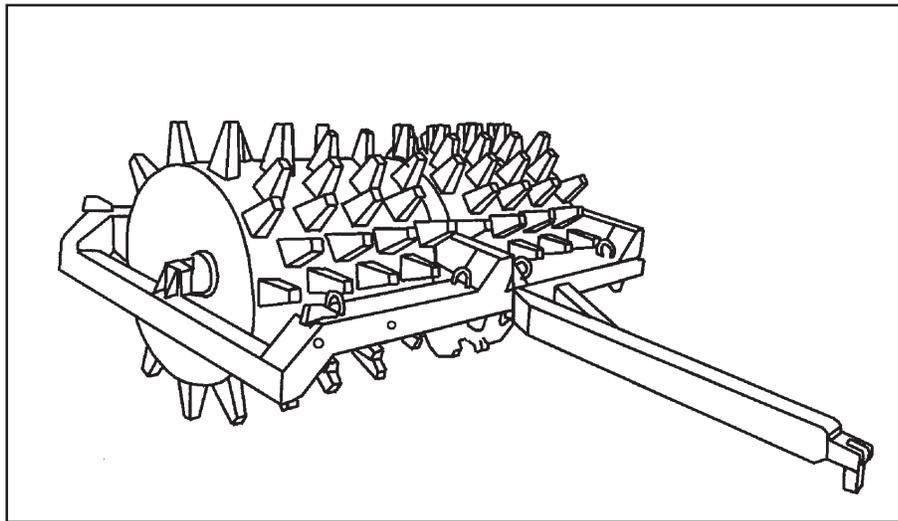


## AIRDROP OF SUPPLIES AND EQUIPMENT: RIGGING ROAD ROLLERS



█ **DISTRIBUTION RESTRICTION:** Approved for public release; distribution is unlimited. █

HEADQUARTERS  
DEPARTMENT OF THE ARMY  
DEPARTMENT OF THE AIR FORCE

CHANGE  
No. 5

HEADQUARTERS  
DEPARTMENT OF THE ARMY  
DEPARTMENT OF THE AIR FORCE  
Washington, DC, 30 May 1997

## AIRDROP OF SUPPLIES AND EQUIPMENT RIGGING ROAD ROLLERS

This change adds the procedures for rigging the MDG 96 towed sheepsfoot road roller for low-velocity airdrop on a type V platform. The distribution restriction is also changed. The destruction notice is no longer needed.

FM 10-528/TO 13C7-26-71, 25 November 1977, is changed as follows:

1. New or changed material is identified by a vertical bar ( █ ) in the margin opposite the changed material.
2. File this transmittal page in front of the publication
3. Remove old pages and insert new pages as indicated below:

### Remove pages

cover

i-ii

vii

1-1

### Insert pages

cover

i-ii

vii-viii

1-1

11-1 through 11-21

**DISTRIBUTION RESTRICTION:** Approved for public release; distribution is unlimited.

By Order of the Secretary of the Army:

Official:



JOEL B. HUDSON

*Administrative Assistant to the  
Secretary of the Army*

03449

DENNIS J. REIMER  
*General, United States Army  
Chief of Staff*

**DISTRIBUTION:**

**Active Army, Army National Guard, and U.S. Army Reserve: To be distributed in accordance with the initial distribution number 110911, requirements for FM 10-528.**

FIELD MANUAL  
No. 10-528  
TECHNICAL ORDER  
No. 13C7-26-71

HEADQUARTERS  
DEPARTMENT OF THE ARMY  
DEPARTMENT OF THE AIR FORCE  
Washington, DC, 25 November 1977

**AIRDROP OF SUPPLIES AND EQUIPMENT:  
RIGGING ROAD ROLLERS**

**TABLE OF CONTENTS**

	<i>Paragraph</i>	<i>Page</i>
<b>PREFACE</b> .....		viii
<b>CHAPTER 1 INTRODUCTION</b>		
Description of Items.....	1-1	1-1
Special Considerations.....	1-2	1-1
<b>CHAPTER 2 RIGGING 7-35-TON ROAD ROLLER</b>		
Description of Load.....	2-1	2-1
Preparing Platform.....	2-2	2-1
Preparing and Positioning Honeycomb.....	2-3	2-2
Preparing Road Roller.....	2-4	2-3
Installing Suspension Slings.....	2-5	2-3
Positioning Road Roller and Stowing Parking Stand.....	2-6	2-4
Installing Lashings.....	2-7	2-4
Stowing Cargo Parachutes.....	2-8	2-4
Installing Extraction System.....	2-9	2-5
Installing Release System.....	2-10	2-9
Deleted.....	2-11	2-9
Positioning Extraction Parachute.....	2-12	2-9
Marking Rigged Load.....	2-13	2-9
Equipment Required.....	2-14	2-9
<b>CHAPTER 3 RIGGING MODEL W-2 SHEEPSFOOT ROAD ROLLER</b>		
Section I RIGGING ROLLER FOR LOW-VELOCITY AIRDROP		
Description of Load.....	3-1	3-1
Preparing Platform.....	3-2	3-1

■ **DISTRIBUTION RESTRICTION:** Approved for public release; distribution is unlimited. ■

	<i>Paragraph</i>	<i>Page</i>
Preparing and Positioning Honeycomb.....	3-3	3-1
Preparing Road Roller.....	3-4	3-1
Installing Suspension Slings.....	3-5	3-1
Stowing Towing Tongue.....	3-6	3-4
Positioning Road Roller.....	3-7	3-5
Installing Lashings.....	3-8	3-5
Installing Extraction Attaching Point Extension.....	3-9	3-6
Stowing Cargo Parachutes .....	3-10	3-7
Installing Extraction System.....	3-11	3-8
Installing Release System.....	3-12	3-9
Deleted.....	3-13	3-9
Positioning Extraction Parachute.....	3-14	3-9
Marking Rigged Load.....	3-15	3-9
Equipment Required.....	3-16	3-9
Section II		
	<b>RIGGING W-2 ROLLER FOR LAPES</b>	
Description of Load.....	3-17	3-11
Special Considerations.....	3-18	3-11
Preparing Platform.....	3-19	3-11
Preparing and Positioning Honeycomb.....	3-20	3-12
Preparing Sheepsfoot Roller.....	3-21	3-12
Positioning Roller.....	3-22	3-12
Installing Lashings.....	3-23	3-12
Installing the Attitude Control Bar.....	3-24	3-12
Installing Extraction System.....	3-25	3-12
Marking Rigged Load.....	3-26	3-17
Equipment Required.....	3-27	3-17
<b>CHAPTER 4</b>	<b>RIGGING MODEL MDG 96 TOWED SHEEPSFOOT ROLLER</b>	
Section I	<b>RIGGING ROLLER FOR LOW-ALTITUDE PARACHUTE EXTRACTION SYSTEM (LAPES)</b>	
Description of Load.....	4-1	4-1
Special Considerations.....	4-2	4-1
Preparing Platform.....	4-3	4-1
Preparing and Positioning Honeycomb.....	4-4	4-1
Preparing Sheepsfoot Roller.....	4-5	4-2
Positioning and Securing Tongue.....	4-6	4-2
Positioning Roller.....	4-7	4-3
Installing Lashings.....	4-8	4-3
Installing the Attitude Control Bar.....	4-9	4-3
Installing Extraction System.....	4-10	4-4
Marking Rigged Load.....	4-11	4-4
Equipment Required.....	4-12	4-4

	<i>Paragraph</i>	<i>Page</i>
Placing Extraction Parachute.....	10-13	10-15
Marking Rigged Load.....	10-14	10-15
Equipment Required.....	10-15	10-15

## **CHAPTER 11 RIGGING MODEL MDG 96 SHEEPSFOOT ROLLER ON A TYPE V PLATFORM FOR LOW-VELOCITY AIRDROP**

Description of Load.....	11-1	11-1
Preparing Platform.....	11-2	11-1
Preparing and Positioning Honeycomb Stacks.....	11-3	11-3
Preparing Roller and Positioning Parachute Stowage Platform.....	11-4	11-5
Positioning and Securing Towing Tongue.....	11-5	11-8
Lifting and Positioning Roller.....	11-6	11-11
Lashing Roller.....	11-7	11-13
Covering Roller and Installing Suspension Slings.....	11-8	11-14
Installing Cargo Parachutes.....	11-9	11-15
Installing Parachute Release.....	11-10	11-16
Installing Extraction System.....	11-11	11-17
Installing Provisions for Emergency Restraints.....	11-12	11-18
Placing Extraction Parachute.....	11-13	11-18
Marking Rigged Load.....	11-14	11-18
Equipment Required.....	11-15	11-18

