBOARDS

8-28. Construct four endboards as shown in Figure 8-24.

- Notes.**
1. This drawing is not to scale.
  2. All dimensions are in inches.
  3. Use 8d nails.



Step:

1. Cut four 3/4- by 80- by 34-inch pieces of plywood.
2. Make eight 2- by 2-inch cutouts on each endboard as shown.
3. Cut four 2- by 4- by 68-inch pieces of lumber.
4. Nail two pieces of plywood flush together using two 2- by 4- by 68-inch pieces of lumber placed 24 inches from each cutout end with 8d nails to make an endboard. Repeat to make two endboards.

Figure 8-24. Endboards Constructed

## LASHING ENDBOARDS TO LOAD

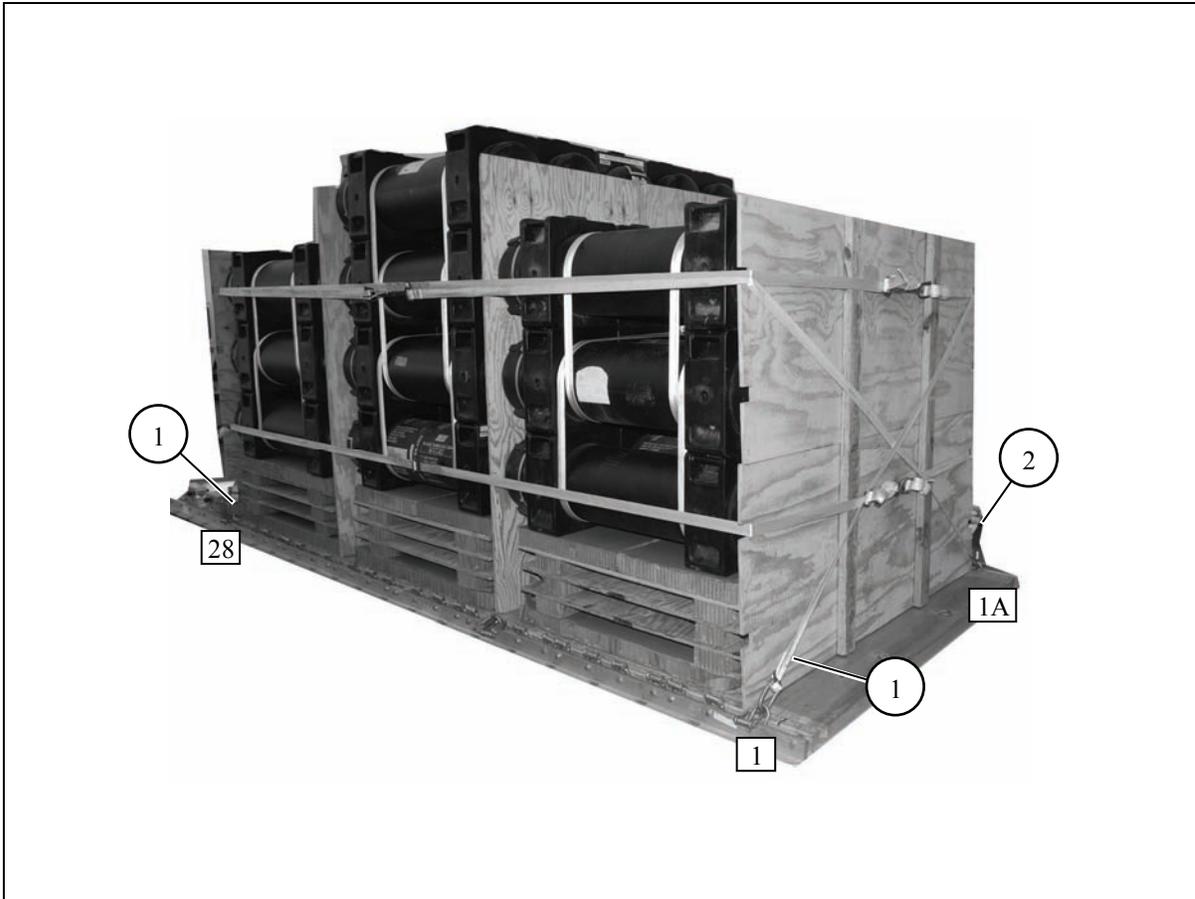
8-29. Lash the endboards to the load as shown in Figure 8-25.

<i>Lashing Number</i>	<i>Tiedown Clevis Number</i>	<i>Instructions</i>
1		Form four 30-foot lashings. Place one 30-foot lashing through the right side bottom middle cutouts of both front and rear endboards. Center the D-rings in the center of stack 2. Repeat the same for the left side. Secure the lashings on each end with four D-rings and two load binders.
2		Place one 30-foot lashings through the right side top cutouts of both front and rear endboards. Center the D-rings in the center of stack 2. Repeat the same for the left side. Secure the lashings on each end with four D-rings and two load binders

**Figure 8-25. Endboards Lashed to Load**

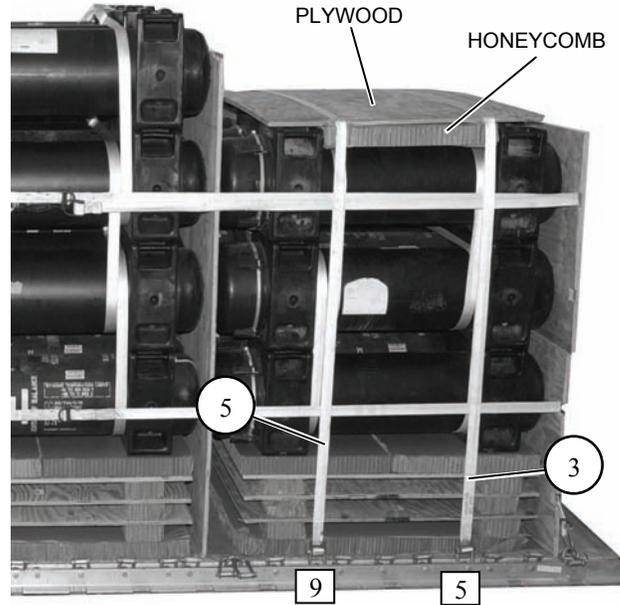
## LASHING LOAD TO PLATFORM

8-30. Lash the load to the platform as shown in Figure 8-26.



<b>Lashing Number</b>	<b>Tiedown Clevis Number</b>	<b>Instructions</b>
1	1 and 28	Route a 15-foot lashing through clevis 1 and through its own D-ring. Route the lashing to the top left front endboard cutout. Route a 15-foot lashing through clevis 28 and through its own D-ring. Route the lashing to the top left rear endboard cutout. Secure the two lashings together on the left side of the load centered on stack 2 with two D-rings and a load binder.
2	1A and 28A	Route a 15-foot lashing through clevis 1A and through its own D-ring. Route the lashing to the top right front endboard cutout. Route a 15-foot lashing through clevis 28A and through its own D-ring. Route the lashing to the top right rear endboard cutout. Secure the two lashings together on the right side of the load centered on stack 2 with two D-rings and a load binder.

Figure 8-26. Load Lashed to Platform

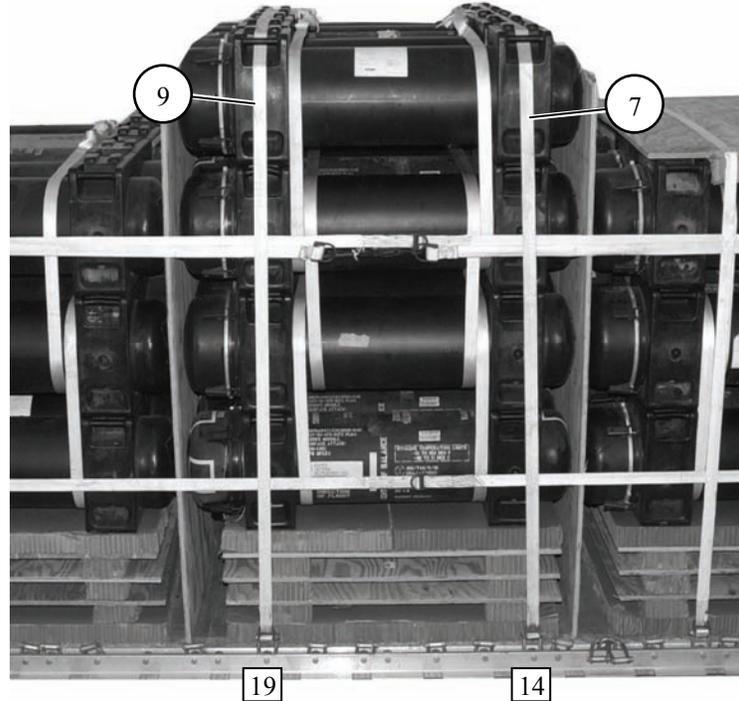


Steps:

1. Cut a 27- by 76-inch piece of honeycomb and position it on top of stack 1.
2. Cut a 3/4- by 43- by 76-inch piece of plywood and position it on top of the honeycomb centered.

