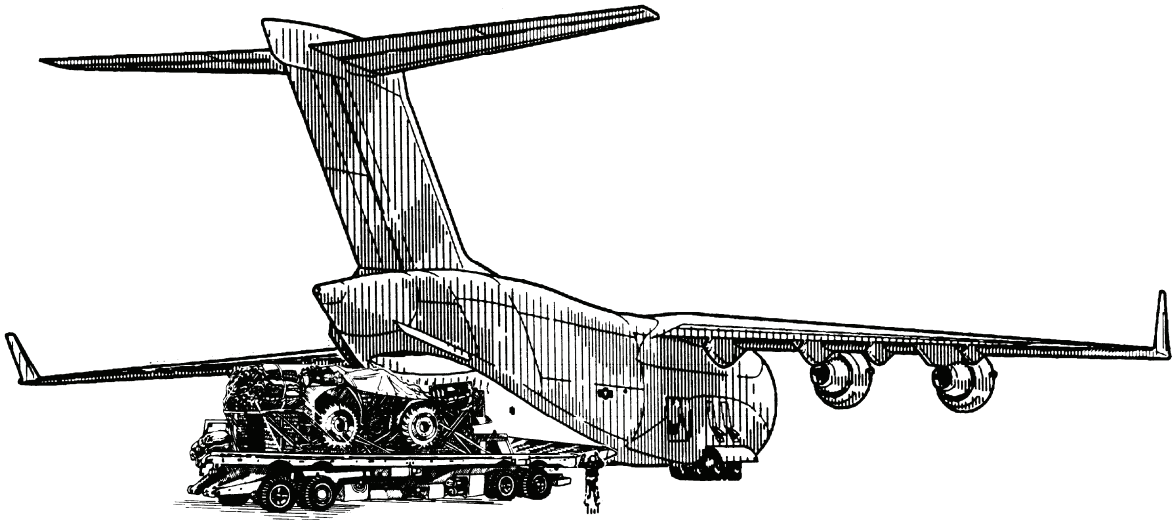
FM 4-20.105-2
TO 13C7-1-51 VOL II
August 2006

Airdrop of Supplies and Equipment: Dual Row Airdrop Systems

Volume II



Headquarters
Department of the Army
Department of the Air Force

This publication is available at
Army Knowledge Online (www.us.army.mil) and
General Dennis J. Reimer Training and Doctrine
Digital Library at (www.train.army.mil).

Field Manual
No. 4-20.105-2
Technical Order
No. 13C7-1-51 Volume II

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 II

Contents

***This publication supersedes FM 4-20.105/TO 13C7-1-51 dated 1 April 2002.**

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 FM 4-20.105-2/TO 13C7-1-51 VOL II.

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.

Army personnel, send your comments on DA Form 2028 directly to:

Director
Aerial Delivery and Field Services Department
USA Quartermaster Center and School
710 Adams Avenue
Fort Lee, Virginia 23801-1502

Air Force personnel, send your reports on AFTO Form 22 through your respective command Weapons and Tactics to:

Headquarters
Air Mobility Command (AMC/A39T)
402 Scott Drive, Unit 3AI
Scott AFB, Illinois 62225-5302

Air Force personnel in Special Operations Command, send your reports on AFTO Form 22. HQ AMC/A39T will consolidate and forward changes to:

Director
Aerial Delivery and Field Services Department
USA Quartermaster Center and School
710 Adams Avenue
Fort Lee, Virginia 23801-1502

Also send an information copy of AFTO Form 22 to:

542d MSUG/GBMUDE
380 Richard Ray Blvd
STE 104
Robins AFB, Georgia 31098-1640

This page intentionally left blank.

Chapter 9

Rigging 105-Millimeter (MM) Ammunition Mass Supply Load on Dual Row Airdrop System Platform

DESCRIPTION OF LOAD

9-1. The mass supply load (Figure 9-1) is rigged on an 18-foot dual row platform. The rigged weight is 12,980 pounds. The load is rigged with 96 containers of 105-mm ammunition. Each individual 105-mm ammunition container weighs approximately 108 pounds. All 105-mm ammunition packaged as shown and listed in FM 4-20.153/MCRP 4-11.3B/TO 13C7-18-41, as certified for airdrop, may be rigged using these procedures. Each load is 98 ½ inches high, 94 inches wide, 216 inches long, and the center of balance is 91 inches from the front edge of the platform. The load is rigged with two to four G-11D cargo parachutes. The M-1 release is used with this load. The minimum allowable weight is 7,500 pounds and the maximum allowable weight is 14,500 pounds.

PREPARING PLATFORM

9-2. Inspect, or assemble and inspect, a dual row airdrop 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 9-2.

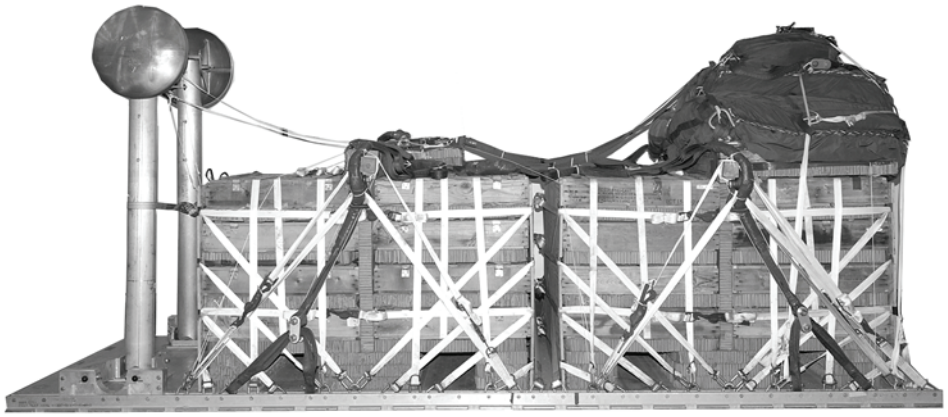
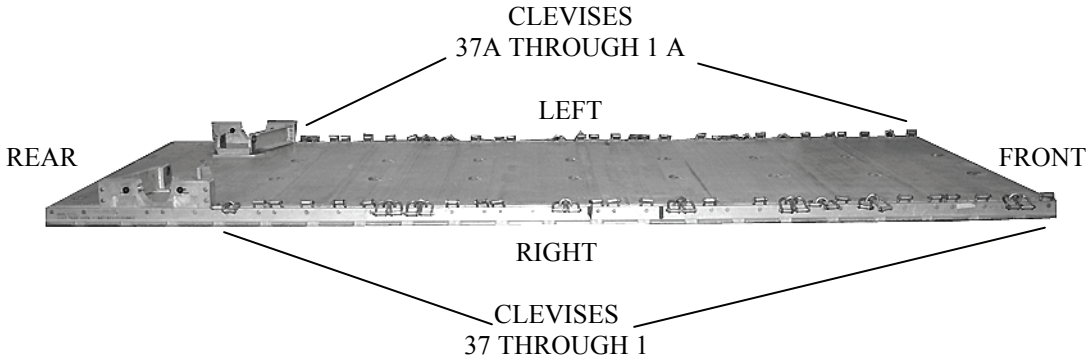


Figure 9-1. 105-mm Ammunition Mass Supply Load Rigged on DRAS Platform



Step:

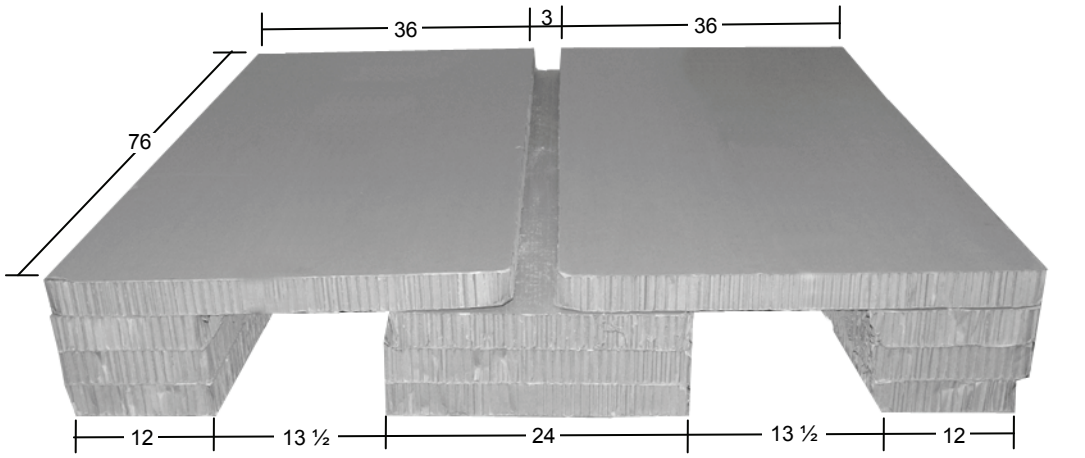
1. Starting at the front of each platform side rail, install clevises on the bushings bolted on holes 1, 2 (tripled), 3, 4, 5, 6, 7 (tripled), 8, 9 (tripled), 10 (tripled), 11, 13, 14 (tripled), 15, 16, 17, 18 (tripled on the right side and doubled on the left side), 20, 21, 22, 23 (tripled), 24 (tripled), 25, 26, 27, 28, 29, and 30 (tripled).
2. Starting at the front of each platform side rail, number the clevises 1 through 37 on the right side and 1A through 37A on the left side.
3. Label the tie-down rings according to Figure 2-2.

Figure 9-2. Platform Prepared

BUILDING HONEYCOMB STACKS

9-3. Build the honeycomb stacks for the load as shown in Figure 9-3.

Note. All measurements are given in inches.



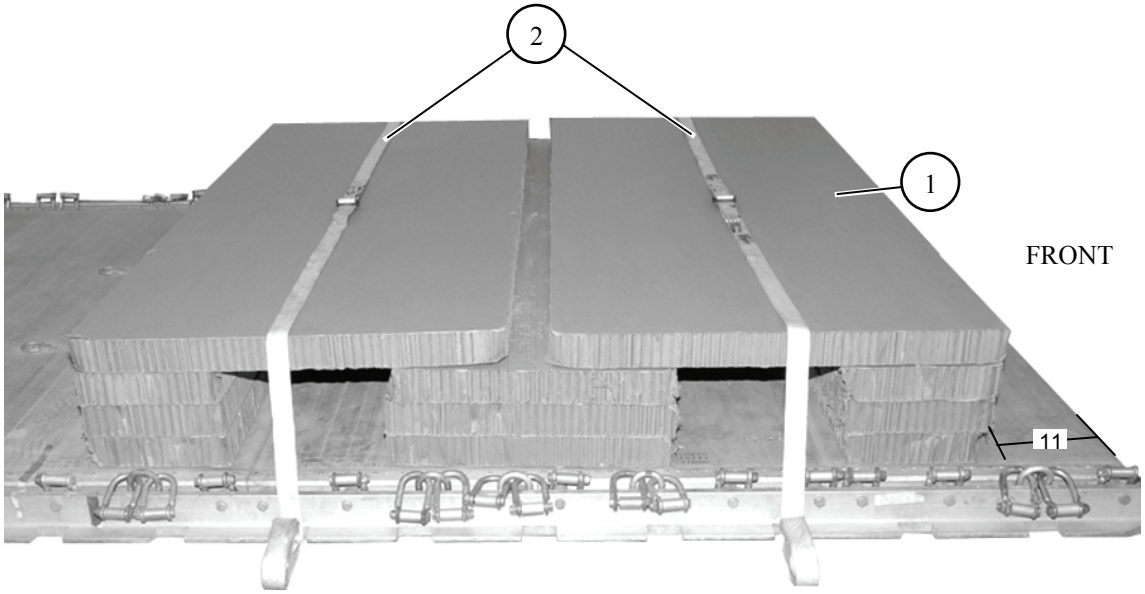
Stack Number	*Pieces*	*Width (inches)*	*Length (inches)*	*Material*	*Instructions*
1 and 2	3	76	12	Honeycomb	Glue flush together to form a front stack.
	3	76	24	Honeycomb	Glue flush together to form a center stack and center 13 ½ inches from the front stack.
	3	76	12	Honeycomb	Glue flush together to form a rear stack and center 13 ½ inches from the center stack.
	2	76	36	Honeycomb	Glue one piece flush with the front edge of the front stack. Glue one piece flush with the rear edge of the rear stack. Glue both pieces to the center stack leaving a 3-inch gap in the center.

Figure 9-3. Honeycomb Stacks Prepared

POSITIONING HONEYCOMB AND SECURING FIRST AMMUNITION STACK

9-4. Position the honeycomb and secure the first stack of 105-mm ammunition as shown in Figure 9-4.

Note. All measurements are given in inches.

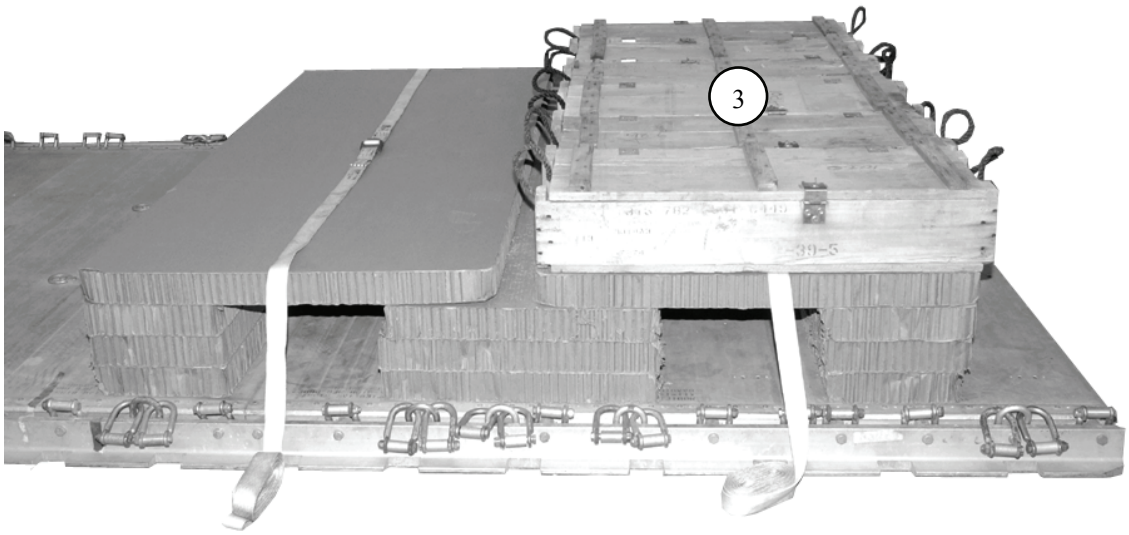


1. Position the first honeycomb stack 11 inches from the front edge of the platform and centered.
2. Form two 30-foot lashings as shown in Figure 2-14. Center them over the honeycomb as shown.

Figure 9-4. Honeycomb Positioned and Ammunition Secured

CAUTION

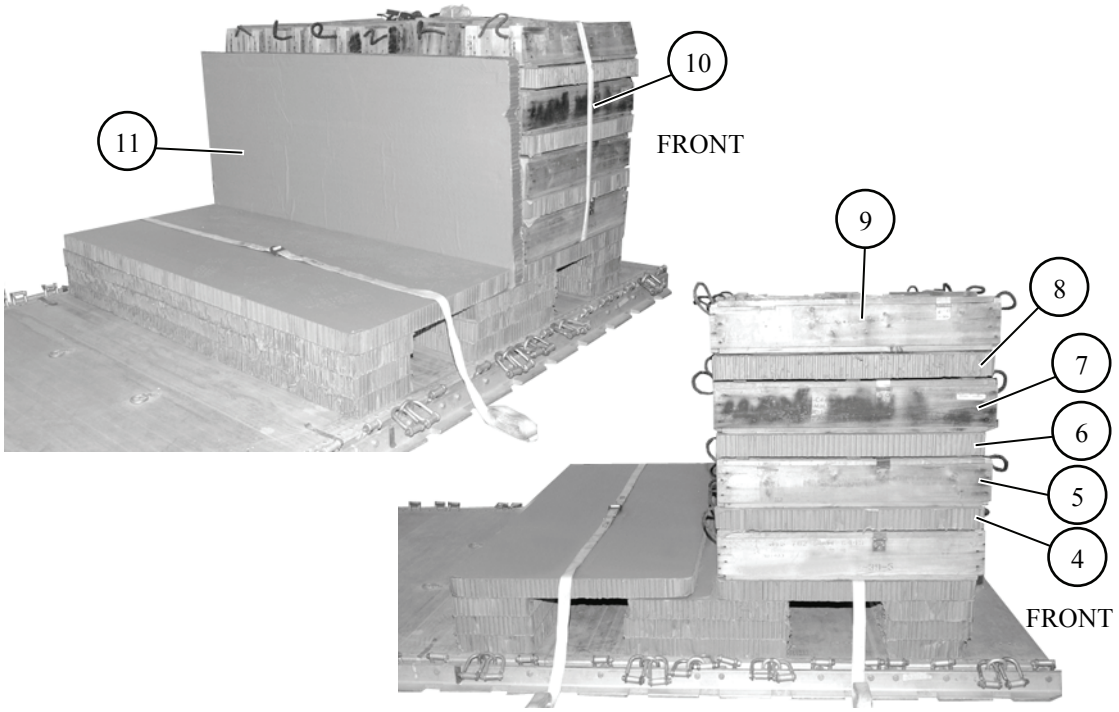
Only ammunition listed in FM 4-20.153/MCRP 4-11.3B/TO 13C7-18-41 may be airdropped. Hazardous material must be packaged, marked, and labeled as required by AFMAN 24-204 (I)/TM 38-250.



(3) Position six 105-mm ammunition containers on top of the honeycomb and centered on the pre-positioned lashings on the front of the stack.

Note. Ensure the rear edge does not cover the 3-inch channel in the honeycomb stack.

Figure 9-4. Honeycomb Positioned and Ammunition Secured (Continued)



4. Place a 36- by 76-inch piece of honeycomb on top of the positioned ammunition containers.

5. Position six 105-mm ammunition containers on top of the 36- by 76-inch piece of honeycomb.

6. Place a 36- by 76-inch piece of honeycomb on top of the positioned ammunition containers.

7. Position six 105-mm ammunition containers on top of the 36- by 76-inch piece of honeycomb.

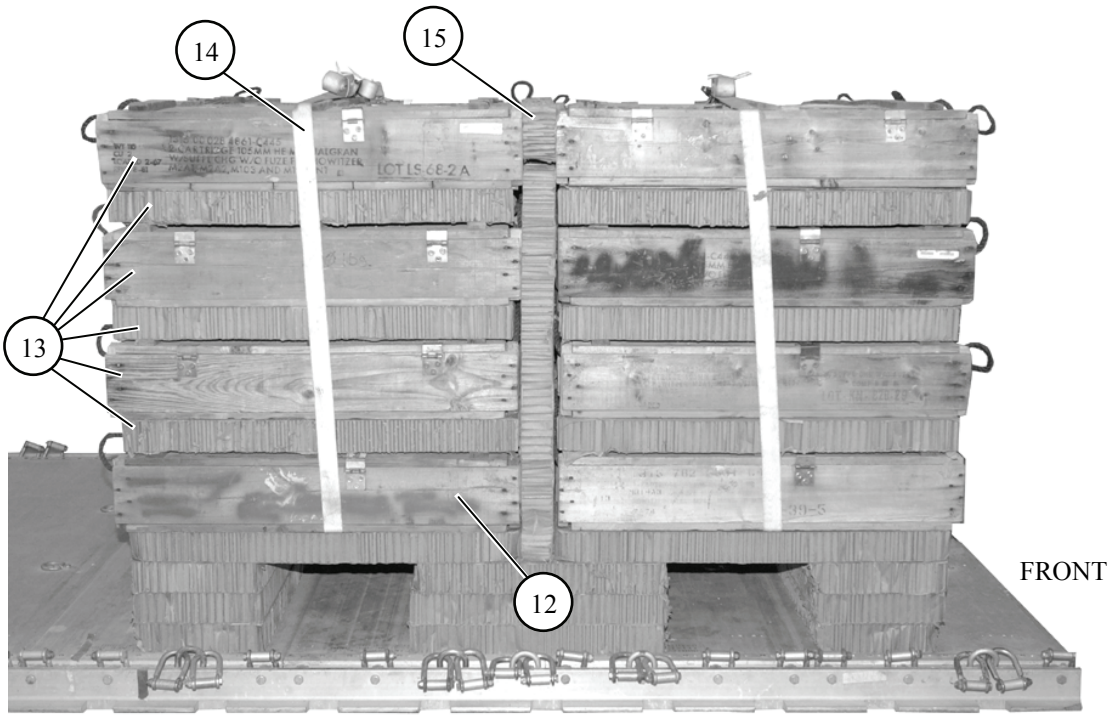
8. Place a 36- by 76-inch piece of honeycomb on top of the positioned ammunition containers.

9. Position six 105-mm ammunition containers on top of the 36- by 76-inch piece of honeycomb.

10. Secure the pre-positioned 30-foot lashing around the four layers of 105-mm ammunition boxes and secure it on top with two D-rings and a load binder.

11. Place a 36- by 76-inch piece of honeycomb in the 3-inch channel and against the rear of the front layers of 105-mm ammunition containers.

Figure 9-4. Honeycomb Positioned and Ammunition Secured (Continued)



(12) Position six 105-mm ammunition containers on top and centered on the pre-positioned lashings on the rear stack of honeycomb stack 1.

(13) Repeat steps 4 through 9 for the rear stack of honeycomb stack 1.

(14) Secure the pre-positioned 30-foot lashing around the four layers of 105-mm ammunition boxes and secure it on top with two D-rings and a load binder.

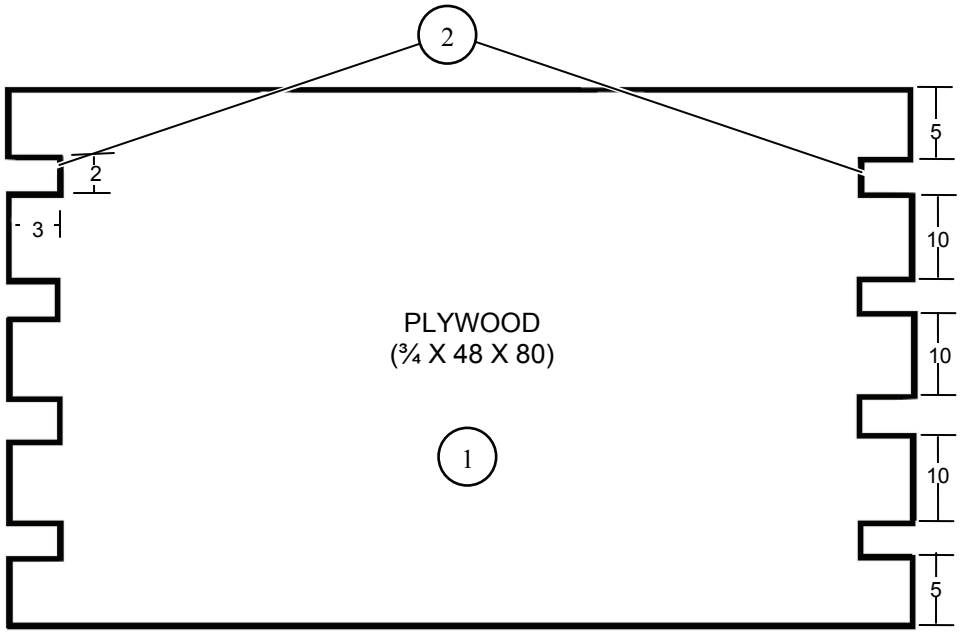
(15) Place a 6- by 76-inch piece of honeycomb in between the two stacks on top of the 36- by 76-inch piece of honeycomb.

Figure 9-4. Honeycomb Positioned and Ammunition Secured (Continued)

CONSTRUCTING AND PLACING ENDBOARDS

9-5. Construct four endboards and place them on the load as shown in Figure 9-5.

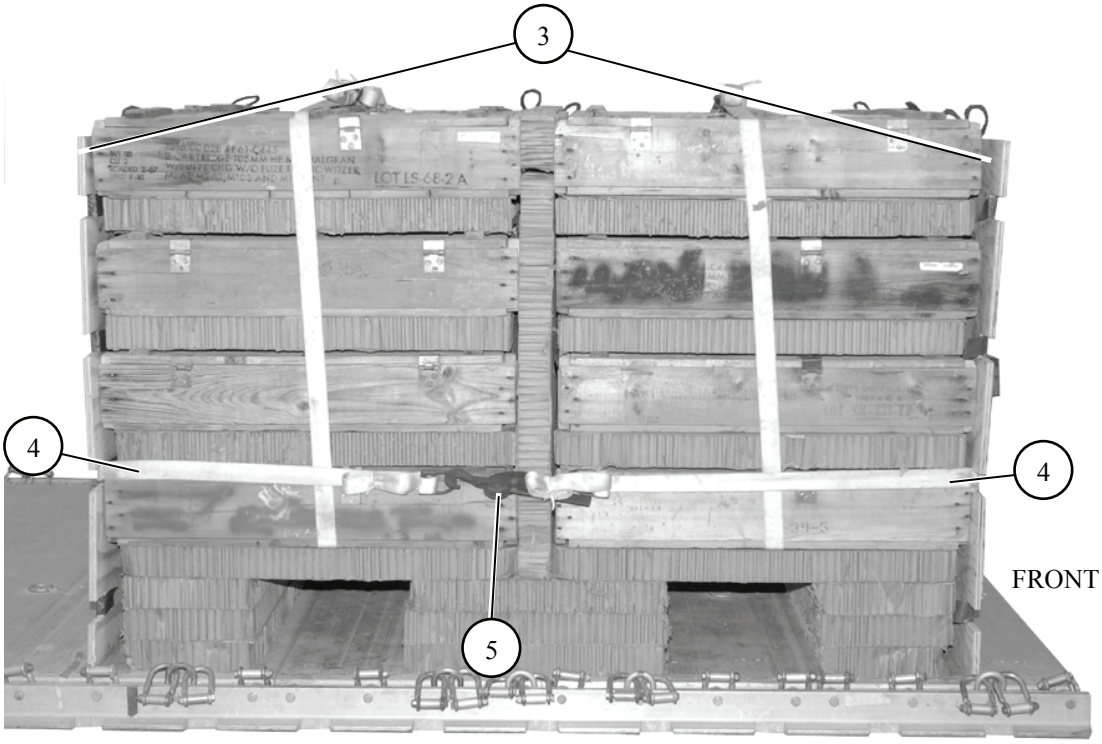
Notes. 1. This drawing is not to scale.
2. All dimensions are in inches.
3. All cutouts are 2 inches by 3 inches.



(1) Cut four pieces of ¾- by 48- by 80-inch plywood to make four endboards.

(2) Make eight 2- by 3-inch cutouts in each endboard as shown. Pad all cutouts with cellulose wadding and tape in place.

Figure 9-5. Endboards Constructed and Placed



3 Position one endboard at the front and rear of stack 1.

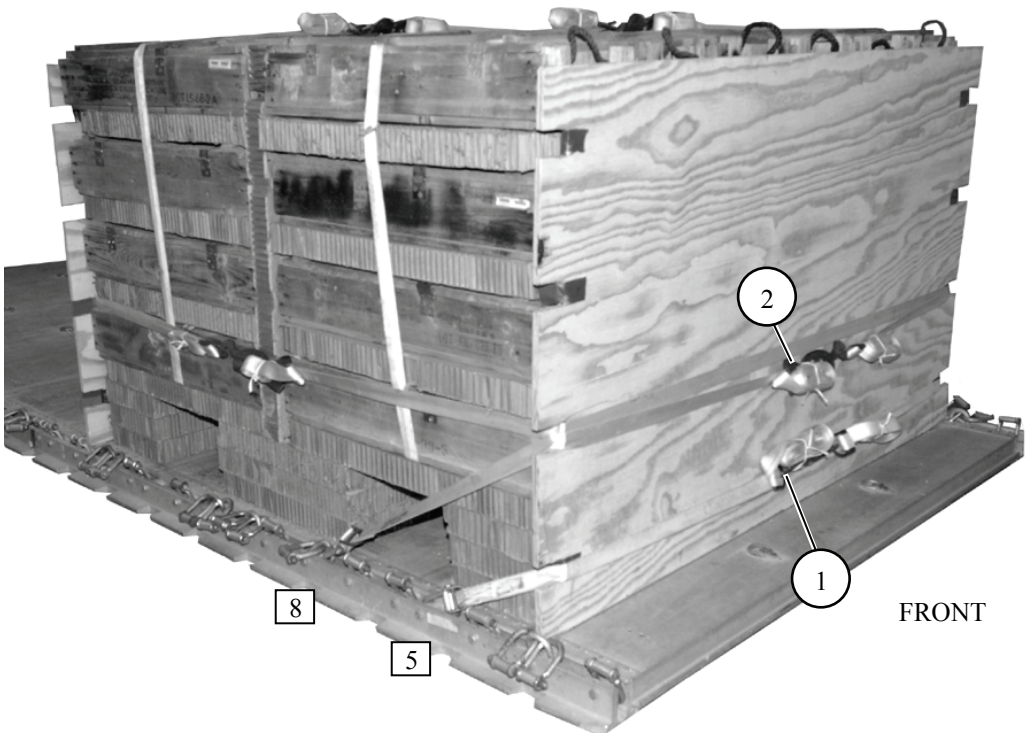
4 Construct a 30-foot lashing and route it horizontally around the cell and through each of the third from the top cutouts.

5 Secure the lashings with two D-rings and a load binder on the right side centered between the two stacks of ammunition containers.

Figure 9-5. Endboards Constructed and Placed (Continued)

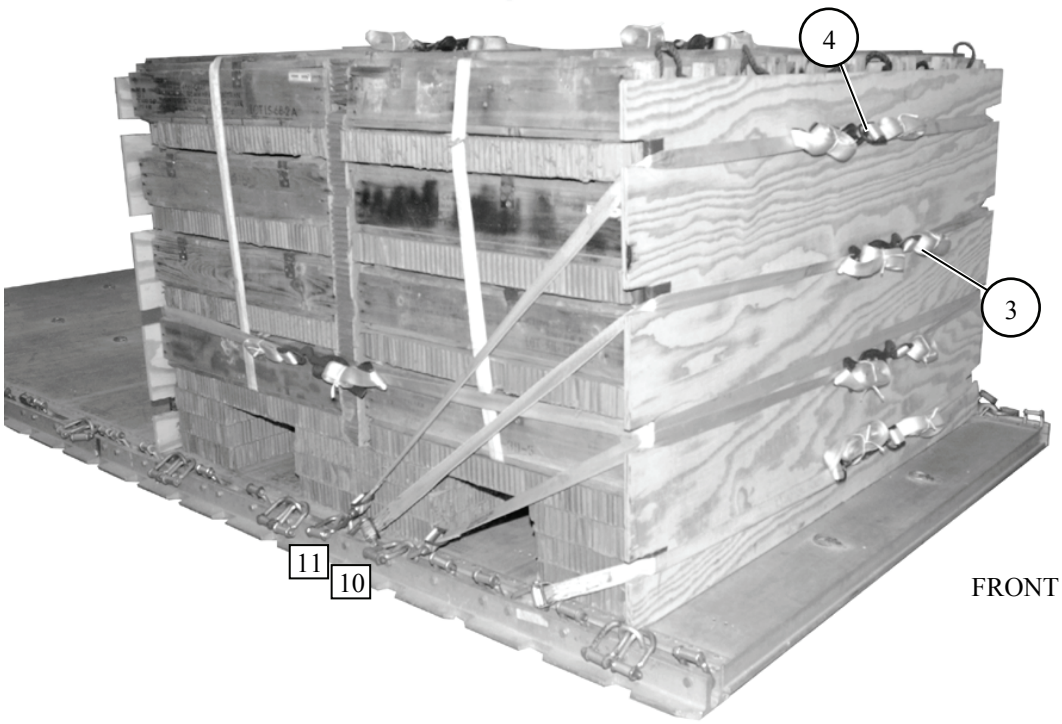
INSTALLING LASHINGS ON FIRST AMMUNITION STACK

9-6. Lash the load to the platform according to Chapter 2, Volume I of this manual and as shown in Figure 9-6.



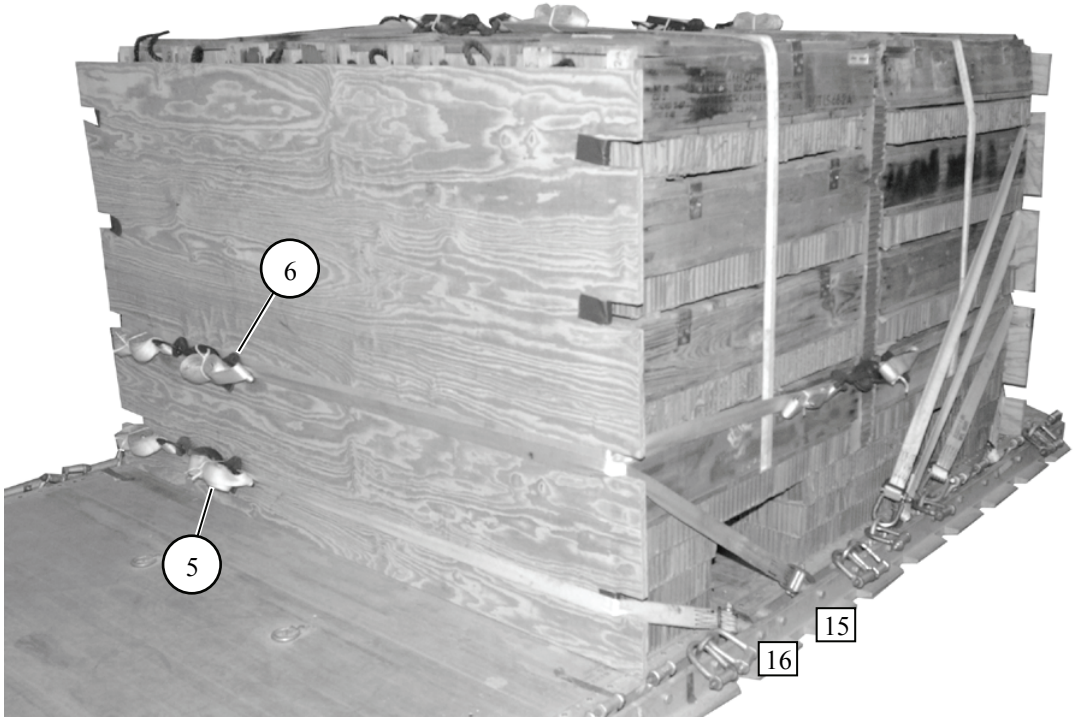
Lashing Number	*Tiedown Clevis Number*	*Instructions*
1	5 and 5A	Route a 15-foot lashing through clevis 5 and through its own D-ring. Route the lashing through the front right bottom cutout of the endboard. Route a 15-foot lashing through clevis 5A and through its own D-ring. Route the lashing through the front left bottom cutout of the endboard. Secure centered on the endboard with two D-rings and a load binder.
2	8 and 8A	Route a 15-foot lashing through clevis 8 and through its own D-ring. Route the lashing through the front right, third from the top, cutout of the endboard. Route a 15-foot lashing through clevis 8A and through its own D-ring. Route the lashing through the front left, third from the top, cutout of the endboard. Secure centered on the endboard with two D-rings and a load binder.

Figure 9-6. Lashings Installed for First Stack



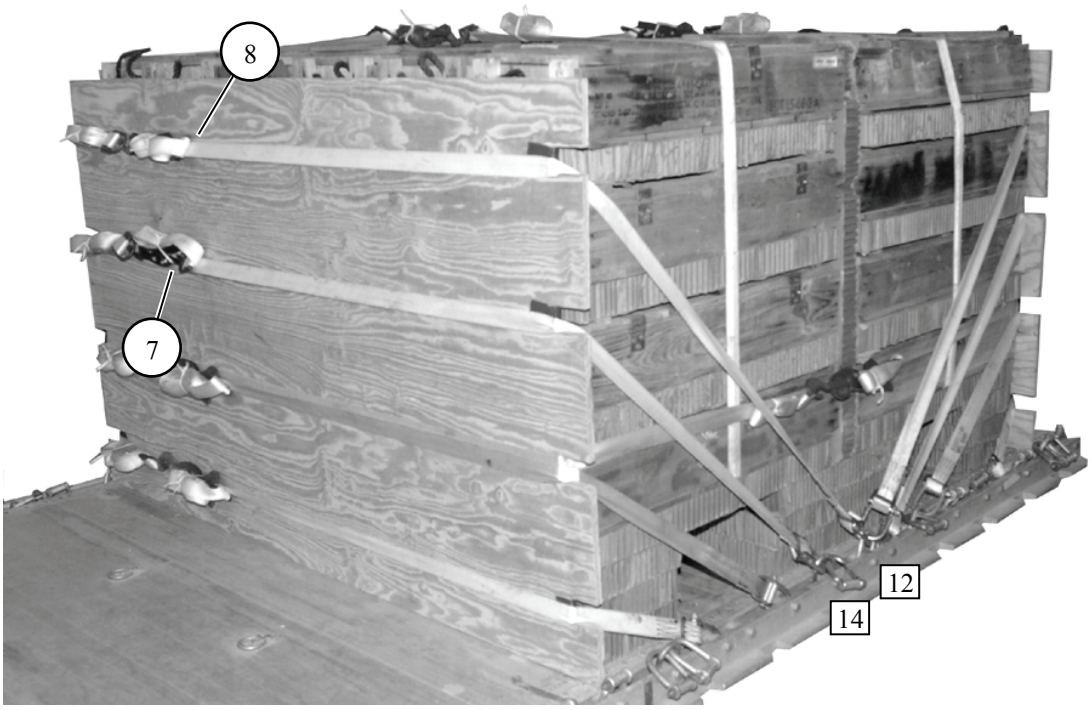
Lashing Number	*Tiedown Clevis Number*	*Instructions*
3	10 and 10A	Route a 15-foot lashing through clevis 10 and through its own D-ring. Route the lashing through the front right, second from the top, cutout of the endboard. Route a 15-foot lashing through clevis 10A and through its own D-ring. Route the lashing through the front left, second from the top, cutout of the endboard. Secure centered on the endboard with two D-rings and a load binder.
4	11 and 11A	Route a 15-foot lashing through clevis 11 and through its own D-ring. Route the lashing through the front right top cutout of the endboard. Route a 15-foot lashing through clevis 11A and through its own D-ring. Route the lashing through the front left top cutout of the endboard. Secure centered on the endboard with two D-rings and a load binder.