<b>GLOSSARY</b> .....	Glossary-1
<b>REFERENCES</b> .....	References-1

## PREFACE

### SCOPE

This manual tells and shows how to prepare and rig the following towed road rollers for low-velocity airdrop on the type II platform from C-130 and C-141 aircraft: the 7- to 35-ton, W-2, MDG 96, vibrating, and 13-wheel. This manual also gives procedures for rigging the W-2, MDG 96, vibrating and 13-wheel towed road rollers for LAPE airdrop on the metric platform from C-130 aircraft. Additionally, procedures are given for rigging the following towed road rollers for low-velocity airdrop on the type V platform from C-130, C-141, C-17, and C-5 aircraft: 11-wheel, 13-wheel, Type I, M435, and MDG 96. This manual gives procedures for rigging the Type I and M435 towed road rollers for LAPE airdrop on the type V platform from C-130 aircraft. It is designed for use by all parachute riggers.

### USER INFORMATION

The proponent of this publication is HQ TRADOC. You are encouraged to report any errors or omissions and to suggest ways for making this a better manual. Army personnel, send your comments on DA Form 2028 directly to:

Aerial Delivery and Field Services Department  
USA Quartermaster Center and School  
1010 Shop Road  
Fort Lee, Virginia 23801-1502

Air Force personnel, send your reports on AFTO Form 22 through:

Headquarters  
Air Mobility Command (AMC/DOTX)  
402 Scott Drive, Unit 3A1  
Scott AFB, Illinois 62225-5302

to:

Aerial Delivery and Field Services Department  
USA Quartermaster Center and School  
1010 Shop Road  
Fort Lee, Virginia 23801-1502

Also send information copy of AFTO Form 22 to:

SA-ALC/TILD  
485 Quentin Roosevelt Road  
Kelly AFB, Texas 78241-6421

## CHAPTER 1 INTRODUCTION

---

### 1-1. Description of Items

The towed road rollers covered in this manual are listed below. Dimensions and weights are given in the description of items paragraph in each chapter.

- a. 7- to 35-ton ballast pneumatic tire roller
- b. Model W-2 sheepsfoot roller
- c. Model MDG 96 sheepsfoot roller
- d. 13-wheel pneumatic tire roller
- e. 11-wheel pneumatic tire roller.
- f. M435 4- to 35-ton ballast pneumatic tire roller
- g. Type I, SM 54 vibrating smooth drum roller
- h. DED gas/VP4D diesel vibrating roller

### 1-2. Special Considerations

A copy of this manual should accompany the rigged load to the aircraft. The loads covered in this manual may include hazardous materials such as explosives, gasoline, or batteries. When included, these items must be packaged, marked, and labeled according to AFJMAN 24-204/TM 38-250.

## CHAPTER 11

### RIGGING MODEL MDG 96 SHEEPSFOOT ROLLER ON A TYPE V PLATFORM FOR LOW-VELOCITY AIRDROP

#### 11-1. Description of Load

The MDG 96 towed sheepsfoot roller is rigged on a 12-foot type V airdrop platform. The unrigged roller weighs 7,440 pounds. It is 140 inches long, reducible to 77 inches; 54 inches high, and 119 inches wide.

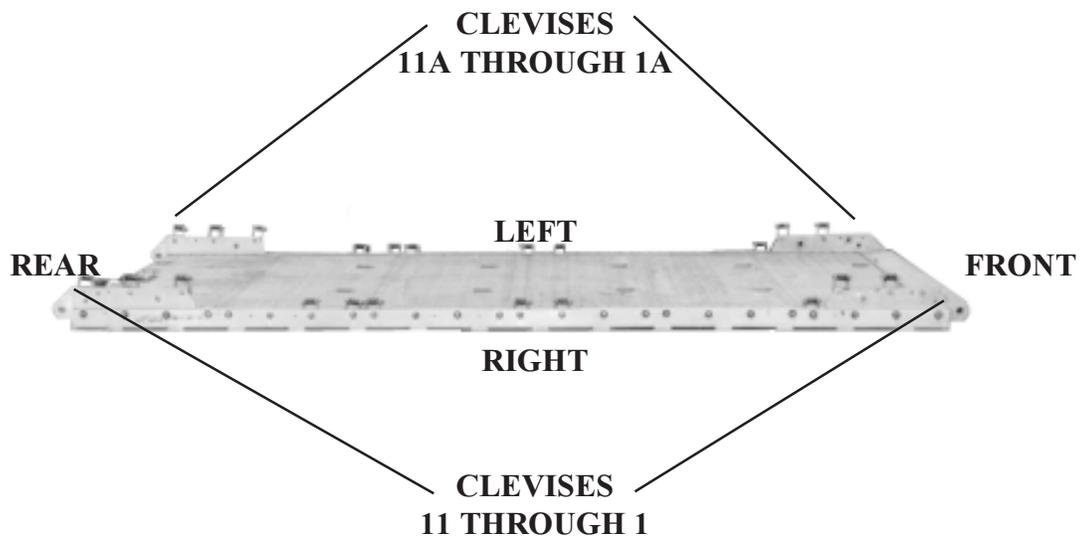
#### 11-2. Preparing Platform

a. Inspecting Platform. Inspect, or assemble and inspect, the platform as outlined in TM 10-1670-268-20&P/TO 13C7-52-22.

b. Installing Tandem Links. Install tandem links on the front and rear of each rail as shown in Figure 11-1.

c. Installing and Numbering Clevises. Bolt and number 22 clevis assemblies as shown in Figure 11-1.

- Notes:** 1. The nose bumper may or may not be installed.  
2. Measurements given in this chapter are from the front edge of the platform, NOT from the front edge of the nose bumper.



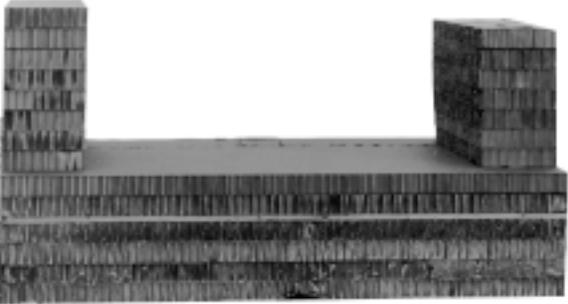
**Step:**

1. Install a tandem link on the front of each platform side rail using holes 1, 2, and 3.
2. Install a tandem link on the rear of each platform side rail using holes 22, 23, and 24.
3. Install clevises on bushings 3 and 4 of each front tandem link.
4. Install clevises on bushings 1, 2, and 4 of each rear tandem link.
5. Starting at the front of the platform, install clevises on each platform side rail using the bushings bolted on holes 4, 11, 12, 16, 17, and 18.
6. Starting at the front of the platform, number the clevises bolted to the right side of the platform from 1 through 11, and those bolted to the left side from 1A through 11A.
7. Label the tie-down rings according to FM 10-500-2/TO 13C7-1-5.

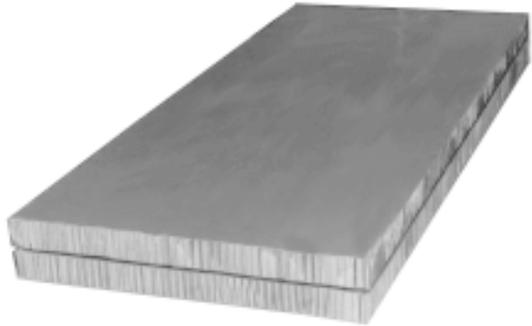
*Figure 11-1. Platform prepared*

**11-3. Preparing and Positioning Honeycomb Stacks**

Prepare the honeycomb stacks as shown in Figure 11-2. Position the honeycomb stacks on the platform as shown in Figure 11-3.