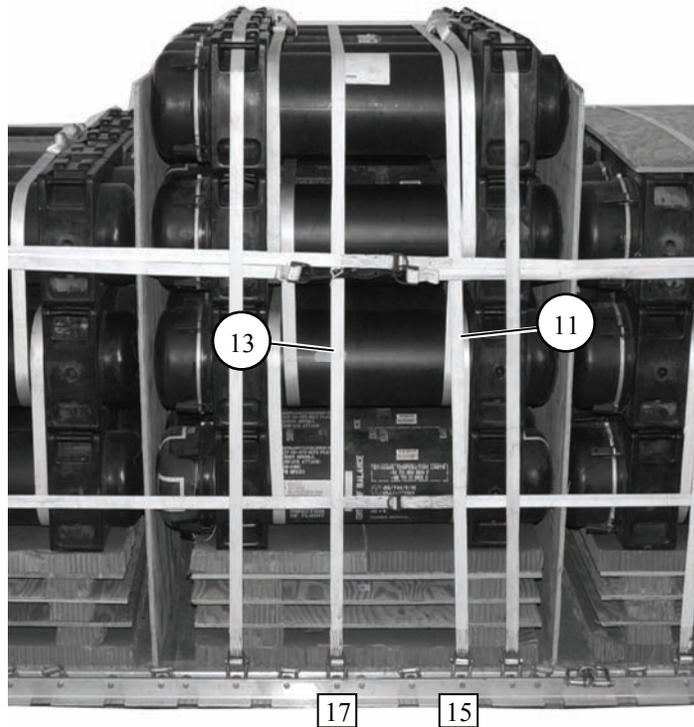
<i>Lashing Number</i>	<i>Tiedown Clevis Number</i>	<i>Instructions</i>
3	5	Route a 15-foot lashing through clevis 5 and through its own D-ring. Route the lashing over the top of stack 1 on the front end of the positioned plywood.
4	5A	Route a 15-foot lashing through clevis 5A and through its own D-ring. Secure the lashing to the lashing from clevis 5 on the left side with two D-rings and a load binder.
5	9	Route a 15-foot lashing through clevis 9 and through its own D-ring. Route the lashing over the top of stack 1 on the rear end of the positioned plywood.
6	9A	Route a 15-foot lashing through clevis 9A and through its own D-ring. Secure the lashing to the lashing from clevis 9 on the left side with two D-rings and a load binder.

Figure 8-26. Load Lashed to Platform (Continued)



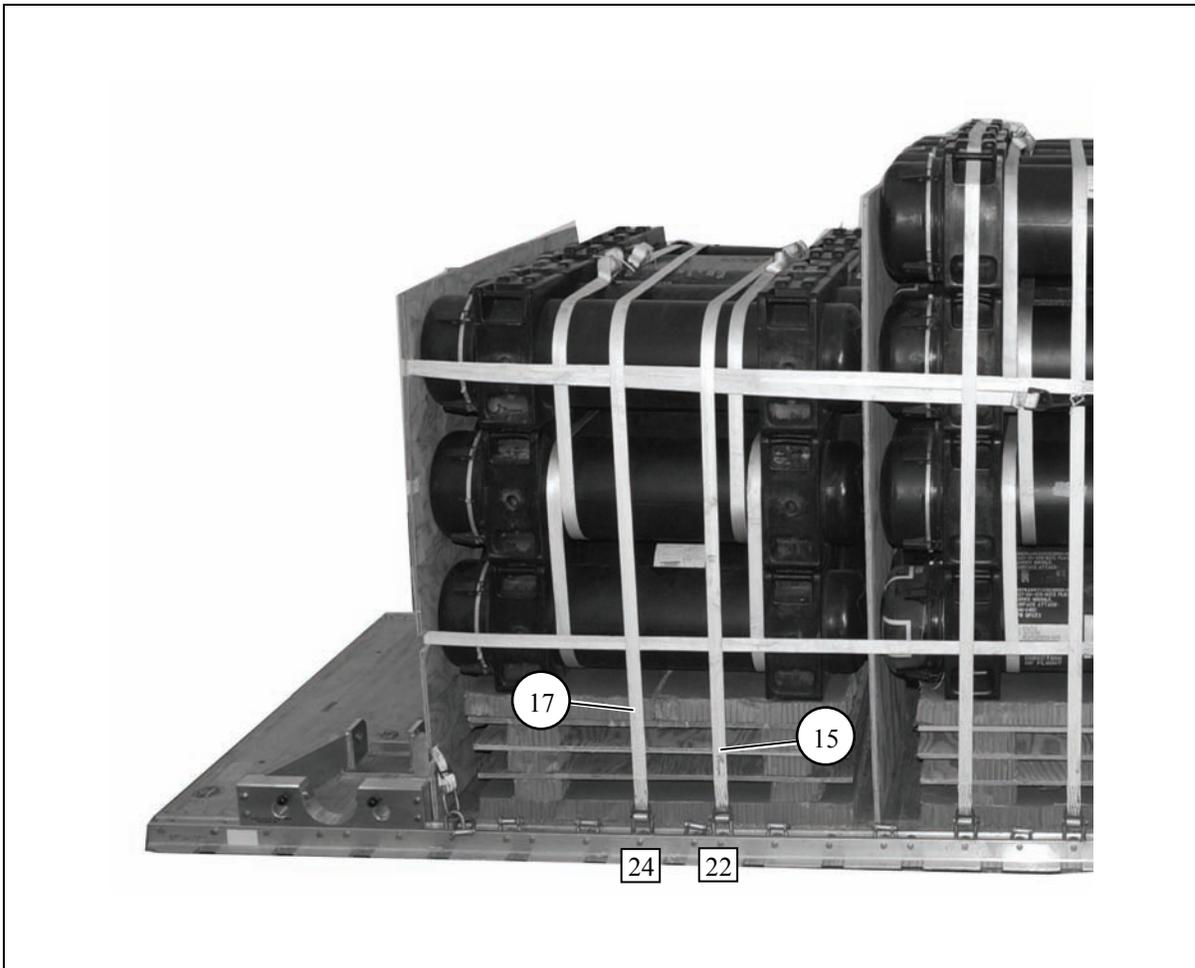
<b>Lashing Number</b>	<b>Tiedown Clevis Number</b>	<b>Instructions</b>
7	14	Route a 15-foot lashing through clevis 14 and through its own D-ring. Route the lashing through the right side top front handle of stack 2 over the stack, through the left side front handle.
8	14A	Route a 15-foot lashing through clevis 14A and through its own D-ring. Secure the lashing to the lashing from clevis 14 on the left side with two D-rings and a load binder.
9	19	Route a 15-foot lashing through clevis 19 and through its own D-ring. Route the lashing through the right side top rear handle of stack 2 over the stack, through the left side rear handle.
10	19A	Route a 15-foot lashing through clevis 19A and through its own D-ring. Secure the lashing to the lashing from clevis 19 on the left side with two D-rings and a load binder.

Figure 8-26. Load Lashed to Platform (Continued)



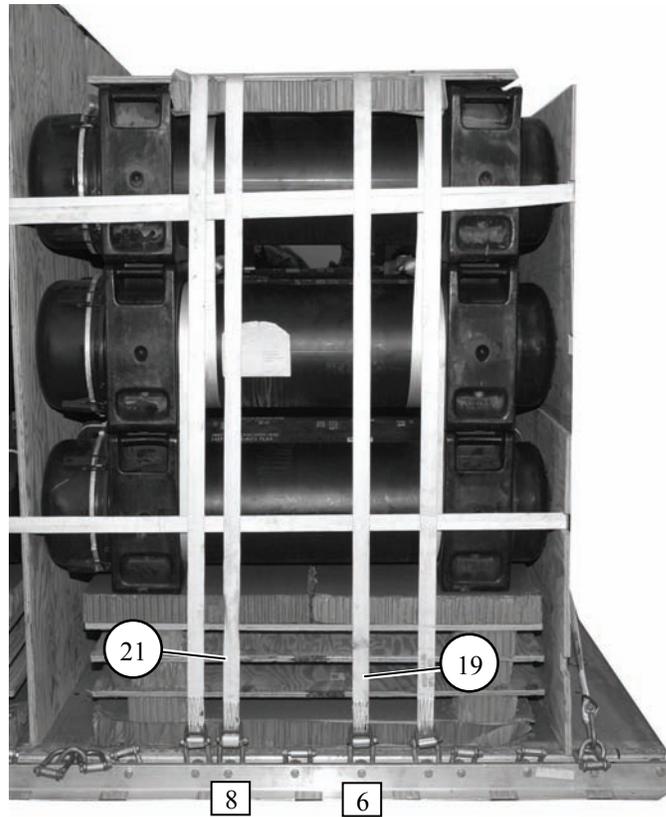
<i>Lashing Number</i>	<i>Tiedown Clevis Number</i>	<i>Instructions</i>
11	15	Route a 15-foot lashing through clevis 15 and through its own D-ring. Route the lashing over and across the top of stack 2.
12	15A	Route a 15-foot lashing through clevis 15A and through its own D-ring. Secure the lashing to the lashing from clevis 15 on the left side with two D-rings and a load binder.
13	17	Route a 15-foot lashing through clevis 17 and through its own D-ring. Route the lashing over and across the top of stack 2.
14	17A	Route a 15-foot lashing through clevis 17A and through its own D-ring. Secure the lashing to the lashing from clevis 17 on the left side with two D-rings and a load binder.