Figure 9-6. Lashings Installed for First Stack (Continued)



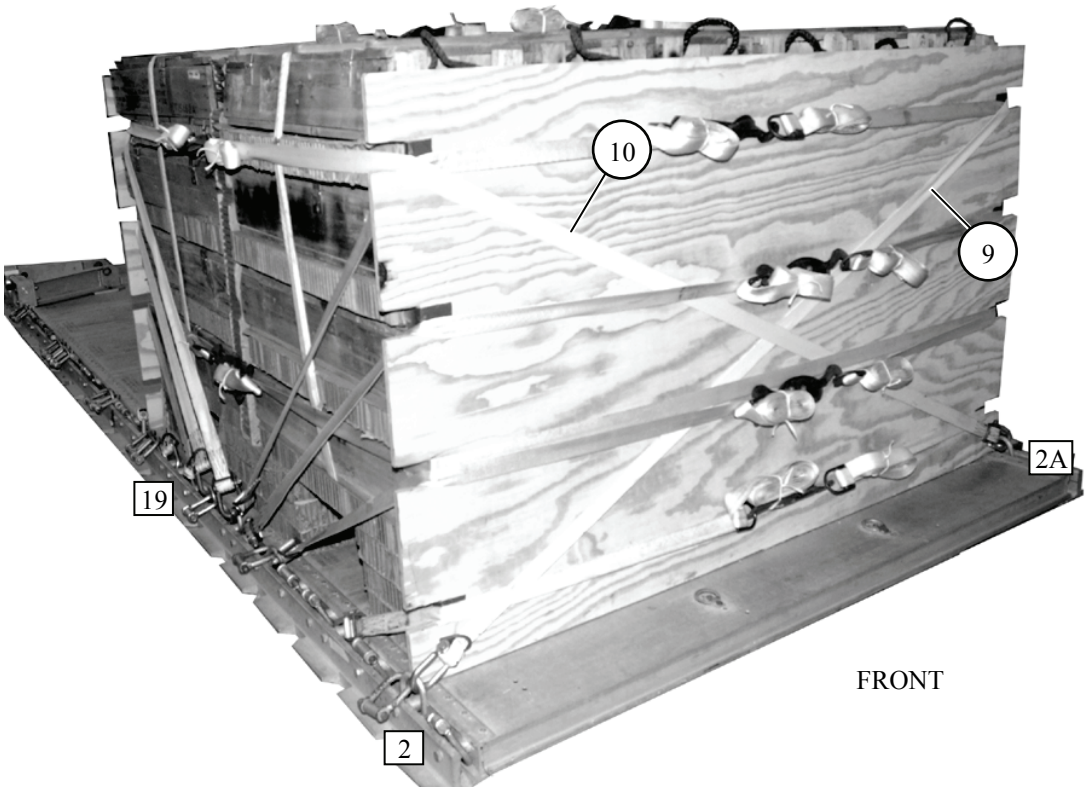
Lashing Number	*Tiedown Clevis Number*	*Instructions*
5	16 and 16A	Route a 15-foot lashing through clevis 16 and through its own D-ring. Route the lashing through the rear right bottom cutout of the endboard. Route a 15-foot lashing through clevis16A and through its own D-ring. Route the lashing through the rear left bottom cutout of the endboard. Secure close to the left side of the endboard with two D-rings and a load binder.
6	15 and 15A	Route a 15-foot lashing through clevis 15 and through its own D-ring. Route the lashing through the rear right, third from the top cutout of the endboard. Route a 15-foot lashing through clevis 15A and through its own D-ring. Route the lashing through the rear left, third from the top, cutout of the endboard. Secure close to the left side of the endboard with two D-rings and a load binder.

Figure 9-6. Lashings Installed for First Stack (Continued)



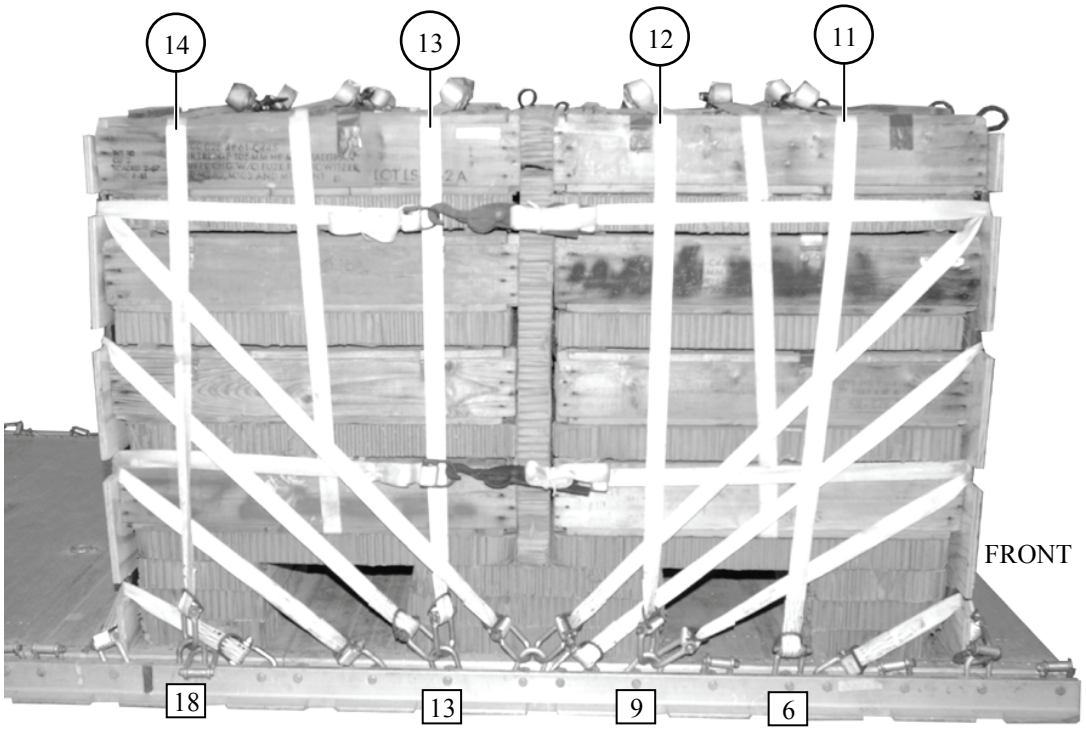
Lashing Number	*Tiedown Clevis Number*	*Instructions*
7	14 and 14A	Route a 15-foot lashing through clevis 14 and through its own D-ring. Route the lashing through the rear right, second from the top, cutout of the endboard. Route a 15-foot lashing through clevis14A and through its own D-ring. Route the lashing through the rear left, second from the top, cutout of the endboard. Secure close to the left side of the endboard with two D-rings and a load binder.
8	12 and 12A	Route a 15-foot lashing through clevis 12 and through its own D-ring. Route the lashing through the rear right top cutout of the endboard. Route a 15-foot lashing through clevis 12A and through its own D-ring. Route the lashing through the rear left top cutout of the endboard. Secure close to the left side of the endboard with two D-rings and a load binder.

Figure 9-6. Lashings Installed for First Stack (Continued)



Lashing Number	*Tiedown Clevis Number*	*Instructions*
9	2 and 19	Route a 15-foot lashing through clevis 2 and through its own D-ring. Route the lashing to the front top left cutout of the endboard. Route a 15-foot lashing through clevis 19 and through its own D-ring. Route the lashing to the rear top left endboard cutout. Secure the two lashings together, centered on the left side, with two D-rings and a load binder.
10	2A and 19A	Route a 15-foot lashing through clevis 2A and through its own D-ring. Route the lashing to the front top right cutout of the endboard. Route a 15-foot lashing through clevis 19A and through its own D-ring. Route the lashing to the rear top right endboard cutout. Secure the two lashings together, centered on the right side, with two D-rings and a load binder.

Figure 9-6. Lashings Installed for First Stack (Continued)

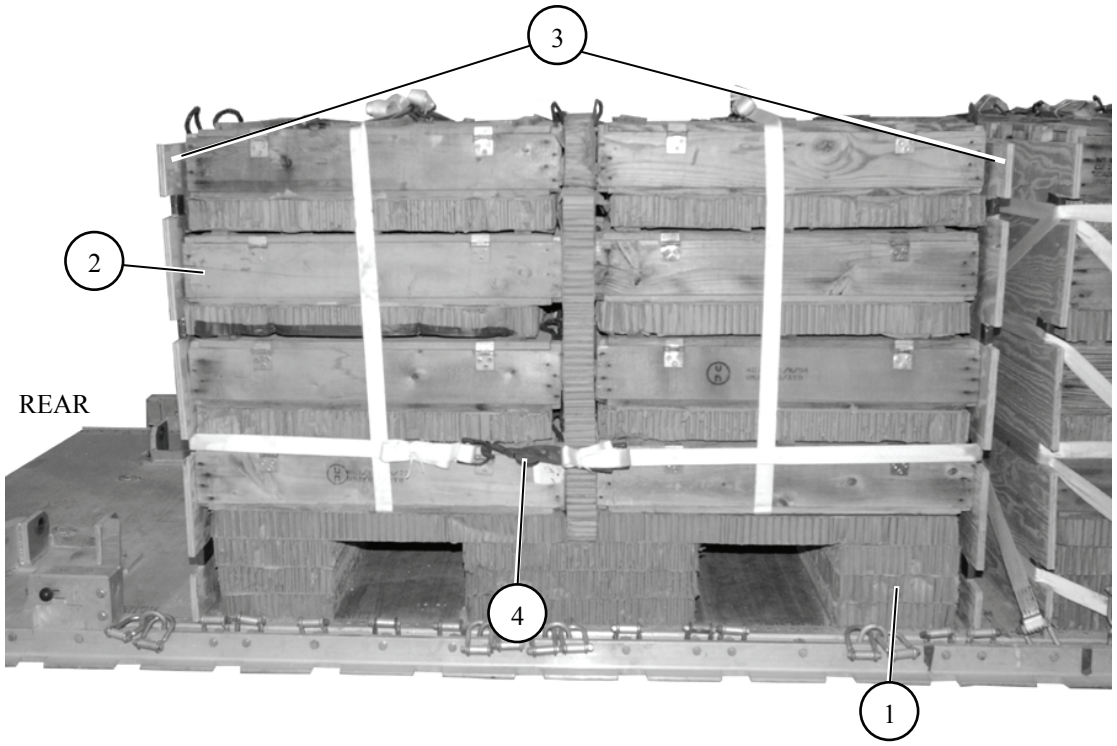


Lashing Number	*Tiedown Clevis Number*	*Instructions*
11	6 and 6A	Route a 15-foot lashing through each clevis and through its own D-ring. Pass both lashings over the ammunition boxes and secure them on top of the load with two D-rings and a load binder.
12	9 and 9A	Route a 15-foot lashing through each clevis and through its own D-ring. Pass both lashings over the ammunition boxes and secure them on top of the load with two D-rings and a load binder.
13	13 and 13A	Route a 15-foot lashing through each clevis and through its own D-ring. Pass both lashings over the ammunition boxes and secure them on top of the load with two D-rings and a load binder.
14	18 and 18A	Route a 15-foot lashing through each clevis and through its own D-ring. Pass both lashings over the ammunition boxes and secure them on top of the load with two D-rings and a load binder.

Figure 9-6. Lashings Installed for First Stack (Continued)

POSITIONING AND SECURING SECOND AMMUNITION STACK

9-7. Position the second honeycomb stack, lashings, ammunition boxes and endboards as shown in Figure 9-7.

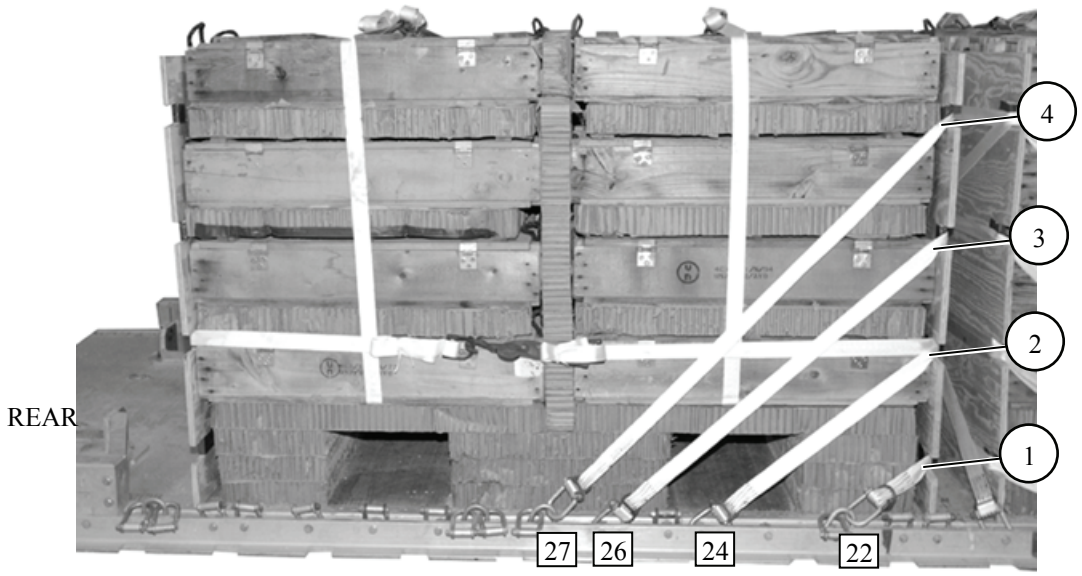


1. Center the second honeycomb stack 8 inches from the rear endboard of the first ammunition stack.
2. Repeat steps 2 through 15 as shown in Figure 9-4 to place and secure the second ammunition stack.
3. Position one endboard at the front and rear of the second ammunition stack.
4. Construct a 30-foot lashing and route it horizontally around the second ammunition stack and through each of the third from the top cutouts. Secure the lashing with two-D-rings and a load binder on the right side centered between the two stacks of the second ammunition stack.

Figure 9-7. Honeycomb, Lashings, Ammunition and Endboards Placed for Second Stack

INSTALLING LASHINGS ON SECOND AMMUNITION STACK

9-8. Lash the second ammunition stack to the platform as shown in Figure 9-8.

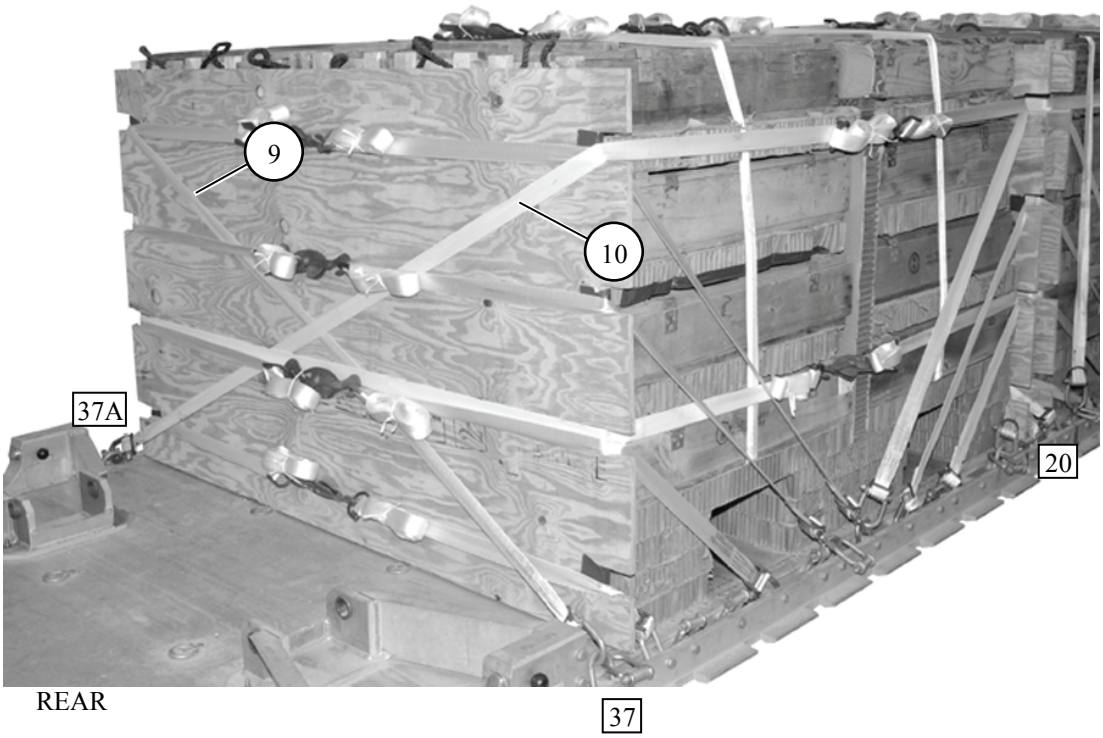


Lashing Number	*Tiedown Clevis Number*	*Instructions*
1	22 and 22A	Route a 15-foot lashing through clevis 22 and through its own D-ring. Route the lashing through the front right and left bottom cutouts of the endboard. Secure the lashing with a D-ring and load binder to clevis 22A.
2	24 and 24A	Route a 15-foot lashing through clevis 24 and through its own D-ring. Route the lashing through the front right and left, third from the top, cutouts of the endboard. Secure the lashing with a D-ring and load binder to clevis 24A.
3	26 and 26A	Route a 15-foot lashing through each clevis and through its own D-ring. Route the lashing on clevis 26 through the front right and left, second from the top, cutout of the endboard. Secure both lashings together on the left side of the load with two D-rings and a load binder.
4	27 and 27A	Route a 15-foot lashing through each clevis and through its own D-ring. Route the lashing on clevis 27 through the front right and left top, cutout of the endboard. Secure both lashings together on the left side of the load with two D-rings and a load binder.

Figure 9-8. Lashings Installed for Second Stack

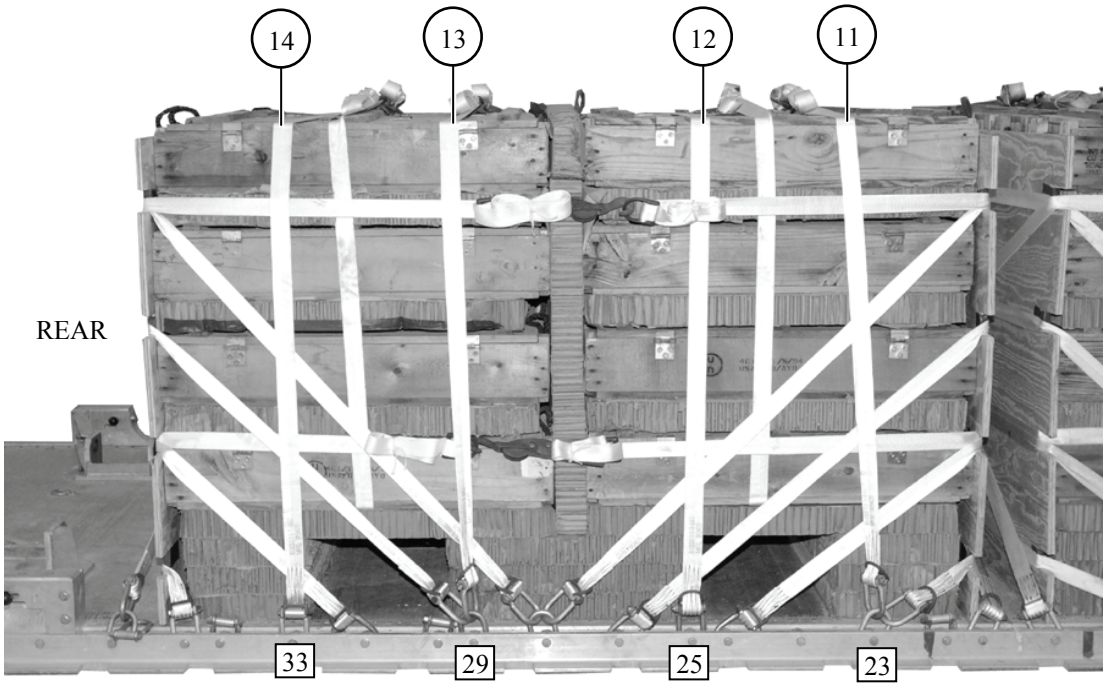
Lashing Number	*Tiedown Clevis Number*	*Instructions*
5	35 and 35A	Route a 15-foot lashing through each clevis and through its own D-ring. Route the lashings through the rear right and left bottom cutouts of the endboard. Secure both lashings centered at the rear with two D-rings and a load binder.
6	32 and 32A	Route a 15-foot lashing through each clevis and through its own D-ring. Route the lashings through the rear right and left, third from the top, cutouts of the endboard. Secure both lashings centered at the rear with two D-rings and a load binder.
7	30 and 30A	Route a 15-foot lashing through each clevis and through its own D-ring. Route the lashings through the rear right and left, second from the top, cutouts of the endboard. Secure both lashings centered at the rear with two D-rings and a load binder.
8	28 and 28A	Route a 15-foot lashing through each clevis and through its own D-ring. Route the lashings through the rear right and left top cutouts of the endboard. Secure both lashings centered at the rear with two D-rings and a load binder.

Figure 9-8. Lashings Installed for Second Stack (Continued)



Lashing Number	*Tiedown Clevis Number*	*Instructions*
9	20 and 37	Route a 15-foot lashing through clevis 20 and through its own D-ring. Route the lashing through the front top left cutout of the front endboard. Route a15-foot lashing through clevis 37 and through its own D-ring. Route the lashing to the rear top left cutout of the rear endboard. Secure the two lashings together centered on the left side of the load with two D-rings and a load binder.
10	20A and 37A	Route a 15-foot lashing through clevis 20A and through its own D-ring. Route the lashing through the front top right cutout of the front endboard. Route a 15-foot lashing through clevis 37A and through its own D-ring. Route the lashing to the rear top right cutout of the rear endboard. Secure the two lashings centered on the right side of the load with two D-rings and a load binder.

Figure 9-8. Lashings Installed for Second Stack (Continued)

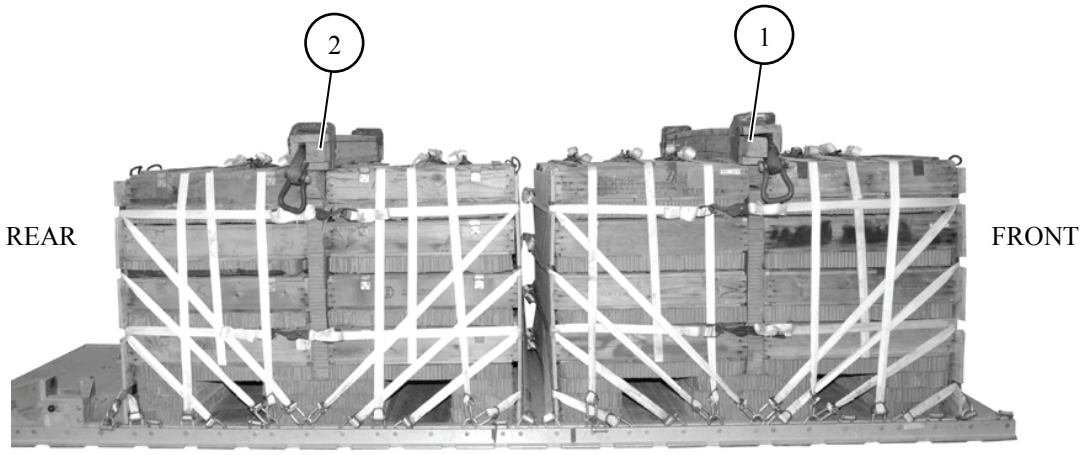


Lashing Number	*Tiedown Clevis Number*	*Instructions*
11	23 and 23A	Route a 15-foot lashing through each clevis and through its own D-ring. Pass both lashings over the ammunition boxes and secure them on top of the load with two D-rings and a load binder.
12	25 and 25A	Route a 15-foot lashing through each clevis and through its own D-ring. Pass both lashings over the ammunition boxes and secure them on top of the load with two D-rings and a load binder.
13	29 and 29A	Route a 15-foot lashing through each clevis and through its own D-ring. Pass both lashings over the ammunition boxes and secure them on top of the load with two D-rings and a load binder.
14	33 and 33A	Route a 15-foot lashing through each clevis and through its own D-ring. Pass both lashings over the ammunition boxes and secure them on top of the load with two D-rings and a load binder.

Figure 9-8. Lashings Installed for Second Stack (Continued)

INSTALLING THE ATTITUDE CONTROL SYSTEM (ACS) AND SUSPENSION SLINGS

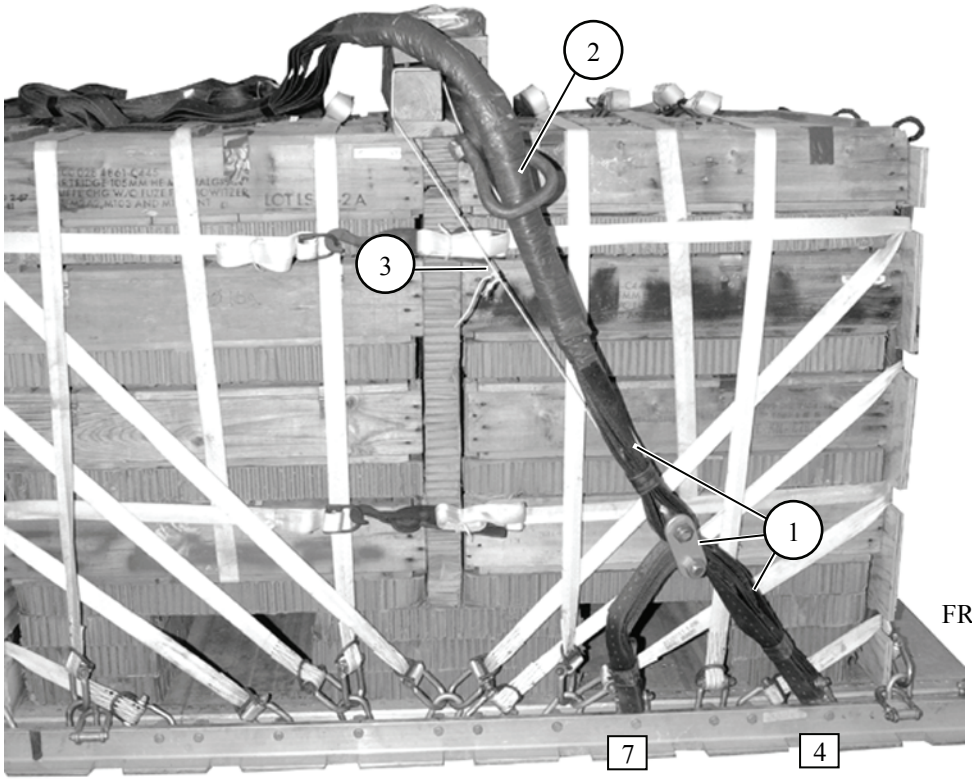
9-9. Construct, inspect and position the ACS according to Chapter 2 of this manual and as shown in Figure 9-9. Install the suspension slings and secure the ACS according to Chapter 2, Volume I and as shown in Figure 9-10.



1. Position the front ACS centered on top of the front ammunition stacks. The ACS 4- by 4-inch piece of lumber must face the rear of the platform.

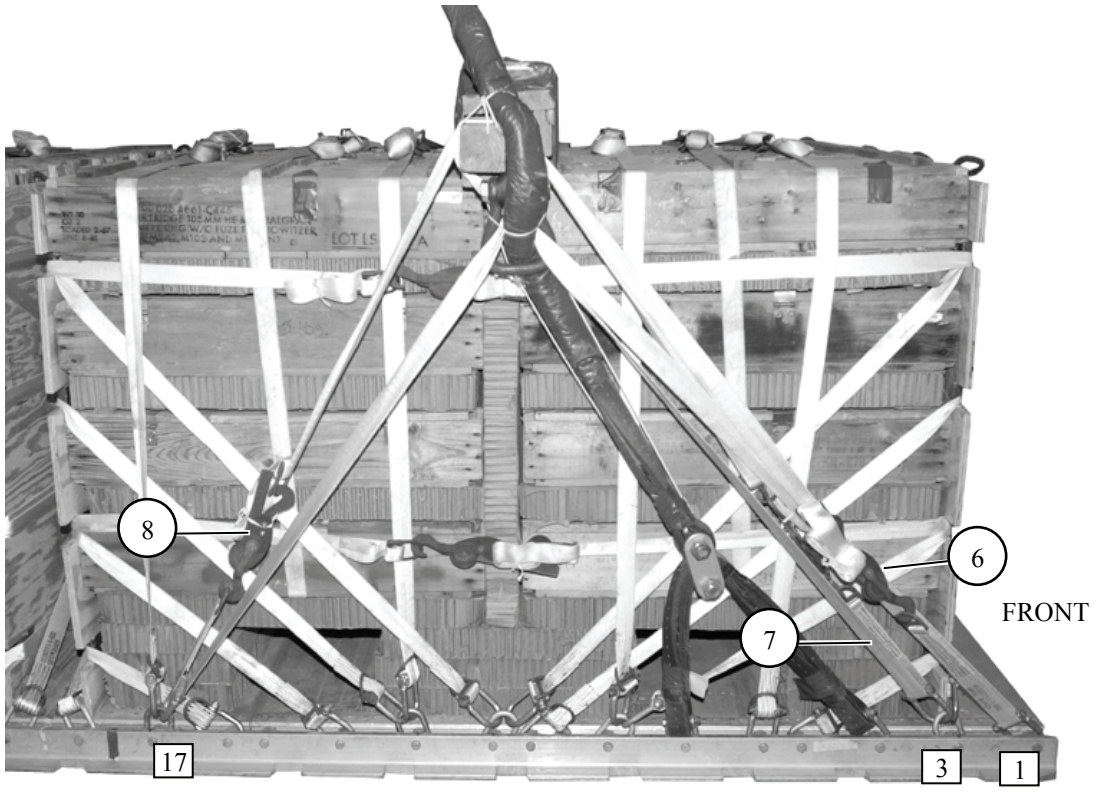
2. Position the rear ACS centered on top of the rear ammunition stacks. The ACS 4- by 4-inch piece of lumber must face the front of the platform.

Figure 9-9. ACS Positioned



1. Install a 3-foot (4-loop), type XXVI nylon sling to clevises 4 and 7. Connect an 11-foot (4-loop), type XXVI nylon sling to the center of the 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 (4 loop), type XXVI nylon sling with felt from a point 6 inches below the clevis to a point 6 inches above the ACS.
3. Safety tie the 3 ¾-inch, two-point link to the 4- by 4-inch piece of lumber using one-turn single, 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 (4 loop), type XXVI nylon 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 4A and 7A.

Figure 9-10. Suspension Slings Installed and Secured



6 Route a 15-foot lashing from clevis 1 through the right front ACS clevis from outside to inside, rear to front and around the ACS 4- by 4-inch piece of lumber and back to clevis 1.

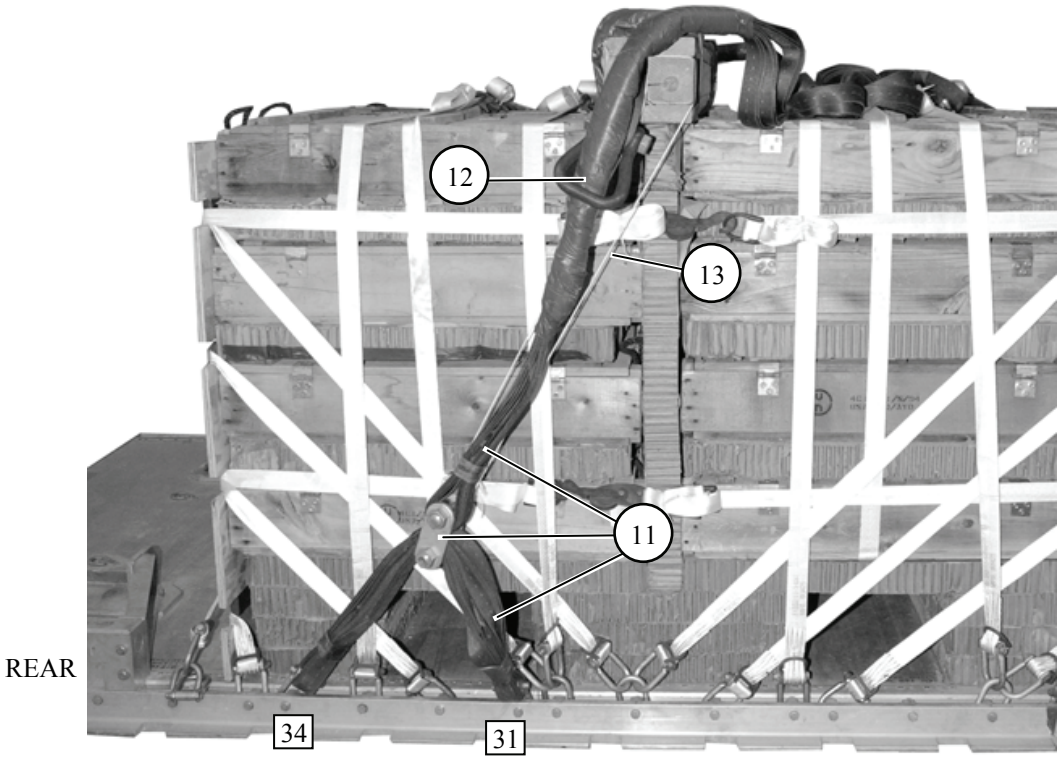
7 Repeat above step using clevis 3.

8 Route a 15-foot lashing from clevis 17 through the right front ACS clevis from outside to inside, front to rear and around the ACS 4- by 4-inch piece of lumber and back to clevis 17.

9 Repeat steps 6 through 8 on the left side of the load using clevises 1A, 3A, and 17A (not shown).

10 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: 1 and 1A, 3 and 3A and 17 and 17A.

Figure 9-10. Suspension Slings Installed and Secured (Continued)



(11) Install a 3-foot (4-loop), type XXVI nylon sling to clevises 31 and 34. Connect an 11-foot (4-loop), type XXVI nylon sling to the center of the sling with a 3 ¾-inch, two-point link.

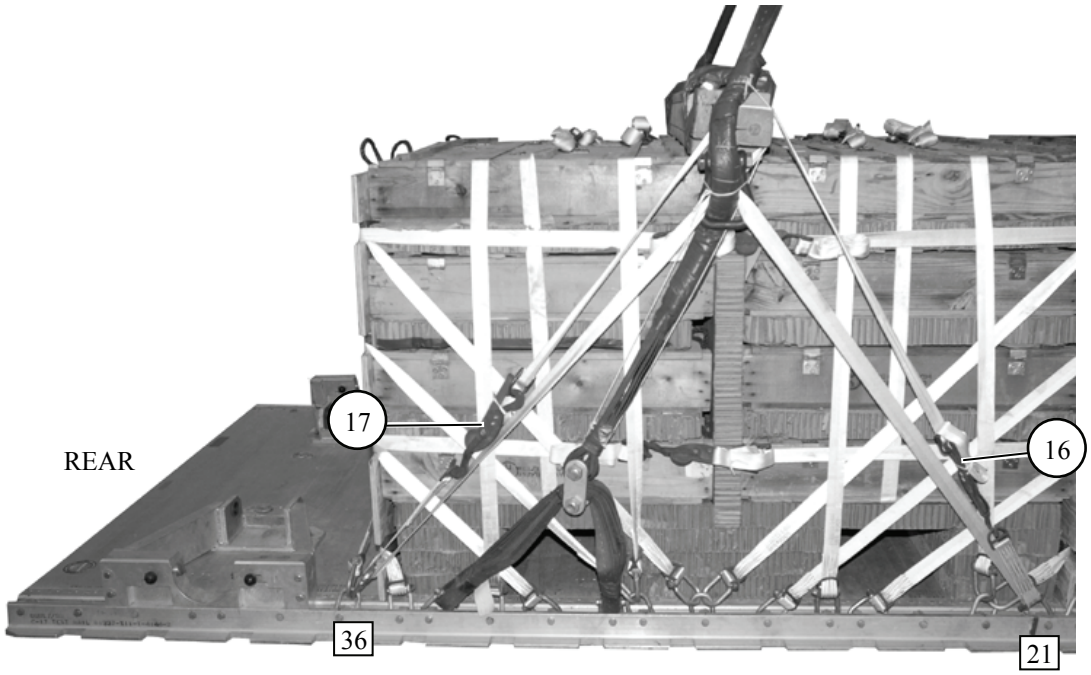
(12) Route the sling through the clevis on the ACS from rear to front. Pad and tape the 11-foot (4 loop), type XXVI nylon sling with felt from a point 6 inches below the clevis to a point 6 inches above the ACS.