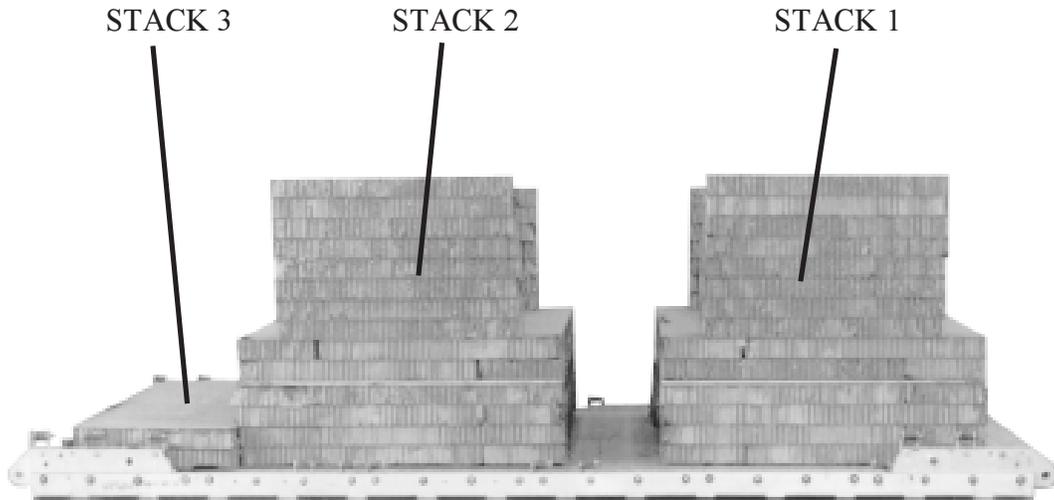
FRONT  
STACKS 1 AND 2



STACK 3

Stack Number	Pieces	Width (inches)	Length (inches)	Material	Instructions
1 and 2	4	83	36	Honeycomb	Alternate layers to form a four-layer base 83 -by 48 inches.
	4	83	12	Honeycomb	
	1	83	48	3/4-inch plywood	Glue flush on base.
	2	83	36	Honeycomb	Form two additional layers 83 -by 48 inches.
	2	83	12	Honeycomb	
	7	12	36	Honeycomb	Center and glue flush with left side of base.
	8	12	36	Honeycomb	Center and glue flush with right side of base.
	3	2	88	24	Honeycomb

*Figure 11-2. Honeycomb stacks prepared*

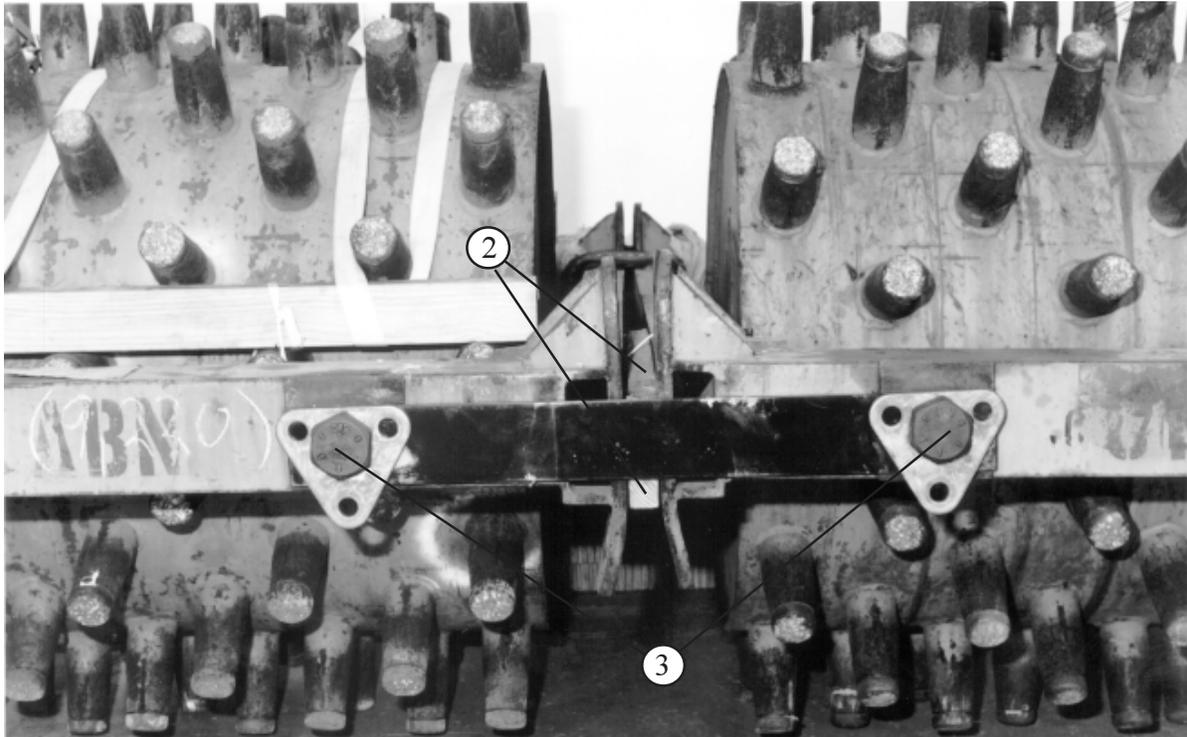


Stack Number	Position of Stack on Platform
	Place stack:
1	Centered and 5 1/2 inches from the front edge of the platform.
2	Centered and 14 1/2 inches from stack 1.
3	Flush with the rear of stack 2 and 6 1/2 inches from the right side rail.

*Figure 11-3. Honeycomb stacks placed on platform*

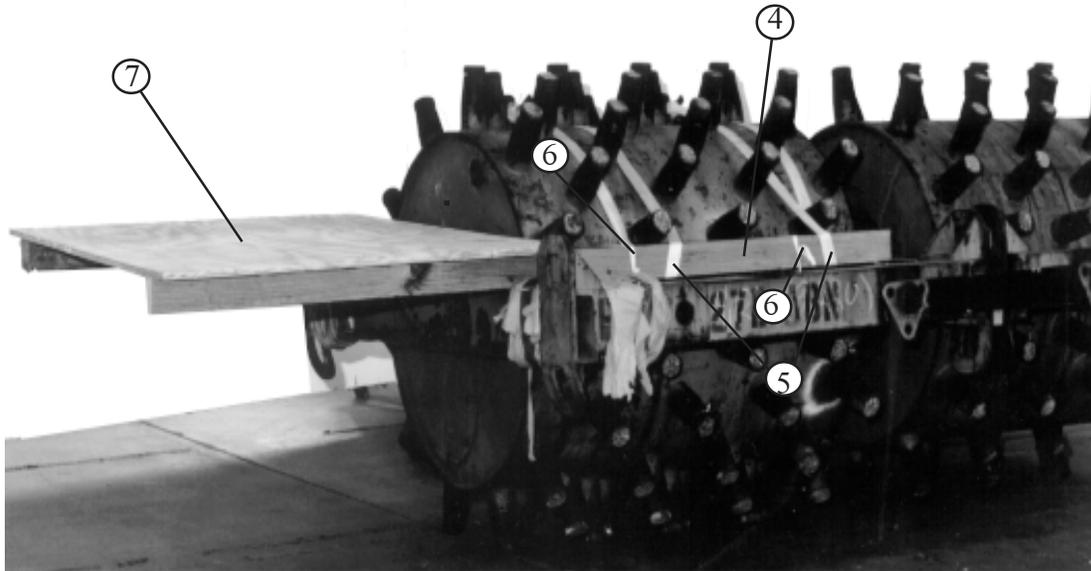
#### 11-4. Preparing Roller and Installing Parachute Stowage Platform

Prepare the roller and install the parachute stowage platform as shown in Figure 11-4.