**Figure 8-26. Load Lashed to Platform (Continued)**



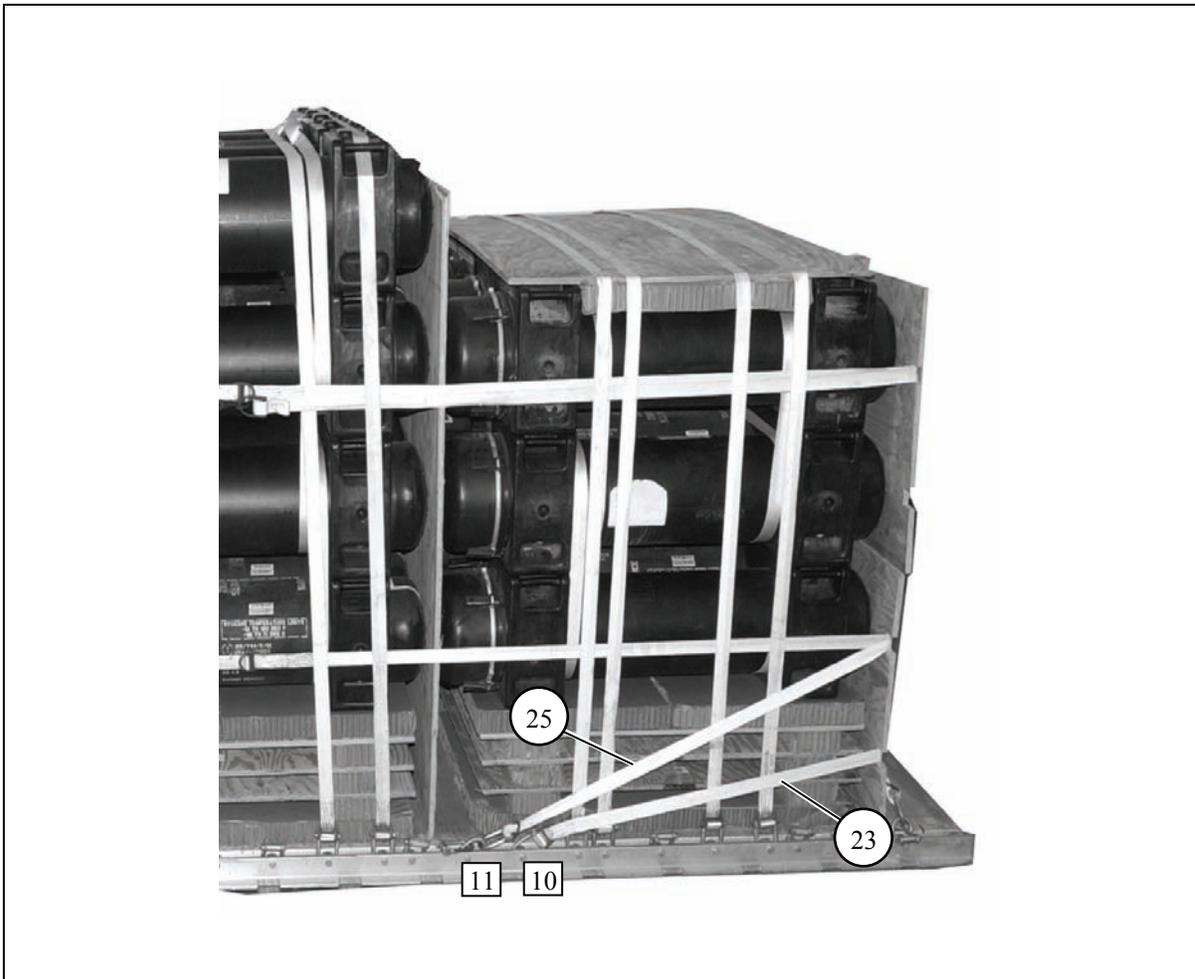
<i>Lashing Number</i>	<i>Tiedown Clevis Number</i>	<i>Instructions</i>
15	22	Route a 15-foot lashing through clevis 22 and through its own D-ring. Route the lashing over and across the top of stack 3.
16	22A	Route a 15-foot lashing through clevis 22A and through its own D-ring. Secure the lashing to the lashing from clevis 22 on the left side with two D-rings and a load binder.
17	24	Route a 15-foot lashing through clevis 24 and through its own D-ring. Route the lashing over and across the top of stack 3.
18	24A	Route a 15-foot lashing through clevis 24A and through its own D-ring. Secure the lashing to the lashing from clevis 24 on the left side with two D-rings and a load binder.

**Figure 8-26. Load Lashed to Platform (Continued)**



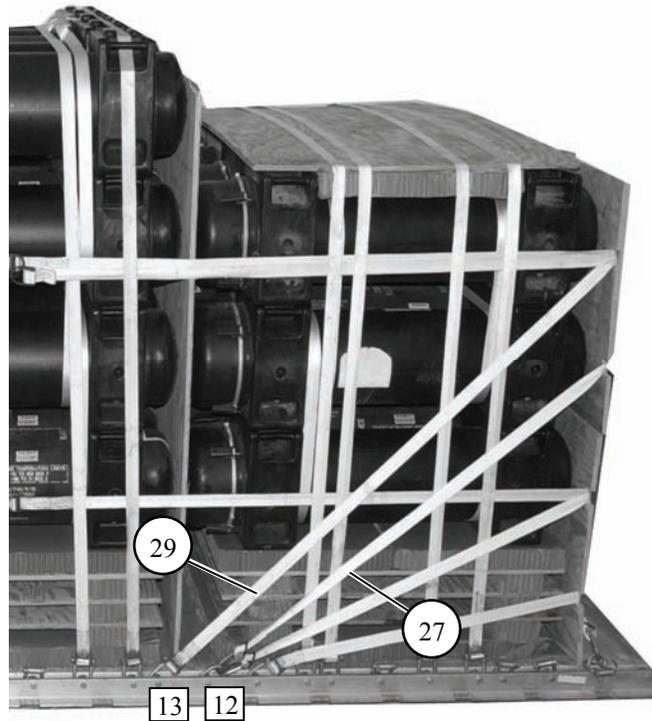
<b>Lashing Number</b>	<b>Tiedown Clevis Number</b>	<b>Instructions</b>
19	6	Route a 15-foot lashing through clevis 6 and through its own D-ring. Route the lashing over the top of stack 1 on the plywood.
20	6A	Route a 15-foot lashing through clevis 6A and through its own D-ring. Secure the lashing to the lashing from clevis 6 on the left side with two D-rings and a load binder.
21	8	Route a 15-foot lashing through clevis 8 and through its own D-ring. Route the lashing over the top of stack 1 on the plywood.
22	8A	Route a 15-foot lashing through clevis 8A and through its own D-ring. Secure the lashing to the lashing from clevis 8 on the left side with two D-rings and a load binder.

**Figure 8-26. Load Lashed to Platform (Continued)**



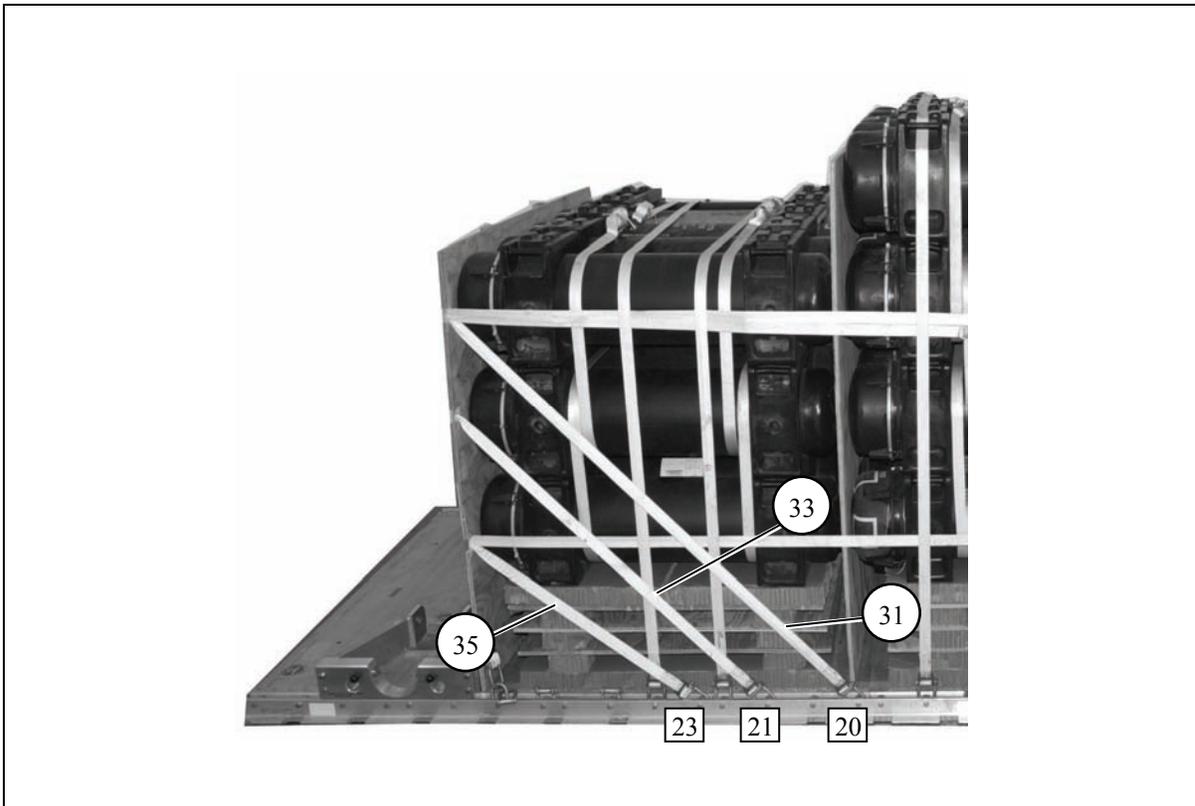
<i>Lashing Number</i>	<i>Tiedown Clevis Number</i>	<i>Instructions</i>
23	10	Route a 15-foot lashing through clevis 10 and through its own D-ring. Route the lashing to the bottom front cutout.
24	10A	Route a 15-foot lashing through clevis 10A and through its own D-ring. Route the lashing to the bottom front cutout. Secure the lashing to the lashing from clevis 10 centered on the front endboard with two D-rings and a load binder.
25	11	Route a 15-foot lashing through clevis 11 and through its own D-ring. Route the lashing to the bottom middle front cutout.
26	11A	Route a 15-foot lashing through clevis 11A and through its own D-ring. Route the lashing to the bottom middle front cutout. Secure the lashing to the lashing from clevis 11 centered on the front endboard with two D-rings and a load binder.