(13) Safety tie the 3 ¾-inch, two-point link to the 4- by 4-inch piece of lumber using one-turn single, 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 (4 loop), type XXVI nylon sling with a 3 ¾-inch, two-point link. Pad and tape the link with felt (not shown).

(15) Repeat steps 11 through 14 on the left side of the load using clevises 31A and 34A.

Figure 9-10. Suspension Slings Installed and Secured (Continued)



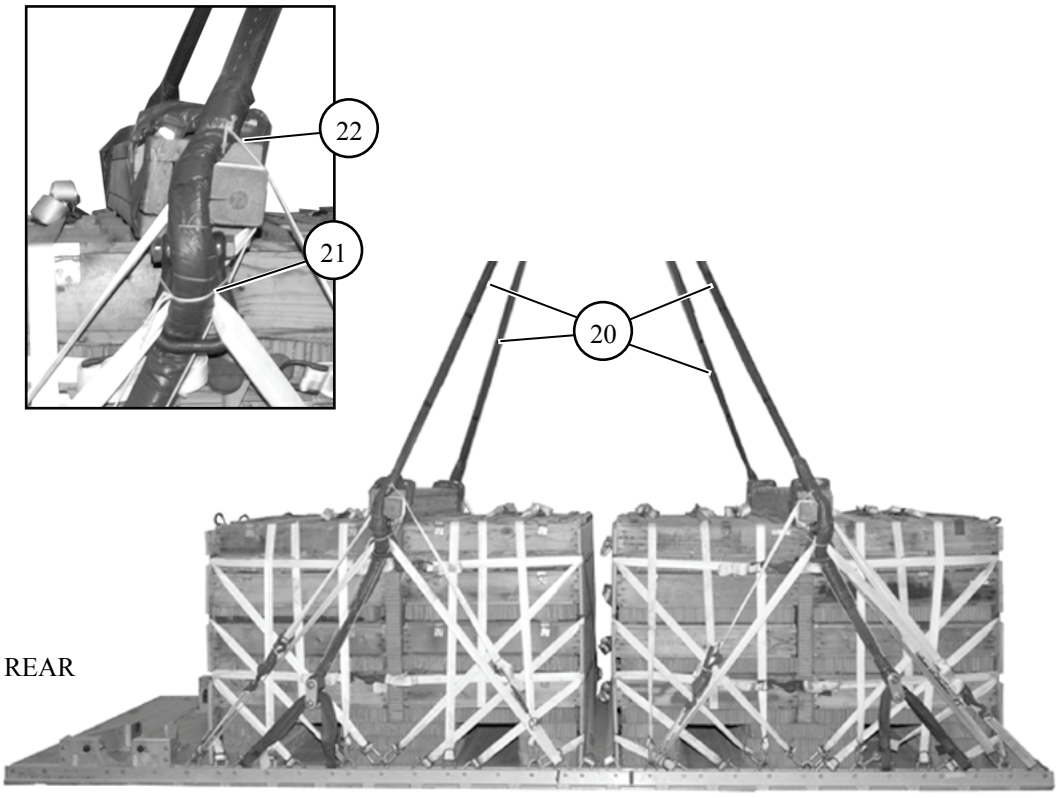
16 Route a 15-foot lashing from clevis 21 through the right rear ACS clevis from outside to inside, rear to front and around the ACS 4- by 4-inch piece of lumber and back to clevis 21.

17 Route a 15-foot lashing from clevis 36 through the right rear ACS clevis from outside to inside, front to rear and around the ACS 4- by 4-inch piece of lumber and back to clevis 36.

18 Repeat steps 16 through 17 on the left side of the load using clevises 21A and 36A (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: 21 and 21A, and 36 and 36A.

Figure 9-10. Suspension Slings Installed and Secured (Continued)



(20) Extend the slings upward and remove all slack.

(21) Tie a length of type III nylon cord around the 11-foot sling and the ACS sling.

(22) Tie a length of type III nylon cord around the 11-foot (4 loop), type XXVI nylon sling, behind all lashings, and around the 4- by 4-inch piece of lumber of the ACS and tie the ends together.

(23) Repeat steps 20 through 22 on all slings (not shown).

Figure 9-10. Suspension Slings Installed and Secured (Continued)

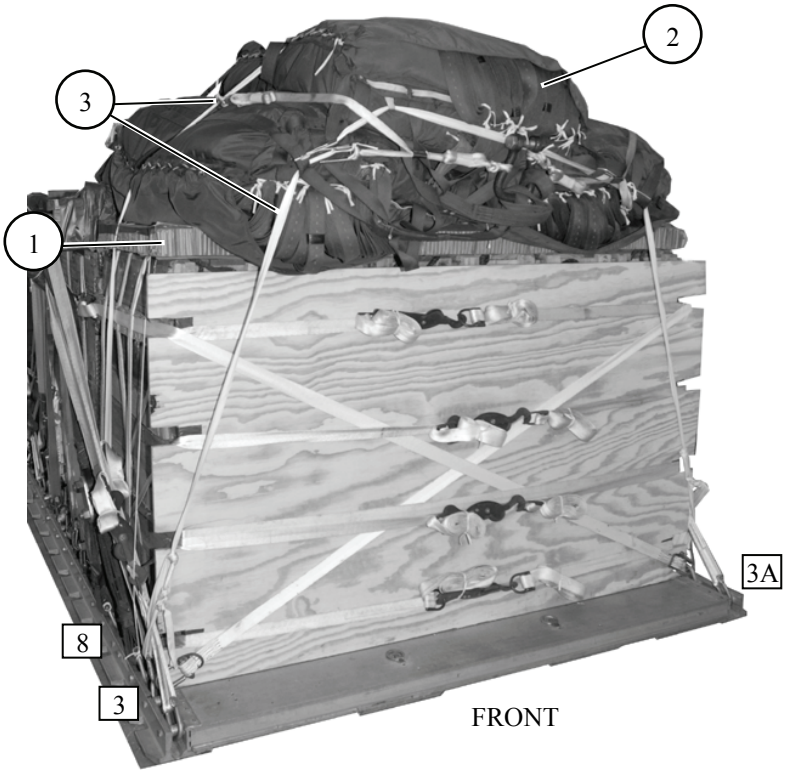
INSTALLING OUTRIGGER ASSEMBLIES

9-10. 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, Volume I, Figures 2-42 through 2-44 and Figure 2-45, steps 1, 2, and 3.

STOWING CARGO PARACHUTES

9-11. Stow and restrain three G-11D cargo parachutes on top of the stowage platform as shown in Chapter 2, Volume I and Figure 9-11.

Note. If the load varies from the one shown the parachute requirements must be recomputed.

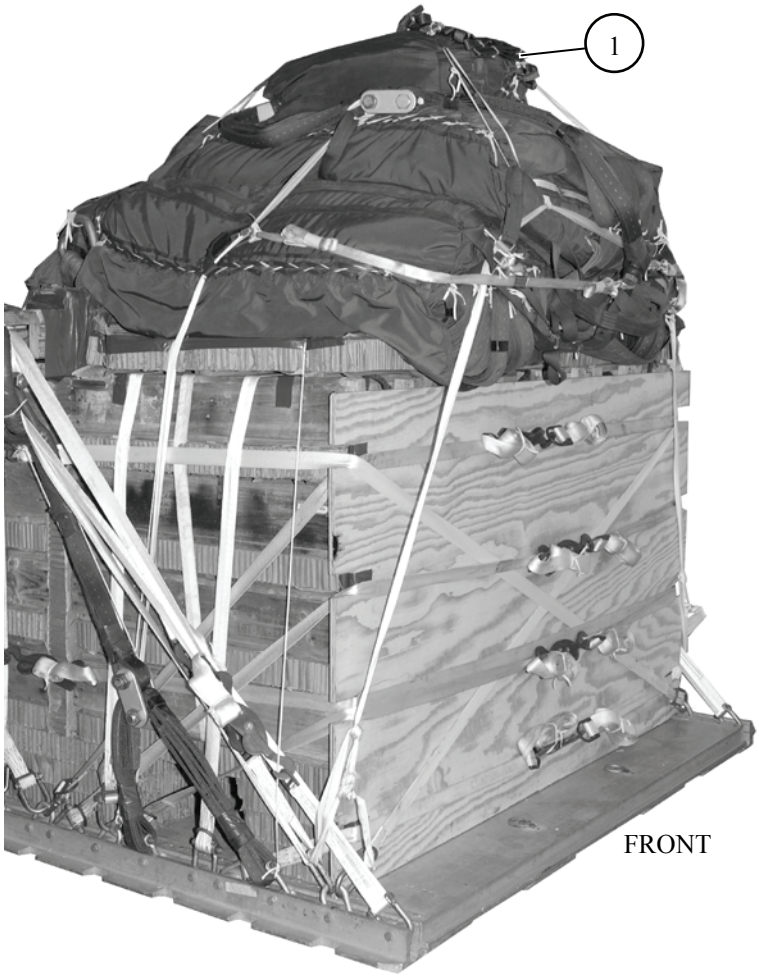


1. Cut and position a 30- by 76-inch piece of honeycomb on top of the front ammunition stack, and to the front of the ACS. Secure the honeycomb to a convenient point on the load with type III nylon cord.
2. Prepare and install three G-11D cargo parachutes on top of the honeycomb as shown above and in Chapter 2, Volume I.
3. Restrain the parachutes as shown in Chapter 2, Volume I using type VIII nylon webbing tied to clevises 3 and 3A, and 8 and 8A.

Figure 9-11. Cargo Parachute Stowed

STOWING DEPLOYMENT PARACHUTE

9-12. Prepare, stow and install the deployment parachute according to Chapter 2, Section V, Volume I and as shown in Figure 9-12.

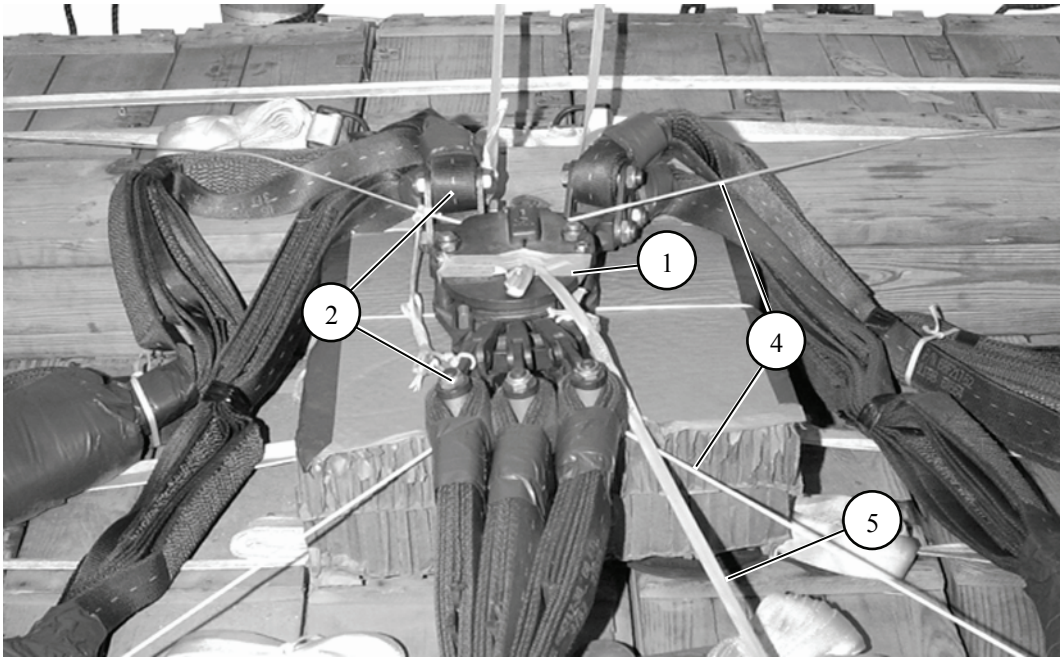


(1) Prepare, stow and install the deployment parachute according to Chapter 2, Section V, Volume I and as shown above.

Figure 9-12. Deployment Parachute Installed

INSTALLING PARACHUTE RELEASE SYSTEM

9-13. Build an M-1 parachute release stack, prepare and install an M-1 parachute release system according to Chapter 2, Section VI, Volume I and as shown in Figure 9-13.



FRONT

(1) Cut two 18- by 18-inch pieces of honeycomb and glue together. Tape the edges and position and center the honeycomb to the front of the rear ACS. Secure the honeycomb to a convenient point on the load using type III nylon cord. Center the M-1 release on the honeycomb stack.

(2) Attach the 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 (not shown). S-fold the slack in the front and rear suspension slings and secure with type I, ¼-inch cotton webbing.

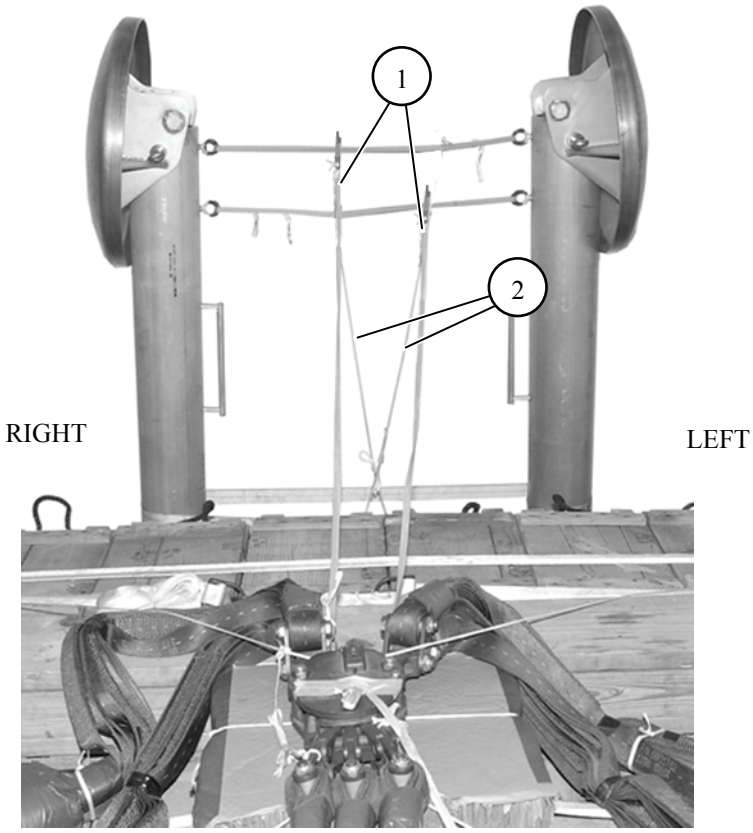
(4) Secure the release to convenient points on the load with type III nylon cord.

(5) Secure the arming wire and lanyard to a parachute carrying handle with three alternating half hitches and a knot in the running end.

Figure 9-13. M-1 Cargo Parachute Release Installed

INSTALLING MAST RELEASE KNIVES

9-14. Install the mast release knives as shown in Chapter 2, Volume I, Figure 2-45, steps 4 through 10 and as shown in Figure 9-14.



(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 release is 95 inches as shown in Figure 2-45, steps 5 and 6.

(2) Tie a length of type III nylon cord from the upper guillotine knife to the left top lashing on the rear endboard of the second ammunition stack that measures 72 inches. Repeat for the lower guillotine knife attaching the type III nylon cord to the right top lashing on the rear endboard of the second ammunition stack as shown in Figure 2-45, steps 9 and 10. Fold the slack in the type III nylon cord and tape with 2-inch masking tape.

Note. All measurements are from knot to knot.

Figure 9-14. Mast Release Knives Installed

MARKING RIGGED LOAD

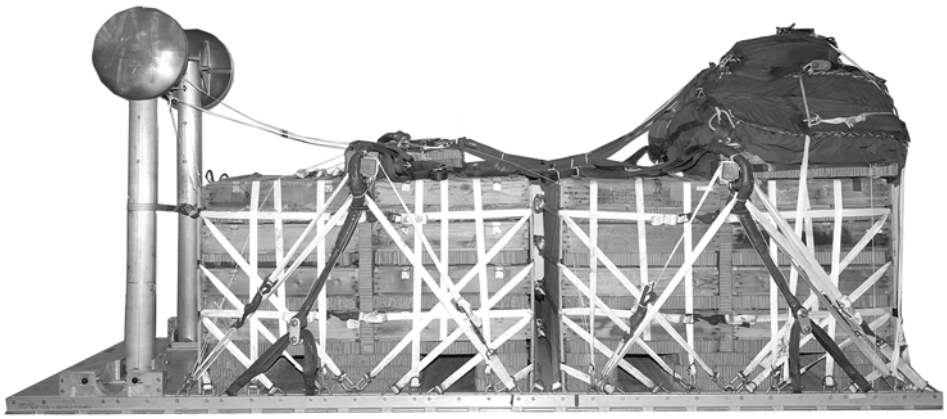
9-15. Mark the rigged load according to Chapter 2, Section IX, Volume I and as shown in Figure 9-15. A Shipper's Declaration for Dangerous Goods is required. If weight varies from the one shown, the weight, height, CB and parachute requirements must be recomputed.

EQUIPMENT REQUIRED

9-16. The equipment required to rig this load is listed in Table 9-1.

CAUTION

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



RIGGED LOAD DATA

Weight: Load shown	12,980 pounds
Maximum load allowed	14,500 pounds
Height	98.5 inches
Width	94 inches
Overall Length	216 inches
Overhang: Front	0 inches
Rear	0 inches
Center of Balance: (from front edge of platform):	91 inches

Figure 9-15. 105-mm Ammunition Mass Supply Load Rigged on DRAS Platform

Table 9-1. Equipment Required for Rigging 105-mm Ammunition Mass Supply Load on DRAS Platform

National Stock Number	*Item*	*Quantity*
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	2 sheets
5315-00-010-4659	Nail, steel wire, common, 8d	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	92
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:	
1670-01-063-7761	16-foot (2-loop), type XXVI nylon webbing	2

Table 9-1. Equipment Required for Rigging 105-mm Ammunition Mass Supply Load on DRAS Platform (Continued)

National Stock Number	*Item*	*Quantity*
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	76
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

This page intentionally left blank.

Chapter 10

Rigging M-Gator with Accompanying Load on Dual Row Airdrop System Platform

DESCRIPTION OF LOAD

10-1. This load consists of one John Deere Diesel, which has been named the Military Utility Vehicle (M-Gator) (Figure 10-1). The M-Gator is rigged with an accompanying load of thirty-six 105-mm ammunition boxes and airdrop related items. The M-Gator and accompanying load are rigged on a DRAS platform with two G-11D cargo parachutes. The total rigged weight is 8,650 pounds, 97 inches high, 94 inches wide, and has a center of balance of 90 inches.

PREPARING PLATFORM

10-2. Inspect, or assemble and inspect, a dual row airdrop 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 10-2.

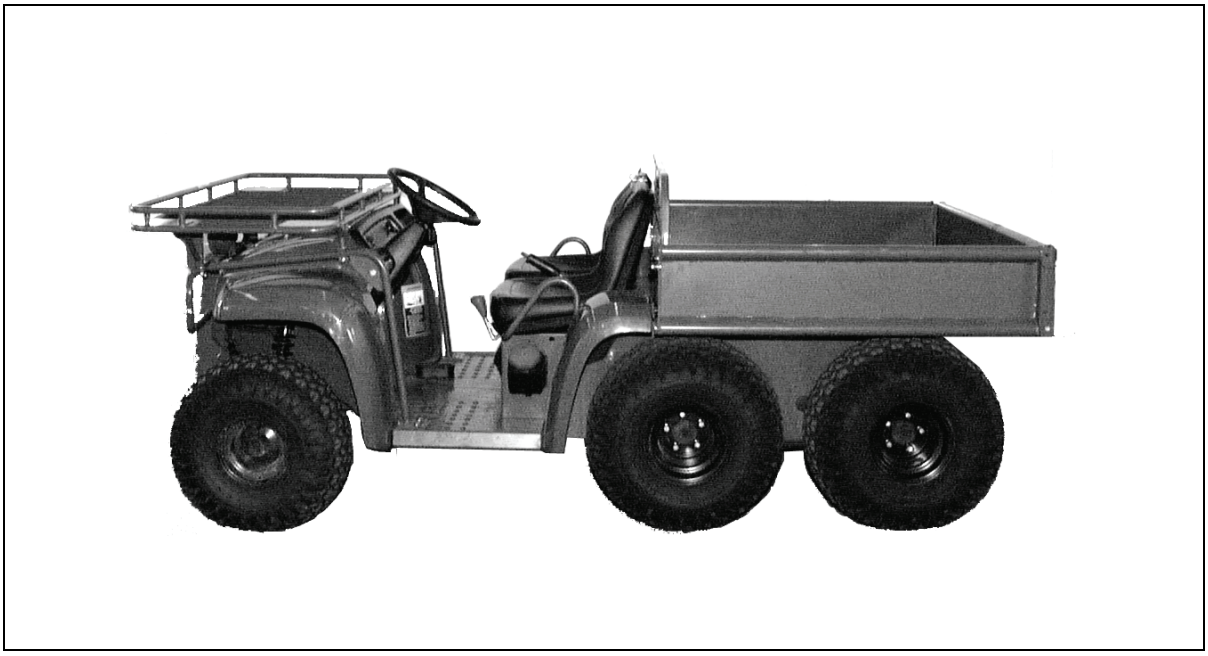
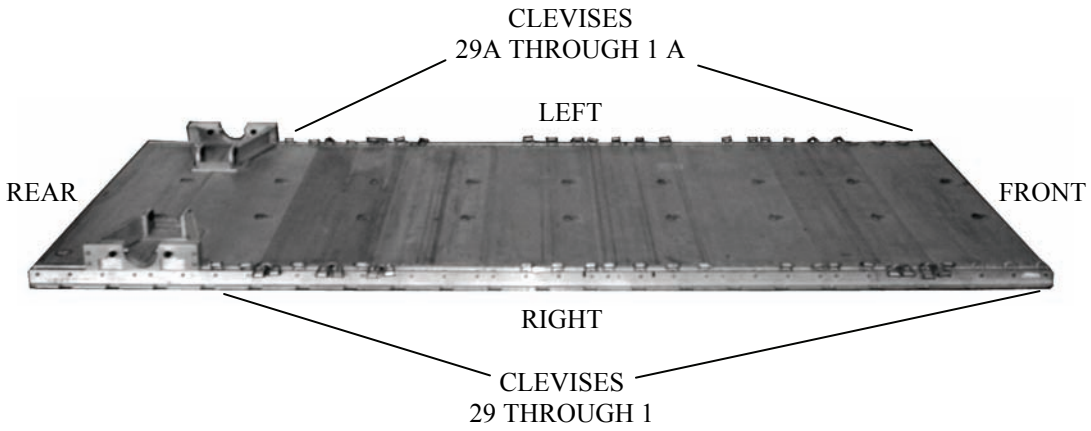


Figure 10-1. Military Utility Vehicle (M-Gator)



Steps:

1. Starting at the front of each platform side rail, install clevises on the bushings bolted on holes 1, 2, 3, 4, 5 (tripled), 6 (tripled), 7, 8, 9, 10, 13, 14, 15, 16, 17, 18, 19, 24 (tripled), 25, 26 (tripled), 27, 28 (tripled), 29, and 30.
2. Starting at the front of each platform side rail, 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 10-2. Platform Prepared

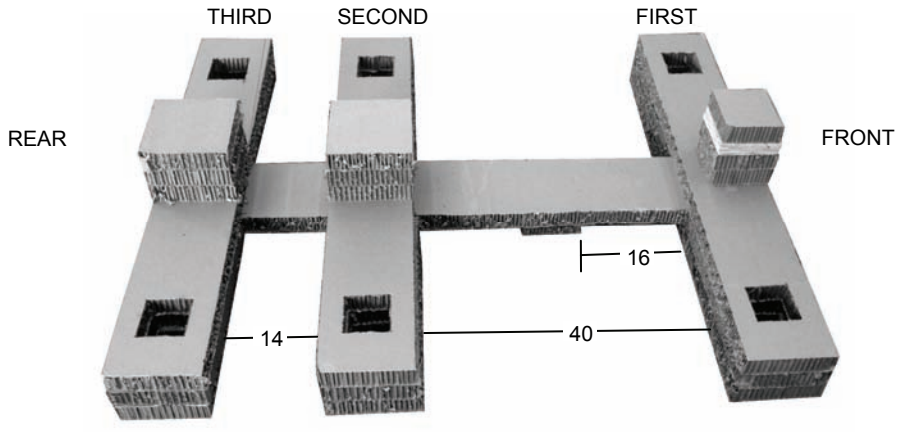
BUILDING AND POSITIONING THE HONEYCOMB STACKS

10-3. Build the honeycomb stack for the load as shown in Figure 10-3. Position the honeycomb stack as shown in Figure 10-4.

Stack Number	*Pieces*	*Width (inches)*	*Length (inches)*	*Material*	*Instructions*
1 and 3	2	76	24	Honeycomb	Glue the pieces together to form stack.

Figure 10-3. Honeycomb Stacks Prepared

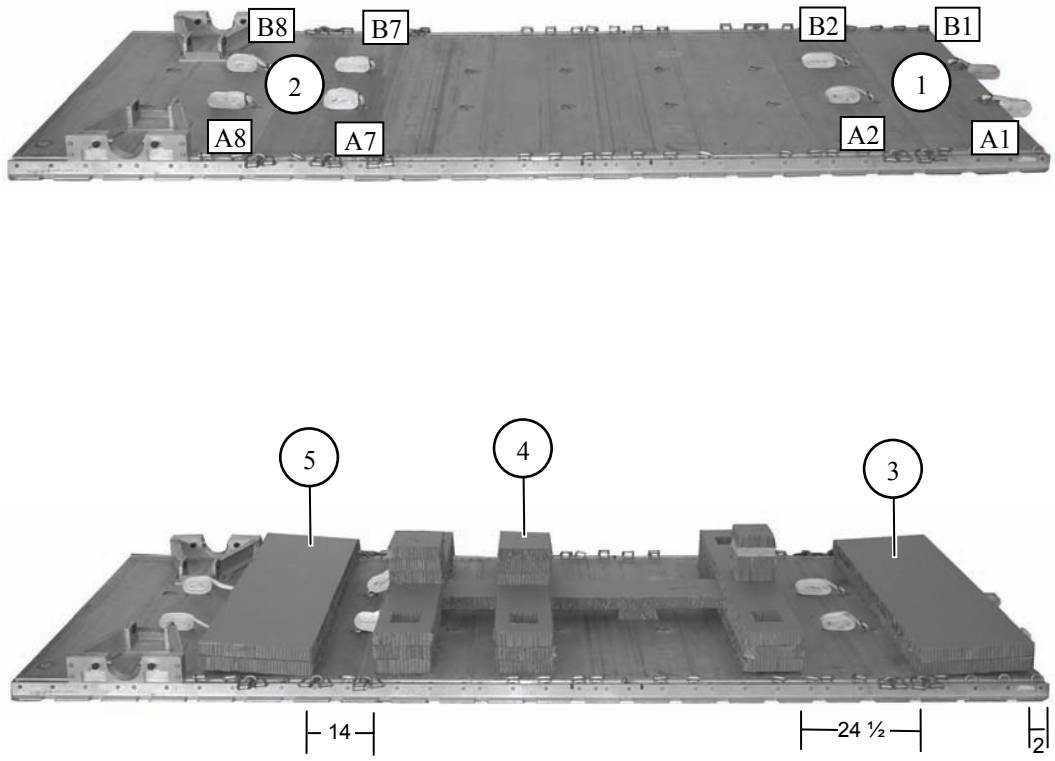
Note. All dimensions are given in inches.



Stack Number	*Pieces*	*Width (inches)*	*Length (inches)*	*Material*	*Instructions*
2	3	72	12	Honeycomb	Position on the floor with the second piece 40 inches from the first and the third piece 14 inches from the second. Cut a 6- by 6-inch hole in each piece of honeycomb 6 inches in from the side and centered.
	1	9	9	Honeycomb	Centered and 16 inches from the rear of the first piece of honeycomb.
	1	12	90	Honeycomb	Center and glue across the first four pieces of honeycomb.
	6	30	12	Honeycomb	Cut 6- by 6-inch holes, 6 inches from one side, in the center of each piece. Line the holes up on the base and glue in place.
	3	72	12	Honeycomb	Cut 6- by 6-inch holes on each side of the honeycomb, 6 inches from the sides and centered. Line the holes up on the base and glue in place.
	6	12	12	Honeycomb	Center and glue three pieces on the second and third sections.
	2	9	9	Honeycomb	Center and glue on the first section's front edge.
	3	9	9	¾-inch Plywood	Glue on top of the 9- by 9-inch honeycomb stack.
	1	9	9	Honeycomb	Glue on top of the 9- by 9-inch plywood stack.

Figure 10-3. Honeycomb Stacks Prepared (Continued)

Note. All dimensions are given in inches.

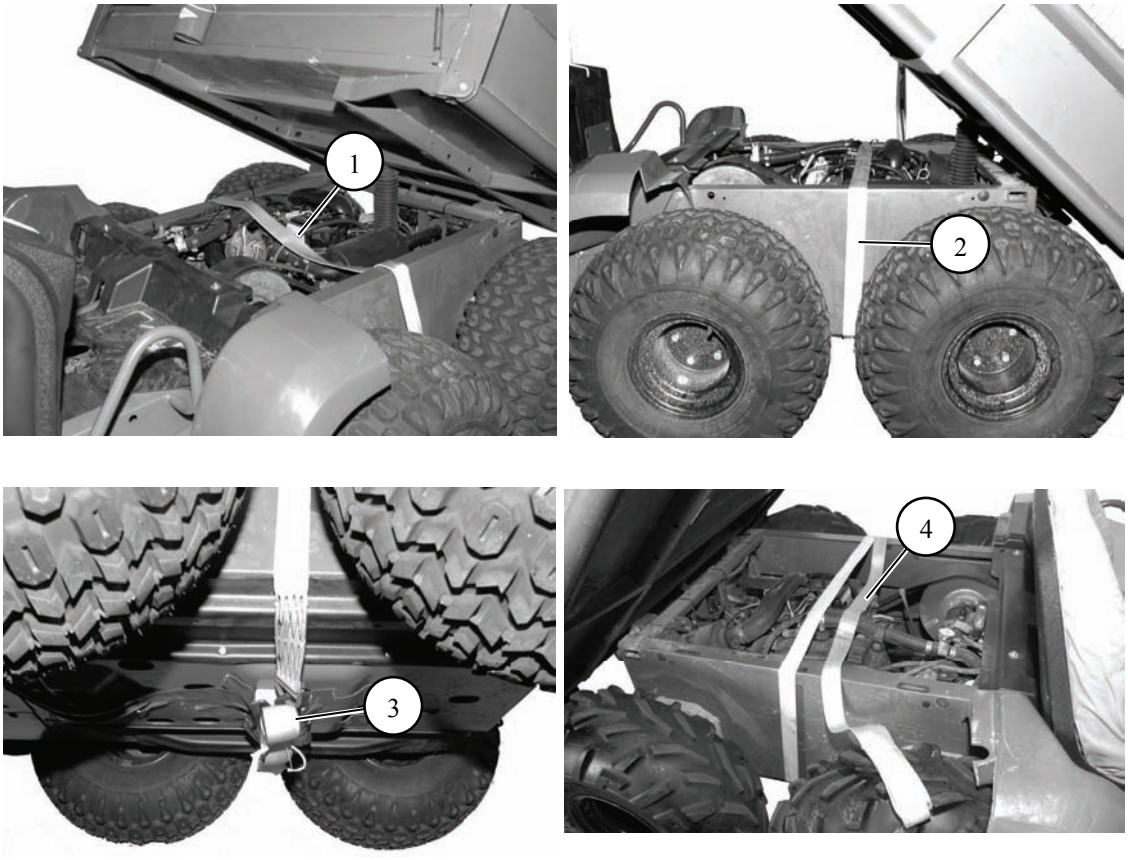


1. Route a 15-foot lashing though platform tie-down ring A1 and through its own D-ring. Repeat this step for platform tie-down rings A2, B1, and B2.
2. Route a 15-foot lashing though platform tie-down ring A7 and through its own D-ring. Repeat this step for platform tie-down rings A8, B7, and B8.
3. Position stack 1 between the pre-positioned lashings 2 inches from the front edge.
4. Position stack 2 24 ½ inches from stack 1 and centered or 50 inches from the front edge.
5. Position stack 3 between the pre-positioned lashings 14 inches from stack 2 and centered or 154 inches from the front edge.

Figure 10-4. Honeycomb Stack Positioned

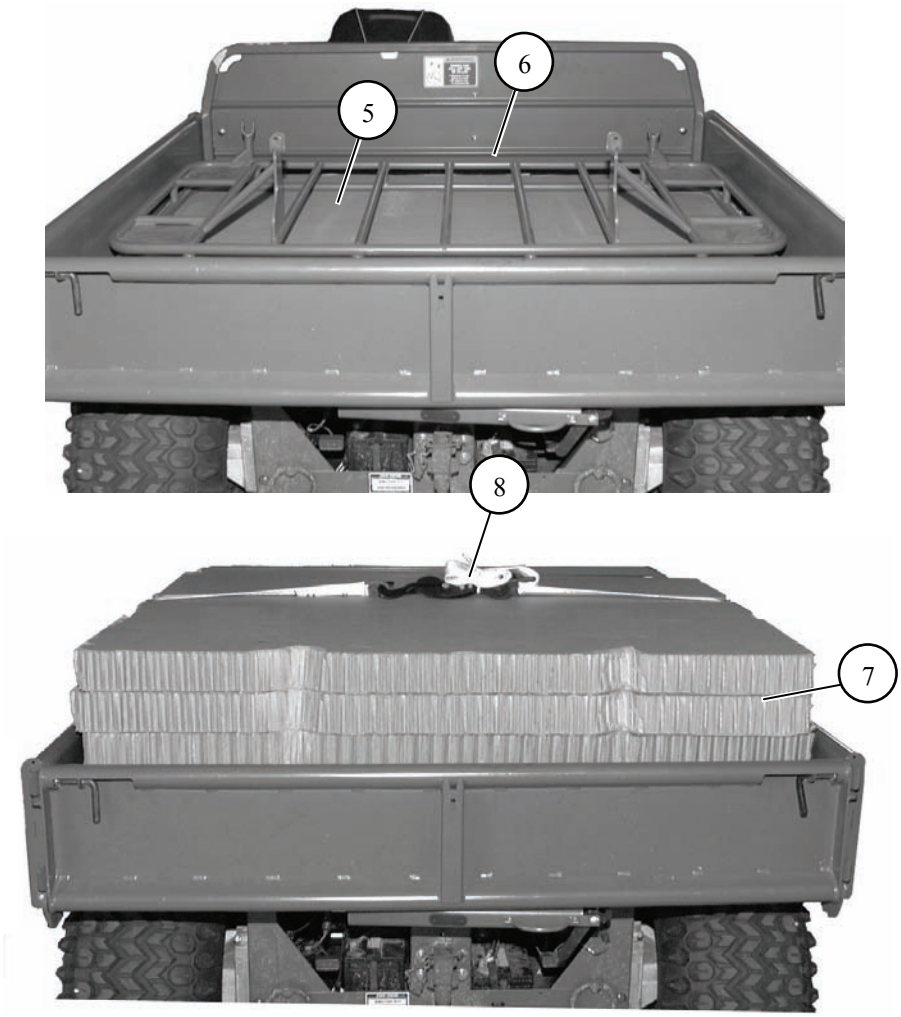
PREPARING THE M-GATOR

10-4. Prepare the M-Gator according to Figure 10-5.



1. Raise the bed and position a lashing across the frame, centered between the rear tires.
2. Route lashing around the frame and the engine.
3. Secure a piece of 2-inch by 4-inch by 8 1/2-inch lumber, laterally, under the engine. Lumber may be temporarily secured using cloth-backed tape. Position the load binder against the lumber.
4. Pre-position a 15-foot lashing to the front of the previously installed lashing over the frame.

Figure 10-5. M-Gator Prepared



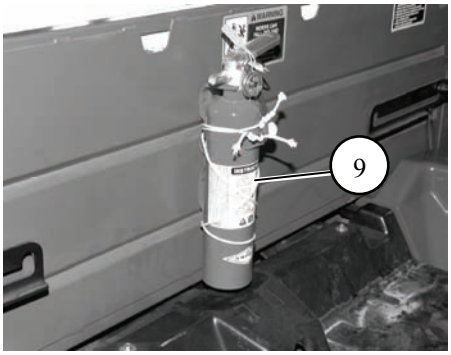
5 Lower the bed and place one layer of 36-inch by 56-inch honeycomb in it.