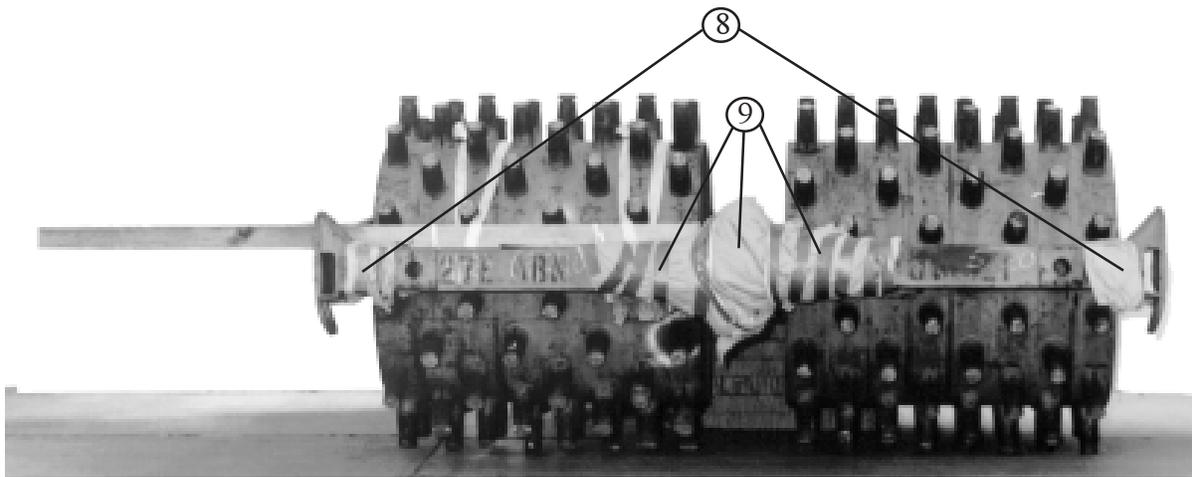
- ① Remove the plugs and drain all ballast from the rollers. Replace and tighten the plugs. Remove the towing tongue from the frame sections (not shown).
- ② Tie a length of 2- by 6-inch lumber between the frame sections to maintain spacing. (The length of the lumber will vary among rollers.)
- ③ Align the holes in the section bar (1/2-inch steel 4 inches by 36 inches) with the towing tongue bolt holes. Place a side plate from a three-point link assembly over each towing tongue bolt as a spacer. Bolt the section bar to the frame sections using the towing tongue bolt holes.

*Figure 11-4. Roller prepared and parachute stowage platform installed*



- ④ Place an 8-foot piece of 4- by 4-inch lumber on the frame section at the rear of the load, even with the front edge of the rear roller, and resting on a row of teeth so that the lumber is horizontal.  
**Note: It may be necessary to raise the roller and rotate it slightly so that the lumber will rest horizontally.**
- ⑤ Pass two 15-foot lashings over the roller and around each piece of lumber. Pass the front lashing around the third row of teeth. Pass the rear lashing around the seventh row of teeth. Fasten the lashings over the roller.
- ⑥ Tie the lumber to the next lower row of teeth on each side in two places with 1/2-inch tubular nylon webbing.
- ⑦ Center and nail a 60- by 48-inch piece of 3/4-inch plywood over the lumber flush with the ends of the 4- by 4's. Center a 2-inch hole in each 48-inch side of the plywood 3 inches from the edge, measured on center.

*Figure 11-4. Roller prepared and parachute stowage platform installed (continued)*

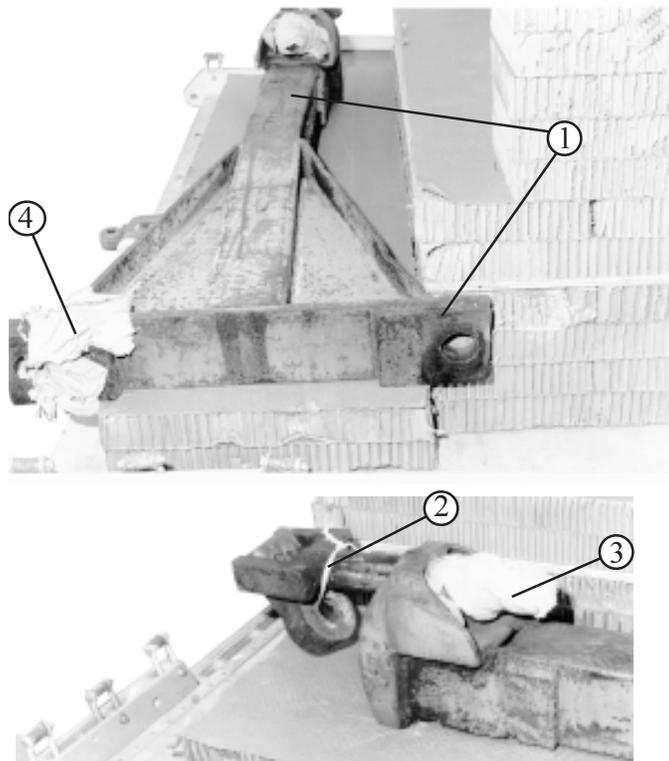


- ⑧ Pad the outside corners of the frame sections with cellulose wadding taped in place.
- ⑨ Pad the frame junction areas at the middle of the roller with cellulose wadding taped in place.

*Figure 11-4. Roller prepared and parachute stowage platform installed (continued)*

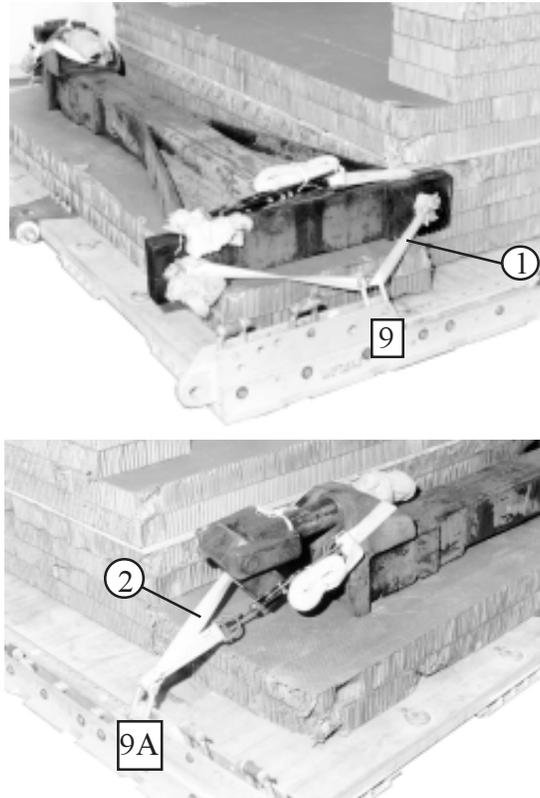
### 11-5. Positioning and Securing Towing Tongue

Place the towing tongue on the honeycomb and lash it to the platform as shown in Figure 11-5.



- ① Center the towing tongue on stack 3 with the lunette shaft on top and to the left. Align the right side of the tongue against stack 2 as shown. Crush the honeycomb on stack 2 enough to allow lashings to pass through the bolt hole.
- ② Pass a length of 1/2-inch tubular nylon webbing through the lunette hole. Tie the lunette to the lunette shaft.
- ③ Pad the lunette shaft with cellulose wadding taped in place.
- ④ Pad the bolt holes with cellulose wadding (only the left hole is shown padded).