Figure 8-26. Load Lashed to Platform (Continued)



<b>Lashing Number</b>	<b>Tiedown Clevis Number</b>	<b>Instructions</b>
27	12	Route a 15-foot lashing through clevis 12 and through its own D-ring. Route the lashing to the top middle front cutout.
28	12A	Route a 15-foot lashing through clevis 12A and through its own D-ring. Route the lashing to the top middle front cutout. Secure the lashing to the lashing from clevis 12 centered on the front endboard with two D-rings and a load binder.
29	13	Route a 15-foot lashing through clevis 13 and through its own D-ring. Route the lashing to the top front cutout.
30	13A	Route a 15-foot lashing through clevis 13A and through its own D-ring. Route the lashing to the top front cutout. Secure the lashing to the lashing from clevis 13 centered on the front endboard with two D-rings and a load binder.

**Figure 8-26. Load Lashed to Platform (Continued)**

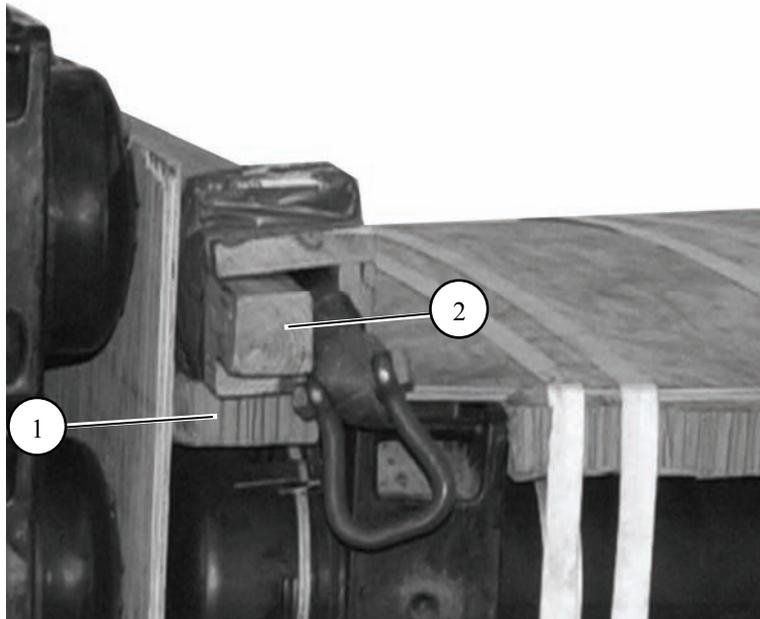


<i>Lashing Number</i>	<i>Tiedown Clevis Number</i>	<i>Instructions</i>
31	20	Route a 15-foot lashing through clevis 20 and through its own D-ring. Route the lashing to the top rear cutout.
32	20A	Route a 15-foot lashing through clevis 20A and through its own D-ring. Route the lashing to the top rear cutout. Secure the lashing to the lashing from clevis 20 centered on the rear endboard with two D-rings and a load binder.
33	21	Route a 15-foot lashing through clevis 21 and through its own D-ring. Route the lashing to the top middle rear cutout.
34	21A	Route a 15-foot lashing through clevis 21A and through its own D-ring. Route the lashing to the top middle rear cutout. Secure the lashing to the lashing from clevis 21 centered on the rear endboard with two D-rings and a load binder.
35	23	Route a 15-foot lashing through clevis 23 and through its own D-ring. Route the lashing to the bottom middle rear cutout.
36	23A	Route a 15-foot lashing through clevis 23A and through its own D-ring. Route the lashing to the bottom middle rear cutout. Secure the lashing to the lashing from clevis 23 centered on the rear endboard with two D-rings and a load binder.

Figure 8-26. Load Lashed to Platform (Continued)

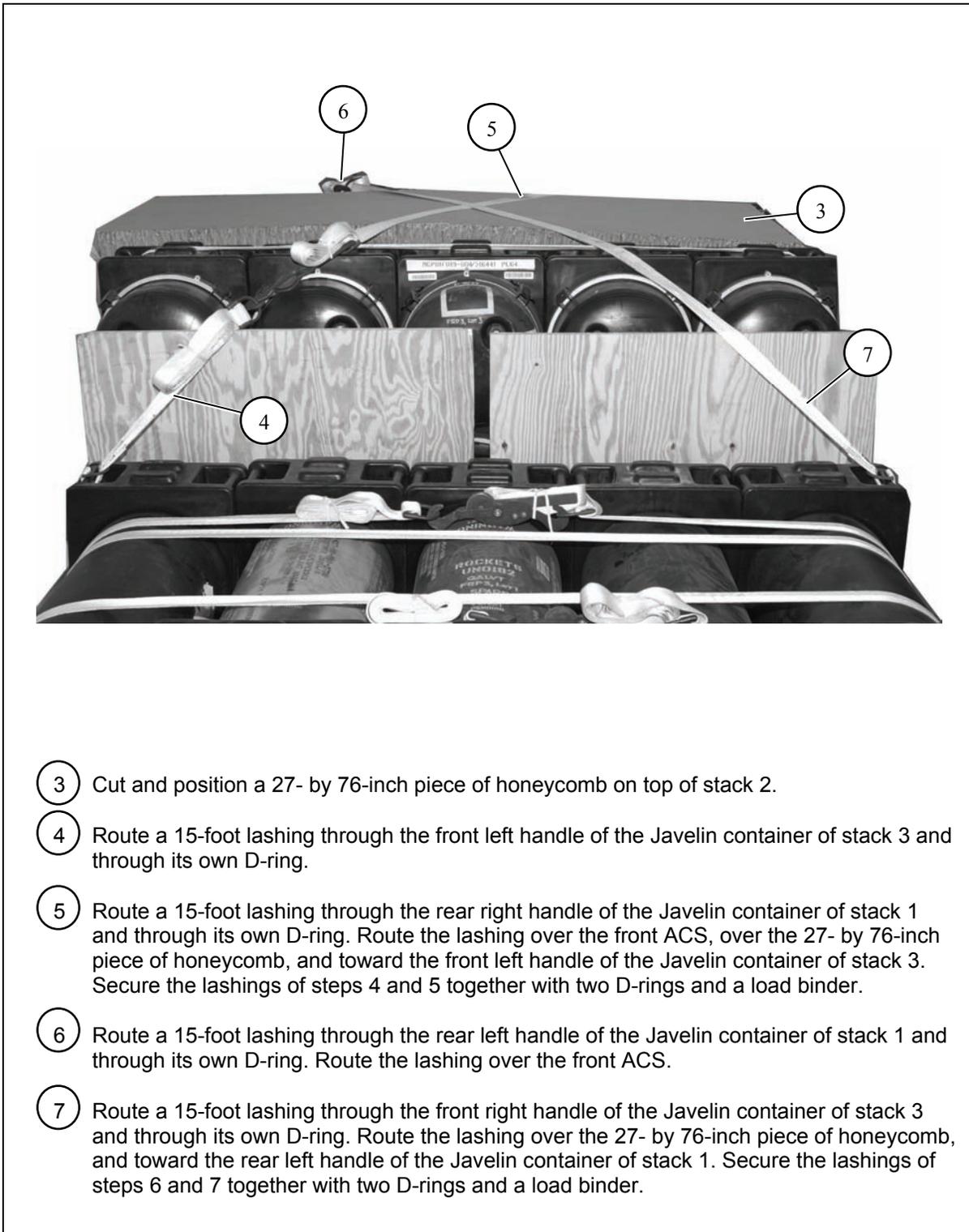
## POSITIONING THE ATTITUDE CONTROL SYSTEM (ACS) AND INSTALLING SUSPENSION SLINGS

8-31. Construct the ACS according to Chapter 2, Section VII. Position the ACS and install suspension slings as shown in Figure 8-27.



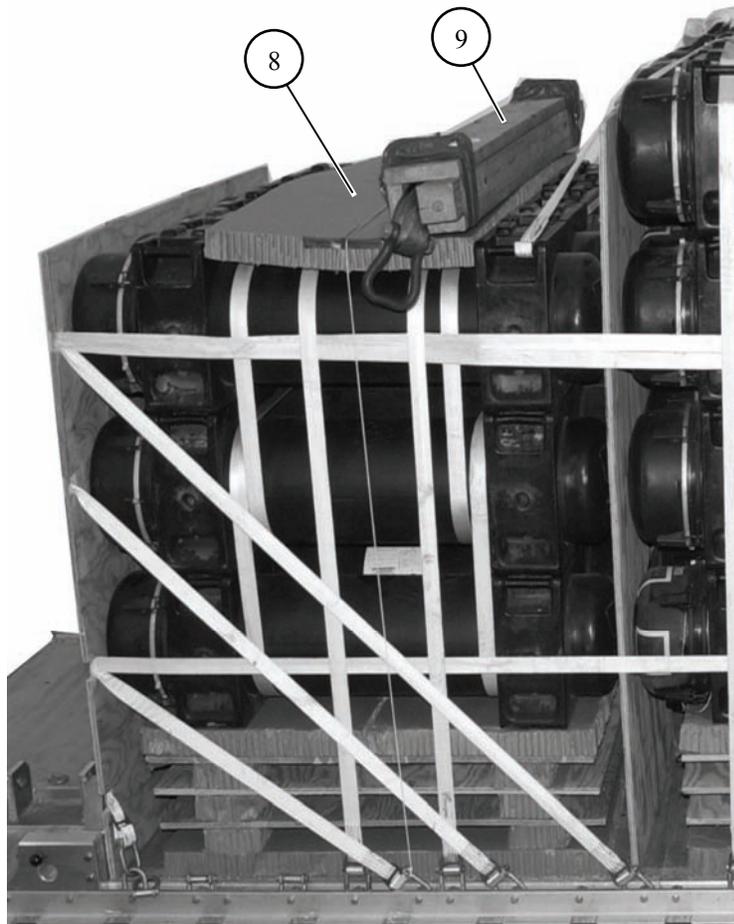
- ① Cut a 7- by 76-inch piece of honeycomb. Position it on stack 1.
- ② Position the front ACS on top of the 7- by 76-inch piece of honeycomb against the front of the board against stack 2 with the 4- by 4-inch piece of lumber to the rear.