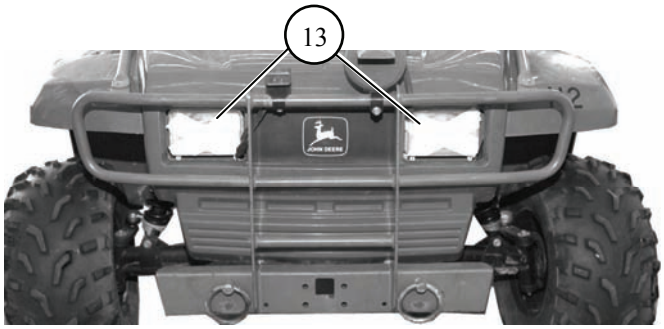
6 Remove the litter from the front of the M-Gator and place the litter upside down and centered on the honeycomb.

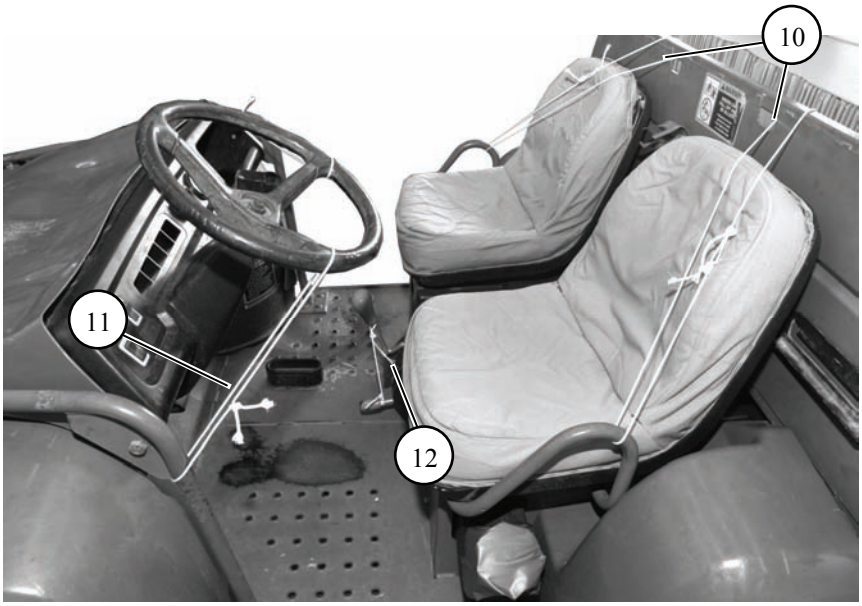
7 Place three more 36-inch by 56-inch pieces of honeycomb pieces on the litter and force them all the way down.

8 Secure the litter and honeycomb to the bed with the pre-positioned lashing shown in Step 4.

Figure 10-5. M-Gator Prepared (Continued)







(9) Secure the fire extinguisher in place with lengths of type III nylon cord if present.

(10) Secure the seats in place with type III nylon cord.

(11) Secure the steering wheel in place with lengths of type III nylon cord.

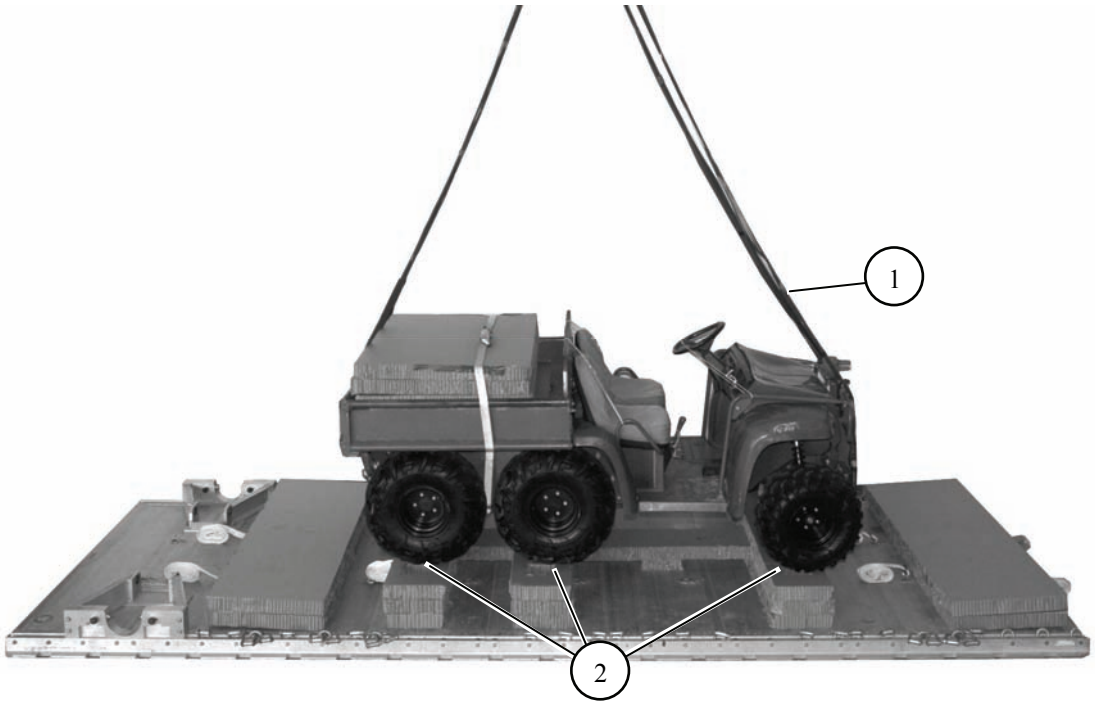
(12) Secure the gear stick to the emergency brake with type III nylon cord.

(13) Tape the lights with 2-inch masking tape.

Figure 10-5. M-Gator Prepared (Continued)

POSITIONING THE M-GATOR

10-5. Position the M-Gator as shown in Figure 10-6.

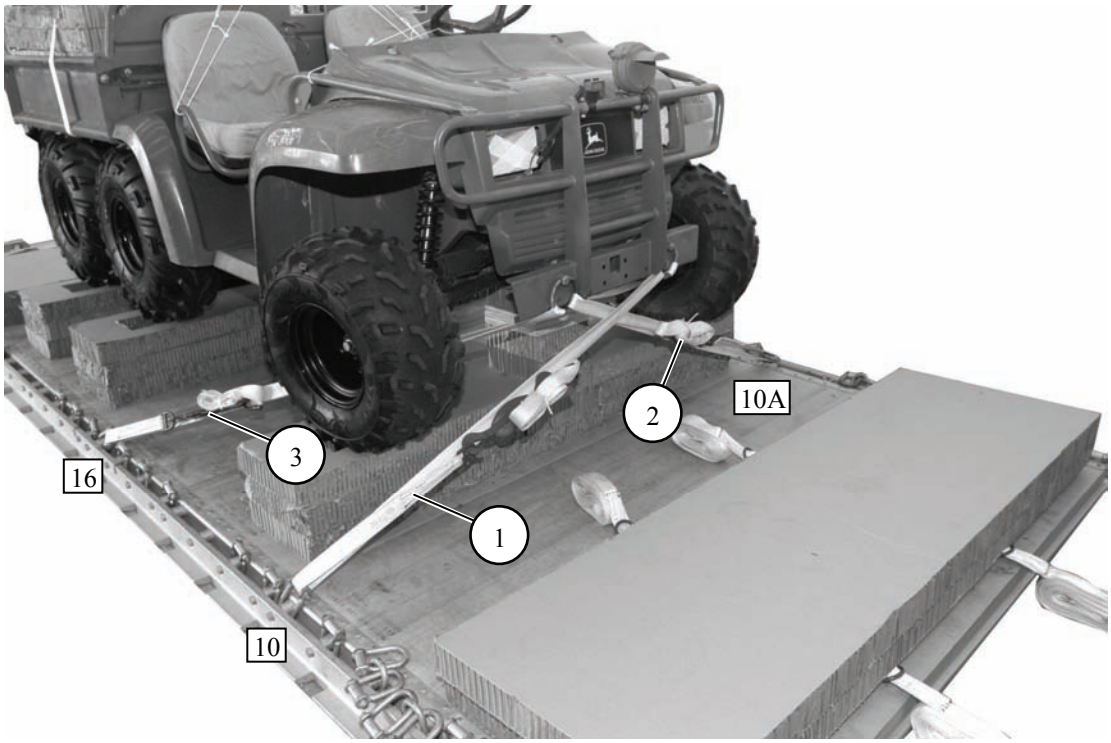


1. Attach a 12-foot (2-loop), type XXVI nylon sling to each lifting point on the front and rear of the vehicle with a large clevis.
2. Position the M-Gator with the front of the vehicle toward the front of the platform with the tires centered over the cutouts in honeycomb stack 2.
3. Remove the lift kit (not shown).

Figure 10-6. M-Gator Positioned

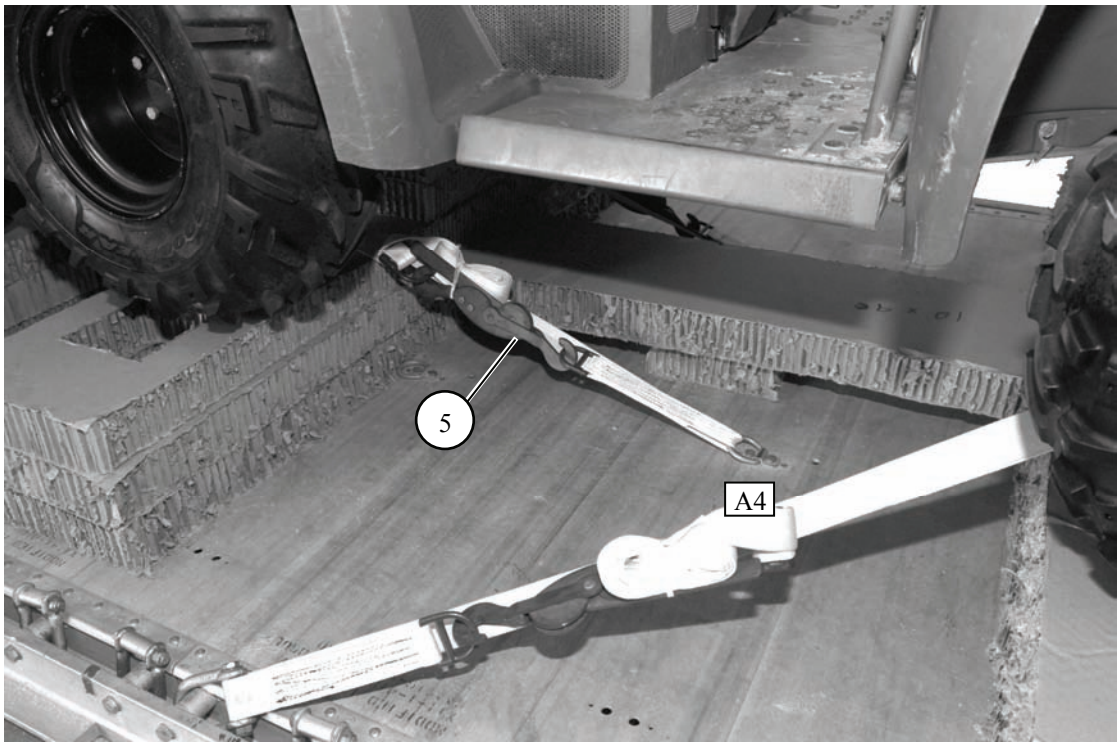
LASHING THE M-GATOR

10-6. Lash the M-Gator to the platform according to Chapter 2, Volume I and as shown in Figures 10-7 through 10-9.



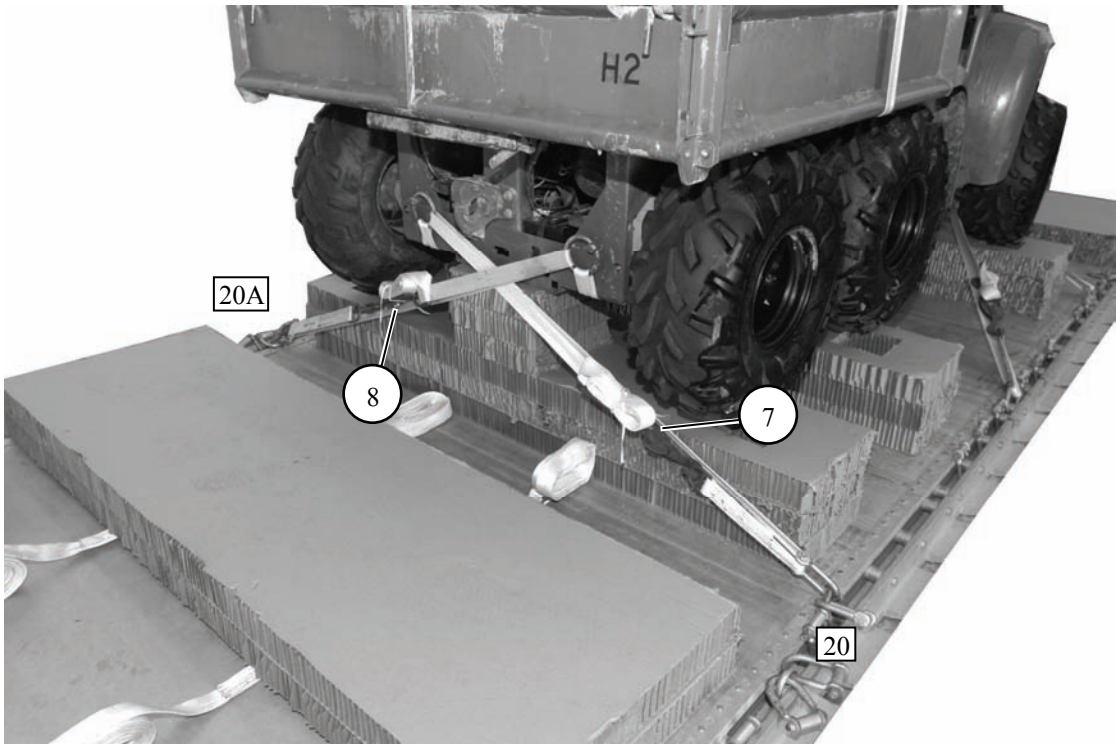
Lashing Number	*Tiedown Clevis Number*	*Instructions*
		Pass lashing:
1	10	Through left front lifting point.
2	10A	Through right front lifting point.
3	16	Under the tire and axle through right front lifting point.
4	16A	Under the tire and axle through left front lifting point.

Figure 10-7. Lashings 1 Through 4 Installed



Lashing Number	*Platform Clevis Number*	*Instructions*
		Pass lashing:
5	A4	Under the frame through right rear lifting point.
6	B4	Under the frame through left rear lifting point.

Figure 10-8. Lashings 5 and 6 Installed



Lashing Number	*Tiedown Clevis Number*	*Instructions*
		Pass lashing through:
7	20	Left rear lifting point.
8	20A	Right rear lifting point.

Figure 10-9. Lashings 7 and 8 Installed

BUILDING M-GATOR BOX

10-7. Build the M-Gator box using 8d common nails as shown in Figure 10-10.

Note. Use wood glue and 1 ½ inch long, #4 wood screws to sturdy box for multiple airdrop use.

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

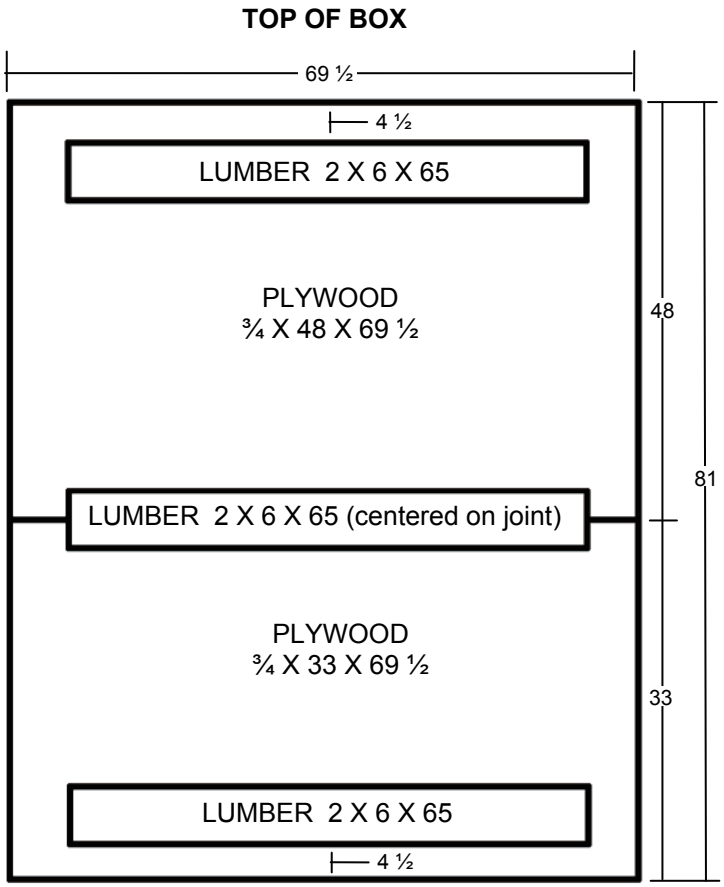


Figure 10-10. M-Gator Box Built

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

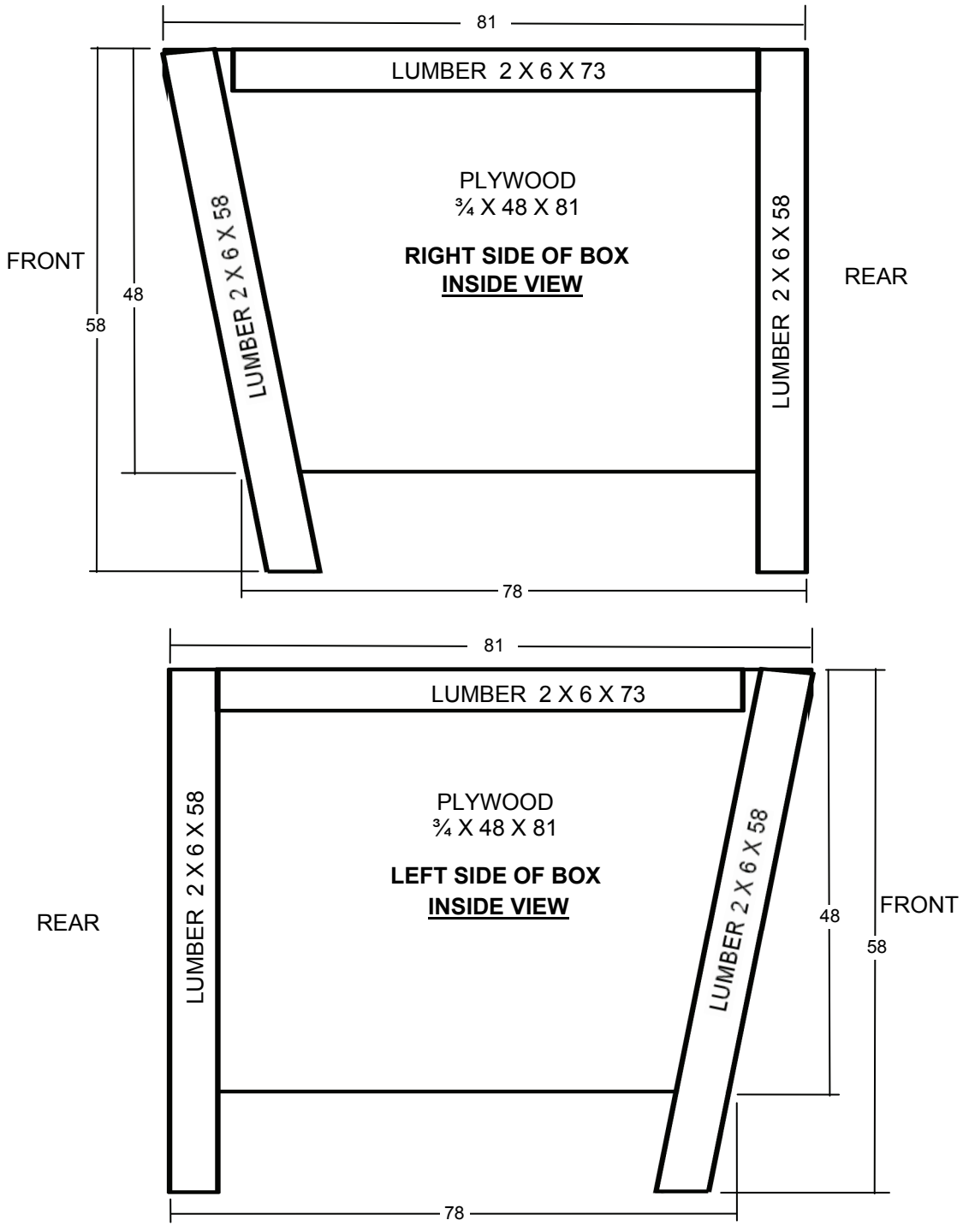


Figure 10-10. M-Gator Box Built (Continued)

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

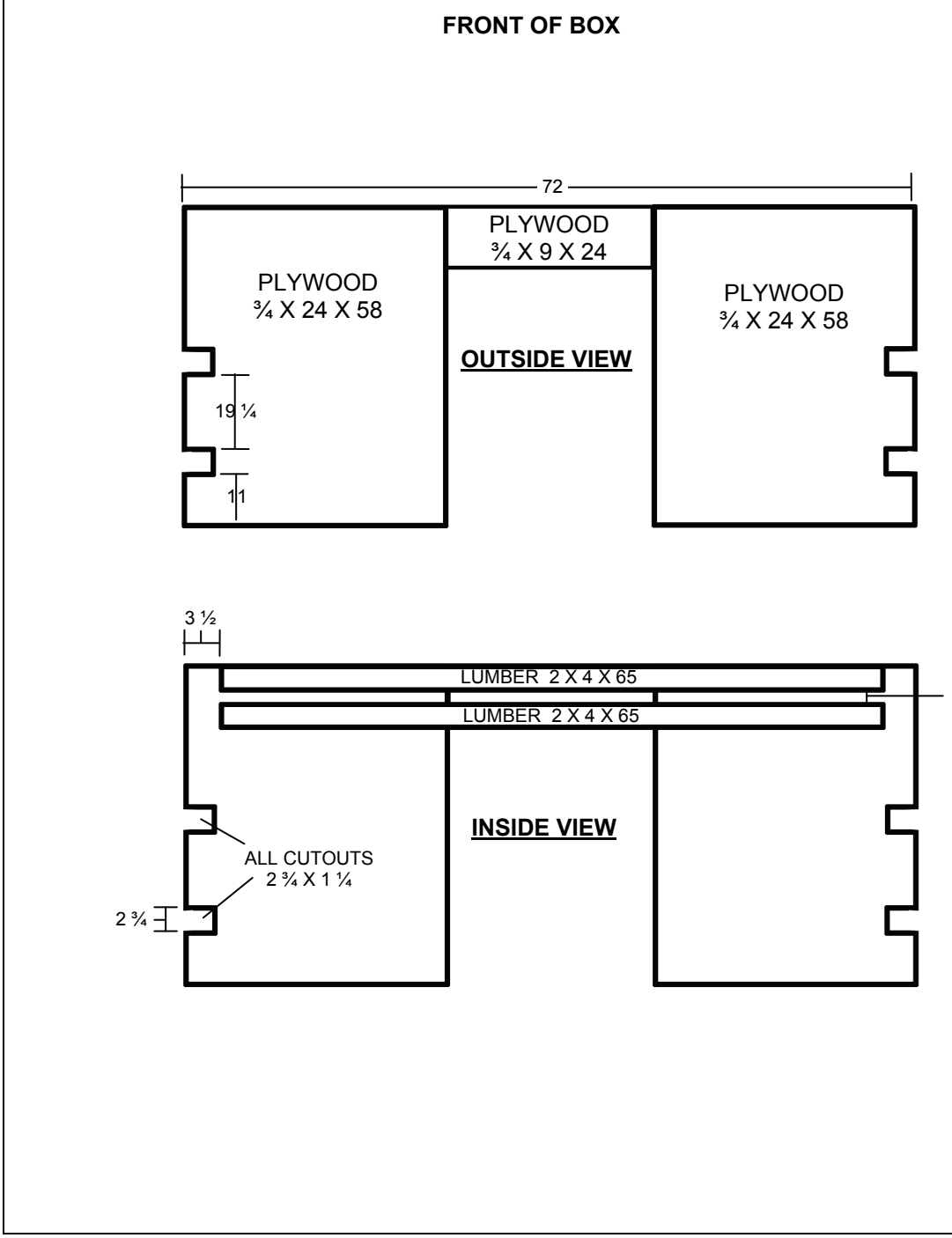
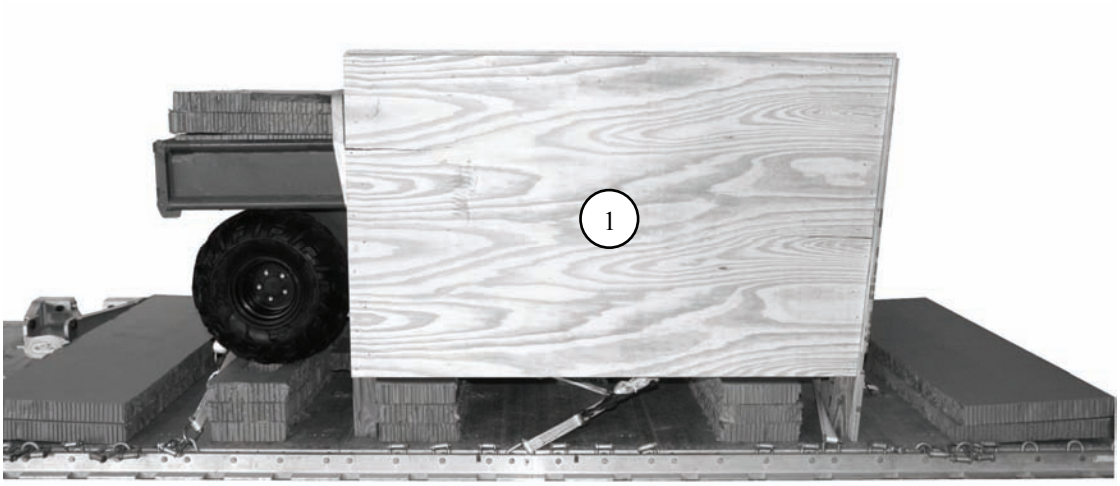


Figure 10-10. M-Gator Box Built (Continued)

POSITIONING M-GATOR BOX

10-8. Position the M-Gator Box as shown in Figure 10-11.

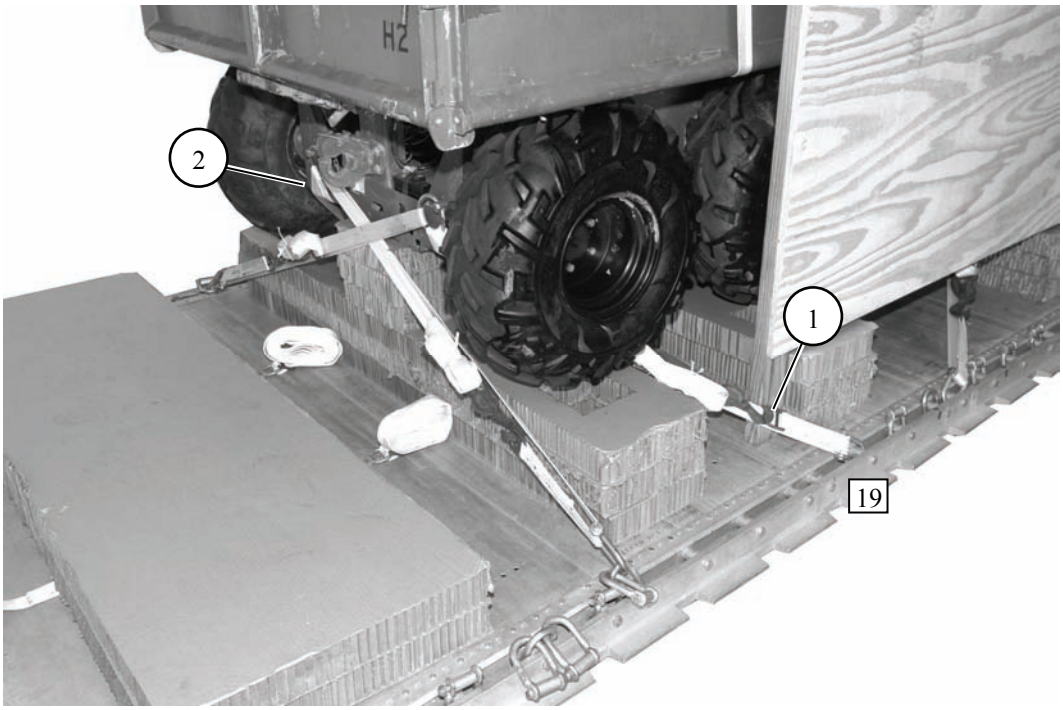


(1) Position the front of the box 41 inches from the front edge of the platform.

Figure 10-11. M-Gator Box Positioned

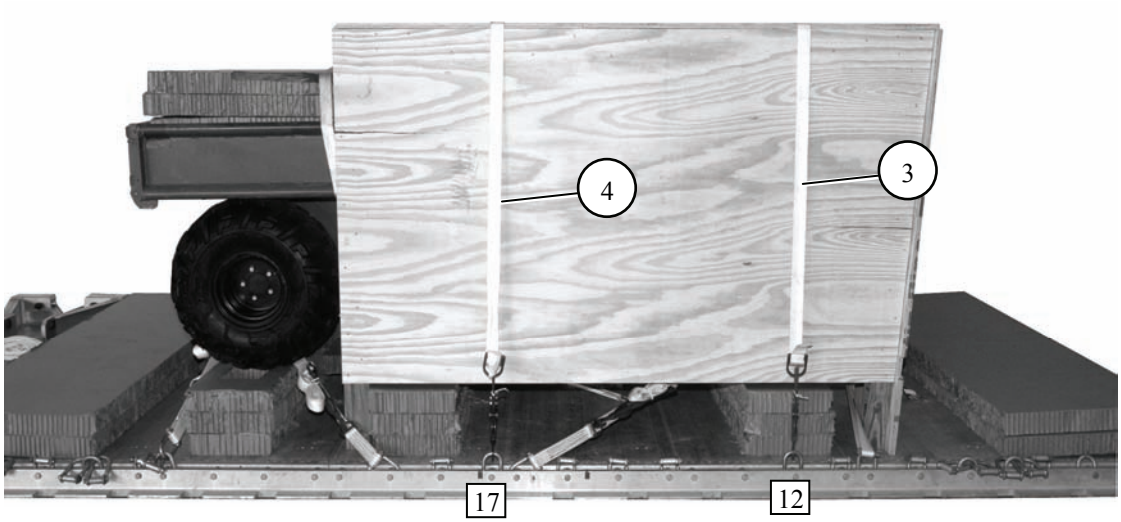
LASHING M-GATOR BOX

10-9. Lash the M-Gator box to the platform according to Chapter 2, Volume I and as shown in Figures 10-12 through 10-14.



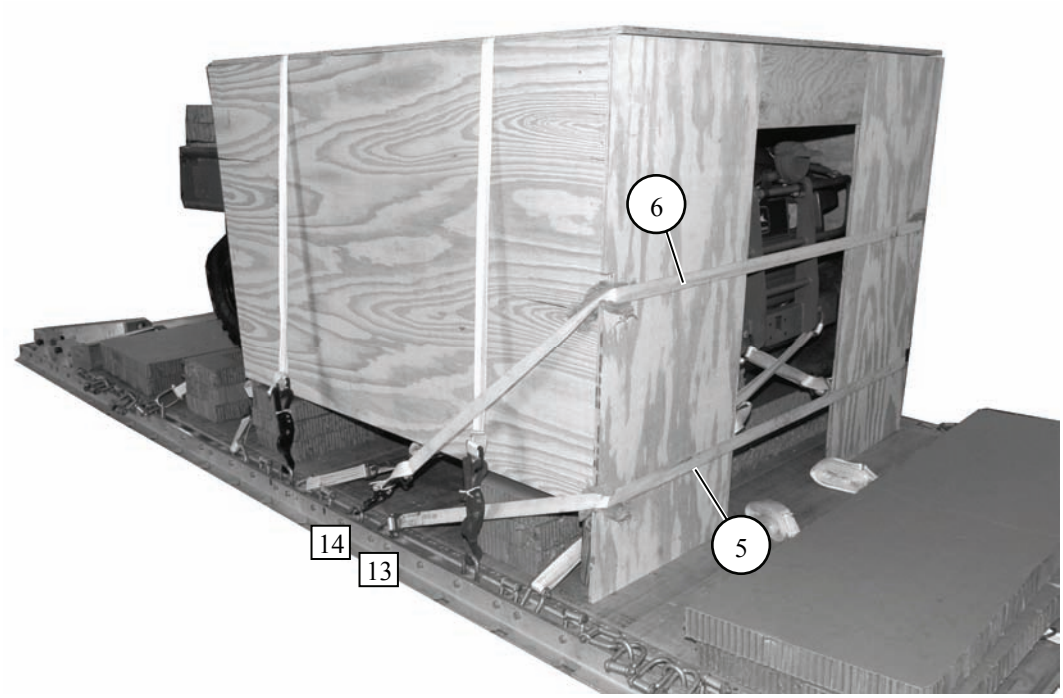
Lashing Number	*Tiedown Clevis Number*	*Instructions*
		Pass lashing:
1	19	Around the leg of the box, under the tire, and to the right rear lifting point.
2	19A	Around the leg of the box, under the tire, and to the left rear lifting point.

Figure 10-12. Lashings 1 and 2 Installed on M-Gator Box



Lashing Number	*Tiedown Clevis Number*	*Instructions*
		Pass lashing:
3	12 and 12A	Through clevis 12A and through its own D-ring. Route the lashing over the box and secure the lashing to clevis 12 with a D-ring and load binder.
4	17 and 17A	Through clevis 17A and through its own D-ring. Route the lashing over the box and secure the lashing to clevis 17 with a D-ring and load binder.
Note. Pad plywood edge with cellulose wadding where lashings make contact.		

Figure 10-13. Lashings 3 and 4 Installed on M-Gator Box



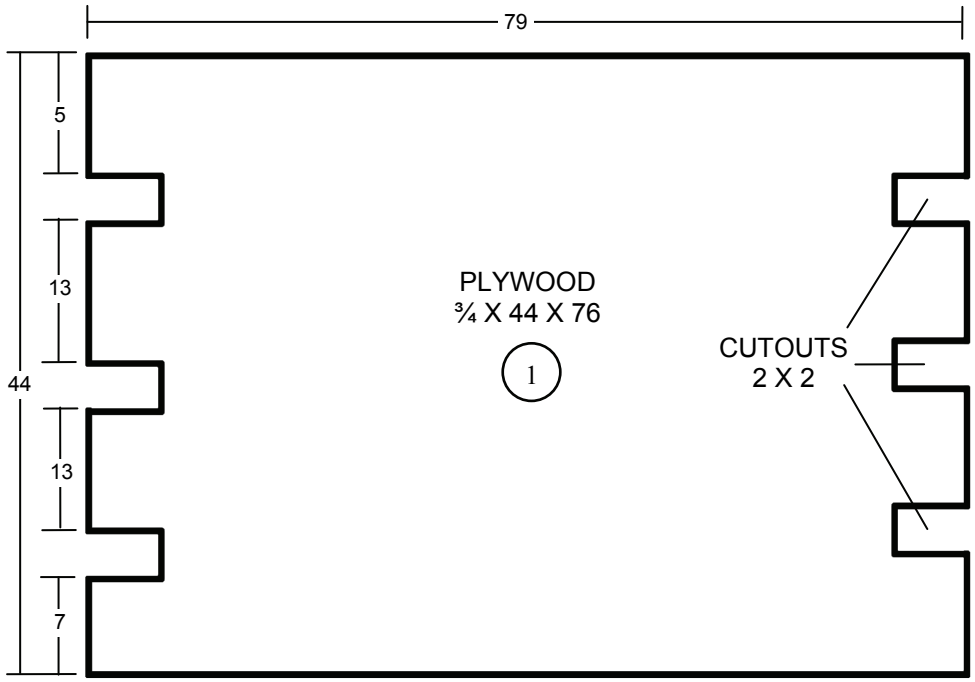
Lashing Number	*Tiedown Clevis Number*	*Instructions*
		Pass lashing:
5	13 and 13A	Through clevis 13 and through its own D-ring. Route the lashing through the bottom cutouts of the box and secure the lashing to clevis 13A with a D-ring and load binder.
6	14 and 14A	Through clevis 14A and through its own D-ring. Route the lashing through the top cutouts of the box and secure the lashing to clevis 14 with a D-ring and load binder.
Note. Pad cutouts with cellulose wadding.		

Figure 10-14. Lashings 5 and 6 Installed on M-Gator Box

CONSTRUCTING ENDBOARDS FOR AMMUNITION STACK 1

10-10. Construct two endboards as shown in Figure 10-15.