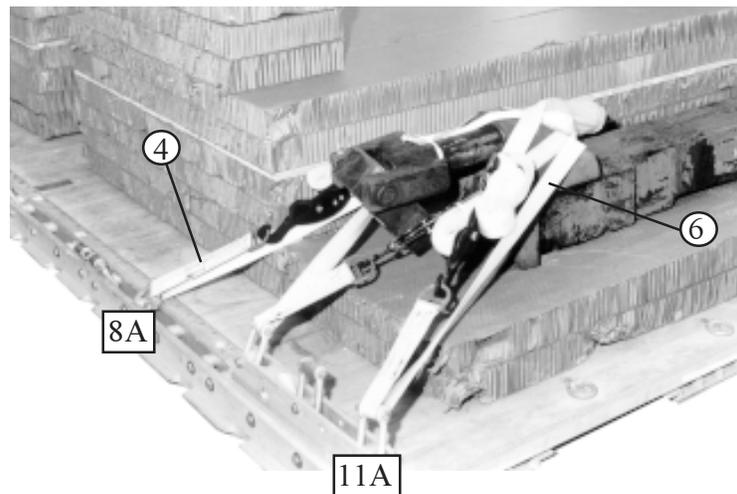
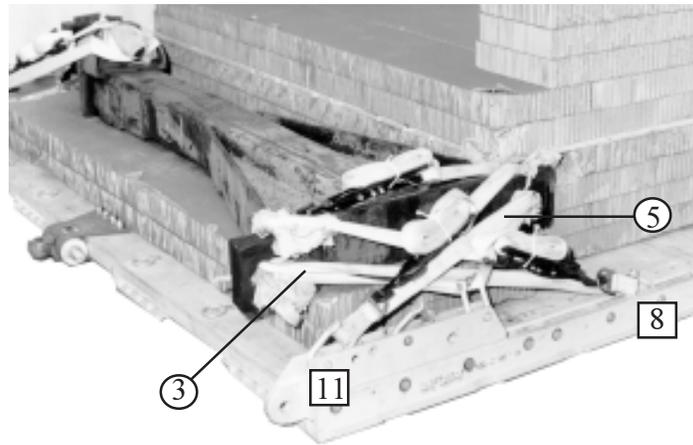
*Figure 11-5. Towing tongue positioned and lashed to platform*



⑤ Lash the towing tongue to the platform as shown below.

Lashing Number	Clevis Number	Instructions
1	9	Pass lashing: Through both bolt holes, and secure on top of tongue frame. Note: Pad top of tongue frame with cellulose wadding.
2	9A	Under lunette shaft.

Figure 11-5. Towing tongue positioned and lashed to platform (continued)

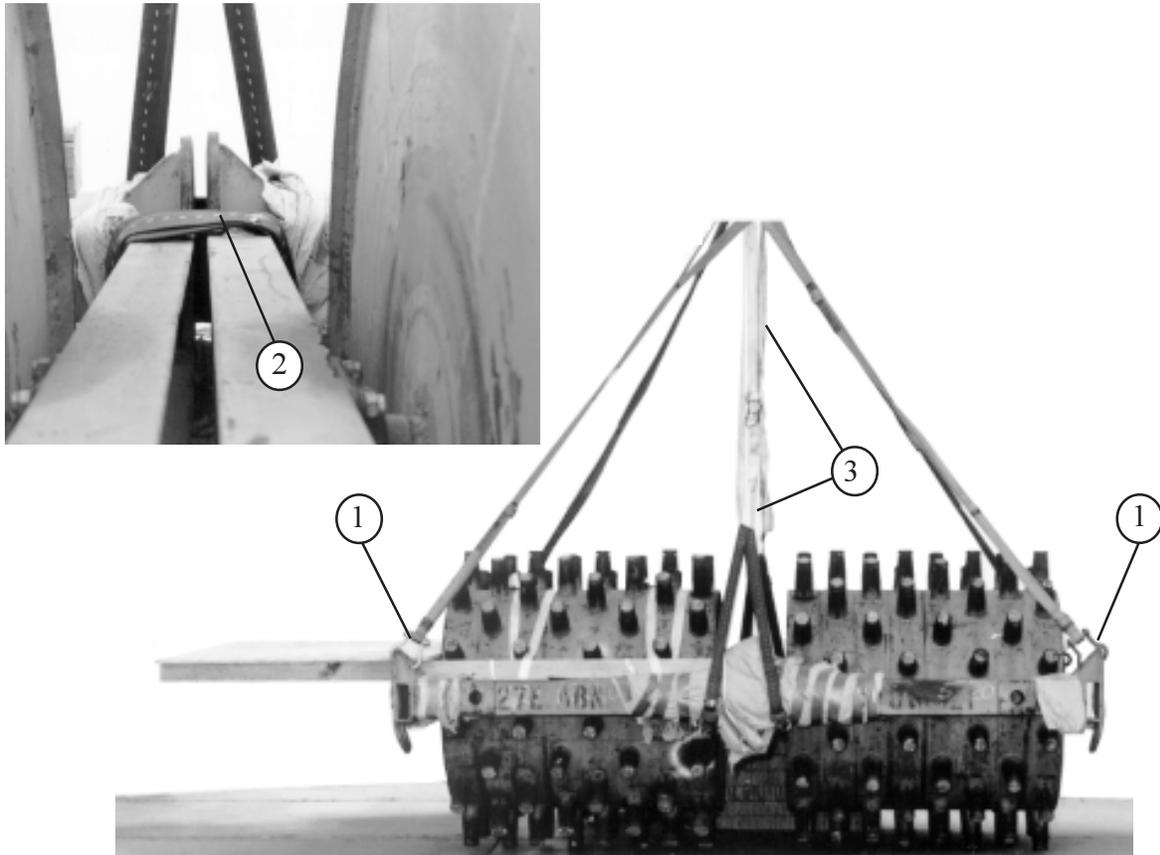


Lashing Number	Clevis Number	Instructions
3	8	Pass lashing: Through rear bolt hole.
4	8A	Around lunette shaft.
5	11	Through front bolt hole.
6	11A	Around lunette shaft.

Figure 11-5. Towing tongue positioned and lashed to platform (continued)

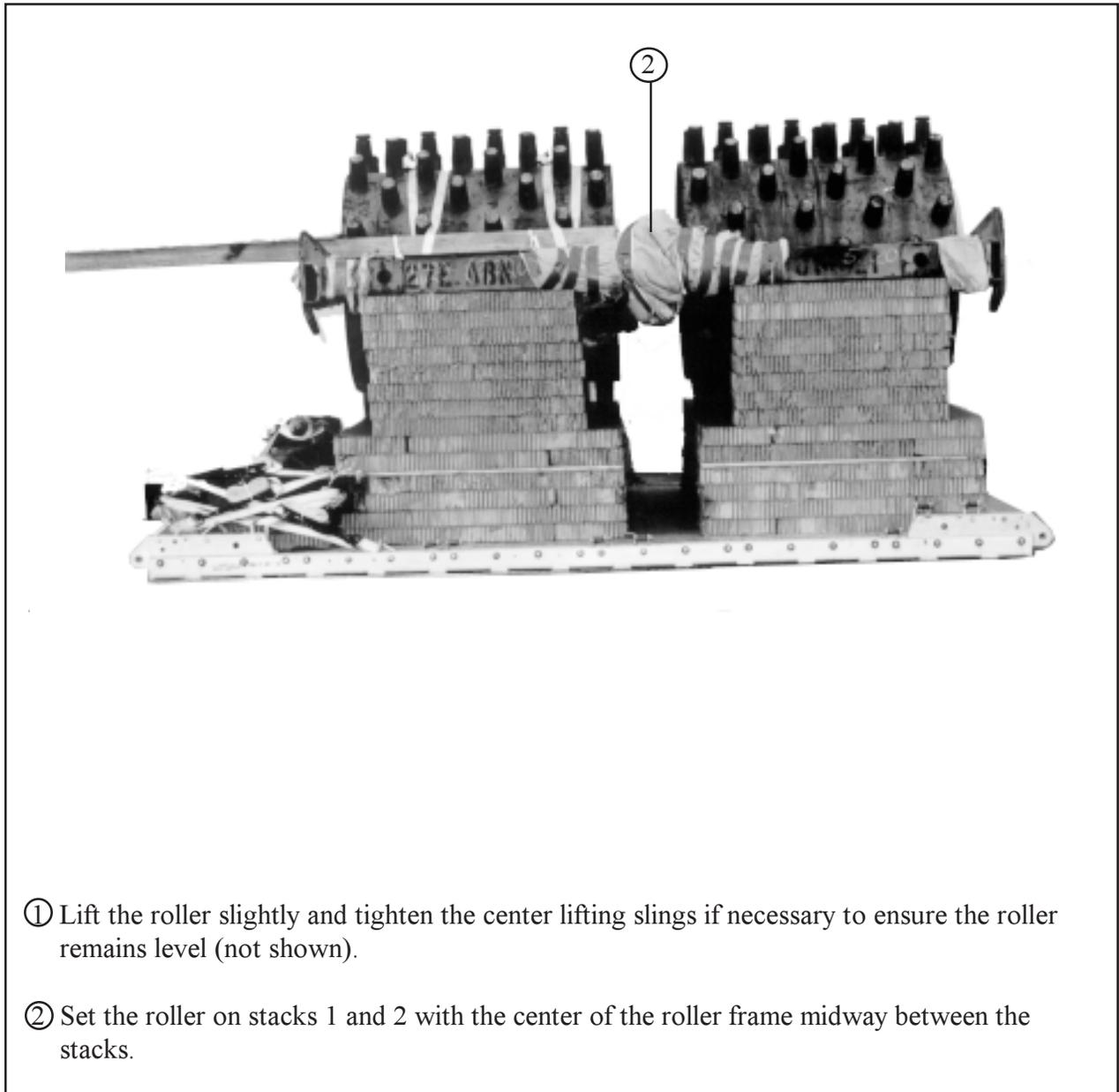
### 11-6. Lifting and Positioning Roller

Install lifting slings as shown in Figure 11-6.  
Position the roller on the honeycomb stacks as shown in Figure 11-7.