**Figure 8-27. ACS Positioned and Suspension Slings Installed**



- 3 Cut and position a 27- by 76-inch piece of honeycomb on top of stack 2.
- 4 Route a 15-foot lashing through the front left handle of the Javelin container of stack 3 and through its own D-ring.
- 5 Route a 15-foot lashing through the rear right handle of the Javelin container of stack 1 and through its own D-ring. Route the lashing over the front ACS, over the 27- by 76-inch piece of honeycomb, and toward the front left handle of the Javelin container of stack 3. Secure the lashings of steps 4 and 5 together with two D-rings and a load binder.
- 6 Route a 15-foot lashing through the rear left handle of the Javelin container of stack 1 and through its own D-ring. Route the lashing over the front ACS.
- 7 Route a 15-foot lashing through the front right handle of the Javelin container of stack 3 and through its own D-ring. Route the lashing over the 27- by 76-inch piece of honeycomb, and toward the rear left handle of the Javelin container of stack 1. Secure the lashings of steps 6 and 7 together with two D-rings and a load binder.

**Figure 8-27. ACS Positioned and Suspension Slings Installed (Continued)**



- 8 Cut and position a 27- by 76-inch piece of honeycomb on top of stack 3. Secure the piece of honeycomb with a length of type III nylon cord to convenient points.
- 9 Position the rear ACS flush on the front edge of the 27- by 76-inch piece of honeycomb with the 4- by 4-inch piece of lumber to the front.

**Figure 8-27. ACS Positioned and Suspension Slings Installed (Continued)**

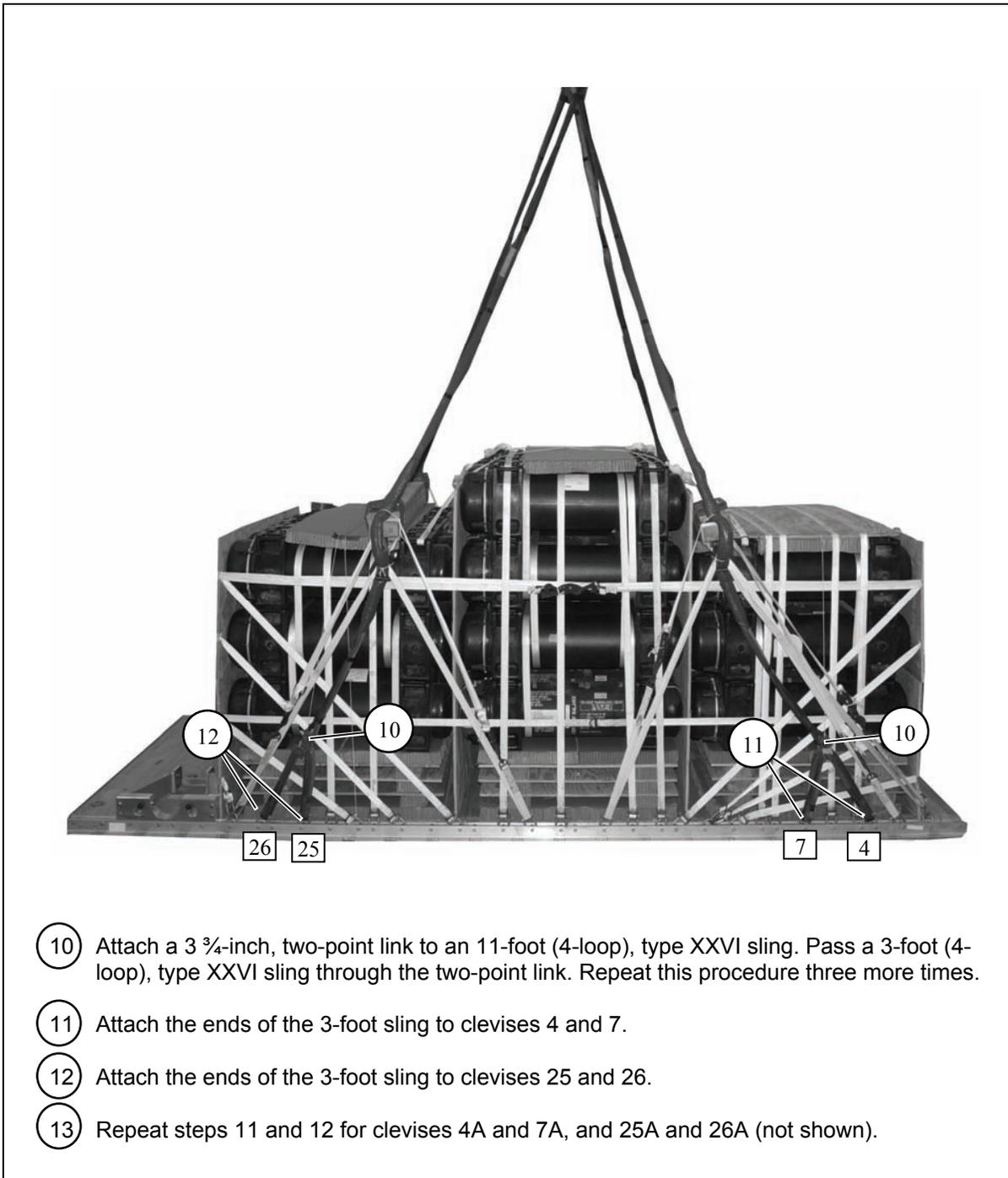
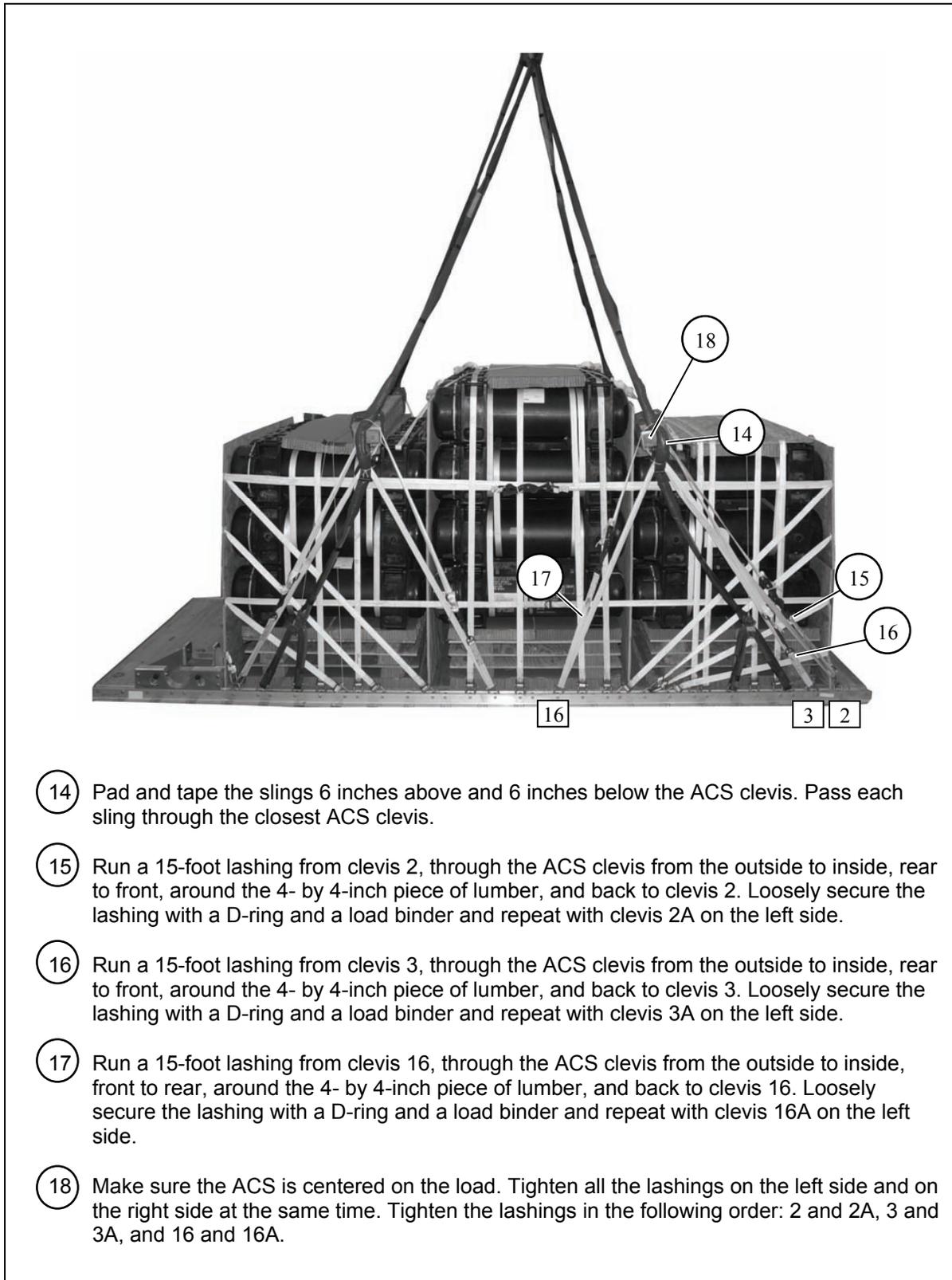
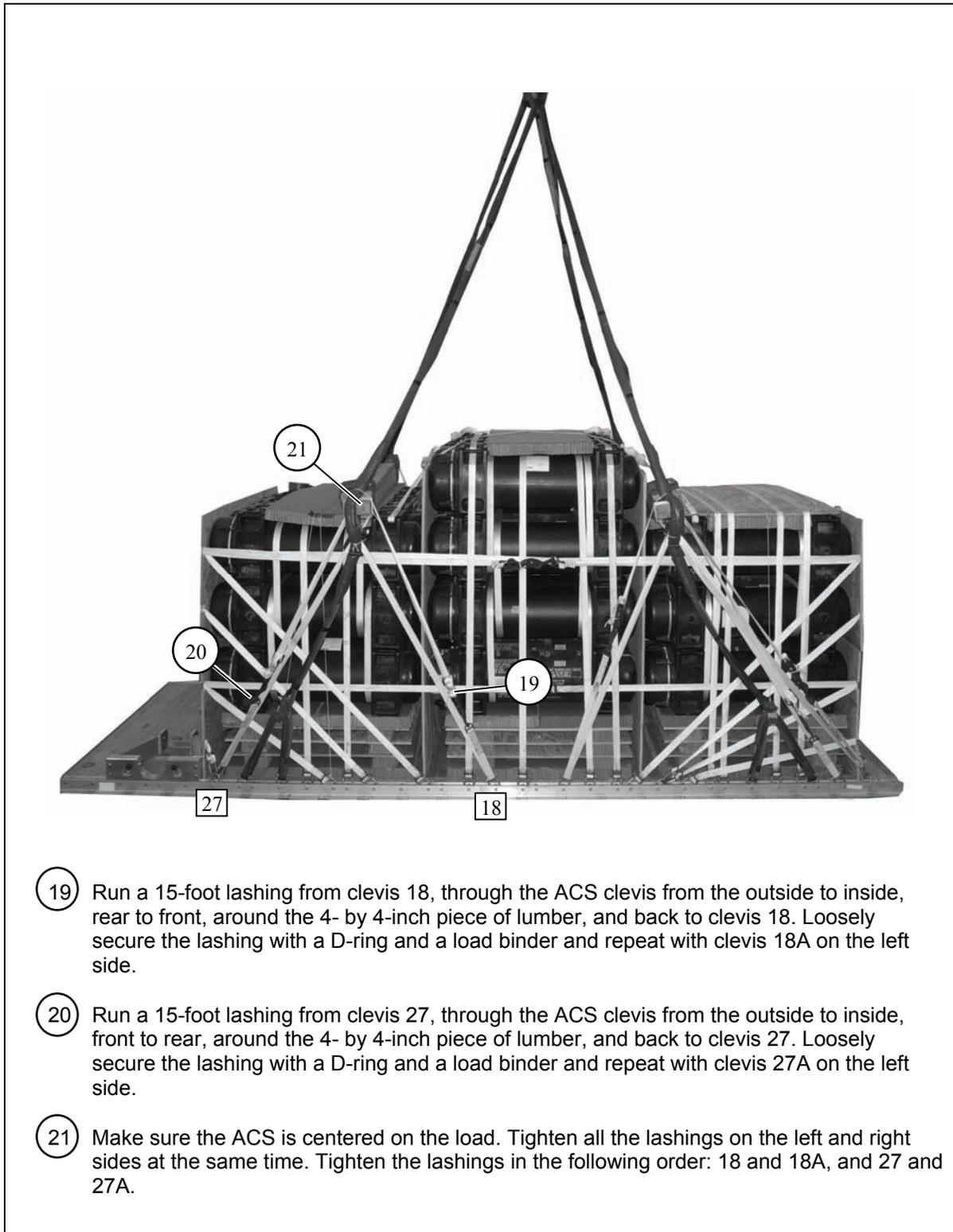