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

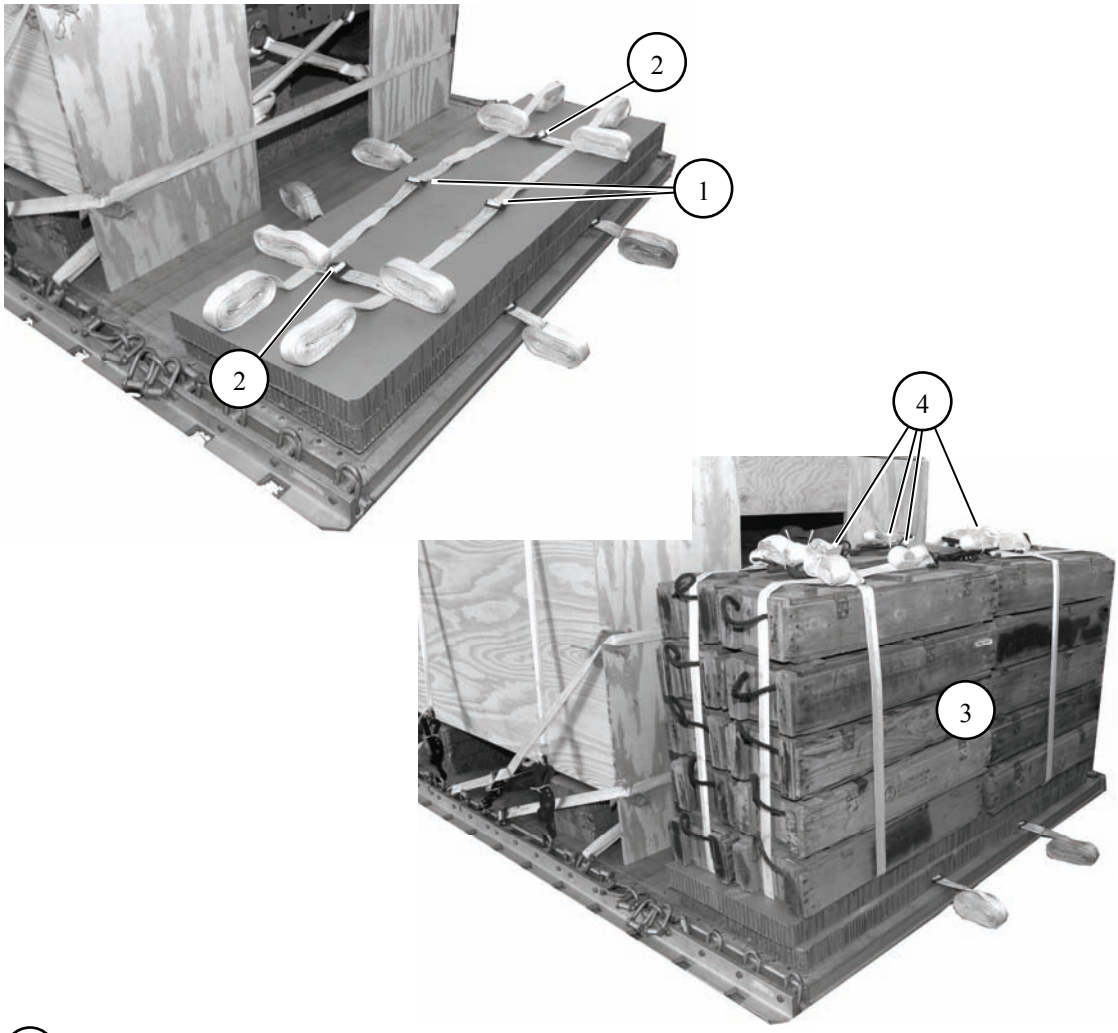


(1) Construct two endboards using a ¾- by 44- by 79-inch piece of plywood.

Figure 10-15. Endboards Constructed

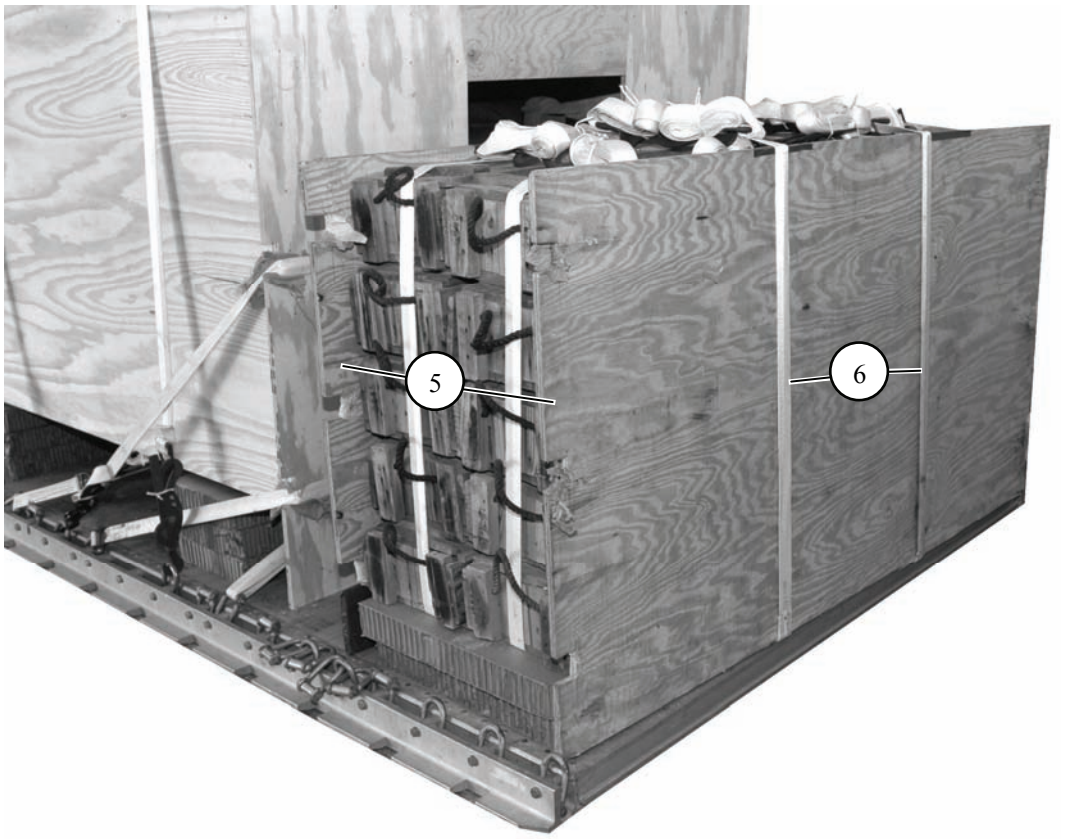
POSITIONING FIRST AMMUNITION STACK

10-11. Position the first ammunition stack as shown in Figure 10-16.



1. Form two 30-foot lashings. Pre-position one 30-foot lashing widthwise 6 inches in from the front edge and the other widthwise 6 inches in from the rear edge of stack 1. Ensure the D-rings are centered on stack.
2. Form two 30-foot lashings. Pre-position a 30-foot lashing centered between the D-rings and the right edge of stack 1. Repeat this for the left side of stack 1.
3. Position twenty 105-mm ammunition boxes on stack 1.
4. Secure the pre-positioned lashings from steps 1 and 2 around the 105-mm ammunition boxes with D-rings and load binders. Secure the load binders on top of the ammunition boxes.

Figure 10-16. First Ammunition Stack Positioned



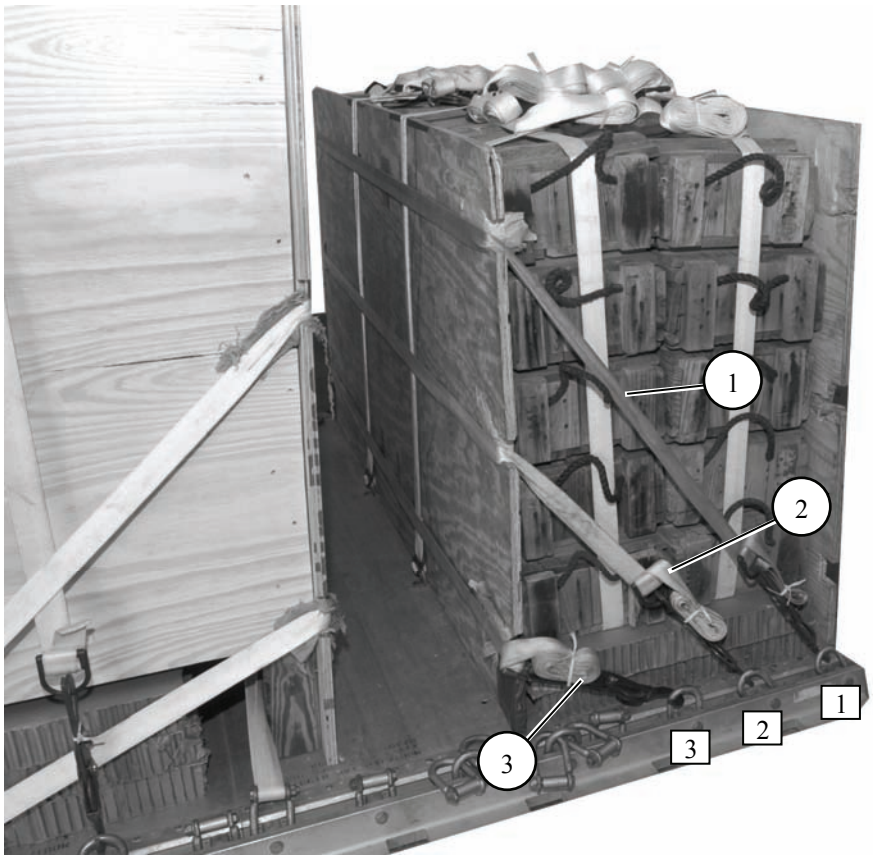
5 Position an endboard in front of ammunition stack 1 and one behind ammunition stack 1. Pad the cutouts with cellulose wadding and tape in place.

6 Secure the pre-positioned lashings routed through platform tie-down rings A1, A2, B1 and B2 over the top of the endboard. Secure on top of ammunition stack 1 with D-rings and load binders.

Figure 10-16. First Ammunition Stack Positioned (Continued)

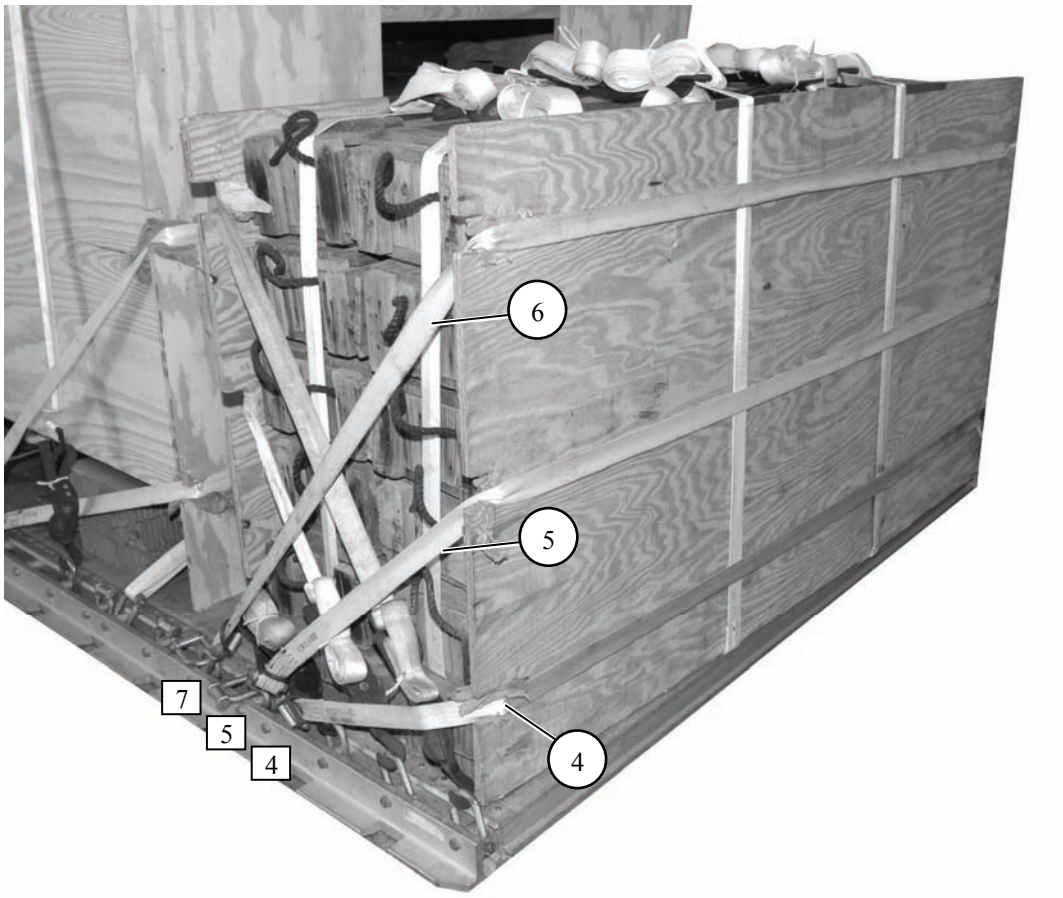
LASHING ENDBOARD OF FIRST AMMUNITION STACK

10-12. Lash the endboard to the platform as shown in Figures 10-17 and 10-18.



Lashing Number	*Tiedown Clevis Number*	*Instructions*
		Pass lashing:
1	1 and 1A	Through clevis 1A and through its own D-ring. Route the lashing through rear top cutouts in the endboard and secure to clevis 1 with a D-ring and load binder.
2	2 and 2A	Through clevis 2A and through its own D-ring. Route the lashing through rear center cutouts in the endboard and secure to clevis 2 with a D-ring and load binder.
3	3 and 3A	Through clevis 3A and through its own D-ring. Route the lashing through rear bottom cutouts in the endboard and secure to clevis 3 with a D-ring and load binder.

Figure 10-17. Lashings 1 Through 3 Installed on First Ammunition Stack



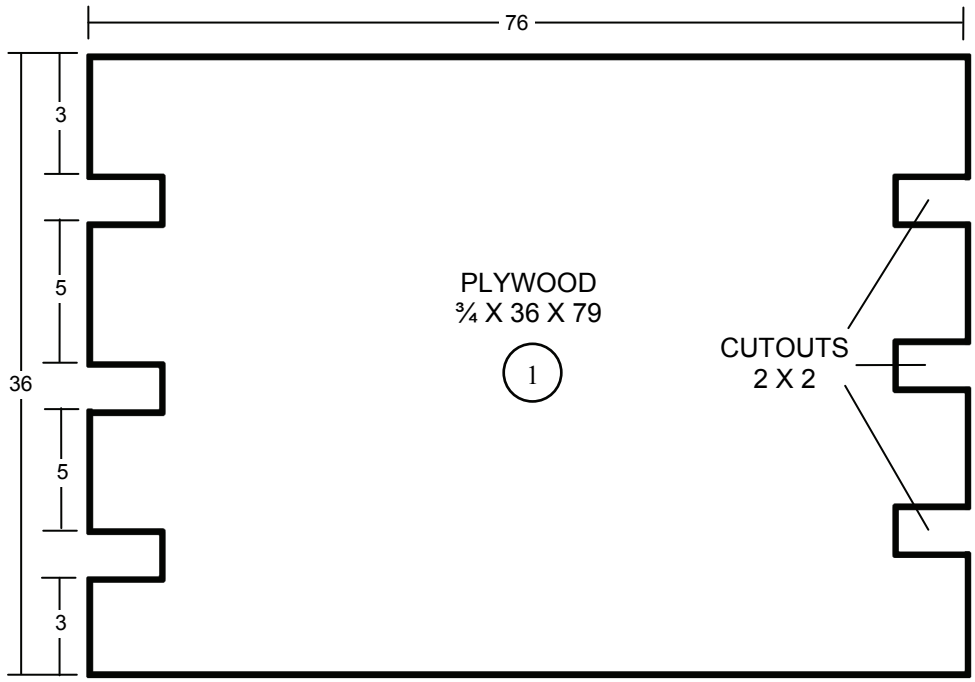
Lashing Number	*Tiedown Clevis Number*	*Instructions*
		Pass lashing:
4	4 and 4A	Through clevis 4 and through its own D-ring. Route the lashing through front bottom cutouts in the endboard and secure to clevis 4A with D-ring and a load binder.
5	5 and 5A	Through clevis 5 and through its own D-ring. Route the lashing through front center cutouts in the endboard and secure to clevis 5A with D-ring and a load binder.
6	7 and 7A	Through clevis 7 and through its own D-ring. Route the lashing through front top cutouts in the endboard and secure to clevis 7A with D-ring and a load binder.

Figure 10-18. Lashings 4 Through 6 Installed on First Ammunition Stack

CONSTRUCTING ENDBOARDS FOR SECOND AMMUNITION STACK

10-13. Construct two endboards as shown in Figure 10-19.

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

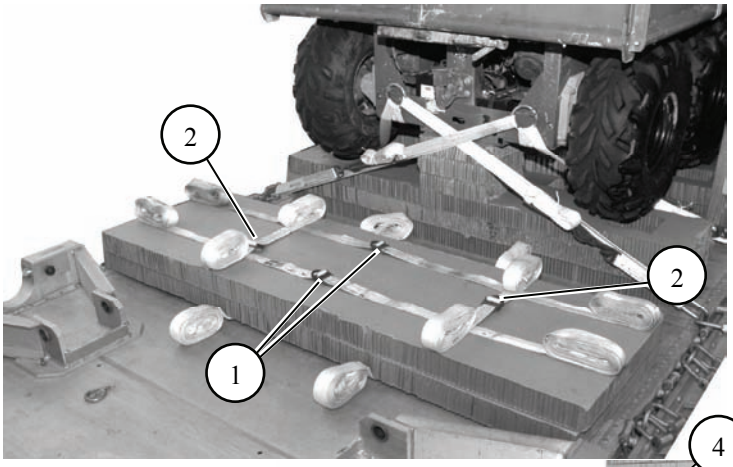


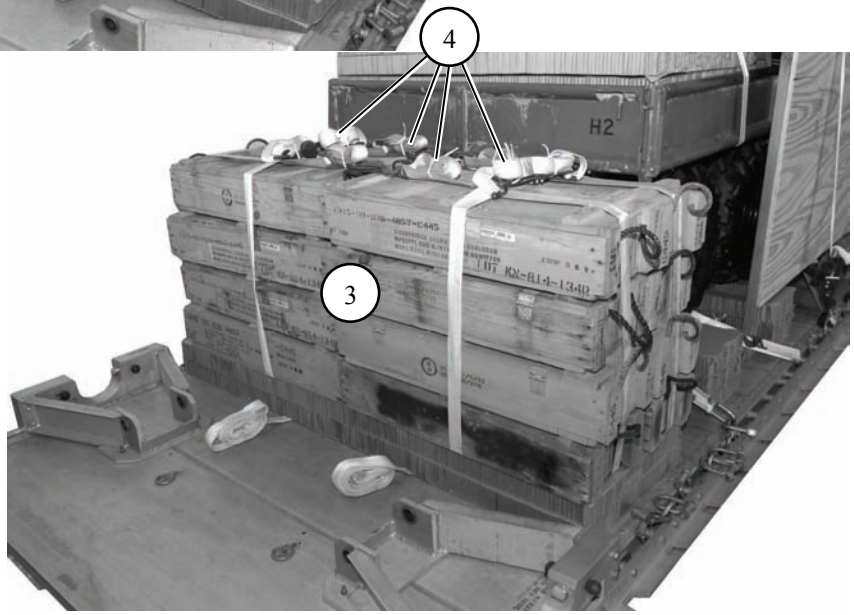
(1) Construct two endboards using a ¾- by 36- by 76-inch piece of plywood.

Figure 10-19. Endboards Constructed

POSITIONING SECOND AMMUNITION STACK

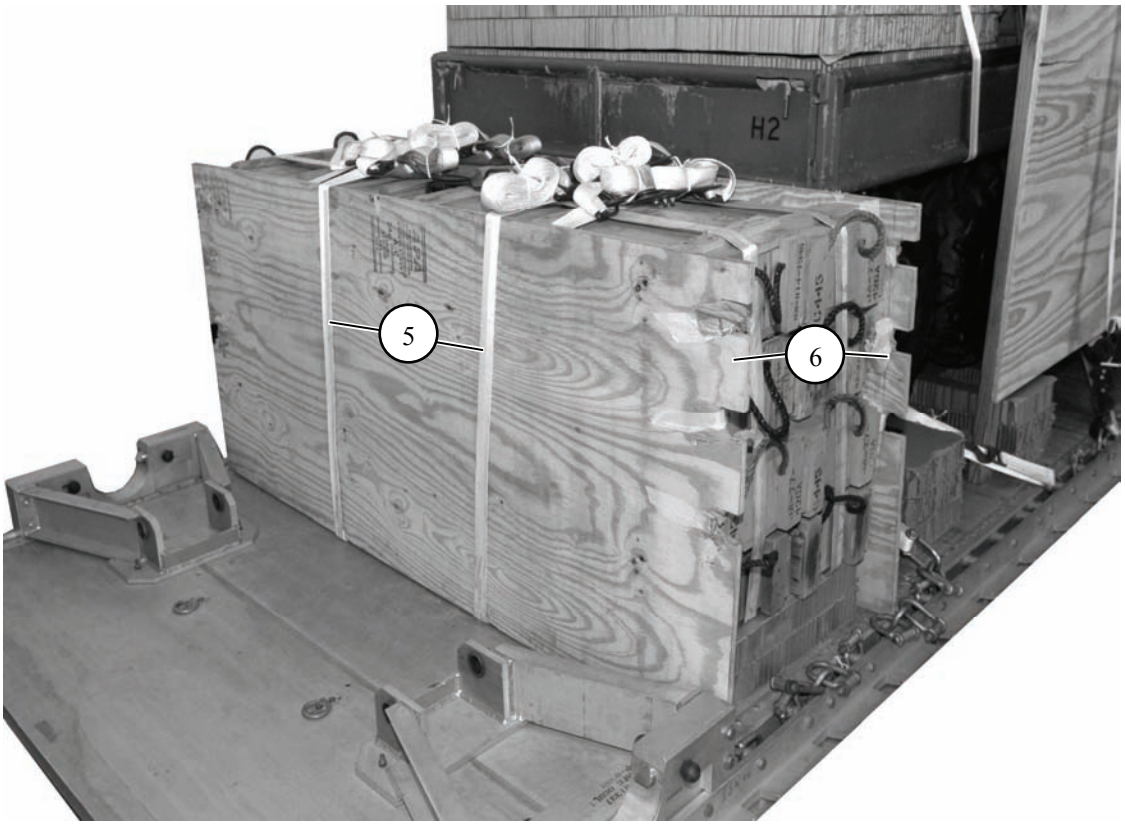
10-14. Position second ammunition stack as shown in Figure 10-20.





1. Form two 30-foot lashings. Preposition one 30-foot lashing widthwise 6 inches in from the front edge and the other widthwise 6 inches in from the rear edge of stack 2. Ensure the D-rings are centered on stack.
2. Form two 30-foot lashings. Pre-position a 30-foot lashing centered between the D-rings and the right edge of stack 2. Repeat this for the left side of stack 2.
3. Position sixteen 105-mm ammunition boxes on stack 2.
4. Secure the pre-positioned lashings from steps 1 and 2 around the 105-mm ammunition boxes with D-rings and load binders. Secure the load binders on top of the ammunition boxes.

Figure 10-20. Second Ammunition Stack Positioned



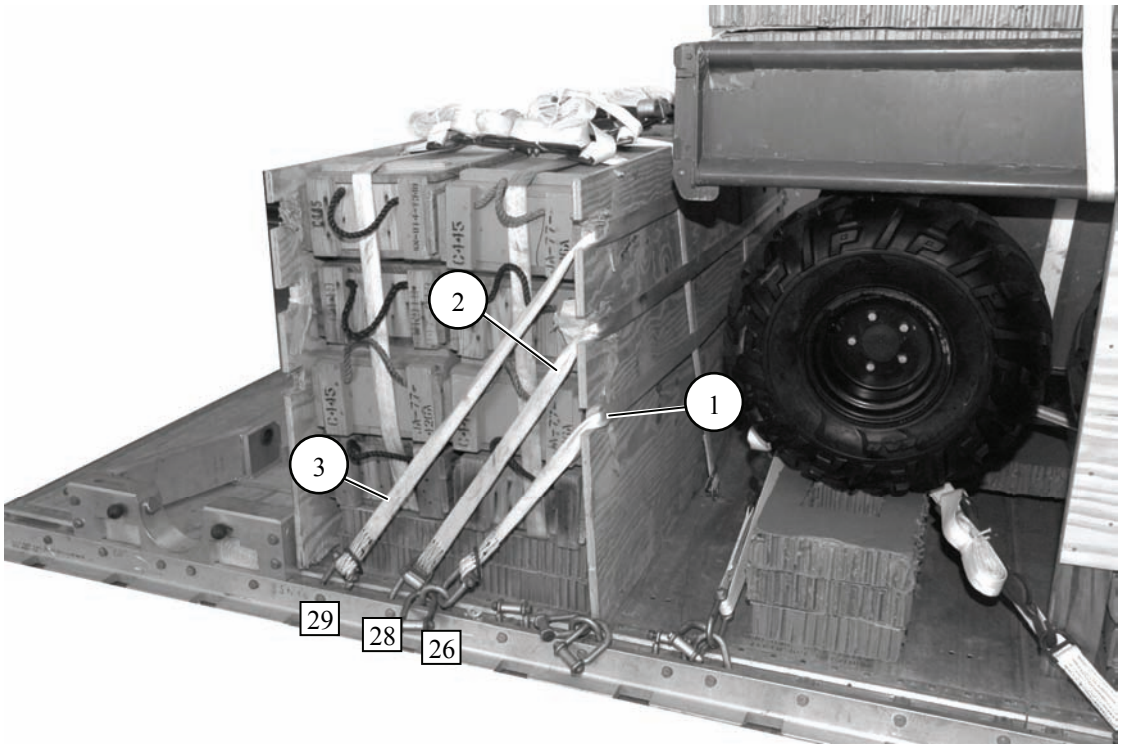
5 Position an endboard in front of ammunition stack and one behind ammunition stack. Pad the cutouts with cellulose wadding and tape in place.

6 Secure the pre-positioned lashings routed through platform tie-down rings A7, A8, B7 and B8 over the top of the endboard. Secure on top of ammunition stack 2 with D-rings and load binders.

Figure 10-20. Second Ammunition Stack Positioned (Continued)

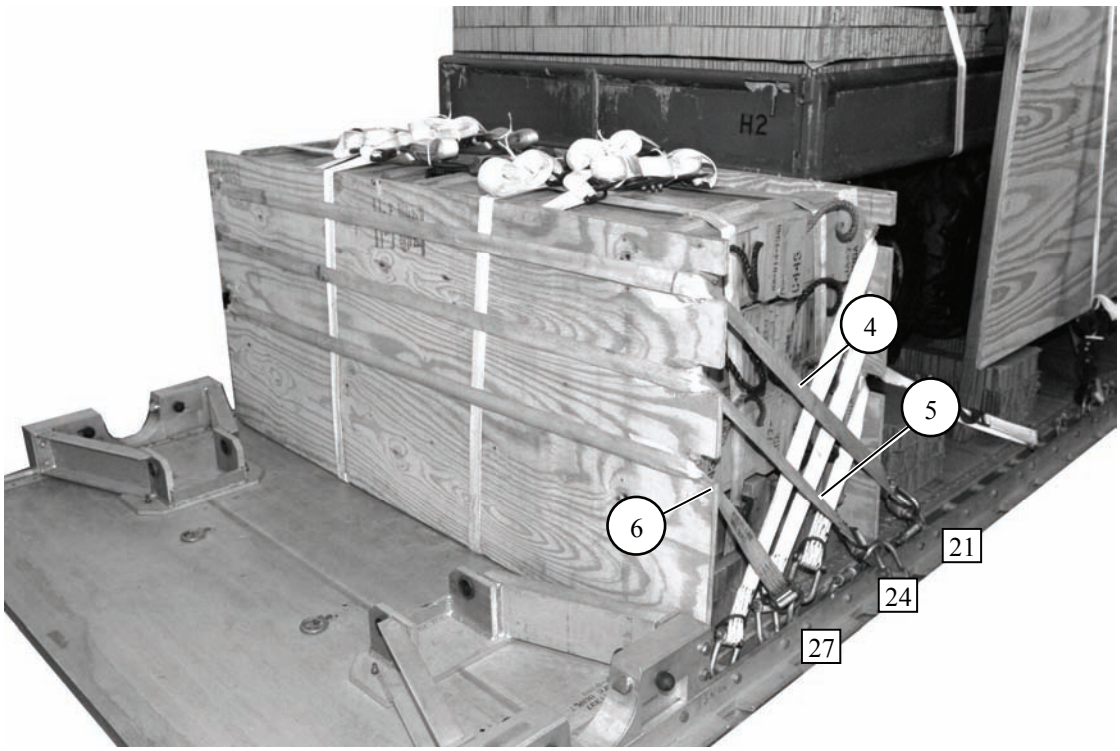
LASHING ENDBOARD OF SECOND AMMUNITION STACK

10-15. Lash the endboard to the platform as shown in Figures 10-21 and 10-22.



Lashing Number	*Tiedown Clevis Number*	*Instructions*
		Pass lashing:
1	26 and 26A	Through clevis 26 and through its own D-ring. Route the lashing through front bottom cutouts in the endboard and secure to clevis 26A with a D-ring and load binder.
2	28 and 28A	Through clevis 28 and through its own D-ring. Route the lashing through front center cutouts in the endboard and secure to clevis 28A with a D-ring and load binder.
3	29 and 29A	Through clevis 29 and through its own D-ring. Route the lashing through front top cutouts in the endboard and secure to clevis 29A with a D-ring and load binder.

Figure 10-21. Lashings 1 Through 3 Installed on Second Ammunition Stack

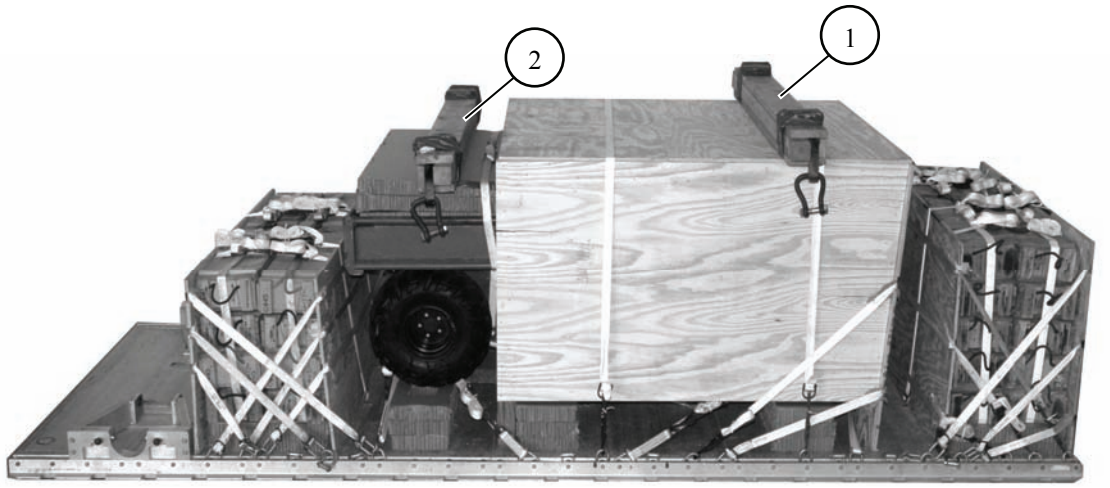


Lashing Number	*Tiedown Clevis Number*	*Instructions*
		Pass lashing:
4	21 and 21A	Through clevis 21 and through its own D-ring. Route the lashing through rear top cutouts in the endboard and secure to clevis 21A with D-ring and a load binder.
5	24 and 24A	Through clevis 24 and through its own D-ring. Route the lashing through rear center cutouts in the endboard and secure to clevis 24A with D-ring and a load binder.
6	27 and 27A	Through clevis 27 and through its own D-ring. Route the lashing through rear bottom cutouts in the endboard and secure to clevis 27A with D-ring and a load binder.

Figure 10-22. Lashings 4 Through 6 Installed on Second Ammunition Stack

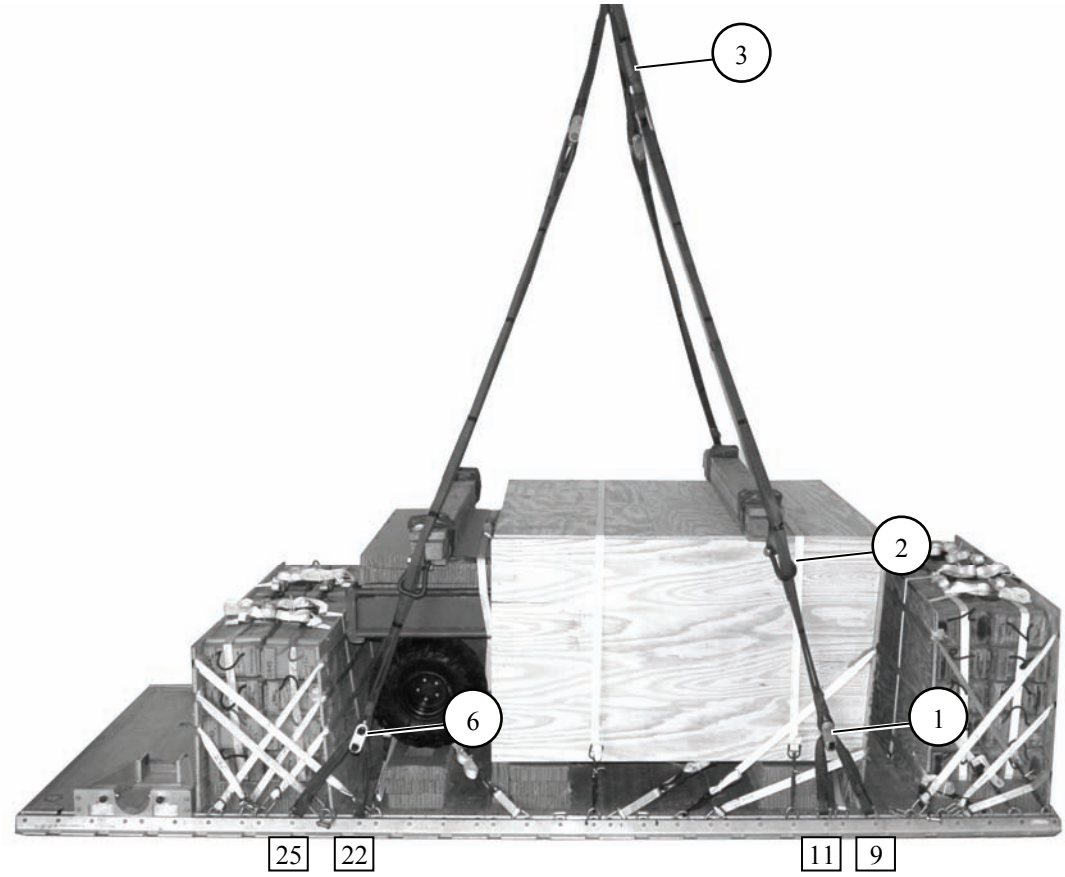
POSITIONING THE ATTITUDE CONTROL SYSTEM (ACS) AND INSTALLING SUSPENSION SLINGS

10-16. Construct the ACS according to Chapter 2, Section VII, Volume I. Position the ACS and install the suspension slings as shown in Figures 10-23 and 10-24.



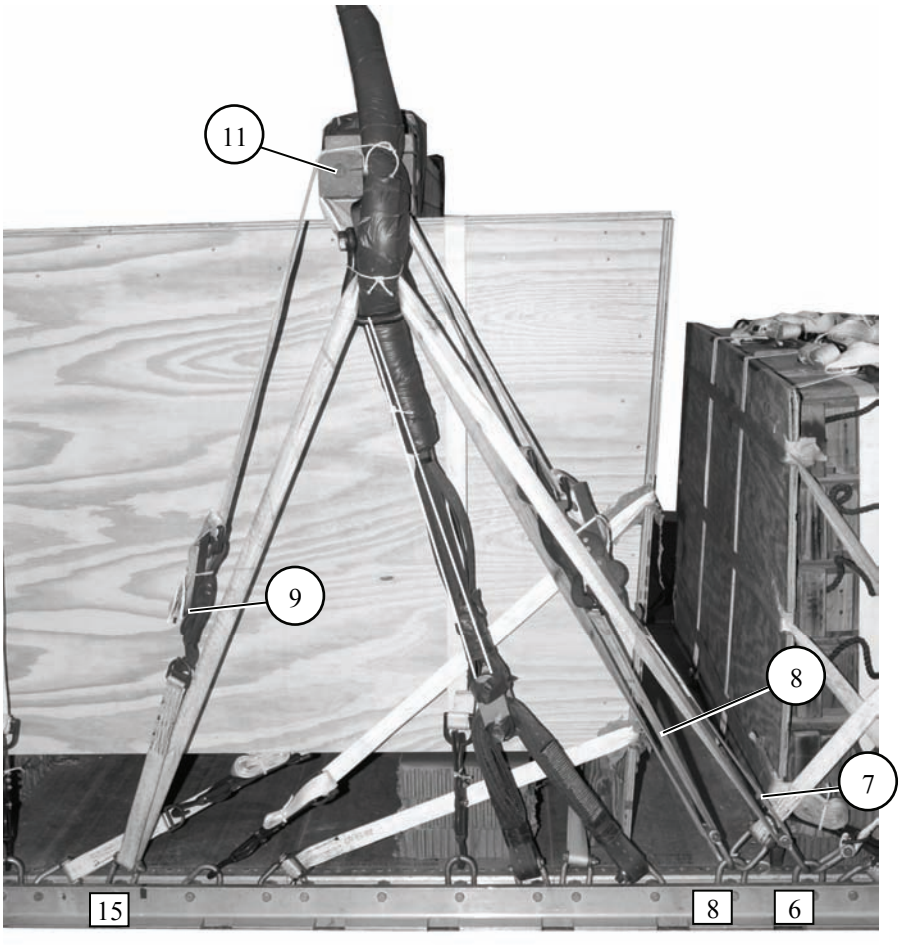
1. Position the front ACS to the rear of the front lashing on top of the M-Gator box with the 4- by 4-inch piece of lumber to the rear of the platform.
2. Position the rear ACS on top of the honeycomb in the M-Gator's bed with the 4- by 4-inch piece of lumber to the front of platform.