- ① Attach a 9-foot (2-loop), type XXVI nylon webbing sling to each corner lifting point with a large clevis.
- ② Center a 9-foot (2-loop), type XXVI nylon webbing sling over the inside center frames on each side. Pass the ends of the sling under the frames and upward.
- ③ Suspend each center sling from the crane hook with a 15-foot lashing passed through the end loops of the slings and through their own D-rings.

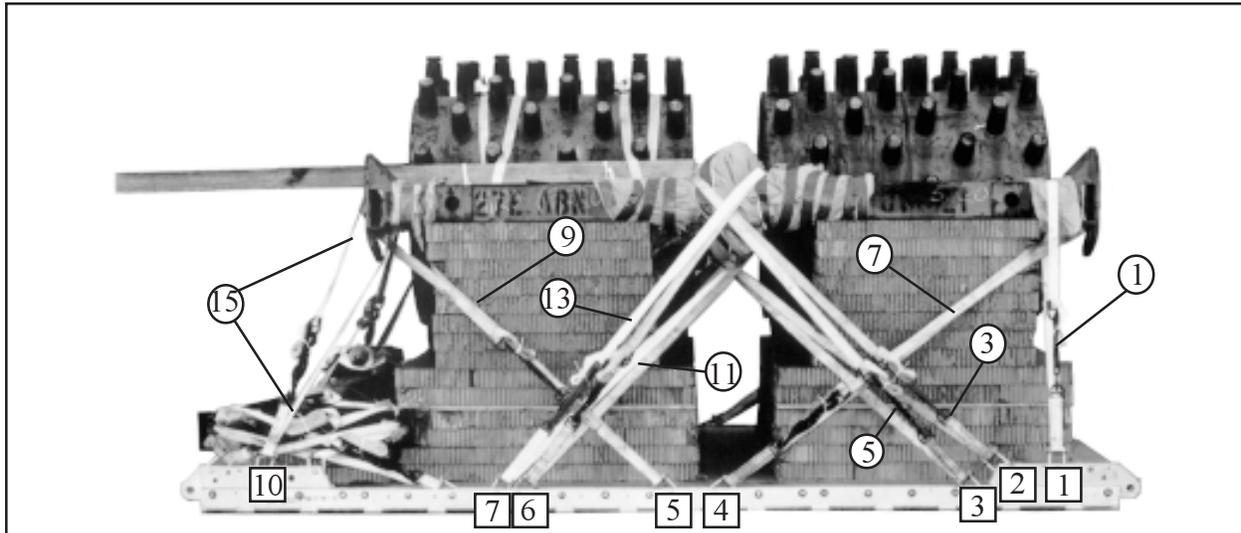
*Figure 11-6. Lifting slings installed*



*Figure 11-7. Roller positioned on honeycomb stacks*

### 11-7. Lashing Roller

Lash the roller to the platform as shown in Figure 11-8 and according to FM 10-500-2/TO 13C7-1-5.

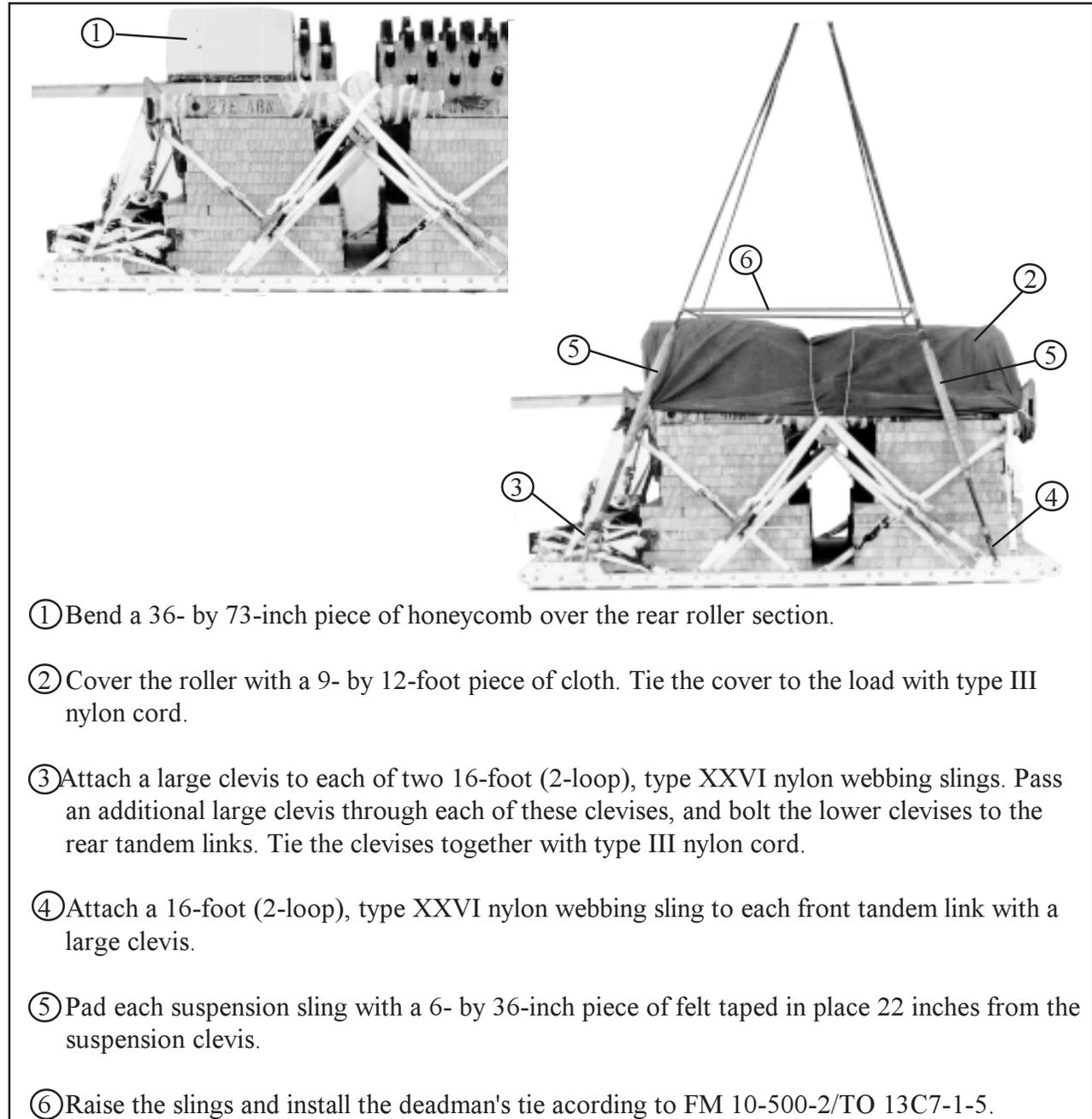


Lashing Number	Clevis Number	Instructions
1	1	Pass lashing: Around frame, right side.
2	1A	Around frame, left side.
3	2	Around rear side of center frame.
4	2A	Around rear side of center frame.
5	3	Around rear side of center frame.
6	3A	Around rear side of center frame.
7	4	Around end bar of frame, front.
8	4A	Around end bar of frame, front.
9	5	Around end bar of frame, rear.
10	5A	Around end bar of frame, rear.
11	6	Around front side of center frame.
12	6A	Around front side of center frame.
13	7	Around front side of center frame.
14	7A	Around front side of center frame.
15	10	Around end bar of frame, rear.
16	10A	Around end bar of frame, rear.