Figure 8-27. ACS Positioned and Suspension Slings Installed (Continued)



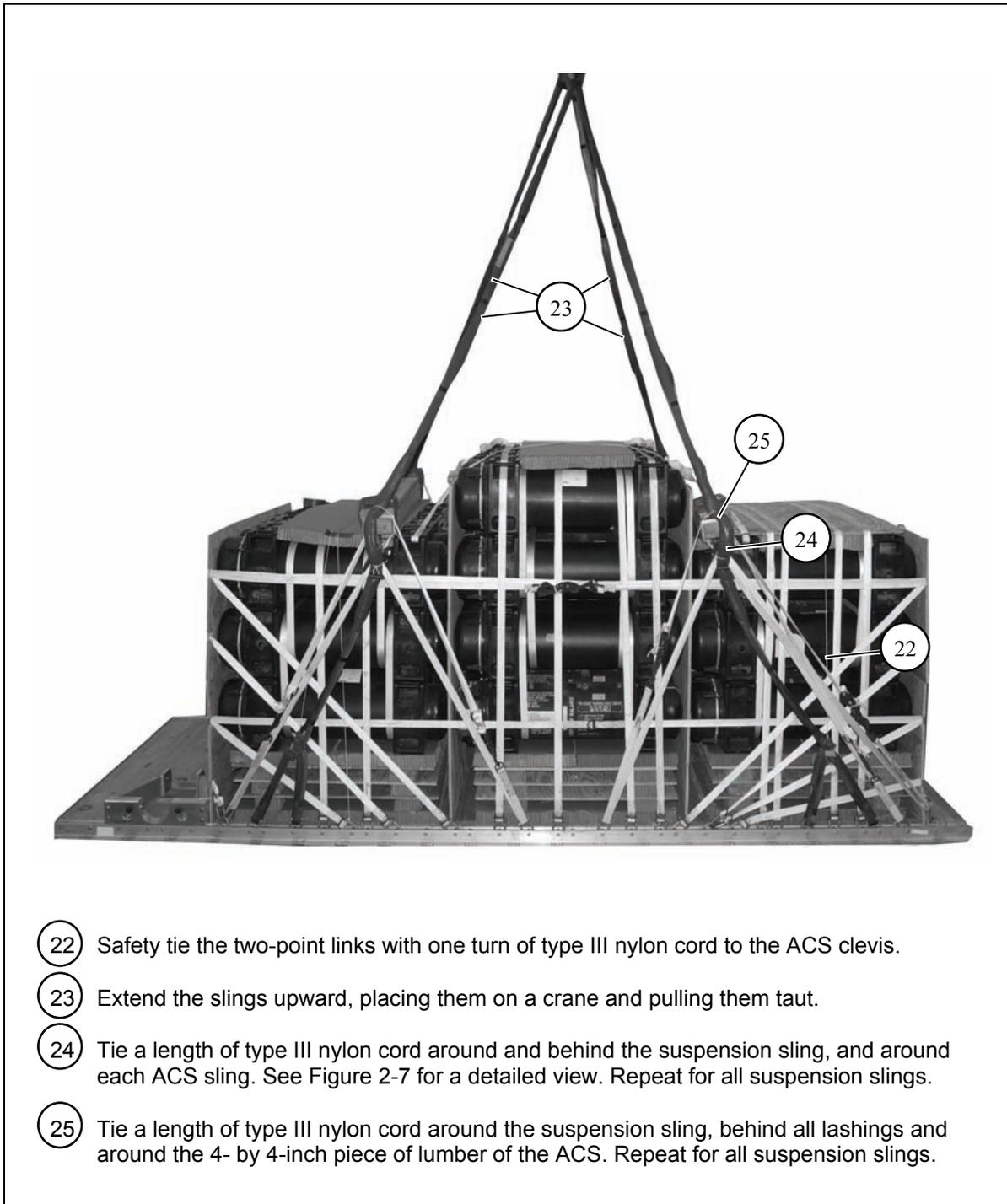
- 14 Pad and tape the slings 6 inches above and 6 inches below the ACS clevis. Pass each sling through the closest ACS clevis.
- 15 Run a 15-foot lashing from clevis 2, through the ACS clevis from the outside to inside, rear to front, around the 4- by 4-inch piece of lumber, and back to clevis 2. Loosely secure the lashing with a D-ring and a load binder and repeat with clevis 2A on the left side.
- 16 Run a 15-foot lashing from clevis 3, through the ACS clevis from the outside to inside, rear to front, around the 4- by 4-inch piece of lumber, and back to clevis 3. Loosely secure the lashing with a D-ring and a load binder and repeat with clevis 3A on the left side.
- 17 Run a 15-foot lashing from clevis 16, through the ACS clevis from the outside to inside, front to rear, around the 4- by 4-inch piece of lumber, and back to clevis 16. Loosely secure the lashing with a D-ring and a load binder and repeat with clevis 16A on the left side.
- 18 Make sure the ACS is centered on the load. Tighten all the lashings on the left side and on the right side at the same time. Tighten the lashings in the following order: 2 and 2A, 3 and 3A, and 16 and 16A.

**Figure 8-27. ACS Positioned and Suspension Slings Installed (Continued)**



- 19 Run a 15-foot lashing from clevis 18, through the ACS clevis from the outside to inside, rear to front, around the 4- by 4-inch piece of lumber, and back to clevis 18. Loosely secure the lashing with a D-ring and a load binder and repeat with clevis 18A on the left side.
- 20 Run a 15-foot lashing from clevis 27, through the ACS clevis from the outside to inside, front to rear, around the 4- by 4-inch piece of lumber, and back to clevis 27. Loosely secure the lashing with a D-ring and a load binder and repeat with clevis 27A on the left side.
- 21 Make sure the ACS is centered on the load. Tighten all the lashings on the left and right sides at the same time. Tighten the lashings in the following order: 18 and 18A, and 27 and 27A.