Figure 10-23. ACS Positioned



1. Install a 3-foot (4-loop), type XXVI nylon sling to clevises 9 and 11. Connect an 11-foot (4-loop), type XXVI nylon sling to the center of the sling with a 3 ¾-inch, two-point link.
2. Route the sling through the clevis on the front ACS from front to rear. Pad and tape the 11-foot (4 loop), type XXVI nylon sling with felt from a point 12 inches below the clevis to a point 12 inches above the ACS.
3. Install a 3-foot (4-loop), type XXVI nylon sling to the other end of the 11-foot (4 loop), type XXVI nylon sling with a 3 ¾-inch, two-point link. Pad and tape the link with felt (not shown).
4. Safety tie the 3 ¾-inch, two-point link with a length of type III nylon cord to the ACS clevis. Ensure the tie is tight (not shown).
5. Repeat steps 1 through 4 on the front left side of the load using clevises 9A and 11A (not shown).
6. Repeat steps 1 through 4 for the rear of the load using clevises 22 and 25, and 22A and 25A.

Figure 10-24. Suspension Slings Installed and Secured



7 Route a 15-foot lashing from clevis 6 through the right front ACS clevis from outside to inside, rear to front and around the ACS 4- by 4-inch piece of lumber and back to clevis 6.

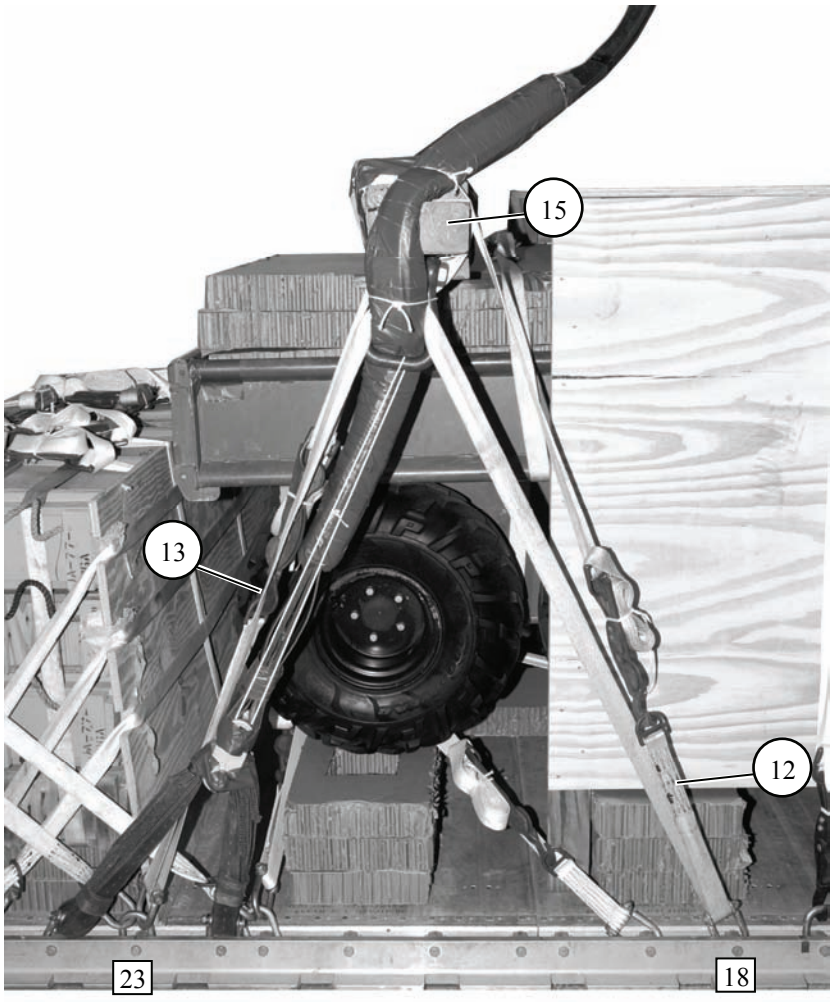
8 Repeat above step using clevis 8.

9 Route a 15-foot lashing from clevis 15 through the right front ACS clevis from outside to inside, front to rear and around the ACS 4- by 4-inch piece of lumber and back to clevis 15.

10 Repeat steps 7 and 9 on the left side of the load using clevises 6A, 8A, and 15A (not shown).

11 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: 6 and 6A, 8 and 8A and 15 and 15A.

Figure 10-24. Suspension Slings Installed and Secured (Continued)



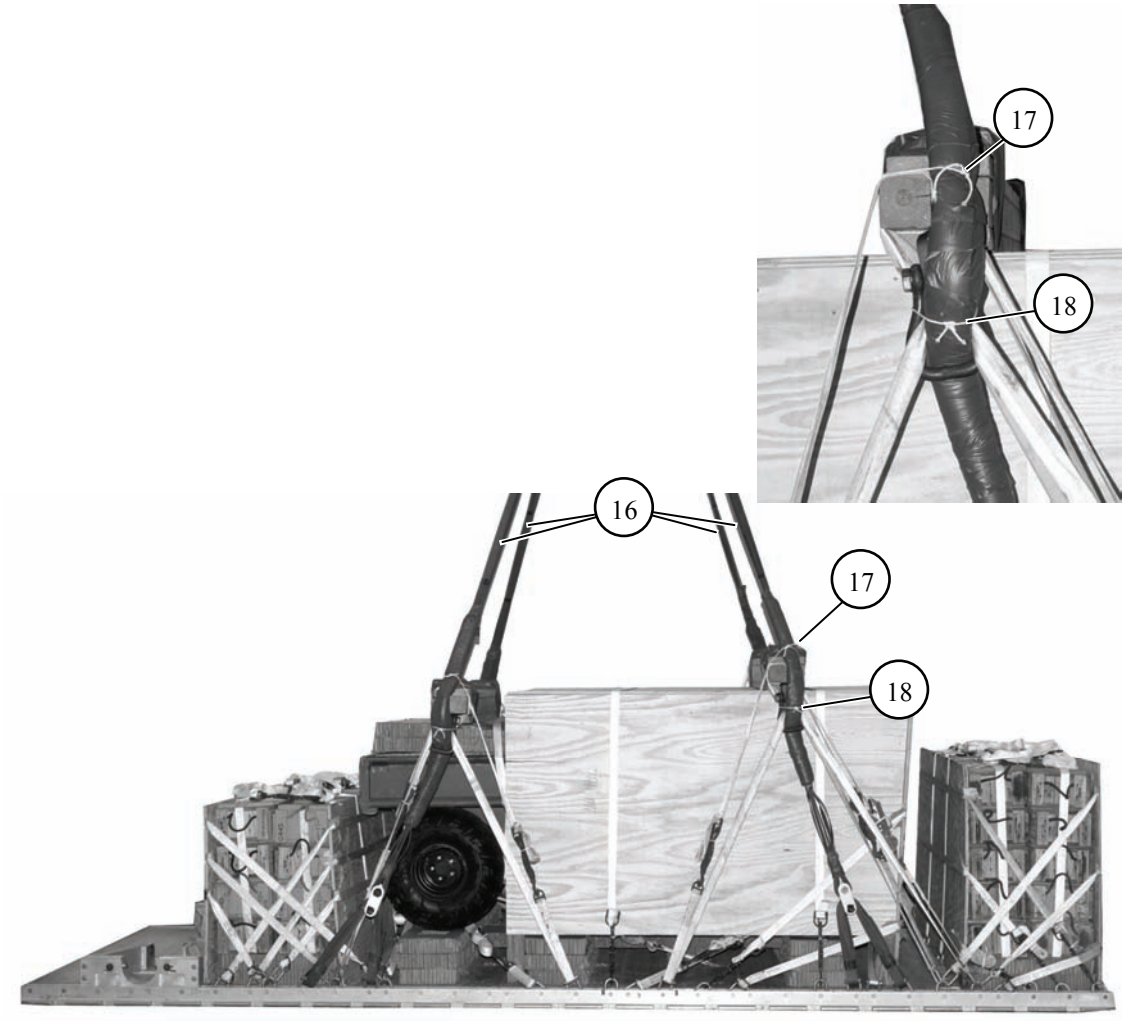
(12) Route a 15-foot lashing from clevis 18 through the right rear ACS clevis from outside to inside, rear to front and around the ACS 4- by 4-inch piece of lumber and back to clevis 18.

(13) Route a 15-foot lashing from clevis 23 through the right rear ACS clevis from outside to inside, front to rear and around the ACS 4- by 4-inch piece of lumber and back to clevis 23.

(14) Repeat steps 12 and 13 on the left side of the load using clevises 18A and 23A (not shown).

(15) 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: 18 and 18A, and 23 and 23A.

Figure 10-24. Suspension Slings Installed and Secured (Continued)



16 Extend the slings upward and remove all slack.

17 Tie a length of type III nylon cord around the 11-foot sling and the ACS sling.

18 Tie a length of type III nylon cord around the 11-foot (4 loop), type XXVI nylon sling, behind all lashings, and around the 4- by 4-inch piece of lumber of the ACS and tie the ends together.

19 Repeat steps 16 through 18 on all slings (not shown).

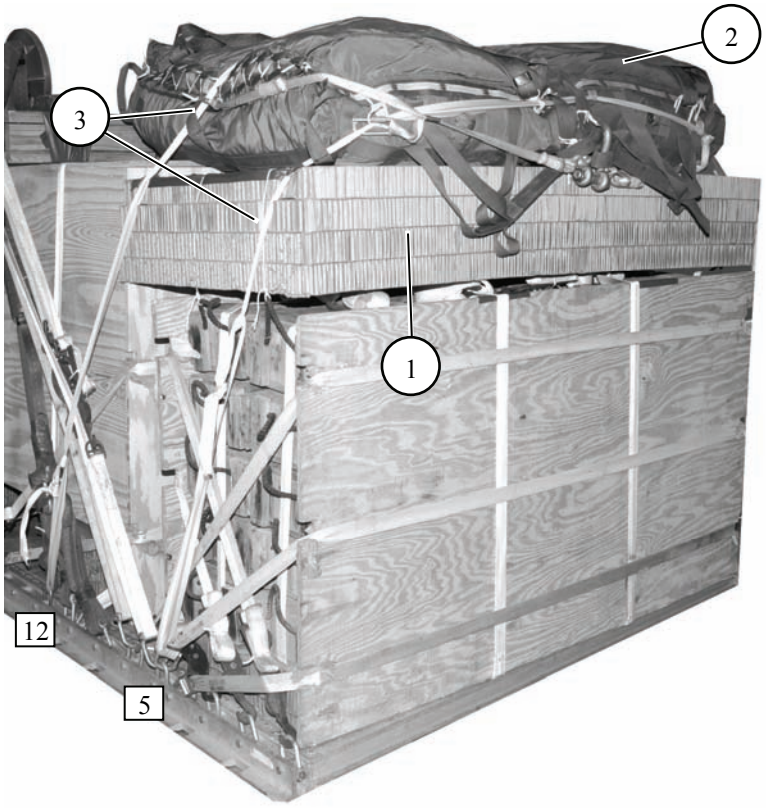
Figure 10-24. Suspension Slings Installed and Secured (Continued)

INSTALLING OUTRIGGER ASSEMBLIES

10-17. 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, Volume I, Figures 2-42 through 2-44 and Figure 2-45 Steps 1, 2, and 3.

STOWING CARGO PARACHUTES

10-18. Stow and restrain two G-11D cargo parachutes on top of the stowage platform as shown in Chapter 2, Volume I and Figure 10-25.



1. Cut and position four 36- by 78-inch pieces of honeycomb on top of the first ammunition stack with the rear edge against the M-Gator box. Secure the honeycomb to a convenient point on the load with type III nylon cord.
2. Prepare and install two G-11D cargo parachutes on top of the honeycomb as shown above and in Chapter 2, Volume I.
3. Restrain the parachutes as shown in Chapter 2, Volume I using type VIII nylon webbing tied to clevises 5 and 5A, and 12 and 12A.

Figure 10-25. Cargo Parachute Stowed

STOWING DEPLOYMENT PARACHUTE

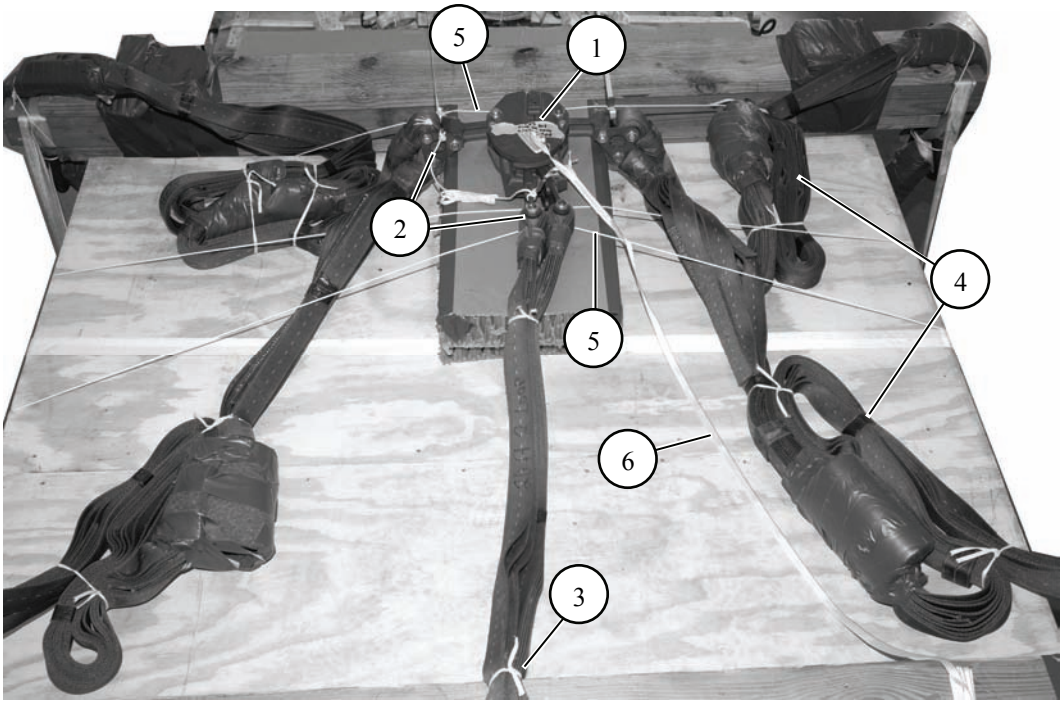
10-19. Prepare, stow and install the deployment parachute according to Chapter 2, Section V, Volume I and as shown in Figure 10-26.

(1) Prepare, stow and install the deployment parachute according to Chapter 2, Section V, Volume I and as shown above.

Figure 10-26. Deployment Parachute Installed

INSTALLING PARACHUTE RELEASE SYSTEM

10-20. Build an M-1 parachute release stack, prepare and install an M-1 parachute release system according to Chapter 2, Section VI, Volume I and as shown in Figure 10-27.



(1) Cut two 12- by 24-inch pieces of honeycomb and glue together. Tape the edges and position and center the honeycomb with the 12-inch side flush with M-Gator box. Secure the honeycomb to a convenient point on the load using type III nylon cord. Center the M-1 release on the honeycomb stack.

(2) Attach the 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) Secure the riser extensions in three places with type I, ¼-inch cotton webbing.

(4) S-fold the slack in the front and rear suspension slings and secure with type I, ¼-inch cotton webbing.

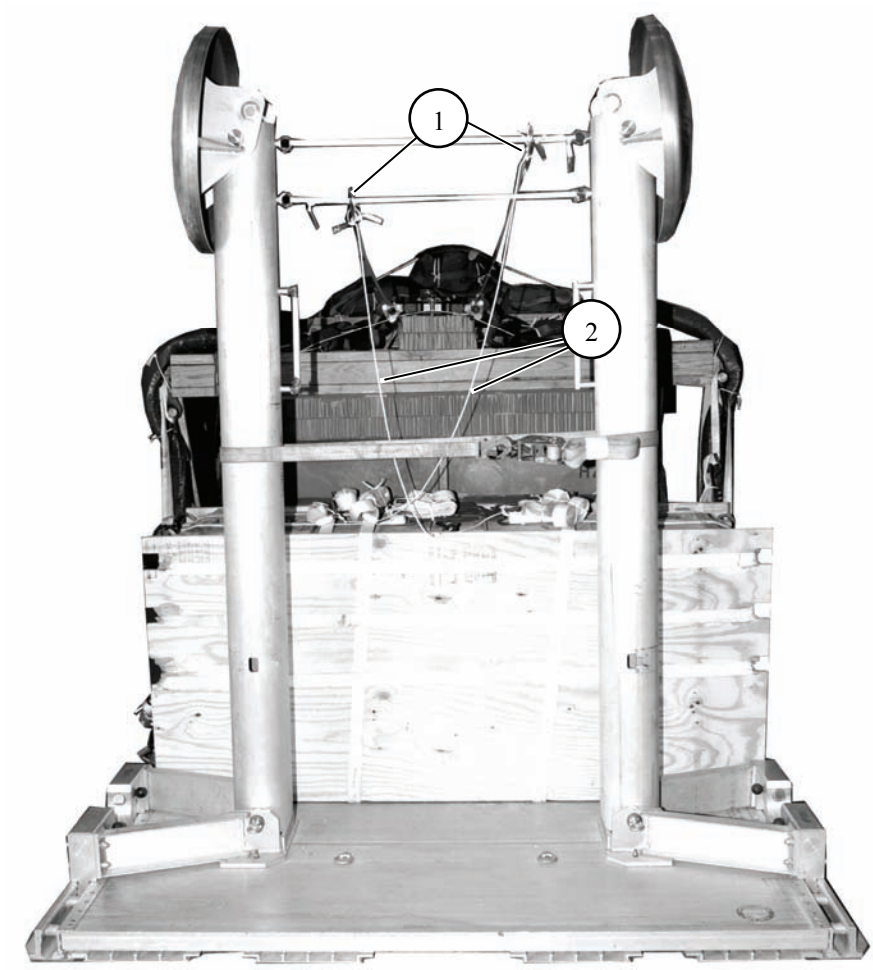
(5) Secure the release to convenient points on the load with type III nylon cord.

(6) Secure the arming wire and lanyard to a parachute carrying handle with three alternating half hitches and a knot in the running end.

Figure 10-27. M-1 Cargo Parachute Release Installed

INSTALLING MAST RELEASE KNIVES

10-21. Install the mast release knives as shown in Chapter 2, Volume I, Figure 2-45, steps 4 through 10 and as shown in Figure 10-28.



(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 release is 80 inches as shown in Figure 2-45, steps 5 and 6.

(2) Tie a length of type III nylon cord from the upper guillotine knife to a lashing on the left rear endboard of the second ammunition stack that measures 56 inches. Repeat for the lower guillotine knife attaching the type III nylon cord to a lashing on the left rear endboard of the second ammunition stack as shown in Figure 2-45, steps 9 and 10. Fold the slack in the type III nylon cord and tape with 2-inch masking tape.

Note. All measurements are from knot to knot.

Figure 10-28. Mast Release Knives Installed

MARKING RIGGED LOAD

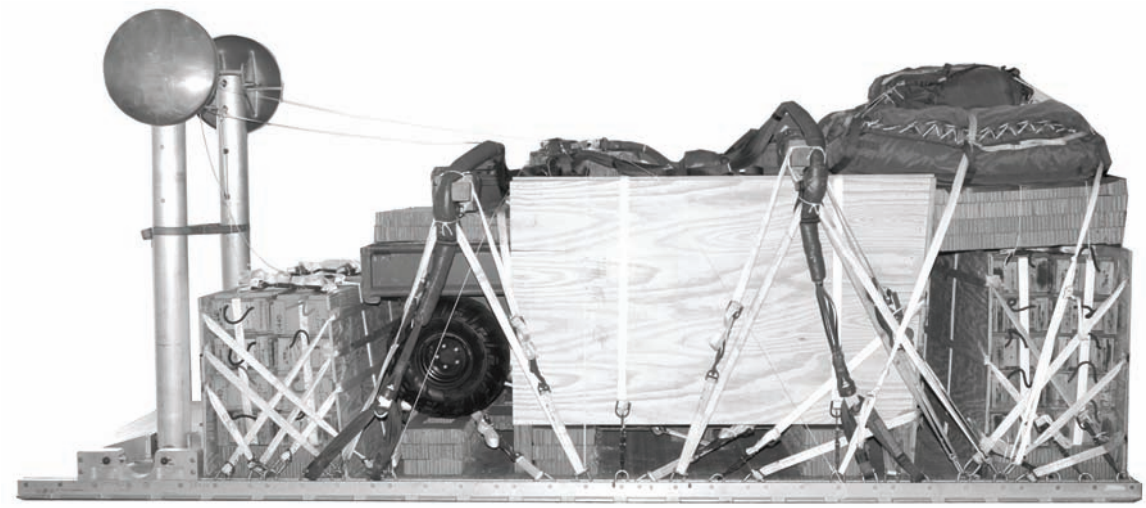
10-22. Mark the rigged load according to Chapter 2, Section IX, Volume I and as shown in Figure 10-29. A Shipper's Declaration for Dangerous Goods is required. If load varies from the one shown, the weight, height, CB and parachute requirements must be recomputed.

EQUIPMENT REQUIRED

10-23. The equipment required to rig this load is listed in Table 10-1.

CAUTION

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



RIGGED LOAD DATA

Weight: Load shown	8,650 pounds
Maximum load allowed	8,820 pounds
Height	97 inches
Width	94 inches
Overall Length	216 inches
Overhang: Front	0 inches
Rear	0 inches
Center of Balance: (from front edge of platform):	90 inches

Figure 10-29. M-Gator with Accompanying Load Rigged on DRAS Platform

Table 10-1. Equipment Required for Rigging M-Gator with Accompanying Load on DRAS Platform

National Stock Number	*Item*	*Quantity*
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	6 sheets
5315-00-010-4659	Nail, steel wire, common, 8d	As required
1670-00-753-3928	Pad, energy dissipating, honeycomb	12 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	68
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:	
1670-01-062-6303	12-foot (2-loop), type XXVI nylon webbing	4

Table 10-1. Equipment Required for Rigging M-Gator with Accompanying Load on DRAS Platform (Continued)

National Stock Number	*Item*	*Quantity*
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	64
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

This page intentionally left blank.

Chapter 11

Rigging the Mass Supply Load on Dual Row Airdrop System Platform

DESCRIPTION OF LOAD

11-1. The mass supply (fast box) load (Figure 11-1) is rigged on an 18-foot dual row platform. The rigged weight is 14,120 pounds. The load is rigged with two pre-constructed plywood boxes. The forward box (box 1) has a minimum weight of 3,500 pounds and a maximum weight of 6,000 pounds. The aft box (box 2) has a minimum weight of 2,800 pounds and a maximum weight of 5,000 pounds. The load is 97 inches high, 94 inches wide, 216 inches long, and the center of balance is 90 inches from the front edge of the platform. The load is rigged with two to four G-11D cargo parachutes. The M-1 release is used with this load. The minimum allowable weight is 8,100 and the maximum allowable weight is 14,500.

PREPARING PLATFORM

11-2. Inspect, or assemble and inspect, a dual row airdrop 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 11-2.

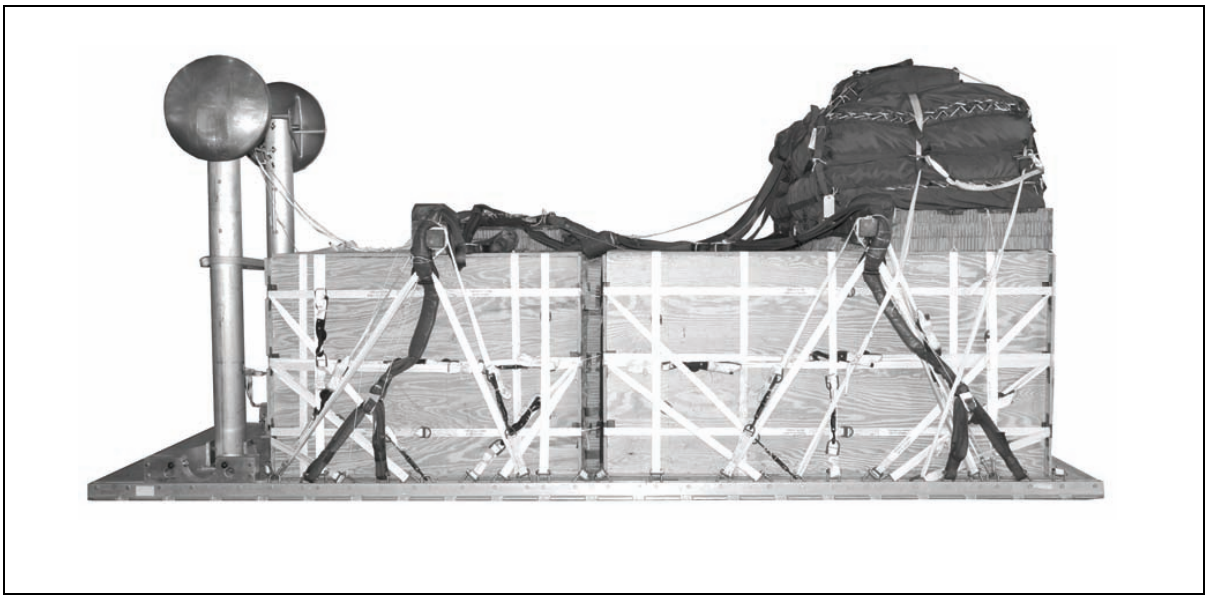
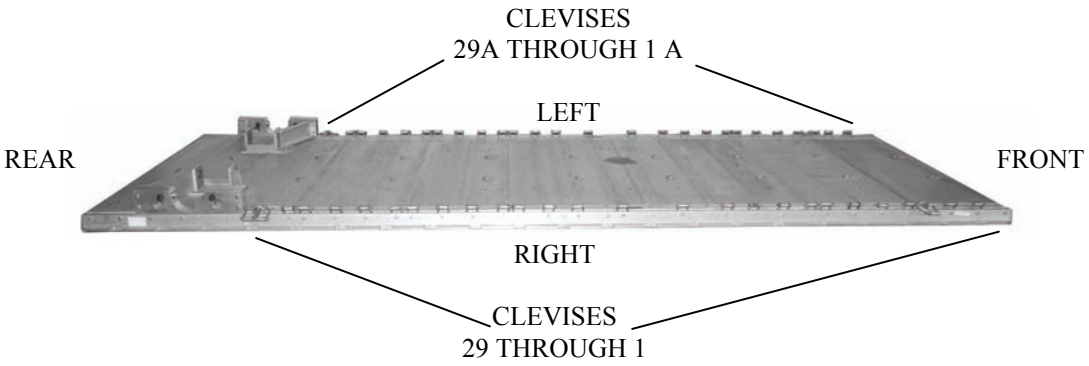
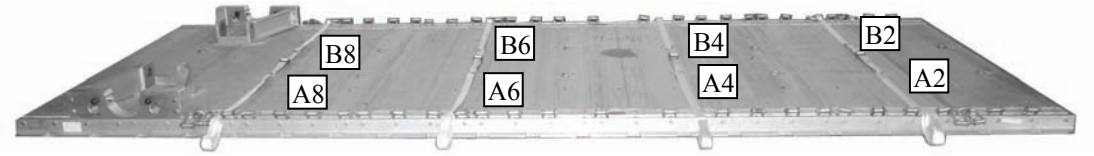


Figure 11-1. Mass Supply Load Rigged on DRAS Platform





Step:

1. Starting at the front of each platform side rail, install clevises on the bushings bolted on holes 2, 3, 4 (tripled), 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 16, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, and 30 (tripled).
2. Starting at the front of each platform side rail, 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.
4. Construct four 30-foot lashings. Route the free ends of the one 30-foot lashing through platform tie-down rings A2 and B2.
5. Route the free ends of one 30-foot lashing through tie down rings A4 and B4.
6. Route the free ends of one 30-foot lashing through tie down rings A6 and B6.
7. Route the free ends of one 30-foot lashing through tie down rings A8 and B8.

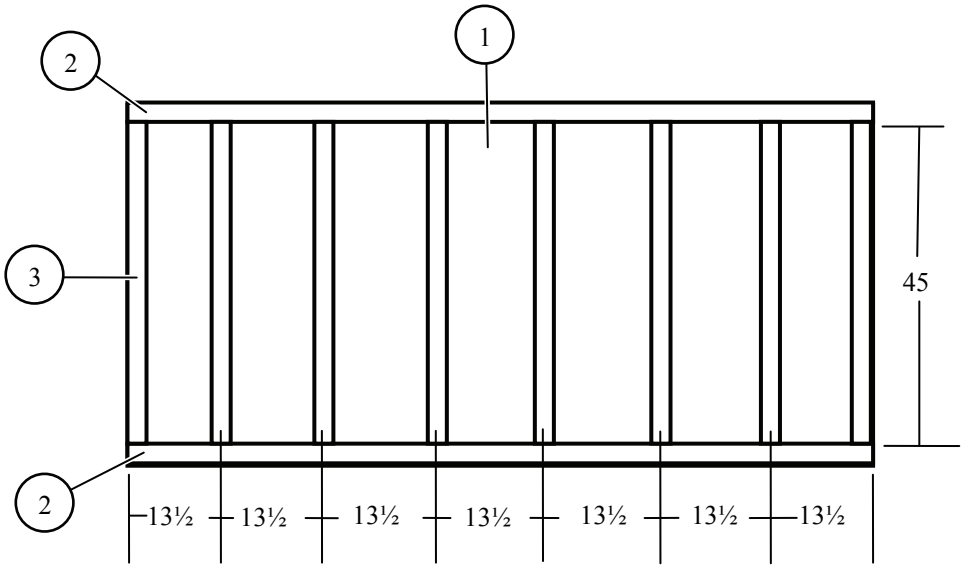
Figure 11-2. Platform Prepared

BUILDING AND POSITIONING THE MASS SUPPLY BOXES

11-3. Build and position each mass supply box according as described below:

- Build box 1 as shown in Figure 11-3.
- Build box 2 as shown in Figure 11-4.
- Position the boxes as shown in Figure 11-5.

Notes: 1. All dimensions are in inches.
2. Drawing is not drawn to scale.
3. Use 8d nails.

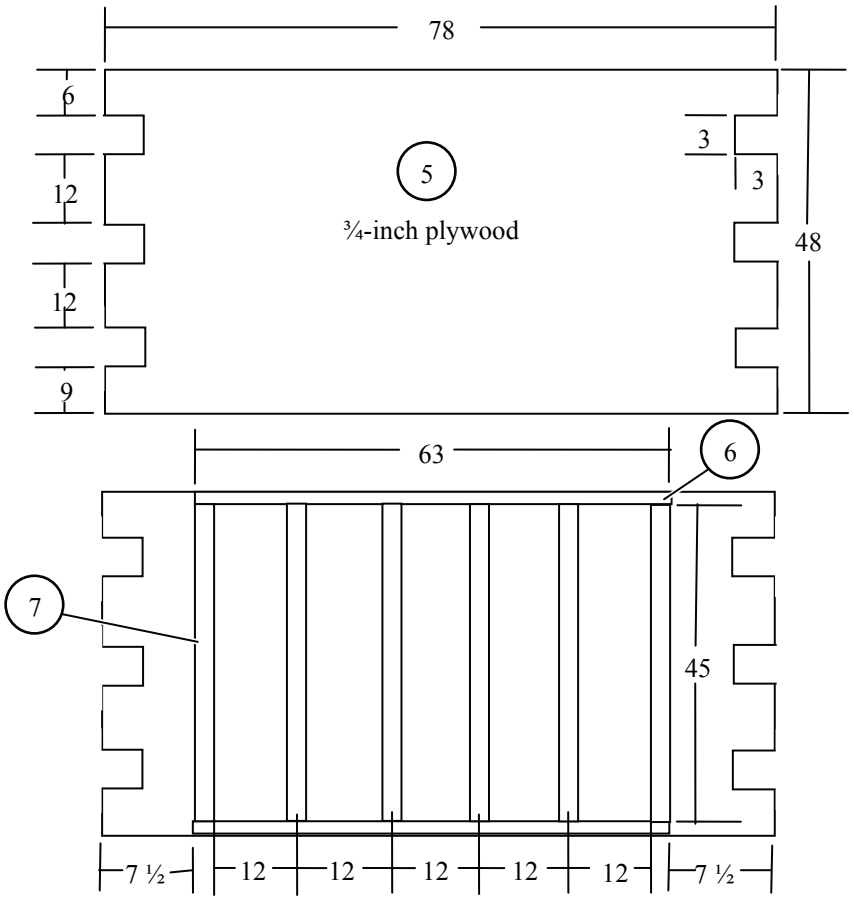


Building side boards:

1. Cut a 94 ½- by 48- by ¾-inch piece of plywood.
2. Cut two 2- by 4- by 94 ½-inch pieces of lumber. Position the 2-inch edge against the 94 ½-inch edge of the previously cut plywood. Nail in place from the plywood side.
3. Cut eight 2- by 4- by 45-inch pieces of lumber. Position two of the pieces with the 2-inch edge flush with the 48-inch plywood edge. Position the remaining six pieces 13 ½-inches from the outer edge of the previously positioned lumber. Nail evenly spaced in place from the plywood side.
4. Repeat steps 1 through 3.

Figure 11-3. Mass Supply Box 1 Built

Notes. 1. All dimensions are in inches.
2. Drawing is not drawn to scale.
3. Use 8d nails.



Building end boards:

(5) Cut a piece of 78- by 48- by ¾-inch plywood with cutouts as shown.

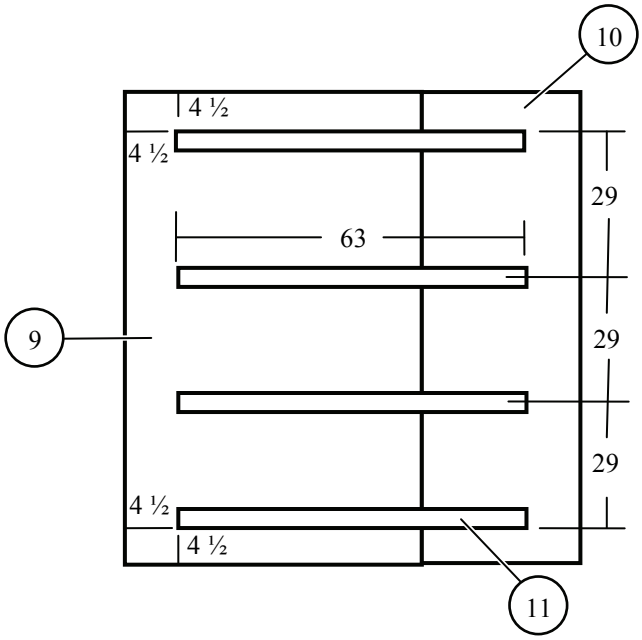
(6) Cut two pieces of 2- by 4- by 63-inch lumber and position the 2-inch edge flush against the 48-inch edge and 7 ½ inches from each end of the 48-inch edge of the previously cut plywood. Nail in place from the plywood side.

(7) Cut six pieces of 2- by 4- by 45-inch lumber and position two of the pieces with the 2-inch edge flush against the plywood and 7 ½ inches from the 48-inch plywood edge. Position the remaining four pieces evenly spaced 12 inches from the previously positioned lumber. Nail in place from the plywood side.

(8) Repeat steps 5 through 7.

Figure 11-3. Mass Supply Box 1 Built (Continued)

Notes. 1. All dimensions are in inches.
2. Drawing is not drawn to scale.
3. Use 8d nails.



Building bottom board:

9 Cut a 48- by 96- by ¾-inch piece of plywood.

10 Cut a 24- by 96- by ¾-inch piece of plywood and position it flush against the 96-inch edge of the previously cut piece of plywood.