Figure 11-8. Roller lashed

### 11-8. Covering Roller and Installing Suspension Slings

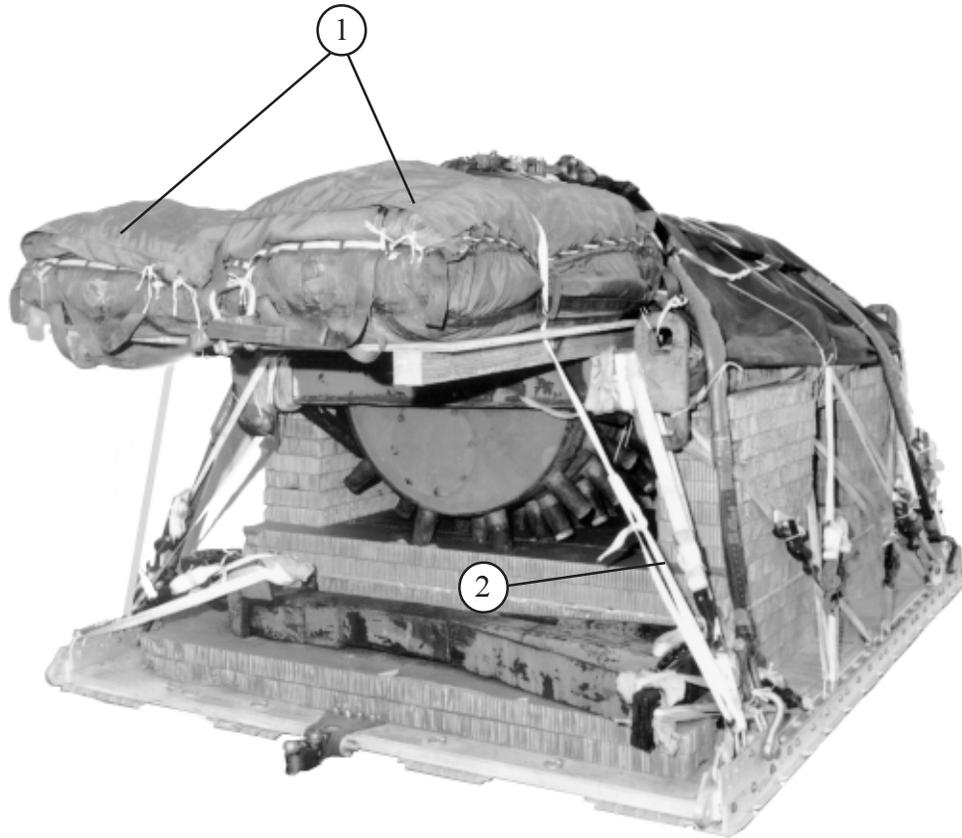
Cover the roller and install the suspension slings as shown in Figure 11-9.



*Figure 11-9. Load cover and suspension slings installed*

### 11-9. Installing Cargo Parachutes

Install two G-11 cargo parachutes according to FM 10-500-2/TO 13C7-1-5 and as shown in Figure 11-10.

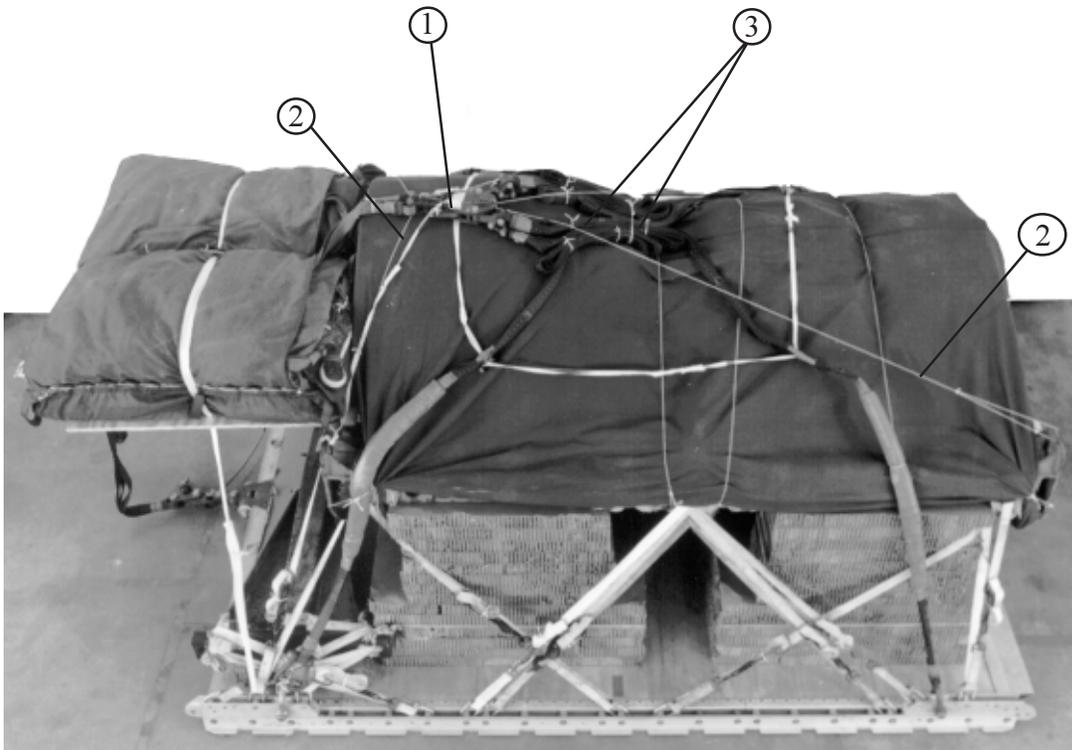


- ① Prepare and install two G-11 cargo parachutes.
- ② Restrain the parachutes to clevises 10 and 10A.

*Figure 11-10. Parachutes installed*

### 11-10. Installing Parachute Release

Install an M-1 cargo parachute release according to FM 10-500-2/TO 13C7-1-5, and as shown in Figure 11-11.