**Figure 8-27. ACS Positioned and Suspension Slings Installed (Continued)**

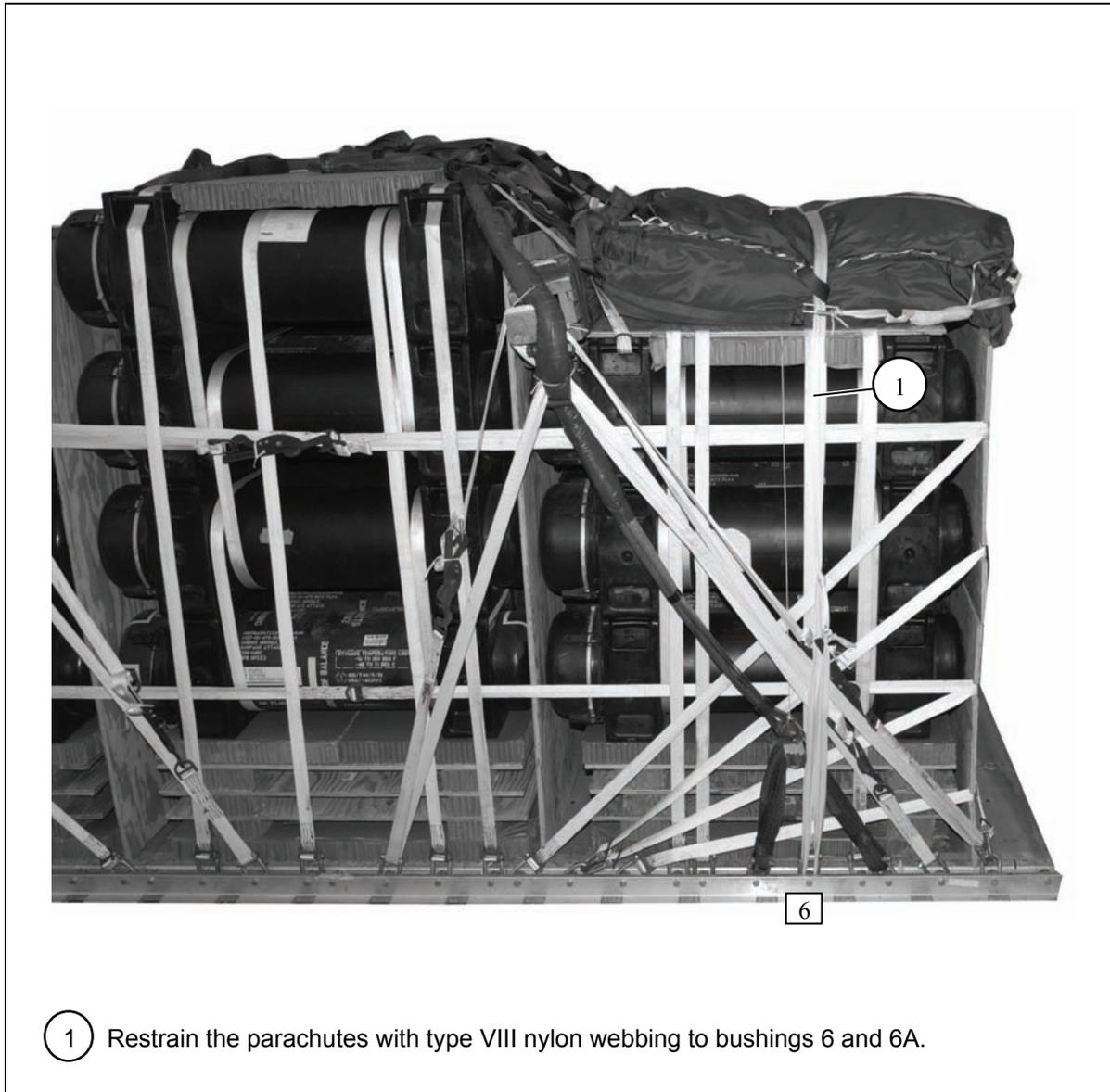


- 22 Safety tie the two-point links with one turn of type III nylon cord to the ACS clevis.
- 23 Extend the slings upward, placing them on a crane and pulling them taut.
- 24 Tie a length of type III nylon cord around and behind the suspension sling, and around each ACS sling. See Figure 2-7 for a detailed view. Repeat for all suspension slings.
- 25 Tie a length of type III nylon cord around the suspension sling, behind all lashings and around the 4- by 4-inch piece of lumber of the ACS. Repeat for all suspension slings.

**Figure 8-27. ACS Positioned and Suspension Slings Installed (Continued)**

## STOWING CARGO PARACHUTES

8-32. Prepare, stow, and restrain two G-11D cargo parachutes as shown in Chapter 2 and as shown on top of the board on stack 1 in Figure 8-28.



**Figure 8-28. Cargo Parachutes Installed and Restrained**

## STOWING DEPLOYMENT PARACHUTE

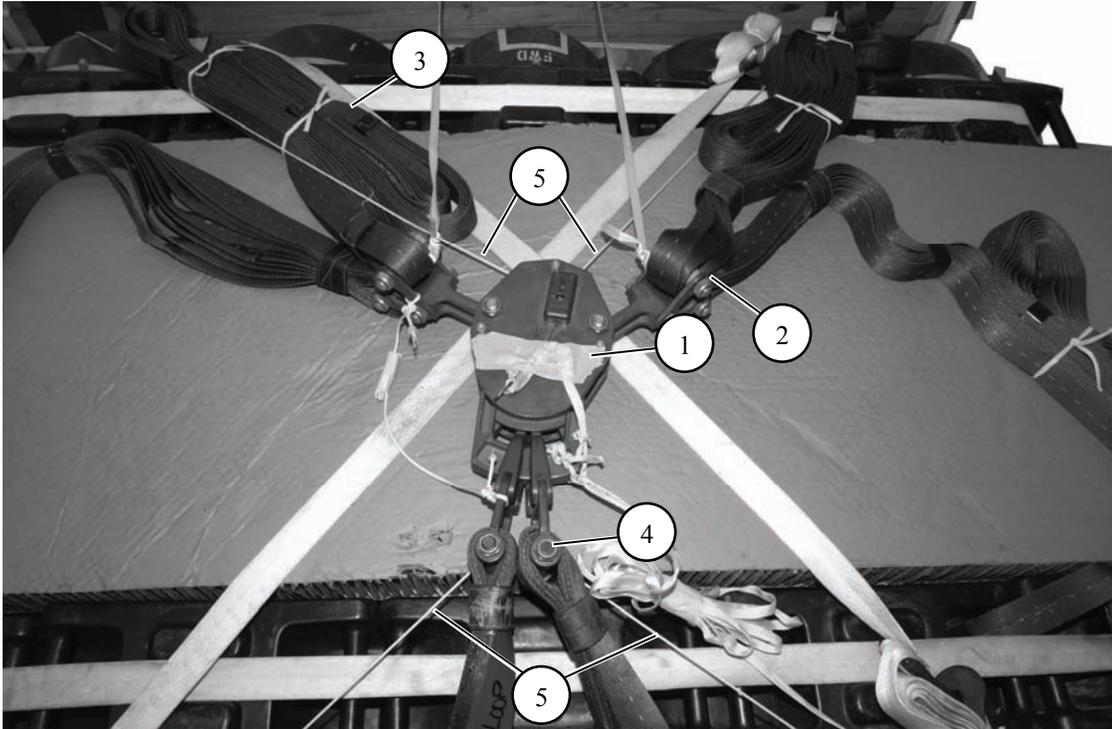
8-33. Prepare, stow, and install the deployment parachute according to Chapter 2, Section V and as shown in Figure 8-29.



**Figure 8-29. Deployment Parachute Installed**

## INSTALLING PARACHUTE RELEASE SYSTEM

8-34. Prepare and install an M-1 release system according to Chapter 2, Section VI and as shown in Figure 8-30.