11 Cut four 2- by 4- by 63-inch pieces of lumber. Position each piece as shown with 4 inch side against the plywood.

Assembling the mass supply box:

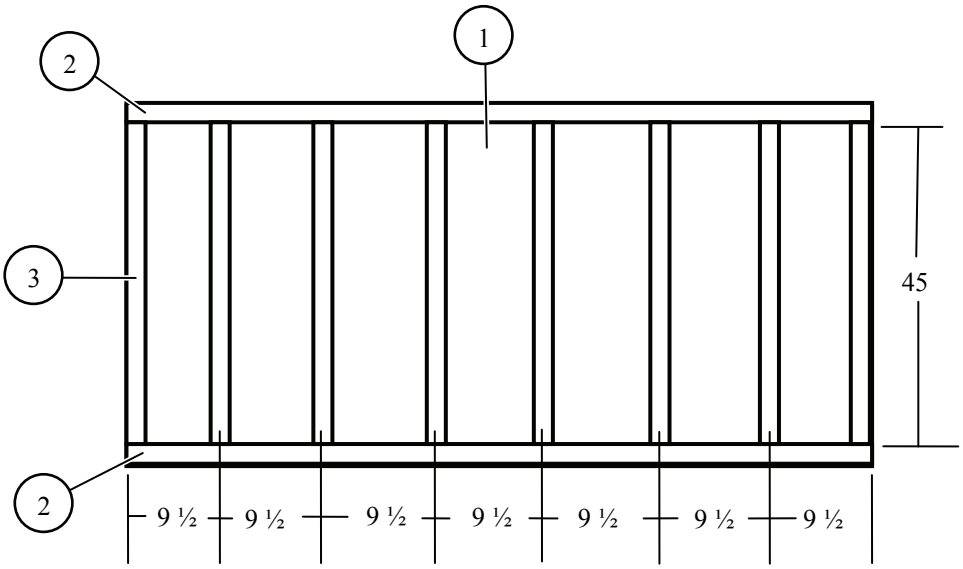
12 Nail the assembled sides to the front and rear endboards. Nail through the plywood side of the front and rear endboards into the 2- by 4- by 45-inch piece of lumber (not shown).

13 Turn the assembled pieces on their side. Nail the assembled bottom from the plywood side to the side and endboards 2- by 4-inch piece of lumber (not shown).

Note. The top will be assembled later in the rigging procedures.

Figure 11-3. Mass Supply Box 1 Built (Continued)

Notes. 1. All dimensions are in inches.
2. Drawing is not drawn to scale.
3. Use 8d nails.

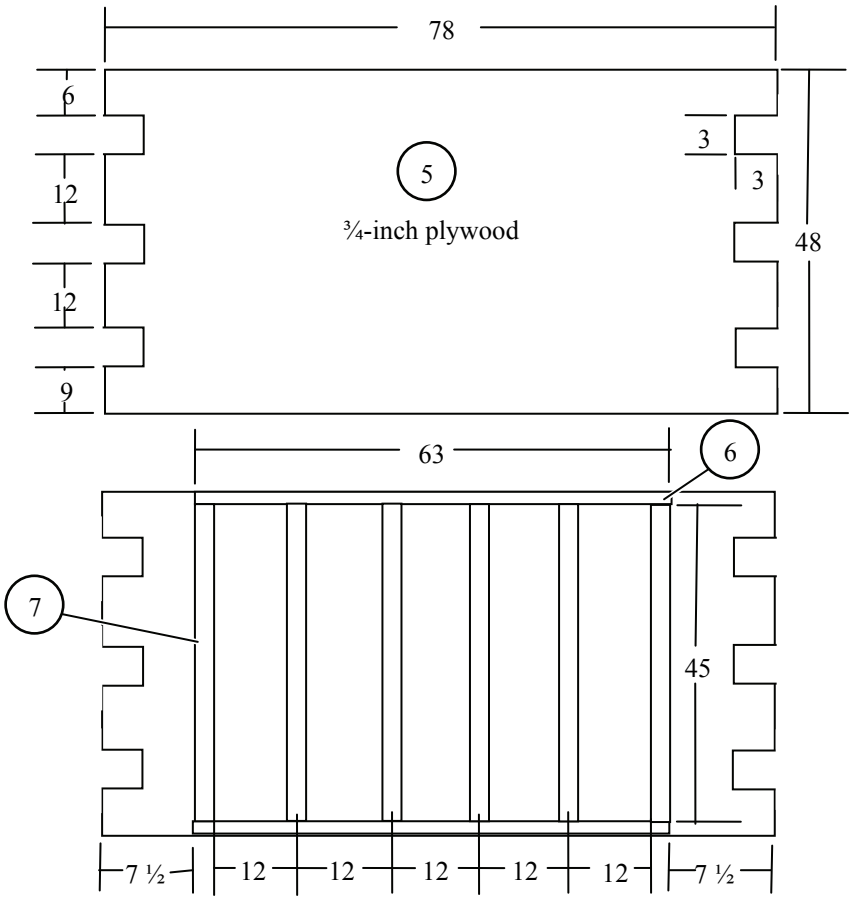


Building side boards:

1. Cut a 66 ½- by 48- by ¾-inch piece of plywood.
2. Cut two 2- by 4- by 66 ½-inch pieces of lumber. Position the 2-inch edge against the 66 ½-inch edge of the previously cut plywood. Nail in place from the plywood side.
3. Cut eight 2- by 4- by 45-inch pieces of lumber. Position two of the pieces with the 2-inch edge flush with the 48-inch plywood edge. Position the remaining six pieces evenly spaced 9 ½-inches from the outer edge of the previously positioned lumber. Nail in place from the plywood side.
4. Repeat steps 1 through 3.

Figure 11-4. Mass Supply Box 2 Built

Notes. 1. All dimensions are in inches.
2. Drawing is not drawn to scale.
3. Use 8d nails.



Building endboards:

5 Cut a piece of 78- by 48- by ¾-inch plywood with cutouts as shown.

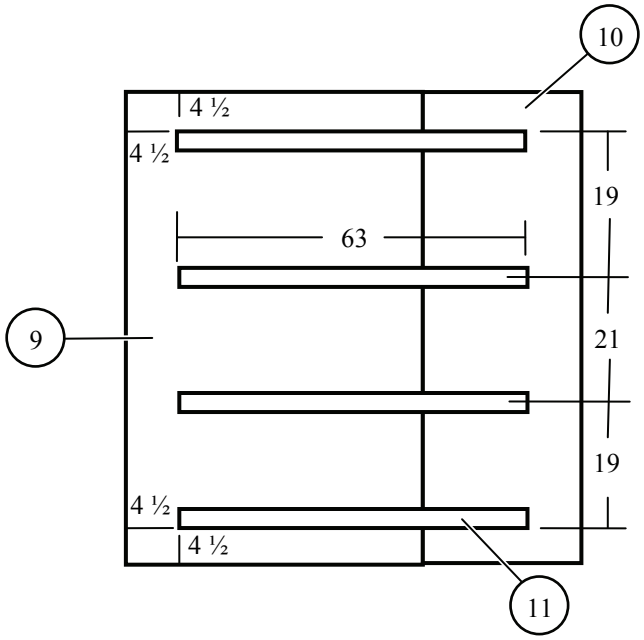
6 Cut two pieces of 2- by 4- by 63-inch lumber and position the 2-inch edge flush against the 48-inch edge and 7 ½ inch from each end of the 48-inch edge of the previously cut plywood. Nail in place from the plywood side.

7 Cut six pieces of 2- by 4- by 45-inch lumber and position two of the pieces with the 2-inch edge flush against the plywood and 7 ½ inches from the 48-inch plywood edge. Position the remaining four pieces evenly spaced 12 inches from the previously positioned lumber. Nail in place from the plywood side.

8 Repeat steps 5 through 7.

Figure 11-4. Mass Supply Box 2 Built (Continued)

Notes. 1. All dimensions are in inches.
2. Drawing is not drawn to scale.
3. Use 8d nails.



Building bottom board:

(9) Cut a 48- by 68- by ¾-inch piece of plywood.

(10) Cut a 24- by 68- by ¾-inch piece of plywood and position it flush against the 68-inch edge of the previously cut piece of plywood.

(11) Cut four 2- by 4- by 63-inch pieces of lumber. Position each piece as shown with 4 inch side against the plywood.

Assembling the mass supply box:

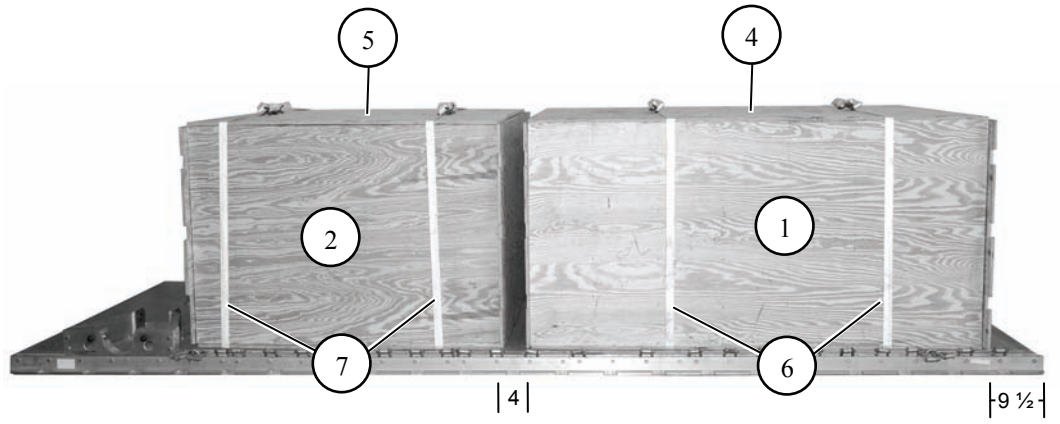
(12) Nail the assembled sides to the front and rear endboards. Nail through the plywood side of the front and rear endboards into the 2- by 4- by 45-inch piece of lumber (not shown).

(13) Turn the assembled pieces on their side. Nail the assembled bottom from the plywood side to the side and endboards 2- by 4-inch pieces of lumber (not shown).

Note. The top will be assembled later in the rigging procedures.

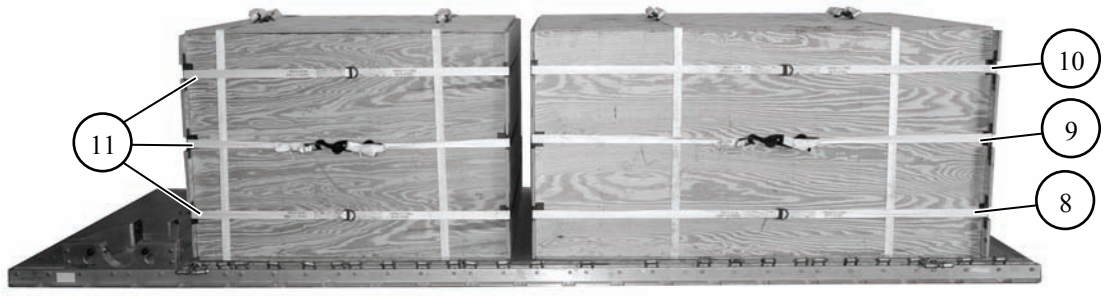
Figure 11-4. Mass Supply Box 2 Built (Continued)

Note. Pad and tape all cutouts on both boxes.



1. Position mass supply box 1 on top of the first and second pre-positioned lashings 9 ½ inches from the front edge of the platform and centered.
2. Position mass supply box 2 on top of the third and fourth pre-positioned lashings 4 inches from the rear of mass supply box 1 and centered.
3. Fill the boxes with items so that the minimum and maximum weights are met for each box. Pad the items with honeycomb or cellulose wadding as needed. Fill empty space with honeycomb to prevent the load from shifting (not shown).
4. Cut a 48- by 96- by ¾-inch piece of plywood and a 24- by 96- by ¾-inch piece of plywood for the top of mass supply box 1. Nail each piece of plywood on top of mass supply box 1 using 8d nails.
5. Cut a 48- by 64- by ¾-inch piece of plywood and a 24- by 68- by ¾-inch piece of plywood for the top of mass supply box 2. Nail each piece of plywood on top of mass supply box 2 using 8d nails.
6. Secure the first and second pre-positioned lashings on top of mass supply box 1 using four D-rings and two load binders.
7. Secure the third and fourth pre-positioned lashings on top of mass supply box 2 using four D-rings and two load binders.

Figure 11-5. Mass Supply Boxes Positioned



8 Form six 30-foot lashings. Route one 30-foot lashing horizontally through the bottom cutouts of mass supply box 1. Secure the lashing using two D-rings and a load binder on the left side of the box.

9 Route one 30-foot lashing horizontally through the middle cutouts of mass supply box 1. Secure the lashings using two D-rings and a load binder on the right side of mass supply box 1.

10 Route one 30-foot lashing horizontally through the top cutouts of mass supply box 1. Secure the lashing using two D-rings and a load binder on the left side of mass supply box 1.

11 Route and secure the remaining three 30-foot lashings using the procedures from steps 8 through 10 for mass supply box 2.

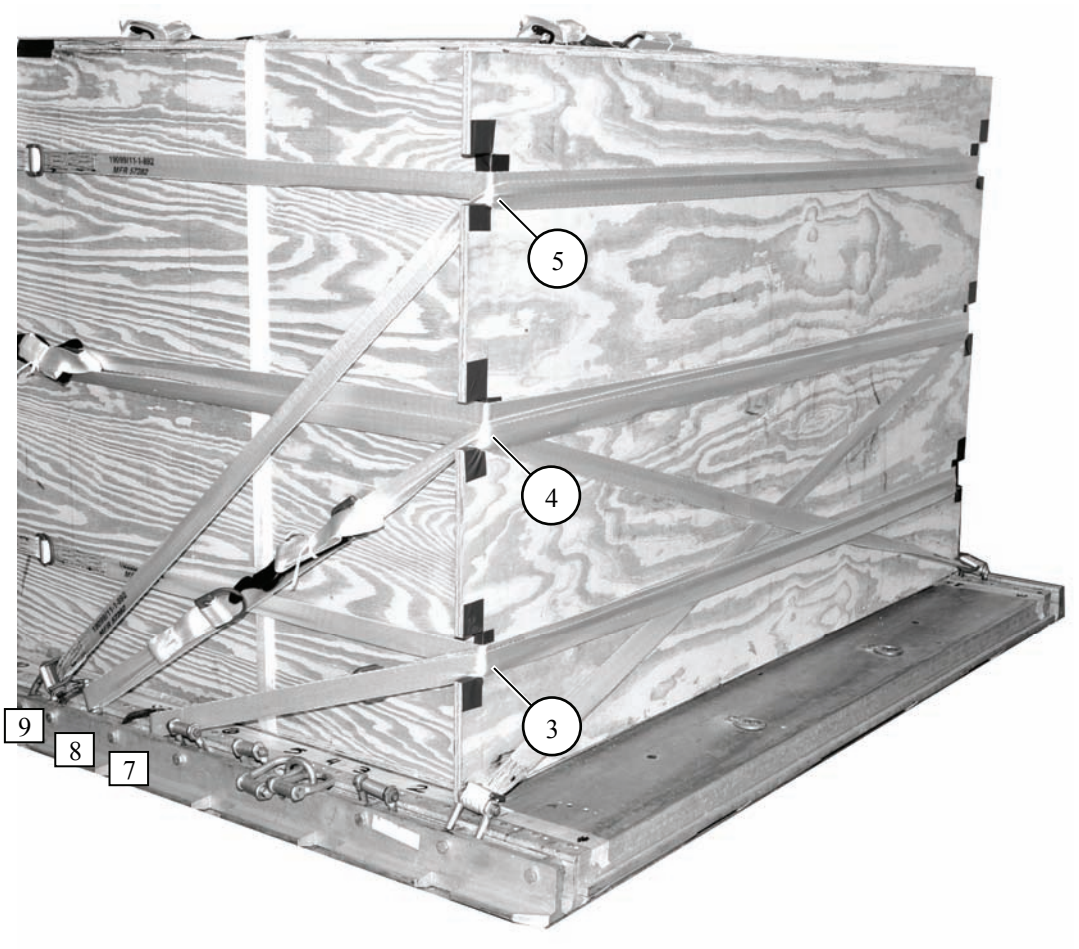
Figure 11-5. Mass Supply Boxes Positioned (Continued)

INSTALLING LASHING ON MASS SUPPLY BOXES

11-4. Install lashings as shown in Figures 11-6 through 11-13.

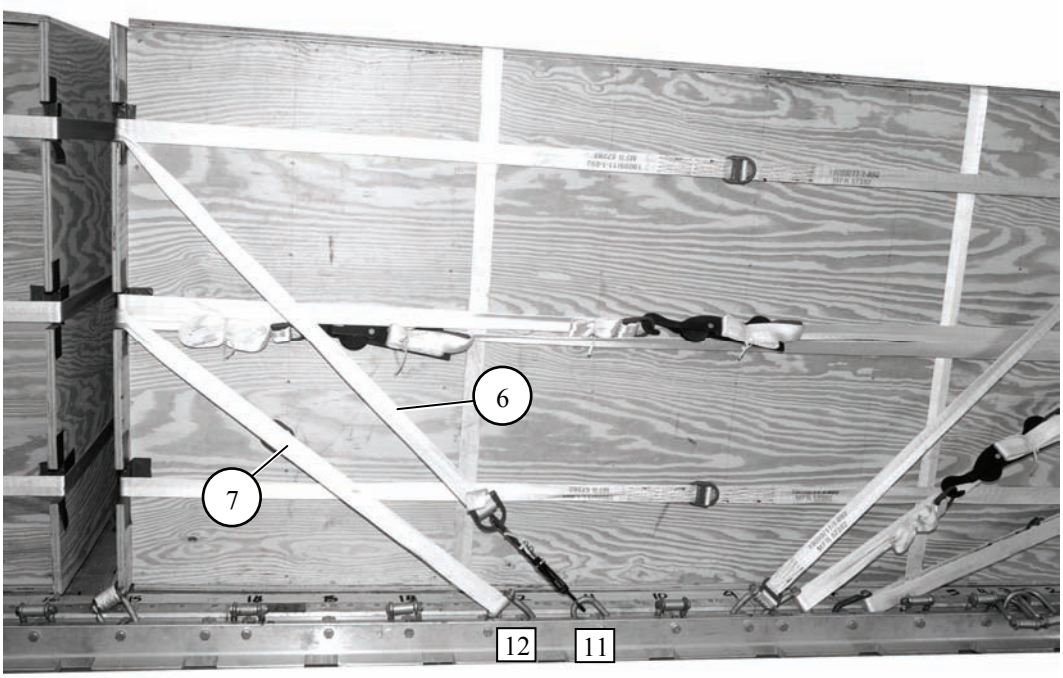
Lashing Number	*Tiedown Clevis Number*	*Instructions*
1	1 and 15	Route a 15-foot lashing through clevis 1 and through its own D-ring. Route the lashing through the front left middle cutout of box 1. Route a 15-foot lashing through clevis 15 and through its own D-ring. Route the lashing through the rear left middle cutout of box 1. Secure the free ends of each lashing on the left rear side of box 1 using two D-rings and a load binder.
2	1A and 15A	Route a 15-foot lashing through clevis 1A and through its own D-ring. Route the lashing through the front right middle cutout of box 1. Route a 15-foot lashing through clevis 15A and through its own D-ring. Route the lashing through the rear right middle cutout of box 1. Secure the free ends of the lashings on the right rear side of box 1 using two D-rings and a load binder.

Figure 11-6. Lashings 1 and 2 Installed



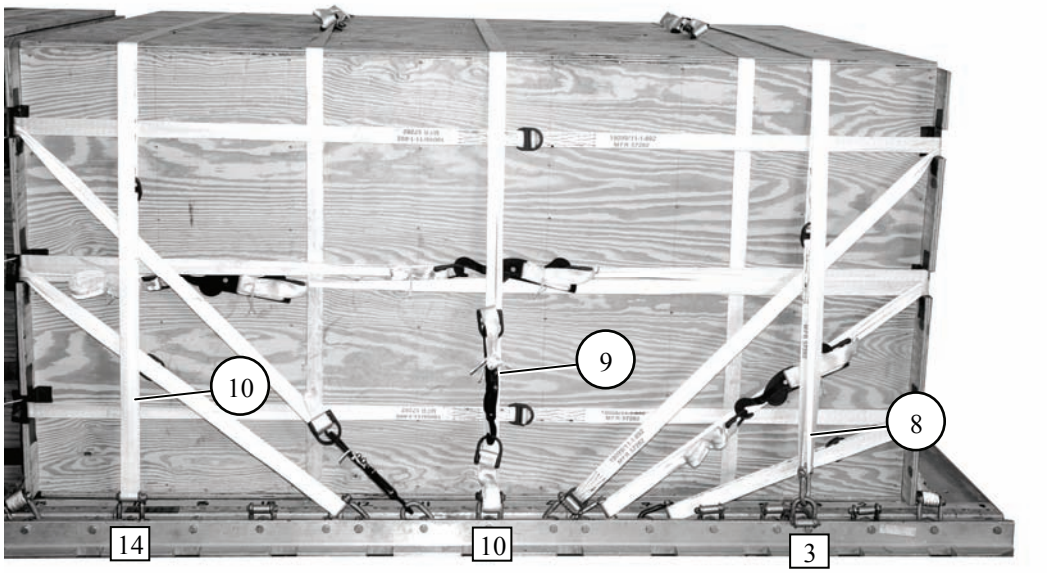
Lashing Number	*Tiedown Clevis Number*	*Instructions*
3	7 and 7A	Form a 30-foot lashing. Route the free of the ends lashing through the front bottom cutouts of box 1 and through clevises 7 and 7A. Route the free end from clevis 7 through both front bottom cutouts and secure with two D-rings and a load binder on the left side of box 1.
4	8 and 8A	Form a 30-foot lashing. Route the free ends of the lashing through the front middle cutouts of box 1 and through clevises 8 and 8A. Route the free end from clevis 8A through both front middle cutouts and secure with two D-rings and a load binder on the right side of box 1.
5	9 and 9A	Route a 15-foot lashing through clevis 9 and through its own D-ring. Route the lashing through both front top cutouts of box 1. Secure the lashing with a D-ring and a load binder to clevis 9A.

Figure 11-7. Lashings 3 Through 5 Installed



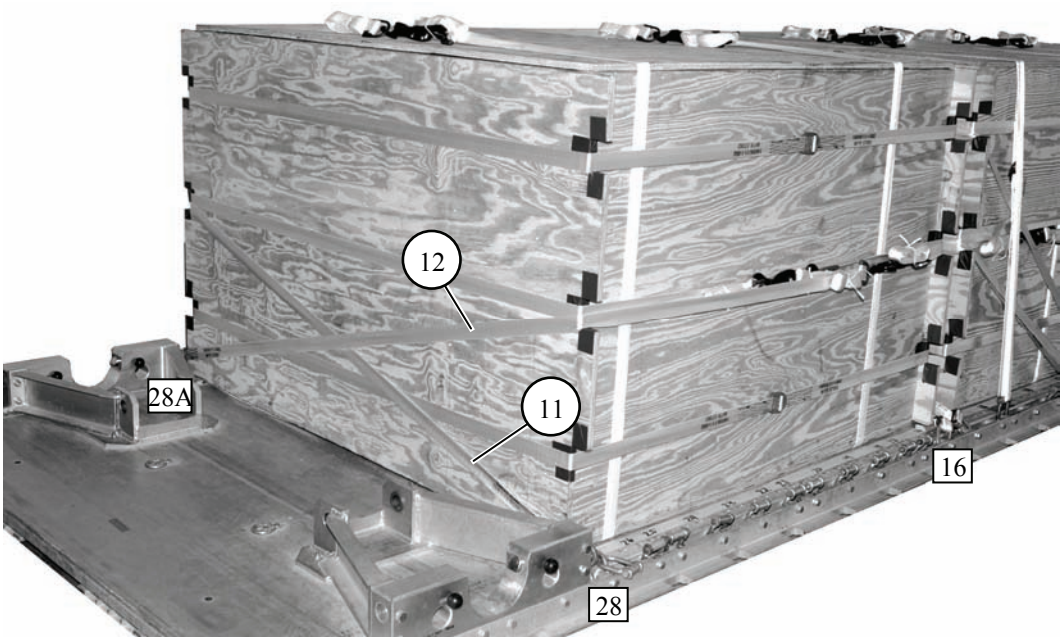
Lashing Number	*Tiedown Clevis Number*	*Instructions*
6	11 and 11A	Route a 15-foot lashing through clevis 11A and through its own D-ring. Route the free end through both rear top cutouts of box 1. Secure the lashing with a load binder and D-ring to clevis 11.
7	12 and 12A	Form a 30-foot lashing. Route the free ends of the lashing through the rear middle cutouts of box 1 and through clevises 12 and 12A. Route the free end from clevis 12 through both middle cutouts and secure with two D-rings and a load binder on the left side of box 1.

Figure 11-8. Lashings 6 and 7 Installed



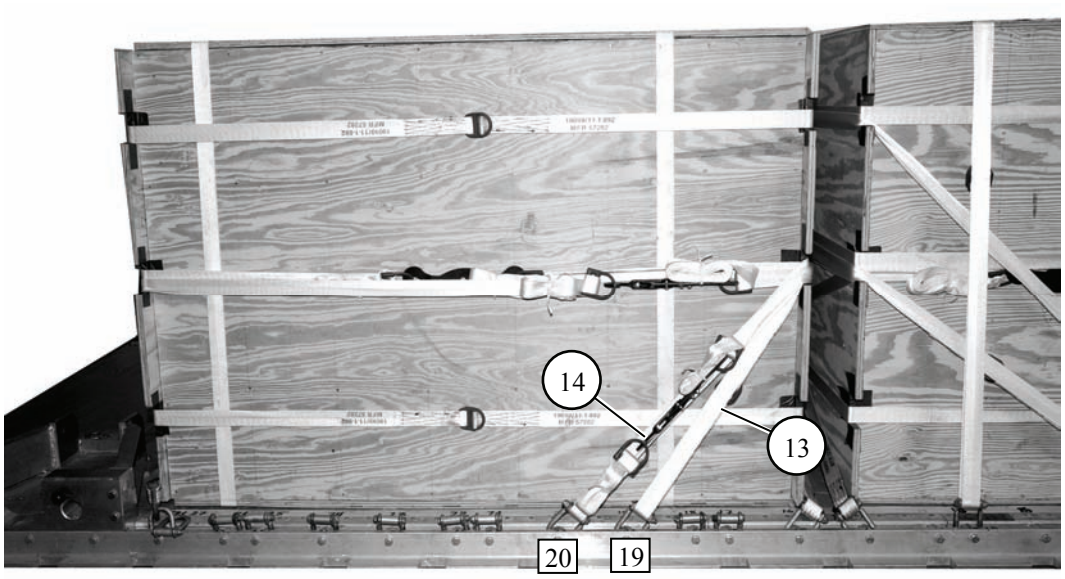
Lashing Number	*Tiedown Clevis Number*	*Instructions*
8	3 and 3A	Form a 30-foot lashing. Route the free ends through clevises 3 and 3A. Secure the free ends of the 30-foot lashing on the left side of box 1 with two D-rings and a load binder.
9	10 and 10A	Form a 30-foot lashing. Route the free ends through clevises 10 and 10A. Secure the free ends of the 30-foot lashing on the right side of box 1 with two D-rings and a load binder.
10	14 and 14A	Form a 30-foot lashing. Route the free ends through clevises 14 and 14A. Secure the free ends of the 30-foot lashing on the left side of box 1 with two D-rings and a load binder.

Figure 11-9. Lashings 8 Through 10 Installed



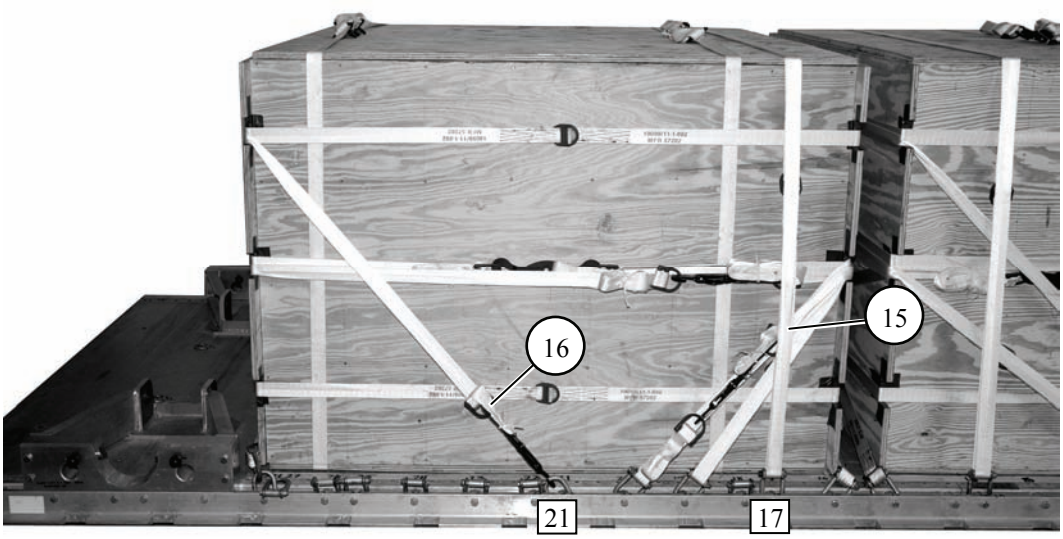
Lashing Number	*Tiedown Clevis Number*	*Instructions*
11	16 and 28	Route a 15-foot lashing through clevis 16 and through its own D-ring. Route the lashing through the front left middle cutout of box 2. Route a 15-foot lashing through clevis 28 and through its own D-ring. Route the lashing through the rear left middle cutout of box 2. Secure the free ends of the lashings on the front left side of box 2 using two D-rings and a load binder.
12	16A and 28A	Route a 15-foot lashing through clevis 16A and through its own D-ring. Route the lashing through the front right middle cutout of box 2. Route a 15-foot lashing through clevis 28A and through its own D-ring. Route the lashing through the rear right middle cutout of box 2. Secure the free ends of the lashings on the front right side of box 2 using two D-rings and a load binder.

Figure 11-10. Lashings 11 and 12 Installed



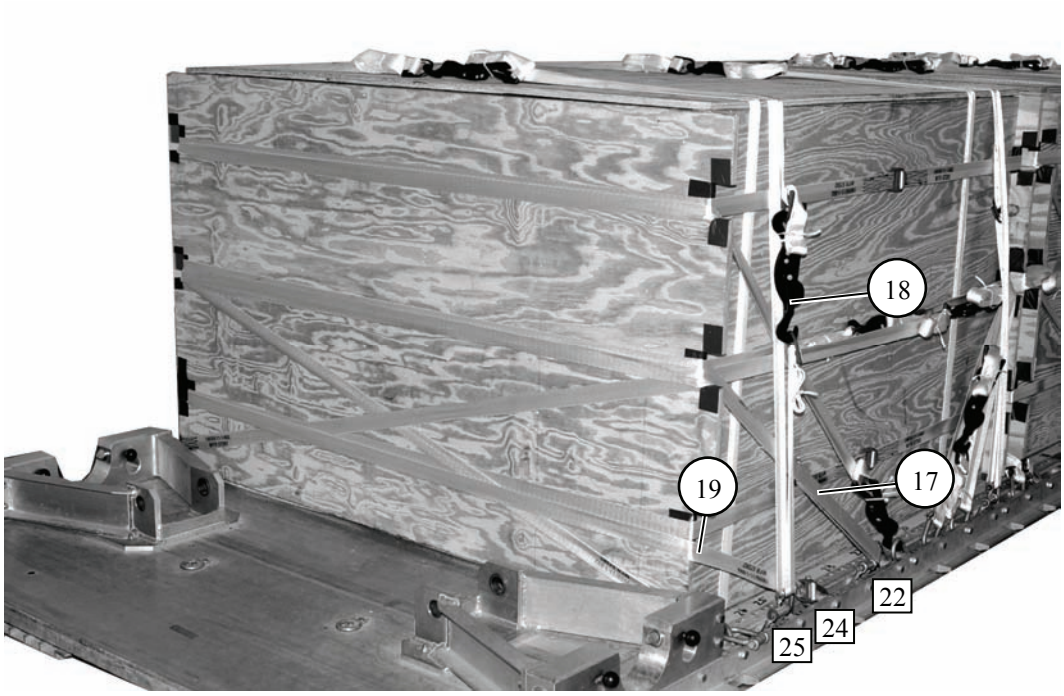
Lashing Number	*Tiedown Clevis Number*	*Instructions*
13	19 and 19A	Form a 30-foot lashing. Route the free ends of the lashing through the front middle cutouts of box 2, and through clevises 19 and 19A. Route the free end from clevis 19 through both middle cutouts and secure with two D-rings and a load binder on the left side of box 2.
14	20 and 20A	Form a 30-foot lashing. Route the free ends of the lashing through the front middle cutouts of box 2 and through clevises 20 and 20A. Route the free end from clevis 20A through both middle cutouts and secure with two D-rings and a load binder on the right side of box 2.

Figure 11-11. Lashings 13 and 14 Installed



Lashing Number	*Tiedown Clevis Number*	*Instructions*
15	17 and 17A	Form a 30-foot lashing. Route the free ends through clevises 17 and 17A. Secure the free ends of the 30-foot lashing on the left side of box 2 with two D-rings and a load binder.
16	21A and 21	Route a 15-foot lashing through clevis 21A and through its own D-ring. Route the lashing through both rear top cutouts of the box 2. Secure the lashing with a D-ring and a load binder to clevis 21.

Figure 11-12. Lashings 15 and 16 Installed

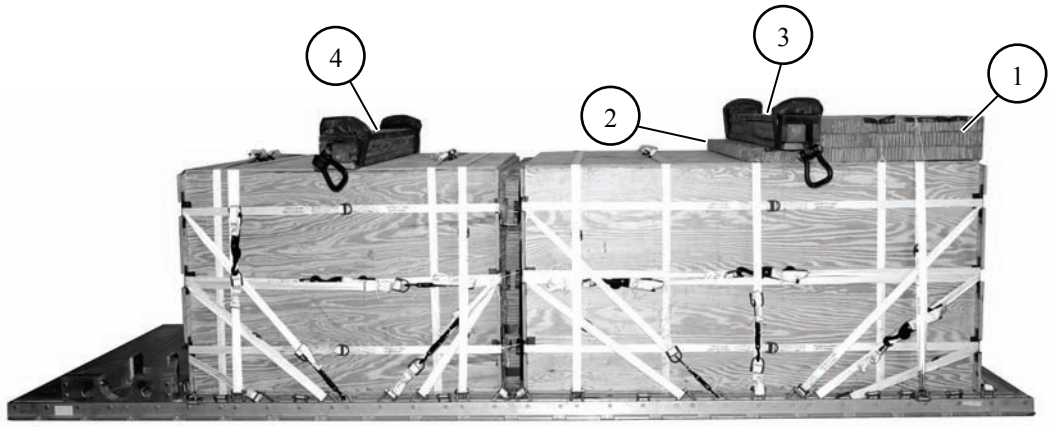


Lashing Number	*Tiedown Clevis Number*	*Instructions*
17	22 and 22A	Form a 30-foot lashing. Route the free ends of the lashing through the rear middle cutouts of box 2, and through clevises 22 and 22A. Route the free end from clevis 22 through both middle cutouts and secure with two D-rings and a load binder on the left side of box 2.
18	24 and 24A	Route a 15-foot lashing through clevis 24 and through its own D-ring. Route the lashing through both rear bottom cutouts of box 2. Secure the lashing with a load binder and D-ring to clevis 24A.
19	25 and 25A	Form a 30-foot lashing. Route the free ends through clevises 25 and 25A. Secure the free ends of the 30-foot lashing on the right side of box 2 with two D-rings and a load binder.
Note. Fill the space between box 1 and box 2 with honeycomb and cellulose wadding. Secure with type III nylon webbing.		

Figure 11-13. Lashings 17 Through 19 Installed

INSTALLING THE ATTITUDE CONTROL SYSTEM (ACS) AND SUSPENSION SLINGS

11-5. Construct, inspect and position the ACS according to Chapter 2, Volume I and as shown in Figure 11-14. Install the suspension slings and secure the ACS according to Chapter 2, Volume I and as shown in Figure 11-15.



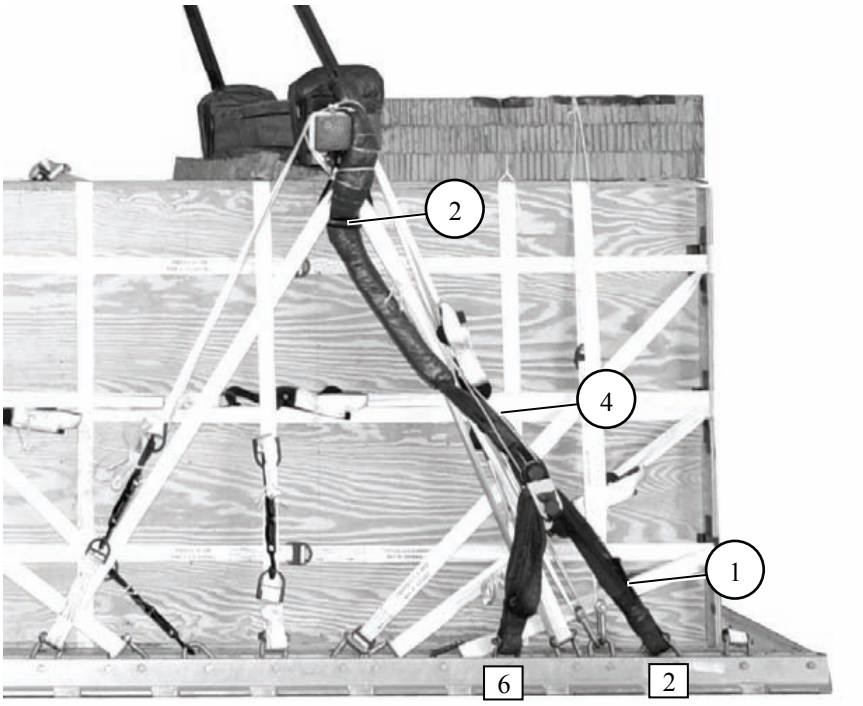
1. Cut three pieces of 36- by 72-inch honeycomb. Position the three pieces on top of one another and flush with the front edge of box 1. Secure the pieces in place with two lengths of type III, nylon cord to a convenient point on the load. Tape the edges where the cord makes contact with the honeycomb.