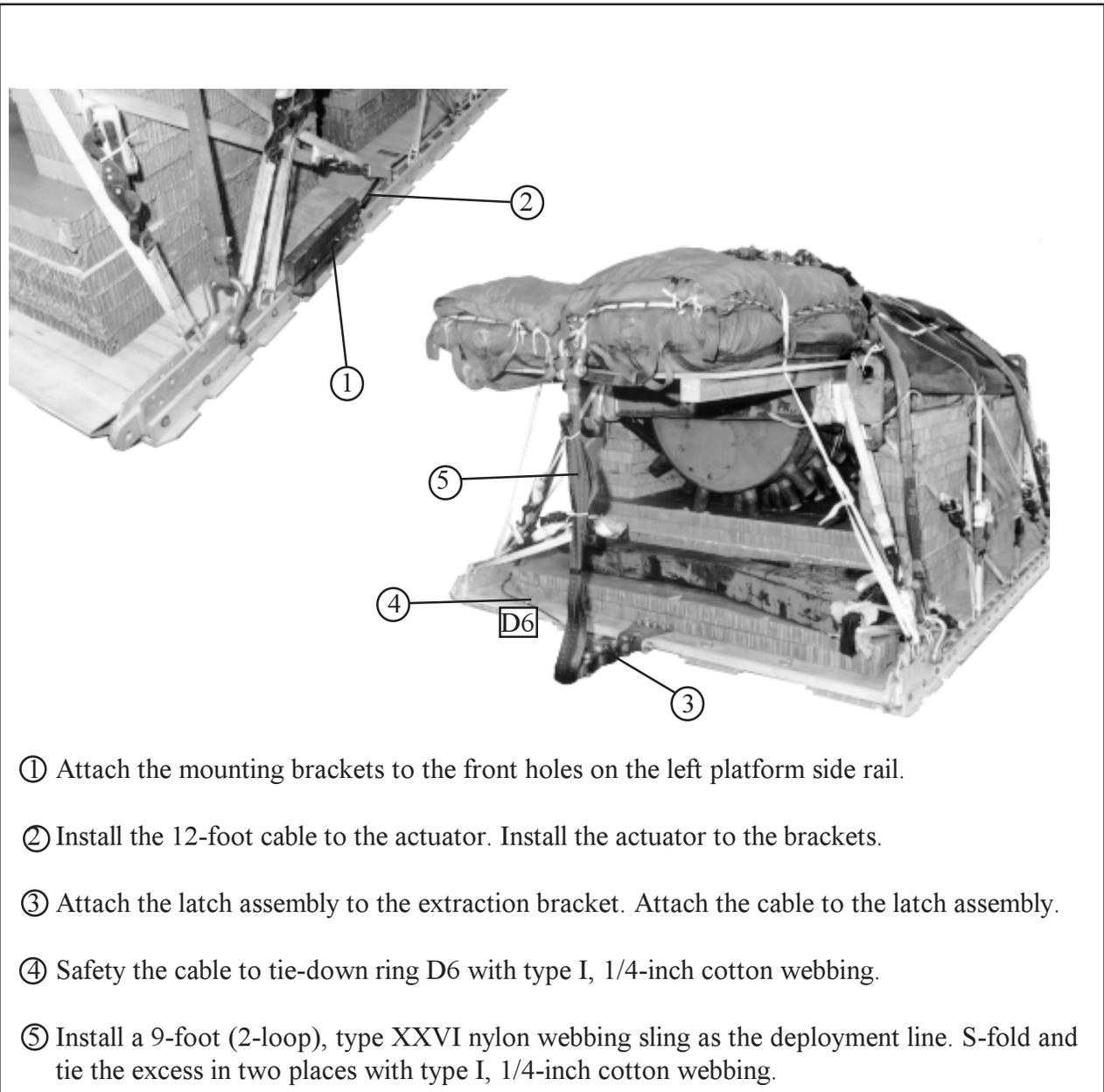


- ① Prepare an M-1 cargo parachute release assembly. Center the release on the rear roller section.
- ② Secure the release to the roller frame with type III nylon cord.
- ③ Fold the suspension slings. Tie the folds with type I, 1/4-inch cotton webbing.

*Figure 11-11. M-1 release installed*

### 11-11. Installing Extraction System

Install the EFTC extraction system according to FM 10-500-2/TO 13C7-1-5, and as shown in Figure 11-12.



- ① Attach the mounting brackets to the front holes on the left platform side rail.
- ② Install the 12-foot cable to the actuator. Install the actuator to the brackets.
- ③ Attach the latch assembly to the extraction bracket. Attach the cable to the latch assembly.
- ④ Safety the cable to tie-down ring D6 with type I, 1/4-inch cotton webbing.
- ⑤ Install a 9-foot (2-loop), type XXVI nylon webbing sling as the deployment line. S-fold and tie the excess in two places with type I, 1/4-inch cotton webbing.

*Figure 11-12. EFTC installed*

**11-12. Installing Provisions for Emergency Restraints**

Select and install provisions for emergency restraint according to the emergency aft restraint requirements table in FM 10-500-2/TO 13C7-1-5.

**11-13. Placing Extraction Parachute**

Select the extraction parachute and extraction line needed using the extraction line requirements table in FM 10-500-2/TO 13C7-1-5.

Place the extraction parachute and extraction line on the load for installation in the aircraft.

**11-14. Marking Rigged Load**

Mark the rigged load according to FM 10-500-2/TO 13C7-1-5 and as shown in Figure 11-13.

If the load varies from the one shown, the weight, height, CB, tip-off curve, and parachute requirements must be recomputed.

**11-15. Equipment Required**

Use the equipment listed in Table 11-1 to rig this load.

**CAUTION**

**Make the final rigger inspection required by FM 10-500-2/  
TO 13C7-1-5 before the load leaves the rigging site.**

**Rigged Load Data**

Weight	9,760 pounds
Maximum Weight	9,900 pounds
Height	82 inches
Width	108 inches
Length	173 inches
Overhang Front	5 inches
Rear	24 inches
CB (from front edge of platform)	71 inches
Extraction System (adds 18 inches to length of platform)	EFTC

*Figure 11-13. MDG 96 sheepsfoot roller rigged for low-velocity airdrop on a type V platform*

Table 11-1. Equipment required for rigging MDG 96 sheepsfoot roller for low-velocity airdrop on a type V platform

National Stock Number	Item	Quantity
1670-00-162-4981	Adapter, coupling, EFTC	1
8040-00-273-8713	Adhesive, paste, 1-gal	As required
4030-00-090-5354	Clevis, suspension, 1-in (large)	7
8305-00-242-3593	Cloth, cotton duck, 60-in	As required
4020-00-240-2146	Cord, nylon, type III, 550-lb	As required
1670-00-434-5783	Coupling, airdrop, extraction force transfer with cable, 12-ft	1
	Cover:	
1670-00-360-0328	Clevis, large	1
1670-00-360-0329	Link, type IV	3
8135-00-664-6958	Cushioning material, packaging, cellulose wadding	As required
1670-01-183-2678	Leaf, extraction line (line bag)	2
	Line, drogue (for C-17)	
1670-01-062-6313	60-ft (3-loop), type XXVI	1
	Line, extraction:	
1670-01-062-6313	60-ft (3-loop), type XXVI (for C-130)(Use w/ 140-ft for C-5)	1
1670-01-107-7651	140-ft (3-loop), type XXVI (for C-141B,C-5, or C-17)	1
	Link assembly:	
1670-00-783-5988	Type IV	3
	Two-point:	
5306-00-435-8994	Bolt, 1-in diam, 4-in long	2
5310-00-232-5165	Nut, 1-in, hexagonal	2
1670-00-003-1954	Plate, side, 5 1/2-in	2
5365-00-007-3414	Spacer, large	2
	Lumber:	
5510-00-220-6448	2- by 6- by 36-in	1
5510-00-220-6274	4- by 4- by 96-in	2
5315-00-010-4659	Nail, steel wire, 8d	As required

Table 11-1. Equipment required for rigging MDG 96 sheepsfoot roller for low-velocity airdrop on a type V platform (continued)

National Stock Number	Item	Quantity
1670-00-753-3928	Pad, energy-dissipating (honeycomb) 3- by 36- by 96-in	20 sheets
	Parachute:	
	Cargo:	
1670-01-016-7841	G-11B	2
	Cargo extraction:	
1670-01-063-3716	22-ft	1
	Drogue (for C-17)	
1670-01-063-3715	15-ft	1
	Platform, airdrop, type V, 12-ft	
1670-01-353-8425	Bracket assembly, coupling	(1)
1670-01-162-2372	Clevis assembly, type V	(22)
1670-01-162-2376	Extraction bracket assembly	(1)
1670-01-162-2381	Tandem link assembly (Multipurpose link)	(4)
5530-00-128-4981	Plywood, 3/4-in:	3 sheets
	48- by 60-in	(1)
	48- by 83-in	(2)
1670-01-097-8816	Release, cargo parachute, M-1	1
	Sling, cargo, airdrop	
	For suspension:	
1670-01-063-7761	16-ft (2-loop), type XXVI nylon webbing	4
	For lifting:	
1670-01-062-6304	9-ft (2-loop), type XXVI nylon webbing	6
	For deployment:	
1670-01-062-6304	9-ft (2-loop), type XXVI nylon webbing	1
	For riser extension:	
1670-01-062-6302	20-ft (2-loop), type XXVI nylon webbing	2
1670-00-040-8219	Strap, parachute release, multi-cut, comes w/ 3 knives	2
7510-00-266-5016	Tape, adhesive, 2-in	As required
1670-00-937-0271	Tie-down assembly, 15-foot	26
	Webbing:	
8305-00-268-2411	Cotton, 1/4-in, type I	As required
8305-00-082-5752	Nylon, tubular, 1/2-in	As required
8305-00-263-3591	Type VIII	As required