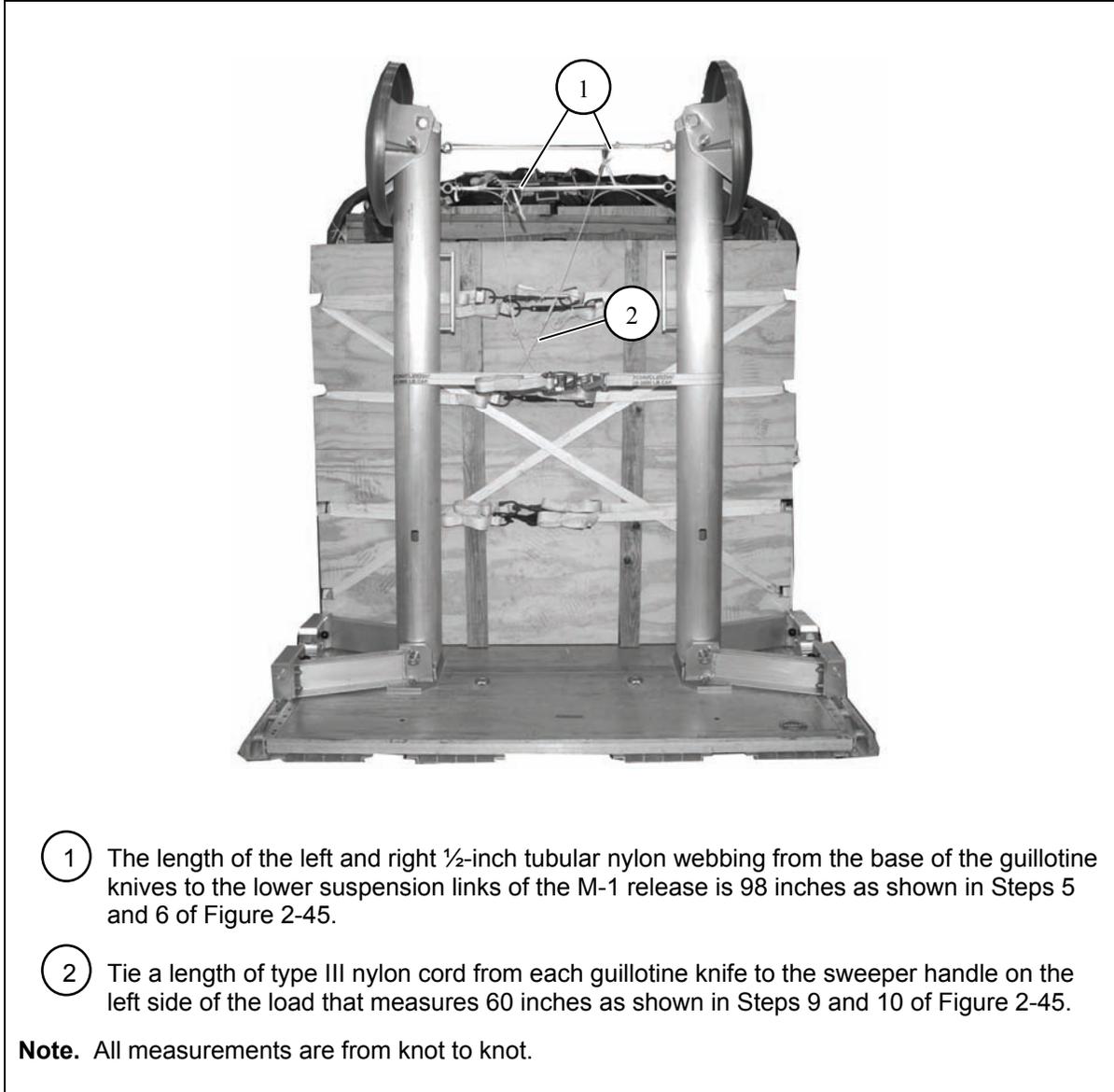


- ① Position the M-1 release on top of the release platform.
- ② Remove the buffers from the free ends of the suspension slings and attach them to the release.
- ③ S-fold the suspension slings safety tie at or near the 3 ¾-inch link with type I, ¼-inch cotton webbing. Make two ties on each sling.
- ④ Attach the riser extensions to the parachute connectors. Secure the riser extensions together with type I, ¼-inch cotton webbing.
- ⑤ Restrain the release through the parachute release connectors to convenient points on the platform. Secure the bottom of the release to convenient points on the platform.

Figure 8-30. Parachute Release System Installed

## INSTALLING MAST RELEASE KNIVES

8-35. Install the mast release knives according to Chapter 2, Figure 2-45, Steps 4 through 10 and as shown in Figure 8-31.



**Figure 8-31. Mast Release Knives Installed**

## MARKING RIGGED LOAD

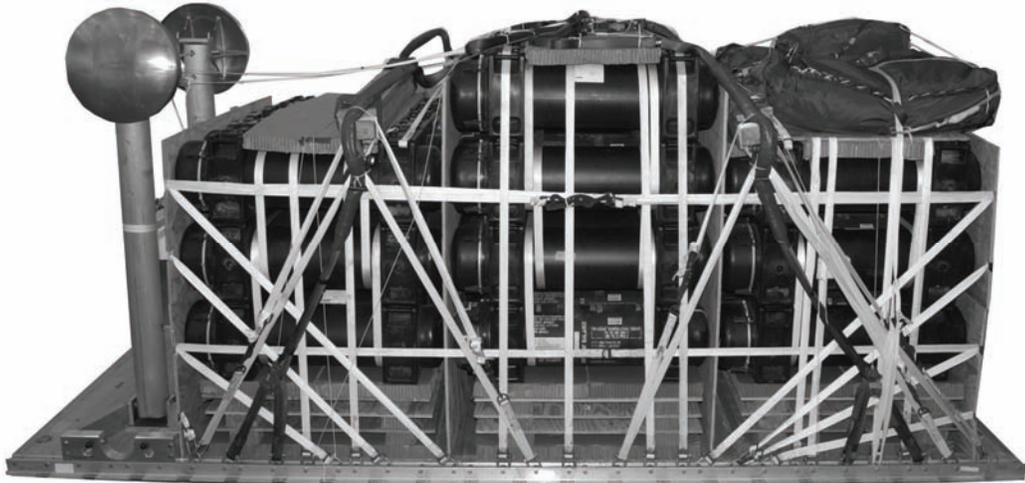
8-36. Mark the rigged load according to Chapter 2, Section IX and as shown in Figure 8-32. A Shipper's Declaration for Dangerous Goods is required.

## EQUIPMENT REQUIRED

8-37. The equipment required to rig this load is listed in Table 8-2.

### CAUTION

Make the final rigger inspection required by Chapter 2, Section IX before the load leaves the rigging site.



### RIGGED LOAD DATA

Weight: Load shown.....	8,920 pounds
Maximum load allowed .....	9,000 pounds
Height.....	98 inches
Width .....	94 inches
Overall Length.....	216 inches
Overhang: Front.....	0 inches
Rear .....	0 inches
Center of Balance: (from front edge of platform): .....	98 inches

Figure 8-32. Javelin (Plastic) Containers Rigged on DRAS Platform

**Table 8-2. Equipment Required for Rigging Javelin (Plastic) Containers on DRAS Platform**

<i>National Stock Number</i>	<i>Item</i>	<i>Quantity</i>
8040-00-273-8713	Adhesive paste, 1-gallon	As required
4020-00-240-2146	Cord, nylon, type III, 550-pound	As required
	Clevis:	
4030-00-090-5354	Large	5
4030-00-678-8562	Medium	4
1670-00-360-0328	Cover, clevis, large	3
8135-00-664-6958	Cushioning material, cellulose wadding	As required
8305-00-191-1101	Felt, ½-inch	As required
1670-01-493-6418	Link assembly, two-point, 3 ¾-inch	9
	Lumber:	
5510-00-220-6146	2- by 4-inch	As required
5510-00-220-6148	2- by 6-inch	As required
5510-00-220-6274	4- by 4-inch	As required
5530-00-618-8073	Plywood, ¾-inch	18 sheets
	Nail, steel wire, common:	
5315-00-010-4659	8d	As required
5315-00-010-4662	12d	As required
5315-00-753-3885	16d	As required
1670-00-753-3928	Pad, energy dissipating, honeycomb	33 sheets
1670-01-487-5461	Static line assembly release away	1
	Parachute:	
	Cargo:	
1670-01-016-7841	G-11D	2
1670-00-040-8135	Cargo extraction: 28-foot (deployment parachute)	1
	Platform, dual row, 18-foot	
1670-01-485-1654	Rail, DRAS	2
1670-01-486-1342	Roller Pad, DRAS	4
1670-01-486-1656	Panel Assembly, Main	9
1670-01-162-2372	Clevis assembly	62
1670-01-097-8816	Release, cargo parachute, M-1	1
	Sling, cargo airdrop	
	For suspension:	
1670-01-062-6310	11-foot (4-loop), type XXVI nylon webbing	4
1670-01-062-6306	3-foot (4-loop), type XXVI nylon webbing	4
	For deployment:	
1670-01-062-6306	3-foot (4-loop), type XXVI nylon webbing	1
	For riser extension:	
1670-01-062-6313	60-foot (3-loop), type XXVI nylon webbing	2
	For ACS:	
1670-01-063-7761	16-foot (2-loop), type XXVI nylon webbing	2

**Table 8-2. Equipment Required for Rigging Javelin (Plastic) Containers on DRAS Platform  
(Continued)**

<i>National Stock Number</i>	<i>Item</i>	<i>Quantity</i>
1670-00-040-8219	Strap, parachute release, multicut	2
1670-00-937-0271	Knife release, cargo (guillotine)	6
1670-01-487-5464	Outrigger assembly	1
7510-00-266-5016	Tape, adhesive, 2-inch	As required
1670-00-937-0271	Tie-down assembly, 15-foot	88
1670-00-725-1437	Tie-down, cargo, aircraft, (CGU-1B)	5
	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	As required

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## Glossary

ACS	attitude control system
AD	airdrop
AFB	Air Force base
AFMAN	Air Force Manual
AFR	Air Force regulation
AFTO	Air Force technical order
ALC	Airlift Logistics Center
AGL	above ground level
attn	attention
CB	center of balance
d	penny
DA	Department of the Army
DC	District of Columbia
DD	Department of Defense
diam	diameter
DRAS	dual row airdrop system
FM	field manual
HMMWV	high mobility multipurpose wheeled vehicle
HQ	headquarters
JAI	joint airdrop inspector
lb	pound
MAJCOM	Major Command
LV	low-velocity
LVOSS	light vehicle obscuration smoke system
MCRP	Marine Corps Reference Publication
mm	millimeter
NSN	national stock number
OVE	on-vehicular equipment
PFA	platform fitting assembly
TM	technical manual
TO	technical order
TOW	tube-launched, optically tracked, wire-guided
TRADOC	US Army Training and Doctrine Command
US	United States
wt	weight
w	with

<b>w/o</b>	<b>without</b>
<b>yd</b>	<b>yard</b>

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