2. Cut a 12 ½- by 72-inch piece of honeycomb. Position the piece to the rear of the 36- by 72-inch honeycomb previously installed.

3. Position the front ACS on top of the 12 ½- by 72-inch piece of honeycomb on box 1. The ACS will set flush against the 36- by 72-inch piece of honeycomb with the 4- by 4-inch piece of lumber to the rear.

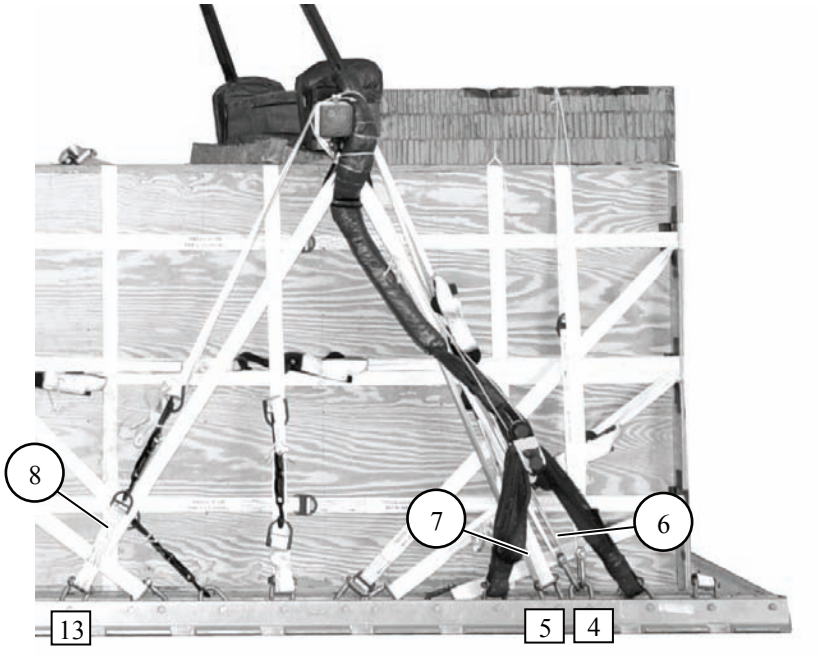
4. Position the rear ACS on top of box 2, 32 inches from the rear edge and centered with the 4- by 4-inch piece of lumber to the front.

Figure 11-14. ACS Positioned



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

Figure 11-15. Suspension Slings Installed and Secured



6 Route a 15-foot lashing from clevis 4 through the right front ACS clevis from outside to inside, rear to front and around the ACS 4- by 4-inch piece of lumber and back to clevis 4.

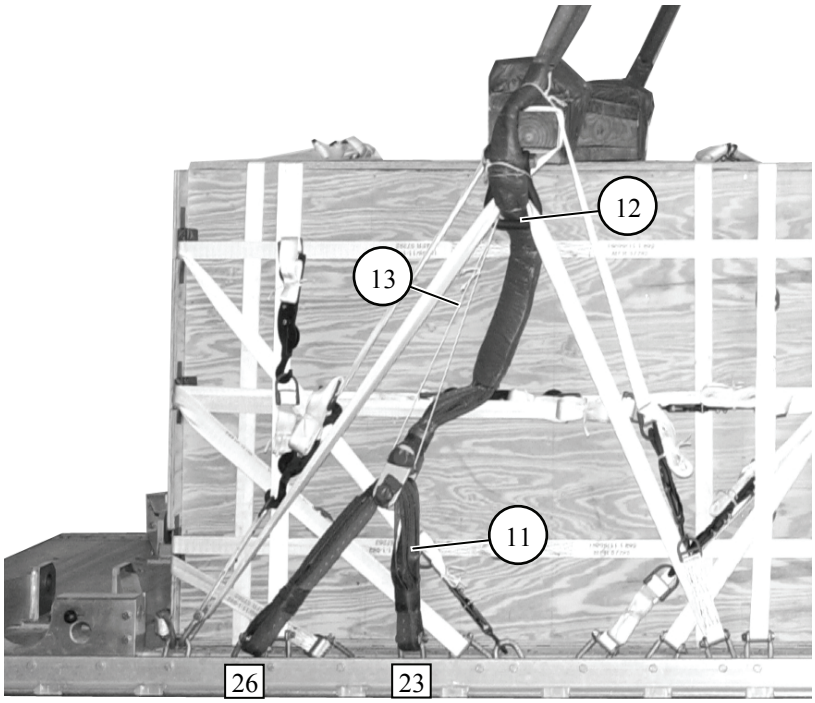
7 Repeat above step using clevis 5.

8 Route a 15-foot lashing from clevis 13 through the right front ACS clevis from outside to inside, front to rear and around the ACS 4- by 4-inch piece of lumber and back to clevis 13.

9 Repeat steps 6 through 8 on the left side of the load using clevises 4A, 5A, and 13A (not shown).

10 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: 4 and 4A, 5 and 5A and 13 and 13A.

Figure 11-15. Suspension Slings Installed and Secured (Continued)



(11) Install a 3-foot (4-loop), type XXVI nylon sling to clevises 23 and 26. Connect an 11-foot (4-loop), type XXVI nylon sling to the center of the sling with a 3 ¾-inch, two-point link.

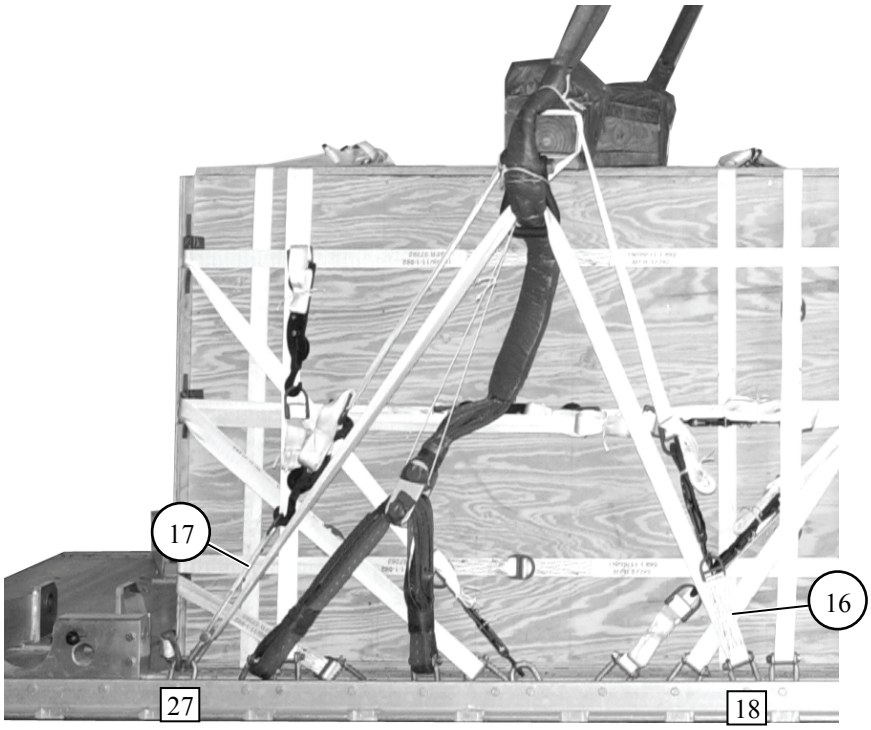
(12) Route the sling through the clevis on the right rear ACS. Pad and tape the 11-foot (4 loop), type XXVI nylon sling with felt from a point 6 inches below the clevis to a point 6 inches above the ACS.

(13) Safety tie the 3 ¾-inch, two-point link to the ACS clevis using one-turn single, 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 (4 loop), type XXVI nylon sling with a 3 ¾-inch, two-point link. Pad and tape the link with felt (not shown).

(15) Repeat steps 11 through 14 on the left side of the load using clevises 23A and 26A.

Figure 11-15. Suspension Slings Installed and Secured (Continued)



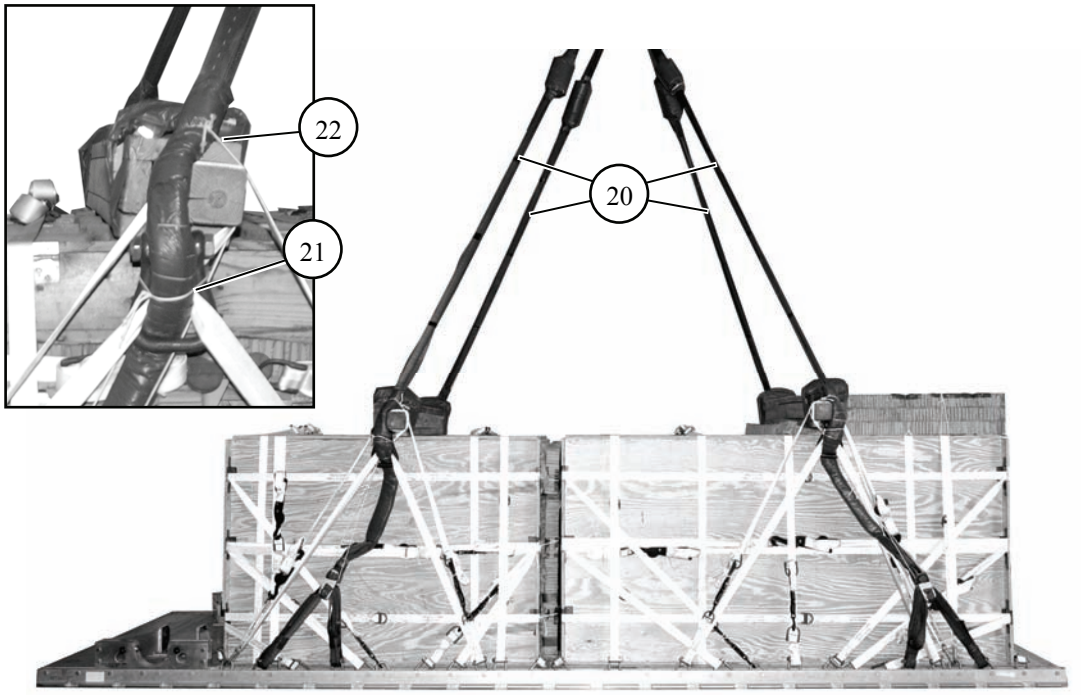
16 Route a 15-foot lashing from clevis 18 through the right rear ACS clevis from outside to inside, rear to front and around the ACS 4- by 4-inch piece of lumber and back to clevis 18.

17 Route a 15-foot lashing from clevis 27 through the right rear ACS clevis from outside to inside, front to rear and around the ACS 4- by 4-inch piece of lumber and back to clevis 27.

18 Repeat steps 16 through 17 on the left side of the load using clevises 18A and 27A (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: 18 and 18A, and 27 and 27A.

Figure 11-15. Suspension Slings Installed and Secured (Continued)



(20) Extend the slings upward and remove all slack.

(21) Tie a length of type III nylon cord around the 11-foot sling and the ACS sling.

(22) Tie a length of type III nylon cord around the 11-foot (4 loop), type XXVI nylon sling, behind all lashings, and around the 4- by 4-inch piece of lumber of the ACS and tie the ends together.

(23) Repeat steps 20 through 22 on all slings (not shown).

Figure 11-15. Suspension Slings Installed and Secured (Continued)

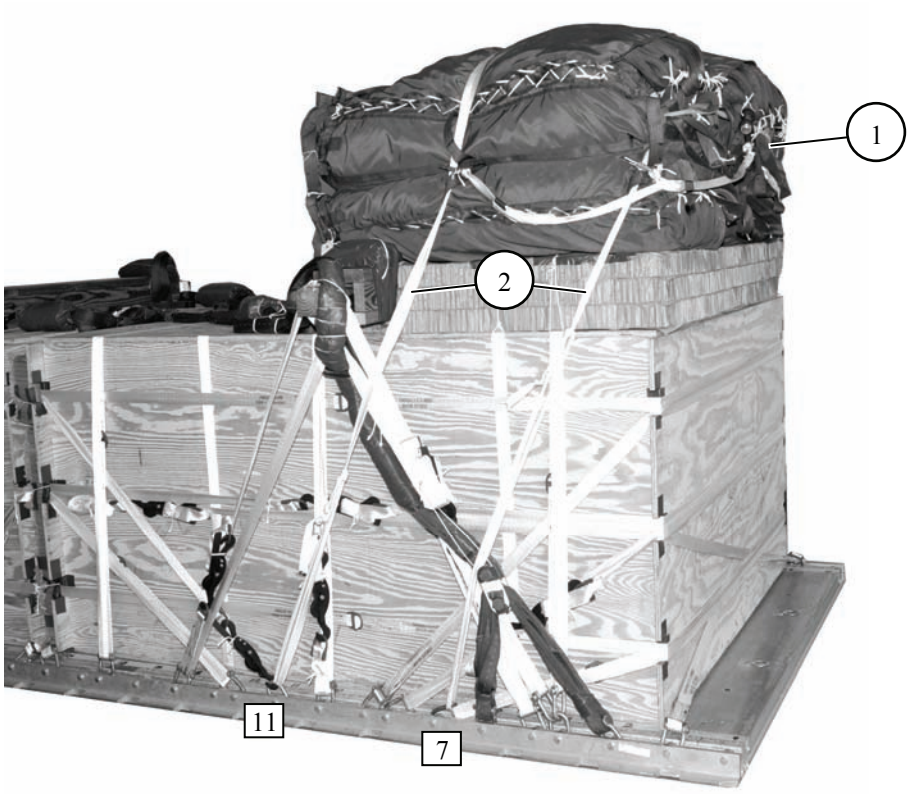
INSTALLING OUTRIGGER ASSEMBLIES

11-6. 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, Volume I, Figures 2-42 through 2-44 and Figure 2-45, steps 1, 2, and 3.

STOWING CARGO PARACHUTES

11-7. Stow and restrain four G-11D cargo parachutes on top of the stowage platform as shown in Chapter 2, Volume I and Figure 11-16.

Note. If weight differs from the load shown, the number of parachutes required must be recomputed.



1. Prepare and stow four G-11D cargo parachutes on the parachute platform.
2. Restrain the parachutes using type VIII nylon webbing to clevises 7 and 7A, and 11 and 11A for the restraint.

Figure 11-16. Cargo Parachute Stowed

STOWING DEPLOYMENT PARACHUTE

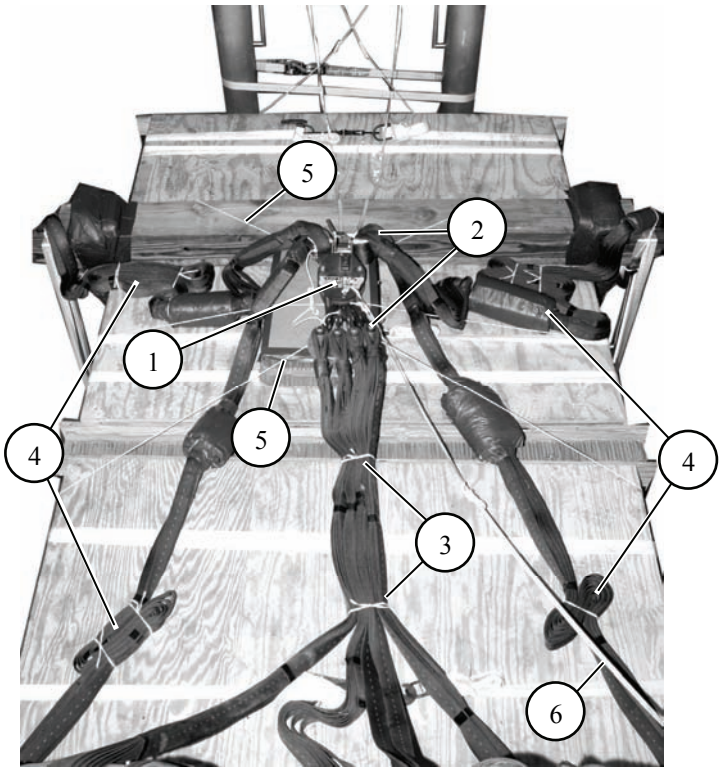
11-8. Prepare, stow and install the deployment parachute according to Chapter 2, Section V, Volume I and as shown in Figure 11-17.

(1) Prepare, stow and install the deployment parachute according to Chapter 2, Section V, Volume I and as shown above.

Figure 11-17. Deployment Parachute Installed

INSTALLING PARACHUTE RELEASE SYSTEM

11-9. Build an M-1 parachute release stack, prepare and install an M-1 parachute release system according to Chapter 2, Section VI, Volume I and as shown in Figure 11-18.



(1) Cut two 12- by 18-inch pieces of honeycomb and glue together. Tape the edges and position and center the honeycomb to the front of the rear ACS. Secure the honeycomb to a convenient point on the load using type III nylon cord. Center the M-1 release on the honeycomb stack.

(2) Attach the 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.

(4) S-fold the slack in the front and rear suspension slings and secure with type I, ¼-inch cotton webbing.

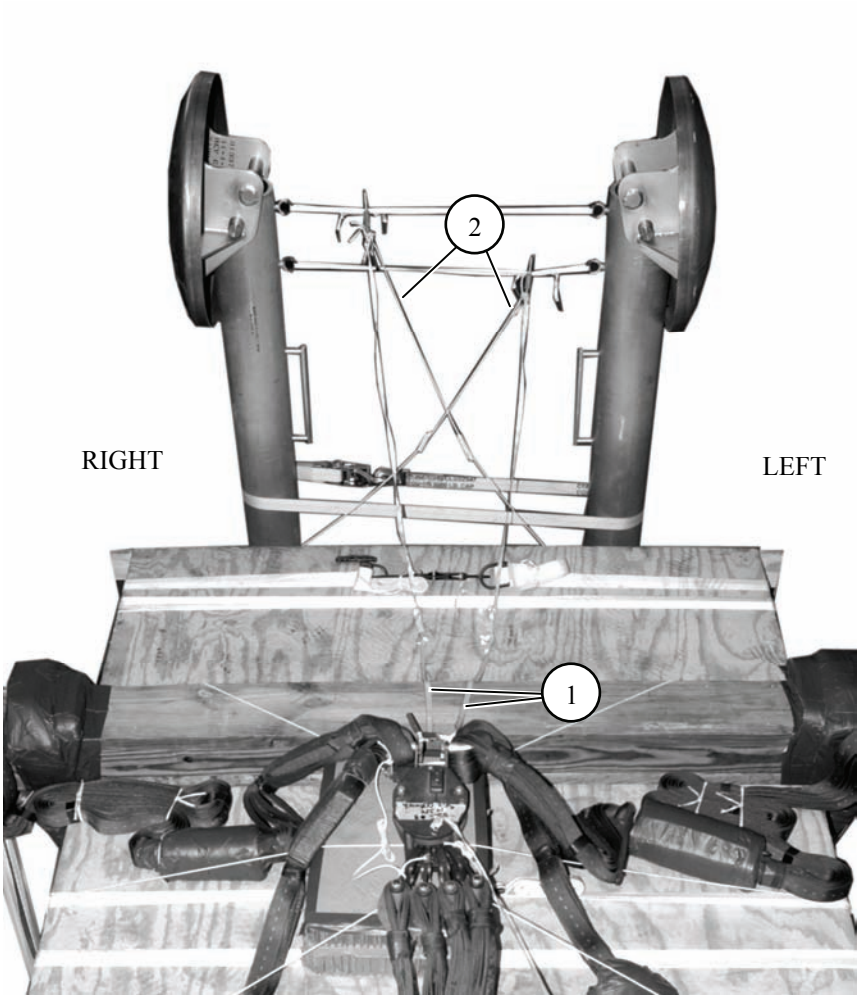
(5) Secure the release to convenient points on the load with type III nylon cord according to Chapter 2, Section VI, Volume I.

(6) Secure the arming wire and lanyard to a parachute carrying handle with three alternating half hitches and a knot in the running end.

Figure 11-18. M-1 Cargo Parachute Release Installed

INSTALLING MAST RELEASE KNIVES

11-10. Install the mast release knives as shown in Chapter 2, Volume I, Figure 2-45, steps 4 through 10 and as shown in Figure 11-19.



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 release is 112 inches as shown in Figure 2-45, steps 5 and 6.

2. Tie a length of type III nylon cord from the upper guillotine knife to the left top lashing on the rear endboard of box 2 that measures 73 inches from knot to knot. Repeat for the lower guillotine knife attaching the type III nylon cord to the right top lashing on the rear endboard of box 2 as shown in Figure 2-45, steps 9 and 10. Fold the slack in the type III nylon cord and tape with 2-inch masking tape.

Note. All measurements are from knot to knot.

Figure 11-19. Mast Release Knives Installed

MARKING RIGGED LOAD

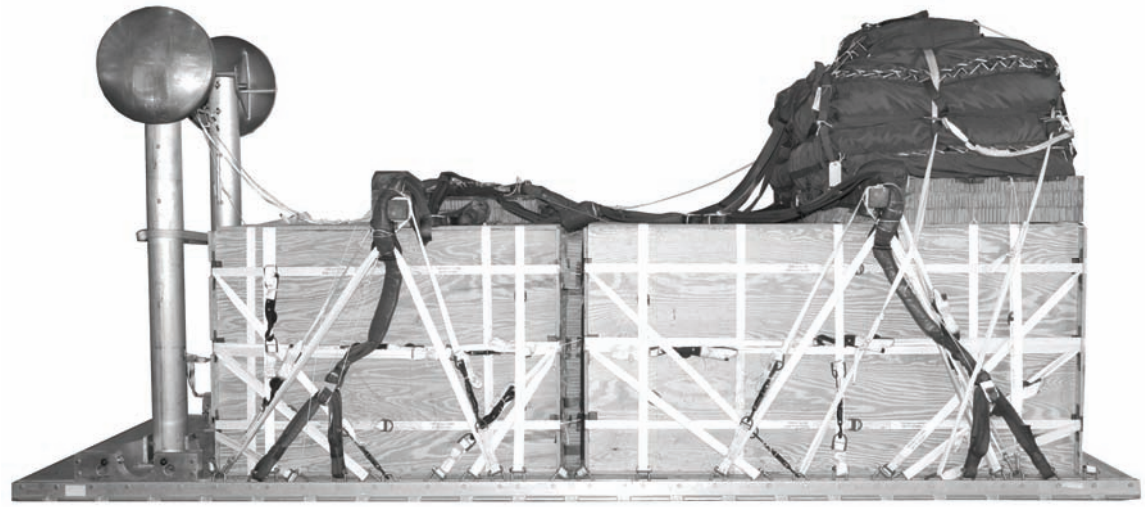
11-11. Mark the rigged load according to Chapter 2, Section IX, Volume I and as shown in Figure 11-20. A Shipper's Declaration for Dangerous Goods is required. If load varies from the one shown, the weight, height, CB and parachute requirements must be recomputed.

EQUIPMENT REQUIRED

11-12. The equipment required to rig this load is listed in Table 11-1.

CAUTION

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



RIGGED LOAD DATA

Weight: Load shown	14,120 pounds
Maximum load allowed	14,500 pounds
Height	97 inches
Width	94 inches
Overall Length	216 inches
Overhang: Front	0 inches
Rear	0 inches
Center of Balance: (from front edge of platform):	90 inches

Figure 11-20. Mass Supply Load Rigged on DRAS Platform

Table 11-1. Equipment Required for Rigging a Mass Supply Load on DRAS Platform

National Stock Number	*Item*	*Quantity*
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	14 sheets
5315-00-010-4659	Nail, steel wire, common, 8d	As required
1670-00-753-3928	Pad, energy dissipating, honeycomb	As required
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	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	4
	For ACS:	
1670-01-063-7761	16-foot (2-loop), type XXVI nylon webbing	2

Table 11-1. Equipment Required for Rigging a Mass Supply Load on a DRAS Platform (Continued)

National Stock Number	*Item*	*Quantity*
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	64
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

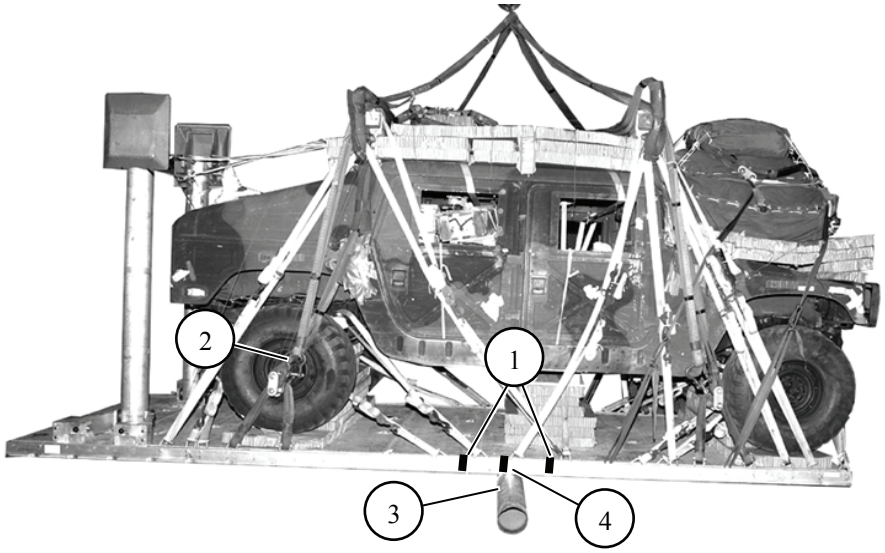
This page intentionally left blank.

Appendix A

Verifying the Center of Balance on a DRAS Platform Load

VERIFYING THE CENTER OF BALANCE

A-1. The center of balance (CB) of a DRAS load must be verified and marked on each side of the platform. The pole method and the calculation method are two ways of verifying the CB. The instructions for these methods are given in Figures A-1 and A-2.



1. Mark the CB range on the side of the platform by placing a piece of adhesive tape 85 inches from the front of the platform and another piece of adhesive tape 99 inches from the front of the platform.

2. Make a lift kit by placing four 11-foot (4-loop), Type XXVI nylon slings on a large clevis. Attach the lift kit sling legs to the 3-foot suspension slings on the front and rear of the platform with medium clevises (if additional length is required add a second medium clevis through the first medium clevis). Ensure the lift kit slings are routed to the front of the front ACS and to the rear of the rear ACS.

3. Raise the load and place a pipe or pole (minimum length of 8 feet and minimum diameter of 6 inches) under the load, perpendicular to the platform, in the CB range.

4. When the load balances, mark the CB on both sides of the platform.

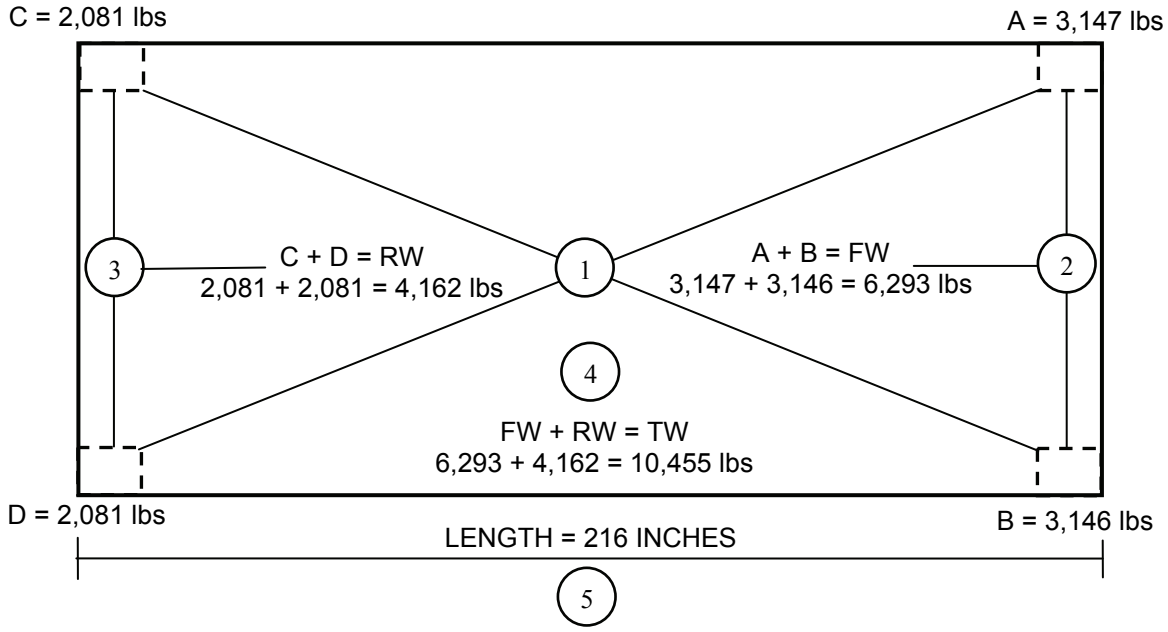
Note. The center of balance MUST be within the CB range of 85 - 99 inches from the front of the platform.

Figure A-1. CB Verified Using the Pole Method

Note. When using the calculation method, it is best to put a 4- by 4-inch piece of lumber across the front and rear ends of the platform. The lumber should cross the center of any portable scales used. If the 4- by 4-inch piece of lumber is unavailable, make sure that the forward and rear edges of the platform line up with the center of the scales.

$$\frac{L \times RW}{TW} = \text{CB in inches from front edge of platform}$$

$$\frac{216 \text{ inches} \times 4{,}162 \text{ lbs}}{10{,}455 \text{ lbs}} = 86 \text{ inches from front edge of platform}$$



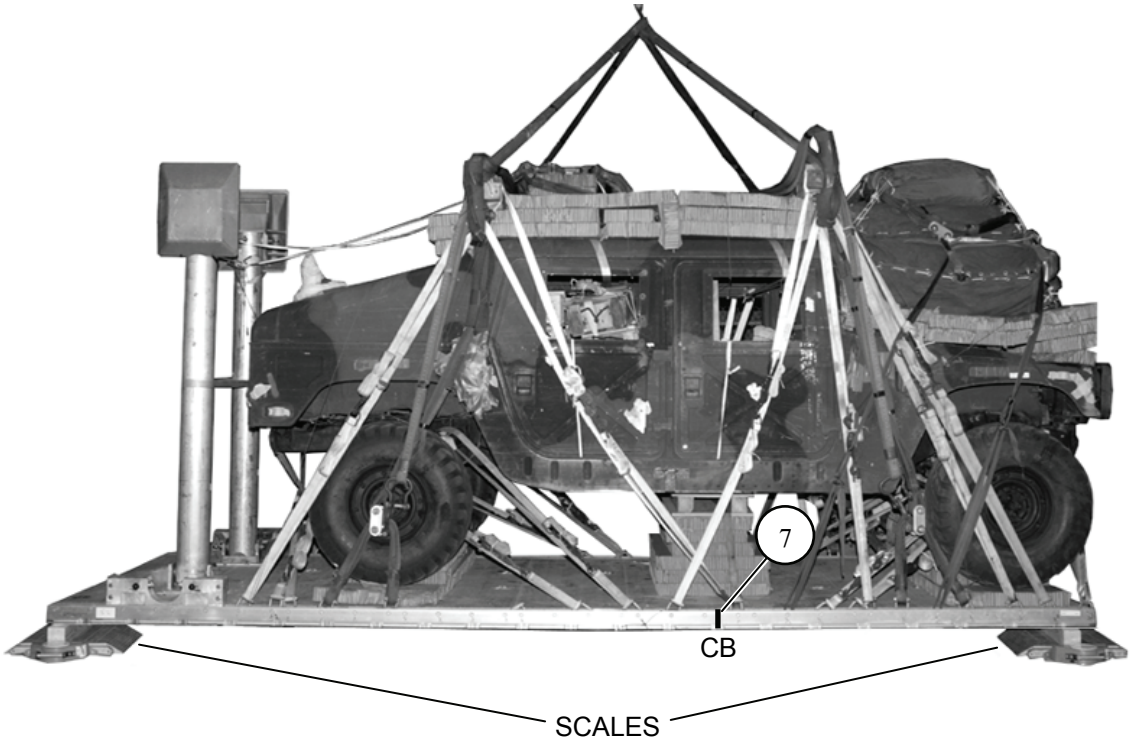
Note. Use the lift kit and instructions in Figure A-1, Step 2 to lift the load.

1. Place a portable scale under each corner of the DRAS platform. Label the front scales A and B and the rear scales C and D. Place the scales the same distance from the front and rear edge of the platform on both sides.
2. Add the weights of the front scales together (A + B = FW) (FW = Front Weight).
3. Add the weights of the rear scales together (C + D = RW) (RW = Rear Weight).
4. Add the front weight (FW) and the rear weight (RW) together. This equals the total weight (FW + RW = TW) (TW = Total Weight).
5. Measure the platform length in inches. This equals the length (Length = L).
6. Multiply the length (L) by the rear weight (RW) and divide by the total weight (TW). This equals the center of balance (CB) in inches from the front edge of the platform.

Figure A-2. CB Verified Using the Calculation Method

Notes. 1. Use the lift kit and instructions in Figure A-1, Step 2 to lift the load.

2. When using the calculation method, it is best to put a 4- by 4-inch piece of lumber across the front and rear ends of the platform. The lumber should cross the center of any portable scales used. If the 4- by 4-inch piece of lumber is unavailable, make sure that the forward and rear edges of the platform line up with the center of the scales.



(7) Mark the CB on both sides of the platform.

Note. The center of balance MUST be within the CB range of 85 - 99 inches from the front of the platform.

Figure A-2. CB Verified Using the Calculation Method (Continued)

This page intentionally left blank.

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 obscruation 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**

w/o	**without**
yd	**yard**

References

AFMAN 24-204(I)/TM 38-250/NAVSUP PUB 505/MCO P4030.19H/DLAI 4245.3. *Preparing Hazardous Materials for Military Air Shipments*. December 2001.

FM 4-20.153/MCRP 4-11.3B/TO 13C7-18-41. *Airdrop of Supplies and Equipment: Rigging Ammunition*. 1 May 2004.

TM 9-2320-280-10/TO 36A12-1A-2091-1/TM 2320-10/6B. *Truck, Utility: Cargo/Troop Carrier, 1 ¼-Ton, 4X4, M998 (2320-01-107-7155)*. 31 January 1996.

TM 9-2330-202-14&P. *Operator's, Unit, Direct Support and General Support Maintenance Manual Including Repair Parts and Special Tools List for Trailer, Cargo.* 12 May 1997.

TM 10-1670-268-20&P/TO 13C7-52-22. *Organizational Maintenance Manual Including Repair Parts and Special Tools List for Type V Airdrop Platform and Dual Row Airdrop*. 15 September 2002.

TM 10-1670-277-23&P/TO 13C5-28-2/NAVAIR 13-1-30. *Unit and Direct Support (DS) Maintenance Manual (Including Repair Parts and Special Tools List) for Parachute, Cargo Type: 28-Foot Diameter, Cargo Extraction Parachute Assembly (NSN 1670-00-040-8135).* 30 April 2002.

TM 10-1670-280-23&P/TO 13C5-31-2/NAVAIR 13-1-31. *Unit and Direct Support (DS) Maintenance Manual (Including Repair Parts and Special Tools List) for Parachute, Cargo Type: 100-Foot Diameter, Model G-11B, Model G-11C, and Model G-11D (NSN 1670-01-016-7841) (Reprinted with Basic Included C1-3)*. 15 September 2002.

TM 10-1670-296-20&P/TO 13C7-49-2. *Unit Maintenance Manual Including Repair Parts and Special Tools List for Ancillary Equipment for Low Velocity Airdrop System*. 30 October 2002

AFTO Form 22. *Technical Order Publication Improvement Report*

DA Form 2028. *Recommended Changes to Publication and Blank Forms*.

DD Form 1748 Series. *Joint Airdrop Inspection Record*

This page intentionally left blank.

FM 4-20.105-2
TO 13C7-1-51, VOL II
29 August 2006

By Order of the Secretary of the Army and the Air Force:

PETER SCHOOMAKER
General, United States Army
Chief of Staff

Official:

JOYCE E. MORROW
Administrative Assistant to the
Secretary of the Army
0622006

GREGORY S. MARTIN
General, USAF
Commander, AFMC

JOHN P. JUMPER
General, USAF
Chief of Staff

DISTRIBUTION:

Active Army, Army National Guard, and U.S. Army Reserve: To be distributed in accordance with the initial distribution number 115866, requirements for FM 4-20.105-2.

This page intentionally left blank.

This page intentionally left blank.

This page intentionally left blank.

PIN: 083485-000